

## **BBS Conference Messages**

**October 25, 1995**

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## 3D Development

9/7/95 2:27 PM  
3D Development  
Administrator  
News

We have just added a new conference on the BBS called 3D Development. This conference is a non-Sony sponsored forum therefore, we will not promise responses here. This area is for the Developer's use and is non-PSX specific.  
Enjoy

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9/8/95 10:04 AM

Time to Break-in the folder!

chris m. coffin  
3D Development  
Carl Ferreira

Since Carl liked the idea I posted in LIBGTE and it's more towards general 3D than PSX I'll put it here to break-in our new folder (With some revisions and to be more readable since I was in a rush before)

>Here's a method that has worked for me in the past. You can create a 3D polygon dome or cylinder with texture mapped facets to represent your skyline. Build it with shared vertices quads of course :) >Improvements could be gouraud shading facets on dome to show a gradation skyline instead of texture mapping or both :)

>Translate the dome's center point to your camera's location, transform it and then draw it before and completely separate of your 3d terrain it will work fine.

>Make sure you don't light the dome and since you're always at its center it won't shimmy when you move through the world. This method works flawlessly provided the dome has enough facets and its size is reasonably small. There are other ways but they are not true 3D which is what you wanted.

A cylinder with a polygon 'lid' works as long as its color is the same as the topmost color of the faceted sides topmost pixel color where it joins the lid. A dome works best when you map clouds in it starting above your normal skyline towards the dome's top so when you look up it looks extremely 3D :)

Hope this helps, chris :)

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9/8/95 4:47 PM

3D Recommendations ?  
John Brandwood  
3D Development

What 3D package(s) are people using out there ?  
Is 3D Studio the best choice ?  
How do LightWave and TrueSpace compare, if at all ?  
Thanks, John.

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9/10/95 12:09 PM

Re: 3D Recommendations ?  
chris m. coffin  
John Brandwood

### 3D Development

My personal preference is Truespace 2.0 which I use for modeling because of its deformation tools allowing more organic style modelling and easier manipulation. It models in quads which is a big plus and you can even color polygon vertices for gouraud shading :)

For texture mapping my models I export them to the Sony version of Truespace(1.0) where I apply my texture maps (TIM files). It saves out to RSD/GRP/PLY/MAT format which makes things easier.

We tried using 3D studio but model/texture conversion was more drawn-out and burdensome with no quad modelling possible or vertices coloring for gouraud shading !!! 3D studio is nowhere near AUTOCAD accurate so you'll probably have trouble modelling to exact proportions even with snap mode on. The 3D studio plugin sux also.

Truespace is a better choice because it runs in Windows 95 and your artist can create/edit texture maps in Adobe Photoshop, save out to TIM format (using the TIM plugins) and switch back over to Truespace and render with the new TIM textures right away! I can't begin to express how good this setup is!!!!

If your artists haven't used Truespace before it's pretty easy to pick up. It's cheaper than 3D studio too :)

The main reason I model my geometry in 2.0 because the Sony version does not have a flat plane primitive (you have to chop up a cube in the sony version) and there are more modelling tools. Just using the sony version however produces good results.

If using Truespace 2.0 to model : Just dont apply any texture maps until it's put into the sony version. Truespace 2.0 will not be able to recognize an object file from the sony version with TIM texture maps applied so keep an untextured copy of your geometry backed up. (you can have vertices painted and flat color applied)

Hope this helps :) (I'm not a 3D studio hater or anything its just not well suited to sony development)

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9/13/95 7:14 PM

Re(2): what's wrong with GsLib?

Blake E. Senftner

David W. Marshall

3D Development

>> I have limited knowledge of PMD's, but I think they are only >> good if you don't need to do lighting.

I should have said this in my last posting...

PMDs are:

a double buffered set of rendering primitives, grouped by their rendering primitive type.

For example, a sphere model might be composed of quad and triangle polys, some textured, some not. The PMD would be four banks of rendering prims. as such: 1 bank of flat quads 1 bank of flat triangle polys 1 bank of flat textured quads 1 bank of flat textured triangle polys. Each bank of rendering primitives is two complete sets, one for sorting and one for the GPU to access async.

The verticies are organized by faces, and one set of poly verts per each pair of rendering prims. At first I was concerned that the verticies were organized by face, meaning that shared verticies are calculated for each face they share... but the bottle neck is not vertex calculations, it's setting the UVs and other fields in a rendering prim... so now I don't care about the repeated vertex calcs. In a PMD, all the UVs and other fields are set at PMD creation before the data is mastered, so our apps do not have to set these fields at all...

The rendering prims are grouped together by their type so that the logic that places them into the ordering table needs little to no conditional logic when operating on each different primitive type. The logic just knows "here's 10 poly\_ft4s..." rather than "next primitive is? so now I do..."

FYI.

-Blake

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9/13/95 11:37 AM

what's wrong with GsLib?

Blake E. Senftner

3D Development

Since no one else seems to be starting any threads here...

What is it about GsLib that some people, who take the tone they speak for everybody, dislike it so much?

From what I can tell, GsLib has four basic components: a hierarchy structure: the GsCoordinate2 a camera transform: GsView2, or other form that converts to this internally object types: TMD (bad) PMD (very good) assorted geometry/sorting routines for messing around with the above If one wants a different hierarchy structure than provided, there is nothing to stop one from using it, our own code sets the matrices into the GTE, so one could just put their own...

The camera transform is a bitch, but we were able to figure out what they were doing, and I posted that somewhere on the BBS awhile ago. Eventually, after testing various flavors of our own camera, we went back to just using the GsLib routines that calculated it.

The object types are quite a bit of overkill... I'm hoping that our compiler/linker is able to link out the routines that are not being called. I've asked for the different PMD sorting routines (which are assembly) to be each compiled into separate files, if that's what it takes for the linker to work smart. But basically, the PMD object type is a pretty optimized means of dealing with the rendering primitives. I'd like to hear of a better one.

The assorted geometry routines are just that, they don't really depend on the rest of the GsLib to be used.

Well, how's this for stoking a few fires? anyone else?

-Blake

flame retardant disclaimer: I don't really know if my methods are the best, or even very good, I just know that they're working and we've moved into different things beyond getting our 3D operating. I'm interested in hearing other peoples solutions and methods to this common problem.

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9/13/95 3:27 PM

Re: what's wrong with GsLib?

David W. Marshall

Blake E. Senftner

3D Development

I have limited knowledge of PMD's, but I think they are only good if you don't need to do lighting.

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9/13/95 6:38 PM

Re(2): what's wrong with GsLib?

Blake E. Senftner

David W. Marshall

3D Development

>> I have limited knowledge of PMD's, but I think they are only >> good if you don't need to do lighting.

True, the PMD model type was created for situations where lighting can be predetermined...

But for many situations, that is the case.

Also, there is nothing to stop one from going into the PMD and doing lighting calculations. The real advantage of a PMD is its nature of being based upon rendering primitives, and the routines that place them into the ordering tables are assembly.

For example: both Ridge Racer and Tekken use PMDs. That's where they came from, when Sony was working with Namco to get Japan launch titles completed, PMDs were the result of their cooperation.

-Blake

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9/14/95 10:24 PM

Re(3): Line drawing speed? (And quad speed)

Dr. Cat

Bugs

LIBGPU

> Nice idea but even with placing a line texture around the polys edge you'll still get texture mapping distortion.

I actually was using that approach on the Saturn (am I the only one here simultaneously coding the same title for Saturn and Playstation both? And on a tight deadline, yet!) and got some nasty distortion. Which is why I went to actual line drawing there, which they have a nice primitive for. The only reason I was considering this approach on the Playstation is the possibility it might be faster.

It looks like the problem I was having wasn't necessarily a speed problem so much as perhaps some kind of low level timing conflict in the hardware or in the Sony libraries. My code currently has a 4 level ordering table. If I put the first batch of 121 LINE\_F4 primitives in table 2, and the second batch in table 3, I get flicker and a few missing lines. If I swap that, putting the first batch in table 3 and the second batch in table 2, everything works fine. I have no idea why.

I needed to make some changes to this whole driver anyway, and I'll be putting the whole batch of 242 into the same ordering table. I hope THAT works ok!

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9/14/95 5:52 PM

Re(4): what's wrong with GsLib?

Blake E. Senftner

Carl Ferreira

David W. Marshall

All right! now we have a conversation going...

Carl says:

>> My basic gripe about the GS library (and no, I certainly don't speak for everyone) is that there is no source code.

I agree, this is a major problem with any software. In fact, my being at my company is exactly for this reason. We wrote all our own modeler, animation, rendering and compositing software because when you are under deadlines, and the software you depend upon does not work... you are shit out of luck!

>> Writing games is usually an exercise in pushing the hardware to its limits, and if you think you can do that with a generic library you >> are mistaken. LIBGS has to be all things to all people and if you want to add functionality or remove unnecessary operation (or >> unused code for size restrictions) you are SOL.

As far as this goes, the GsLib should not be described as a "generic library" intended for all purposes. It's an implementation of the Painter's algorithm for fast basically 2D rendering. I should let on that I worked at Sony for a brief time, and during that time I went to Japan and worked with the authors of the GsLib. My brief opportunities to see the GsLib's source code were not unpleasant. The engineer doing the low level geometry routines came from a real time video paintbox background, and the other engineers were all veteran 3D programmers. The code that I saw was tight, with nothing present inside a routine beyond that routine's purpose.

>> The GS library is fine to get a program running somewhat quickly, but without source code...

I agree that a black box is a scary object to place one's trust in. All I can say there is that I've seen inside the black box, and what I saw I liked very much. (More background, I've been writing 3D software since '85 when I was staff at the Boston University Graphics Lab. I've done animation languages, scanline & raytraced renderers, stochastic post processors and quite a few scientific animations. I feel like I know 3D methods quite well, and what I saw under the GsHood was very smart.)

>> Also, there's no telling how much overhead is involved with making a GS function call. Who knows WHAT is being done when a call >> is made. To add functionality, how do you know what low-level calls might be compatible with the high-level ones?

From what I saw, when you make a GsLib call, nothing extra occurs. For example, the hierarchy calculation routine is very fast, and only calculates the minimum required matrix for each object passed. When I was at Sony, we caught a bug in that routine and I was able to help them debug what looked like a very over-complicated algorithm; what it turned out to be was one of the most optimized hierarchy concats I've every seen. The error was one of those "off my one" calculations, which is now fixed and worked correctly.

After my experiences working on games these last several years, I've come to fear ANYONE'S software, including members of my own team as far as "who knows what's going on when I make a subroutine call." The library authors at Sony are an exception to that feeling. They are the best Japan has to offer, and Sony has the power to insure that fact. (\$\$\$)

>> What is Sony thinking by not releasing the source to the GS library? Are they afraid that some competitor will create a chip which >> works like the Playstation just so the GS convolutions around the hardware will work on their system? Get real.

The people that make this policy are not technologists; they are business managers that do not understand software, nor the software creation process. As far as that goes, DOES YOU OWN BOSS UNDERSTAND SOFTWARE? Few do. Many former engineers don't anymore, after the advances the industry has made these last two years. This brings up the reason I'm not at Sony anymore... they're a hardware company that is just beginning to understand software, its value is understood, but not its creation process. The PSX is a great little piece of engineering, but I had to leave them to make the software that I knew the machine was capable of.

>> And to add injury to insult, I hear that Sony is spending their development time optimizing the GS library IN ASSEMBLY while leaving >> the 'low-level' library calls in C?!?!? What the hell kind of logic is that?

The assembly routines are the sorting operations that place rendering primitives into the ordering table. These routines may be used without the GsLib. In fact, almost any component of the GsLib stands alone and may be used with or without the rest of the GsLib. The low level routines being left in C are the initializers for GsCoordinate2 structs and such; low level routines that are only called once or very few times. The assembly routines are the ones called every refresh.

>> Sony -- Post the damn code for GS, optimize the low-level stuff and leave the programming to us!

Carl, I'd like the source code too, but don't make the mistake thinking that Sony's engineers don't know what they're doing.

Now, not to insult anyone, I still have not heard a valid criticism of the GsLib's methods, only attacks against it's politics. Does anyone have IMPROVED techniques beyond the optimizations of PMD models, and Sony's hierarchy calculations? I read on the BBs about the Descent team's b-tree method they're using instead of the ordering table... how fast is that? any negatives encountered with that scheme?

-Blake

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9/14/95 7:45 AM

Re(3): what's wrong with GsLib?

Carl Ferreira

Blake E. Senftner

David W. Marshall

OK. You asked for my gripes and here they are!

[start flame]

My basic gripe about the GS library (and no, I certainly don't speak for everyone) is that there is no source code.

Writing games is usually an exercise in pushing the hardware to its limits, and if you think you can do that with a generic library you are mistaken. LIBGS has to be all things to all people and if you want to add functionality or remove unnecessary operation (or unused code for size restrictions) you are SOL.

The GS library is fine to get a program running somewhat quickly, but without source code...

Also, there's no telling how much overhead is involved with making a GS function call. Who knows WHAT is being done when a call is made. To add functionality, how do you know what low-level calls might be compatible with the high-level ones?

What is Sony thinking by not releasing the source to the GS library? Are they afraid that some competitor will create a chip which works like the Playstation just so the GS convolutions around the hardware will work on their system? Get real.

And to add injury to insult, I hear that Sony is spending their development time optimizing the GS library IN ASSEMBLY while leaving the 'low-level' library calls in C?!?!? What the hell kind of logic is that?

Sony -- Post the damn code for GS, optimize the low-level stuff and leave the programming to us!

[end flame]

Carl

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9/14/95 11:31 AM

Re(2): Line drawing speed? (And quad speed)

chris m. coffin

LIBGPU

Dr. Cat

>>Since you are drawing a grid, perhaps drawing POLY\_FT4s using a texture that was transparent apart >>from >>a line around the edges might be faster than drawing lines? Nice idea but even with placing a line texture around the polys edge you'll still get texture mapping distortion. Also, the width of the grid line would be dictated by the texture size used (you'd have to use 64x64 4bit to get decent results). Using polys would be more storage too. Your grid lines would not be uniformly sized either because they are a texture on a poly with its line size dictated by distance from camera with grid lines falling out in the distance.

I believe the line approach is better because it produces nice uniform results with no line fallouts and you could color the lines based on distance from the camera giving a nice feeling of depth (you could take it to the extreme and use LINE\_G4 and set the point colors using the same approach for best results) Polys might be faster but their weaknesses to this specific application outweigh any speed increase they might have over lines in my opinion. Chow, Chris :)

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9/15/95 2:02 PM

Re(5): what's wrong with GsLib?

Dave R. Scheele

Blake E. Senftner

3D Development

>> Does anyone have IMPROVED techniques beyond the >> optimizations of PMD models, and Sony's hierarchy >> calculations?

Sure ... I'm using a technique that is not GS-compatible, and thus cannot use any GS lib drawing calls. I think it's an improvement over what Sony has given, because it uses less memory and is not significantly slower. I'm using what is basically a single-buffer PMD. I can't use actual PMDs because they're too big. Only half (or so) of the primitives in my game get drawn each frame (the rest are back-clipped or behind the camera), so I have a master copy of all of them and a scratchpad where only the changed elements of poly's that will be drawn are stored. A quick little routine (soon to be in assembler) copies the fields back into the master as soon as when the GPU is done with it, and off it goes to the GPU again. I've saved enough memory to allow much more complex models, and the game looks better because of it.

Now, if someone can tell me how stupid I am and show me how to do this using the GS library, GREAT!! I've avoided the GS because there was always some stumbling block to using a routine from there, and have ended up over time looking at it less and less. If it can do what I do, please tell me!

In the meantime, my comments on Carl's points:

>> 1) No source

I would like source, because then I could pull the PIECES of code that fit my application, and use them to make it faster. For example, I'd like to know how the PMD etc. calls build their OT's. If I could create a GS-compatible OT, I could use some GS drawing calls. I could probably figure out how by studying the documentation and creating test programs, but that takes time I haven't been able to spare yet. If I knew I could do such a thing, I could stop experimenting and start coding my game.

>> 2) Little or no explanation of what each function >> call does or how it works

Yes, detailed explanations would help me write my own equivalent pieces where necessary, without showing me source code. This point will probably be addressed in the future by Sony. I imagine they have just been too busy to really polish the documentation. To be honest, I wouldn't want that job!

>> 3) No explanation of how to extend functionality > such as support for data structures other than > TMD and PMD.

I wish I could use GS drawing routines on my buffers instead of PMD's double-buffers... how's that for an example?

>> 4) Mixing low-level calls into the GS library (or at >> least using the Gs prefix) without clearly >> identifying them.

Since I don't know much about how GS works as a whole, I find it "safer" to avoid it entirely rather than use bits and pieces of it combined with bits & pieces of low-level. I don't know how much time I've lost because of this (it would be nice to just "cheat" & use GS ...), but I do know my routines are exactly specific to my application. Another example besides the polygon buffering above is my camera routine, which is very different from the GS view stuff. It does what I need, and no more, with a minimum of data space used.

Does any of that make sense, or am I just showing everyone how little I know about GS??? :)

Dave

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9/15/95 2:13 PM

Re(6): what's wrong with GsLib?

Blake E. Senftner

Dave R. Scheele

3D Development

>> >> Does anyone have IMPROVED techniques beyond the >> >> optimizations of PMD models, and Sony's hierarchy >> >> calculations?

>> Sure ... I'm using a technique that is not GS-compatible, and thus cannot use any GS lib drawing calls. I think it's an improvement >> over what Sony has given, because it uses less memory and is not significantly slower. I'm using what is basically a single-buffer >> PMD. I can't use actual PMDs because they're too big. Only half (or so) of the primitives in my game



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I'd say that you have a memory optimization that improves beyond what GS can do. PMDs work very well for my purposes, because I've already removed back faces that would never be rendered because of my situation/context in the game. But for your situation, with sounds like a rather general 3D problem, you know that 1/2 of your polys will be clipped, so you only keep storage for one set, and you're still able to double buffer. I like it.

How's your OT not GS comparable? Is it a hash based OT like Sony's , or are you using b-trees or something other sorting means?

-Blake

9/15/95 8:46 PM

Re(7): what's wrong with GsLib?

Dave R. Scheele

Blake E. Senftner

3D Development

>> >> >> Does anyone have IMPROVED techniques beyond the >> >> >> optimizations of PMD models, and Sony's hierarchy >> >> >> calculations?

3 deep! Cool!

>> >> (discussion of my hack .. blah blah .. read it in the earlier post.

>> I'd say that you have a memory optimization that improves beyond what GS can do.

Is this not, then, the improved technique you asked for above? It is, in fact, the application of a specific solution to a specific problem. I'm sure that the GS lib is excellent at what its designed to do, as you stated in your earlier post. It's just not what I need to do, and thus I can't use it. Bummer.

>> for your situation, which sounds like a rather general 3D problem,  
^^

your words, my emphasis ... read on ...

>> you know that 1/2 of your polys will be clipped, so you only keep >> storage for one set, and you're still able to double buffer. I like it.

Thanks. It hit me when I was staring at the "Number of polys rendered" output I had on my screen for about 2 months of testing. After seeing it that many times, I realized that it was never above 1/2 the total number of polys, and often only about 1/3 that number.

Anyways, as you said yourself, my situation is a rather general 3D problem, but I can't use the "general" library Sony provided. This is what irks the people who are griping, I think. GS has so much good stuff, but many of us can't/won't use it because it's just slightly different from what we want to do. If Sony published source to GS, I could make the slight modifications to it to use my structures, etc., and have much better performance than I'm getting now, I'm sure. As it is, I spend weeks testing, experimenting, optimizing, etc. until I get acceptable results. This means longer development times, which translates into a lower number of games coming out for the PSX, or lower quality games if people just give up trying.

And yes, you could attribute this to simple programmer laziness. Aren't we all? ;-) However, we also typically like efficiency, and the current situation is very inefficient. "So share your own code, programmers", the cry went up. Sure, great idea, but people who slaved weeks and months to get the perfect camera routine, or 165,000 lit gouraud shaded colored/textured polys/second, don't want to give up something that cost them so much. (I've heard this gripe on the Internet, not here, but in a PSX-related discussion). Its a catch-22.

That's why I've ended up rolling my own everything. Performance matches fairly well with what I've heard people are getting with GS, and I know it's as good as it's gonna get (or where to

improve it). There's no "black box" to worry about.

GS is great for what it was designed for. If you're doing something different, you're out of luck. Sony won't provide source code, and I can see some valid reasons for that. The next best thing would be providing it in a much more modular manner, where the pieces (ot's, draw routines, camera routines, whatever) stand completely on their own, come in several flavors (e.g. single buffer, double buffer ..hint, hint!), and are thoroughly documented. This is probably the direction Sony's heading in (they'd be silly not to), but it will take time.

>> How's your OT not GS compatible? Is it a hash based OT like Sony's, >> or are you using b-trees or something other sorting means?

Uh, hehe .. it IS Sony's, it's the good old GTE/GPU OT -- nothing simpler than "ulong OT[4096];" is there? I looked at the GsOT\_TAG, GsOT, GsSortxxx to register stuff, "typical Z offset"s, etc., and between the sketchy documentation and the BBS discussion at the time of how slow (and buggy?) GsSortxxx et al were at the time, I decided to shelve the whole thing until later. The GPU/GTE order table was just too easy and quick to implement; I couldn't be bothered with all the baggage the GS routines seem to have. If/when I have the time, I do plan on researching the stuff because getting my own version of an OT to work in a similar way may let me start to use the PMD routines, which I've heard are "the fastest way to get [polygons] into an order table". This is attractive to me, and I will look into it, if/when I have time. Another alternative is to stick with the ulong[] format, but use some sort of radix thingy to get polys into it quickly. (did I just make a pun?)

Like I said before, this may all just be my ignorance of LibGS, and if there are ways to apply it, fill me in!!

Dave

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9/15/95 3:01 PM

Re(7): what's wrong with GsLib?

stephen chaplin

Blake E. Senftner

Carl Ferreira

To tell you the truth, the documentation that we are getting is unacceptably BAD. I mean, even on the PC/MAC, the documentation is in English! To tell the truth, we haven't coded for any consoles til now (with the Cyberia port for the Saturn and the Virtual Pool for the PSX). I kinda like the PC/Mac architectures, because they don't close you in (of course you pay for that with support issues). Hey, does anyone know if there is a better way to do 64-bit math than on the R3000? It is really slow (slower than a hypothetical 486-10Mhz). RISC processors were meant to have fast clock speeds, and 33Mhz just isn't cutting it!

Thanks, Romesh Prakashpalan Celeris Inc.

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9/15/95 2:03 PM

Re(6): what's wrong with GsLib?

Blake E. Senftner

Carl Ferreira

David W. Marshall

>> I suppose it all comes down to one major objection: DOCUMENTATION. >> I don't like using something when I don't understand how it works, how it manipulates data, and how to extend or modify its >> functionality.

I agree fully. Documentation is the key to this whole situation. I gotta admit, I've always worked for the companies that created the technology because of a very pessimistic view that the software industry was FUCKED when it came to explaining itself to itself. After becoming tired of the "oral tradition" towards documentation that most companies take, I stopped working for anyone but the hardware/standard creators.

Documentation is SO KEY, what is the problem? Sony's actually doing one hell of a lot better than 3DO did, and as far as that goes Philips, SEGA, and Nitwitendo. Even the Mac needs all the tech notes to get things straight. Windows? same boat. The Mac and PC have so many layers of reference to wade through, I very glad that these game consoles are single purpose directed.

But bitching gets us little beyond a temporary relief from wading through an ocean of black boxes that must be decoded for our work to continue...

Oh well...

-Blake

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9/15/95 9:22 AM

Re(5): what's wrong with GsLib?

Carl Ferreira

Blake E. Senftner

David W. Marshall

>> All right! now we have a conversation going...

Excellent!

[Selected conversation flow follows -- authors omitted]

>> Writing games is usually an exercise in pushing the hardware to its limits, and if >> you think you can do that with a generic library you >> are mistaken. LIBGS has to be all things to all people and if you want to add >> functionality or remove unnecessary operation (or >> unused code for size restrictions) you are SOL.

>> As far as this goes, the GsLib should not be described as a "generic library" intended >> for all purposes. It's an implementation of >> the Painter's algorithm for fast basically 2D rendering. Do you mean 3D or 2D? The library is designed to provide FULL support of PSX hardware at a high level. In attempting to address the needs of all people (lighting, primitive usage, etc.) the code is generic.

>> I should let on that I worked at Sony for a brief time, and during that >> time I went to Japan and worked with the authors of the GsLib. My brief >> opportunities to see the GsLib's source code were not >> unpleasant. The engineer doing the low level geometry routines came from a real >> time video paintbox background, and the other >> engineers were all veteran 3D programmers. The code that I saw was tight, with >> nothing present inside a routine beyond >> that routine's purpose.

The code may be tightly written for its purpose. BUT, what if its purpose goes beyond my needs? What if I don't NEED to consider all primitive types; what if I don't need lighting calculations, or what if I \*gasp\* want to perform different transform or lighting calculations? Because the GS library is generic in the sense that it attempts to handle the full functionality of the PSX even though someone may not need that full functionality, it WILL have unnecessary code which increases the program size and slows (who knows how little or how much) the program code.

>> The GS library is fine to get a program running somewhat quickly, but without >> source code...

>> I agree that a black box is a scary object to place one's trust in. All I can say there >> is that I've seen inside the black box, and >> what I saw I liked very much. (More background, I've been writing 3D software since >> '85 when I was staff at the Boston >> University Graphics Lab. I've done animation languages, scanline & raytraced >> renderers, stochastic post processors and >> quite a few scientific animations. I feel like I know 3D methods quite well, and >> what I saw under the GsHood was very >> smart.)

I actually do feel somewhat reassured about the GS library by hearing from someone who's actually seen the stuff. Still...

>> Also, there's no telling how much overhead is involved with making a GS function >> call. Who knows WHAT is being done when a call >> is made. To add functionality, how do you know what low-level calls might be >> compatible with the high-level ones?

>> From what I saw, when you make a GsLib call, nothing extra occurs. For example, the >> hierarchy calculation routine is very >> fast, and only calculates the minimum required matrix for each object passed. When >> I was at Sony, we caught a bug in >> that routine and I was able to help them debug what looked like a very >> over-complicated algorithm; what it turned out to >> be was one of the most optimized hierarchy concats I've ever seen. The error was >> one of those "off by one" calculations, >> which is now fixed and worked correctly. >> After my experiences working on games these last several years, I've come to fear >> ANYONE'S software, including members >> of my own team as far as "who knows what's going on when I make a subroutine >> call." The library authors at Sony are >> an exception to that feeling. They are the best Japan has to offer, and Sony has the >> power to insure that fact. (\$\$\$)

When you say that nothing 'extra' occurs, you mean that the function does 'only' what it is intended to do. This may be more or less than I need it to do. I'm not convinced that GS routines can be safely and effectively mixed with low-level routines. While I'm sure that you can add low-level routines which are self-contained, the process of added low-level functionality to extend GS routines sound to be a very iffy concept.

>> What is Sony thinking by not releasing the source to the GS library? Are they afraid >> that some competitor will create a chip which >> works like the Playstation just so the GS convolutions around the hardware will >> work on their system? Get real.

>> The people that make this policy are not technologists; they are business managers >> that do not understand software, nor the >> software creation process. As far as that goes, DOES YOU OWN BOSS UNDERSTAND >> SOFTWARE? Few do. Many former >> engineers don't anymore, after the advances the industry has made these last two >> years. This brings up the reason I'm not >> at Sony anymore... they're a hardware company that is just beginning to understand >> software, its value is understood, but >> not its creation process. The PSX is a great little piece of engineering, but I had to >> leave them to make the software that I knew >> the machine was capable of.

I agree that many bosses are so caught up in the corporate environment that they believe if someone shits that a patent should be obtained on the result. It is much the same situation as scientists vs politicians. The scientists (we engineers) feel that information should be shared (within reason) so that greater advances can be realized sooner -- acknowledging that there are proprietary limits to this policy. Politicians (managers and up) look at the whole world as US vs. THEM, and are of the opinion that anything WE create was wholly conceived within our political unit (country / company) from the invention of the lever on up, ignoring the fact that our work was built upon the work of others, and will form the basis (if we're good) of work that is yet to come.

>> And to add injury to insult, I hear that Sony is spending their development time >> optimizing the GS library IN ASSEMBLY while leaving >> the 'low-level' library calls in C?!?!? What the hell kind of logic is that?

>> The assembly routines are the sorting operations that place rendering primitives >> into the ordering table. These routines may be used >> without the GsLib. In fact, almost any component of the GsLib stands alone and may >> be used with or without the rest of the GsLib. >> The low level routines being left in C are the initializers for GsCoordinate2 structs >> and such; low level routines that are only called >> once or very few times. The assembly routines are the ones called every refresh.

This is not at all certain. The impression which I have been left with by Sony is that they are optimizing many facets of the GS library, in preference to the low-level libraries. While I agree that this argues strongly for adopting the GS library, it is obviously counter to standard optimization policies and does not benefit people who do not want to use the GS library (something which is under debate in this forum)!

>> Sony -- Post the damn code for GS, optimize the low-level stuff and leave the programming to us!

>> Carl, I'd like the source code too, but don't make the mistake thinking that Sony's >> engineers don't know what they're doing.

I never said that they didn't know what they were doing, but there's no getting away from the fact that a general purpose library (general purpose means supporting a wide range of

functionality) is going to be larger and slower than specialized code written with a very specific purpose in mind.

>> Now, not to insult anyone, I still have not heard a valid criticism of the GsLib's >> methods, only attacks against it's politics. Does >> anyone have IMPROVED techniques beyond the optimizations of PMD models, and >> Sony's hierarchy calculations?

No offense taken. I'm eager to explore this topic to gain better understanding between our camps. Who knows? I may even decide to use some of the GS calls myself some day...

Granted, I have a BIG problem with Sony's politics in: 1) Not releasing GS source; 2) Primarily supporting GS functions -- many times I've been told to do something using the GS library rather than getting information on how to do it with low-level calls; and 3) Optimizing the GS code over the low-level code. The documentation for all of the code is so sketchy that it is uncertain how to use some functions at all, let alone interface low-level calls safely with GS functionality.

It is difficult to criticize GsLibs methods because WE DON'T KNOW WHAT THE HELL THEY ARE!!!!!! That is my criticism. I'm supposed to put my faith in Sony that THEIR design is the best one for my game?!? I think not. If Sony won't release source to the GS library, then at LEAST explain in good, comprehensible English exactly what the GS library does and how it accomplishes its tasks.

Let me summarize my objections to the GS library: 1) No source 2) Little or no explanation of what each function call does or how it works 3) No explanation of how to extend functionality such as support for data structures other than TMD and PMD. 4) Mixing low-level calls into the GS library (or at least using the Gs prefix) without clearly identifying them.

I suppose it all comes down to one major objection: DOCUMENTATION. I don't like using something when I don't understand how it works, how it manipulates data, and how to extend or modify its functionality.

I appreciate your comments as well as those from anyone else having an opinion.

Carl Ferreira

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9/17/95 12:16 PM

vocabulary & 3D help

Shaival Varma

Dave R. Scheele

3D Development

FYI: ok, instead of saying "triangle polygon"... (follow me here for a sec...)

pentagon quadragon trigon <==

PS. a friend of mine came up with an algorithm for calculating vertex/vertices for 3d polygonal forms. If anyone can put it to use, i'll dig it up.

---

Can anyone suggest some good books that would be useful in learning the 3D programming environment (especially our sony env.)?

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9/18/95 1:58 PM

Re(3): vocabulary & 3D help

Mark Beardsley

chris m. coffin

3D Development

I guess 3d transformation math is what I'm looking for, and/or other general 3d info (not psx specific stuff). Yes, it's a pretty vague question, but since I don't know what I'm talking about, what else is there?

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9/18/95 11:39 AM

Re(2): vocabulary & 3D help

chris m. coffin

Mark Beardsley

3D Development

>>Yes, I would also love to find a good book or something on 3D programming techniques. Thats a pretty vague question... What specific aspects of 3D programming??? 3D hit testing? 3D Transformation Math? Texure mapping? Lighting? What do you exactly need to know??

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9/18/95 6:14 AM

Re: vocabulary & 3D help

Mark Beardsley

3D Development

Yes, I would also love to find a good book or something on 3D programming techniques. I've done several games on various platforms (even some psuedo-3d stuff), but have never before had the chance/need to to any real 3d transformation stuff before (and trying to understand the 2-page explanation of LIBGTE without the necessary foundation is just not possible). If anyone can recommend a simple/starting text, I'd appreciate it. I'm doing basically 2D stuff for this game, but I'm sure I'll need 3D for the next one. Thanks.

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9/18/95 5:18 PM

Re(2): 3D Recommendations ?

John Brandwood

chris m. coffin

3D Development

Sorry for the delayed reply, I've been suffering terrible troubles trying to get some stuff on our Saturn port working.

Thanks for the information about TrueSpace, it sounds more useful than I'd expected with its good integration with the Sony tools.

John.

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9/18/95 11:33 AM

Re(8): what's wrong with GsLib?

chris m. coffin

3D Development

Blake E. Senftner

GsLib isn't all that bad since it can get you up and running pretty quickly. Thats why sony made it in the first place. I was drawn to it in the beginning because they have truckloads of sample code for it.

[start bitching] Where the hell are the samples that use libGTE???? I find myself suffocating under the storage of PMD's and using LIBGS forcing me to go to a proprietary compressed format and using LIBGTE which is a lot nicer. I would like the source for LIBGS too (so I can butcher it for my own evil ends he he). I agree with Carl that creating a game means pushing the hardware to its limits and after screwing around with LIBGS I felt an extreme lack of true control over the hardware. I want to squeeze every last drop of power out of this machine and LIBGS doesn't cut it! I'm not saying programmers that use LIBGS suck or they're wussin out, I personally wont be content using it. Update the LIBGTE functions SONY! [end bitching] :) food

for thought: Do you think sony's own games use LIBGS????(I think NOT)

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9/18/95 3:58 PM

Re(2): vocabulary & 3D help

Mike McAulay

Blake E. Senftner

Shaival Varma

Foley and Van Damme is the standard starting point, with lots of bibliographical pointers to more in-depth treatments.

For 3D basics I recommend 3D Computer Graphics by Alan Watt, ISBN 0-201-63186-5. This book contains the best introduction to transforms, matrices, and spaces that I've seen.

Also invaluable are the Graphics Gems volumes, especially the first 3. (ISBNs 0-12-286166-3, 0-12-064481-9, 0-12-409673-5 respectively). Lots of goodies here. For instance, I got everything I need for a nice GTE camera module from a gem in Vol 1.

For a more thorough explanation of texture mapping, see Paul Heckbert's 1989 Master's thesis (available from UC Berkeley via FTP or hardcopy), and Digital Image Warping by George Wolberg (sorry, no ISBN). Wolberg has the only discussion of real-time perspective approximations that I've seen in print.

Need more? Surf the Internet to [rec.games.programming](http://rec.games.programming) and look for Brian Hook's 3D book review FAQ. He posts it semi-regularly. Or, find it archived somewhere, possibly [x2ftp oulu.fi](http://x2ftp oulu.fi). BTW, this site is chock-a-block with useful source snippets and docs related to all areas of game programming.

Hope this helps!

M.

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9/18/95 1:59 PM

Re: vocabulary & 3D help

Blake E. Senftner

Shaival Varma

Dave R. Scheele

The "standard" text is "Fundamentals of Interactive Computer Graphics", by J.D. Foley & A. Van Dam; Usually referred to as "Foley, Van Dam" by most readers, and any good technical book store will know it by this name also.

This book, 2nd edition now, covers almost everything from image processing, hierarchies, transforms, coordinate systems, graphics rendering pipelines, object models, light models, rendering methods and the programming of them all.

-blake

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9/19/95 8:32 AM

Re(10): what's wrong with GsLib?

Mark Beardsley

Carl Ferreira

chris m. coffin

If Ridge Racer was done with LibGs, how do you think they got the ground done, without the polys distorting when they approach the camera? Or is this a stupid question?

---

9/19/95 6:25 AM

Re(9): what's wrong with GsLib?

Carl Ferreira

chris m. coffin

3D Development

>I find myself suffocating under the storage of PMD's and using LIBGS >forcing me to go to a proprietary compressed format and using LIBGTE which is a lot nicer.

Just thought I would point out the the LIBGS formats are 'proprietary' also. There is NO hardware support for TMD or PMD formats -- just Sony inventing those formats for their 'high' level library.

>food for thought: > Do you think sony's own games use LIBGS????(I think NOT)

I could be mistaken, but I'm under the impression that Ridge Racer was produced using LIBGS.

Carl

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9/19/95 10:24 AM

Re(11): what's wrong with GsLib?

chris m. coffin

Mark Beardsley

Carl Ferreira

>>If Ridge Racer was done with LibGs, how do you think they got the ground done, without the polys distorting when they approach the camera? Or is this a stupid question?

They subdivide the hell out of the slice of road closest to the camera. (hence the cracks in the road during gameplay) The ground does distort as it approaches the camera but since most people play the game racing at 200mph so they don't see it happening. Try driving slow you'll see the distortion! If you drive straight up to a wall in the city in ridge racer the wall will pop out showing the large buildings behind it floating in space! Ugh! They may have used LIBGS but since they created it don't you think they'd tweak it according to the game application???? :)

---

9/20/95 10:38 AM

Ginsu those polys

chris m. coffin

LIBGPU

Shaival Varma

One more thing you can do to reduce warpage for those brick wall texture using people(not a good idea in the first place). Since the longest straight lines in a brick wall run horizontally(usually) from one end of the poly to another they will distort the most because the brick wall lines will point into the distance (assuming a doom style game). When drawn in 3D they will bend into WWWW.

The way to reduce warpage best for this type of situation is not to use a LIBGS style autodivide which uniformly divides a wall up (4x4 etc.) The way to go is to only slice the wall horizontally across (in the direction of those long brick lines). This method of dividing in one direction works best for specific style textures like brick walls/pipe textures. Hope this helps :)

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9/21/95 11:23 AM

Re: Object culling

Dave R. Scheele

Carl Ferreira

3D Development



>> Isn't there a better way to perform object culling?

Maybe you could just transform one point at the center of the object (I track a global x,y,z location of each of our objects), instead of the entire box around it, and allow some "slop" for large objects whose center is "behind" the camera but may have pieces sticking in front of it???

Dave

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9/21/95 3:25 PM

Re: Object culling

Jay Stelly

Carl Ferreira

3D Development

>At this time, I associate a 3D box with the object's local coordinates, transform those 8 points and see if any >of them either fall within the screen or cross the screen.

>Isn't there a better way to perform object culling?

Yes. Check out foley & van dam, pg. 275-276, clipping in Homogeneous coordinates. Basically, when you calculate the the World to screen matrix for the object, the translation matrix contains the object's center in camera relative coordinates. Precalculate the radius of the object and clip it against the canonical view, it's very simple. This will be a bit faster since you don't project any points. I use this method with much success.

Jay Stelly Tetragon

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9/21/95 12:45 PM

Re(3): vocabulary & 3D help

Shaival Varma

chris m. coffin

Mark Beardsley

[re: Good 3d development books]

What specific aspects of 3D programming??? 3D hit testing? yes 3D Transformation Math?

yes Texture mapping? yes Lighting? yes What do you exactly need to know?? yes

all dee above please senior.

-bretto

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9/21/95 8:07 AM

Object culling

Carl Ferreira

3D Development

I have a world which consists of many objects (each with their own coordinate system). Since it takes a significant amount of time to set up polys which are never displayed (off-screen) anyway, I would like to remove those objects which are outside of the viewing area.

At this time, I associate a 3D box with the object's local coordinates, transform those 8 points and see if any of them either fall within the screen or cross the screen.

Isn't there a better way to perform object culling?

Carl Ferreira

---

9/22/95 12:30 PM

Fog FX

chris m. coffin

Shaival Varma  
3D Development

FOG FX 9/22/95 ----- Here's some fog techniques I've come up with and thought I'd share since this is 3D development kind of stuff :) These methods seem easiest to implement if you're using LIBGTE(shove shove).

\*all examples assume x/y plane extends ahead/back/left/right with z going up/down

Generic Fog ----- Set a near and far RGB color for your fog. Loop through all visible polygons and set their RGB value based on Z-distance from the camera.

-A quick and dirty way to get z-distance which is sloppy is to find the sum of the x/y distance from the object center to the camera. -A quicker and dirtier method is to jump through your final OT and set the POLY RGB based on its position in OT. (Produces good to bizarre results depending on your world geometry)

Layered Fog ----- (Fog with a little twist) 1) Basically what you do is modify the base RGB color of a poly based on distance from an arbitrary PLANE in 3d space(ground level). Simply use the z value of a poly vertice to get the distance.

2) Then modify that base color based on distance from the camera using your near/far fog colors. This works good if you want to portray a water enviroment for example.

3) A further improvement would be to darken the far fog color based on how 'deep' you go.

z=16k \_\_\_\_\_ <light blue ( plane) | | (base color gets darker as it goes 'deeper') | V (visibility is less as you go deeper) z=0 \_\_\_\_\_ <dark blue (ground plane)

Gouraud Fog ----- Basically what you do here is apply the above techniques to the individual vertex RGB values producing smoother results than the poly based 'faceted'look.

Fog Abyss ----- This is where you just make a single pass through your world geometry and use the Layered Fog method using step 1 only making the ground plane black going to whatever color as it goes up.

Fog Cluster ----- Fog an area based on distance from a point in 3D space.

Anybody got any other versions/improvements? These methods can be further optimized of course. Hope this info is of use to you. Enjoy:) Chris

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9/25/95 6:31 AM

Re(2): 3D Recommendations ?

Sky Lounge

chris m. coffin

John Brandwood

>> For texture mapping my models I export them to the Sony version >> of Truespace(1.0) where I apply my texture maps (TIM files). >> It saves out to RSD/GRP/PLY/MAT format which makes things easier.

Where does one find the Sony version of Truespace?

Thanx,

Andy

---

9/25/95 12:04 PM

Re(2): TMD object Z order problems

chris m. coffin

Sky Lounge

3D Development

Make sure also that polygons in your model do not intersect each other since intersections of polys are not clipped like your 3D modeler program. If you're using humanoid 3D models make sure the polys around joints where limbs bend/intersect are small so there is less "poly sort pop"

A good way to sidestep the problem is to make the joints which are flat colored only (black for example) so you see no sorting errors around the body joints. (ZeroDivide by zoom(robot fighting game) for Playstation does this with good results) Hope this helps :)

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9/25/95 11:54 AM  
Re(3): 3D Recommendations ?  
chris m. coffin  
Sky Lounge  
John Brandwood  
From Sony of course ;) Chris :)

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9/25/95 11:26 AM  
Re: TMD object Z order problems  
Roy Eltham  
Sky Lounge  
3D Development  
The problem is not in the conversion or the TMD itself. It's in the rendering. Z sorting is done using the "average" Z value for the triangle/quad, because of this small polys in front of large polys will pop behind the large polys at some view angles.  
One way around this is to break apart the object into separate TMDs and render them separately, e.g. draw the head then draw the eyes. This can work for some cases but not for others. BTW, you have to use a separate OT for each piece or you'll end up with similar problems as drawing the object all at once.  
Roy Eltham Regal Productions

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9/25/95 6:26 AM  
TMD object Z order problems  
Sky Lounge  
3D Development

After having built some models in 3d studio and converting them down to TMD, I've noticed that in some of the models, the sorting of the polygons in the object have changed from some of the original models. In particular, in this humanoid object, the eyes do not always project in front of the main body objects. As far as the TMD is concerned, the eyes and body are actually part of the same object. I've checked if it's a "normals" problem, but it's not. I also tested several conversion paths (3DS->DXF->RSD, 3DS->RSD pcp, 3DS->RSD 3ds2rsd.exe) the results have been the same (or worse in the DXF conversion case).  
Has anyone experience this sort of internal polygon/vtx wrong sort with a single TMD object before?  
Thanx,  
Andy

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9/26/95 11:35 AM  
Re: Request for info on Truespace.  
Blake E. Senftner  
Christopher C. Rywelski  
Art Tools

I was only briefly exposed to Truespace for PSX, and during that time I only used it for trivial modeling. It had a few bad habits like when I'd be dragging a vertex around, if I dropped the vertex in the wrong place it would start subdividing the polygons to "allow" for the vertex to be located at that spot. This meant that I had to save my model before every vertex adjustment, just in case I dropped the vertex in a bad location I could restore to just before that. (Undo failed after the model had been subdivided.) It also had a habit of creating front and back polygons, when I only wanted front facing polygons- but that was supposed to be fixed... but I stopped using it.

Truespace is very difficult to model objects that do not have interior polygons, or interpenetrating polygons- and the PSX rendering scheme does not like such polygons, it causes polygon flickering.

My 2 cents.

-Blake

---

9/26/95 5:38 AM

Request for info on Truespace.

Christopher C. Rywelski

Art Tools

I have been trying to define a method to use 3D Studios here for our model creation for PSX data. Due to limitations in the 3ds2rsd util and the 3D Studio plug in (hey they are just betas) the following do not seem possible at this moment: - Tiling of textures. - Mapping of textures to an object. - Conversion of large models. (3ds2rsd will crash).

I have heard a little about the Truespace version for Sony and would like some more info on it. I have heard it has a way to output straight to RSD file format(s). If it can solve any of the above problems it would be very useful.

Therefore I would appreciate hearing from any Developer that has experience using Truespace or from anyone at Sony on this BBS that might be able to answer these and other questions about Truespace.

Questions: - What is the cost? - Does it properly handle tiling of textures and the conversion of this tiling to PSX RSD file format? - Does it properly handle mapping for textures and the conversion to PSX RSD file format? - Will it allow more than one mapping to be applied to an object? - Will Truespace import 3D Studio 3ds file format? - Will Truespace import DXF file format?

Thanks in advance.

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9/27/95 2:11 PM

Re(2): Request for info on Truespace.

chris m. coffin

3D Development

Christopher C. Rywelski

You should use Truespace(both sony's 1.0(rsd output) and the commercial 2.0 version). That's my 3 cents worth (no i don't work for Caligari ;) ) Here's the lowdown on it.

>>What is the cost? Cheaper than 3D studio ;) >>Does it properly handle tiling of textures and the conversion of this tiling to PSX RSD file format? NO! NOTHING DOES THIS

AUTOMATICALLY :( There is no way to infer tiling in your modeling data since UV mapping coordinates on the sony get turned into 0-255 :( Tiling has to be programmed into the transformation/link to OT process which means using LIBGTE ;) You have to store your tiling information separately since you can't directly 'tag' it onto your objects.

To tile you have to insert texture window primitives in your OT to tell the GPU to tile all subsequent drawing commands. Setting up texture the window primitive is slow and you pretty

much have to make one for each primitive since every primitive's tiling is unique and when another primitive gets placed in the list it probably just jumped in between 2 primitives that could have used the same texture window primitive! Errors in placing the texture window primitive are visually unpleasant! To say this is a pain in the butt is an understatement. If anybody knows a better way i'd like to know. Now back to your questions..

>>Will it allow more than one mapping to be applied to an object? Well...on a face by face basis no you can't even though caligari will let you slap 7 textures on top of each other. Basically you'll need to detach each face that needs to be specially textured, map it, then glue it back onto the parent object.

>>Will Truespace import 3D Studio 3ds file format? YES...but everything will be in triangles(yuck) so your models will take more data whereas you could have built them from quads in the first place using Truespace.

>>Will Truespace import DXF? YES. Also takes 3D studio ascii files as well

Hope this helps :)

---

10/2/95 12:06 PM

multiple pmd

cary hammer

3D Development

I'm not sure if this is a 3ds plug-in problem or a general programming problem, but here goes... We have multiple rectangular solids in 3ds (call them buildings) which we'd like to work with as a collection (call it city block). Unfortunately, the 3ds plug in spits out a separate rsd file for each building in our 3ds model instead of just one for the entire collection.

#1 - Is there some way of getting the 3ds plug-in to combine the 3ds objects of a single model into a single rsd file?

#2 - What is the best way to load and deal with multiple pmd files? All of the pmd sample routines seem to deal with a single pmd.

Thanks, Mark Nicely

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10/4/95 9:39 AM

Re(3): 3D Recommendations ?

Kristine Severson

Sky Lounge

chris m. coffin

The Sony version of TrueSpace is available from Sony. Give your Account Executive a call to place an order. I believe it is now priced below \$1000.

Kris

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10/4/95 12:27 PM

Re: Texture tools (UVs)

chris m. coffin

Tim Crossman

3D Development

UV's go 0-255(u\_char)

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10/4/95 2:58 PM

Re(5): 3D Recommendations ?

Kristine Severson

Silas S. Warner

Sky Lounge

Hmm...we don't have an upgrade path. You might talk to Caligari...see if they would refund your money. Or talk with your Sony AE...maybe they can cut you a special deal given the circumstances.

Kris

---

10/4/95 9:11 AM

Texture tools (UVs)

Tim Crossman

3D Development

Is anyone out there using artwork generated by MultiGen? I am having trouble converting the texture UVs provided by that program. I sure would like to know the limits of UVs in the PSX, considering there is virtually no mention of them in the documentation. Tim

---

10/4/95 4:06 PM

Re(6): 3D Recommendations ?

chris m. coffin

Kristine Severson

Silas S. Warner

FYI: You need BOTH Sony's caligari 1.0 from sony AND Version 2.0 (Truespace) which you get directly from caligari.

Using just one of these is not a good idea from my experience since 2.0 has MUCH better modeling/deformation tools. Sony's version 1.0 allows you to map with TIM files/Save to RSD and accurately see what you'll get on the playstation when converted.

The cost of both is less than a copy of 3D studio. Also version 2.0 has a 3D runtime mode which lets you model in textured/shaded mode (AWESOME!) Hey sony, how about making your version updated to 2.0 ? (PLEASE) :)

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10/4/95 2:29 PM

Re(4): 3D Recommendations ?

Silas S. Warner

Kristine Severson

Sky Lounge

>The Sony version of TrueSpace is available from Sony. Give your Account Executive a call >to place an order. I believe it is now priced below \$1000.

What do we do if we have already ordered Truespace directly from Caligari?

Silas Warner

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10/5/95 10:48 AM

Re(7): 3D Recommendations ?

David W. Marshall

chris m. coffin

3D Development

>>>and accurately see what you'll get on the playstation when converted.  
Does 1.0 of TrueSpace interface with the Artist board or the dev boards to let you preview your models in the Sony World?  
If not, what does the above comment refer to?  
thanks,  
dave

---

10/5/95 1:59 PM

Suggestions for making a PMD or TMD file?

Silas S. Warner

3D Development

Art Tools

Does anyone have suggestions for a tool that is not part of the Graphic Artist Tools, that will convert a 3DS or DXF file directly to a TMD or PMD file without going through the RSD stage? The RSD files are apparently only useful if working with the Graphic Artist tool, which we do not have. It would be far better to convert our DXF models directly to TMD or PMD data. If there isn't such a tool, I'll probably write one.

Silas Warner

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10/5/95 8:15 PM

Re(10): 3D Recommendations ?

chris m. coffin

David W. Marshall

3D Development

>>Do you know if TrueSpace generates G G polygons? These are Gouraud Gradation which >>contain 3 colors per poly.

YES. It does gouraud tris/quads and lets you paint a vertice at a time and see the results in truespace( Very cool! :)).

>>Does TrueSpace do animation or only modeling? If it does animation, does 1.0 save TOD >>format?

It does animation, but that is something best left to 3D studio. Does not save to TOD format :( Hope this helps :)

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10/5/95 12:00 PM

Re(8): 3D Recommendations ?

chris m. coffin

David W. Marshall

3D Development

It does not interface with the sony dev boards.

I'm referring to the texture placement on your models as viewed in truespace is the same when it ends up on the playstation.(Unlike 3D studio were this does not hold true all the time) When painting the object's vertices(gouraud shading) in truespace, what you see there is nearly exact to what you see on the playstation when converted.

Maybe it would be nice if it did interface with the dev boards but what you see in truespace is pretty much what you get when it goes into the playstation anyway. Sorry about the confusing statement :)

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10/5/95 5:44 AM

Collision Detection

Christopher C. Rywelski

LIBGS

Hi.

Does anyone have any suggestions or help on the following:

I am trying to perform collision detection with my world mesh. For my uses I have to find out if a destination position xyz is touching or already inside the mesh. I am only really interested if the y co-ordinate at a given xz location has collided with my mesh. I believe I should proceed in the following manner: 1) Search all polygons until I find the first one that bounds the xz location. Ideally this would entail a binary search of the sorted polygon data. 2) Find the equation for the plane for the found polygon. 3) Find y value for the calculated plane equation at the given xz location. 4) Compare this y value with the destination position y value to determine if a collision has occurred.

Searching the polygon data has and will prove to be a problem. I am using TMD data and could possibly parse the TMD data for my mesh where it is loaded in memory although it is not sorted here and is not the most efficient. I thought at one time that I might be able to use the sorted poly data the library uses after the GsSortObject4 call is made by looking through the appropriate zsort table (struct GsOT object\_table->org). The info on how this is laid out is rather sketchy though.

Maybe I am missing something obvious, don't have enough info or should just try a different method. I would appreciate any comments and questions that may help.

Thanks.

---

10/6/95 11:55 AM

Re: Collision Detection

William Botti

Christopher C. Rywelski

LIBGS

Your steps are correct. The only thing I recommend is using primitives instead of tmd for your polygon data. That way you can keep the mesh organized in X and Z. We went down the TMD path and had to back track. Cheers, Will Botti Black Ops Entertainment

---

10/6/95 10:36 AM

Re(12): 3D Recommendations ?

chris m. coffin

David W. Marshall

3D Development

>>Will Truespace save out a model file in .3ds format (if you made your model in tris)?

It will import 3ds but save only to 3ds ascii format. If you build your geometry with quads and save it to .3ds ascii format it triangulates the quads and then saves it. :)

---

10/6/95 3:06 PM

multiple tmd/pmd

cary hammer

3D Development

This is a respecification of an earlier question. Any help would be much appreciated. What is the best way to construct a static world comprised of multiple pmd or tmds (i.e. GsDObj3 or GsDObj5) using libgs? Loading the pmd data into an object array like tmdvunew\tmd5view\tuto1 seems easy enough but it's not clear that I want to have each object take up it's own sort list. Let's say i have 3 cubes, larry, curly and moe, and I want to have them



in a straight line, east to west in my world, never to move in relationship to each other. Unfortunately, it is not practical for me to jam all three into the same pmd/tmd file in the first place, though the effective result would be the same -- each will be fixed position from the others. Sorry if this seem \*really\* simple. Thanks in advance. - Mark Nicely

---

10/9/95 2:28 PM

Re: Suggestions for making a PMD or TMD file?

Blake E. Senftner

Silas S. Warner

3D Development

Write you own conversion program. The knowledge you'll gain from getting that familiar with PMD models is well worth it.

-Blake

---

10/12/95 1:11 PM

Re: multiple pmd

Angus

cary hammer

3D Development

Multiple PMDs is not a big deal. Just sort each object separately. Remember a file is just a depository for objects. You can have as many PMD files as you wants and as many objects as you want. They all come together when you call GsSortObject. You will only have 1 sort list. The sort list does not understand objects, it only understands polygons. You can send separate objects to the sort routine and it will be sorted appropriately.

Something like for (i=0; i < 10; i++) GsSortObject50);

If you have 10 objects they will handled appropriately.

As far as getting 1 rsd file, you can still have multiple pmd files for each.

Angus

---

10/26/95 7:52 PM

Texturing RSD files

Silas S. Warner

3D Development

I cannot use MEDITOR to texture RSD files on my PC, because this company does not have an Artist Board. (I would like to see a version of MEDITOR that will accept a DTL-2000 as an Artist Board, but realize that this will happen a few months after H\*ll freezes over.) Because of this, I am planning to write a converter which will read the appropriate RSD files together with a definition file linking RSD texture names to locations in the video RAM, and change the MAT files appropriately.

1) Has anyone already written a DOS or Windows tool like this?

2) When looking at the MAT file, my texture lines are seriously goofy. They do not quite match the format shown in the Appendix to the Graphic Tools manual, and in several places on a 128-by-128 texture they place a corner co-ordinate at 0,128. There also seems to be only one number where the manual says there should be R,G, and B values.

Can anyone enlighten me on these points?

Silas Warner

---

10/26/95 3:30 PM

Caligari and Quads  
David W. Marshall  
Art Tools

Someone posted a while back the Caligari TrueSpace allows you to make models out of true quads. Is this true?  
We have TrueSpace 2.0 (and are waiting for the 1.0 version from Sony). We made a test model, saved it as a DXF, brought it into the Material Editor, textured it, and saved it into RSD format. The RSD file contained triangle data.  
Is there a button to turn on in TrueSpace to say "make models from true quads and not 2 triangles"? Do we need 1.0 to make quad models?  
Any help would be appreciated,  
thanks, dave

---

10/26/95 4:19 PM  
Re: Caligari and Quads  
chris m. coffin  
David W. Marshall  
Art Tools

>>Someone posted a while back the Caligari TrueSpace allows you to make models out of true quads. Is this true? YES it does!  
>>Is there a button to turn on in TrueSpace to say "make models from true quads and not 2 triangles"? Do we need 1.0 to >>make quad models? Both version 1 and 2 model in quads by default, you just need to make sure you save to the appropriate format that does not break the quads into tris (.cob <-caligari object file).Make/uv map your models in 2.0 and texture them in 1.0.  
>>We have TrueSpace 2.0 (and are waiting for the 1.0 version from Sony). We made a test model, saved it as a DXF, >>brought it into the Material Editor, textured it, and saved it into RSD format. The RSD file contained triangle data. That conversion process is what destroys the quads. If you save the model as a .cob(caligari object file) import it into Truespace 1.0(sony) paint it with your TIM texture maps and save to RSD you get your quads.  
I found the best way to go was to model only in version 2.0 and write a tool that took a .cob file that was textured with TGA texture maps, convert it to RSD format and convert all associated TGA files to TIMs and be done with it.  
Chris :) Tip: (if you use the 3DR mode in Truespace 2.0 it renders all polys non-perspective texture mapped and as triangles so you can basically see what it looks like on the Playstation since the textures distort the same) >>>> I call it the sony mode :)

---

11/1/95 10:48 AM  
Re: Texturing RSD files  
FLORIA L. ROSS  
Silas S. Warner  
3D Development  
Hi, but I was wondering if you are THE Silas Warner???? Of Castle Wolfenstein fame????

---

11/3/95 10:47 AM  
My 3d acumen  
Joe J. Toolman  
3D Development

Please put in quaternions instead of matrices. Is the gte going to be replaced with 8x4 matrices instead of lowlife 3x3 matrices?

JJ

---

1/9/96 10:45 AM  
MIIME CONVERSION  
William Botti  
3D Development  
Angus

This question is from Maggie, one of our artists: What is the best way to convert an animation loop I have created using Wavefront Kinemation, to Mime? We are using the mime tool on the PC, and are having problems retaining the same fluid motion. Is there a secret to choosing the keyframes? Is there a way to set the waveforms in mime? Right now I can't seem to avoid jumps and glitches in the loop. -Maggie

---

1/16/96 10:40 AM  
Translucency  
Paul Masters  
3D Development

How does one set multiple levels of translucency on a single poly using LIBGPU and avoiding LIBGS? Any advice would be greatly appreciated.  
Paul and Company

---

1/19/96 4:07 PM  
Lightwave?!  
Jay Ryness  
3D Development

Is anybody out there using Lightwave for 3d models with textures? What's the best conversion process? Are there any plug-ins to save RSD's directly? Thanks for the help.  
-- Jay Ryness, Semi Logic Entertainments

---

1/26/96 1:22 PM  
Hey! Slower Libs?  
Paul Masters  
LIBGTE

What gives? we downloaded the new libraries and lost framerate in our 3D engine. We're not doing anything that tricky and indications were that we should have gained some ground. Any advice would be helpful...

Tim Ray (Speaker for The Pablo)

---

2/4/96 7:05 PM

TOD2TEXT.EXE  
Silas S. Warner  
Art Tools

TOD2TEXT.EXE      15K  
3D Development

I have attached to this file a simple reader for TOD files. The program takes a TOD file and transfers its information to a text file with the default extension of TLS. It is a DOS utility program written in Microsoft Visual C.

This software is NOT guaranteed by Velocity, Inc., the undersigned, or any other party with respect to utility, fitness of purpose, integrity of code or data, program maintenance, or in any other way whatsoever.

However, if you are stuck figuring out the data in a TOD file, this program can convert it into at least a somewhat more readable form.

If you notice bugs in the program's interpretation of the data, please tell me on this forum. I would not exactly welcome suggestions for improvement or other comments, but I wouldn't totally ignore them either.

Silas Warner

---

2/8/96 8:52 AM  
Strange TMDs  
Paul Masters  
3D Development

Is it possible to build a TMD file with no polys only vertices? Will the libraries handle such abuse? Has anyone tried it? Thanks.

Pablo !Picasso

---

2/9/96 11:34 AM  
Re: Lightwave?!  
Christian F. Aubert  
Jay Ryness  
3D Development

JR> Is anybody out there using Lightwave for 3d models with textures? JR> What's the best conversion process? Are there any plug-ins to save JR> RSD's directly? Thanks for the help.  
JR>                    -- Jay Ryness, Semi Logic Entertainments

Jay,      Just thought I would let you know that yes, it's possible. I don't know of any plug-ins that will save RSD's directly, but we are creating our models in LightWave, texturing them there, and converting them to RSD with software we wrote for that purpose. Motion captured animation will be converted as well.

The formats are all fairly well documented, so you shouldn't have too much of a problem writing conversion utilities. When we started we had hoped there would be better tools available, but since there were not, we "rolled our own"

It's our opinion that using LightWave makes much more sense than using 3DS.

Good Luck!

---

2/20/96 10:40 AM  
Help Caligari!  
Jay Ryness  
3D Development

oes anybody know how to weld two vertices of different polygons together in truespace so the faces can share that vertex?! It seems like it should be easy, but we can't figure it out.  
Thanks, Jay R.

---

2/26/96 6:22 PM  
Re: Help Caligari!  
Michael Koziniak  
Jay Ryness  
3D Development

>oes anybody know how to weld two vertices of different polygons together >in truespace so the faces can share that vertex?! It seems like it should >be easy, but we can't figure it out. I was not able to figure out how to do this either. I suspect there is another way to go about this. I'm waiting to hear back from the people at Caligari. I'll let you know what I find out.  
Thanks, Michael

---

3/14/96 3:54 PM  
RSD Files, and Line Segments  
Jason G. Andersen  
3D Development

Does anyone out there know a way to get a LINE\_F? Primitive to be exported into an RSD? 3D Studio can't do it, I was wondering if Caligari can?  
I would greatly appreciate it if someone could get a 3-d model to export just using line segments. Its important that the primitives are not poly's, but lines, so they won't disappear when scaled into the distance. If you could actually upload the RSD,PLY, and MAT files it would be very helpful.  
Thanks in advance,  
Jason Andersen Tiburon Entertainment

---

3/19/96 12:00 PM  
3d sources  
Robert w. Calfee  
3D Development

Hi all!  
We're at a crossroads in development, and I wanted to know what 3d modelling programs are supported for the sony libraries. If I go with the low level libgte instead of libgs what format does the data need to be in/come from?  
Robert W. Calfee

---

3/20/96 2:25 PM  
Re: My 3d acumen  
Michael Koziniak  
Joe J. Toolman  
3D Development

>Please put in quaternions instead of matrices. Is the gte going to be replaced with 8x4 >matrices instead of lowlife 3x3 matrices?

If you used quaternions wouldn't you deny yourself access to the GTE functions since it works with matrices?  
Michael

---

3/20/96 3:33 PM

Re: 3d sources

Michael Koziniak

Robert w. Calfee

3D Development

>We're at a crossroads in development, and I wanted to know what 3d modelling programs  
>are supported for the sony libraries. If I go with the low level libgte instead of libgs what  
>format does the data need to be in/come from?

Model data for our libraries comes from PMD and TMD. Both binary. The authoring/ascii format is RSD. Here is the support we have for RSD. Caligari trueSpace reads and writes this directly. 3DStudio can write out RSD and animation(TOD) format.

P.S. In the coming weeks we will have two more 3rd party tools. One for Alias | Wavefront and another for 3DStudio.

Michael

---

3/20/96 4:54 PM

Re: RSD Files, and Line Segments

Michael Koziniak

Jason G. Andersen

3D Development

>Does anyone out there know a way to get a LINE\_F? Primitive to be exported into an RSD?  
>3D Studio can't do it, I was wondering if Caligari can?

Doesn't look like Caligari can do it either?

Michael

---

3/20/96 6:41 PM

Re: 3d sources

player 1

Robert w. Calfee

3D Development

Well, the GTE and GPU don't really have a file format, you make up your own. Whether you want to use an existing file format or come up with a new one is up to you, but I've written tools (and most are really easy to do) to convert files from 3d studio, Wavefront, and Alias to both TMD and our own custom file formats.

Tom Ketola PSX Lead Engineer Player 1, Inc.

---

3/20/96 3:21 PM

Re: MIIME CONVERSION

Michael Koziniak

William Botti

3D Development

>This question is from Maggie, one of our artists: >What is the best way to convert an animation loop I have created using >Wavefront Kination, to Mime? >We are using the mime tool on the PC, and are having problems retaining the same fluid >motion. >Is there a secret to choosing the keyframes? >Is there a way to set the waveforms in mime? >Right now I can't seem to avoid

jumps and glitches in the loop. >-Maggie

There is now way to take kinemation data and apply that to MIMe data. You would have to write a tool to do that. As I understand kinemation there are some very complex formulas which are applied to make motion for example, very natural. Say if you had a hand make a fist with all the finger closing at seperate speeds you would need multiple waveforms to accomplish that. The best you could do is save out your model data as seperate RSD files and then bring them into the wave editor and make make seperate waves for that data.

If you are interested in making a tool you might want to see if Nichimen Graphics could give you some advice on this subject. There animator can write out MIMe format files.

Michael

---

3/20/96 3:34 PM

Re(2): Help Caligari!

Michael Koziniak

Michael Koziniak

Jay Ryness

>>Does anybody know how to weld two vertices of different polygons together >>in truespace so the faces can share that vertex?! It seems like it should >>be easy, but we can't figure it out.

>I was not able to figure out how to do this either. I suspect there is another way to go about

>this. >I'm waiting to hear back from the people at Caligari. I'll let you know what I find out.

You can't weld vertices with Caligari.

Michael

---

3/27/96 10:48 PM

Re: SoftImage

Brett Bourbin

John Woznack

3D Development

We are using Softimage at Z-Axis for 3d model design. We have our own tools for getting the data out into the Playstation.

Kevin Parker, Z-Axis LLC

---

3/27/96 2:06 PM

SoftImage

John Woznack

3D Development

Is anyone out there using SoftImage?

-JWW

---

4/3/96 11:24 AM

Re(2): RSD Files, and Line Segments

Jason G. Andersen

Michael Koziniak

3D Development

Thanks. Its all documented in 3d Graphics Tools Manuals, however, the Gs 3-d object library chokes on line segments in a tmd, when you use pre-set packets. (not using preset packets is not an option for me, so I didn't try it ...

---

4/18/96 11:28 AM

Re(2): tim utility

Brett Butler

Carl Ferreira

Graphic Art Tools

i filled out my resume. check it out.

ps. I'm about to complete a DOS version tool of "VAGS2VAB.exe"

This would allow you to take your vags and pack them together into a vab FROM DOS. Then from there, just run VABSPLIT.exe to get your .VH and .VB files.

So, if anyone out there is tired of leasing a Mac just to do sound,...here's your tool.

Is anyone interested in this VAB tool?

Send me mail.

:) Bretto

---

4/18/96 8:47 AM

Re: tim utility

Carl Ferreira

Brett Butler

Graphic Art Tools

This is a cruel joke in the worst possible taste. As every PSX programmer knows, VRAM is worth its weight in gold and to taunt us with the possibility of having a noticeably greater amount of it is a torture beyond words.

Don't toy with me. I know that Black Magic exacts a heavy toll.

Now-- on the off-chance that you are serious, why not post the methodology used and we'll let you know if it would actually help us in a real situation.

BTW-- Who the Hell \*are\* you, anyway? This seems to be your first posting and there is no resume on file for you.

Carl Ferreira (resume on file, albeit brief) =====>Just a little feeler here.

>>Would anyone be interested in a Sony Utility that would allow you >to go through your texture art files and replace those Vram & Dram >memory eating textures with just a few bytes of data? [snip] >This package would include all structure formats, examples how to >load in, AND the tool is Visual in nature. You could take all your >textures that your artist or your publisher dumped on ya, and toss >out the unneeded ones. >>This puts a major smile on your face when it comes time to make >room in Dram & Vram for all those model textures you're using. >>-Lemme know if this is something you would be interested in.

---

4/18/96 8:19 AM

tim utility

Brett Butler

Graphic Art Tools

Just a little feeler here.

Would anyone be interested in a Sony Utility that would allow you to go through your texture art files and replace those Vram & Dram memory eating textures with just a few bytes of data? ex: converts .tims to a new file format that only a few of the new files actually contain a texture, which saves memory BigTime.

1. Texture remains the same (keep this texture). 2. Texture and Texture (keep this texture, and reference another one that would be on top of it at a varied translucency level. Which is all



stored in the new file.) (This is Great for Gun shots/burns/holes on textures & saves memory!) 3. Texture combined with flat shade data to create darkness level in file. 4. Texture combined with gouraud shading data stored in file. 5. Texture tossed, store flat shade data in file instead. 6. Texture tossed, store gouraud shading data instead.

Instead of your models reading .tim files, they would read this new .JAT format.

This package would include all structure formats, examples how to load in, AND the tool is Visual in nature. You could take all your textures that your artist or your publisher dumped on ya, and toss out the unneeded ones.

This puts a major smile on your face when it comes time to make room in Dram & Vram for all those model textures you're using.

-Lemme know if this is something you would be interested in.

:) Bretto

---

8/23/96 6:29 PM

3D Studio Developers

Dane Emerson

3D Development

Does Anyone use 3D Studio or MAX for Development? If so what tools to you use to export (or convert) to a TMD (or other PSX file)? How well does it work and what kind of problems do you encounter? Where can I look for these tools? Do I have to write my own? --MAC.

---

9/9/96 5:04 PM

Collision Detection

Dane Emerson

3D Development

I am attempting to detect collisions between my hero and a maze of walls. There are no restrictions to the width, length, position, or direction the wall faces (there are no horizontal & vertical restrictions... that would be easy!) For ease of presentation, let my hero be a single point in space represented on a single Y plane as (x, z) or (Px,Pz). Points A=(Ax, Az) & B=(Bx, Bz) are the endpoints of each wall in the loop. 'distance' is the final value calculated to determine the hero's distance from each wall in the loop. When distance is 0, a collision has occurred. All formulas were derived from the well-known Graphics Gems book by Andrew S. Glassner (pp. 9,10).

I pose the following questions: -Without regard to the overhead of such a process, is this completely over the top of what I should be doing? Perhaps using bounding rectangles and keeping it simple? (How is that possible?) -WITH regard to the overhead, how can I simplify this formula and optimize each operation? I am fairly new to most any optimization technique, meaning I am open to any suggestions.

```
int HeroCollision() { int Ax, Az, Bx, Bz; int Px, Pz; int Vx, Vz; int Nx, Nz; int Qx, Qz;
int t; int distance, dist; int i;
for(i=0;i<scn.nWalls;i++) { Px = salinas.cord[0].coord.t[0]; Pz =
salinas.cord[0].coord.t[2];
Ax = scn.wall[i].x1; Az = scn.wall[i].z1; Bx = scn.wall[i+1].x1; Bz =
scn.wall[i+1].z1;
dist = SquareRoot0((Bx-Ax)*(Bx-Ax) + (Bz-Az)*(Bz-Az)); Vx = (Bx-Ax)/dist; Vz =
(Bz-Az)/dist; Nx = -Vz; Nz = Vx;
t = ( (Nx*Px+Nz*Pz)-(Nx*Ax+Nz*Az) ) / (Nx*Nx+Nz*Nz);
Qx = Px-Nx*t; Qz = Pz-Nz*t;
distance = SquareRoot0( (Qx-Px)*(Qx-Px) + (Qz-Pz)*(Qz-Pz) ); if(distance == 0)
```

```
return 1; }  
return 0; }
```

---

9/18/96 2:11 PM  
3D Texture mapping  
Mark Harmon  
3D Development

I am new to PSX development. I am wondering what is the preferred method of setting up texture maps for a 3D model. I don't have the graphic artist tools or hardware and I don't have Truespace 1.0(Sony). I DO have Truespace2 and Photoshop with the .tim plug-in. Do I need to use one or the other of these tools or is there another way, like editing the .mat file by hand or writing a routine to map the textures at runtime. Again, I am new to this so if I have missed something obvious then please let me know.

---

10/2/96 9:52 AM  
Caligari TrueSpace 1.0  
Mark Harmon  
3D Development

I just received the Sony version of truespace 1. It came with 4 disks, 3 of them for the actual program and 1 more for the video for windows program. I have installed the software and am trying to save an object in a PSX format. I don't see any options to do this in the save or saveas filetype drop-down combo list.(whew!). I also can not use .tim files as textures. The reason I bought the package from sony was so that I could do these things. What is the deal? Is there some secret command line switch I have to enter or something. I have been calling tech support for days and have not been called back yet and I need to finish a demo and can't until I get some models texture mapped. HELP!  
Am I missing some disks??

---

10/7/96 5:05 PM  
Re: Caligari TrueSpace 1.0  
Brian Dawson  
Mark Harmon  
3D Development  
F.Y.I.

It turns out Mark had been sent Ver. 1.4 of truespace. The correct version should be identified in the Help>About box as PS 1.4. In this version \*.RSD is offered as a save option in the save dialogbox. And Tims can be assigned as textures in the same way as other image formats are in the commercial versions of truespace.  
Brian Dawson@SCEA

---

10/10/96 9:43 PM  
Re: Collision Detection  
Jeff Lander  
Dane Emerson  
3D Development

Since you are doing a guy in a maze type of game, a lot of times the it can be more simple. Many times you can reduce the problem to a 2D one. This makes the math much more simple.

If this is not possible, there are a couple of things you can do.

Break the areas down into regions. This will allow you to reduce the number of walls you need to compare to. This is easier to do at the level design stage. After the fact it takes a bit more time to mark them all.

Also, it is not necessary to computer the exact distance to the wall. By only solving for the Squared distance, you can eliminate the Sqrt's. They are a MAJOR slowdown. You can then adjust your threshold to take this into account.

Without knowing more about your world restrictions, that is about all I can offer.

Jeff

---

10/10/96 11:05 AM

Caligari Truespace

Mark Harmon

3D Development

Why is it that I can select multiple faces with some models and can't with others?

---

10/10/96 5:59 PM

near clipping in tuto1

Bob Polaro

3D Development

is there way to make the globe in tuto1 in psx\sample\graphics\tmd not prematurely clip the near polygons when zooming in?

---

10/23/96 7:27 PM

Re: Caligari Truespace

Michael Koziniak

Mark Harmon

3D Development

Why is it that I can select multiple faces with some models and can't with others?

There is no easy way to do the UV projection you are trying to do on a face by face basis.

-Michael

---

## CD Creation

3/20/95 4:31 PM

\*Re: sio functions

Bill "Angus" Guschwan

CD

Sample code would help me here.

Send me something.

ANgus

---

3/20/95 5:37 PM

\*CD serial numbers

Noah J. Stein

CD

Is there a way to retrieve the unique serial number off the CD?

---

3/20/95 3:30 PM

\*sio functions

Dave Berrisford

CD

We are having problems with the sio functions (e.g. open .cd) If we pass a valid device name it crashes but if we send garbage it returns an error .

What are we doing wrong ?

---

3/21/95 1:41 PM

\*movieconv outputting bs files

Borden Covell II

CD

We are having problems converting rgb files to bs files. it seems that the movie converter tool generates an invalid file name when trying to convert a number of files. conversion to str works just fine.

anyone know a way around this?

borden

---

3/22/95 8:04 PM

\*Interleave with < 5 sectors

Administrator

CD

It is possible to interleave 30fps(5 sectors video) with audio. Then the resulting frame rate would be 2x fps. But if you do so, the video playback occurs at a slower speed, than the actual speed, and consequently synchronization between audio and video would be destroyed. At

present MOVCONV does'nt allow creation of such kind of str data. However you can create this kind of data with the interleaving capabilities being offered on the CD-ROM generator software (done only during the process of actually burning the CD) and also with CD-EMULATION Dos utilities (setup your desired control file in the BUILDCD process). Hope this helps..

---

3/22/95 2:33 PM

\*Fwd: sio sample code  
Dave Berrisford  
CD

IOTEST.ZIP 1K

CD Creation

Hi Here is the sample code trying to open a file and read it ,with the makefile in case there are any problems with that . It doesn't crash now as we put \_96\_init() in ,even though 2.6 isn't supposed to need it , but it still won't read.

---

3/22/95 12:32 PM

\*Re: Pentium CD Emulation  
Bill "Angus" Guschwan  
CD

Are you having any problems?  
Angus

---

3/22/95 12:25 PM

\*Pentium CD Emulation  
Jose R. Villeta  
CD

Administrator

Has anyone succesfully hook up a CD ROM Emulation system on a Pentium-based system. If so, any pointers to follow? jose boe

---

3/22/95 5:40 PM

\*Debugging Stations Status  
Bill "Angus" Guschwan  
CD

1. When will the "debug" Playstations be available in the US? We should have some available in April. The issue involves approval by the FCC. So until then we will allow developers to come to Foster City and try it out here.

---

3/23/95 6:02 PM

\*Re(2): Pentium CD Emulation  
Sam Black  
CD

I haven't been able to make it work on my Micron Pentium; so far, I've only posted to the BBS and ignored it, hoping that it would get fixed before I needed to use it... ;)  
Symptoms were that all of the cd related tools would hang, usually causing my local drives to be inaccessible when I dumped out of the tool and into DOS.  
Identical configs worked fine on our 486s...

---

3/24/95 11:01 AM

\*Re: Interleave with < 5 sectrs  
Blake E. Senftner  
CD

When will MOVCONV allow for creation of str or bs data that is less than 5 sectors a frame?  
Currently, setting sector limits or byte limits per frame is ignored. The only thing that seems to make a difference is the 30fps/15fps "easy" setting.  
Is the information about the MDEC frame format being released to any tool development companies? I heard that the author of the SGI DeBabelizer was talking with SCEA about getting that information for inclusion into DeBabelizer. Any word on that?  
-Blake

---

3/24/95 8:26 AM

\*Re(3): Pentium CD Emulation  
Ian McGee  
CD

Does your Micron use SCSI for the internal drive? If so, is it onboard or a separate card?  
What IRQs, DMA and SCSI IDs are you using? Include all other equipment onboard.  
I haven't had the joy of a Pentium install yet, but I've had good fun getting it to work with an on-board Compaq SCSI. I'd be inclined to think it's something other than just it being a Pentium...

---

3/27/95 7:56 PM

\*How to make Debug Station CD  
Bill "Angus" Guschwan  
CD

To make debug station cds:

1) Get rid of PCread, pollhost, etal 2) Link with 2mbyte.obj 3) Do a cpe2x on the .cpe file 4a) Add files to the CDGEN. 4b) Choose correct file type for XA stuff. Use Mode 2 Form 1 for game data. Use Mode 2 Form 2 for XA files. Use the File Type button to set it for each file. Standard file is Mode 2 Form 1. 5) In Additional Information button dialog of Volume panel of CDGEN, set System Area File to the path of your company's license.dat file. For example, c:\cdgen\licensej.dat 6) In Master button dialog of Layout panel of CDGEN, set License Area to J if you have a Japanese debug station. If you have an American one, set it to A. If it is European, set it to E. 7a) Set the minutes to 74 minutes. You should use 71 minute media. 74 minute might work but we don't support it. Use it at your own risk. 7b) Hit RECÉ button. Double speed record should work OK. 8) Always Verify after you bake a disc. It is that easy.  
Angus

PS: We need to get you the license.dat file. I know. Bug your Account Executive for it. PSPS: Note you will not see the license.dat file on final discs because it is stored in the system area.

System area is in the leadin area and you don't look at the leadin area.

---

3/27/95 11:36 AM

\*Re(2): Interleave with < 5 sectors

Bill "Angus" Guschwan

CD

For question about MovConv...

> When will MOVCONV allow for creation of str or bs data that is less than 5 sectors a frame?

> Currently, setting sector limits or byte limits per frame is ignored. The only thing that seems to > make a difference is the 30fps/15fps "easy" setting.

MovConv 1.8e ignore limits you specify on the [MDEC Parameters] dialog box. It is a bug of MovConv 1.8e. It will be improved at the next release. > Is the information about the MDEC frame format being released to any tool development companies? > I heard that the author of the SGI DeBabelizer was talking with SCEA about getting that information > for inclusion into DeBabelizer. Any word on that? > > -Blake

Information about bs format (== MDEC frame format) has not been released to any tool development companies and licencies.

Angus

---

3/27/95 9:59 PM

\*Fwd: Hey Mon, CDMON

Administrator

CD

> Second, do you actually use the interrupt for anything other than cdmon? > I can't seem to get the interrupt to work correctly. Can you > explain how the emulator uses the interrupt?

Currently only CDMON will make use of this interrupt. When you are using boot image 2.3 (the one that can drive CDMON) the emulator will regularly disconnect from the HD, connect to the PC, send CDMON info to the PC then disconnect from the PC). For this version of the boot code to work at all you must have a fast interrupt response - no response or a slow response (e.g. if running it under windoze) will not turn the SCSI bus around fast enough.

---

3/27/95 10:00 PM

\*Emu & Memory

Administrator

CD

> Third, I assume the emulator runs off 8 megs no problem. Correct?

You mean 8MB of PSX RAM or 8MB PC RAM? The emulator is completely independent of PSX memory configuration and it doesn't make use of any PC high memory so either way the answer should be yes.

---

3/27/95 11:09 AM

\*MDEC playback

Dave Berrisford

CD

Is it possible to playback a .str file from anywhere within the file, other than just from frame one?

Also, has there been any progress on my problems with CD and OPEN?

Thanks.

---

3/27/95 9:51 PM

\*Speed of CD?

Administrator

CD

Hi, Bill

>What is the arm movement track to track stepping time for the CD? Do you know?

A seeking action is not repeat of single track seek. So, the spec of a CD-ROM drive is described by "minimal access time". A minimal access time of PlatStation is as follows.

minimal access time = 1/3 seek + settling time = 500msec

short seek(5min) + settling time = about 300msec long seek(60min) + settling time = about 1000-1300msec

But, if the seeking distance is very short (less than 30 sec), the stepping action will be very fast.

Because it goes without a pick-up unit moving. (only moving of the lens.)

>2) How many Megabytes can you seek per second on the cd?

Please refer to the description about long seek (above).

---

3/27/95 9:59 PM

\*Problems with multi-parts ems

Administrator

CD

> We've been having problems with getting more than 1 partition to work on a 4

> GIG drive. The drive is > Description: Micropolis 3243 AV Ext SR2000 >

4 GB Hard Disk, including SCSI cable > ..... > > The led will blink then lock a solid green. cddisk

-a1 3 will make it work. > Partitions are about 1 GIG in size. We use the whole hard disk. >

There should be no problem with this drive. I think we'll have to see if Martin or Paul have any ideas. Are you using the latest CD-emu boot image?

---

3/27/95 11:37 AM

\*Re: MDEC playback

Bill "Angus" Guschwan

CD

Your original reply was cryptic and I sent this message. Please send me more information.

Here's the previous email:

Sample code would help me here.

Send me something.

ANgus

---

3/27/95 10:07 PM



\*MDEC format  
Administrator  
CD

Questions:

I want to generate a large quantity of movie data. It is expected to take considerable time to compress image data using Movie Converter, which utilizes software for compression. It takes about thirty minutes to generate 100 frames of data using the currently available movie converter. I want to compress data using any other system. According to newspapers and documents distributed in briefings last year, the compression method is designated as JPEG. Does it comply with JPEG Standard? I am not familiar with the details of algorithm. In magazines featuring articles on JPEG, I have never seen the coding method VLC in the algorithm DCT+IQ+two-dimension VLC described in the manual. Is the compression method for PlayStation closed within PlayStation?

Answers:

Fundamentally, only "MPEG macro-block layer" level compression is performed in PlayStation. The encode/decode in a MPEG macro-block consists of:

DCT+IQ+Two-dimension VLC

It has the same composition as the one used with PlayStation. It differs from the MPEG macro-block in the following points:

1) A MPEG macro-block performs VLC in the order of Y, Cb, and Cr. PlayStation do so in the order of Cb, Cr, and Y. 2) A MPEG macro-block outputs the values of Y, Cb, and Cr. PlayStation outputs them in RGB. The specification of the IQ table and VLC code book are the same as MPEG. If you are going to use a commercially available encoder, we recommend MPEG because it seems more suitable than JPEG. The compression speed of MovConv version 1.5 has been almost doubled.

Although dependent on the contents, 320x320 data can be compressed at a rate of less than six seconds per frame.

Keywords: Movie, MovConv

---

3/28/95 9:01 AM

\*Re(3): Interleave with < 5 sectors

Borden Covell II

CD

I'd like to add my vote for getting at least a library of routines that one could call to do compression. This would allow us to create a DOS based batch file oriented conversion capability. This need would be removed, of course, if Sony provided such a tool. What do ya say???

---

3/28/95 6:55 PM

\*Re(4): Pentium CD Emulation

Unni Pillai

CD

There's been a lot of speculation regarding CD-emulation not working with Pentiums. I just assembled my Playstation development environment on my new P90, and I experienced no problems whatsoever. In my current P90, I have successfully installed DTL2000 boards, the graphic artist card, and also the CD-emulation card. All my systems are up and running. My advice to people experiencing problems, is the following... Be patient and systematically troubleshoot conflicts with IRQ's, Addresses, DMA's etc. GOOD LUCK

---

3/28/95 2:48 PM

\*Re(4): Interleave with < 5 sectors  
Administrator  
CD

I would reply but you're in the penalty box.  
We are looking in to windows dlls. I'll keep you posted.  
Angus

---

3/29/95 4:09 PM

\*Re(2): Certified hard drives for CD emulation  
Christopher Deel  
CD

Bill "Angus" Guschwan  
Is there an updated list of drives that will work with the CD emulator?

---

3/29/95 2:34 PM

\*Why 71 minute? Why 900e?  
Bill "Angus" Guschwan  
CD

>I had 2 CD questions: >1) Can we use the CDW950E with the CDGEN software? Why or why not?

CD-ROM Generator doesn't support CDW-950E. CDW-950E doesn't have compatibility in SCSI protocol and doesn't have capability to create master disc.

>2) Why do we need to use 71 minute media? Some people like to use the cheaper >74 minute media. Can you tell me why we need the 71 minute CDRs?

The 71min disc is different from 74min at the density. PlayStation is tuned up for 71min and make reliability for data read. A 74min disc makes error rate more higher.

---

3/29/95 3:29 PM

\*CD Times  
Bill "Angus" Guschwan  
CD

----- \*\*\* Answer \*\*\* -----

>Hey could you fill out the questions and chart below? Joe Developers is doing a new title >and needs the precise CD info. I appreciate the help.

I can not explain about \*precise\* or \*fix\* value of the seek time of a CD-ROM drive.

The action of the mechanism is not logical. So, to calculate the seek time, you must simulate from many parameters such as a temperature, a vibration, an aging, errors in manufacturing etc... So, I can tell you only about rough spec of seeking time.

It is very dangerous to create an application program critically depends on the seek time.

>minimal access time = 1/3 seek + settling time = 500msec >### What is 1/3 seek?

>### what is settling time?

1/3 seek means the movement for 1/3 distance from top sector(0min 0sec 0sector) to last sector(70min 59sec 74sector for 71min disc).

The settling time means the time to stable the tracking servo and focusing servo.

>### How do I determine the length of (5min) is the following formula correct >### 1 second is 75 frames at 2048 (other frame sizes available) bytes per frame

A position of the pick-up (=head) is specified by ATIME (absolute time). See CdILOC in libcd.h

ATIME = "min:sec:sector" from the top of the disc (min = 50sec, sec = 75sector)

Each sector has 2048Byte of user data.

----- \*\*\* End of Answer \*\*\* -----

---

3/30/95 6:39 PM

\*Playstr example problem

Michelle Feraud

CD

I've been trying to get the UK streaming example (playstr) to work - it works fine with the example .str file they sent but blows up in the first call to DecDCTvlc (with a bus error) when I try to play a .str generated by the movie convertor supplied by Sony. There was a similar problem report back around 3/13 - was it ever resolved?

---

3/30/95 11:05 AM

\*Building a CD image

Mark Beardsley

CD

I'm having some difficulty in building a working CD image on my emulator. I can run the RCUBE demo without problems, but I can't seem to get any of my own code to execute. I suspect that my files are not in the proper format or something. I've been using CPE2X to convert my CPE file to an EXE and then replacing the RCUBE.EXE with my file, and running BuildCD. Even the simple BALLS demo won't execute this way. Am I using CPE2X incorrectly (the doc file I have is in Japanese) ? What exactly is the file PSX.EXE doing in the RCUBE demo ? Shouldn't there be a SYSTEM.CNF file there ? I'm so confused!

---

3/30/95 7:19 PM

\*Re: Building a CD image

Administrator

CD

To build a cd, you have to run the cdexec.cpe file after running snpatch.cpe and resetsps 1. Rcube is a bad example because it was built with lib2.0 which does not need the snpatch.cpe. So it can run with a resetsps 0.

---

3/31/95 9:46 AM

\*SIO sample code

Dave Berrisford

CD

IOTEST.ZIP        1K

CD Creation

Here is the sample SIO code that we can't get to work with either v2.6 or v3.0 of the libraries.

What are we doing wrong?

Thanks.

---

3/31/95 2:53 PM

\*Re: Playstr example problem

Mark Beardsley

CD

I have been able to take an AVI file created here and play it with playstr (just by replacing example.str). It took a few tries. Be sure to select 24-bit(MDEC) as the output file type (not 24bit direct). I've also had the movie converter crash on me a couple times. Also, make sure that your avi has no audio and does not have an "alpha channel". I have now been trying to get the same file running off the emulator instead of from memory (so far no luck). I'm also trying to get it run with audio interlaced but I don't think I'm using the movie converter properly for that. Does anyone know if it expects the audio source to be in a different file or inside the avi file?

---

3/31/95 10:43 AM

CD Emulation Problems

Mark Beardsley

CD

DISK.ZIP           5K

CD Creation

I still have been unable to run even the simplest program from the CD emulator, other than the RCUBE demo. I am using RUN 2.30, RESETPS 1.02, DEXBIOS 1.22, CDBIOS 1.02, CPE2X 1.3, BUILD CD 1.16, and my SELEMU is dated 3/3/95, CDEXEC is 2/6/95 and SNPATCH is 3/3/95. I believe these are the latest.

I have attached the batch file that I'm using along with the CD control file. I'm just trying to get the original BALLS demo running (I put that in too). Please see if you can give me a pointer or two. I'm probably just running things in the wrong order or something, but I've tried all the combinations I can think of. Thanks.

---

4/1/95 11:32 AM

\*MovConv Issues

Mark Beardsley

CD

In converting an avi file using MOVCONV (I was playing with playstr), I found that if I specify the output str file to be 15fps, the size of the generated file is double the size of a 30fps str file. This seems a bit unusual, I would have thought it would be smaller (or at worst the same size). Is there a reason for this? Secondly, in the windows help file for MOVCONV and MOVPACK, the instructions for interleaving seem to be strange (the fourth step is a repeat of the second step). I think that this is a text-edit "block copy" error (either that or I'm completely confused). Thirdly, I know that I've been posting several "I don't understand" messages lately. Please understand that they are not meant as complaints. So far I've been amazed at the amount of support Sony has provided to us. I'm used to dealing with those other manufacturers who hand us a japanese manual, a non-working development system and no libraries.

---

4/3/95 10:59 AM

\*Re: MovConv Issues

Blake E. Senftner

CD

Mark:

When you set the frame rate to 15, rather than 30, in MOVCONV you you get larger files. This is because the current version of MOVCONV assumes that you want to play your data at full bandwidth. Basically, you're saying "convert these frames into X frames per second, when I have 300K per second." So to ask for 30 frames a second is to ask for frames around  $300/30=10K$  per frame, where asking for 15 frames a second is  $300/15=20K$ .

The current software ignores when you set the byte limit for a frame, so the 15/30 frames per second is the only control we currently have...

-Blake

---

4/3/95 11:34 AM

\*Re: MovConv Issues

Scott Berfield

CD

Wanna bet that MovConv is assuming mono audio for 30FPS and stereo for 15FPS? -sb

---

4/3/95 10:31 AM

\*SIO problems solved!

Dave Berrisford

CD

We've found out what we were doing wrong with READ. It seems that the read size has to be a multiple of 2048 bytes.

---

4/3/95 11:18 AM

UK BBS discussion resolved to...

Blake E. Senftner

CD

Bill "Angus" Guschwan

Angus:

In the UK BBS a discussion about the emulator drives resolved to the fact that "any SCCI AV hard drive" will work correctly for emulation purposes. I'd like to hear from you about that fact.

-Blake

---

4/3/95 12:01 PM

Emulator SCSI cable?

Dean M. Grandquist

CD

What is the external connector to the Emulator card look like? Is it DB25 (mac like), Cetronics 50 pin, or the SCSI-2 mini connector type?

Thanks --Dean "go E3 go" Grandquist What is the external connector to the Emulator card look like? Is it DB25 (mac like), C

---

4/3/95 2:18 PM

Re: Movie Streaming Issues

Bill "Angus" Guschwan  
CD

Try the new movconv. I posted in Art Tools. It is version 1.9  
ANgus

---

4/3/95 10:47 AM  
Movie Streaming Issues  
Mark Beardsley  
CD

I have our CD emulator working now. The problem was that scsi ids 0-2 don't work (I found this info buried in an old message). It would work with the RCUBE demo, but thats all. Anyway, in playing a movie from the emulator (using code from the posted streaming example) I've found a few problems. First, there are bad frames displayed occasionally (usually it contains garbage pixels on the right side of the screen). Second, it drops a large percentage of the frames (about 20%). I assume this is due to speed issues. This occurs on both the posted STR file from playstr and from a movie converted here from an avi. Both movies are 320x240, 24-bit, 30fps without sound. Is this frame rate/resolution not a realistic expectation? Are there any official rates that the streaming library will support? P.S. I am using lib 3.0

---

4/3/95 8:04 PM  
test.cti for DA  
Bill "Angus" Guschwan  
CD

Disc CDROMXA\_PSX  
LeadIn XA Empty 1350 PostGap 150 EndTrack  
Track XA Pause 150 Volume ISO9660 PrimaryVolume SystemIdentifier PLAYSTATION  
ApplicationIdentifier PLAYSTATION LPath MPath Hierarchy File DATA.XA  
XASource C:\TMP\DATA.XA EndFile File PSX.EXE XAFileAttributes Form1  
Data Source C:\TMP\PSX.EXE EndFile EndHierarchy EndPrimaryVolume  
EndVolume PostGap 150 EndTrack  
Track Audio Empty 150 Source C:\TMP\DATA.DA EndTrack  
LeadOut Audio Empty 150 EndTrack  
EndDisc

---

4/4/95 2:09 PM  
MOVCONV 1.9  
Mark Beardsley  
CD

I tried using the new MOVCONV. It doesn't seem to help much. I still get about 25% of the frames dropped, and I still have occasional glitches in some frames. The glitches resemble the glitches in the demo movie shown at the CD conference in NY. Since these glitches only show up sometimes (a particular frame will usually appear fine, but sometimes will have glitches), I'm would think that the problem is in decoding, not in MOVCONV. A related problem is that when frames are being dropped, if the last frame of a movie is dropped, it will go on beyond the end (not knowing the movie is over). Adding a couple of extra frames will keep it from crashing, but I'm surprised that the MDEC format doesn't have an end sentinel or something. I tried

using a larger ring buffer as well as limiting the frame size to 4 sectors. When I tried limiting the frame size to 9000 bytes, I got a stream of error messages in kanji. Any helpful hints? P.S. Is there any documentation on MOVCONV and MOVPACK besides the help file? The help file says to refer to the documentation, but I can't find any. Thanks.

---

4/4/95 8:47 PM

MOVCONV 1.9 vs. 1.8

Blake E. Senftner

CD

Bill "Angus" Guschwan

After running some simple tests, I have generated the following stats:

	decDCTvlc max time	decDCTvlc min time	average time
200 frames compressed as rl buffer size 5 varying sectors, version 3	570	500	559
6784 4 varying sectors, version 3	508	488	497
5920 3 varying sectors, version 3	408	395	399
4672 5 varying sectors, version 2	268	253	260
4 varying sectors, version 2	220	196	208
3 varying sectors, version 2	154	139	142

These frames were all compressed with version 1.9e, but the rows labeled "version 2" were created by setting the "version 2" button- which should revert back to the 1.8e algorithm.

The time measurements were made using the VSync(1) routine and are assumed to be scanline counts. (is that true? this fact has never been confirmed by Sony documentation.)

As one can see, the new version takes alot of r3000 time to process the data before we can hand data over to the MDEC chip.

I propose that the DecDCTvlc() routine be rewritten in assembly, at the very least.

As is, version 3 is unusable. What are the plans for MDEC routines between now and launch?

Additionally, I'd like to point out that this is not a gripe. I fully expect the Sony engineers to solve these issues, as they have previous issues, with the quality that is evident in the PlayStation.

-Blake

---

4/5/95 11:55 AM

Using audio in MOVCONV and MOVPACK

Mark Beardsley

CD

I'm trying to build an str file with audio interleaved. If I have an avi file with both audio and video, how can I get the interleaved str. I've tried various combinations of MovConv with MovPack, but I can't get anything useful out of it. Is there any documentation on this other than the windows help file? The text files I have are in kanji.

---

4/7/95 8:20 PM

\*Re: cd emulator problems

Bill "Angus" Guschwan

CD

1) Don't use SCSI ids 0-2 2) To reset the emulator, use cddisk -a ActivePartition# SCSIID 3) Make sure you change the SCSI id on the emulator card so as not to conflict. 4) Please use the

latest tools from Psyq Tools folder.  
Angus

---

4/7/95 7:10 PM  
\*cd emulator problems  
Jim Rogers  
CD

I'm trying to set up my cdemu environment. I'm using the microp 1.6 MB AV drive. whenever I try to start cddisk (ie: cddisk -n 0) I am getting Error in opening SCSI device 0, Error 0x02F0. Is this a cddisk error or a scsi error code from the drive. Has anyone else had similar problems. I was able to connect to the drive once and created two 71min partitions but I can't seem to reconnect.

What is the most current version of the cd emu tools? I'm using the 2/6/95 beta release from floppy as I cant get to the EMU folder.

Thanks In advance Jim Rogers Electronic Arts

---

4/7/95 8:26 AM  
Conflict with CdSearchFile and playing DA tracks  
Travis Hilton  
CD  
Bill "Angus" Guschwan  
TEST.C 3K  
CD Creation

I am having trouble with the combination of CdSearchFile and playing DA tracks. Enclosed is the bare bones code. Without the CdSearchFile it plays just fine. As soon as I insert the CdSearchFile line the CD continues to read sectors but no audio is output. This one is critical for all of our file I/O in its current state. Once the data is concrete we will use exact locations for file access, but until then we have to use file names.

Why does CdSearchFile conflict with the audio?

Thanks in advance.

-Travis

---

4/7/95 8:22 PM  
\*Re: cd emulator problems  
Administrator  
CD

Also, there is a new cdemulator upload in the Psyq Tools conference as of today. Please try that.  
Angus

---

4/10/95 2:46 PM  
UpdateCD problem  
Mark Beardsley  
CD

I'm having a problem in using UPDATECD. I can build a complete CD image using BUILDCD and it runs fine. However, if I try to update it using UPDATECD, the image won't run (the drive in-use light stays on). UPDATECD says that it has read the map and that the image has been



correctly updated. This happens even if the files have only had their dates changed (i.e. the data is the same). I'm using UPDATECD version 1.09 which I believe is the current one, and I am creating a map file with BUILDCD. Please tell me if I've got the wrong version or something. Thanks.

---

4/11/95 4:04 PM  
DCTout callback problems  
Borden Covell II  
CD

I am trying to integrate our movie player code into our multi-tasking environment. The movie playing code, which is based on the playstr code that I got from the BBS, works just fine when it is called as a subroutine from the main program. It defines a callback for the DCTout completion and everything moves along just fine. When I move the player into a separate thread everything works up to the point of getting the DCTout completion callback. The program hangs waiting for the callback routine to be called.

btw, we can create vbl callback routines which work just fine under our multi-tasking system. My first question is this: are the DCT callback routines exactly the same as the vbl (root counter) callback routines? IF not, what is the difference? If they are, why would they not work when our multi-tasking system has been added to the mix???!!!  
HELP!  
borden

---

4/13/95 11:37 AM  
Sound in str files The Sequel  
Joe J. Alemanni  
CD

We are another voice in the chorus expressing our desire to get more information about how to use MOVCONV or MOVPACK to weave our XA audio into our video streams. The error messages from the tools don't give us enough clues.

---

4/13/95 4:49 PM  
Re: CD emulator  
Christopher Deel  
Mark Beardsley  
CD  
Yes it did help! Thank you!  
I am now having trouble reading files from the CD. Are there any tricks I need to know?

---

4/13/95 11:56 AM  
Re(2): Building a CD image  
Christopher Deel  
CD  
Administrator  
To build a cd, you have to run the cdexec.cpe file after running snpatch.cpe and resetsps 1. Rcube is a bad example because it was built with lib2.0 which does not need the snpatch.cpe. So it can run with a resetsps 0.  
----- Can you give us a good example. Complete with a BAT file that goes all the way from compile to running on the CD Emulator?

---

4/13/95 12:34 PM  
Re(3): Building a CD image  
Mark Beardsley  
CD

NEWCD.BAT           1K  
CD Creation

Here is a batch file that will compile a MAIN.C program, build a CD image, and boot it. Examine the commands (the paths may need to be altered based on your setup). When BuildCD runs, it will give a couple of warnings, but it should work ok. I found this procedure mainly by trial and error, but it seems to work. Hope it helps.

---

4/13/95 5:26 PM  
Reading from CD  
Christopher Deel  
CD

Bill "Angus" Guschwan

I am having trouble reading files from the CD. Here are my Examples. Any suggestions?

```
/*-----*/ #include <sys/types.h> #include <libetc.h>
#include <libgte.h> #include <libgpu.h> #include <libgs.h> #include <libsn.h>
/*-----*/
*/ initSystem() { PadInit(0); GsInitGraph(320, 240, 0, 0, 0); GsDefDispBuff(0, 0, 0, 240);
GsInit3D(); }
/*----- TestCDFile ~ -----*/
-----*/ void TestCDFile(void) { int fd; int i; char *fname = "sim:TEST.TXT;1"; fd =
open( fname, 1); printf("fd = %d\n", fd); for (i=0; i < 11000; i++) pollhost(); }
/*-----*/
*/ main() { int i; initSystem(); /* grobal variables */ printf("Main\n\n"); for (i=0; i < 11000;
i++) pollhost(); TestCDFile(); while(1) { pollhost(); } }
/*----- Program Output -----*/
```

Psy-Q Message buffer test program - press a key to exit

ResetCallback: \_96\_remove .. TYPE : 6 free button or flying-V form PS-X Control PAD Driver

Ver 3.0 Main

fd = -1

/\*----- CD Map File -----\*/

```
===== = Generated Map File CD.MAP =
===== LeadIn 0 XA
Empty 00:00:00 1350 PostGap 00:18:00 150
Track 1 XA Pause 00:20:00 150 TrackDef
SystemArea 00:22:00 16 0 PrimVol 00:22:16 1 16 TermVol
00:22:17 1 17
Lpath 00:22:18 1 18 OptLpath 00:22:19 1 19 Mpath
00:22:20 1 20 OptMpath 00:22:21 1 21 Dir() 00:22:22 1
22 File(PSX.EXE) 00:22:23 13 23 00:22:22 04-13-1995 17:01:52 26624 Form1
D:\BBALL\TEST\TEST.EXE File(MADO.TIM) 00:22:36 6 36 00:22:22 02-08-1995
14:49:10 10304 D:\BBALL\TEST\CDFILES\MADO.TIM File(MADO.TMD)
00:22:42 1 41 00:22:22 02-08-1995 14:49:10 1712
D:\BBALL\TEST\CDFILES\MADO.TMD File(TEST.TXT) 00:22:43 1 42 00:22:22
04-13-1995 16:13:36 28 D:\BBALL\TEST\CDFILES\TEST.TXT EndTrackDef
Empty 00:22:44 300 PostGap 00:26:44 150
```

---

4/13/95 5:03 PM  
Re(2): CD emulator  
Scott Berfield  
CD

There seem to be severe limits on the numbers of files in a directory on the CD. If you seem to be able to load some but not all of your files, try splitting them into subdirectories. 35 files per directory seems to work.

-sb

---

4/13/95 9:38 AM  
Sound in str files  
Mark Beardsley  
CD

Could you please explain the procedure for embedding XA-PCM sound into a str file? The windows help file for MOVCONV/MOVPACK is very cryptic. Is there any documentation for it beyond this? I have an uncompressed avi (that i can convert to an str and play), and I have an xa audio file, but I can't seem to get them merged. Do I use Movconv or Movpack or some combination of the two? Also, if I have an avi with audio included, can I use that somehow? Finally, is it best to address questions to Administrator, Angus or Unni? Thanks.

---

4/14/95 1:00 PM  
Re: Sound in str files  
Buzz Burrowes  
CD

I've successfully interleaved XA audio with str's. I probably can't answer all of your questions, but I can describe the process I've used and that I have actually seen work.

Uncompressed AVI WITH audio: Not only does the AVI need to be uncompressed, but the audio needs to be 16 bit. I've successfully generated an STR using an uncompressed AVI with 16bit,44.1k, stereo audio as input with MovConv.

Interleaving with an existing STR: I've created 44.1k, 16 bit stereo audio (in WAV format) and converted it to XA using MovConv. (BTW: MovConv is MUCH faster at doing XA conversion than RAW2XA on the MAC!)

- specify your WAV file as the input. - be sure to select .wav from the "Format" drop down menu. - enter an output file name. - select xa from the "Format" drop down list. - select the "Detail" button and specify the desired output format. (37.8 / 18.9 / stereo / mono) - click the >> button and your off!

Now, to interleave into an STR...

- select "Interleave Video with Audio" from the "Convert" menu. - specify your str file name. - select str(MDEC) from the "Format" list. - select "Video with Audio" from the "Type" box. - select the correct "Frame Rate" and "# of Channels" (I've been using 15fps and 1(150Sectors/Sec)) (this should be the same as when the str was created) - enter the name of your XA file in the Audio section. - be sure the Freq. and Type buttons are set correctly. (I've been using 37.8 and stereo) - enter an output str name - select OK!

NOTE: I have had some odd problems that SEEM to have to do with trying to interleave audio with an STR that already has audio interleaved. I stay away from that now! I have clean str's

and then interleave.

I hope some of that helps. Again, I'm not saying these are the only methods that work... these are just the methods I've used successfully!

---

4/15/95 10:43 AM

Re(2): Sound in str files

Mark Beardsley

CD

I tried the method suggested here, and I still get various error messages from MOVCONV when I try to interleave the audio. Usually it claims "Frame XX is too Large, It must be less than X sectors.", at which point it causes a "General Protection Fault" or simply crashes Windows. This seems to occur at both 15fps or at 30fps. I can build and play movies fine as long as I stay away from using audio. Does anyone else seem to have this problem?

---

4/17/95 3:02 PM

Using CDGEN

Mark Beardsley

CD

I have found some strange things in trying to use CDGEN to burn a disk. I have been able to complete all the setup tests in CDREC, so I believe that my hardware setup is ok. However...  
1) we have been told to use only 71 minute disks (others are not supposedly reliable), but the CDGEN program only allows us to select 18, 63, or 74 minute disks. This seems strange.  
2) each time we add files to the disk (in the directory mode), a window appears with a title of "Warning & Error Message", but there is no text in the window. Does this mean it is ok (i.e. no error), or is the error text missing for some reason?  
Also, I'm assuming that the disks we burn can be booted in the black cd rom drive attached to the development system. Is this true or do we need to wait for a debugging station to test the disks? And when will the debugging stations become available? I believe we will need a few for E3. Thanks.

---

4/17/95 9:11 AM

Sound in str files

Mark Beardsley

CD

Using MOVCONV, I have taken an uncompressed avi with audio (44.1K,16bit) and generated an str file (15fps). It seemed to be processed ok (at least MOVCONV didn't complain, and seemed to realize that there was audio there). However, when I try to play it (using playstr), it just crashes. So...

1) Should this use the 15fps or 15fps(2ch) selections for the output details in MOVCONV? I tried both, with identical results. 2) Does there need to be additional code in playstr to handle the ADPCM audio? The docs seem to say that the audio data will be routed "without processor intervention", but this seems too easy. Isn't there at least some initialization stuff that needs to be done? If so, what is it?

I'm sorry to keep bringing this up, but I need to get this working right away to have all my stuff ready for E3.

Thanks.

---

4/17/95 12:01 PM  
CD: Need access to the CD folder  
Thomas Engel  
CD

Hi, this is thomas of LucasArts. We need access to the CD folder, if there is any tool - software to use with the emulator, because we seem to have a software problem with our CD emulator we got about a week ago. After installing the BIOS and starting CDDISK -n <SCI-ID> we got the error message: 'SCSI error reading disk sector per track. error 0x300' Does anyone know what to do about this? Thomas

---

4/18/95 12:24 PM  
Read Data from CD?  
Christopher Deel  
CD

CDTEST.ZIP        3K  
CD Creation

/\*\*\*\*\* CD Read Test    So Far I have  
been unable to get CD reading to work. Here is my test    project. If anyone has any suggestions  
let me know.        Christopher Deel  
\*\*\*\*\*/

```
***** /
#include <sys/types.h> #include <libetc.h> #include <libgte.h> #include <libgpu.h>
#include <libgs.h> #include <libsn.h> #include <libcd.h>
#define MAXSECTOR 256 #define NSECTOR 32
#define Cmarker() printf("#%d ", __LINE__)
CdFILE fp; CdLOC pos; int mode = CdIModeSpeed; int nsector; static u_long
sectbuf[2][MAXSECTOR*2048/4];
/*-----*/ void DumpMemory(unsigned char *data, int
lines) { int n; printf("\n"); while (lines--) { printf("%08x: ", data); for (n=0; n < 16; n++) {
printf("%02x ", *data); data++; } printf("\n"); }
/*----- Test2 ~ -----
-----*/ void Test1(void) { // char *file = "cdrom:\\TEST.TXT;1"; // char *file =
"/PSX.EXE;1"; char *file = "PSX.EXE;1"; int i, cnt, ipos; int result; printf("Test1\n");
CdInit(0); // CdInitFileSystem(); // This causes Vsync timeout CdSetDebug(2); Cmarker();
CdSync(0, &result); result = CdSearchFile(&fp, file); printf("Search = %d\n", result);
Cmarker(); if ((nsector = (fp.size+2047)/2048) > MAXSECTOR) nsector = MAXSECTOR;
// nsector = MAXSECTOR; /* for debug */ CdControl(CdISetloc, (u_char *)&fp.pos, 0);
Cmarker(); CdRead(nsector, sectbuf[0], mode); Cmarker(); while ((cnt = CdReadSync(1, 0)) >
0) { // printf("Reading(1) ...%d Sectors\n", cnt); i++; } DumpMemory((unsigned
char*)sectbuf[0], 10); Cmarker(); }
/*-----
*/ void Test2(void) { int fd; int i; char *file = "cdrom:\\PSX.EXE"; printf("Test2\n");
Cmarker(); CdInit(0); CdSetDebug(2); Cmarker(); fd = open( file, 1); // program hangs here
printf("fd = %d\n", fd); }
/*-----
*/ main() { int i; printf("Start\n"); Test1(); Test2(); printf(" The End.\n"); while(1) {
pollhost(); } }
/*===== Program Output =====*/ Psy-Q
Message buffer test program - press a key to exit
Start Test1 #65 CdISetloc... CdISetmode... CdIReadN... CdIPause... CdISetloc... CdISetmode...
CdIReadN... CdIPause... CD_newmedia: sarching dir.. 00000016,0001,0001, CD_newmedia: 1 dir
```

```
entries found Search = 0 #69 CdlSetloc... #77 CdlSetmode... CdlReadN... #79 80085ad0: 00 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 80085ae0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
80085af0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 80085b00: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00 00 00 00 00 00 80085b10: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 80085b20: 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 80085b30: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
80085b40: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 80085b50: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00 00 00 00 00 00 80085b60: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 #86 Test2 #99
CdlReset... #102
/*===== CD.CTI =====*/ Disc CDROMXA_PSX
MapFile cd.map CatalogNumber 000000000000 LeadIn XA Empty 1350 PostGap
150 EndTrack
Track XA Pause 150 Volume ISO9660 PrimaryVolume SystemIdentifier
PLAYSTATION ApplicationIdentifier PLAYSTATION Hierarchy
XAFileAttributes Form1 Data File PSX.EXE Source PSX.EXE
EndFile EndHierarchy EndPrimaryVolume EndVolume Empty 300
PostGap 150 EndTrack
LeadOut XA Empty 500 EndTrack
EndDisc
/*===== Makefile.mak =====*/
Prog = test
.c.pe: ccpsx -comments-c++ -O -Xo$80080000 $*.c -o$*.cpe,$*.sym
.c.pe.exe: cpe2x $*.cpe
#----- Main Target ----- all: cd.map
cd.map: cd.cti $(Prog).exe copy $(Prog).exe psx.exe - builcd -l -m cd.cti -s3:1 dir *.exe RUN:
batcmd printtime resetps 1 run /w10 c:\psx\cd_utils\selemu run /w10
c:\psx\patch\snpatch run /w10 c:\psx\cd_utils\cdexec - mess1 - tee testmess > output.txt # -
dbugpsx - mess1 Partition: cddisk -n 3
```

---

4/18/95 10:22 AM  
Re: Using CDGEN  
Unni Pillai  
CD

Ignore the warning message window, also ignore the fact that CDGEN allows 18,63,74min CD's (you can burn those CD's right now, but eventually for the mastering process and production runs you would need to burn on 71 min CD-R). Good Luck...

---

4/19/95 6:46 AM  
access to emu etc.  
Andrew Summerfield  
CD

Could you please give me access to the EMU and CDEGEN sections Thanks.  
Andrew

---

4/19/95 6:45 PM  
CD switching between data and audio  
scott s. patterson  
CD

After I do CdRead calls I can only get CD-DA audio to play if I do the CdInit call before my CdSetMode and CdPlay commands. What does a CdRead call do to inhibit CdPlay calls??  
- Scott Patterson

---

4/19/95 3:16 PM  
Re: CD Times  
David R. Sullivan  
CD

TEST.OUT 4K  
CD Creation  
The Attached file has a report generated by a CD seek test

---

4/20/95 10:45 AM  
MovConv problem  
Dean M. Grandquist  
CD

OK, I can get playstr to play the example.str from memory. But when I try to convert an uncompressed AVI to str(MDEC) format one of three things happens. Windows slows down and is almost impossible to exit. The application crashes with a General Protection Fault or It seems to finish processing the file and I exit fine. When it seems to process the AVI fine, the .STR file I get crashes playstr(). What am I doing wrong? Is there any way I can get the .AVI that was used to make example.str? Is this going to be addressed on the 24th?  
frustrated.

---

4/20/95 12:16 PM  
Re: Read Data from CD (Works)  
Christopher Deel  
CD

CDTEST.ZIP 15K  
CD Creation  
I managed to get CD reading to work As long As I use the Low level calls.  
I could not get open() to work.  
I have included my project in case it is helpful.  
Chris

---

4/20/95 1:12 AM  
please give me access to EMU & CDGEN  
Alex Dommasch  
CD

Please give me access to EMU & CDGEN.  
Thanks, alex

---

4/20/95 4:54 PM

Re(3): Sound in str files  
Noah J. Stein  
CD

I just determined a couple of hours ago that the MDEC stream has to be version 3; version 2 will not work. Be sure to set the sound parameters identically on all dialogs. My only problem now is finding source for playing version 3 streams. Anyone?

---

4/20/95 12:42 PM  
Update CD not working  
Mark Beardsley  
CD

I'm still unable to get UPDATECD to work properly. I can use BUILDCD to create a working image (along with a map file). If I simply recompile my PSX.C file and produce a new .EXE file, and then tell UPDATECD to update the image, UPDATECD will tell me correctly that only one file has changed and will claim to have updated the disk image correctly. However, the new image will not run. This occurs even with the new 1.5 release of the EMU stuff. I can get a usable disk image back by running BUILDCD again. Has anyone been able to use UPDATECD effectively? Or am I just an idiot?

---

4/20/95 4:57 PM  
Re: MovConv problem  
Noah J. Stein  
CD

I have been unable to convert an AVI file to STR. I have had to convert to individual TGA files and then to TIM's. I'm running MOVCONV on a Pentium and it slows to an absolute crawl for 30 minutes when I make our streams, but it works.

---

4/21/95 6:29 PM  
Making Playstation master disc  
Administrator  
CD

Here are general notes on making a Playstation master disc. Comments?  
Angus

Special notes for PlayStation master disc creation

1. IDs for Master Disc	1) License
Data -> Please use "License Data File" (floppy disc)	2) System ID / Boot
environment -> Those have to be settled in programs	-> As for 1) and
2), if it can boot, that means the disc can be	clear those checkings. 3)
Disc Name -> Product number "XXXX-xxxx" issued by SCEA/SCEE	Disc creation
date/time	Copy Right holder
Area Code -> "A" for USA/Canada "E" for Europe	Producer Name
	(Capital letter)
->On CD-ROM generator, read "ccs.file", click "Layout" command in left upperhand	
corner of the screen, click "Master" command in right lower hand corner of the screen.	
Then the window where abovementioned 5 items can be input is opened. 4)	
Memory Card File Name	-> Top 12 byte -> BEXXXX-xxxxx for SCEE
BAXXXX-xxxxx for SCEA	(Comment to SCE groups)



XXXX-xxxx part is the software title's Model No.  
No., we'll send separate fax.

As for the Model  
2. Other comments

(Especially on memory card) 1) On Screen Display for Memory card is all right?  
2) Memory card can be formatted? 3) Process and its display in the case there is no  
enough space for memory card is all right? 4) Process and its display in the  
case Memory card is not inserted is all right? \* Since PlayStation is designed under  
the policy that the memory card CAN be inserted or removed even during game playing,  
2), 3) and 4) have to be checked every time just before saving and loading. \* Please  
settle reconfirmation stage in the formatting process such as "Do you really want to format  
this memory card? Yes?/No?". Please do not let the program start formatting just after  
choosing "Formating" without asking it's reconfirmation. It is for avoiding the risk of  
re-formatting cards and erasing data by any un-intended reason such as a small electric  
shock etc. 3. When writing Master CD-R - Please choose normal speed. (Not  
double speed) - Please verify the disc. That means please check the data on the  
disc with its original data on hard disc. -> Please use CD-ROM generator  
for the check. 4. Other rules - When data volume is less  
than one minute -> Please add dummy data and make the total data volume  
volume more than one minute. - Please make each Track more than 4  
seconds. - All the DATA track have to be in No.1 track. - Since noises might  
also be generated in the case that CD-DA data with header is converted on  
writing CD-R, please use CDDA data without header. -> As for the method of  
omitting header, please follow SCE suggestion. 5. Treatment on read error  
judgement and read error - Please use Library ver 3.0 for the process.

Best Regards,

1. (From ) There is a bug to report with the Master information as mentioned in Step 1. If  
you modify the Area Code to 'J' and save the .CCS file, then the 'J' will not be there after  
reloading the .CCS file.

(Reply) According to our engineer. It's not a bug. It's a part of features. Area Code cannot be  
saved. Please input Area code every time before mastering. Since CCS file is not dedicated to  
PlayStation, additional data dedicated PlayStation format cannot be added into CCS. Our  
engineer knows it's a little inconvenient.

2. (From ) Why must we choose normal speed (Not double speed) as in Step 3? We have run  
tests here with double speed and had no problems. Also, wouldn't any problems be caught in  
the verify step?

(Reply) Double speed writing often causes Read errors. The most frequent symptom is ADPCM  
sound interrupted.

3. (From ) Step 4 mentions using "CDDA data without header." Please explain this statement  
and detail the SCE suggestion as to how to achieve this. Our CDDA data has no header that we  
are aware of...

(Reply) Some sound format such as AIFF has header part. Then the header is often read as a  
part of sound data and causes noises. That means 16 bit straight PCM data is most favourable.  
In order to avoid abovementioned problem, we'd like to suggest:

For Mac user, Sound Designer 2 format For PC user, WAVE format

4. (From ) I do not understand Step 5. Could we receive more information about what process  
we should be using Library ver 3.0 for?

(Reply) Retry function is newly added into our Library in Lib ver 3.0 and our engineers would  
like to recommend to use the Retry function. In previous version, even in read error, program  
didn't retry.

---

4/21/95 7:10 PM

Loading CD Data & CDDA  
Administrator

CD

Looks like people have problems with playing CDDA on emulator after doing CDReads. CDDA would not play after the reads. Weird huh?

So, please call the SpuSetCommonAttr() with the CDMix set after you do the CDReads. It seems to work.

Let me know if it fails.

Angus

---

4/21/95 9:35 AM

Re: Using MOVCONV with sound

Mark Beardsley

CD

One more note regarding my previous message.

The Version 3 MDEC option seems to work, but the conversion process takes much longer, and it seems to have problems maintaining the frame rate (frames get dropped). It also appears to create more glitches in the output video. There are occasional glitches using Version 2, but they are rare.

It would seem that version 3 has no advantage over version 2. I had heard that the image quality on 3 was supposed to be better, but I haven't seen that.

---

4/21/95 11:52 AM

Debugging Station CDs

Mark Beardsley

CD

We just got in a couple of Debugging Stations (the blue looks pretty cool). The station can play a Ridge Racer disk fine, but.... It doesn't want to play a disk that I've burned myself. My disk will boot fine from the black CD drive hooked to the development system, but on the Debugging Station it just hangs on the Sony Computer Entertainment Logo Screen. Is there something special that the disk needs in order to run on the Debugging Station? I thought that if it played on the Black CD drive that it should be ok.

---

4/21/95 7:11 PM

Re: Update CD not working

Administrator

CD

Martin Day will be here next week. I will try to do a BBS private conference with him next week. Get your questions ready. Also come Monday to the Game Developers Conference.

Angus

I'm still unable to get UPDATECD to work properly. I can use BUILDCD to create a working image (along with a map file). If I simply recompile my PSX.C file and produce a new .EXE file, and then tell UPDATECD to update the image, UPDATECD will tell me correctly that only one file has changed and will claim to have updated the disk image correctly. However, the new image will not run. This occurs even with the new 1.5 release of the EMU stuff. I can get a usable disk image back by running BUILDCD again. Has anyone been able to use UPDATECD effectively? Or am I just an idiot?

---

4/21/95 2:12 PM

Re: Debugging Station CDs  
Bill "Angus" Guschwan  
CD

LICENSEJ.DAT 28K

CD Creation

Hey Mark,

Thanks for the posts on streaming.

Getting a CD to work on a Debugging station needs additional information added to the System area, specifically licensej.dat. You won't see this on the black cds because on a Mac or PC they won't show what is in the system area. The rules are at the bottom of this link.

If you only get the SCE logo, and you do not get the black PSX logo, it means you did not add the licensej.dat file and did not specify "J" as your country code. It hangs on the Gold SCE if you don't add this.

If you make it to the black PSX, it means then that there is a problem in your code, like you left in a pollhost or PCRead or something.

For E3 we have Japanese debugging stations, so you must use licensej.dat and the letter J. Later, for the US machines, you need to use the letter A and the license.dat for America. You need to wait on that. Sound good?

To make debug station cds, you need to use CdGEN but first:

1) Get rid of PCread, pollhost, etal 2) Link with 2mbyte.obj 3) Do a cpe2x on the .cpe file  
GOTO CDgen: 4a) Add files to the CDGEN. Use the insert key in the Directory window of CDGEN. 4b) Choose correct file type for XA stuff. Use Mode 2 Form 1 for game data. Use Mode 2 Form 2 for XA files. Use the File Type button to set it for each file. Standard file is Mode 2 Form 1. 5) In Additional Information button dialog of Volume panel of CDGEN, set System Area File to the path of your company's license.dat file. For example, c:\cdgen\licensej.dat 6) In Master button dialog of Layout panel of CDGEN, set License Area to J if you have a Japanese debug station. If you have an American one, set it to A. If it is European, set it to E. 7a) Set the minutes to 74 minutes. You should use 71 minute media. 74 minute might work but we don't support it. Use it at your own risk. Using 74 minutes is weird for a 71 minute cd. Oh well, you're getting paid right? 7b) Hit RECÉ button. Double speed record should work OK. 8) Always Verify after you bake a disc. It is that easy.

Angus

PS: We need to get you the license.dat file. I know. Bug your Account Executive for it. PSPS: Note you will not see the license.dat file on final discs because it is stored in the system area. System area is in the leadin area and you don't look at the leadin area.

---

4/21/95 6:04 PM

>1Gbyte Emulator Fix  
Bill "Angus" Guschwan  
CD

Greetings

We have found a problem with the image build tools with hard drives >1Gbyte (this is the problem that Angus reported to me when I saw him in America a few weeks ago). The problem is in the image build programs and there should be new versions on our BBS by the time you get this.

In the process of looking for this bug I found a small bug in the emulator code that would make it impossible to seek to 1 sector in 65536 (a carry wasn't being propogated). This has been fixed

in versions 1.5 / 2.5 now on our BBS in CDBOOT15.ZIP

---

4/21/95 6:04 PM

What Hard Drive for Emulator?

Bill "Angus" Guschwan

CD

We have recently had an American developer contact us about the hard drive he should use with the PSX CD emulator. This is the reply I sent and IMO this is what you should pass on to other developers who ask :

You can use any modern SCSI drive as long as you have cd emulator boot code 1.3 or later (current is 1.5). If the drive performs a thermal recalibration that breaks the data flow for a long time then your program will see what appears to be a cd read error and the normal recovery sequence should occur. If for some reason you need to be absolutely clear of these errors then I would recommend any of the Micropolis hard drives with the AV designation, e.g. 3243AV. Unless you are trying to develop your own fmv streaming code I would think it unlikely that you'll need an AV drive.

If anyone has any questions or points to raise about this then please let me know.

---

4/21/95 6:00 PM

About CDboot 1.4

Bill "Angus" Guschwan

CD

This version fixes a bug that was stopping file access to a disc containing cd-rom or cd-rom XA together with audio tracks.

The distinction between v 1.4 and v 2.4 is the same as between 1.3 and 2.3.

---

4/21/95 9:30 AM

Using MOVCONV with sound

Mark Beardsley

CD

I have MOVCONV producing usable movies with sound now (much thanks to Erick S. Dyke)!! Since some people are still having trouble, maybe I can provide some info.

This example assumes creating a 15fps movie (24bit). Step 1. Use MOVCONV to create an str file from an uncompressed avi file. a) in MovConv specify the input file name. b) specify input file format as avi (uncompressed) c) specify the output file name d) specify the output file format as str (MDEC) e) specify the detail parameters as follows: Enable Easy Setting Disable Audio in Output Type Set CD-ROM speed to Double Use MDEC image version 2 set frame rate to 20 (yes 20, not 15 !! this will leave space for the audio later) f) click on center button to start conversion

Step 2. Use MOVCONV to create an XA file from Wav file a) specify the input file name b) specify the input file format as wav c) specify the output file name d) specify the output file format as xa e) specify the detail parameters as follows: use 37.8 Khz and Stereo (other settings probably work also) f) click on center button to start conversion

Step 3. Use MOVCONV to combine the audio with video (creating a new str file) a) from the convert menu, choose Interleave Audio with Video b) specify the input video file name (the str

file created in step 1) c) specify the input video file format to str (MDEC) d) Enable Video with Audio e) set CD-ROM speed to double f) set frame rate to 15fps (Yes, now use 15) g) set #of channels to 1(150sectors/sec) h) specify the audio file name (xa file created in step 2) i) specify audio parameters the same as used in step 2 (37.8khz and stereo) j) specify the new output str file name (do not use same file name as step 1 str file) h) click ok.

You will then have a file which can be played by the PLAYSTR example.

Special Note: When using a movie with audio, make sure that in your cd CTI file that the str file uses XAsource, not just source for the str file. If the movie has just video, use source. Don't ask me why, but that's the way it works.

Hope this is useful to someone. If people have trouble, let me know, I'll try to help if I can.

---

4/21/95 7:12 PM

Re: Using CDGEN

Administrator

CD

If you add the licenseh.dat to the System Area, the warning should go away.

Angus

Use 74 minutes for 71 minutes is still weird. Accept it.

I have found some strange things in trying to use CDGEN to burn a disk. I have been able to complete all the setup tests in CDREC, so I believe that my hardware setup is ok. However...

1) we have been told to use only 71 minute disks (others are not supposedly reliable), but the CDGEN program only allows us to select 18, 63, or 74 minute disks. This seems strange.

2) each time we add files to the disk (in the directory mode), a window appears with a title of "Warning & Error Message", but there is no text in the window. Does this mean it is ok (i.e. no error), or is the error text missing for some reason?

Also, I'm assuming that the disks we burn can be booted in the black cd rom drive attached to the development system. Is this true or do we need to wait for a debugging station to test the disks? And when will the debugging stations become available? I believe we will need a few for E3. Thanks.

---

4/22/95 3:53 PM

BS Files Correct?

Borden Covell II

Art Tools

Is there anyone out there who is using Movie Converter to generate BS files? If so, and you think that the files are being produced correctly, please let me know. I'm having a problem with all of my BS files and would like to know for sure that the problem is not in the movie converter tool. thanks!

---

4/24/95 2:34 PM

Can't read cd-emu files anymore

Alex Dommasch

CD

Last week, everything was going great. I was reading files from the CD-emulator with no problems. This week, I started up right where I left off, and whole thing is being flaky.

So exactly what is the recommended procedure for reading off the emulator?

What was working last week was:

```
_96_init(); ... f = open("cdrom:filename.ext"); read(f, buffer, 2048); close(f);  
----- Now it hangs on the _96_init(). Is there something wrong with how I'm  
doing things? I am using the 3.0 Libraries.  
Thanks for any help alex
```

---

4/24/95 9:40 PM  
Re: Update CD not working  
Alex Dommasch  
CD

I, too, am having bad luck with updatedcd. It was working fine when I had just a few files, but now it causes problems. Just out of curiosity, one time after running updatedcd, I ran cddisk and looked at the contents of my partition - the first time I tried this it took about a minute, and came back with an error - I tried it again and the file list came up fine. Updatedcd is doing something really screwy to the system. I've resorted to running buildcd every time. (This is EXTREMELY TEDIOUS!)

Another related point is how buildcd and updatedcd always return a nonzero exit code, making them useless in makefiles. (Psmake presumes a nonzero exit code means an error and it quits.)  
alex

---

4/25/95 5:11 PM  
UpdateCD  
Thomas Boyd  
CD

Some people have been having problems getting UpdateCD to work correctly. I am working with UpdateCD right now. For updateCD to work correctly, the replacement files must be exactly the same size as the original files. To ensure this will be the case, you can pad your original files you expect to change in size by using MINSIZE when you buildCD (in your .CTI file). Choose MINSIZE to be the maximum size you expect the file in question to ever be. This may not answer all of the UpdateCD problems, let me know Tom Boyd

---

4/25/95 6:24 PM  
Access to folders.  
Dean M. Grandquist  
Administrator

I need access to EMU CDGEN folders. We have purchased 3 emulators.

---

4/26/95 9:30 PM  
MovConv 2.0  
Dean M. Grandquist  
CD

Hi, Where can I get the latest version of Movie Convert? All I have been able to find is the update to 1.9e and that doesn't have all the required files for installing it.

Is there a newer version than 1.9e? We purchased a few art boards but received no movie converter.

---

4/26/95 1:23 PM

Re: Movie Converter Redux  
Mark Beardsley  
CD

Have you made sure that your source avi does not have either audio already in it, and that it does not have an "alpha" channel (whatever that is). Either one may screw up the conversion process. Also, I am having a problem with an str that is especially large. I think it may be a problem on my end, on the other hand, it may be movconv. Try a short avi first (about 20 seconds).

---

4/26/95 6:08 PM

Re(2): Movie Converter Redux  
Joe J. Alemanni  
Mark Beardsley  
CD

Thanks for the quick response Mark,  
Your question tells me that your conversions are not starting from RAW RGB frames as are ours. We start with Raw RGB files and create audioless .STRs and then attempt to interleave the audio. I have discovered the VFD tool to create .AVI files, which I will test tonight.  
We also discovered today, that "Raw RGB" format from Debabelizer is not the "Raw RGB" format required by Movie Converter. Movie Converter didn't complain about the fact that Debabelizer Raw RGB prefaces the pixel data with 12 bytes of info including the height and width. As Debabelizer is such a commonly used tool, we were surprised that Movie Converter didn't work right (output BSs or STR frames were created that caused the rightmost 4 horizontal lines of pixels to be appended to the left side of the frame). DeBabelizer is great in its ability to automate the conversion we go through with source art.  
This should not be so difficult!  
Thanks, Joe Alemanni

---

4/26/95 5:16 PM

UpdateCD problem #2 (solved)  
Thomas Boyd  
CD

ROTTEN.CTI        1K  
CD Creation

If you use CCS2CTI to make your CTI file (as I did in Monday's demo), BuildCD will function properly, but UpdateCD will not work correctly. The problem has something to do with UpdateCD's interpretation of "XA Mode1, data" files. It treated my .STR file (which contained no interleaved sound) as if it had interleaved sound.  
solution: Edit the .CTI file before BuildCD to refer to "standard" data files as Mode1, not XA Mode1 data. I am including two files with this to demonstrate the changes. The first is the rotten .CTI file, and the second is the working .CTI file. Both files are designed to work with that spaceship demo I showed Monday which you all should have with your development goodies. (you may have to shuffle directories a bit).

---

4/26/95 10:04 AM  
Re: UpdateCD  
Thomas Boyd  
CD

Ooops, that is MinLength, not MinSize Tom

---

4/26/95 11:34 AM  
Movie Converter Redux  
Joe J. Alemanni  
CD

Using the step by step instructions presented both by Mark Beardsley and Buzz Burrowes, I have tried interleaving audio and video using MOVCONV a variety of ways without success. The most obvious inconsistency is the number of sectors (fourth word) in the first header. It should be around 10 and it's above 32K (\$8042 to be exact). The high bit does not seem to signify anything. Successive sector headers are similar to the first, including the sector counter. Any ideas??  
Thank you, Don Cherr Visual Integration, Inc.  
As an aside, is there any way to foretell the final sector of an unknown length .str file?

---

4/27/95 12:05 AM  
Sound in movies  
Brian C. Lewis  
CD

HELP! Has anyone been able to get movies streaming off of the emulator with sound? I have been trying to get this to work and have no idea where my problem is, because there are so many steps from AVI to building the CDEMU and no way to check the results other than it crashes the machine.  
If any one has gotten this to work could they post the steps in building the .str file and the .cti file they are using to load it onto the emulator or any peice of those two.  
frustrated-

---

4/27/95 9:13 AM  
CD emulator locking up  
Dave Berrisford  
CD

I've been having problems playing movies using the emulator If I leave it running the reading dies any time between 30 seconds and 4 hours . What happens exactly is that the strNext fails to return as command received and CdRead2 locks up if called to try and kick start the cd again . This does not happen when running from a real cd so it is definitely an emulator problem.

---

4/27/95 7:15 AM  
Re(3): Movie Converter Redux



Mark Beardsley  
Joe J. Alemanni  
CD

Everything I've done so far has been using AVI files straight from DOS Premier. I haven't needed to worry about either RGB files or BS files, hopefully I won't need to. Sorry.

---

4/28/95 5:54 PM  
CdRead  
Dave Berrisford  
CD

I'm having problems using CdRead after playing a movie (using streams). The first sector I read is always garbage, this replaces the first sector I request rather than being before it. I'm getting round the problem by doing a dummy 1 sector read, but I'd like to know if this is a bug or whether I'm doing something wrong.

---

4/28/95 2:13 PM  
Access to EMU folder  
Todd Blackburn  
CD

I would like access to the EMU folder.  
Thanks,  
Todd

---

4/28/95 11:26 AM  
CD reading & callbacks  
Daniel L. Berke  
CD

Hello all,  
I've just started to fart around with the CD and, needless to say, I have a whole bunch of questions...  
(1) What is the difference between CdISetloc vs CdISeekL? (2) As far as I can tell, the CdSyncCallback is called when a CdControl command completes, and the CdReadCallback is called when a CdRead completes. What is the CdReadyCallback for? What does it mean for the CD to be "ready"? (3) I'm currently using the SyncCallback and ReadCallbacks... however, they seem to get called at times other than when I issue a CdControl or CdRead, perhaps by lower level actions. What's going on? How can I be certain that the callback is being called as a result of \*my\* seeks and reads rather than any internal ones?  
Thanks for the info, Dan

---

4/28/95 4:45 PM  
CD CTI2CCS.EXE?  
David R. Sullivan  
CD  
Bill "Angus" Guschwan

With lib 1.5, CCS2CTI.EXE was included....for easy development, it would be nice to be able to go in the opposite direction, from CTI to CCS (note: original CTI file created from CCS). The point is, I do not wish to have a 900E on my desk, after starting the initial CTI from CDGEN -- I would like to use BuuildCD until my product is ready to burn and then be able to transfer the CTI into CCS format.

How can I do this? Is there a CTI to CCS converter? Docs on the CCS format??? etc.?  
Dave Sullivan.

---

4/28/95 10:09 AM  
access to EMU please  
P. (Leake / Scharnberg)  
CD

Sony folks -

We still don't seem to have access to the EMU directory. any chance somebody could grant us access? we have three CD emulator systems.  
- Brian LEake Viacom New Media

---

4/28/95 4:03 PM  
Access to EMU and CDGEN  
Gene Sewell  
CD

Hi,  
I would like access to EMU and CDGEN please!  
Thanks  
Gene Sewell Minds EYe Games

---

4/28/95 9:36 AM  
interleaving a/v strms w/ MOVCONV  
Don E. Cherf  
CD

Thank you to everyone who has posted help msgs re: MOVCONV and streaming data. I've read all of it and have succeeded in getting a movie (without sound) to play using PlayStr. BUT! I have been unable to generate a stream with audio and video interleaved which works. The resulting file does not even look close. The header of the first sector is always:

```
00 01 42 80 00 01 42 80 60 01 01 80 00 00 09 00
```

This will not work as I understand streams. This is what I am doing. (Perhaps something will ring a bell with someone.)

(The version of MOVCONV I am using is 1.9e. I am not currently using MOVPACK. I tried with no success.)

I am starting with 40 .rgb files and using MOVCONV to convert them to a stream. I can view this stream with no difficulty using PlayStr. (I modified the ConcatEncodedFile routine to concatenate variable sector length frames as the frames were coming out 7 and 8 sectors long using the 20fps setting.)

I have converted a 2 second .wav file to .xa format using MOVCONV.

Following the steps from Mark Beardsley, I tried interleaving the two. The file is absolutely

unplayable and begins with the header I mentioned above which implies the first sector is sector #256 (0x0100) of 32834 (0x8042). Successive sectors have the same header.

I have tried Mark's suggestion of creating the first stream at 20fps and then interleaving at 15fps as well as both streams at 15fps with identical results.

I also tried converting the .rgb sequence to an .avi file and then to a .str (using MOVCONV for both conversions). The .avi file looks valid through Media Player and the stream it produces runs fine using PlayStr.

I have done perhaps 3 dozen tests with various setups and have no difficulty producing a valid stream without audio, but have not yet created a working interleaved stream.

- 1) Is the above header example valid?
- 2) Should I be using .rgb files? (they produce a valid stream before interleaving)
- 3) Am I missing something obvious? or not obvious?
- 4) Is my .avi conversion valid?

Thank you for any help.  
Don Cherf

---

4/29/95 4:49 PM  
CDW-900E Troubles  
David Foley  
CD

We are trying to burn some CD's and our CD burner from Sony doesn't want to take the discs we are putting in. It will flash the disk light for about 15 seconds and they stay off. We have tried a number of disks. Has anyone had this problem?  
David

---

4/29/95 8:40 AM  
Re: interleaving a/v strms w/ MOVCONV  
Mark Beardsley  
CD

SAMPLE.CTI 1K  
CD Creation

How are you putting the str files into your disk image.  
The commands for including a str file with audio are different from those for one without audio. I've attached a sample.cti file that shows both. Note the difference between the two str entries. One uses the XAsource command, the other just Source. Give it a try.

---

4/30/95 6:15 PM  
File size > 512k from CD  
Heather Barclay  
CD

I am trying to read a file > 512k from the CD Emulator. I can read the first 256 sectors fine, but the subsequent sectors are not read correctly. I am using a CdRead()/CdReadSync() loop to read each chunk of data, with a maximum read of 256 sectors at a time. I have verified that the sector sizes and the destination buffer addresses are correct. I am not getting errors reported. After a CdRead()/CdReadSync(), where is the next CdRead() position? Do I have to manually reposition the CD for each subsequent read? Is there up-to-date documentation on LIBCD? I

can't find any...  
HB

---

5/1/95 12:33 PM  
Re(3): New CD Emulator blues  
Dave Berrisford  
CD

IOTEST.ZIP           23K  
CD Creation

Here's a ZIP file with some OPEN & READ code that works.  
Also in there is VERSIONS.TXT, so that you can make sure that all of your tools are the same version numbers as mine. (RESETPS.EXE is version 1.03). I'm using LIBS 3.0  
From power-up:- 1. RUN SELEMU.CPE 2. RESETPS 1 3. RUN SNPATCH.CPE 4. RUN IOTEST.CPE  
Make sure there is a PSX.EXE file in your active emulation partition.  
Sometimes, it may need a couple of downloads to get it to work (?).  
Hope this helps, Dave.

---

5/1/95 11:37 AM  
Can I play too??  
Dave R. Scheele  
CD

Gee, everyone here seems to be having so much fun!! I finally got my CD emulator today, and would love to join in. Can I have access to the EMU folder?  
Seriously, would it be possible for someone to gather all the tidbits, code and examples in this conference into a zip file and post it? It'd be great for beginners like me, we could learn from the experiences of others without having to wade through all the messages ...  
Dave

---

5/1/95 5:47 PM  
CD Questions  
Bill "Angus" Guschwan  
CD

Question #:

Q. 1. When do the events (CD) events occur ?

A. 'data ready' occurs when one sector of data is in the CD-ROM buffer. 'data end' occurs when the track ends. 'error' and 'completion' after the command completes.

Q. 2. There are callbacks ( CD-ROM ) CDSYNC, CDREADY, CDREAD, do they use the events in question #1 ?

A. Yes, events use callbacks.

Q. 3. If we use CD callbacks can we also use CD events ?

A. Well yes and no. Events are handled by a default event handler. When you use callbacks you are supplying a routine to use in lieu of this default handler. It may be possible to call the default event handler after your routine is completed, passing along the arguments (unmodified) to the default handler.

- Q. 4. Is there a callback when a CD error occurs ?  
 A. No.
- Q. 5. Is there a way to wait for an event instead of just polling it ?  
 A. No, but as a standard practice it's a good idea to put your error checking in the ( CD ) callback.
- Q. 6. Where on disk is the TOC ?  
 A. We are still researching this answer, expect to have an answer by the end of this week.
- Q. 7. How can I tell the track type, i.e. data, CDDA, etc. ?  
 A. The philosophy is that the system is to be used as a delivery system, with known file types, so you as the creator of the CD-ROM disk should know the contents of your disk ! and therefore no allowances have been made to provide this level of functionality to the programmer.
- Q. 8. How can I tell the mode and form of an individual file ?  
 A. See the answer to question number 7 above.
- Q. 9. What happens if I try to read a CDDA sector using CDREAD() ?  
 A. As you reported the system currently locks up !, it is undefined and therefore returns garbage.
- Q. 10. What is the proper conversion between sector numbers and time code on tracks other than zero ?  
 A. Time code -> sector: ( minutes \* 60 + second ) \* 75 + sector - 150.
- Q. 11. Can I access subcode of CDDA, sync info sector #'s etc. ?  
 A. No.
- Q. 12. Can directories be mode 2 form 2 ?  
 A. No, directories are mode 2 form 1 only.
- Q. 13. Currently, mode 1 data tracks work fine. Will they be supported in the future ?  
 A. No, they will not be supported.
- Q. 14. What actually happens when a 63 or 74 minute CD write once media is used ?  
 A. The PSX has been optimized to use 74 minute media and although I know of at least one occurrence of 74 minute media being successfully used for debugging purposes, SONY claims that the density ( bit ) is not up to specifications. So the answer is that you may in fact get unrelated CD errors from out of spec media.
- Q. 15. What is the proper way to abort a CD function ?  
 A. To reissue a CDINIT() function call. This will bring things back to a 'power on' state.
- Q. 16. What is the right name to find a file whose name is unknown ?  
 A. This question falls under the same category as questions 7 & 8. But you may be able to use the Firstfile() and NextFile() functions. I unfortunately was unable to find any example code demonstrating this tho.
- Q. 17. Do callbacks need to be reset every callback ?  
 A. Yes.
- Q. 18. FntFlush() some or all of the screen seems to be cleared - what is being cleared and when ?  
 A. From the question, if this is flickering problem, be advised to update both buffers that the font is being rendered into.
- Q. 19. Where is the CLUT in relation to font sprite ?  
 A. It is 32 (decimal) below the bottom of the font sprite, in VRAM.

> I wonder if you could pass this message (from one of our developers) on > to whoever deals with CD-ROM generator bug fixes. >> -> When the 'REC' button is pressed, the dialog boxes which > -> appear mess up the display. I'm running 0124\*768 with large fonts. It is a known bug about version 1.1. It depends on a font size. Please set up the size of system font into 16pixel.  
We will fix this bug in the next release of CD-ROM Generator.

---

5/1/95 3:52 PM  
UpdateCD  
Thomas Boyd  
CD

Many have noticed that updatedcd does not work correctly with the emulator. SN Systems is busy fixing it as you read this. If you NEED to make it work for the next day before it is repaired, you can hack your way around the problems like so:

1. do buildcd with an image file (hooray! this means you have to have enough room on your hard drive for the image)

```
buildcd -s3:1 -mtom.map -itom.img tom.cti
```

2. now when you updatedcd, it will update the image and the disk file correctly (by forcing image update, it works. Without image update, it fails)

```
updatedcd tom.map
```

This bug will be repaired quickly, and I will post the updated version ASAP. Tom

---

5/1/95 10:42 AM  
Re: New CD Emulator blues  
Bill "Angus" Guschwan  
Todd Blackburn  
CD  
I'll give you emulator access.  
Angus

---

5/1/95 10:13 AM  
Update interleaving chapter 2  
Don E. Cherf  
CD  
Mark Beardsley  
Here's some additional info.  
WHen I use MOVCONV to create the first (video only) conversion to .str format, the sectors are 2048, which is in line with the documentation. When I then try to interleave the .xa file with this .str file, the sectors become 2336 as if a subheader has been added. This is a big reason why PLAYSTR barfs. Is this correct?  
Also, do we need to be running in CDROM emulation mode or should PLAYSTR be able to play these interleaved .str files as they come from the PC into memory?  
thanks Don

---

5/1/95 10:01 AM  
Re: CD CTI2CCS.EXE?  
Bill "Angus" Guschwan

David R. Sullivan  
CD

There is no CTI2CCS.exe. You can still use the CDGEN tool to make the CTI file, and then cti2ccs to convert for buildcd. You DON'T need a CDW900E for it. That is our recommended way.  
Angus

---

5/1/95 10:29 AM  
New CD Emulator blues  
Todd Blackburn  
CD

I am trying to use my new CD Emulator and am having lots of problems reading data files from the CD emulator. I have read the messages in this conference and have tried the solutions presented, but none are working.  
If I do a \_96\_init and try open/read, I can open the file, but my read fails. I have tried reading all of the file in one read -- return status of -1; reading in blocks of 2048 -- some of the reads complete, the number varies, but finally fails.  
I tried using the low level CdSearchFile and CdRead, but I can't even get past the CdInit; it fails. Some of the messages in the conference suggest that I need newer versions of the CD emulation software tools, i.e. CDBOOT, BUILDCD, etc., but I don't have access to the EMU folder. I am at my wits end. Please help. By the way, I am using a Micropolis AV 1.9GB drive.  
Thanks,  
Todd

---

5/1/95 11:06 AM  
Re(2): New CD Emulator blues  
Todd Blackburn  
CD

Thanks for the quick reply. I really appreciate it.  
Todd

---

5/1/95 8:53 AM  
Working example of CD reading with callbacks  
Borden Covell II  
CD

Does anyone have an example of code that reads from a file on the CD using the asynchronous callback procedures? We would appreciate it if someone would post it to us!  
Thanks, Borden Covell II Visual Integration, Inc.

---

5/1/95 12:18 PM  
Still Using Sound in MovConv  
Mark Beardsley  
CD

I posted directions for creating movie streams with audio a week or so ago. I have since found a slightly easier way of doing this. And since several people still seem to be having difficulty with it, I thought that another attempt might be helpful.

The video source that I'm using is an uncompressed avi file from Adobe Premiere. The audio source is a 16bit WAV file.

This example assumes creating a 15fps movie (24bit). Step 1. Use MOVCONV to create an str file from an uncompressed avi file. a) in MovConv specify the input file name. b) specify input file format as avi (uncompressed) c) specify the output file name d) specify the output file format as str (MDEC) e) specify the detail parameters as follows: Enable Easy Setting Enable Audio in Output Type Choose Audio parameters (choose the correct parameters for the sound that will be added later) Set CD-ROM speed to Double Use MDEC image version 2 (don't trust version 3, it tends to drop frames) set frame rate to 15 f) click on center button to start conversion

Step 2. Use MOVCONV to create an XA file from Wav file a) specify the input file name b) specify the input file format as wav c) specify the output file name d) specify the output file format as xa e) specify the detail parameters as follows: use 37.8 Khz and Stereo (or other settings as specified in step 1, part E) f) click on center button to start conversion

Step 3. Use MOVCONV to combine the audio with video (creating a new str file) a) from the convert menu, choose Interleave Audio with Video b) specify the input video file name (the str file created in step 1) c) specify the input video file format to str (MDEC) d) Enable Video with Audio e) set CD-ROM speed to double f) set frame rate to 15fps g) set #of channels to 1(150sectors/sec) h) specify the audio file name (xa file created in step 2) i) specify audio parameters the same as used in step 2, part E (and step 1, part E) j) specify the new output str file name (do not use same file name as step 1 str file) h) click ok.

You will then have a movie file, with audio, which can be played by the PLAYSTR example.

Special Note: When using a movie with audio, make sure that in your cd CTI file that the str file uses XASource, not just source for the str file. If the movie has just video, use source. Don't ask me why, but that's the way it works.

Hope this is useful to someone. If people have trouble, let me know, I'll try to help if I can.

Answers to frequently asked questions : 1. No extra code is needed to play the sound. The sound data gets routed automatically to the Audio hardware. 2. Movpack is not needed for this at all. 3. The str file created this way cannot be played from memory, it must come from the CD (or emulator).

---

5/1/95 9:26 AM

Update interleave w/MOVCONV

Don E. Cherf

CD

Mark Beardsley

Thanks for responding Mark, but I think you're way ahead of me.

I am referring to your message posted April 21 "Using MOVCONV with sound." You stated you have MOVCONV producing usable movies with sound which can be played using PLAYSTR. I am unable to do even that. I've tried following your procedure with no luck, but I do have some info which may (or may not) be useful.

The file which MOVCONV produces for me is not usable by PLAYSTR. It is incorrect data which PLAYSTR simply fails with. We did have some luck using 18.9khz and stereo instead of 37.8khz. MOVCONV was then able to create an interleaved file. (This was at 15 fps.) Do you have any ideas why 37.8khz doesn't work but 18.9khz does?

PLAYSTR is still unable to play the resulting file, but I was able to modify PLAYSTR to ignore the sound data (it treats the entire file as video) and play the movie (w/out sound). It appears to me (and you had the same question in one of your posts) that PLAYSTR needs to be modified in order for it to play sound. Is that correct? Where do I look for those modifications?



BTW, the interleaved file which gets produced has the following format: the first frame is 10 sectors of video; the second frame is 9 sectors of video with one sector of audio tossed in at the 6th sector position - in other words V0,V1,V2,V3,V4,A,V5,V6,V7,V8, where V is V stands for video sectors (the digits represent the sector number found in the header) and A is the audio sector. The frames then alternate: 10 V sectors for the 3rd frame, 9V and 1A sector for the 4th, and so on. Does this sound correct? If so, how is it possible for PLAYSTR to know which is the sound? My modification currently skips the audio sectors.

Thank you for any assistance.

Donald E. Cherf Jr.

---

5/1/95 10:38 AM

Re(2): CD CTI2CCS.EXE?

Thomas Boyd

CD

But you can use buildCD to output a ccs file using a cti file. The following works:

```
Buildcd -mtom.map -gtom.ccs -s3:1 tom.cti
```

This will take tom.cti, make an emulation image on SCSI drive 3, partition 1, output a map file for use with updatedcd (which is currently being repaired and updated by SN systems), and spit out a corresponding ccs file for burning. Some older versions did not support this option, but 1.5/2.5 does.

---

5/1/95 9:20 AM

Re: CDW-900E Troubles

John Phua

CD

Hi David,

To make sure the system worked out ok before burning any CD's, I went through the "System Setup" process as mentioned in the CD-ROM Generator manual. This will test the connection, read, write and verification test. If this all goes well then the system should be ready to burn.

Also, what type of media are you using? I have only used the CD-R 71P (71 minute media).

Please let us know if there are still problems.

Thanks, John Phua

---

5/1/95 5:54 PM

Streaming Transparent

Bill "Angus" Guschwan

CD

If you want to transparent back ground image out of MDEC , you must set the mode of

DecDCTin()

DecDCTin() has two arguments , first is the top address of input data , and the second is the mode.

the mode is 32 bit unsigned data , and the format follows.

bit0 output mode 0 16bit direct color 1 24bit direct color

bit1 STP 0 0 BG is TRANSPARENT 1 1 BG is BLACK

STP is the MSB of color data , and if you set the STP the pixel have the color even if the RGB

values of the pixel are all 0 (BLACK) .

---

5/2/95 3:19 PM  
Update Ver 1.12  
Administrator  
CD

Please look in the CDEMU folder for the update version of 1.12

---

5/2/95 8:34 AM  
Movie conversion and CDGEN Q+A  
Thomas Boyd  
CD

AV\_INT.CTI 1K  
CD Creation

The following are answers to a number of movie conversion, CDgen, and CD emulation questions I have found over the last several days. An example CTI file for emulation using interleaved audio video playback is attached. Tom Boyd

Q: What's the difference between MDEC 2.0 and MDEC 3.0 ??? A: MDEC 3.0 produces slightly higher quality than 2.0, but is slower, resulting in reduced frame rate. It is usually recommended to use MDEC 2.0

Q: Should I use movie converter at 15 fps or 20 fps if I plan to add in the audio later? A: If you plan to add audio after conversion, use 15fps and enable audio (in movie converter) even though there is no audio yet. You can use 20fps with audio off to make room for audio, but it turns out that 15 fps is more efficient (20 fps conversions end up with occasional blank sectors)

Q: PLAYSTR doesn't seem to do sound. What is going on? A: PLAYSTR doesn't do sound, only video. there is an example program with a subroutine called anim(). The anim subroutine plays audio and video (anim is in a main.c with a header that says "movie sample program." You want version 1.30.) Version 1.30 of anim() is in the SAMPLES\EXEC\MENU\ANIM directory. There is an older version that produces glitches also included in one of the directories, use the newest version described above.

Q: What is the latest version of movie converter and where is it? A: 1.9e, the art tools conference area

Q: Why wont my CTI file work once my sound has been interleaved? A: In the CTI file, you must specify XASource instead of Source for audio/video XA files.

Q: In CDGEN, what is the difference between standard and subheader (forms 1 and 2) options?  
A: Standard means that the source file (on your PC) has no pre-added subheader information. CDGEN will add the subheaders as it constructs the disk image. Data will be divided into 2048 byte chunks from the original file and the subheader info and the error correction info will be added on. Use standard mode for files such as executables and video with no sound. Standard mode corresponds to "XAFileAttributes form1 data" and "Source <fname>" in the CTI files" Subheader files have subheader information pre-added to the PC source file. When you interleave audio and video together for XA source files, subheader data (and ECC data) is added to the resulting PC file. Audio and video are interleaved on a sector-by sector basis. Audio sectors are form 2, and video sectors are form 1. When using CDGEN, you select the subheader info on a file-by-file basis, so check the Form 1 box AND the form 2 box for XA files with interleaved audio and video. The "Interleave" check box does not work. It seems to be a red herring of sorts. In these PC source file containing the subheader information, sectors containing video data (form1) will have the ECC area left blank, because CDGEN adds this

later when burning the CD. The error correction data is location dependant and gets added on the fly, replacing the blank area in the PC source file. In the CTI file, Interleaved audio and video files will be specified without the XAFileAttributes command, using "XASource <fname>" Finally, the CDDA button is for red book audio.

Q: I am having problems with Movie converter. Any ideas? A: Start by making sure you have the files THREEED.VBX and GUAGE.VBX from the BBS.

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5/2/95 9:30 AM  
MakeCTI - A must have tool!  
Erick S. Dyke  
CD

MAKECTI.ZIP 9K  
CD Creation  
This tool takes and generates a cti include file of a whole directory tree.  
Enjoy!  
Erick

---

5/3/95 2:13 PM  
Re: CDW-900E Troubles  
David R. Sullivan  
David Foley  
CD

Yes, we had tgehe same problem when using Generic disks -- though there should be no difference when we switched to a higher quality brand -- no prob. (So Far). I did not spend the time to identify if the generic was acutally the problem.  
DaveS.

---

5/3/95 9:45 PM  
HELP ... Problem with file seeks AFTER flic plays!  
Mark W. Kelly  
CD

Hi,  
We are having a few minor problems when it comes reading / seeking large files after playing a flic. After getting a flic with audio working (Well almost ... It clicks like crazy) we have lost the ability to seek for large files on the EMULATOR  
Does any one have any ideas on this one?  
Cheers,  
Mark Kelly VIE Inc.

---

5/3/95 8:33 PM  
This is getting silly.  
Dean M. Grandquist  
CD

Can we get access to the CDGen folder, we have the CDGen software.  
What point is it to deny access to sectoins on this BBS when you need a Sony password to get on anyway. Why would Sony care if I get the sound board files when we haven't got the sound board?  
Thanks --Dean "having a bad hair day" Grandquist 8-)

---

5/3/95 5:45 PM  
Transparent Movie  
David Foley  
CD

How do we define what is the transparent color in a movie that will be converted to a .STR from an AVI file? We are going to experiment with this but haven't figured out how to explain to MOVCONV where to get transparent information.  
David

---

5/4/95 11:15 AM  
Re: SCSI Card?  
Mark D. Hirsch  
CD

You also have to get a specific adaptec card, i think any of the 1540 series, though I think it is AHA-1542CF

---

5/4/95 9:44 PM  
Re: SCSI Card?  
Unni Pillai  
Christopher Deel  
CD

Yes you need to purchase the Adaptec SCSI card. The CDW900E or the CD Generator manual refers to the ADAPTEC SCSI family 1542xx series of SCSI cards to be compatible. We have had success with the following Adaptec card: 1542CF. Thanks Unni

---

5/4/95 10:27 AM  
Basic "How to burn a CD" question  
Montgomery Singman  
CD

To make a CD, you use CDGEN to setup the disk layout.  
When you say REC to burn the CD, is it pulling the files off of a DOS drive, or do you need to have the external SCSI drive used for emulation hooked to the burner?  
Is the external SCSI drive involved at all in the CD burning process?  
thanks

---

5/4/95 9:24 AM  
Re: This is getting silly.  
Kristine Severson

CD

Access is given to different tool sections as you purchase the tools. This is the way our business is organized. It's unfortunate that our accounting database is not integrated with this bbs (hence allowing for automated access once you've purchased the appropriate tools), but then, just blame it on Sony having a bad hair day.

By the way, if any of you out there have purchased various tools and need access to the corresponding areas on this bbs, please send private email to the bbs administrator. No need to waste public space for private issues.

Kris

---

5/4/95 10:11 AM

SCSI Card?

Christopher Deel

CD

Kristine Severson

We received our CD-ROM burner from Sony last week. In the documentation it mentions "the Adaptec SCSI card" several time.

We did not get a SCSI card with our burner. Should we have gotten one or is this another thing we have to buy?

---

5/4/95 10:25 AM

Re: CDGen and Dates

Administrator

David R. Sullivan

CD

There have been no changes or updates to the CDGEN file. I had to repost it because the system went down and it was magically deleted.

Kathleen

---

5/4/95 9:16 PM

HELP ... Flics and Audio

Mark W. Kelly

CD

Can you help...

1. We are trying to find a simple way to detect the end of our stream. Currently we are using a frame count, by as our flics change in size, we have to keep altering the counter value. Any ideas how to detect the end of a flic stream.

2. We have not problems, playing flic at 15fps (version 2) with 37kHz Stereo XA, but that seems to be the only method that we can generate that it stable. Any ideas or comments on getting 30fps with audio.

Cheers,

Mark.

---

5/4/95 10:20 AM

Re: HELP ... Problem with file seeks AFTER flic plays!

Dave Berrisford

CD

I haven't had any problems seeking after playing movies , but I have found that the first sector read after playing a movie is rubbish , so I have to read a dummy sector before doing anything else .

---

5/4/95 10:49 AM  
Re: SCSI Card?  
Thomas Boyd  
CD

You must buy the SCSI card in addition to the 900E burner. Tom

---

5/4/95 10:09 AM  
CDGen and Dates  
David R. Sullivan  
CD

Administrator

Ok, whats the deal with the magical changing dates on stuff. This time CDGen appears new, (by date) but it's still version 1.10...right? Is there something new in the NEW .zip file ??  
Just Asking, DaveS.

---

5/4/95 10:47 AM  
Re: Basic "How to burn a CD" question  
Thomas Boyd  
CD

The CD emulator is not involved in burning a CD. The data burnt onto the CD is taken from the PC hard drive. In fact, there is currently no way to stream info from the emulator hard drive to CD (or anywhere else). the emulation system is a one way trip for data. Tom Boyd

---

5/5/95 9:38 AM  
Does lseek() work???  
Montgomery Singman  
OS

Does the lseek() routine work? Whenever I try to seek to the end of a file to get the length, the routine always returns a length of 0.

```
fp = open("sim:test.tim",O_RDONLY);  
len = lseek(fp,0L,SEEK_END);
```

len is always 0.

thanks

---

5/5/95 4:27 AM

Why doesn't this work?

Daniel L. Berke

CD

Bill "Angus" Guschwan

Hello all, it's 4:20 AM.

This code works on the development boards, but not on the debugging station:

```
CdControl(CdlSetloc, (u_char *)&(cd_fp.pos), 0); CdRead(num_sectors, (u_long *)buf,  
CdlModeSpeed); CdReadSync(0, 0);
```

cd\_fp.pos (type CdlLOC) has been set to an absolute time on the CD. We don't use CdSearchfile to get it, it's just hardcoded. We know the time is valid since the CDs we burn work just fine on the black cd drive hooked up to our development boards.

num\_sectors is the filesize (again, correct) divided by 2048. (Yes, I added 2047 before dividing.)

Buf is a valid malloced region of memory. It's a valid pointer (we check). Yes we're linking with 2mbyte.obj.

Our code runs and never returns from the CdRead on the blue box. It works with no problems on the development boards., both off the emulator and a real CD drive.

We've burned 8 disks tonight and I'm very tired. If someone knows why this code isn't behaving properly on the blue box, I'd sure like to know.

By the way, similar code which uses the CdReadCallback instead of CdReadSync works just fine. How odd.

I'm going to sleep now. Thanks for the help.

Dan

---

5/5/95 9:41 AM

DecDCT... Functions

Alex J. Garden

CD

I have been experiencing considerable problems trying to get MDEC movies working correctly. I am unable to find any documentation for the DecDCT... functions contained in LIBPRESS.LIB. Using MOVCONV, I have converted some test .TIM files into both MDEC movies and 24 bit direct movies. In both cases, when I try to load and play these movies using the test code we downloaded from this BBS, we receive a runtime error of "Invalid VLC code." This is incredibly frustrating. If anyone has any insight into where I can find this documentation, or what I may be missing, please, let me know.

thanks in advance...

Alex Garden@Radical Entertainment.

---

5/5/95 9:39 AM

Re: Does lseek() work???

Bill "Angus" Guschwan

CD

Unfortunately, SEEK\_END does not work.

ANgus

---

5/5/95 10:29 AM

Re: HELP ... Flics and Audio

Dave Berrisford

CD

1. The only way we've managed to catch the end of video is to put a dummy file after the film then wait until the frame number drops to stop . Not very elegant but it works. 2. What size video are you playing ? 320x240 won't work reliably at 24bit 30fps , try 256x240 .

---

5/5/95 2:58 PM  
MovConv Anomalies  
Mark Beardsley  
CD

I believe I've found some peculiarities in MovConv. I have a movie which fades to black at the end (it actually has about 20 completely black frames at the end). This is because the music continues on for a bit after the video is over. However, when playing the movie, the last 10 frames or so are not black, but show as multicolored vertical lines (the audio continues as expected). If I stop the movie 10 frames early, I won't see the lines (but then I don't get to hear the end of the audio). The audio file I am using is 37kz Mono. Please note that it is not that the video is missing in the source (the original .avi file actually has 20 black frames at the end). Secondly, what should happen if your source audio is longer than your source video? When I'm using Stereo sound, it seems that the excess audio is dropped. However, when I use Mono sound, it seems that the video is padded (with garbage) to the length of the audio. Neither of these is immediately critical, because I have work arounds that I can live with for E3. However, when things have calmed down a bit, maybe someone can look into this. Thanks.

---

5/5/95 10:47 AM  
Re(2): HELP ... Flics and Audio  
Don E. Cherf  
CD

Re: Q1. We were under the impression the best way to check for the end of the video is to insert the number of frames directly into the code and keep track.  
Don

---

5/7/95 10:58 AM  
Movie Glitch Problems  
Mark Beardsley  
CD

I had thought that the problem with small square glitches on the playback of str files had gone away once I figured out how to use the audio options correctly. However, I have one movie that still displays this problem. It appears that the compression is faulty. Once the conversion is done, the movie will always have the identical glitches in identical frames each time it is played. However, if I re-run the conversion I will get different glitches in different frames (sometimes more, sometimes less). I am also still having some trouble with the other type of glitches (the dash pattern on the right side of the screen). These only seem to appear when using the emulator (I have not seen it occur on a burnt disk). I am not currently using an AV spec drive, so this may be part of the problem (but I was under the impression that other drives should only cause frames to skip due to read errors). Lastly, thanks for all the help in getting this movie stuff going. Things are starting to look good.

---



5/8/95 12:45 PM  
Re: MovConv Anomalies  
Borden Covell II  
CD

vertical bars sound like the original test pattern. are you double buffering correctly?

---

5/8/95 6:47 PM  
Re: HELP ... Flics and Audio  
Jim Rogers  
CD

I have found if I take the file size of the XA file that is returned by cdsearchfile and divide it by 21225 it pretty closely gives the number of frames contained in the movie. Of course cdsearch file is a bit flakey so there is a downside to this approach.  
Hope this helps Jim R

---

5/8/95 12:52 PM  
CD Emulator runs at 1/2 to 1/3 speed of real CD  
Borden Covell II  
CD

We have noticed that when running on the Debug Station we get CD access performance about 2x or 3x the speed of accessing the CD under emulation. Is there some reason for this?

---

5/8/95 2:41 PM  
Re: HELP ... Flics and Audio  
Thomas Boyd  
CD

Due do the nature of the movie converting and playing process, there is no easy way to detect the end of the movie. You must either know the frame count, or find a way around it. Tom

---

5/8/95 11:25 AM  
URGENT: CDGEN information  
Thomas Boyd  
CD

When cutting CDs with CDGEN, use the single speed option (do not cut with double speed option). There are problems with CDs cut with the double speed option. After the playstation has been running for a while with a CD cut with double speed, you may get video synch problems. Tom

---

5/8/95 5:26 PM  
FAQ: burning debugging station CDs  
Thomas Boyd

CD

Bill "Angus" Guschwan

As the news article stated, most of our staff will be at E3 starting tomorrow (Tuesday the ninth) so here is a list of the most common solutions to burning CDs for the debugging station.

Basic problems going from emulation (dev system) to debugging station (blue playstation):

Two meg problems Make your program fit into two meg minus 64K used by the Rom kernel.

Generate and check your map file to be sure executables fit if you are unsure. Check your malloc() calls to be sure they succeed. Remove references to memory outside the 2Meg memory map. Your 2Meg memory map is between 0x80010000 (the 0x10000 is the 64K used by the kernel) and 0x801FFFFFF. Either link with 2MBYTE.OBJ or use \_ramsize and \_stacksize (specify as externs). Just because it compiles with 2MBYTE.OBJ does not mean it will fit in 2Meg. That is up to you.

Burning with CDGEN.EXE Put LICENSEJ.DAT into the system file area using the "additional information" button on the "volume" screen of CDGEN. You do not need to include LICENSEJ.DAT in your list of files on the "directory" screen. Put a "J" in the System area box under the "master" button on the bottom of the "layout" screen of CDGEN. Be forewarned that this "J" is not saved with the rest of the information when you save your .CCS file in CDGEN. You must reenter it every time. If you get the license information entered correctly, the debugging station (not a development system) will display a black screen with the "PS" logo and licensing text after the white screen with the gold logo. If the system hangs on the black screen, the problem is in the program, not the licensing information.

Development system to debugging station transition Remove Pollhost() calls. Remove PCIO calls. Beware CdSearchFile(). CdSearchFile() may work under emulation and the black development CD-ROM drive, but fail on the debugging station. A solution is to hard code your files and their locations into your program. Although this is less flexible, the location of the files will be fixed on the final CD-ROM anyhow. You can use CDGEN to do a mock layout with your file structures built in, then go back and fill them in with the correct locations. If you need it, the formula for converting between time and absolute sector is as follows: Absolute sector = (minutes \* 60 + seconds) \* 75 + sector - 150

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5/8/95 12:42 PM

Re(2): Does lseek() work???

Borden Covell II

CD

we use the PC family of routines. PCSeek works for us.

Borden

---

5/8/95 1:46 PM

Re: Acceptable CDs for burning

Thomas Boyd

CD

74 min CDs work, but are not supported. They cause problems with final mastering (for production). I have tested, and had no problem with, CD-R 74 disks in the debugging station. If you can, save your 71 min CDs for your final E3 copies, and burn 74 min CDs for intermediate testing. Tom

---

5/8/95 12:43 PM

Re: DecDCT... Functions  
Borden Covell II  
CD

we have docs that seem up to date. we got them from Sony quite a while ago.  
If you can't get any help from them, I'd be glad to fax you a copy.  
Borden

---

5/8/95 3:19 PM  
Re: CD Emulator runs at 1/2 to 1/3 speed of real CD  
Thomas Boyd  
CD

I will check it out... Sometimes it is the PC and DTL2000 interaction that slows things down. It may not be the emulator. If you run PC processes with the DTL2000 running, things will bog down. TomI will check it out... Tom

---

5/8/95 4:05 PM  
Re(2): CD Emulator runs at 1/2 to 1/3 speed of real CD  
Scott Berfield  
CD

My developers, n-Space, also report considerable timing differences between the emulator and the gold discs. They also report a lot of trouble with the emulator causing error flags to be set wrong on loads - ie: it reports a file loaded when it is not. They have basically stepped away from the emulator for any timing critical work. -sb

---

5/8/95 12:53 PM  
Acceptable CDs for burning  
Borden Covell II  
CD

What media can we use to create CDs for use on the debugging stations. We are running out of the 50 that we got from Sony and we need to burn a bunch of CDs for E3. Can we use TDK #CD-R 74B disks???

---

5/8/95 9:38 AM  
read() and getting data from the CD  
Montgomery Singman  
CD

Are CDInit() and CDInitFileSystem() needed anymore? Some of the demo code still uses these, but there is no documentation that I can find for these routines.  
Does anyone use open() and read() for getting files or are these not the best way to get data?  
When you say open(fp,...), what is the system actually doing?  
Does the system have a concept of "tracks"? If you want to play a redbook track can you just tell it to go play redbook track 5 or do you have to actually manually seek the head to the time stamp for the start of track 5.  
What does CDPlay() do when it gets to the end of a redbook track?  
Does the system read in the default TOC? Do you have to handle the TOC differently if you are

using read() or if you are using CDRead()?

Does having subdirectories on the disk layout mean that a different TOC will be generated for each subdirectory? If this is true, then does that mean you have to send the head back to track 0 to read a new TOC every time you need to change subdirectories?

thanks

---

5/9/95 11:18 AM

Re: CD Boot

Ian McGee

CD

The PSX.EXE with the RCUBE demo loads RCUBE.TMD and RCUBE.TIM and then calls RCUBE.EXE.

Rename your program to PSX.EXE and it should load.

Take a look at CPEXEC.C and you'll see that all it does is execute PSX.EXE from the CD.

---

5/9/95 11:04 AM

CD Boot

Matt S. Arrington

CD

I have a few questions regarding boot-up from CD. First, the RCUBE demo works fine, but when I try to substitute RCUBE.EXE with say, BALLS.EXE it doesn't work. I typically, do the following:

resetsps 1 run seleemu run snpatch run cdexec

I've tried many other variations on the above with delays, etc, but with no success. The above steps work with RCUBE.

Last, what is PSX.EXE and what determines what EXE file gets loaded in off the CD at boot time? Is it always the program that follows PSX.EXE??

---

5/10/95 11:48 AM

Re(2): CD Boot

Buzz Burrowes

CD

Also... You mentioned balls.exe... You did convert it from balls.cpe using CPE2X didn't you?

1) CPE2X you .cpe file 2) rename it PSX.EXE 3) burn your CD (or build your CD emulator image)

---

5/11/95 1:55 PM

How to find out the end of a sound track on a CD?

Mark D. Hirsch

CD

Is anyone knows how to find out the end of a sound track on an audio CD? I had used "tuto4.c" sample program in the downloaded "movie30" zipfile. I found that when I play a sound and when it reaches to its end, I can hear several notes of the next sound track. I use

"cdRepeat(CdPosToInt(&toc[thistrack]), CdPosToInt(&toc[nexttrack]));" function to play a sound track repeatedly. I checked the CdILOC structure. It only tells us the beginning of each track.

-Mark

---

5/12/95 2:19 PM

Re: How to find out the end of a sound track on a CD?

Mark Beardsley

CD

I cut and pasted code from that same demo, and it seems to repeat the song properly. Does the CD you're using have blank gaps between tracks (some audio CDs sort of fade into the next song)? Either way, have you tried adjusting the endpos? It seems that the callback function decides that the song is over when the CD position gets to the endpos (ie. the start of the next song). You could tell it to end a second or two earlier. I may try that anyway just so that the dead time between repeats is less. Don't know if it will work though. Good Luck.

---

5/16/95 5:20 PM

FAQ: CD emulator

Thomas Boyd

CD

Answers to "my CD emulator wont work" questions. These tips are in addition to the basic instructions in the manual.

When installing hardware:

Make sure that the CD emulator card is set at the default SCSI address of 7. Although other addresses work, set the CD emulator hard drive to address 3,4, or 5. Nobody has had problems with address 3,4, or 5. People have reported problems with addresses 0 through 2 (although they usually work). Addresses 6 and 7 are used by the board. Hook the internal cable up to the DTL2000 boards as shown in manual (don't laugh, it has been forgotten). Choose a base address, interrupt, and DMA channel that does not conflict with other cards. Choosing the wrong DMA channel will occasionally take your BIOS out. It is a great idea to back it up first if you are unsure which DMA channels are available.

When installing software:

Some users have found that they need to set the /s option in their call to CDBIOS. Uther users have found that setting the /s option in their CDBIOS call inhibits CDDISK. Try calling CDBIOS without the /s option first, and then as a last resort (after trying the rest of the steps listed below), try using it. The /s option is called in the following form: CDBIOS /a388 /I7 /d6 /s3 where /s3 means that the drive is located at SCSI address 3. Only one person I have talked to date has reported needing this option. On other occasions, it has inhibited CDDISK. When calling CDDISK, remember that the number passed as a parameter is the SCSI ID of your CD emulator hard drive. For the example of initializing a hard disk with SCSI ID 3 the call would be CDDISK -n 3 where the -n option specifies initialization or re-initialization. You only need the -n option once. When you load the system area, load CDBOOT15.BIN or CDBOOT25.BIN (available in the CDEMU15.ZIP file of the BBS). These are the current versions of the boot programs. Do not use the old versions. When calling BUILD CD, the -s option specifies the SCSI ID and partition of the emulator hard drive you wish to access. For example: BUILD CD -s3:1 CD.CTI will access SCSI address 3, partition 1.

When running RCUBE or any other program:

RCUBE is ancient, and the RESETPS 0 call that brings it to life does not work for every program. Here is a list of commands that will launch anything: RESETPS 1 (Version 1.03 is the newest) Pause RUN SNPATCH (Currently better than PATCHX) Pause RUN SELEMU (You

only need to call this once after power-on or after a SELCD command) Pause RUN CDEXEC (instead of RESETPS 0) The pause commands indicate that you should wait for the commands to complete, or you will get "Cannot connect to target" error messages. I use the DOS batch file command PAUSE and hit keys between each command. Needless to say, you will have to insert path names where appropriate to access RESETPS, SNPATCH, and SELEMU. Under normal circumstances, RCUBE takes a max of 20 seconds to begin execution. Finally, if you have just installed your emulator card, changed SCSI IDs, reset the DTL2000 a zillion times, re-installed your BIOS after the emulator lunched it, kicked the CPU a few times while launching multiple DOS sessions with complicated communications packages, loaded RCUBE from different SCSI IDs, and had 106 "Cannot connect to target" messages all in one power-on session, it is advised that you power everything down, power it all up again, and start by rerunning CDDISK -n ## fresh. A cold boot does wonders for this process.

---

5/16/95 5:57 PM  
Re: FAQ: CD emulator  
Ian McGee  
CD

>> A cold boot does wonders for this process.  
So does a cold shower. <g>  
I know it goes without saying, but most SCSI controllers are set to id 7. So if you have a SCSI hard drive, you probably can't use id 7 without changing your HD setup. Personally I'm using SCSI id 6 for the CD emulator card. Do you know of any problems with this?

---

5/17/95 7:42 AM  
Re(2): FAQ: CD emulator  
Thomas Boyd  
CD

I have had no problems with SCSI ID 3,4,5, or 6, even though 6 is supposed to be the ID of the channel between the DTL2000 and the CD emulator adapter card.

---

5/17/95 3:48 PM  
SNPATCH vs PATCHX  
Paul A. Wilkerson  
CD

Is there a difference? What are the differences? What are the current versions? Where can I find them?

---

5/17/95 9:54 AM  
CDReadSync bug fixed.  
Bill "Angus" Guschwan  
CD

> Can you help me with this CD question. >> [Libcd] >> - CdSync() returns CdlComplete when a CD command is finished. > CdReady() returns CdlDataReady when sectors of data

are ready in the CD > buffer > CdReadSync() returns 0 when reading of sectors is complete.  
> > However, CdReadSync() seems to return 0 when the last sectors have been > read into  
the CD buffer. > If I am reading sectors from the CD, how can I detect when the sectors > are  
ready in main RAM (not the CD buffer), as > all of the syncing functions above work with the  
CD buffer, not main RAM. >

This is a bug in ver3.0 . Finally I found the cause. This is because the DMA from CD-ROM  
subsystem to main memory is not asynchronous. I fixed it at ver3.1.

---

5/17/95 1:52 PM  
CD Emulator Speed  
Borden Covell II  
CD

Since our title is so dependant on the speed of the CD, we need to get an answer on why the  
emulator is 2-3 times slower than the real CD. We can not burn CDs every time we want to test  
a change. Any ideas???

HELP! Borden

---

5/17/95 4:09 PM  
Re: SNPATCH vs PATCHX  
Thomas Boyd  
CD

PATCHX does not flush the cache of the old kernel when it loads a new one. SNPATCH does  
Tom .

---

5/17/95 6:53 AM  
Re: FAQ: CD emulator  
Mark Beardsley  
CD

An easier way to run the various commands, rather than using pause and hitting a keystroke, is  
to use the /w option on the run command.

for example: RESETPS 1 RUN /w10 SNPATCH RUN /w10 SELEMU RUN /w10 CDEXEC  
This seems to be much more reliable than using pauses. I don't think that I've had a "cannot  
connect to target" message in weeks. Also, the command RUN /w without a file name can be  
used to create a "pause" that will wait until the DTL2000 has responded. Be aware though, I  
believe that the /w option only works on the newer versions of RUN.EXE, some of the old  
versions don't support it.

---

5/17/95 9:55 AM  
CdRead Bug  
Bill "Angus" Guschwan  
CD

> One of our developers has reported this feature of CdRead - it always > leaves the head of  
the CD on the last sector read. > Is this a bug, or will it always be like this ? > For example: >  
> u\_long buf[2048], buf1[2048]; > CdRead(1, buf, 0); > CdReadSync(0,0) > CdRead(1, buf1, 0);  
> CdReadSync(0,0); > > After the code runs, buf1 and buf contain the same sector. This is not

a > problem, so long as it does not change at some point in the future. > Please could you let me know whether this will change ? >

This is a bug. Finally I found the cause. This is because asynchronous DMA from CD-ROM subsystem to Main memory. I fixed it in ver3.1. ver3.0 remains this bug.

---

5/18/95 2:02 PM

Re(3): SNPATCH vs PATCHX

Thomas Boyd

Paul A. Wilkerson

MESS1.COM 1K

CD Creation

>>>Is there a difference? What are the differences? What are the current versions? Where can I find them?

>>PATCHX does not flush the cache of the old kernel when it loads a new one. >>SNPATCH does

>Thanks for answering part one. (...and two. Now I will skip part three and proceed directly to four)

>Where do you get SNPATCH? I have looked all over the place and cannot find it. I can't find it on the BBS either. It is rumoured to be in one of the ZIP files, but I downloaded and searched them all and it is not. I attached it to this document.

>In addition where do you find the following 'mess1.com' and 'testmess.com' + accompanying documentation? TESTMESS.COM is in the PSX.ZIP file under the PSYQ TOOLS folder in the TOOLS subfolder. It is also attached handily to this message.

As for the documentation... I am still searching for it. When I find it, I will EMail you on the BBS. SNPATCH.ZIP contains its own documentation.

Finally, part three: The versions I have sent you are the current versions. Tom

---

5/18/95 12:31 PM

Re(2): SNPATCH vs PATCHX

Paul A. Wilkerson

CD

Administrator

Thanks for answering part one. Where do you get SNPATCH? I have looked all over the place and cannot find it.

In addition where do you find the following 'mess1.com' and 'testmess.com' + accompanying documentation?

---

5/19/95 7:33 AM

CDBIOS/Alchemy conflict?

David Minogue

CD

I've recently installed a CD emulator and the associated software, and find that alchemy crashes my PC, sometimes reporting a memory fault. The problem goes away if I don't run CDBIOS in my autoexec. Any ideas?

---

5/19/95 9:16 AM



Re: CDBIOS/Alchemy conflict?  
Ian McGee  
CD

I'm seeing the same problem on my machine (Compaq p90).  
Alchemy only crashes when trying to display something, not when displaying the help message or converting file formats.  
The crash appears to be right around when Alchemy queries the VGA card, but before switching video modes.  
It doesn't appear to be related to having NCC or MGAVESA (Vesa driver) loaded. I still get the crash.  
I noticed also that CDBIOS (and I believe DEXBIOS) conflict with DOS 6.2's MEMMAKER utility. If they are loaded, MEMMAKER is unable to come up with a suggested LH setup. If they are rem'd out, then it works fine.  
I do not have DEXBIOS or CDBIOS loaded high.  
Because of these two problems (MEMMAKER & ALCHEMY), my guess is that CDBIOS is being sloppy about something.  
Any ideas?

---

5/23/95 6:36 PM  
Video capture services?  
Dean M. Grandquist  
Non-tech talk  
CD  
What video capture methods are being used for live video? Does Sony recommend a video capture service?  
We tried Radius Video Vision board on the Mac to capture real time JPEG. The quality is low coming through JPEG in real time.  
Thanks --Dean Grandquist Spectrum HoloByte Inc.

---

5/23/95 7:09 AM  
MovConv Anomalies  
Mike Bartholomew  
CD

Hi Mark, Tom, & Unni:  
We believe we have seen similar problems when attempting to synchronize audio and video. We were using 44.1 kHz audio and Adobe Premiere to synchronize audio hits with video actions. We then converted the audio to 37.8 kHz before running the Raw2XA and MovConv tools. The audio was out of synch, and ran longer than the video. We also tried timing the audio and video using 37.8 kHz source audio, and running it through as 37.8 XA. This track also did not synch. The audio gets further out of synch the longer the FMV runs. HAS ANYONE BEEN ABLE TO KEEP AUDIO AND VIDEO CUES SYNCHRONIZED? Please let us know how or what step(s) we are missing.  
Thanks, Sandi Geary (via Mike Bartholomew's account)

---

5/23/95 5:58 PM  
Re: MovConv Anomalies  
Buzz Burrowes  
CD

I've done a few 15fps STRs with sync'd audio for Razor Wing, and we used this procedure...

- Create movies from raw frames selecting 20fps as the output rate (YES, 20fps!) disabling audio in the output. Using 20fps will leave room for the audio later.
- Take any audio file and convert it to the .xa format of choice (the format you will use for the final audio.) We used 37.8K STEREO.
- Interleave this temp audio with the str using MovConv, but this time select 15fps as the output rate. Keep the 20fps version with no audio around for later use. Note: we interleave the dummy audio just to be sure no timing issues creep in when we interleave audio later.
- Play the movie off the CD emulator and record it onto video tape with SMPTE timecode. Use this tape to do post production. (I use a Sony V0-9850 3/4" U-matic machine which gives me a nice timecode window to spot my effects to.)
- Dump final stereo post dub to 44.1k, 16bit stereo. I post using ProTools III then mix to DAT. I then dig. copy the DAT back into SoundDesigner II for mastering (compress, eq, etc.) Then I save a copy from SDII in .wav format (still 44.1k, 16bit stereo.)
- Bring that .wav file to the PC and convert to XA using MovConv (use the same xa format as used for the dummy audio track!)
- Now interleave with the original 20fps str again selecting 15fps as the frame rate.

I've only done ~1 minute movies using the method described above, but I've had no sync problems at all.

---

5/23/95 6:00 PM  
Re: MovConv Anomalies  
Buzz Burrowes  
CD

Also, search the archive for 'movconv' and you'll find a bunch of posts regarding movie generation.

---

5/24/95 6:19 PM  
Using 525mb disk on cde  
Borden Covell II  
CD

My 2gig drive died so I'm trying to use an older 525mb Seagate drive. I can get cddisk to recognize it, but it senses that there is no space on the drive. The drive had been used on a PC and was formatted and partitioned for DOS. Any hints on how to use this drive???

thanks!

---

5/25/95 10:45 AM  
CD EMulator problems  
Steve DeFrisco  
CD

PSX CDEMU problem:  
OK, I've read all the on-line messages regarding booting off of the cd emulator, and I just can't seem to get it to work.  
DELL PENTIUM SYSTEM P90 Number Nine SVGA PCI Internal IDE Hard / Floppy /  
CDROM interface System Setup: PCI gets no IRQs COM1, COM2 internals are off. parrallel is

on.

PSX CDEMU BOARD SETTINGS: ADDRESS = 390 DMA = d7 IRQ = 11 SCSI ID = 6 DTL-2000

BOARD SETTINGS: ADDRESS = 1340 DMA = 6 IRQ = 10

Emulation Hard Drive: Micropolis 2210 AV SCSI ID = 4

autoexec.bat setup: REM ===== Development Environment Variables ===== path

c:\psx\bin;c:\psx\cdemu\psyq\_cd;c:\psx\psyq;%path% set

COMPILER\_PATH=c:/psx/compiler set PSYQ\_PATH=c:/psx/psyq set

C\_INCLUDE\_PATH=c:/psx/include set C\_PLUS\_INCLUDE\_PATH=c:/psx/include set

LIBRARY\_PATH=c:/psx/lib set DEX2000=0x1340 dexbios /a1340 /b8 /i10 cdbios /a390 /d7

/i11 mess1 cdmon

REM ===== GNU C/C++ ===== set GO32TMP=c:\tmp

set TMPDIR=c:/TMP

Versions:

dexbios --- version 1.22 cdbios --- version 1.02 mess1 --- version 1.01 cdmon --- version 1.00

run --- version 2.30 resetps --- version 1.03

Symptoms: I can use cddisk to initialize the Emulation drive, set up partitions, load in cdbios25.bin for the boot code, and set partition 1 to the active partition. I can build the \sample\rcube disk using: buildcd -m cd.cti -s4:1 I use cddisk to look at the contents of the partition and the files are there.

If I tell the cdbios that the emulation drive is 4 (with the '/s4' switch), it has the same problems.

NOTE: If I tell the cdbios what the scsi address of the emulation drive is, cddisk will not work if I call it using 'cddisk 4', but it will work if I call it using 'cddisk 0'. It looks at the correct drive, and all of the functionality seems to be working. IS THE /S SWITCH FOR CDBIOS A SCSI ADDRESS OFFSET?

From a cold boot, after re-loading cdboot25.bin using cddisk, I run this batch file from a DOS prompt (Not under Windows).

```
resetps 1 run /w4 snpathc.cpe delay run /w4 newdex.cpe delay run /w4 selemu.cpe delay 8
resetps 0
```

All seems fine, the various programs tell me they are starting, no 'cannot connect to' messages. At the resetps 0, the screen flashes (the system is resetting), I get colorbars, and there are short accesses to the emu drive (approx 2 seconds apart, less than 1/2 second duration) which go on forever (more than 5 minutes if I leave it alone). The program never runs. I have tried also not running the cdmon TSR, because it doesn't seem to do anything at all. No messages on screen whatsoever.

At this point I \*MUST\* Cold boot in order to try anything else. If I use 'resetps 1', It takes approx. 8 seconds to reset, and I get 'cannot connect' messages from then on, no matter how many times I 'resetps 1'. I can, at this point, run cddisk and look at things, and update the boot code, etc., but it does nothing for being able to connect to target again.

If, from a cold boot, after re-loading cdboot25.bin using cddisk, I run any of these batch files it does the same thing.

```
resetps 1 run /w4 snpathc.cpe delay run /w4 newdex.cpe delay run /w4 selemu.cpe delay 8
run /w4 cdexec.cpe
```

OR: resetps 1 run /w4 selemu.cpe delay 8 run /w4 cdexec.cpe

OR: resetps 1 run /w4 selemu.cpe delay 8 resetps 0

HELP!

Steve DeFrisco Digital Pictures

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5/25/95 9:15 AM

Re: Using 525mb disk on cde

Dave Berrisford

CD

You can initialise the drive for emulation by using the -n option with CDDISK:-

CDDISK -n 2

where 2 is the SCSI ID of the emulator drive.

Dave.

---

5/25/95 9:44 AM

Re: Using 525mb disk on cde

Thomas Boyd

CD

are you using the -n option for initializing new disks?

---

5/30/95 1:16 PM

Re: CD EMulator problems

Jeff Davies

CD

I also had problems with the emulator using cdboot25.bin. I switched to cdboot15.bin and everything has been working fine.

Thomas, any ideas why?

-Jeff

---

5/31/95 2:16 PM

CDBIOS/MESS3 conflict

Paul A. Wilkerson

CD

Kristine Severson

I have just spent the last 2 hours tracking this one down. I was using cdbios 1.02, dexbios 1.22 and mess3 3.01. I tried to perform a CDDISK -n 0 to update my boot partition, but CDDISK reported that CDBIOS was not loaded, thus I could not touch the disc. I replaced mess3 with mess1 and the problem went away.

But I would still like to be able to view and capture my printf's. Can CDBIOS be made to work with MESS3? Any word on the new version of mess1 that works in windows window? I heard last month that this was in the works.

---

5/31/95 12:02 PM

Re: CD EMulator problems

Dean M. Grandquist

CD

Be sure and use cdboot15.bin. The 15 doesn't mean 1.5, it means cdboot1 v5, so cdboot25.bin is not the latest version. Also, don't use the /S switch in cdbios. If you get the disk using CDDISK 0, something is wrong.

The batch file you run to reset the emulator is using some things I have never heard of, what is newdex.cpe? Take out newdex.cpe and resets 0, they are not used in emulation. If you want to execute what you have loaded on the emu as PSX.EXE, after selemu.cpe run cdexec.cpe, or if only the .cpe has changed just run <name of your file>.cpe instead of using cdexec.cpe.

P.S. Steve D, I have exactly the same machine setup (Dell P90 no sound) as you , so any questions feel free to ask.  
aka dand@netcom.com

---

6/2/95 8:22 AM  
Re: CDBIOS/MESS3 conflict  
Mike Benna  
CD

What's the difference between MESS1 and MESS3? Where is MESS3? I'd like to be able to send debugger messages to a named pipe under OS/2 (I could probably do it with unbuffered file redirection from DOS). Is there a MESS program which will send messages to a file and flush the output after each line?

---

6/2/95 8:34 AM  
Re(3): CD EMulator problems  
Thomas Boyd  
CD

>I am using just plain old cdboot.bin. Where can I get cdboot15.bin? in the ZIP file in the emulator folder  
>Also, I read here that scsi id's 3,4,5 seem to work better than 0!? Is this true? yes. For some people, zero does not work. Tom

---

6/2/95 10:42 AM  
Playing XA Interleaved Audio  
Todd Blackburn  
CD

CD.CTI            2K  
CD Creation

I have a lot of digitized speech samples that I want to play from XA interleaved audio files. I cannot find any examples of how to do this. From reading all of the docs I can find, I put together the attached sample program. This, of course, is not working. I have also attached the CTI file I am using with BUILDCD. The audio source file that I am using is a VAG which is 37.8KHz mono. From what I understand, the interleave rate for 37.8KHz mono played at normal speed is 1-8.

Would you please answer the following questions?

1. What is the sequence of things I need to do in a program to tell the CD subsystem to play my XA interleaved audio?
2. What are the correct definitions needed in the CTI file to generate an XA interleaved file composed of only audio channels?
3. What type of source files are needed? I tried a VAG and an XA file created by AIFF2XA; neither worked. If the source file must be only the ADPCM data without any headers (i.e. VAG, XA), how do I create such a file?

Thanks,  
Todd

---

6/5/95 9:26 AM  
Access to EMU Folder  
Mark DeSimone  
CD

Please give me access to the EMU and CDGEN Folders Thank You  
Jim Hatfield

---

6/5/95 11:42 AM  
CD Master Information  
Bill "Angus" Guschwan  
CD

=====

= How to specify the Volume Descriptor and Master Information

1. Volume descriptor ----- The fields in the Volume-mode. NECESSARY  
[Application] Always "PLAYSTATION" [Creation date] Automatically filled, but can be  
modified. NOT NECESSARY [Volume],[Volume set],[Publisher],[Data Preparer],  
[Copyright],[Abstract],[Bibliography],[Modification date], [Expiration date],[Effective date]  
2. Additional Information ----- The fields in the dialogs that appears when you  
press "Additional information" button in Volume-mode screen. NECESSARY [System  
Identifier] Always "PLAYSTATION" [System Area File] The full path for license data file.  
(licencej.dat/licencea.dat/licencee.dat) NOT NECESSARY [Volume Descriptor File]  
3. Master Information ----- The fields in the dialogs that appears when you press  
"Master" button at the bottom of the Layout-mode screen. NECESSARY [Disc Name] Product  
number ("SLPS-\*\*\*\*" in Japan) [Producer Name] The name of the licensee company.  
[Licence Area] One character that means license area. ("J"=Japan / "A"=US / "E"=Europe)  
[Creation Date] The time to create master disc. It is necessary to identify the revision of a  
master disc at the re-mastering. (automatically filled, but can be modified) NOT  
NECESSARY [Copyright Holder]

---

6/5/95 3:01 PM  
off by one when using CdReadyCallback  
Paul A. Wilkerson  
CD  
Bill "Angus" Guschwan  
OUT.txt 16K  
CD Creation

Enclosed is example that uses the different forms of DISC IO (read,CdRead,etc.).  
To run, modify G.BAT for your system then type G to compile and run. Requires a CD or  
Emulator with PSX.EXE on the disc image.  
All read functions worked, but in using CdControl( CdReadN, (u\_char \*)loc, 0 ) or CdControl(  
CdReadS, (u\_char \*)loc, 0 ) with a callback function cbdataready(), I discovered that I was  
losing a buffers worth of data. I was able to fix this by seeking -1 sector (See Enclosed MAIN.C).  
The questions are as follows: Is this a bug? Am I doing something wrong? (See attached  
MAIN.C) If so what am I doing wrong?

---

6/6/95 7:38 PM  
Re: CdInit: What it does

David R. Sullivan  
Thomas Boyd  
CD

What does CdInitFileSystem do? and why does it hang. (uses VSync commands is all I can tell from the debugger).

You listed CdlReset, is this documented? where?  
DaveS.

---

6/6/95 3:31 PM

FAQ - CD emulator and CD burning

Thomas Boyd

CD

This FAQ covers the CD emulator and CD burning issues

CD EMULATOR: Answers to "my CD emulator wont work" questions. These tips are in addition to the basic instructions in the manual.

\*\*\*NEW! Q: "My CD emulator runs 2 to 3 times slower than the debugging station." A: We are working to repair this problem. \*\*\*

When installing hardware:

Make sure that the CD emulator card is set at the default SCSI address of 7. Although other addresses work, set the CD emulator hard drive to address 3,4, or 5. Nobody has had problems with address 3,4, or 5. People have reported problems with addresses 0 through 2 (although they usually work). Addresses 6 and 7 are used by the board. Hook the internal cable up to the DTL2000 boards as shown in manual (don't laugh, it has been forgotten). Choose a base address, interrupt, and DMA channel that does not conflict with other cards. Choosing the wrong DMA channel will occasionally take your BIOS out. It is a great idea to back it up first if you are unsure which DMA channels are available.

When installing software:

Although it normally should not be needed, some users have found that they need to set the /s option in their call to CDBIOS. Uther users have found that setting the /s option in their CDBIOS call inhibits CDDISK. Try calling CDBIOS without the /s option first, and then as a last resort (after trying the rest of the steps listed below), try using it. The /s option is called in the following form: CDBIOS /a388 /I7 /d6 /s3 where /s3 means that the drive is located at SCSI address 3. Only one person I have talked to to date has reported needing this option. On other occasions, it has inhibited CDDISK. When calling CDDISK, remember that the number passed as a parameter is the SCSI ID of your CD emulator hard drive. For the example of initializing a hard disk with SCSI ID 3 the call would be CDDISK -n 3 where the -n option specifies initialization or re-initialization. You only need the -n option once. When you load the system area, load CDBOOT15.BIN or CDBOOT25.BIN (available in the CDEMU15.ZIP file of the BBS). These are the current versions of the boot programs. Do not use the old versions.

CDBOOT25.BIN allows you to monitor the emulator for debugging. Some people have trouble with it. Try CDBOOT15.BIN first to make sure your system works, and then use CDBOOT25.BIN. When calling BUILD CD, the -s option specifies the SCSI ID and partition of the emulator hard drive you wish to access. For example: BUILD CD -s3:1 CD.CTI will access SCSI address 3, partition 1.

When running RCUBE or any other program:

RCUBE is ancient, and the RESETPS 0 call that brings it to life does not work for every program. Here is a list of commands that will launch anything: RESETPS 1 (Version 1.03 is the newest) Pause RUN SNPATCH (Currently better than PATCHX) Pause RUN SELEMU (You only need to call this once after power-on or after a SELCD command) Pause RUN CDEXEC (instead of RESETPS 0) The pause commands indicate that you should wait for the commands to complete, or you will get "Cannot connect to target" error messages. I use the

DOS batch file command PAUSE and hit keys between each command. Needless to say, you will have to insert path names where appropriate to access RESETPS, SNPATCH, and SELEMU. Under normal circumstances, RCUBE takes a max of 20 seconds to begin execution. Finally, if you have just installed your emulator card, changed SCSI IDs, reset the DTL2000 a zillion times, re-installed your BIOS after the emulator lunched it, kicked the CPU a few times while launching multiple DOS sessions with complicated communications packages, loaded RCUBE from different SCSI IDs, and had 106 "Cannot connect to target" messages all in one power-on session, it is advised that you power everything down, power it all up again, and start by rerunning CDDISK -n ## fresh. A cold boot does wonders for this process.

CD BURNING Here is a list of the most common solutions to burning CDs for the debugging station.

Basic problems going from emulation (dev system) to debugging station (blue playstation):

Two meg problems Make your program fit into two meg minus 64K used by the Rom kernel.

Generate and check your map file to be sure executables fit if you are unsure. Check your malloc() calls to be sure they succeed. Remove references to memory outside the 2Meg memory map. Your 2Meg memory map is between 0x80010000 (the 0x10000 is the 64K used by the kernel) and 0x801FFFFF. Either link with 2MBYTE.OBJ or use \_ramsize and \_stacksize (specify as externs). Just because it compiles with 2MBYTE.OBJ does not mean it will fit in 2Meg. That is up to you.

Burning with CDGEN.EXE Put LICENSEJ.DAT into the system file area using the "additional information" button on the "volume" screen of CDGEN. You do not need to include LICENSEJ.DAT in your list of files on the "directory" screen. Put a "J" in the System area box under the "master" button on the bottom of the "layout" screen of CDGEN. Be forewarned that this "J" is not saved with the rest of the information when you save your .CCS file in CDGEN. You must reenter it every time. If you get the license information entered correctly, the debugging station (not a development system) will display a black screen with the "PS" logo and licensing text after the white screen with the gold logo. If the system hangs on the black screen, the problem is in the program, not the licensing information.

Development system to debugging station transition Remove Pollhost() calls. Remove PCIO calls. Beware CdSearchFile(). CdSearchFile() may work under emulation and the black development CD-ROM drive, but fail on the debugging station. A solution is to hard code your files and their locations into your program. Although this is less flexible, the location of the files will be fixed on the final CD-ROM anyhow. You can use CDGEN to do a mock layout with your file structures built in, then go back and fill them in with the correct locations. If you need it, the formula for converting between time and absolute sector is as follows: Absolute sector = (minutes \* 60 + seconds) \* 75 + sector -150

---

6/6/95 11:07 AM

Playing XA audio files

Matt S. Arrington

CD

There is tutorial code that plays XA files directly. I was unable to get the sample code to work correctly. The file played through too fast. I am guessing that XA files that come from the RAW2XA utility need to be interleaved before they can be played, is this true? If XA files must be interleaved with empty data, then it seems to me that XA has no advantage over DA. Is this correct?

Matt

---

6/6/95 4:53 PM



CdInit: What it does  
Thomas Boyd  
CD

I have been asked by several people what CdInit does. Here is a loose interpretation:  
It tries this several times { init some hardware/library variables ResetCallback Hook CD  
system callback reset SPU volume reset CD-ROM volume reset SPU CdIReset CdSync } if  
successful above, it calls these functions, hooking default callbacks { CdSyncCallback  
CdReadyCallback CdReadCallback }  
Tom

---

6/8/95 5:20 PM  
Re(2): CdInit: What it does  
Thomas Boyd  
CD

> You listed CdIReset, is this documented? where?  
It is in LIBCD.H (not quite documentation per se - It is also in the lib 3.0 docs, but no  
information is added to what's in the header). In my "loose interpretation" I did not mention that  
it is not a function, but only a command call sent to the CD.  
>What does CdInitFileSystem do? and why does it hang. (uses VSync commands is all I can tell  
from the debugger).  
I will see what I can find...

---

6/8/95 5:58 PM  
CDGEN basics  
Matt S. Arrington  
CD

When booting from a CD (not the emulator) does the OS automatically execute PSX.EXE? I  
remeber reading something about a SYSTEM.CNF file, but have seen no mention of it here. Is this  
used?  
Thanks

---

6/8/95 6:40 PM  
CDGEN 1.10 Problems  
David Foley  
CD

Has anyone experienced this one and found a way around it. When we load up our CDGEN  
and prepare to burn a disc, it prompts us telling us that there are some files that need updating,  
would we like it to update them. If we say yes, it clobbers a bunch of the files and directories  
from our structure!  
any suggestions.  
David

---

6/8/95 3:14 PM  
Converting to str movie format.  
Mike Bartholomew  
CD

Message from Polly Harris via Mike Bartholomew...  
I am trying to write a converter for the sgi which creates str format movies. I think I understand the headers str uses, but I don't have much experience with data compression. Could someone explain the compression routines that the movie converter tool uses to create str movies, and how I can recreate them on an sgi in "C". Thank you.

---

6/9/95 8:42 AM  
PSX frame rate answer  
Thomas Boyd  
CD

> How does PSX know a movie is 30 frames per second or 15 frames per second? Is it imbedded in the STR?  
Frame rate is not imbedded in STR format. PlayStation never knows frame rate. PlayStation simply reads the data from CD-ROM and shows it on TV. Frame rate is defined in encoding process in MovConv. MovConv defines the data size of encoded image. In other words, we can say frame rate is defined at this time, because data transfer rate from CD-ROM is fixed.

---

6/9/95 8:45 AM  
JPEG/MPEG movie compression  
Thomas Boyd  
CD

> I have been asked the following: > ----- > I am considering playing animation in JPEG/MPEG on the playstation. I am > wondering whether the decoding functions in libpress.lib support third party > JPEG/MPEG format, for example: if I compress my data into JPEG/MPEG using tools > like Alchemy on IBM PC. (It will be hard to compress my data using the encoding > functions supplied by libpress.lib, which needs to be run on playstation). I > appreciate any guidance on this. > -----  
We have no plan to support third party JPEG/MPEG format with libpress.lib now. But they can make their own tools like Alchemy, as long as they use it personally and they use our libraries. If they want to sell it or distribute it to anyone else they need to let us know. I think libpress.lib doesn't have encoding functions now while we have the documentation of them. So, I think it is impossible to implement Alchemy.  
Koji

---

6/12/95 5:55 PM  
CD Commands  
David R. Sullivan  
CD

Angus,  
Can you please tell me about CD\_isopen, etc. within libcd ... this stuff is in lib30 and not documented in the lib30 docs (among other things like CdGetSector)...  
I would like to use CD\_isopen .. in my product, is this going to remain in the library through

future revs? what are the parameters? I know it returns a 1 if the door is open.  
Where is the docs for CdGetSector, yes, I know that CdGetSector(buffer, 2048/4) works and returns a 1 on success...what are the other parameters for size.  
Why do most of the Cd commands call CD\_ -- and some even directly -- it seems that if the CD\_ is documented, I could save a layer of code.  
How do I get the time back from the CD, it might be nice to know. Is it set properly upon factory shipping? Can the user set it somehow? I know there is a clock -- I'd like to see if it is useable.  
Can we separate CdRead, CdRead2, CdReady, etc. from the rest of the module so that they are not included is I only use CdInit and CdControl, etc.  
What is CdReset !!! NOT CdlReset! There is now a CdReset, what does it do?  
It would be real nice if there were docs that told about all of the functions -- not just those that we seem to be happy talking about.  
DaveS.

---

6/13/95 6:33 PM  
Re: Slow emulator  
Borden Covell II  
Thomas Boyd  
CD

Isn't the info needed to use the debug station's serial port available on the BBS. We have downloaded some example programs from the SIO conference.  
Thanks. I'll be in touch tomorrow to discuss the rest of our problems.  
Borden

---

6/13/95 2:22 PM  
Slow emulator  
Thomas Boyd  
CD

Kristine Severson  
Update: here's what SN Systems wrote to me about the emulator problem (We are asking Sony Japan to send us firm hardware specs urgently to solve this problem) Tom -----  
----- We think it's just that we emulated the timing of our external PSX CD drive and ours is very slow.  
Only problem now is determining exactly how fat the real PSX CD is. We've never been given any performance figures for PSX CD seeks and we're afraid that if we make the emulator seek too fast then we'll do more harm than good because developers will be able to write software for the emulator that would then be very slow & jerky on the real CD  
We can't profile a real playstation drive like we did the external black one because we cannot run a program on a real Playstation that we can get any useful output from. We considered piping the necessary info out of the debug station's serial port but unfortunately we do not know how those serial ports work.  
So we're still trying to decide the best way to go about this.

---

6/13/95 9:40 AM  
Re(2): CdInit: What it does  
Thomas Boyd  
David R. Sullivan

CD

>What does CdInitFileSystem do? It is very similar to CdInit. It calls the same initialization routine that CdInit does, but CdInit tries 4X before bailing out. It does not work reliably. Do not use it. Tom

---

6/13/95 10:32 AM

Re: CD EMulator problems (in archive)

Robert w. Calfee

Steve DeFrisco

CD

Hey!

I'm having the \*exact\* same problems!!! I've also got a pentium system. Our settings are pretty much the same, but I've got SCSI id 3 set. I'm not using cdmon or mess-- (what are they?) run selemu seems to completely lock up the devStation.

John Phua suggested that the EMU card might be bad--It's not the drive though, he tested it on his own system.

If you get a fix on this problem \*please\* let me know.

Thanks rwc

---

6/13/95 3:39 PM

Re(3): CdInit: What it does

David R. Sullivan

CD

You say do not use CdInitFileSystem, the 3.0 manuals say definately to use it if you plan on using any of the Kernel CD stuff -- is this correct, if not then why the conflict? I am using CdINit right now -- though when it fails I would really like a result code...

Thanks.

DaveS.

---

6/14/95 7:09 PM

Changing disks

Dave Berrisford

CD

A couple of questions here. Is there anyway to tell if the disk tray is open ? Is there anyway of flushing the directory cache ? Thanks

---

6/15/95 5:08 PM

CD FAQ (6/15/95)

Thomas Boyd

CD

This FAQ covers the CD emulator and CD burning issues

CD EMULATOR: Answers to "my CD emulator wont work" questions. These tips are in addition to the basic instructions in the manual.

\*\*\*NEW! Q: Which SCSI addresses are taken by the PC? A: SCSI address 6 is reserved for the communication channel on the disk side of the emulator. SCSI address 7 is used on the PC side

of the emulator by default. This can be changed, but CDMON and CDBOOT25.BIN require the address to be set to 7.

Q: What is the difference between CDBOOT15.BIN and CDBOOT25.BIN? A: CDBOOT25.BIN allows feedback to be sent using CDMON to see what the emulator is doing.

Q: What is the The /s switch? A: The /s switch is \*not\* for telling cdbios what the scsi id of the drive is. It is for setting the scsi id of the pc side of the system. In general people don't need this option at all. It may be deleted from future versions of cdbios to avoid confusion.

Q: "My CD emulator runs 2 to 3 times slower than the debugging station." A: We are working to repair this problem. \*\*\*

When installing hardware:

Make sure that the CD emulator card is set at the default SCSI address of 7. This is the address of the PC on the bus. Although other addresses work, set the CD emulator hard drive to address 3,4, or 5. Nobody has had problems with address 3,4, or 5. People have reported problems with addresses 0 through 2 (although they usually work). Addresses 6 and 7 are used by the board. Hook the internal cable up to the DTL2000 boards as shown in manual (don't laugh, it has been forgotten). Choose a base address, interrupt, and DMA channel that does not conflict with other cards. Choosing the wrong DMA channel will occasionally take your BIOS out. It is a great idea to back it up first if you are unsure which DMA channels are available.

When installing software:

When calling CDDISK, remember that the number passed as a parameter is the SCSI ID of your CD emulator hard drive. For the example of initializing a hard disk with SCSI ID 3 the call would be CDDISK -n 3 where the -n option specifies initialization or re-initialization. You only need the -n option once. When you load the system area, load CDBOOT15.BIN or CDBOOT25.BIN (available in the CDEMU15.ZIP file of the BBS). These are the current versions of the boot programs. Do not use the old versions. CDBOOT25.BIN allows you to monitor the emulator for debugging. Some people have trouble with it. Try CDBOOT15.BIN first to make sure your system works, and then use CDBOOT25.BIN. When calling BUILDCD, the -s option specifies the SCSI ID and partition of the emulator hard drive you wish to access. For example: BUILDCD -s3:1 CD.CTI will access SCSI address 3, partition 1.

When running RCUBE or any other program:

RCUBE is ancient, and the RESETPS 0 call that brings it to life does not work for every program. Here is a list of commands that will launch anything: RESETPS 1 (Version 1.03 is the newest) Pause RUN SNPATCH (Currently better than PATCHX) Pause RUN SELEMU (You only need to call this once after power-on or after a SELCD command) Pause RUN CDEXEC (instead of RESETPS 0) The pause commands indicate that you should wait for the commands to complete, or you will get "Cannot connect to target" error messages. I use the DOS batch file command PAUSE and hit keys between each command. Needless to say, you will have to insert path names where appropriate to access RESETPS, SNPATCH, and SELEMU. Under normal circumstances, RCUBE takes a max of 20 seconds to begin execution. Finally, if you have just installed your emulator card, changed SCSI IDs, reset the DTL2000 a zillion times, re-installed your BIOS after the emulator lunched it, kicked the CPU a few times while launching multiple DOS sessions with complicated communications packages, loaded RCUBE from different SCSI IDs, and had 106 "Cannot connect to target" messages all in one power-on session, it is advised that you power everything down, power it all up again, and start by rerunning CDDISK -n ## fresh. A cold boot does wonders for this process.

CD BURNING Here is a list of the most common solutions to burning CDs for the debugging station.

Basic problems going from emulation (dev system) to debugging station (blue playstation):

Two meg problems Make your program fit into two meg minus 64K used by the Rom kernel. Generate and check your map file to be sure executables fit if you are unsure. Check your malloc() calls to be sure they succeed. Remove references to memory outside the 2Meg memory map. Your 2Meg memory map is between 0x80010000 (the 0x10000 is the 64K used by the kernel) and 0x801FFFFFF. Either link with 2MBYTE.OBJ or use \_ramsize and \_stacksize (specify as externs). Just because it compiles with 2MBYTE.OBJ does not mean it will fit in 2Meg. That is up to you.

Burning with CDGEN.EXE Put LICENSEJ.DAT into the system file area using the "additional information" button on the "volume" screen of CDGEN. You do not need to include LICENSEJ.DAT in your list of files on the "directory" screen. Put a "J" in the System area box under the "master" button on the bottom of the "layout" screen of CDGEN. Be forewarned that this "J" is not saved with the rest of the information when you save your .CCS file in CDGEN. You must reenter it every time. If you get the license information entered correctly, the debugging station (not a development system) will display a black screen with the "PS" logo and licensing text after the white screen with the gold logo. If the system hangs on the black screen, the problem is in the program, not the licensing information. Development system to debugging station transition Remove Pollhost() calls. Remove PCIO calls. Beware CdSearchFile(). CdSearchFile() may work under emulation and the black development CD-ROM drive, but fail on the debugging station. A solution is to hard code your files and their locations into your program. Although this is less flexible, the location of the files will be fixed on the final CD-ROM anyhow. You can use CDGEN to do a mock layout with your file structures built in, then go back and fill them in with the correct locations. If you need it, the formula for converting between time and absolute sector is as follows: Absolute sector = (minutes \* 60 + seconds) \* 75 + sector -150

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6/15/95 2:17 PM  
emulator board config notes  
Thomas Boyd

CD  
Bill "Angus" Guschwan

Here is some additional information about emulator configuration: -----

----- Question 1:

>We have emulator hardware problems where, after setting everything up, and you >call RESETPS 0, the hard drive green lcd blinks for a few seconds, and then >holds at solid green. The RCUBE demo will then not load. On the SCEE BBS there >is a report (it describes the problem as a failure of the seek for PSX.EXE to >work), and below is a descriptive account of the problem from another >developer. We have at least 2 other developers with the problem. Which version of the boot code are you using (1.5 or 2.5) ? If you're using 2.5 can you see the emulator feedback info using CDMON ? If not then there's probably something not set up right somewhere along the line. Possibilities are : interrupt clash, interrupt not specified to cdbios, old version of cdbios, old version of resetps. If you are getting feedback then what do you see the emulator doing. -----

----- Question 2:

>PSX CDEMU problem: > >OK, I've read all the on-line messages regarding booting off of the cd >emulator, and I just can't seem to get it to work.

[text deleted]

>PSX CDEMU BOARD SETTINGS: >ADDRESS = 390 >DMA = d7 >IRQ = 11 >SCSI ID = 6  
^^^^^^^^^^^^ This is the problem. The PC side of the cd emulator should be configured to scsi id 7 (actually any number except 6 and the id of the drive but 7 is the default). The cd emulator side of the system uses scsi id 6. This cannot be changed. When two devices have the same scsi id this can cause strange effects with some things working and some not. -----

----- Question 3:

>DTL-2000 BOARD SETTINGS: >ADDRESS = 1340 >DMA = 6

^^^^^^^^ You should tell developers not to bother setting the dma on the dex-2000 boards. The dma on these boards does not work (unless they fixed it without telling us). dexbios does not use dma. Setting the dma jumpers just has the effect of wasting one of the dma channels in the pc. -----

----- Question 4:

[text deleted] >I can build the \sample\rcube disk using: >buildcd -m cd.cti -s4:1 >I use cddisk to look at the contents of the partition and the files are there. > >If I tell the cdbios that the emulation drive is 4 (with the '/s4' switch), it  
^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^ The /s switch is \*not\* for telling cdbios what the scsi id of the drive is. It is for setting the scsi id of the pc side of the system. In general people don't need this option at all. I may delete it from future versions of cdbios to avoid confusion. -----

----- Question 5:

>All seems fine, the various programs tell me they are starting, no 'cannot >connect to ' messages. At the resetsps 0, the screen flashes (the system is >resetting), I get colorbars, and there are short accesses to the emu drive >(approx 2 seconds apart, less than 1/2 second duration) which go on forever >(more than 5 minutes if I leave it alone). The program never runs. >I have tried also not running the cdmon TSR, because it doesn't seem to do >anything at all. No messages on screen whatsoever.  
^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^ This is because of the scsi id problem. cdboot 2.5 required the pc to be set to scsi id 7.

---

6/19/95 10:34 AM  
Need help with CD-Emulator  
Yoram Berkowicz  
Thomas Boyd  
CD

Dear Thomas

1. We are unable to work with the CD-Emulator at all. 2. First we could not format the HD. The CDDISK (v1.11) program stated that the HD has 0 MB on it This happened with 2 different 1GB HD's an IMPRIS and an HP-C2247-300. 3. After not being able to use the IMPRIS and HP hard drives, we switched to the recommended MICROPOLIS 4221 drive. Now we are finally able to issue 'CDDISK -n 3' and define a partition.

Issuing a 'buildcd' for the RCUBE demo seems to work, but when executing 'resetsps 0', the disk's LEDs flash, then the screen blanks, but the demo itself does not appear. Secondly, when attempting to examine the partition table and contents using the 'cddisk 3' command, an error is displayed stating that 'some values are clearly invalid'. Please find the error screen below:

----- CDDISK Error Screen -----

CD Disk Information

This program has read the partition table from the SCSI disk specified and has found some values that are clearly invalid. properly :- Please re-run this program with the /n option or a data error from the SCSI bus has not been detected correctly :- Please re-run this program allowing the SCSI bus to re-orientate itself

-----  
Before running BUILDCD, 'CDDISK 3' work fine! (We are using BUILDCD v1.18 and RESETPS v1.03)

4. Please advise us with the current list of compatible drives for the emulator. It might be useful to have this updated list posted on the BBS for everyone's benefit.

Thank you,  
Yoni Owen and Yoram Berkowicz VIP

---

6/19/95 5:28 PM  
Re: Need help with CD-Emulator

Thomas Boyd  
CD

It sounds like your communication channel between the emulator and the DTL-H2000 boards is in conflict. The jumper setting on the card should be seven (all three jumpers crossed). Did you load CDBOOT15.BIN into the boot sector of the partition? Have you tried other interrupt channels? Make sure that your CDBIOS command matches the current configuration of the jumpers on the board. Do you have two cards so you can swap out and be sure the card is not bad? I am assuming you have gone through the FAQ I posted. Let me know what all you have tried.

There are newer versions of the emulator tools being posted soon, but they involve solving problems with Seagate Hawk drives and stuff not related to your case. There is no real list of acceptable drives. SN Systems says that any SCSI drive should work. I stick with the micropolis, because I know it does. Tom

----- 1. We are unable to work with the CD-Emulator at all. 2. First we could not format the HD. The CDDISK (v1.11) program stated that the HD has 0 MB on it This happened with 2 different 1GB HD's an IMPRIS and an HP-C2247-300. 3. After not being able to use the IMPRIS and HP hard drives, we switched to the recommended MICROPOLIS 4221 drive. Now we are finally able to issue 'CDDISK -n 3' and define a partition.

Issuing a 'buildcd' for the RCUBE demo seems to work, but when executing 'resetps 0', the disk's LEDs flash, then the screen blanks, but the demo itself does not appear. Secondly, when attempting to examine the partition table and contents using the 'cddisk 3' command, an error is displayed stating that 'some values are clearly invalid'. Please find the error screen below:

----- CDDISK Error Screen -----

CD Disk Information

This program has read the partition table from the SCSI disk specified and has found some values that are clearly invalid.

This could be due to the disk not having been initialized properly :- Please re-run this program with the /n option

or a data error from the SCSI bus has not been detected correctly :-

Please re-run this program allowing the SCSI bus to re-orientate itself

-----  
Before running BUILDCD, 'CDDISK 3' work fine! (We are using BUILDCD v1.18 and RESETPS v1.03)

4. Please advise us with the current list of compatible drives for the emulator. It might be useful to have this updated list posted on the BBS for everyone's benefit.

Thank you,

Yoni Owen and Yoram Berkowicz VIP

---

6/19/95 9:00 AM

MinLength in build files and changes to CDGEN

David W. Marshall

CD

Tom Boyd

I know that when you make a script file to build images to the external hard drive, you can insert a MINLENGTH statement to make the build allocate more space for your files.

Is there a way, or can one be added, in CDGEN to specify MINLENGTHS for files? This would allow the SCSI disk image and the CD-ROM image to look the same. It would also allow more options for reading data off of the CD.

Does CDGEN save the J in the License Area yet?

When you make a track CD/DA (redbook) does CDGEN still put all the tracks in track 2 or does it make a separate redbook track for each CD/DA track selected (which is what it should do)?

Can CDGEN or the CTI convertor put the files in the correct order so the build program doesn't



keep saying that files are in the wrong order and it has reordered them for you?  
Is there an FAQ available for reading data from the CD? Right before E3, there was discussion on the BBS because things like SearchFile() did not work and routines like open(), read(), and seek() were buggy. Seek() did not work when you wanted it to seek to the end of a file. At the time, one of the suggestions was to hardcode the sector locations of the files. Allowing MINLENGTHS in CDGEN would seem to make this task easier.

thanks,  
dave

---

6/19/95 9:52 AM  
Re: CD FAQ (6/15/95)  
Jeff Davies  
CD

Tom, in your CD FAQ message you say...  
>Try CDBOOT15.BIN first to make sure your system works, and then use CDBOOT25.BIN.  
I can get everything to work with CDBOOT15, however I still can not get CDBOOT25 to work at all. Is there anything special that must be done differently to work with CDBOOT25?

---

6/19/95 9:59 AM  
Re: MinLength in build files and changes to CDGEN  
Thomas Boyd  
CD

>Is there a way, or can one be added, in CDGEN to specify MINLENGTHS for files? >This would allow the SCSI disk image and the CD-ROM image to look the same. >It would also allow more options for reading data off of the CD.  
Not currently, I passed the request along. For now, you might just pad your files with blanks if you wanna do this.  
>Does CDGEN save the J in the License Area yet? >When you make a track CD/DA (redbook) does CDGEN still put all the tracks in track 2 >or does it make a seperate redbook track for each CD/DA track selected >(which is what it should do)?  
no and yes, we have no new release of CDGEN.  
>Is there an FAQ available for reading data from the CD? Right before E3, there was  
>discussion on the BBS because things like SearchFile() did not work and I am building onto the CD FAQ now.  
Tom

---

6/20/95 8:36 AM  
CDW900E w/ other SCSI cards  
Thomas Boyd  
CD

Another note for those who do not want to use the recommended SCSI card (Recommended = adaptec AHA 1542CF) for the CD burner. Tom ----- You may have already discovered this but just in case:-

We could not get the CDW900 to work with the relatively new (but very popular, especially in Pentium machines) Adaptec 2940 PCI SCSI card. We messed some more with the Adaptec configuration utility and eventually discovered that it is necessary to turn off Adaptec's sync

negotiation for the target ID that is the CDW900.  
After that everything is fine.  
-- Andy

---

6/22/95 2:49 PM  
Wildcard search  
David Minogue  
CD

Is it possible to traverse the CD directory tree using wildcard filenames? 'firstfile' and 'nextfile' in LIBAPI sound right, but they crash and burn when I specify the device 'cdrom:'. Any suggestions?  
-- David.

---

6/22/95 5:18 PM  
CdRead failures  
Thomas Boyd  
Crystal Dynamics

Info from a message from SCE Japan: ----- The reason of CdRead failure are followings.

- 1) The write once problem The write once disc is not stable, and if you write double speed the case is worse. PLEASE WRITE NORMAL SPEED !
- 2) Debug Station problem The cd drive of the debug station is weak when it gets hot. There are some variations for each debug station, so please select the strong debug station for that problem. And we do not fix that problem yet. And cool it down when you don't use the debug station.

You can easily find out the bug which is caused by the temperature,

1 the bug never occurs when the debug station is cool. 2 the bug never occurs if you use DEX-2000 board.

3) The outer 3 minutes access problem. The sub cpu for the cdrom can't access outer 3 minutes to the plain area (the data are not written area).

Please write 3 minutes dummy data in the last data area, if you access that last area.

Finally, The bug doesn't occur when on the DEX-2000 I think 1) or 2), if it is that case, the bug doesn't occur when burned on the BLACK CD.

If the bug occurs on the DEX-2000 board, I think the bug is the software. Let me know the version of libcd.lib, please.

> 2) Interrupts are being lost occasionally. >

If you use the ROOT COUNTER interrupt by handling the EVENT, it can be possible to occur. We are solving that problem now.

---

6/23/95 11:07 AM  
Re: CdRead failures  
Scott Berfield  
CD

My debug station behaves much better with a simple kludge to keep the lid open. Take a pencil eraser and tape it in place holding down the drive motor cutout button (where the post on the

lid sticks down). This will let you run with the lid up which makes everything much cooler.  
-sb

---

6/23/95 11:03 AM  
CDGEN: "Output may be failed"  
Thomas Boyd  
CD

Dear everybody, Heres info on CDGEN from SCE Japan: Tom -----  
----- >We are having problems with the CDGEN >program when large numbers of files,  
in subdirectories, are put onto the CD.  
>When the files are added, a message "output may be failed #####" appears in the >warning &  
error box. The files are not correct, and the disk cannot be made >successfully. It appears to  
take about 600 files in a small directory >structure, and fewer the deeper the directory structure  
is nested. They need  
>this limit to be increased, or removed, so that they can easily burn a game >disk. To  
reproduce the problem, I simply added the WINDOWS directory structure >within cdgen, and  
the error occurred, though any directory structure should do >the same. They can occasionally  
get it to work by adding single files or di >rectories at a time, but not consistently. Please let me  
know what can be done >to allow this type of operation to work, and how long it will take to  
get it.  
Specified error must be occurred in the case of the speed of file reading is not enough to writing  
speed.  
If writing data is consists from many small files or subdirectories, the open/close of files will be  
frequently executed and it takes more load of the CPU. And also, the fragmentation on the HDD  
causes similar situation. It depends on a performance of the file system of the PC. (Please refer  
CD-ROM Generator Manual 3.1.3 "About the source files")  
To avoid this error, you should create CCI file. When you save the format information by "Save"  
command, you can select the file type (CCS/CCI). CCI file has format information and a whole  
image of the CD-ROM.  
After the saving of CCI file, data will be read from CCI file instead original source file. And  
reading speed will be more high. But, it is \*recommended\* to also save as CCS file not only CCI  
file. You can save the disk space by deleting CCI file.

---

6/23/95 9:15 AM  
Re: CdRead failures  
David W. Marshall  
CD

How much extra for a "strong debug station"

---

6/23/95 10:29 AM  
Re(2): CdRead failures  
Thomas Boyd  
CD

> How much extra for a "strong debug station"  
You never know 'till you buy and use the thing for a few zillion hours. (It is like buying \$1700  
packs of baseball cards).

Tom

---

6/27/95 6:43 PM  
Re(2): CD FAQ (6/15/95)  
Bill "Angus" Guschwan  
CD

Try resetps version 1.03.  
Angus

---

6/29/95 11:31 AM  
Re(3): CdRead failures  
Kirk Bender  
CD

I notice that the debug station runs on 100v. The power in the US is 110-120volts. Could this cause overheating? Is the power supply officially OK'ed for 110-120volts instead of the typical Japanese 100 volts? Should we use stepdown transformers? Is the power supply in the blue debug station the same as in the grey Japanese station? domo

---

6/30/95 4:21 PM  
CdSearchFile  
Todd Blackburn  
CD

Some messages have been posted in this conference stating that CdSearchFile may be unreliable on the debugging stations. Is this true for the consumer units as well? Is CdSearchFile more reliable in version 3.1? Can I read the directory and subdirectory sectors myself and extract the position information for my files? If so, where can I find the directory sector format?  
Thanks,  
Todd Blackburn

---

7/4/95 11:02 AM  
Which CDROM burners work?  
Mike Benna  
CD

We've got a Pinnacle and a Yamaha CD-ROM burner and we'd like to know if we can burn CDs for the PSX using them. Our Debug Stations haven't arrived yet so we are unable to test and we'd like to know if there are problems we need to plan for. Thanks in advance for any info you can provide.

---

7/5/95 4:54 PM  
simple answer, complex question  
Blake E. Senftner  
CD

LIBGS

I have the following situation:

Because CD emulation does something that makes printf() stop working, I've been trying to get the FntPrint() routines to work while I'm loading my emulated data. Without printf()'s and inside timing critical code, I don't want to use the debugger- rather I want to FntPrint() my logical situation to the PSX display screen.

(You may remember that this is the method that the CD tuto programs use for their status display.)

But here's the problem: I'm using the GsLib to handle my draw/display buffer rotations and all examples showing the usage of FntPrint() for screen display do not use the GsLib to handle buffer display rotation.

I have FntPrint() working in my other code, but for some reason I can not get FntPrint() to work on a just initalized display environment. The logic goes like this:

```
/* program has just begun */ ResetCallback(); CdInit( 0 ); PadInit( 0 ); ResetGraph( 0 );  
SetGraphDebug( 0 ); GsInitGraph( 512, 240, 0, 0, 0 ); GsDefDispBuffer( 0, 0, 0, 240 ); GsInit3D();  
/* ordering table initalization omitted */ FntLoad( 960, 256 ); gFontId[0] = FntOpen( 0, 16,  
512, 24, 0, 512 ); gFontId[1] = FntOpen( 0, 240 + 16, 512, 24, 0, 512 ); setDumpFnt( gFontId[0] );  
VSync( 0 ); GsSwapDispBuff(); FntPrint( "this should, but does not display!\n" ); FntFlush( -1 );  
As can be seen, this logic simply initalizes the PSX, like any program running from emulation.
```

Can you see any reason why the FntPrinting should not work?

What does GsSwapDispBuff() do anyway?

I've gone underneath GsLib everywhere except where it swaps my buffers for me... And at this point in the logic, I have not gone underneath GsLib at all, so no conflicts could be triggered yet...

So, can I get a simple answer to this? I'd love something complete where I won't have to look up functionality that I don't have documentation to... I guess what I'm saying here is that I'm trying to understand why this is not working, and I'd prefer a non-cryptic reply.

Thanks very much. -Blake

---

7/5/95 8:27 AM

Re: Which CDROM burners work?

Thomas Boyd

CD

Unfortunately, the sony CDW-900E is the only burner that works for the PSX. Tom

>We've got a Pinnacle and a Yamaha CD-ROM burner and we'd like to know >if we can burn CDs for the PSX using them. Our Debug Stations >haven't arrived yet so we are unable to test and we'd like to know if >there are problems we need to plan for. Thanks in advance for any >info you can provide.

---

7/6/95 10:57 AM

Re: simple answer, complex question

Thomas Boyd

CD

Dan Burnash

Blake, I read your question. I am trying to find out. It will probably be two or three days for me to finish my answer.

>...and I'd prefer a non-cryptic reply.

Welll..... I guess. I WAS going to reply in mime and send you a video with Tagolog subtitles, but if you insist!

Tom

---

7/6/95 2:17 PM

Re: simple answer, complex question

david eader

Blake E. Senftner

CD

I noticed there's no DrawSync() call in your code outline. Could that be the problem? I know I've had to do some juggling of my initialization code to get FntPrint to work. Just hacked variations until it worked, not being very systematic (too many combos!) But I've definitely seen the first call to LoadClut() fail due to missing DrawSync(), as well as FntPrint().

---

7/6/95 2:19 PM

Re(2): simple answer, complex question

Blake E. Senftner

CD

LIBGS

Tom:

Well, I figured it out, and here's what I did so others can too:

just after the call to GsSwapDispBuff() I added the following code:

```
if (GetDrawEnv( &drawEnv )) { setRECT( &drawEnv.clip, 0, 0, 512, 240 ); drawEnv.dfe = 1; PutDrawEnv( &drawEnv ); }
```

And, of course, I had to add this declaration to the beginning of the function:

```
DRAWENV drawEnv;
```

What this does: When the GsLib initializes, it sets up for a double buffer rotation. For FntPrint output without a rotating double buffered display (such is the situation for program initialization) one needs to retrieve the draw environment that the GsLib set up, and change it to allow for rendering in the currently visible display buffer.

Because this change only takes place on a copy of the data that GsLib maintains, once you start rotating buffers the changes you made are lost. Just the behavior one wants.

Chow, -Blake

---

7/6/95 2:22 PM

Re(2): simple answer, complex question

Blake E. Senftner

CD

I figured out how to make it work, but to answer the question about a possibly needed DrawSync() call:

Because this is the first thing ever displayed/rendered, there is no drawing to sync with. Hence no call to DrawSync().

-Blake

---

7/6/95 1:30 PM

CD-Emu demo fails

Thomas Boyd

CD

Ideas:

1 check the cable between the emu and the DTL-H2000 2 SCSI address of emu card should be jumpered to 7 3 Do not set address of HD to 6 4 Play with IRQ/ADDR/DMA settings in that order 5 use CDBOOT15.BIN instead of CDBOOT25.bin 6 try swapping with a working emulator in your dept (if possible) to be sure board is good 7 make sure DTL-H2000 has an external (black) CD-ROM drive or a blue terminator chip installed 8 make sure that your CDBIOS call in AUTOEXEC has the correct values if you have been switching jumpers about 9 what drive are you using? there is a special new version of emu tools for seagate hawk 10 take out a card with a known working IRQ (soundblaster, net card, ...) and use that IRQ temporarily to see if that is the problem 11 pull out hair and release a primal scream (welll.... it helps me sometimes) 12 let me know if you are still stuck Tom

-----  
I have not been able to get the CD-Emu demo program (RCUBE) to run.  
Yes DexBios is installed, yes CDBios is installed, yes BuildCD worked (at least using CDDisk I can view the dir structure)  
Run.exe v2.30 ResetPS v1.03  
After 'run'ing selemu and a 'resetps 0', the emulation HD flashes for ~1 second and then nothing.  
Worse yet, I am unable to 'run' anything after 'selemu' has been installed.  
Ideas?

---

7/6/95 2:54 PM  
use RESETPS 1.03 with emulator  
Thomas Boyd  
CD

Some developers are still using RESETPS 1.02.  
Don't.  
Version 1.03 resets the emulator as well as the DTL-H2000 (see below)  
Tom

-----  
----- Note also that RESETPS.EXE is currently version 1.03 and has been for some time. I expect you probably already have this - I'm just checking. It differs from 1.02 in that it will also reset the CD emulator (if CDBIOS is present) at the same time it resets the DTL-H2000 cards. This is particularly essential if using the version of the CD emulator that provides text feedback on CD activity to the PC.

---

7/6/95 10:58 AM  
Re(3): Which CDROM burners work?  
Thomas Boyd  
CD

>>Unfortunately, the sony CDW-900E is the only burner that works for the PSX.  
>Really? Why? What's special about the discs that burner spits out compared to other burners?  
GDGEN is hard coded to only work with the CDW-900E.

---

7/6/95 9:43 AM

Re(2): Which CDROM burners work?  
Mike Benna  
CD

>Unfortunately, the sony CDW-900E is the only burner that works for the PSX. > Tom  
Really? Why? What's special about the discs that burner spits out compared to other burners?

---

7/7/95 4:40 PM  
Re: error messages from CD  
Thomas Boyd  
Borden Covell II  
CD  
ummmmm, I can find out.  
SN Systems will have the new improved CD emulator available next week (finally) which is  
clocked off of the debug station and will run at the correct speed! I wonder if this will clean the  
problem up. In the meantime, I will find out what the error messages mean.  
Tom

---

7/7/95 3:58 PM  
error messages from CD  
Borden Covell II  
CD

We are getting the following error messages when we try to read from our cd-rom emulator.  
Does anyone know what they mean???

```
CD_init:addr=80032d2c CdIPause: DiskError(03) Ready=DiskError(03) CdIPause: DiskError(03)
Ready=DiskError(03) Ready=DiskError(03) CdIPause: DiskError(03) Ready=DiskError(03)
Ready=DiskError(03) CdIPause: DiskError(43) Ready=DiskError(43) Ready=DiskError(43)
CdIPause: DiskError(43) Ready=DiskError(43)
```

---

7/7/95 4:17 PM  
Re(3): Which CDROM burners work?  
David Foley  
CD

one is made by sony ;-)

---

7/10/95 8:00 AM  
Looping CD DA  
Randy X. Thompson  
CD

Is there any OS support for looping a CD DA track, or do I have to check for the end of the track  
by polling the CD's head position and then restart the song myself with another CdIPlay  
command?  
-Randy Thompson



---

7/10/95 11:26 AM  
Painfully slow CDGEN verify  
David Minogue  
CD

Tom,  
Verifying CD's burnt with CDGEN is painfully slow; maybe 1/4th speed. Is there something wrong with our configuration? At this speed, releases will take several days to prepare (ie. 8 disks burnt at single speed and verified). Any ideas on speeding it up? Is it possible to verify disks using regular CD drives (as opposed to Sony writers)?  
Getting worried...  
-- David Minogue, Acclaim Entertainment.

---

7/10/95 8:42 AM  
Re: Looping CD DA  
Thomas Boyd  
CD

Randy X. Thompson  
>Is there any OS support for looping a CD DA track, or do I have >to check for the end of the track by polling the CD's head position and >then restart the song myself with another CdlPlay command?  
Randy, The only way I know is by setting up a callback to do as you have described (as used in /psx/sample/movie/cdtuto/tuto4.c , repeat.c). Tom

---

7/11/95 11:59 AM  
Re(2): Still Using Sound in MovConv  
Mark Beardsley  
Dave Elton  
CD

It looks like you're doing it right, however, when you build the avi in Premiere, make certain that you select "Millions of Colors", not "Millions of colors+". The plus sign will add an alpha channel that will screw up MovConv. We always used a frame size of 320x240. I don't know your variable size frames could be the problem. Try it with a short movie of a constant frame size first. Hope this helps.

---

7/11/95 5:31 PM  
IMPORTANT MASTERING NOTE  
Thomas Boyd  
CD

There has just been a new version of CPE2X.EXE given to us from Japan today. You need to use it to append the correct header for the US of A. it has a /C option which lets you choose a country. It is in the DTL release area (see news).  
Download it.  
Read the readme.  
T

---

7/11/95 9:05 AM

Re: Still Using Sound in MovConv

Dave Elton

Mark Beardsley

CD

>>The video source that I'm using is an uncompressed avi file from Adobe >>Premiere. The audio source is a 16bit WAV file.

We are also try to use the uncompressed avi files from Adobe Premier as input to MovCon. We are using Adobe Premier 4.0, frame rate is 30 fps, size varies from 256x176 to 640x480, compression mode is set as none. For some reason, when we use MovCon. (v1.93), the preview only give us the size and frame rate of the avi files, nothing really shows up. When we go ahead to convert it (setting as easy set, no audio, 15 fps, MDEC str), the images played back are all scrambled. Can you tell me eaxctly how you get your Adobe .avi files. Maybe we are missing something when we make uncompress avi files (although it looks pretty straightforward to me), because we could not preview the avi files. Thanks.

BTW, I can also be reached at [simon@readysoft.com](mailto:simon@readysoft.com).

Simon Lai

---

7/12/95 3:19 PM

Re: error messages from CD

David R. Sullivan

Borden Covell II

CD

Ok, You'll have to confirm with sony on error numbers (or SN systems on emulator errors), however, the following may help:

Cd\_Init: address=xxx, xxx is the address of an internal table that sony uses, this address contains 6 pointers. #3 & 4 (0 based) are data Sync Result and data Ready Result vars.

Ready=DiskError(errornumber) is printing the valid within ReadyResult. I have never seen those disk errors (03, and 43).

What your list would tell is that you did not pass the init stage. However, the sony code calls Cd\_init from within several functions (ie Read) when a timeout occurs.

Does this happen after a video playback? or is this always, even in test code?

DaveS.

---

7/12/95 8:55 AM

Re: mastering note

Thomas Boyd

David Minogue

CD

>Question regarding the cdmaster.txt procedures. In section "6) Special >Notes Before Creating CD-ROM Disc" the procedures state "Currently, >seeking in the area covering the last 3 min. (the very outside edge of the >data writing area) may be unsuccessful." Is this refering the the last 3 >minutes of the 1st track (ie. the data track) or the last 3 minutes of the >disk as a whole? That is, do we need to add a 3 minute (27MB) file to the >end of track 1, or do we need to add a dummy 3 minute audio track to the >end of the disk? If it's the later, do you have any suggestions on what >the audio track should contain?

Add dummy data at the end of (or in a track following) your last track. I think the reason will make sense if I explain it in detail:

The CD ROM drive in the PSX was chosen to be affordable (cheap!). When seeking to a location,

the head may overshoot. If it overshoots into data (which contains indexing information) it knows where it is and can adjust. If it overshoots into the no-man's-land after the lead out, it cannot recover. Putting three minutes of blank data after the LAST POSITION TO WHICH YOU WILL SEEK solves this. Notice that this means that you can put a DA audio track of length greater than or equal to three minutes last on your CD and not have to pad with dummy data (if you ONLY seek to the beginning of the DA track), because the last position you seek to on the disk is the beginning of the DA track, which is three minutes or more away before the end of your data.

>Secondly, what's going on with the last second release of CPE2X? Is it >critical that we use it for the product we are about to turn over to you???

I am sure the change is because the old version of CPE2X put a header on the executable it created which said "Sony Computer Entertainment Inc., for Japan area." I will be hex dumping it to be sure that is the only difference later today. If you need to know before then, check it and see.

Tom

---

7/12/95 1:46 PM  
Re(2): mastering note  
Ian McGee  
CD

Well, I ran the old CPE2X.EXE on SAMPLE\GRAPHICS\BALLS and then the new one set for Japan. I found quite a few differences that I can't explain.

It looks like several values in the old CPE2X result are now largely set to nulls. Any idea whether this is an inadvertant side effect, or might be something to cause problems later? Otherwise, the new CPE2X with /CA just says "for North America area" instead of "for Japan area"

Here's my difference file:

```
Comparing files O.EXE and J.EXE 00000008: D2 00 00000009: 09 00 0000000A: 09 00 0000000C:
3A 00 0000000D: 0F 00 0000000E: 70 00 0000000F: 1D 00 00000014: 04 00 00000016: 4F 00
00000017: 47 00 00000030: 70 F0 00000031: 47 FF 00000032: 7E 1F 00000033: EF 80 00000034: AA
00 00000035: 36 00 00000036: A8 00 00000037: 01 00 00000038: A8 00 00000039: 01 00 0000003A:
B4 00 0000003B: 06 00 0000003C: A8 00 0000003D: 01 00 0000003E: 74 00 0000003F: 0F 00
00000040: B0 00 00000041: 1C 00 00000042: 60 00 00000043: 33 00 00000045: 14 00 00000046: 06 00
00000047: 9F 00 00000048: FF 00 00000049: 9F 00 0000004B: 14 00 0000007C: 05 00 0000007E: A8
00 0000007F: 0F 00 00000080: 8E 00 00000081: 15 00 00000082: 70 00 00000083: 33 00 00000084: 05
00 00000086: FE 00 00000087: 04 00
```

---

7/12/95 11:21 AM  
Re: URGENT!! CD mastering information  
Thomas Boyd  
CD  
News

Please note that all licensees MUST adhere to this convention in order to pass our final testing approval.

---

7/12/95 5:44 AM  
mastering note

David Minogue  
CD

Hi Tom.

Question regarding the cdmaster.txt procedures. In section "6) Special Notes Before Creating CD-ROM Disc" the procedures state "Currently, seeking in the area covering the last 3 min. (the very outside edge of the data writing area) may be unsuccessful." Is this referring to the last 3 minutes of the 1st track (ie. the data track) or the last 3 minutes of the disk as a whole? That is, do we need to add a 3 minute (27MB) file to the end of track 1, or do we need to add a dummy 3 minute audio track to the end of the disk? If it's the later, do you have any suggestions on what the audio track should contain?

Secondly, what's going on with the last second release of CPE2X? Is it critical that we use it for the product we are about to turn over to you???

-- David.

---

7/12/95 10:43 AM  
URGENT!! CD mastering information  
Thomas Boyd  
News

Late Late Breaking News from Japan: ----- Do not name your executable PSX.EXE Name your executable after the following convention:

Use your product code (AAAA-XXXXX) and turn it into a file name by inserting a period after the eighth character.

Example: AAAA-XXXXX = SLUS-12345

Product code: SLUS-12345 Executable name on CD: SLUS-123.45;1

To run the main file, build SYSTEM.CNF and put it in your root directory. SYSTEM.CNF should look like this:

BOOT=cdrom:\AAAA-XXX.XX;1 (in the example this TCB=4 would be SLUS-123.45;1) EVENT=10 STACK=801fff00

NOTES:

The current emulator tools will not let you put this filename on the emulator (it contains an illegal ISO character). For now, use a different name and change it when you burn.

CDGEN gives an error message based on the illegal character in the filename. You can ignore this error.

I just tried this - it works.

Tom Boyd

---

7/13/95 8:05 AM  
Re(3): Still Using Sound in MovConv  
Dave Elton  
Mark Beardsley  
CD

Thanks for the info, it IS because of the depth in compression setup was set as millions+. Now we can convert the movie we want now.

As I learned from your message, the movie with sound cannot be played from memory and need to be played from CD or emulator board. I don't know where I can find the playstr demo you said. Is it in somewhere on BBS I can download? Is there any other way we can play the movie with sound from memory, I mean either there's some other way to play or other way to generate the movie so we can actually play not using CD emulator? Thanks!

Simon Lai

---

7/13/95 10:12 AM  
sound after 24 bit movie fix  
Thomas Boyd  
CD

All,  
Ever have intermittant problems (changing from compile to compile, seemingly at random) playing sound after running a 24 bit movie? This was caused by a bug in the streaming library which has now been fixed. The new version of libcd (which contains the streaming library) will be released by the administrator soon. I just tested it. It solves the problem.  
Tom

---

7/13/95 9:03 AM  
Re(4): Still Using Sound in MovConv  
Mark Beardsley  
Dave Elton  
CD

There used to be a playstr example posted on the board (but this was months ago). Try looking in the archives of the CD conference. There are two problems with playing from memory instead of the CD emulator. First, the whole movie must fit into the 8 megs of ram on the development system (so it has to be short). Second, you cannot play the XA sound with it (the sound data gets taken directly from the CD read process and is routed to the sound processor), so if you are reading the movie from memory, the sound chip never receives the sound data (I also think that if you run from memory, the sound data will be considered part of the video data and will probably screw it up, but I don't know this for sure). Overall, if you're going to be working with a lot of movies, you should probably get a CD emulator and do it the right way. Hope this helps.

---

7/13/95 1:30 PM  
MovConv slows down vertical retrace  
Dave Elton  
CD  
Art Tools

I am trying to use vertical blank as a time counting base and I found when the movie is played, some interrupt are cancelled. Is anybody there know how I can choose a time base counter not affected by movie decoding?

Also I am considering embedded the joystick move information in the movie in future, so I can basically get information at the right frame in movie, does anybody know how to do it?

Thanks!  
Simon Lai ReadySoft Inc.

---

7/14/95 4:59 PM  
about CdReadCallback()  
Blake E. Senftner  
CD

Support;

Does it matter when the CdReadCallback is set? For example, can I execute CdRead() and then depending upon that calls success set the callback? Or does it need to be set before the call to CdRead()?

Minor point, but it allows for streamlined logic.

-Blake

---

7/14/95 10:06 AM

Re: URGENT!! CD Mastering info

Thomas Boyd

News

Ammendment:

Please use the underscore character instead of the hyphen character in the file naming convention. If you have just burned masters for launch with the hyphen, you do not need to change it. Here is the memo describing this change: Tom -----

----- To  
whom may concern: In my first fax dated July 12, I showed the naming rule of the file which is currently known as "PSX.EXE". In the rule, I explained it using an file name "XXXX-AAAAA". However, SCEA informed us that "-" (hyphen) will not be in the ISO-9660 standard. Therefore we would like to recommend you to use "\_" (underscore) instead. As for this example, the file name should be "XXXX\_AAA.AA;1". I would like to apologize your inconvenience, however, I would like to ask your collaboration on this once again. Best Regards, Shin'ichi Okamoto

---

7/14/95 12:46 PM

CDGEN SCSI driver

Christopher Deel

CD

Administrator

When I run the CD Controller software that came with CDGEN I get an error message.

SCSI Device Driver not found.

Which device driver do I need to load?

I have an Adaptec AHA-1540CF.

---

7/14/95 3:12 PM

Re(5): Still Using Sound in MovConv

Dave Elton

Mark Beardsley

CD

I know XA sound track can be routed directly to SPU and played. But if I use pqbload to load a small movie into memory, is there anyway to figure out which sector has audio data and then transfer them to SPU by DMA and play the audio? I want to figure this out because I want to get sound played before our ordered CD emulation board shipped to us. I figure maybe I need the specs of sector structure for interleaved movie.

BTW, I went thru the archives in CD conference and couldn't find the playstr demo. Could you send me the playstr sample source code if you have it, Mark? Thanks in advance!

Simon Lai ReadySoft Inc

---

7/17/95 3:44 PM

Re: Printf's embedded in libcd

David R. Sullivan

Mike Bartholomew

Bill "Angus" Guschwan

The embedded printf's you spoke of are printed if CdSetDebug(x) is called with x being greater than zero. If you are calling CdSetDebug, use CdSetDebug(0) and they'll go away, if you are not calling it, look more carefully or add a CdSetDebug(0) into your code.

(SONY READ HERE) Although a good point to SONY is please provide a version of the library (example 3.1.final) that does not include any printf's or logic to bypass them, and removes extra debugging stuff. The reason for this is that the current lib 3.1 has many many printf's, especially in the CD code, and it would be real nice to NOT HAVE them or any code to check CD\_debug (CdSetDebug value) at all in our final products. Were not talking about a small amount of memory, printf's add up quick.

DaveS.

---

7/17/95 2:29 PM

Printf's embedded in libcd

Mike Bartholomew

Bill "Angus" Guschwan

Evidently the function CdSearchFile has embedded printf statements that are causing some delays in our code execution. Any chance to have the printf's taken out in the very near future? Thanks, Mike Bartholomew

---

7/17/95 10:55 AM

CdReadCallback() errors

Blake E. Senftner

CD

All;

I get errors when I use CdReadCallback() from the callback:

```
void readCB( unsigned char status, unsigned char *result ) { if (status != CdlComplete) {  
error state that is always true } code that never gets executed }
```

My setup looks like:

```
CdReadCallback( readCB ); CdControl( CdlSetloc, &pos, NULL ); if (CdRead( readSectorSize,  
buffer, CdlModeSpeed )) { return OK; } else { return error; }
```

Has anyone had success with this functionality?

-Blake

---

7/17/95 5:34 PM

Re(2): Printf's embedded in libcd

Kristine Severson

CD

The next library release, 3.2, will alleviate this problem. I am trying to find out a release date from Japan now...It should be very soon as many complaints have come up about this.

Kris

---

7/17/95 6:41 AM

Re(6): Still Using Sound in MovConv

Mark Beardsley

Dave Elton

CD

I don't know if it is possible to do what you want regarding the audio (and if it is possible, I haven't looked at it). Sorry. The code that you want is in with the samples posted on the BBS. I don't remember exactly which sub-directory it is in, but as I recall, it is in two different places (one is an old version, the other is a newer version). I think one is under movie and the other is under CD. If you can't find it, try doing a text search for ANIM (that's a subroutine in the player). Sorry I'm not being more helpful, I don't have the original code anymore, I only have my highly modified version.

---

7/18/95 6:16 PM

Re(2): open("cdrom:") & read() are bad w/ 3.1

David R. Sullivan

CD

CdInitFileSystem DOES NOT WORK, the japanese engineers states this when we met with them, in addition, it differs from CdInit only in that it calls VSync(0) alot, and changes one additional vector.

DaveS.

PS. The Emulator has problems with seek times, open(),read() lseek() and coded in such a way that read() will do alot of seeks)...the emulator will not work well with this. Look to SNSystems for an update to the emulator code for proper CDSeek times.

---

7/18/95 6:17 PM

Re: CdReadCallback()

David R. Sullivan

CD

Yes,

Are you having problems...I have used CdReadyCallback, CdReadCallback, CdSyncCallback and CdDataCallback all successfully.

DaveS.

---

7/18/95 10:24 AM

Re(3): open("cdrom:") & read() are bad w/ 3.1

Thomas Boyd

CD

Alex Dommasch

Try my suggestion of using the CdRead and CdGetSector routines. They work. Tom

---

7/18/95 9:06 AM

open("cdrom:") & read() are bad w/ 3.1



Alex Dommasch  
CD

I just upgraded to the 3.1 Libraries, and now file reading from the CD Emulator is really slow and unreliable. Half the time, open() fails, and the rest of the time, read() takes a long time (lots of retries?). All that's changed is the software. I'm going to have to go back to 3.0 if I can't find a solution, but I'd prefer it if I didn't have to.

On startup, I execute CdInit(0), and \_96\_init(). Is there anything else I have to do to initialize? What is the parameter in CdInit() supposed to do?

Thanks for any help. -Alex

---

7/18/95 9:55 AM  
Re(2): open("cdrom:") & read() are bad w/ 3.1  
Alex Dommasch  
CD

CdInitFileSystem() does not appear to be in the 3.1 Libraries anymore.

---

7/18/95 1:07 PM  
CdReadCallback()  
Blake E. Senftner  
CD  
Thomas Boyd  
Have you guys seen working code that uses CdReadCallback()?  
-Blake

---

7/18/95 9:26 AM  
Re: open("cdrom:") & read() are bad w/ 3.1  
Thomas Boyd  
CD  
Alex Dommasch  
>I just upgraded to the 3.1 Libraries, and now file reading from the CD Emulator >is really slow and unreliable. Half the time, open() fails, and the rest of the time, read() >takes a long time (lots of retries?). All that's changed is the software. I'm going to >have to go back to 3.0 if I can't find a solution, but I'd prefer it if I didn't have to.  
>On startup, I execute CdInit(0), and \_96\_init(). Is there anything else I have to do to >initialize? What is the parameter in CdInit() supposed to do?  
Do you call CdInitFileSystem? That is supposed to be the Init for open and read. None of the examples use the CdInitFileSystem/open/read combo, so I usually use CdRead and CdGetSector instead of open and read, those seem to work a little better.  
The emulator is a bit slow right now. We are getting new emulator software (supposedly last week - but it has not happened yet) that will be accurate.

---

7/19/95 3:02 PM  
Re: Fwd: Re(6): Still Using Sound in MovConv  
Dave Elton  
Thomas Boyd

SONY.TXT            2K  
CD Creation

Thanks for the quick reply, here is some other questions about playing audio from main memory. We summed it up in the attached file. Hope we can get some help from you.

---

7/19/95 4:29 PM  
Re: CdReadCallback() errors  
Thomas Boyd  
CD

Status seems to always return CdDiskError on success for CdReadCallback. I think this is a problem in the library, and I have sent a report to Japan to fix it. Till then, ignore the error.

Tom -----

All;

I get errors when I use CdReadCallback() from the callback:

```
void readCB( unsigned char status, unsigned char *result ) { if (status != CdIComplete) {  
error state that is always true } code that never gets executed }
```

My setup looks like:

```
CdReadCallback( readCB ); CdControl( CdISetloc, &pos, NULL ); if (CdRead( readSectorSize,  
buffer, CdIModeSpeed )) { return OK; } else { return error; }
```

Has anyone had success with this functionality?

-Blake

---

7/19/95 7:50 PM  
Re(2): CdReadCallback() errors  
Blake E. Senftner  
CD

Tom Boyd

Tom;

Thanks for your help... and wouldn't ya know it, soon after taking your advice I ran into the following problem:

Inside the callback function (that I'm ignoring the status parameter of) I'm starting another CdRead(), and leaving the callback function to be the same.

Well, the data is never read... meaning the callback never gets called again... UNLESS I put logic that calls CdReadSync( 1, NULL ) somewhere to poll the status of the read. In that situation, the program seems to hang for about 10-15 seconds (a VERY long time) and then reads the data at the expected speed.

So, the basic idea I'm using is to begin a sector read with CdRead(), and setting the callback function. Inside that callback function I spawn a new CdRead() leaving the callback the same. I repeatedly want to do this to load data into various places in RAM...

Any insight into what's going on would be a great help.

If you can point me towards a different direction, that works better, that would be fine also. I'm getting the feeling that the Sony O.S. engineers that wrote this functionality did not test it at all. Thank you. -Blake

---

7/20/95 2:59 PM  
Re(3): CdReadCallback() errors  
Blake E. Senftner  
CD

POST.C 2K

CD Creation

Tom;

I tried writing my own replacement for CdRead(), and that works like a breeze...

So, unless someone can prove otherwise, the CdReadCallback() functionality does not work for chains of reads where a new CdRead() is executed inside the callback.

But the attached replacements for CdRead(), & CdReadCallback() do work correctly.

-Blake

---

7/20/95 11:23 AM

Mastering info

Thomas Boyd

CD

I have been asked what feilds of CDGEN info get verified by our testing department.

They have a program that looks for all of the information in the MASTER dialog box under the Layout screen.

This includes the following:

Disc Name Name it as per specs in CD mastering doc Product Name Name it as per specs in CD mastering doc Copyright holder You decide what to put here. It is for your legal protection

License area A, J, or E Creation date duh

Tom

---

7/21/95 11:18 AM

Re(4): Printf's embedded in libcd

Lord Angus

David R. Sullivan

Mike Bartholomew

The oracle says that printf's are embedded in CdInit in lib 3.1. You're stuck with it and you can't do the unstuck. Lib 3.2 fixes this.

LA

---

7/24/95 3:39 PM

IMPORTANT MASTERING NOTE

Thomas Boyd

CD

I have posted this before, but it has been unheeded by some developers, so I am re-posting it. ---

-----  
----- This is an important CD Mastering note. If you do not comply to this specification, your master disks will be rejected by our test department!! There has just been a new version of CPE2X.EXE given to us from Japan. You need to use it to append the correct executable header for the USA. it has a /C option which lets you choose a country. It is in the DTL release area (see news).

Download it.

Read the readme for information on how to use it.

Questions? EMail me on the BBS

Thomas Boyd

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7/25/95 9:59 AM

Re(2): CdReadCallback() errors

Thomas Boyd

CD

Blake E. Senftner

They fixed it and sent me an update to the CD library that we will include in the next BBS release. Tom ----- Status seems to always return CdlDiskError on success for CdReadCallback. I think this is a problem in the library, and I have sent a report to Japan to fix it. Till then, ignore the error. Tom -----

All;

I get errors when I use CdReadCallback() from the callback:

```
void readCB( unsigned char status, unsigned char *result ) { if (status != CdlComplete) {  
error state that is always true } code that never gets executed }
```

My setup looks like:

```
CdReadCallback( readCB ); CdControl( CdlSetloc, &pos, NULL ); if (CdRead( readSectorSize,  
buffer, CdlModeSpeed )) { return OK; } else { return error; }
```

Has anyone had success with this functionality?

-Blake

---

7/27/95 11:29 AM

LoadExex()

Mark D. Lyons

CD

It seems that LoadExec is doing single speed CD loads. I have no way of knowing this for sure, but it seems as if a LoadExec of a 500K exe takes about twice as long as a double speed load of a 500K data file. Is it running at single speed and if so, can that be changed?

---

7/28/95 4:33 PM

error when I use cdbios

Blake E. Senftner

CD

Developer Support

I've been trying to get my printf's to work when emulating, and have finally gotten a version that printf's work, but when the emulating psx program starts I get the message:

```
DMA bus error: code=80008000
```

I've tried every combination of IRQ/DMA that I can. I've also had to remove my modem and network cards to get to this point.

My emulator does work, my development environment & printf's now work, but what is that error message?

-Blake

---

7/28/95 8:10 PM

Re: sound after 24 bit movie fix

Jose R. Villeta

CD

What's the status on the new release of libcd!!! We are curious about our sound problems after str playing. jose Black Ops

---

7/31/95 1:14 PM  
Problem making CDs with DA  
Thomas Boyd  
CD

Here is a problem one of our developers encountered recently that sucked up a lot of time. Please read the following:  
Although CD-DA tracks are not in the data track, they are listed in the TOC as if they were in the root directory of the CD. This can cause problems reading files in the root directory, because the TOC can exceed the number of allowable files. Here is an example of the problem. Suppose you have three files in your data track, followed by 50 DA tracks. Your TOC will be alphabetized and look something like this:  
DATA.WAD MUSIC001.DA MUSIC002.DA . . . MUSIC050.DA SLUS\_000.00 SYSTEM.CNF  
Here's what happens:  
The playstation looks for SYSTEM.CNF, but cannot find it because it is last in an illegally large number of files (45 max at root). Finding no SYSTEM.CNF, the playstation assumes the default name PSX.EXE. Finding no PSX.EXE, the playstation stops.  
This is very easy to solve. Drag and drop all of your DA tracks into a subdirectory, or name them all starting with Z to put them at the end of the TOC  
Tom

---

7/31/95 12:19 PM  
Re(2): error when I use cdbios  
Thomas Boyd  
CD

Blake, Below is my response from SN Systems: -----  
----- >>Paul, I  
have a number of developers who cannot get printf's to work with their >>emulators. I am  
having problems helping them because I have no problem with >>mine. >>Blake (below) has  
tried everything, and this is the closest he has come. >>Although >>the obvious guess is that  
his DMA jumper is in conflict, can you tell me >>exactly what >>this error message means? He  
has tried all other jumper settings, and this is >>the only >>on that works. >> >>In general,  
what are the best troubleshooting tips for getting printf's to work >>with the >>emulator? >>  
Tom >----- >>I've been trying to get my printf's to work when  
emulating, and have finally >>gotten a version that printf's work, but when the emulating psx  
program starts >>I get the message: >> >>DMA bus error: code=80008000 >> >>I've tried every  
combination of IRQ/DMA that I can. I've also had to remove my >>modem and network cards  
to get to this point. >> >>My emulator does work, my development environment & printf's now  
work, >>but what is that error message?  
Has he tried working without dma at all? Using dma will speed up the image build a bit but  
there are some motherboards that don't implement the higher dma channel numbers properly.  
Has he set dma jumpers on the dex2000 cards? If so he should take them off because they are  
never used and will waste a dma channel.  
-- Martin Day

---

7/31/95 6:33 PM

Emulator Problems  
Byrt Martinez  
CD

Trying to get the emulator up and running. Using a Quantum Lightening Pro Drive (750MB). I have gotten as far as being able to "see" the drive with CDDISK and place the demo in the first partition.

I have been unable to run the demo. All the programs (resets (v1.03), selemu, run) all execute with no error messages.

Any suggestions would be welcome. thanks. gk

---

7/31/95 1:34 PM

Re: anim/playstr

Thomas Boyd

CD

Dave Elton

Simon,

It should work. Can you post me your .CTI file if this does not help? Don't uncomment the EMULATE stuff, I think that was old stuff for playing off of your PC HD. Emulation with the emulator board is a different story. The version of anim in

\PSX\SAMPLE\EXEC\MENU\ANIM works great. -----

----- -- > Here are my questions:

> a. Is anybody there ever emulate the demo under /psx/sample/exec/menu/anim ? > I assumed it is the playstr routine which has been talked a lot in this conference. > If so, anything I need to change to emulate it? I did change the path to none2.obj in makefile . It works. I use it every day. It is the newest version of playstr, even though it bears a different name now. You should not need to change anything.

> b. Is it true libstr only works for emulation from CD-ROM and memory, not from hard disk? > Or is there a updated version of libstr that will allow you emulate form hard disk? It runs from the emulation HD, not the PC hard drive

> c. What is the StGetNextS used in the main.c under /psx/sample/exec/menu/anim ? > Which library is it in? I know StGetNext is in libcd. It is toast, no longer to grace the libraries.

> d. Do I need to link my code with 2mbytes.obj or 8mbytes.obj instead of none2.obj? > Actuaaly, what is none2.obj for? It will work all three ways, and I will have to see what non2.obj is.

Here are the CTI files I use with the program you have (note: first is for a SILENT str. Second is for a non-silent str) You have to change two lines in the CTI for an str with sound -----

----- Disc CDROMXA\_PSX

LeadIn XA Empty 1350 PostGap 150 EndTrack

Track XA Pause 150 Volume ISO9660 SystemArea \DOWNLOAD\LICENSEJ.DAT

PrimaryVolume SystemIdentifier PLAYSTATION ApplicationIdentifier PLAYSTATION

LPath OptionalLPath MPath OptionalMPath Hierarchy File PSX.EXE

XAFileAttributes Form1 Data Source c:\emu\test\PSX.EXE EndFile File

MOV.STR XAFileAttributes Form1 Data Source c:\emu\test\MOV.STR

EndFile EndHierarchy EndPrimaryVolume EndVolume EndTrack

LeadOut XA Empty 150 EndTrack

EndDisc ----- Here is the CTI for a non-silent str file (your example on the dist disk is silent) ----- Disc CDROMXA\_PSX

LeadIn XA Empty 1350 PostGap 150 EndTrack

Track XA Pause 150 Volume ISO9660 SystemArea \DOWNLOAD\LICENSEJ.DAT

PrimaryVolume SystemIdentifier PLAYSTATION ApplicationIdentifier PLAYSTATION

LPath OptionalLPath MPath OptionalMPath Hierarchy File PSX.EXE

XAFileAttributes Form1 Data      Source c:\emu\test\PSX.EXE      EndFile      File  
MOV.STR      XASource c:\emu\test\MOV.STR      EndFile      EndHierarchy  
EndPrimaryVolume    EndVolume EndTrack  
LeadOut XA    Empty 150 EndTrack  
EndDisc

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7/31/95 8:42 AM

Re: error when I use cdbios  
Thomas Boyd  
CD

Blake, I have passed this question directly to SN systems. I have not gotten that error before, and my only guess is the obvious one (DMA jumper wrong). I will let you know soon as I hear. Tom

---

7/31/95 12:36 PM

Dave Elton  
CD

I am trying to play mov.str from my emulation board. I am using the playcode under psx/sample/exec/menu/anim, and the .cti files is exactly the same as the one in cdemu.txt from the distribution disk coming with the emulator board. I compiled the code and use cpe2x to convert the .cpe file into psx.exe file and build the cd image with psx.exe and mov.str. For some reason, the movie was scrambled. The playcode was linked with none2.obj. I know my system setup for emulation works because I have no trouble emulating the rcube demo and I also successfully emulate the demo under /psx/sample/exec/menu/balls thru the same procedure. I believe my .cti file is OK because it is simple and comes from the cdemu.txt under /cdemu/readme of the distribution disk. I am thinking maybe the code under /psx/sample/exec/menu/anim doesn't work because it use libstr and I read from lib2.6 documents the current version of libstr only support emulation from CD-ROM or semiconductor memory. I try to uncomment the emulation definition in main.c and the code cannot be compiled and linker complained it cannot find StGetNextS. Here are my questions:

- a. Is anybody there ever emulate the demo under /psx/sample/exec/menu/anim ? I assumed it is the playstr routine which has been talked a lot in this conference. If so, anything I need to change to emulate it? I did change the path to none2.obj in makefile .
- b. Is it true libstr only works for emulation from CD-ROM and memory, not from hard disk? Or is there a updated version of libstr that will allow you emulate form hard disk?
- c. What is the StGetNextS used in the main.c under /psx/sample/exec/menu/anim ? Which library is it in? I know StGetNext is in libcd.
- d. Do I need to link my code with 2mbytes.obj or 8mbytes.obj instead of none2.obj? Actualy, what is none2.obj for?

Thanks in advance for any pointer to my questions!  
Simon ReadySoft Inc.

---

7/31/95 8:37 AM

Re(2): sound after 24 bit movie fix  
Thomas Boyd  
CD

It is being posted today Tom

---

8/2/95 3:46 PM  
Problems with CD-Emulator  
stephen chaplin  
CD

I am having problems getting the CD Emulator to run with my FUJITSU M1606S SCSI-2 HDD...  
My configuration: Board set to: 0x318, IRQ 15, DMA 7 Drive set to: SCSI device 4 (I've tried 0 - 5 as well)  
Here's what I get at the DOS prompt:  
C:\PSX\PSYQ\_CD>cdbios /a318 /i15 /d7 /s4 CDBIOS version 1.02 Installed OK - card address 318, DMA channel 7, Interrupt 15  
C:\PSX\PSYQ\_CD>cddisk -n 4 Error in opening SCSI device 4, Error 0x0001 CDbios error string '(b\_õ-2-%'  
C:\PSX\PSYQ\_CD>  
Any suggestions? Developer support couldn't help me, "You HAVE to post on the BBS, you can't talk to anyone directly..."  
Thanks for your time!

---

8/2/95 5:13 PM  
Re: Problems with CD-Emulator  
Thomas Boyd  
CD

stephen chaplin  
Be sure you have the newest version of the emulator tools (off of the BBS in the last month). Try changing to a new base address then DMA channel. Gut your PC of other cards so that you can minimize IRQ/ADDR/DMA conflicts Use CDBOOT15.BIN as your boot file (or CDBOOT16.BIN) Make sure the interior cable between the emulato card and dev boards is hooked up Make sure your emu board SCSI ID is set to seven (drive stays at 4) private EMail me your phone # if you are still stuck. Tom -----  
-----

----  
I am having problems getting the CD Emulator to run with my FUJITSU M1606S SCSI-2 HDD...  
My configuration: Board set to: 0x318, IRQ 15, DMA 7 Drive set to: SCSI device 4 (I've tried 0 - 5 as well)  
Here's what I get at the DOS prompt:  
C:\PSX\PSYQ\_CD>cdbios /a318 /i15 /d7 /s4 CDBIOS version 1.02 Installed OK - card address 318, DMA channel 7, Interrupt 15  
C:\PSX\PSYQ\_CD>cddisk -n 4 Error in opening SCSI device 4, Error 0x0001 CDbios error string '(b\_õ-2-%'  
C:\PSX\PSYQ\_CD>  
Any suggestions? Developer support couldn't help me, "You HAVE to post on the BBS, you can't talk to anyone directly..."  
Thanks for your time!

---

8/3/95 9:20 AM  
Re: son of emulator startup problems  
Thomas Boyd



CD

cary hammer

>The cd emulator installation and quick startup guide says to type: > CDDISK -n 0 >which of course was failing since the SCSI ID for the harddisk was 4. >I am now able to create the new partition by typing "cddisk -n 4". >Q1: Which bootbin should be loaded into the boot sector: CDBOOT15.BIN or > CDBOOT25.BIN? CDBOOT25.BIN is a wee bit slower because it spits back debugging info that can be viewed with CDMON from DOS. CDBOOT15.BIN does not spit out the debug stuff. Get it started with CDBOOT15.BIN and then when it works, switch to CDBOOT25.BIN to see if it poses any additional problems.

>I was able to get the buildcd to work by again substituting '4' for '0': > BUILDCD -m cd.cti -s4:1 >The load seems to work and a subsequent 'view partion' via CDDISK seems to show >PSX.EXE and several RUBE files on the hard disk. >I then type: > RESETPS 0 >and only get a sub-second flicker of harddisk active light but no running RCUBE OK, you did the right thing here. The "0" is the type of boot you wanna do on the DTL-H200 boards. RESETPS 0 means reset dev system and run PSX.EXE RESETPS 1 just resets dev system and waits for you to run something. RESETPS 0 seems like a great idea, except for the fact that it does not run the ROM patch. This works fine for RCUBE which does not cross paths with the ROM bugs. As a result, a better substitute would be the following: RESETPS 1 \\ reset DTL-H2000 and wait RUN (path)\SNPATCH \\ patch ROM bugs RUN SELEMU \\ select your emulator (don't need to do this every time) RUN CDEXEC \\ execute PSX.EXE on emulator All that being said, this is not your problem, since rcube will run with RESETPS 0. Since you can load the info to the drive, your problem lies in one of the following: Boot sector not loaded CDBIOS call does not match emulator board settings DMA channel on emu board is in conflict (change it around) ADDRESS of emu board (318... 388, etc) is in conflict SCSI jumpers on emu board must be set to addr 7 (drive left at 4) Quick explanation of SCSI ids: disk id = user set (use 3 or 4) card id = 7 (comm channel between card and PC bus address = 0 (channel between DTL-H200 and emu board) (The IRQ is most likely correct if you could start your PC and load data)

>Q4: The instructions say "After a long interval the colorbars on your NTSC > monitor disappear and the RCUBES demo appears on screen." About how > long is "long interval"? ~15 seconds

>Q5: Which RESETPS should I use? The older version in \psx\bin or the newer > version in \cdemu\psyq\_io? Should the former be used for ram starts and > the later used for CD ROM emulator starts? RESETPS v1.03 wiats to return control of DOS back to user until the board actually is reset. This saves you from sending the next command too early and crashing it >Alternating with both CDBOOT15.BIN and CDBOOT25.BIN, I try the bug fix >intructions at the end of the installation guide. I then did: > RESETPS 1 > RUN \CDEMU\EXEC\SELMU > RESETPS 1 > RUN \PSX\SNPATCH\SNPATCH > RUN \CDEMU\EXEC\CDEXEC >but this also didn't seem to work. Good idea (you do not need the second RESETPS 1 though - even though it will work) See above

>Q6: Is this the \*proper\* method for getting the emulator sanity check to work? > If not for the sanity check code, then when does this method need to be > used? You are doing all of the commands right (except resetps 4 is uncool). You have a setup problem. See above

>Q7: The installation guide makes mention of the CD-Emulator Manual v1.1 -- how > do we a copy of this manual? Download it from DOCUMENTION - DOCS - PROGRAMMER DOCS - EMULATOR DOCS on this BBS.

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8/3/95 6:49 PM

MDEC issues

Blake E. Senftner

CD

Tom Boyd

I often get the routine DecDCTvlc() hanging. If I rerun, it works. Sometimes I have to re-encode the frames... but eventually they work...

I have no idea what causes this...

Not to mention that this routine takes such a long time to process... it is difficult to tell if it is hung or just taking a very long time...

Is there anyway to tell if this routine is hung or just processing?

Tom- could you give a logical look at that routine to see if maybe there are cases in the logic that just drop off into never never land?

-Blake

---

8/3/95 8:52 AM

Re: Emulator Problems

Thomas Boyd

CD

Byrt Martinez

Byrt,

If you can see the partition contents, it is either the DMA channel or the base address of the card that is fouled up. Let me know if it still doesn't work Tom

---

8/4/95 5:45 PM

Re(3): Fwd: MDEC issues

Angus

CD

2 calls call MDEC\_in\_sync: DecDCTin and DecDCTinSync.

The diagnostics are for the DMA channels in and out. DMA = 1 means DMA in is on and DMA out is off. ADDR gives you the addresses for those DMAs. DREQ equal 1 means there is an outstanding DMA request for DMA out. Both FIFOs for both channels are full.

Thus, the DMA in is failing for some reason and is never turning off. Thus, you time out.

Angus

---

8/4/95 9:59 AM

Re(3): Problems with CD-Emulator

Thomas Boyd

stephen chaplin

CD

>cdbios /a388 /i5 /d7 /s3

Ahh. Try dropping the /s flag from the CDBIOS call. That should return you to normal.

T

---

8/4/95 9:21 AM

Re(2): Problems with CD-Emulator

stephen chaplin

Thomas Boyd

CD

Hello Thomas, We finally got the CD-Emulator to work... It was not a Hardware thing, but rather a Software problem. It seems as if CDBIOS misreports the SCSI id # to CDDISK and all other programs (BUILDCD, etc...) on our system.

Our SCSI drive is set to id #4, but note how we had to get cdbios initialized!

cdbios /a388 /i5 /d7 /s3

We had to use SCSI id 3 in order to get CDDISK to work:

cddisk -n 4 WORKS after we do the initialization (which by all counts shouldn't work anyways)...

Is this a common problem/solution? I was wondering if it was just something finicky in our system or whether CDBIOS has a bug in it...

Thanks for your help

---

8/4/95 11:07 AM

Re(2): Fwd: MDEC issues

Blake E. Senftner

Thomas Boyd

CD

Tom;

After further testing, it appears that I'm getting past the DecDCTvlc() routine, and im hanging on the wait for any callbacks from the MDEC chip's completion of any slices.

I've added a piece of code that called DecDECinSync() and I get the following message:

MDEC\_in\_sync timeout: DMA=(1,0) ADDR=(0x001b7b70-0x001bf7dc)

FIFO=(1,1),BUSY=1,DREQ=(0,1),RGB24=1,STP=0

can you explain this message?

-Blake

---

8/5/95 10:01 AM

Re(2): anim/playstr

Dave Elton

Thomas Boyd

CD

Thanks, Tom. The cd.cti file you sent to me works. It IS because the cd.cti file I copied and pasted from dist disk does not work.

Simon

---

8/8/95 11:15 AM

Re(4): Problems with CD-Emulator

stephen chaplin

Thomas Boyd

CD

Hi again, If I drop the /s flag, NOTHING works! I dunno, but it seems as if it's a bit screwy on my setup or something...

Thanks

---

8/8/95 5:42 PM

about CdGetSector()...

Blake E. Senftner

CD

Tom Boyd

When I'm streaming data, with my own streamer, I have situations where I've placed a filler sector into my data stream...

While streaming data, when I get the sector ready callback, I typically call CdGetSector() to DMA the new sector's data to my final destination...

But in the situation where the just loaded sector is a fill sector, do I need to call CdGetSector() to flush the sector buffer?

-Blake

---

8/9/95 9:46 AM

Debugger hangs when Debugging CD EMU apps...  
stephen chaplin  
CD

For some reason it seems as if I CAN'T debug applications that use the CD-EMULATOR... If I debug an application that uses the CD functions, my debugging session refuses to start debugging. This is very strange, I've tried sample code from this conference (from postings made by others) as well as my own, and still no luck. It works for applications that DON'T use the CD Emulator however...

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8/10/95 10:44 AM

Re(2): Emulator Problems  
Byrt Martinez  
Thomas Boyd  
CD

Tom:

Still having problems.

FYI: Micropolis 4221 AV internal 2.1 GB hdd resetsps 1.03 snpatch 2.30 run 2.30

As per you suggestion, I tried different dma channels and address; however, I am not sure that is the problem. I started iterating through all the addr. and dma selections. During the process of cycling through the various combinations, I pulled out the cdemu card and noticed that the other sony card (dhl2000) was not seated perfectly. I pushed it in slightly. The next pass the cdemu worked. Then I went back to the original addr/dma settings and cdemu worked again. Next, I finished mounting the drive and securing the cdemu card then tried again. Now neither address/dma setting works. The other sony cards seem to be seated fine. I continued wrestling with it. And now I'm left with 1 of 30 passes works.

I did get the 2.5 boot code and cdmon running. When the program fires up it does a long "seek" (I'm assuming seek/read). Then starts another and hangs. It appears (from drive light indications) that the 1.5 boot code is the same.

Appreciate any help. Thanks.

gk

---

8/10/95 6:28 PM

Debugging in CD emulation  
Dave Elton  
Development Env.  
CD

I am having problem to debug my code in cd emulation. I know I can use dbugpsx to debug while I run my code from memory. But since I am using huge amount of data and I want to put them in a file (more than I could use pqbload to load into memory), I have to build disk image and run the emulation. In this case, is there anyway I can debug my code in emulation. Since the emulation uses .exe file instead of .cpe file. How can I debug it?

Another related question is: If I want to read a file in my code, is it possible to code and test this without going thru the cd emulation procedure? I know there are plenty of libapi and libcd functions there to open and read file, but to test this you will have to compile your code into

.cpe file, convert them into .exe file and build disk image to run. Even in this way, I don't know how I can get all the printf messages, and check the variable values while I run the emulation. Maybe I am missing something very basic. Thanks for any advice!  
Simon ReadySoft Inc.

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8/14/95 10:51 AM  
Re: Debugging in CD emulation  
Thomas Boyd  
Dave Elton

I am having problem to debug my code in cd emulation. I know I can use dbugpsx to debug while I run my code from memory. But since I am using huge amount of data and I want to put them in a file (more than I could use pqbload to load into memory), I have to build disk image and run the emulation. In this case, is there anyway I can debug my code in emulation. Since the emulation uses .exe file instead of .cpe file. How can I debug it?

> put a breakpoint at the beginning of your executable, run it, start the debugger, then step over the breakpoint and keep on going.

Another related question is: If I want to read a file in my code, is it possible to code and test this without going thru the cd emulation procedure? I know there are plenty of libapi and libcd functions there to open and read file, but to test this you will have to compile your code into .cpe file, convert them into .exe file and build disk image to run. Even in this way, I don't know how I can get all the printf messages, and check the variable values while I run the emulation.

> emulator still sends printf messages to the debugger if set up correctly. > use updateCD to modify images fast.

> you can also put your data on the CD or emulator, and run the CPE from your PC.

---

8/14/95 6:53 PM  
Re(3): Debugging in CD emulation  
David R. Sullivan  
Jeff Davies  
CD

He is most likely speaking of debugging .exe's booting from the CD Emulator by the sounds of the paragraph above. When debugging .exe files (from emulator or actual CD) you need to STOP the .exe while running -- to do so, a break will work.

DaveS.

---

8/14/95 11:35 AM  
Re(2): Debugging in CD emulation  
Jeff Davies  
CD

Thom, I've never found you need that breakpoint you were talking about to debug on the emulator. I just do the following... resetsps 1 run snpatch run selemu  
dbugpsx /e psx This works for me.

---

8/14/95 8:40 PM  
Re(4): Debugging in CD emulation

Dave Elton

CD

Thomas Boyd

>>He is most likely speaking of debugging .exe's booting from the CD Emulator by the sounds of the paragraph above. >>When debugging .exe files (from emulator or actual CD) you need to STOP the .exe while running -- to do so, a break will work.

Precisely what I was asking , but excuse my dumbness, could you tell me how I can set a break point for my .exe file?

> you can also put your data on the CD or emulator, and run the CPE from your PC.

Does this mean I can build an disk image containing my own data file, then dbugpsx /e myfile.cpe will allow me to access my data on emulation hard drive? If so, will those libcd functions work this way? I know I can try out, just ask this in case anybody already did.

To read data from CD, besides using CD\_Read functions, is there any other functions like fread() there so I don't have to always read in data as multiple of sectors?

Simon ReadySoft Inc.

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8/15/95 4:38 PM

emulation and timing

Blake E. Senftner

CD

Tom Boyd

Tom;

With my streamer working, I'm only getting about 15 frames per second MDEC playback.

Yet, without the streamer running I get 20 frames per second, with the same frames. My streamer is so little code, there is no way that it is affecting the timing from its execution.

What is the impact of reading data from the CD upon our CPU?

I'm using the lowest level CD routines: CdControl( ReadS.), CdGetSector... I suspect that the CdGetSector() has some impact upon processing... but 5 frames per second?

-Blake

---

8/15/95 4:31 PM

tips for printf's during emulation

Blake E. Senftner

CD

Tom Boyd

We've been trying to get printf's from emulation for quite some time, with some success...

We found that Windows 3.1 automatically installs "smartdriv" which when removed restores printf's about 25% of the time. This is also running the cdbios with no DMA... but this "solution" seems to screw up our FTP programs... I guess Trumpet WINSOCK uses an undocumented DMA, because without cdbios loaded, WINSOCK FTP processes run normally. We also tried running Windows'95 to see if we could get printf's and FTP at the same time. This time we are able to get printf's about 5% of the time after changing "read-ahead optimization" to "none" from the "HardDisk" menu, from the "File System" button, inside "Performance" menu, inside "System", from the "Control Panel." One hell of a lot of work to get printing 5% of the time! (FU\*#\$%! PC%&\$#!#!!)

**BUT WE NEED SOMETHING BETTER THAN THIS!!!**

Tom Boyd- I hope that some pressure has been placed on SN Systems about this issue!

Also, printf's are not all that great for debugging emulating code anyways. The time to printf screws the timing of the running application. I've been printing into high memory and then dumping that print block after my timing critical logic... but then I have to pour over pages of time stamped messages to figure out what happened.

Tom, can SN Systems be given a request for another printing method, async printing or something that does not affect our timing so much?

-Blake

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8/15/95 10:41 AM

Re(4): Debugging in CD emulation

Jeff Davies Copies:

CD

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>>He is most likely speaking of debugging .exe's booting from the CD Emulato

---

by the sounds of the paragraph above. When debugging .exe files (fro

---

emulator or actual CD) you need to STOP the .exe while running -- to do so

---

8/17/95 11:27 AM

LibSTR? Streaming Cinematic from CD

Robert w. Calfee

CD

Tom Boyd

I'm still looking for an example of using the streaming functions to pull a cinematic with sound interleaved from the CDRom so that it can be played using the decompression library.

If anyone has a legible code example I would be most appreciative...

rwc

---

8/17/95 1:04 PM

Checking CD-Mastering Information

David Minogue

CD

Tom,

How can I view the information which was entered in the "mastering information" window of CD-GEN on a master CD-ROM? I'm trying to put together procedures so that we can avoid unnecessary problems with our game submissions. Am I correct in assuming that all of the mastering information is injected somewhere into the system area along with licensex.dat?

-- David Minogue, Acclaim Entertainment.

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8/17/95 4:46 PM

Re: LibSTR? Streaming Cinematic from CD

Thomas Boyd

CD

Robert w. Calfee

ANIM150.ZIP 9K

CD Creation

OK, This is the latest versin of the anim() routine. It will play STR streaming movies interleaved with sound.

To make your movie from an AVI with sound

1 launch movie converter 2 enter input and output file names 3 select input type to be uncompressed AVI 4 select output type to be str 5 go to detail dialog 6 check audio box 7 enter stereo/mono, 37.8kHz/18.9kHz 8 select frame rate 9 leave everything else alone 10 exit details box 11 select MDEC 2 compression (not 3) 12 press >> button to convert 13 wait, wait, wait!

Tom

---

8/18/95 9:20 AM

CDGEN software

Geoffrey Sanders

CD

When I try to install the cdgen software I get a "Initialization list file has been corrupted" message. I have downloaded the file twice and tried in on two different machines. Any clue what's going on.

Geoffrey Sanders Top Dog Software

---

8/18/95 2:42 PM

My 9KB/s Cd-reading code...

Rusty Buchert

CD

Dan Burnash

cdread.zip 2K

CD Creation

This is my CD-data reading code. The whole idea of it is that I have a large file that contains all my game data. Then, I just say "read n bytes from offset o from the start of the file". The CD code detects when it needs to read in a new sector, reads it in, and starts reading the next sector in in the background. So, theoretically, by the time I get to the next sector, it should be read in.

The problem is that everything works, but I only get around 10KB/sec on my black CD hooked to my dev station. On my blue dev station, it seems to read a bit faster, but I can't tell for sure. I know one thing, tho, for sure: Reading a 500 KB file takes a lot longer than 2 seconds, which is kind of what I expect it to get.

So, what am I doing wrong?

I think that this block of code would be a very useful example if you want to use it as one...

(Assuming we can speed it up!)

John Slagel Parallax Software

---

8/22/95 3:09 PM

Re(3): LibSTR? Streaming Cinematic from CD

Thomas Boyd

CD



No good way, only hack ways.

You could divide the filesize by 2048 to get the number of sectors, and then divide by your frame rate to get the number of frames (CD streams at 150 sectors/second) Occasionally, this will not be an even integer. This usually happens if your sound is longer than your video. You could find out by keeping track of the frame number by reading the header structure, and then you would know after the movie was over (probably too late for your application) how many frames it had. (see my header info post from today)

Tom =====>Is there a way to determine the number of frames in an .STR file at run-time? >Henrik

---

8/22/95 1:21 PM  
Lib 3.1 Cdread retry  
Crystal Dynamics  
CD

It appears that the added retry functionality of cdread can introduce up to four second pauses when data errors occur as the OS attempts to reset the CD system. Lib 3.0 flags the error but lets the app. retry. Is there any way to stop the pauses in 3.1 ?

Adrian

---

8/22/95 11:14 AM  
Re(2): LibSTR? Streaming Cinematic from CD  
Henrik Markarian  
CD

Is there a way to determine the number of frames in an .STR file at run-time?  
Henrik

---

8/22/95 1:51 PM  
Re(5): Debugging in CD emulation  
David R. Sullivan  
Jeff Davies  
CD

Guys guys guys, here's the scoop. First, printf's and the emulator...I use them, no problem. However, you cannot printf within any interrupts (at any time) unless you only print within them...printf is NOT re-entrant.

As for debugging with an emulator, it is no different than normal debugging, use the .cpe. However, if you need to debug the .exe file instead of the CPE, you need to place a breakpoint in the code, use cdexec.cpe to execute it, then enter the debugger with the symbol file for your .exe code.

Debugging .exe's is a necessary evil if your .cpe works and your .exe doesn't, understanding why is important.

DaveS.

---

8/22/95 3:00 PM  
Re: CdSearchFile()

Thomas Boyd  
CD

>In the CD FAQ we are told to avoid using CdSearchFile(). >Apparently it is unreliable on Debugging Stations. Can anyone >explain why?

CdSearchFile did not work 100% of the time on debug stations in library 3.0. It is fixed for library 3.1. Are you using lib3.0 still?

You may have problems if your directory structure overflows the 2K buffer that CdSearchFile has. Each entry is 18bytes max (smaller filenames take less space).

file limits: root: 45 files subdirs: ~30-35 files

>On a related note, I have been having difficulty getting CdSearchFile() >to work after playing a streaming movie on the emulator. Any clues as >to why? With the warning given in the FAQ, I suppose I should avoid >this function all together. But it sure does come in useful when you're >trying to hack out some quick tests.

>Randy Thompson >Dynamix >randyt@efn.org

---

8/22/95 6:44 AM  
CD-ROM/XA Subheader Format  
David Minogue  
CD

Hello all -

Does anyone have a CD-ROM/XA reference which describes the layout of the 8-byte subheader field? I would like to be able to read this field in a utility I'm writing to examine STR files.

Thanks in advance.

-- David Minogue, Acclaim Entertainment.

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8/22/95 8:38 AM  
Re: CD-ROM/XA Subheader Format  
Thomas Boyd  
CD  
David Minogue

Header info for XA movie STR files with sound (note: sound sectors have an entirely different header and are peeled off in the CDRom subsystem to go straight to the SPU):

8 byte subheader: 00 01 43 80 00 01 42 80 (hex) // I do not know what this means yet. // It is always the same though // and it is repeated for accuracy during streaming

32 byte sector header (this field is part of the 2048 bytes of data, leaving 2016 bytes for the movie) BYTE format ID 0x60 BYTE format version 0x01 WORD undefstrformat 0x8001 WORD current sector number in current frame (ex: 1, 2, 3, 4, 5, 1, 2, 3, 4, 1...) WORD total sector count for current frame (ex: 5, 5, 5, 5, 5, 4, 4, 4, 4, 5, 5, ...) DWORD current frame number (ex: 1, 1, 1, 1, 1, 2, 2, 2, 2, 3...) DWORD size of .BS in bytes (note: this seems to be six bytes smaller than entire .BS data) WORD frame width in pixels WORD frame height in pixels DWORD headm, first DWORD of .BS file DWORD headv, second DWORD of .BS file DWORD 0 (unused?) ===== >Hello all -

>Does anyone have a CD-ROM/XA reference which describes the layout of the 8-byte subheader field? I would like to be able to read this field in a utility I'm writing to examine STR files.

>Thanks in advance.

>-- David Minogue, Acclaim Entertainment.

---

8/22/95 8:57 AM  
CdSearchFile()  
Randy X. Thompson  
CD

In the CD FAQ we are told to avoid using CdSearchFile(). Apparently it is unreliable on Debugging Stations. Can anyone explain why?  
On a related note, I have been having difficulty getting CdSearchFile() to work after playing a streaming movie on the emulator. Any clues as to why? With the warning given in the FAQ, I suppose I should avoid this function all together. But it sure does come in useful when you're trying to hack out some quick tests.  
Randy Thompson Dynamix randyt@efn.org

---

8/22/95 3:03 PM  
more printf's + emulator  
Thomas Boyd  
CD

Martin of SN Systems speaks: ===== Hi Tom  
I think the major problem here is that they're trying to run the system under windows and the other windows programs they're running are getting in the way. Do you know if they'd be interested in trying the Windows 95 version of the debugger ? This should fix all the printf/fileserver problems.  
We're currently looking at handling printf's and other file server operations by an alternative method that won't require interrupts on the pc. This should cure the problems that people have in running dexbios under windows but is still 2-3 weeks away from being implemented.  
Do you know what he means by async printing ? All printing methods will interfere with the timing of his program because of the PC's response time. The main problem though is that in a printf each character is sent to the PC separately and so has a very high overhead. One way to reduce this dramatically is to use sprintf and then send the whole string to the pc in one block, e.g.  
    sprintf(str, "Values are %d, %d, %d\n", a, b, c); PCwrite(-1, str, strlen(str));

---

8/23/95 3:30 PM  
Re(3): UpdaCd problem  
Thomas Boyd  
Dave Elton  
CD

I dunno, It will choke the executable for me too if I do not pad with blanks, but it seems to work for other data if they are the same size. I just always use MINLENGTH if I wanna be sure. Let me know if that still does not work.  
Tom

---

8/23/95 3:25 PM  
Re(2): UpdaCd problem  
Dave Elton

CD

Thomas Boyd

I know that. But the weird thing is I am using the same .cpe file to convert to the .exe file, and theratically, it is the same .exe file I got before. I did not even recompile the .cpe file. So how come updatedcd will choke the emulation when I replace the same file with the previous version in disk image?

Simon

---

8/23/95 10:20 AM

Re(6): Debugging in CD emulation

Dave Elton

CD

David R. Sullivan

> As for debugging with an emulator, it is no different than normal debugging, use the .cpe. However, if you need to debug the .exe file instead of the CPE, you need to place a breakpoint in the code, use cdexec.cpe to execute it, then enter the debugger with the symbol file for your .exe code.

OK, here is what I did for debugging with an emulator: Build a disk image using buildcd on emulation hard drive include the files I want to read, run " resetsps 1; run snpatch; run selemu", then "dbugpsx /e mycode.cpe", In my File window, step thru my code. CDInit() seems fine, which used to fail before I run selemu, and this seems to prove debugging with an emulator works, but then CdSearchFile() failed all the time. I dbl check my .map file, the file is there. Just sort of confuse whether my dbugpsx really pickups the emulation hard drive and search files on it?

Talking about place a breakpoint in the code, I am able to use Alt-B in file window to set a break point, but when I use "C file" option instead of "Assembly file", and choose the line number, it always say the address for break point is invalid, any idea?

Simon ReadySoft

---

8/23/95 3:26 PM

Re(2): CD-ROM/XA Subheader Format

David Minogue

CD

Thanks Tom.

Let me know if you find the description of that 8 byte subheader. All I know is that it describes the sectors contents, be it video, audio, etc. In the case of audio, I assume that it also describes the quality (stereo/mono, sample rate, bit depth, compression method).

-- David.

---

8/23/95 11:54 AM

UpdaCd problem

Dave Elton

CD

I am trying to use "UpdateCd" to seed up my emulation, but for some reason it doesn't work. I successfully build a disk image and run cdexec to get it running. But when I use cpe2x to convert my same .cpe file (not even recompiled) again and use updatedcd to update my disk image ( it did pop up window and ask confirmation of the file to update), I cannot run the emulation again. And when I try to use "dbugpsx /e \*.cpe" to debug, debugger hangs and gives

me the message "Target not respond". I understand somestimes you have to rebuild disk image when the file size of the file increases, but how come the exact \*.cpe file will choke the emulation (nothing really changes). Any help is appreciated.  
Simon ReadySoft Inc.

---

8/23/95 4:17 PM

Re(8): Debugging in CD emulation

Dave Elton

David R. Sullivan

CD

> As for the source level debugging, when loading a .CPE ? or .EXE? Here I referred to dbug .exe since I did a "dbugpsx /e myfile" after I "run cdexec" to start my emulation. According to the previous message, if I want to step thru the .exe , I need to set a break point. I tried to use Alt-B in file window of dbugpsx, there is a option for c file or ASM file. Since I want to step thru my C code, I don't know how to set the break address there. I tried to use line number, but doesn't work. Any suggestions?

Simon

---

8/23/95 2:26 PM

Re: UpdaCd problem

Thomas Boyd

Dave Elton

CD

Simon,

Did you use the MINSIZE (I think thats what its called) command in your .CTI file to pad out the file for future expansion? If you change the size of the executable header by adding the /CA option with CPE2X, you could mess up the next file.

Tom

---

8/23/95 4:10 PM

Re(7): Debugging in CD emulation

David R. Sullivan

Dave Elton

CD

First Problem with CdSearchFile, it would seem as though it is not finding a file...remember the filename format is "\filename.ext;1" for the root dir. The ";1" may not be needed for CdSearchFile, but I think it is. To see if emulation is working and files are there, use the findfirst() and getnext() functions to cdrom: and print out the directory.

As for the source level debugging, when loading a .CPE ? or .EXE?

---

8/24/95 10:33 AM

Rambling About MovConv.

Angus

CD

Participants: Erick S. Dyke                      Angus                      Scroll  
Lock    Sounds                      Invite...                      Send what Angus has joined the  
chat. Erick S. Dyke: Good Eve... Angus: hey Angus: morining right Erick S. Dyke: Time is an

illusion, lunchtime doubly so.... Angus: did you get my explan on your problem Erick S. Dyke: Nope, thats why Im pestering you :) Angus: i sent it to scott the slacker boy Angus: anyway Erick S. Dyke: Ah....hes out of town.... Angus: makes sense Angus: ok Angus: so Angus: the deal is Erick S. Dyke: You have a copy of it or should I pester him to forward it to me? Angus: You have a constant data size that the compression has to fit in. Erick S. Dyke: Ok Angus: So the compressor does a multi pass of the image to try different types of compression on the image. Angus: In this case, fuzz or noise compresses poorly Angus: So, the compressor decides to compress the fuck out of everything that is not noisy. Erick S. Dyke: So the document on the 16x16 blocks during encode is wrong.... Angus: Which means you get poor compression out of your number area Angus: What does that doc say? Erick S. Dyke: It claims that compression occurs on 16x16 blocks.... Angus: IT still does work on 16x16 blocks. Angus: So the doc is correct. Erick S. Dyke: Decompress does, but the doc says that it compresses each 16x16 block.... Angus: It does Erick S. Dyke: Ok, now Im lost....how does the static in one 16x16 block matter to another 16x16 block? Angus: Because you have a constant data size to fit the image in. Angus: You can have variable compression effects on a macroblock. Erick S. Dyke: Ah...so EACH 16x16 block has less room to work with! Angus: Correct Angus: Basically the noisy image is REALLY hard to compress. Erick S. Dyke: ARGH! Ok...how about the other questions....My artists are going to hang me on that one... Angus: So, the compressor decides to get the data room from compressing the numbers et al Angus: What other questions Erick S. Dyke: Why 1.93e v3 cant make a movie that plays smoothly :) Angus: I have not seen that. Angus: Hold on I will go get Kojik Erick S. Dyke: I take the same data using 1.8 vs 1.93e and get different results... Angus: are you using veresion 3 Angus: you don't wnat v3 Erick S. Dyke: Yes 1.8 works 1.93e V3 does not...(The movies are jerky) Angus: tgry v2

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8/24/95 10:54 AM  
Re(9): Debugging in CD emulation  
Jeff Davies  
CD

Make sure the path and filename is in caps. "\FILENAME.EXT;1". The filename is case sensitive.

---

8/24/95 1:39 PM  
Re(10): Debugging in CD emulation  
Dave Elton  
CD

OK, here is what I found out so far, file name in CdSearchFile IS case sensitive, that's what screwed me up.

For UpdateCD, I guess because I was using "run cdexec" to launch my code, and cdexec take "\PSX.exe;1", even you use updatedcd to swap a same PSX.exe in, it will be assigned a different version number other than 1, so "run cdexec" will never work again. (BTW, Tom, I tried using MINLENGTH and ADDLENGTH, still doesn't work). But "dbugpsx /e \*.cpe" works and runs the updated code.

Simon ReadySoft Inc.

---

8/28/95 12:50 PM  
Streams (Questions and Comments)  
David Minogue

CD

Tom,

I have some questions concerning streams on the PSX:

- 1) Why is there no option to terminate a stream based on the file length? This would eliminate the need to hardcode stream lengths in a table; a considerable savings. Also, it would allow us greater flexibility to drop in revised movie sequences without fear of breaking the game.
  - 2) What happens if there happens to be a read error on one (or all) of the sectors containing the last frame of a stream? There is no retry, right? Will the stream run amok into whatever data happens to follow?
  - 3) I've come across a version of the movie player sample (from SCEE?) which seems to calculate a movie's length by dividing the file length by the length of the 1st frame (in sectors). Is this as dangerous as I think it is; ie. don't the sizes of the frames vary within a movie?
- David Minogue, Acclaim Entertainment.

---

8/28/95 5:38 PM

Fwd: Re: Fwd: Streams (Questions and Comments)

Thomas Boyd

CD

- 2) What happens if there happens to be a read error on one (or all) of the sectors containing the last frame of a stream? There is no retry, right? Will the stream run amok into whatever data happens to follow?

The screen will stay black (thanks to headv and headm checking), but the sound is uncool. Hardcoding the exact length is how I go. You can use CdSearchFile to find the size, divide by 2048 bytes/sector and then divide by the frame rate. Any fractional amount will be from audio running longer than the video. Now modify anim() to check for this calculated frame. I have not done this, but it doesn't look impossible. The sector header contains the frame number.

- 3) I've come across a version of the movie player sample (from SCEE?) which seems to calculate a movie's length by dividing the file length by the length of the 1st frame (in sectors). Is this as dangerous as I think it is; ie. don't the sizes of the frames vary within a movie? (Gee, maybe I should have read the whole message first - oops). frame sizes (pixels) may vary, but data streaming rate is constant. 150sectors/sec. so you can use my above formula (same as SCEE) to nail it exactly (minus error from audio overrun). So each frame will be the exact same number of sectors. 15 FPS = 10 sectors per frame. Movie converter will pad extra space (if needed -rare) so the movie can keep time, and it optimizes the compression to match the frame rate.

let me know if you wanna know more,

Tom

---

8/29/95 8:18 AM

Re: Fwd: Re: Fwd: Streams (Questions and Comments)

David Minogue

CD

- > 2) What happens if there happens to be a read error on one (or all) of the > sectors containing the last frame of a stream? There is no retry, right? > Will the stream run amok into whatever data happens to follow?

>> The screen will stay black (thanks to headv and headm checking), but the sound is uncool. Hardcoding the exact length is how I go. You can use CdSearchFile to find the size, divide by 2048 bytes/sector and then divide by the frame rate. Any fractional amount will be from audio

running longer than the video. Now modify anim() to check for this calculated frame. I have not done this, but it doesn't look impossible. The sector header contains the frame number.

Tom,

The point of this question was, given that you were doing everything right and looking for the right frame number on which to end the movie sequence, what would happen if there were an error reading that particular ending frame? The following data could be anything. Would the streaming code continue to read the CD, looking for a frame number which would end the sequence? It seems like the player is not robust in this regard.

-- David Minogue, Acclaim Entertainment.

---

8/29/95 9:31 AM

Re(2): Fwd: Re: Fwd: Streams (Questions and Comments)

Thomas Boyd

CD

David Minogue

>The point of this question was, given that you were doing everything right and >looking for the right frame number on which to end the movie sequence, what >would happen if there were an error reading that particular ending frame? >The following data could be anything. Would the streaming code continue to >read the CD, looking for a frame number which would end the sequence? It >seems like the player is not robust in this regard.

That is exactly what happens. It depends on how the streamer is written. anim() is just an example, so if you try to match the exact frame number, and it gets garbage, it will do as you predicted and keep searching for the frame (this can be forever - I have been there). It will not display the garbage frames. Same goes for audio, that the subheader will never be mistaken, so it could never play a bad audio chunk. It will then play other movies it finds until the frame is reached (This can be kind-of a fun historical journey on an emulator, as you find chunks of old, overwritten movies).

This failure would be rare, since a lot of the sector would have to be bad to so nastify the data that the error correction couldn't fix it in the CD-ROM subsystem. But, this can (and will) happen.

It seems worthwhile to add another conditional to the last frame search that would stop after it tried to read the right number of frames instead of just checking the frame number. Change this part of anim():

```
    if(sector->frameCount > endFrame)    {    Rewind_Switch = 1;    }  
to this (or something like this - I haven't tried it):  
    count=0; ...    if ((sector->frameCount > endFrame) || (++count > endframe))    {  
Rewind_Switch = 1;    }
```

This part is up to you.

Tom

---

8/31/95 2:55 PM

Re(3): Fwd: Re: Fwd: Streams (Questions and Comments)

David Minogue

CD

Tom:

>>It seems worthwhile to add another conditional to the last frame search that would stop after it tried to read the right number of frames instead of just checking the frame number. Change this part of anim():

The problem with this approach is that results will vary depending on the actual number of dropped frames. I've been experimenting with monitoring the actual CD location, with some



success. I'll let you know how it turns out.  
-- David.

---

9/5/95 9:49 AM  
Re: CD size question  
Thomas Boyd  
David Minogue

I always pick 74. I do not know if the other choices affect anything besides total size warnings. I accidentally burned at 63 a couple of times with no ill effects. There is no 71 min selection, because CDGEN is lame.

I will find the exact details you are asking for, but it will be Wednesday before I get to it.

Tom ===== Does the disk size (18min, 63min, 74min) pulldown menu in CDGen affect the formatting of disks, or is it just used to prevent writing beyond the end of a CD? If an image is less than 63min, does it matter what value is used when burning masters for submission? Why isn't there a 71min selection?

---

9/5/95 8:58 AM  
CDGen Disk size question  
David Minogue  
CD

Tom,

Does the disk size (18min, 63min, 74min) pulldown menu in CDGen affect the formatting of disks, or is it just used to prevent writing beyond the end of a CD? If an image is less than 63min, does it matter what value is used when burning masters for submission? Why isn't there a 71min selection?

-- David.

---

9/5/95 5:59 PM  
Problems getting CDEMU working  
Sky Lounge  
CD

So has anyone seen the error

>> Error in opening SCSI device 4, Error 0x0001 >> CDbios error string "

The CDEMU board seems to be set for SCSI ID 4 and the drive [either Micropolis or ADS] is also set to SCSI ID 4.

I'd appreciate any insight on this annoyance.

Thanx

---

9/6/95 6:18 AM  
Emulator file size discrepancy?  
David Minogue  
CD

Tom,

I think I've found a discrepancy between the CD emulator image and the CDGen image. It

seems that, for Form 2 files, the emulator saves in the directory the original size of the file (2352 bytes/sector) while CDGen only saves the size of the data portion of the file (2048 bytes/sector). As I am trying to use this information to calculate the location of the last sector of a streaming file, this is a problem for me.  
-- David Minogue, Acclaim Entertainment.

---

9/6/95 11:25 AM  
Re: Emulator file size discrepancy?  
Thomas Boyd  
CD

I will have SN fix it. T

---

9/6/95 11:25 AM  
Re: Problems getting CDEMU working  
Thomas Boyd  
CD  
Sky Lounge  
Set board to 7, drive to 4. Do not set both to the same address. T  
===== >So has anyone seen the error >>> Error in opening SCSI  
device 4, Error 0x0001 >>> CDbios error string ">The CDEMU board seems to be set for SCSI  
ID 4 and the drive >[either Micropolis or ADS] is also set to SCSI ID 4.  
>I'd appreciate any insight on this annoyance.  
>Thanx

---

9/7/95 5:13 PM  
Re: Sound DMA after movie stream  
Thomas Boyd  
CD

Send me an example of your movie code (not the movie - I have plenty) and a strip-down of the code that calls it that demonstrates the bug when I compile it. Tom

---

9/7/95 2:08 PM  
CD Emu Problems  
Chris J. Pink  
CD

Hi there,  
I have just switch to using the cd-emu. I having got over my initial problems, i am left with the following:

1. when using CdSetDebug(2). it sometimes locks up printing a repeating character (usually '0').
2. since yesterday i have been getting Cd read errors (:) coming up. I assume that there should be numbers in the brackets (ie (00:00:00)) I don't get this.
3. when the cd is initialise the message CD\_init:addr= is printed. after this there used to be an address printed, this no longer appears. any ideas as to why?
4. are there any known problems with CdPos2Int() or CdInt2Pos() function? (i ask because i

am using them).  
any information you can provide on this problem would be most helpful.  
thanks in advance,  
Chris Pink  
programmer/project leader Gray Matter (905-842-567 x249)

---

9/7/95 5:25 PM  
Re: CD Emu Problems  
David Minogue  
CD

>4. are there any known problems with CdPos2Int() or CdInt2Pos() function? > (i ask because  
i am using them).  
Chris,  
I thought these functions were broken until I realized that the CdLLOC fields are in BCD, ie:  
0x15 minutes is 15 minutes, not 21! Hope that helps.  
-- David Minogue, Acclaim Entertainment.

---

9/7/95 4:44 PM  
Sound DMA after movie stream  
Heather Barclay  
CD

Has anyone had a problem with the sound DMA after playing a movie stream?  
After the flic, I call SsVabTransHead() and SsVabTransBody() to load up some sound data.  
Then when I call SsVabTransCompleted() to wait for the transfer to complete, the system never  
returns. It seems that the movie stream code has called something that disabled the sound  
DMA, but I don't know what. To make matters even more interesting, the movie code is in a  
seperate executable that is being Exec'ed. That part seems to work fine, though.  
Tried the new 3.2 libraries, but it didn't help and even made matters for the movie stream worse  
(sound, but no graphics).  
Anyone? Anyone? Bueller?

---

9/8/95 2:20 PM  
Re(3): CD-ROM/XA Subheader Format  
Montgomery Singman  
David Minogue  
CD

Subheader bytes consist of 8 bytes : File Number, Channel Number, Submode and Coding  
Information bytes, each double-written for data integrity.  
16 & 20 : File Number 17 & 21 Channel Number 18 & 22 Submode 19 & 23 Coding Info  
You are probably more interesting in the submode info, they are as follows :  
bit name meaning 7 End of file 1=last sector of file 6 Real-time 1=real time sector 5 form 0 =  
form 1, 1 = form 2 4 trigger 1=trigger on 3 data 1=data sector(form 1) 2 ADPCM 1=ADPCM  
audio sector(form 2) 1 video 1=video sector 0 end of record 1=last logical record sector  
Good luck, Montebheader bytes consist of 8 bytes : File Number, Channel Number, Submode  
and Coding Information bytes, each double-written for data integrity.

---

9/8/95 9:25 AM

Is your lid open? Check and see!

Thomas Boyd

Jose R. Villeta

CD

If you are using lib 3.2, or lib 3.1 try messing with the following: `int CD_shell(void) // this seems to wait till the shell shuts, but I haven't tried it yet. or if (CD_status&0x10) ... // the shell is open` If you are using lib 3.0, use the following `extern int CD_isopen; // shell once open`  
Tom ===== Thanks for your quick response.  
Which routine will return CD lid status? If you can answer me this, we probably can take of the rest. We already have the tuto routine incorporated in the game code. Thanks in advance, jose  
boe

---

9/11/95 10:10 AM

Re: US PSX Games

Dan Burnash

CD

Chris E. Reese

Are you modifying `cdexec.c` for each game so that it boots the correct file? All of the Japanese games use `PSX.EXE` as the executable, so the default `cdexec.cpe` would work for every game. The U.S. games, and future japanese games, use unique filenames.  
Dan B.

---

9/11/95 9:48 AM

US PSX Games

Chris E. Reese

CD

I have bought a few of the US Titles that launched on Saturday and have not been able to get them to play on the development system. The Japanese games play fine. I thought that the development system could play all versions. Is there a different patch program that I need to load for the US versions?

---

9/12/95 10:05 PM

Re: Sound DMA after movie stream

Crystal Dynamics

CD

You need to do `SpuQuit()` before the overlay exec. and `SpuInit()` after.  
Adrian.

---

9/12/95 11:17 AM

Re: Is your lid open? Check and see!

Jose R. Villeta

Thomas Boyd

CD

Tom, Thanks for the info. We got a working example running of the CD player while the game is going on. The deficiencies are the following: 1. After opening the lid and `CdlStop`, `printfs`

continue showing DiskError(16) & CdlNop= DiskError(10). Is there a way to disable these printfs. It appears to happen in the Debugging Station, too. 2. Also, after we close the lid it our code tries to read the TOC. To get it working I had to do a while (toc<=3), that way I am guarantee to read the new CD tracks. The only disadvantage is that it hangs the game for couple seconds.

Any recommendattions? We feel pretty happy about the system specially when we are going the extra mile dealing with CD open. Thanks, in advance jose Black Ops ps. Is there a easy way to know when to read the TOC?

---

9/14/95 6:00 PM

Re(3): Win '95

Thomas Boyd

Development Env.

CD

I have had success with basic tools, movie converter, movpack, emulator, etc

The only problem has been CDGEN. Although it worked for building the CCS file, it failed when I tried to record. Everything was set up correctly, but no dice. Beware, ye burners of CDs

Tom

PS if anyone HAS successfully burned CDs in win95, please lemme know.

---

9/14/95 11:25 AM

Re(2): Is your lid open? Check and see!

Thomas Boyd

Jose R. Villeta

CD

...got your message, I will get to it tomorrow. Tom

---

9/15/95 8:57 AM

Re(4): Win '95

Mark DeSimone

CD

Yeah, I forgot about that one. CDGEN generates errors galore under Win95 even before I get to the recording stage.

Glenn O'Bannon Rainbow America

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9/19/95 2:37 PM

Re: Problems w/CDW-900E

Thomas Boyd

CD

Greg G. Gibson

the CDW-900E works ONLY with the Adaptec AHA-1542CF SCSI card. Sorry. Tom

===== We recently

purchased the CDW-900E CD Writing device, and the CD ROM Generator software (DTL-S2035). We are trying to connect the hardware to an Adaptec 5240 SCSI adapter and are receiving the following error message when trying to run the CD Gen software:

CD Recording Unit Controller The SCSI Host Adapter is Incorrect.

It appears that we may not have received the proper driver disks with the hardware. The only items received with the CD unit were a manual (which does not fully describe how to get the device running) and the CD Generator software (which does not include any DOS level drivers).

---

9/19/95 2:28 PM  
Problems w/CDW-900E  
Greg G. Gibson  
CD

We recently purchased the CDW-900E CD Writing device, and the CD ROM Generator software (DTL-S2035). We are trying to connect the hardware to an Adaptec 5240 SCSI adapter and are receiving the following error message when trying to run the CD Gen software:

CD Recording Unit Controller The SCSI Host Adapter is Incorrect.

It appears that we may not have received the proper driver disks with the hardware. The only items received with the CD unit were a manual (which does not fully describe how to get the device running) and the CD Generator software (which does not include any DOS level drivers).

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9/19/95 4:09 PM  
Re(2): Problems getting CDEMU working  
Angus  
CD

Use boot 1.7 angus

---

9/19/95 6:53 AM  
Problems getting CDEMU working  
Sky Lounge  
CD

HELP! HELP! HELP!

I can get into cddisk (via cddisk -n 4) and I can apparently create partitions and load cdboot27.bin or equivalent, but when I leave cddisk it tells me that it really didn't do anything afterall.

That is, the error message that I get is...

SCSI Error in writing sectors Error returned 0x0370 Please press a key

Any other insights? (please, please, please)

Thanx much,

Andy House

---

9/19/95 2:38 PM  
Re: Problems getting CDEMU working  
Thomas Boyd  
CD

I forwarded this to SN Systems to find out what this error is about. Tom

===== HELP! HELP! HELP!

I can get into cddisk (via cddisk -n 4) and I can apparently create partitions and load cdboot27.bin or equivalent, but when I leave cddisk it tells me that it really didn't do anything

afterall.

That is, the error message that I get is...

SCSI Error in writing sectors Error returned 0x0370 Please press a key

Any other insights? (please, please, please)

Thanx much,

Andy House

---

9/20/95 5:59 AM

MovConv Quality

Mark Beardsley

CD

I recently built a new str from an avi I've had for months (using the new movconv 1.96). I'm also now using the 1.5 version of anim. It seems that the quality of the str is not as good as it was.

The movie is 320x240, 15fps, 24-bit. The original str (which was built in april) looks significantly better. In the new str, the MPEG squares are more visible and there is a sort of "ghosting" around certain elements of the image. Any ideas, comments?

---

9/20/95 1:56 PM

Re(2): problems with emulator

Sky Lounge

Thomas Boyd

CD

IRQ Config 2K

CD Creation

Enclosed is some info on my system and such. The drive itself is an APS drive that was sent to me when we ordered the PSX development station.

I very much appreciate the help! Thanx again.

Andy House

---

9/20/95 2:13 PM

Burning CDs with LICENSEA.DAT

Mark Beardsley

CD

Hi Tom,

I've just burnt my first disk using licensea.dat (the correct one I believe). The disk boots fine in a blue debugging system, but, the black PS logo screen never shows up. The white sony screen is shown, the screen flickers a couple times and then goes into our opening FMV sequence.

The game otherwise runs fine, but how did we miss the black logo screen?

I had burnt disks previously using licensej.dat, and the black logo came up as expected. Is it possible that I have a japanese debugging system or something?

---

9/20/95 5:42 PM

Re(3): Problems w/CDW-900E

Thomas Boyd

Greg G. Gibson

CD

hmmm, I have never tried the AHA - 1540CF, but it sounds like it might. I do not know about the Corel driver. I did not set ours up. I will find out Friday (I am out tomorrow).

Anyone out there use an AHA 1540CF????

Tom ===== Oops...

I mis-typed the name of our Adaptec card, we have the Adaptec AHA-1540CF SCSI card. (This isn't the 1542, but I read in one of the online FAQs that any of the 154x cards will work. Please let me know if I'm going to need to replace our current card.

Also, when connected to the proper SCSI adapter, would I simply load the Corel CD driver to get the device fully operational?

===== the CDW-900E works ONLY with the Adaptec AHA-1542CF SCSI card. Sorry. Tom

===== We recently purchased the CDW-900E CD Writing device, and the CD ROM Generator software (DTL-S2035). We are trying to connect the hardware to an Adaptec 5240 SCSI adapter and are receiving the following error message when trying to run the CD Gen software:

CD Recording Unit Controller The SCSI Host Adapter is Incorrect.

It appears that we may not have received the proper driver disks with the hardware. The only items received with the CD unit were a manual (which does not fully describe how to get the device running) and the CD Generator software (which does not include any DOS level drivers).

---

9/20/95 8:57 AM

Re: MovConv Quality

Thomas Boyd

CD

That is strange. Did you build the old one with movconv 1.93? Did you switch compression types (MDEC 3 - MDEC 2)? Could you mail these movies to me to show to Kojiro? The compression algorithms are the same between version 1.93 and 1.96. There is also the possibility that you changed your sound characteristics, since sound eats up movie bandwidth. Are you using the 1.5 anim for BOTH movie playbacks? Is there anything else different? Tom

===== I recently built a new str from an avi I've had for months (using the new movconv 1.96). I'm also now using the 1.5 version of anim. It seems that the quality of the str is not as good as it was. The movie is 320x240, 15fps, 24-bit. The original str (which was built in april) looks significantly better. In the new str, the MPEG squares are more visible and there is a sort of "ghosting" around certain elements of the image. Any ideas, comments?

---

9/20/95 8:51 AM

Re: problems with emulator

Thomas Boyd

CD

Sky Lounge

Paul at SN Systems speaks: ===== >>So now I can get into cddisk (via cddisk -n 4) and I can apparently create >>partitions and load cdboot27.bin or equivalent, but when I leave cddisk >>it tells me that it really didn't do anything afterall. >> >>That is, the error message that I get is... >> >>SCSI Error in writing sectors >> Error returned 0x0370 >> Please press a key

CDdisk only writes back the partition information right at the end of a session and so what you're seeing here is a straight failure to write. The error 0x0370 is a SCSI media error (Appendix C of the manual) meaning that when it tried to write details it found it to be of the wrong media type. Usually I would expect a media error to be detected earlier than this but I can envisage cases where the above could happen (ie when trying to write to a read-only disk).



Could you supply me with details of the harddrive please.  
Usually a media error is due to a conflict of SCSI id's although it could be possible that it is caused by interrupt, DMA or port address clashes. Please ensure that these aren't the case. Other than that I can only suppose that it is the harddrive that is not responding in quite the way that cddisk expects.

Rgrds,  
Paul

---

9/20/95 10:16 PM  
Re(4): Problems w/CDW-900E  
Dr. Cat  
CD

> hmmm, I have never tried the AHA - 1540CF, but it sounds like it might. I do not know about the Corel driver. I did not set ours up. > I will find out Friday (I am out tomorrow).

> Anyone out there use an AHA 1540CF????

Well no... But I am just about to hook up my CDW-900E here, and we're trying to figure out what (if anything) we need to buy. A cable at the minimum, it seems CD recorders NEVER come with a cable that matches any connector you have!

The Pentium I'm using has an Adaptec 2940 series SCSI controller in it. Haven't pulled the card out yet to see if it's an AHA-2940, AHA-2940W or AHA-2944W. Are these know to work with the CDW-900E, known to definitely not work, or not know one way or the other?

Also I have noticed the tempting SCSI connector on the back of the PSYQ card. Should I presume that this can't be used with the CDW-900E successfully, or can it?

-- Dr. Cat

---

9/20/95 2:22 PM  
Re(2): Problems w/CDW-900E  
Greg G. Gibson  
Thomas Boyd  
CD

Oops...

I mis-typed the name of our Adaptec card, we have the Adaptec AHA-1540CF SCSI card. (This isn't the 1542, but I read in one of the online FAQs that any of the 154x cards will work. Please let me know if I'm going to need to replace our current card.

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===== the CDW-900E  
works ONLY with the Adaptec AHA-1542CF SCSI card. Sorry. Tom

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---

9/20/95 5:40 PM

Re: Burning CDs with LICENSEA.DAT

Thomas Boyd

Mark Beardsley

CD

Japanese debugs will not show the american license screen. American (new) debugs will. If your debug has kanji on the back it is Japanese. It will do everything else just fine. Tom

=====

Hi Tom,

I've just burnt my first disk using licensea.dat (the correct one I believe). The disk boots fine in a blue debugging system, but, the black PS logo screen never shows up. The white sony screen is shown, the screen flickers a couple times and then goes into our opening FMV sequence. The game otherwise runs fine, but how did we miss the black logo screen?

I had burnt disks previously using licensej.dat, and the black logo came up as expected. Is it possible that I have a japanese debugging system or something?

---

9/21/95 11:54 AM

Question about Maker Code?

Greg G. Gibson

CD

I can't seem to locate the proper conference to post this question, so I'll try it here, please let me know if there is a more appropriate place.

We have games in development with outside developers, and they have requested that we supply them with our maker code that they will place in the game before sending us a final version. We were told that we would be able to get our maker code on this BBS, but as I stated above, there doesn't seem to be any appropriate place to get this resolved.

Any help would be appreciated.

---

9/21/95 9:55 AM

Re(3): Burning CDs with LICENSEA.DAT

Kristine Severson

CD

Mark,

Call your Sony Account Executive about exchanging your debugs. It should be no problem.

Kris

---

9/21/95 5:58 AM

Re(5): Problems w/CDW-900E

Mark Beardsley

CD

I also have a pentium with a 2940 series card. I was unable to get it to work with the Sony burner. I spent a day or two working with adaptec on the phone to try to get it working, so I don't think it can be done.

I currently use the burner off of another pc with the correct card, but if anyone can get the 2940s working, please let us know!! It would save me the big hassle of moving huge files across the network to my other pc.

I can't put the working card in my pentium because I'm out of slots (my current SCSI card is PCI

bus).

---

9/21/95 6:09 AM  
Re(2): Burning CDs with LICENSEA.DAT  
Mark Beardsley  
CD

Thanks for the info, but.... How can we get american debugging stations? We purchased 2 debug stations (apparently not knowing that there were american/japanese model differences), and since we have no plans to release any titles in japan, we really want the american ones. Please tell me that we can exchange them, if I have to tell my accountants that we need to spent \$2800 on new debug stations, they'll want to take it out of my paycheck.

---

9/22/95 9:24 AM  
Re(5): Problems w/CDW-900E  
Thomas Boyd  
CD

>The Pentium I'm using has an Adaptec 2940 series SCSI controller >in it. Haven't pulled the card out yet to see if it's an AHA-2940, >AHA-2940W or AHA-2944W. Are these know to work with the >CDW-900E, known to definitely not work, or not know one way or the other? These will usually not work. SN systems once got a 29xx series card to work, so I posted their method to this conference, but nobody else could make it work. Get the AHA-1542CF and you will be much happier.  
>Also I have noticed the tempting SCSI connector on the back of the >PSYQ card. Should I presume that this can't be used with the >CDW-900E successfully, or can it?  
BAD! Whack! Sparks will fly, resistors will melt. Emulator only.  
Tom

---

9/22/95 11:37 AM  
Decompression Speed  
Thomas Boyd  
Mark DeSimone

(I am just guessing here, so my ideas may be puny and worthless until I have all the data). Although the decompression speed of the MDEC may max at 9000 mblocks/sec, some of the decompression is taking place in software using the R3000. (Huffman decoding to be exact). I would expect variable decompression times depending on the complexity of the frame for this reason. Perhaps with this in mind, the limiting factor is not the MDEC, but the software decompression?  
Also, are you using movconv STRs? or have you made your own compressor/decompressor? (This would change my answer a lot).  
How is the game going? Let me know exactly what you are doing besides decompressing movies. If you are playing the game on top of it all, this may be part of the decoding problem.  
Tom Boyd  
PS: This group is fine for libpress and movie Qs, but I will find them wherever you put them.  
===== The documentation for libpress claims the "MDEC's max decompression speed is 9000 macroblocks per second." In recent tests, I have only been able to achieve roughly 60% of this speed.

Furthermore, the decompression speed is not consistent for the same amount of data. I get speeds from 4000 to 7000 macroblocks per second.  
Can anyone shed any light on this?  
Chris Howard Rainbow America  
ps. Where should LIBPRESS queries be posted?

---

9/22/95 11:26 AM  
Decompression Speed  
Mark DeSimone  
CD

The documentation for libpress claims the "MDEC's max decompression speed is 9000 macroblocks per second." In recent tests, I have only been able to achieve roughly 60% of this speed.  
Furthermore, the decompression speed is not consistent for the same amount of data. I get speeds from 4000 to 7000 macroblocks per second.  
Can anyone shed any light on this?  
Chris Howard Rainbow America  
ps. Where should LIBPRESS queries be posted?

---

9/22/95 9:28 AM  
Re: Question about Maker Code?  
Thomas Boyd  
CD

I do not quite understand. What do you mean by "maker code?" Are you referring to the CD generation program to be used with the burner? You can locate the CDGEN software in this newsgroup in the "CDGEN tools folder."  
Let me know if I am misunderstanding your request. Tom  
===== I can't seem to locate the proper conference to post this question, so I'll try it here, please let me know if there is a more appropriate place.  
We have games in development with outside developers, and they have requested that we supply them with our maker code that they will place in the game before sending us a final version. We were told that we would be able to get our maker code on this BBS, but as I stated above, there doesn't seem to be any appropriate place to get this resolved.  
Any help would be appreciated.

---

9/23/95 12:03 PM  
CD Emulator Speed  
Mark DeSimone  
CD

cdboot16,cdboot,26,cdboot17,cdboot27,cdboot18,cdboot28...  
There ALL SIGNIFICANTLY slower than the CD. I have to wait for reads to finish on the emulator and I don't when using the Debugging Station.  
Actually, cdbootX8 seems a little slower than cdbootX7.  
Glenn O'Bannon Rainbow America

---

9/23/95 9:34 PM  
Multichannel XA Streaming Hint  
Rusty Buchert  
CD

it is EXTREMELY important to set the following CD Modes before trying to do multi-channel XA Streaming:  
CdIStream - sets the device to streaming mode CdIStreamRT - turns on ADPCM XA sector recognition CdIStreamSF - enables the ability to switch between logical channels.  
The last one is not really mentioned in the docs, and not clearly related to XA streaming. Hope this saves some other poor soul the 2 hours of frustration I just had. ...  
Argh,  
-Neil

---

9/25/95 7:49 PM  
Re: Decompression Speed  
David R. Sullivan  
Mark DeSimone  
CD

Depending upon the QFactor (quality factor) of the encoded data, you should be able to get approx. 9000 macroblocks a second. Here's the deal, the smaller QFactor you have (ie. the MORE DATA you have) the SLOW the MDEC process is.

Encoding:  
RAW DATA                      DCT transformation of data                      Quantize Encoding  
(QFactor)                      THIS CONTROLS THE SIZE/QUALITY OF DATA                      VLC  
Encoding  
Decoding:                      VLC Decoding                      Software Decoding Routines  
(Huffman-like)                      MDEC                      >> Quantize Decoding of Bitstream                      Time  
depends upon data size                      >> DCT transformation                      RAW  
DATA  
DaveS.

---

9/25/95 8:47 AM  
Re: CD Emulator Speed  
Thomas Boyd  
CD

Mark DeSimone  
Glen, When I timed 1.8 vs. the debug, they were identical. Maybe your reading is different than my test case. Can you describe details about how your reads are running so I can try myself? (number of files, size of files, etc...).

1.6 is old, possibly 3X slower than debug. 1.7 was built by timing the black external drive. 1.8 was built by timing the debug station directly. (therefore 1.8 is the one to use for accuracy). If you use 2.X, you may be slower from passing debug stuff. Tom

=====  
cdboot16,cdboot,26,cdboot17,cdboot27,cdboot18,cdboot28...  
There ALL SIGNIFICANTLY slower than the CD. I have to wait for reads to finish on the emulator and I don't when using the Debugging Station.

Actually, cdbootX8 seems a little slower than cdbootX7.  
Glenn O'Bannon Rainbow America

---

9/27/95 1:56 PM

Re(2): More problems w/CDW-900E

Greg G. Gibson

CD

Thomas Boyd

RECLOG.TXT 9K

CD Creation

1. There are no .STR files, the game doesn't have any FMV. 2. I used CD Creator from Corel using another CDR drive that can read CD-DA into WAV format. 3. I have attached the RECLOG.TXT file of the two failed attempts, please let me know if you need more info. 4. We did not receive any instruction from the Developer. This game is a Japanese license and we were sent their 'Final' Japanese version, we are using this to learn how to create test and master CD's for testing and ultimately submitting the Master to Sony for approval.

I tried returning your call, but you weren't around, hope this helps. I should be in my office all afternoon.

=====

Ummm, before I started using CCI files (I have yet to be successful with this), tell me more about this disk you are trying to duplicate.

Does it have .STR files (FMV with sound)? What software did you use to scrape the CD-DA tracks off with? What error did you get with CDGEN? What instructions came with the disk from your developer?

---

9/27/95 10:49 AM

More problems w/CDW-900E

Greg G. Gibson

CD

I finally got the CD-Gen software to communicate properly with the CDW-900E. It was a problem with the SCSI adapter, so for future reference, the Adaptec 1540 card DOES NOT work with the CDW-900E.

Now for my new troubles...

I received a game from one of our developers on a CDR-71P disk, and needed to make additional copies for testing. After copying the data files from the CD to the hard drive, I then converted all of the CDDA files into WAV format. I opened CD-Gen and created the layout using the instructions that came with the LICENSEA.DAT file and proceeded to create the CD.

On two separate attempts now, the procedure errored about 9 minutes in.

I saw the message below about creating a CCI file, and that may solve this problem, but I was hoping to receive some confirmation prior to attempting this again, as these recordable disks are quite expensive and I'd hate to waste any more of them.

Thank you in advance for your help.

Greg Gibson

---

9/27/95 12:17 PM

Re: More problems w/CDW-900E

Thomas Boyd

CD

Greg G. Gibson

Ummm, before I started using CCI files (I have yet to be successful with this), tell me more about this disk you are trying to duplicate. Does it have .STR files (FMV with sound)? What software did you use to scrape the CD-DA tracks off with? What error did you get with CDGEN? What instructions came with the disk from your developer?

Tom

=====

I finally got the CD-Gen software to communicate properly with the CDW-900E. It was a problem with the SCSI adapter, so for future reference, the Adaptec 1540 card DOES NOT work with the CDW-900E.

Now for my new troubles...

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I saw the message below about creating a CCI file, and that may solve this problem, but I was hoping to receive some confirmation prior to attempting this again, as these recordable disks are quite expensive and I'd hate to waste any more of them.

Thank you in advance for your help.

Greg Gibson

---

9/27/95 9:06 AM

CDGEN and the elusive .CCI file

Thomas Boyd

CD

Jeff Davies

Here is the conversation I recently had about building CCI (pre-built image) files with CDGEN

===== >Hi Tanaka-san, > >I cannot get CDGEN to work correctly with an image file (.CCI file). >Whenever I burn a CD using a CCI file, the CD appears to be blank and >will not work. I have tried several different methods, but either get >a bad CD or an error. > >One error I get is the following: > "Cannot execute image saver: 3" > >Does the CCI file system work with CDGEN? >If it does work, what are the detailed steps to use it? >I think I might be using it incorrectly. > >Thank you, > > Tom Boyd

===== CD-ROM Generator has a problem about using of CCI. When you read CCI file by "Open" command, some part of the CD-ROM construct information will be lost. Please use CCS file to save the CD-ROM information.

But, in the case of PC has less power to make enough speed to open or close data files on the HDD, it may be failed in the writing. Only in that case, you must make CCI file by "Save as" command in the following step.

1) Save edited information as CCS file to save the CD-ROM information. 2) Also, save as CCI file before writing into CD-R. 3) Start writing.

If PC is powerful (i.e. Pentium machine), access speed for HDD must be enough to write CD.

---

9/28/95 3:24 PM

CD-Emulator locking on seeks

Jeff Lander

CD

We're experiencing a problem when accessing files on the CD-Emulator. If I execute a CDSearchFile() call, or a CDRead() call, the emulator seems to get stuck on a seek. This happens

roughly 90% of the time, other times it works fine. It does the same thing on occasion when after running cdexec.cpe. Anyone else experienced this problem and have a solution? I'm fairly sure it is not a problem in my software, as it has run fine on several other CD-Emulators. Any help or advice would be appreciated. Thanks.

---

9/29/95 3:50 PM  
Universal CDEXEC.CPE  
Jay Carlson  
CD

CDEXEC.ZIP           20K  
CD Creation  
Here is a CDEXEC file that will launch executables with the new naming formats:  
SLPS\_XXXXX SCPS\_XXXXX SLUS\_XXXXX SCUS\_XXXXX SLES\_XXXXX SCES\_XXXXX  
& the old PSX.EXE  
-J

---

9/29/95 10:23 AM  
More on the .CCI file  
Henrik Markarian  
CD

Are there any plans to for CDGEN to support burning from a single image file? I thought that's what the .CCI file was for, but now we know better! It's a major pain to have to move the entire project directory structure to the machine which has the CD-WriteOnce connected to it, everytime we want to burn a CD. It would be much easier to move a single image file. While on the subject, a tool which converts from .CTI to .CCS would also be very useful. It's much faster for me to add files into a text file (i.e. .CTI) than to have to jump into Windows and add it through CDGEN. Once I'm ready to burn a CD, I can convert my .CTI to a .CCS, then go into CDGEN and (hopefully) save an image file that I can transfer to the CD burn station.  
Henrik Mindscape

---

10/2/95 10:35 AM  
Re: More on the .CCI file  
Thomas Boyd  
CD

Henrik Markarian  
Supposedly, the CCI file MAY work on occasion. I do not know of any plans to fix it, and I have grown weary of trying to find out how to make the sucker work. I may try again soon, though. buildcd -gwhatever.ccs ... will output a CCS file from a CTI file. (Does it work? Usually). Tom  
===== Are there any plans to for CDGEN to support burning from a single image file? I thought that's what the .CCI file was for, but now we know better! It's a major pain to have to move the entire project directory structure to the machine which has the CD-WriteOnce connected to it, everytime we want to burn a CD. It would be much easier to move a single image file. While on the subject, a tool which converts from .CTI to .CCS would also be very useful. It's much faster for me to add files into a text file (i.e. .CTI) than to have to jump into Windows and add it through CDGEN. Once I'm ready to burn a CD, I can convert my .CTI to a .CCS, then go into CDGEN and (hopefully) save an image file that I can transfer to the CD burn station.  
Henrik Mindscape



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10/2/95 10:42 AM

Re: CD-Emulator locking on seeks

Thomas Boyd

CD

Jeff Lander

What hard drive are you using as your emulator? I suspect something is wrong with your board, drive, or DTL-H2000 cards. If you can, swap the drive with a different one and experiment. Same for the emu and dev boards.

Next, when the attempted access to the drive is being made, try to open the door on your black, external CD-ROM drive (if you have one). It should not open. If it does, I suspect the DTL-H2000 boards, as I have had problems with boards "forgetting" to switch to the emulator upon running selemu in the past.

If you cannot diagnose who is broken, send the emu board to me and I can test it to see if it works.

Please EMail me with your results. I know you may not have all of the hardware you need to run my tests.

Tom ===== We're experiencing a problem when accessing files on the CD-Emulator. If I execute a CDSearchFile() call, or a CDRead() call, the emulator seems to get stuck on a seek. This happens roughly 90% of the time, other times it works fine. It does the same thing on occasion when after running cdexec.cpe. Anyone else experienced this problem and have a solution? I'm fairly sure it is not a problem in my software, as it has run fine on several other CD-Emulators. Any help or advice would be appreciated. Thanks.

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10/3/95 5:59 PM

Creating Bootable CD

Greg G. Gibson

CD

I've also been having problems burning a CD that will boot. I will try the below from Tom, as I realized that I flagged all of the CD-DA files from the root, which appears to have caused my problem.

Another item that I have noticed is that when I try playing the CD-DA tracks (from a non-bootable CD) through a standard CD player, the music is playing back distorted. I've been trying to make a copy of a prelim. code CD sent from a developer, so the original CD-DA tracks were saved to WAV format using Corel CD-Creator (are there any better programs to do this with?). Also, do I need to do anything special in the layout with a FMV logo? It is stored as an STR file.

Any additional help would be appreciated.

--Greg Gibson

>==Tom Boyd: >This has happened to me and it was because of the "too many files listed in the root directory" problem I described briefly in my last post. DA tracks sometimes show up in the root TOC on the CD causing too many files to be read in at the beginning. The list is alphabetic, so PSX.EXE would be sooner than SLUS\_XXX.XX (and SLUS may be too far along in the TOC). (soln: drag CD-DA track references into a subdirectory). > Tom

---

10/3/95 10:00 AM

How to make a bootable CD?

Dave Elton

CD  
Thomas Boyd  
BD13.CCS 16K  
CD Creation

I am trying to cut a CD, but I cannot make my CD self boot. I have included the system.cnf file and set the boot parameter as PSX.exe and rename my playcode as PSX.exe. But for some reason, my CD cannot boot itself from the debugging station (the blue one). I did get the Sony Logo and license image on screen, so it looks like the system is finding the liscenea.dat I put in system area. So why does't it find my PSX.exe then? I include my bd13.ccs and system.cnf here, maybe you can point out what's wrong. Thanks in advance! ( I know my code works because I can use "run \*.cpe" to run it either from emulation hard drive or from the CD I cut. And I used the cpe2x to convert my .cpe file to .exe file)  
Simon ReadySoft Inc.

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10/3/95 12:54 PM  
Re(2): How to make a bootable CD?  
Thomas Boyd  
CD

This has happened to me and it was because of the "too many files listed in the root directory" problem I described briefly in my last post. DA tracks sometimes show up in the root TOC on the CD causing too many files to be read in at the beginning. The list is alphabetic, so PSX.EXE would be sooner than SLUS\_XXX.XX (and SLUS may be too far along in the TOC). (soln: drag CD-DA track references into a subdirectory). Tom ===== I don't know if this is your problem, but try not having a SYSTEM.CNF file, and letting the system use PSX.EXE as the default instead. We've been unable to get a disk to boot if we have a CNF file, but everything works fine if we omit it.

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10/3/95 10:55 AM  
Re: How to make a bootable CD?  
Mark Beardsley  
CD

I don't know if this is your problem, but try not having a SYSTEM.CNF file, and letting the system use PSX.EXE as the default instead. We've been unable to get a disk to boot if we have a CNF file, but everything works fine if we omit it.

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10/3/95 10:56 AM  
Re: How to make a bootable CD?  
Thomas Boyd  
Dave Elton  
CD

There are many possible problems. 1. too many files listed in your TOC (put in a PC dirve and count 'em) break into subdirs to fix 2. lingering pollhosts remove them 3. use of CdSearchFile() in 3.0 libs (it does not always work) hard code your directory structure to fix, or switch to 3.2 4. other hmmm  
I think PSX.EXE is being found, but it is hanging on the debug. try putting changing colors or numbers in the beginning of main() to see how far it gets. Then you will know where in main() it is dying. Tom ===== I am trying to cut a CD, but I cannot make my CD self boot. I have included the system.cnf file and set the boot parameter as PSX.exe and rename my playcode as PSX.exe. But for some reason, my CD cannot boot itself

from the debugging station (the blue one). I did get the Sony Logo and license image on screen, so it looks like the system is finding the liscenea.dat I put in system area. So why does't it find my PSX.exe then? I include my bd13.ccs and system.cnf here, maybe you can point out what's wrong. Thanks in advance! ( I know my code works because I can use "run \*.cpe" to run it either from emulation hard drive or from the CD I cut. And I used the cpe2x to convert my .cpe file to .exe file)  
Simon ReadySoft Inc.

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10/4/95 10:02 AM

Re(3): How to make a bootable CD?

Dave Elton

CD

Thomas Boyd

I have included my .ccs file in my previous post, as you will find, I only have 4 directories and the maximum number of files in each directory is less than 45 ( 41 exactly). According to the docs, we can have as many as 30 directories and 45 files under each directory including subdirectories. I don't have any CD-DA files, all of them are standard mode1 files (I used them as data files). I do have a pollhost() in my pad detection function, but usually at the very beginning, when I init graph system, the screen will turn into black first, the CD from debugging station did not turn the screen into black though after the license logo. So I doubt it is caused by the pollhost(). Morelikely the system didn't start the PSX.exe at all. I will try to cut another one without system.cnf to test. But I am wondering why the released Title CDs I got have system.cnf files in it and their boot parameter are set to their own playcode. I found this when I list the files of those CDs. Thanks for any advice.

Simon ReadySoft Inc.

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10/4/95 10:14 AM

Re(4): How to make a bootable CD?

Thomas Boyd

Dave Elton

CD

>I have included my .ccs file in my previous post, as you will find, I only have 4 >directories and the maximum number of files in each directory is less than 45 ( 41 >exactly). According to the docs, we can have as many as 30 directories and 45 files >under each directory including subdirectories. I don't have any CD-DA files, all of them >are standard mode1 files (I used them as data files). OK so far...

>I do have a pollhost() in my pad detection function, but usually at the very beginning, >when I init graph system, the screen will turn into black first, the CD from debugging >station did not turn the screen into black though after the license logo. So I doubt it is >caused by the pollhost(). Still sounds OK

>More likely the system didn't start the PSX.exe at all. Could be...

>I will try to cut another one without system.cnf to test. good idea

>But I am wondering why the released Title CDs I got have system.cnf files in it and >their boot parameter are set to their own playcode. I found this when I list the files of >those CDs.

Thanks for any advice. Production CDs have to have system.cnf to support the file naming convention. Best plan is to go strip one off of a production CD for starters. The spaces between the equal signs matter The values are in hex (even the TCB and event numbers) so be carefull Try without system.cnf first to be sure your game even works on a debug.

---

10/4/95 10:51 AM

Re: How to make a bootable CD?

Dan Burnash

CD

Dave Elton

>( I know my code works because I can use "run \*.cpe" to >run it either from emulation hard drive or from the CD I cut. And I used the cpe2x to convert >my .cpe file to .exe file)

Another possibility is that you are defaulting to the 8 meg memory model, which puts your stack in never never land( as in never boot) on a debug station. This would also account for the program working on a dev system. Try linking in 2mbyte.obj or specifying the following in your program:

```
unsigned int _ramsize = 0x200000; unsigned int _stacksize = 0x8000; /* or whatever you want to set aside for your stack */
```

---

10/4/95 9:18 AM

bootable CDs

Thomas Boyd

CD

FMV with audio (your logo) will need special attention. You will need the original source file that the developer uses to make the CD, not the file on the playable PSX CD. The reason is that the interleaved XA audio uses the ECC and subheader region of the sectors in the STR file. Just reading these sectors with a PC from DOS will not get the ECC area, hence you will have the wrong file.

It is possible to get those files off with some CD utilities (I do not have them, and therefore do not know how to go about it) that are commercially available, but it would prolly be a total pain in the butt.

The music should not play back distorted. Something is wrong.

Tom ===== I've also been having problems burning a CD that will boot. I will try the below from Tom, as I realized that I flagged all of the CD-DA files from the root, which appears to have caused my problem.

Another item that I have noticed is that when I try playing the CD-DA tracks (from a non-bootable CD) through a standard CD player, the music is playing back distorted. I've been trying to make a copy of a prelim. code CD sent from a developer, so the original CD-DA tracks were saved to WAV format using Corel CD-Creator (are there any better programs to do this with?). Also, do I need to do anything special in the layout with a FMV logo? It is stored as an STR file.

Any additional help would be appreciated.

--Greg Gibson

>==Tom Boyd: >This has happened to me and it was because of the "too many files listed in the root directory" problem I described briefly in my last post. DA tracks sometimes show up in the root TOC on the CD causing too many files to be read in at the beginning. The list is alphabetic, so PSX.EXE would be sooner than SLUS\_XXX.XX (and SLUS may be too far along in the TOC). (soln: drag CD-DA track references into a subdirectory). > Tom

---

10/5/95 4:25 PM

Re(3): How to make a bootable CD?

Thomas Boyd

Dave Elton

CD

You will have to use SYSTEM.CNF with your final release, because PSX.EXE is not a legal name for a production CD. Let me know when you get to final stages, and we will make it work. Tom  
===== 1. Do not include system.cnf, only rename your code as psx.exe. Mark is right at this and I proved it. Although I do not know why other release titles all have their system.cnf there. Maybe because our develop system is Japanese version?

---

10/5/95 4:22 PM

Re(2): How to make a bootable CD?

Dave Elton

CD

OK, I finally found out how to cut a bootable CD, here are the mistakes I've made and hope this will help others to save their time:

1. Do not include system.cnf, only rename your code as psx.exe. Mark is right at this and I proved it. Although I do not know why other release titles all have their system.cnf there. Maybe because our develop system is Japanese version?

2. Take out pollhost() in your code. This will definitely crash your CD.

3. Test your code and linking with 2mbyte.obj. Make sure it runs from emulation drive.

Thanks for all the advices from you guys!

Simon ReadySoft Inc.

---

10/6/95 12:41 PM

How many files each directory can have ?

Dave Elton

CD

Thomas Boyd

The docs says we can have as many as 30 directories and 45 files in each directory, but I found I can only put about 30 files in each directory. When I put 41 files in a directory, I cannot find any files above 30, the CdSearchFile will report cannot find these files. But when I reduce the number below 30, all the files can be found. Another interesting thing is the emulation looks consistent with what docs says because I have no problem stuff 41 files under each directory. Anybody experienced the same problem?

Simon ReadySoft Inc.

---

10/9/95 7:54 PM

CD-Emulator Problems

John Brandwood

CD

Thomas Boyd

I've been using the Psyq system for a couple of months now, using the PCHost calls for file access. I've just had a CD-Emulator card and 4GB Micropolis AV-GOLD drive delivered, but can't seem to get them working properly.

The emulator card won't work with DMA (I've tried 5,6, and 7). This isn't a major surprise since in the 5 years I've used SNASM and now PSYQ on various platforms and various PCs, I've never got the DMA to work properly.

Without DMA, the CDBIOS loads fine and I can successfully run CDDISK to partition the drive, and BUILDCD to build the RCUBE demo (using the new 1.8/2.8 boot program). After the build,

I can look at the partition with CDDISK and everything appears to be OK.

But I can't get the RCUBE demo to run off the CD.

Running ...

resetps 1 pause run snpatch.cpe - 247796 bytes, dated 5-31-95 pause run selemu.cpe -  
350 bytes, dated 4-19-95 pause run cdexec.cpe - 447 bytes, dated 4-19-95

the system locks with CDMON reporting a continual increasing sequence of seeks.

Replacing snpatch.cpe with snpatchw.cpe (267834 bytes, dated 9-20-95) causes the system to lock,  
but on a single seek "SEEK 01 00 00 00 13 00 01 61".

Hardware-wise I've removed the little blue plastic connector with the single wire from the DTL-  
H2010 connector that was there to allow the DTL-H2000 to reset properly. If there is now  
supposed to be something else plugged in there, then I've never seen it.

Any suggestions?

Thanks, John.

---

10/11/95 8:51 AM

Re: How many files each directory can have?

Dan Burnash

CD

The limitation varies depending on the length of the filenames. 30 seems like a safer limit, but if  
you reduce the filename length you should be able to find more of your files.

---

10/11/95 10:29 AM

Various CD Issues

Angus

CD

> What is the differences between lib 3.1 and libcd & libspu 3.2.1? What is the > differences  
between lib 3.2 and libcd & libspu 3.2.1? They are getting disk > errors that they were not  
getting before. > ACTION: Have not heard back on this one from EA.

DMA delay time is different between 3.2libcd and 3.2.1libcd. Since the change of delay time  
causes the timing of interrupt, I think it reveals the hidden bugs.

> CdIControl(CdIPause,0,0) is slow and takes from 0 to 44 scanlines. > ACTION: Ask Suzuoki.

> > CdControlF(CdIPause,0,0) does not appear to work on the blue debugging > stations. >  
ACTION: Send this to Suzuoki and Yutaka.

CdIPause may take 0 to 44 scanlines, but CdControlF is fast. I checked in some test programs.  
But when some other command is executing, CdControlF is blocked until this previous  
command is finished.

For example, the following code may takes long time to execute CdIPause in the worst case.

```
cbvsync(void) { if (play_request) { play_request = 0; CdControl(CdIplay, pos, 0); } }
```

```
main() { .... VSyncCallback(cbvsync); ....
```

```
CdControlF(CdIPause, 0); }
```

In this case, we should write as follows:

```
if (CdSync(1, 0) == CdIComplete) CdControlF(CdIPause, 0);
```

> We need a new libcd function > Add a new function, CdInitInterrupts which is simply a  
duplicate of the code > execute at the top of CD\_init. > > This would prevent an 8 second wait  
inbetween loading code modules due to the > issuing of a CdIReset command by CD\_init. The  
projects in concern do not use > code overlays -- they actually load all new code for each  
module.... -- therefore each new module MUST > re-init the CD to give control to it's local  
callbacks. > > CdInitInterrupts() > { > CD\_cbready=0; > CD\_cbvsync=0; >

```
ResetCallback(); // Note: This should happen Last! > InterruptCallback(2,callback);  
> // callback is a static or we could write this ourselves. > } > I add it in lib3.3,  
CdReset(3) only resets interrupt.  
CdReset(0) resets interrupt, CDROM subsystem. CdReset(1) resets interrupt, CDROM  
subsystem, CD/SPU volume. CdReset(2) resets interrupt.
```

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10/12/95 9:46 AM  
v-cd?  
Kirk Bender  
Non-tech talk

I heard on the internet that the demo disc that comes with the european PSX has a program called "v-cd". It supposedly shows cool graphics that change in time with audio cds, similar to the Atari Jaguar VLM. Anyone know who makes this program, and how we can get it? If it is a sony demo, is the source available?

---

10/12/95 4:28 PM  
Re(2): Emulator file size discrepancy?  
David Minogue  
Thomas Boyd  
CD  
Tom,  
Any progress on this one?

---

I will have SN fix it. T

---

Tom,  
I think I've found a discrepancy between the CD emulator image and the CDGen image. It seems that, for Form 2 files, the emulator saves in the directory the original size of the file (2352 bytes/sector) while CDGen only saves the size of the data portion of the file (2048 bytes/sector). As I am trying to use this information to calculate the location of the last sector of a streaming file, this is a problem for me.  
-- David Minogue, Acclaim Entertainment.

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10/13/95 5:50 PM  
Re(3): Emulator file size discrepancy?  
David R. Sullivan  
David Minogue  
Thomas Boyd  
Thomas,

The problem of CDGen NOT reporting the correct (2352 bytes per sector) size on Form 2 files needs to be fixed in CDGem, NOT Build CD...we would like to know the number of bytes that would be read given the current sector format.  
? Is SN Systems responsible to CDGen? Are any new versions of CDGen being released?  
DaveS.

---

10/13/95 8:16 AM

New Lisencea.dat doesn't work?

Dave Elton

CD

Dan Burnash

I replace the new lisencea.dat (the Oct. 6 one) with my old one. The CD I cut somehow becomes instable. If you leave the debugging station power off long enough, the license image will show up and boot up my playcode properly, but if you reset the debugging station or turn on it before it is coold off, the CD will not boot up and will choke when it loads the new lisence image. I cut th CD in double speed, but I doubt this will cause such problem, because if it booted up the first time, it should boot up everytime. I think the new lisencea.dat doesn't not work?  
Simon ReadySoft Inc.

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10/15/95 6:02 PM

Fwd: Turning debug executable

cary hammer

CD

We have working PlayStation code that runs on the debugger, and we are ready to make a CD for testing, but cannot seem to get a working CD.

We followed the directions in the FAQ (4-5-3), but still have problems: 1. CPE2X does not accept any /C (or -C) flag as indicated in step 3. It responds with file /C not found, but still manages to turn our MAIN.CPE into a MAIN.EXE. Furthermore, the instructions don't explain what the "area" means: "Perform a cpe2x /C[area] on the .cpe file", so even if the flag worked, the instructions are not complete.

2. With our MAIN.EXE and data files in CDGEN, along with the licenseA.dat file in the System Area, all we get when we try to run the CD is a black screen.

3. Looking at the RCUBE example and past Questions about this topic, we find that there is a file "PSX.EXE" which is somehow vital to the process. However, no mention is made of how to make a PSX.EXE file, what it contains, etc. The ly hint I find is that this should be the main executable file. So we renamed our MAIN.EXE to PSX.EXE, and it still will not emulate properly.

4. Can we get some COMPLETE, STEP-BY-STEP instructions on taking a working MAIN.CPE program and turning it into a working test CD?

Thanks for your help...

Unexpected Development

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10/16/95 11:56 AM

Re: Fwd: Turning debug executable

Dan Burnash

CD

>We followed the directions in the FAQ (4-5-3), but still have problems: >1. CPE2X does not accept any /C (or -C) flag as indicated in step 3. It responds with file /C >not found, but still manages to turn our MAIN.CPE into a MAIN.EXE. Furthermore, the >instructions don't explain what the "area" means: "Perform a cpe2x /C[area] on the .cpe file", >so even if the flag worked, the instructions are not complete.

Get the latest cpe2x.exe, and all will be revealed. Then try the following: cpe2x /? // list options cpe2x /c // bad option, options listed cpe2x /ca foo.cpe // generates foo.exe for North American area

>2. With our MAIN.EXE and data files in CDGEN, along with the licenseA.dat file in the System >Area, all we get when we try to run the CD is a black screen. Is the 'A' in the layout->master-



>license area set? If not, set it. Do you have a 'system.cnf' file in the root directory that specifies to load MAIN.EXE instead of the default PSX.EXE? If not, it won't boot. I recommend using PSX.EXE as your executable name until you get the system working, then add the system.cnf file later. Also, make sure you set the CD length to 74 minutes, even though you are using 71 minute cd's.

>3. Looking at the RCUBE example and past Questions about this topic, we find that there is a >file "PSX.EXE" which is somehow vital to the process. However, no mention is made of how >to make a PSX.EXE file, what it contains, etc. The ly hint I find is that this should be the main >executable file. So we renamed our MAIN.EXE to PSX.EXE, and it still will not emulate >properly. Stick to PSX.EXE for now. Make sure all of your typing within cdgen is done in ALL CAPS.

>4. Can we get some COMPLETE, STEP-BY-STEP instructions on taking a working MAIN.CPE >program and turning it into a working test CD? Read the latest docs and the faq, and keep trying.

Dan Burnash

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10/16/95 3:17 PM

Re(4): Emulator file size discrepancy?

Thomas Boyd

CD

>? Is SN Systems responsible to CDGen? Are any new versions of CDGen being released?

No. CDGEN is a Sony Japan baby. The original authors of the software are history, and so no changes will be made to CDGEN unless they utterly-positively-or-we-all-die have to be made.

I suspect CDGEN will get a rewrite when the new model burners start shipping later next year (No, they are not better. Yes, we have tons of CDW-900Es).

Tom

---

10/16/95 7:09 PM

FYI

chris m. coffin

CD

For those of you searching for the elusive Adaptec 1542CF card to get your CD burner up and running.... The adaptec 1542CP works also. The card is essentially the same as the CF model but has the itty bitty SCSI 2 connector on the back instead so you'll need to get a converter (We never could find the CF model and stumbled onto this solution) Hope this helps

---

10/16/95 2:08 PM

Re: Loading .tmd/.tim

Thomas Boyd

CD

cary hammer

use CdRead() and CdGetSector() to load crud from disk into memory. This is the best way to load data. You need to know the file locations, so use CdSearchFile() to find them, or better yet, figure them out and hard code them into a structure for speed. This is proly what the Emu version of RCUBE does. (I don't have the source to the emu version). NOTE: CdSearchFile does not work right on debugs under lib 3.1

If you want to make a special load program to load this stuff (although this would not be

something I would do unless I had to), you still will use the same technique and then LoadExec() your main(). Tom

===== Thanks  
for the scoop on cpe. Unfortunately, I think that we are still missing an important item. The demo we want to put on disk consists of one main and several image and model files. Currently, we run the program on the development system by doing pqbload's from a make file into ram. We do not seem to be able to follow the rcube example to get our demo to run from cd emulator because the rcube sample seems to have a special load program (named psx.exe) which specifically loads RCUBE.EXE, RCUBE.TIM and RCUBE.TMD (based on looking at the text within PSX.EXE). Obviously, RCUBES.EXE does not load it's respective .tim and .tmd files but expects them to already be in ram. Our demo program is the same as all of the graphics example programs which expect .tim and .tmd to be already loaded into magic locations within ram.

What we need to know is how to create a PSX.EXE file which will load in our MAIN.EXE,IMAGE1.TIM...IMAGEN.TIM,MODEL1.TMD...MODELM.TMD files into memory and then pass execution to main. The source file which created PSX.EXE in the CDEMU\SAMPLE\RCUBE would be helpful. Thanks.

---

10/16/95 2:14 PM  
Re: dove (where is) cpe2x?  
Thomas Boyd  
cary hammer  
CD  
CPE2X.EXE           18K  
CD Creation  
Here

---

10/16/95 2:13 PM  
dove (where is) cpe2x?  
cary hammer  
CD

Could you tell us \*exactly\* from where we should download the latest cpe2x. We've tried numerous locations with promising names, most of which seem to say "Access Denied". Thanks.

---

10/16/95 1:56 PM  
Loading .tmd/.tim  
cary hammer  
CD

Thanks for the scoop on cpe. Unfortunately, I think that we are still missing an important item. The demo we want to put on disk consists of one main and several image and model files. Currently, we run the program on the development system by doing pqbload's from a make file into ram. We do not seem to be able to follow the rcube example to get our demo to run from cd emulator because the rcube sample seems to have a special load program (named psx.exe) which specifically loads RCUBE.EXE, RCUBE.TIM and RCUBE.TMD (based on looking at the text within PSX.EXE). Obviously, RCUBES.EXE does not load it's respective .tim and .tmd files but expects them to already be in ram. Our demo program is the same as all of the graphics example programs which expect .tim and .tmd to be already loaded into magic locations within ram.

What we need to know is how to create a PSX.EXE file which will load in our

MAIN.EXE,IMAGE1.TIM...IMAGEN.TIM,MODEL1.TMD...MODEL.M.TMD files into memory and then pass execution to main. The source file which created PSX.EXE in the CDEMU\SAMPLE\RCUBE would be helpful. Thanks.

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10/16/95 6:37 AM

Re(4): Emulator file size discrepancy?

David Minogue

David R. Sullivan

Thomas Boyd

I'm not sure what the right solution is, but I suspect that CDGen is right and BuildCD is wrong. In any case, I am just looking for a way to consistently calculate the location of a stream's last sector so that I can stop it at the end of an FMV. Since MovConv generates 2048 bytes/sector (Form 1) when there is no interleaved audio and 2336 bytes/sector (Form 2 w/o Sync and Header fields) when there is interleaved audio, I'm not sure what my divisor should be. Also, as I understand it, the choice of how the data is read is independent of how it was written.

-- David Minogue.

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10/16/95 2:42 PM

Re: CD-Emulator Problems

Thomas Boyd

CD

John Brandwood

>The emulator card won't work with DMA (I've tried 5,6, and 7). This isn't a major surprise >since in the 5 years I've used SNASM and now PSYQ on various platforms and various PCs, I've >never got the DMA to work properly. It works. Press on. (see below)  
>Without DMA, the CDBIOS loads fine and I can successfully run CDDISK to partition the drive, >and BUILDCD to build the RCUBE demo (using the new 1.8/2.8 boot program). After the >build, I can look at the partition with CDDISK and everything appears to be OK. >the system locks with CDMON reporting a continual increasing sequence of seeks. >Replacing snpatch.cpe with snpatchw.cpe (267834 bytes, dated 9-20-95) causes the sytem >to lock, but on a single seek "SEEK 01 00 00 00 13 00 01 61".

Use 1.8 till you get it going - skip CDMON for now

>But I can't get the RCUBE demo to run off the CD. >Running ... >resets 1 >pause >run snpatch.cpe - 247796 bytes, dated 5-31-95 >pause >run selemu.cpe - 350 bytes, dated 4-19-95 >pause >run cdexec.cpe - 447 bytes, dated 4-19-95

This is all correct so far...

>Hardware-wise I've removed the little blue plastic connector with the single wire from the >DTL-H2010 connector that was there to allow the DTL-H2000 to reset properly. If there is now >supposed to be something else plugged in there, then I've never seen it.

The thing you have not seen is critical. It is sort-of a terminator. It is blue, plastic and fits in the slot. Go beat on whoever gave you the boards without the "blue chip" until they cough it up. (hint: we shipped one in the little plastic bag of junk that came in the box with the boards.)

Tom

---

10/17/95 6:02 AM

Re(2): Loading .tmd/.tim

Mark Beardsley

CD

DATA4.ASM 1K

#### CD Creation

An alternative method for handling you tim/tmd/data files is to link them in with your program code (making one EXE file that contains your code and data). This has several advantages. First, you don't have to worry about loading your data into ram (if your code is loaded, so is your data!!). Second, you don't have to come up with any magic ram locations (or doing a lot of malloc's). Third, the loading time is faster since you won't be doing a whole lot of seeks all over the disk. The way to do this is to use the INCBIN command in an assembly file. I create an assembly file that just includes my data files, assemble it into an object file, and link it to my C code. It really works well. The only disadvantage I've found to this method is that you may have some tims that you want to load into vram and then clear out from main ram (ie. only exist in main ram during loading). In this case, you might want to load those tims from the disk separately. I've attached a sample asm file (in case anyone wants to try it).

Hope It Helps.

(Hope It Helps is a Registered Trademark of Angus, and any publication, reproduction, re-transmission or other use of this trademark, without express written consent is prohibited!!!!).

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10/17/95 2:47 PM

Re(2): CD-Emulator Problems

John Brandwood

Thomas Boyd

CD

>>Hardware-wise I've removed the little blue plastic connector with the single wire from the >>DTL-H2010 connector that was there to allow the DTL-H2000 to reset properly. If there is now >>supposed to be something else plugged in there, then I've never seen it.

>The thing you have not seen is critical. It is sort-of a terminator. It is blue, plastic and fits in the slot. >Go beat on whoever gave you the boards without the "blue chip" until they cough it up.

>(hint: we shipped one in the little plastic bag of junk that came in the box with the boards.)

Thanks Tom,

I'll check the boxes again, and let you know if we've somehow managed to lose this terminator.

John.

---

10/17/95 4:54 PM

Re(4): CD-Emulator Problems

John Brandwood

CD

Thomas Boyd

> Let me know if you still have problems or cannot find the "blue chip." This will solve one problem, but maybe > not all.

I've checked in the office, and also with the guys at Crystal Dynamics who sent us the emulator. No one has seen of or heard of one of these terminator things.

The only 'blue-chip' that any of us has ever had is the little 40-pin IDC plug that has a single-wire connected between two pins that came with the DTL-H2000 board, and instructions that ...

"If the DTL-H2000 is not connected to the DTL-H2010 (CD-ROM drive, sold seperately) or the Psy-Q PSX04 (CD emulator), the SPU may not reset. In order to insure proper functioning, please attach the included SPU attachment to the DTL-H2010 connector."

If, as I suspect, this isn't the terminator plug that you are referring to, then someone had better check the Psy-Q boxes at your end, because none of the ones that Crystal have received have ever had this plug in them.

> I may be able to find an extra blue terminator if you can't find yours (I have given most of them away, but may > have one left).

Pretty please with a box of chocolates :-)  
Thanks,  
John.

---

10/17/95 7:11 AM  
Re: FYI  
Dave R. Scheele  
CD

chris gave some helpful hints re: Adaptec controllers, but at the end he said:  
>> Hope this helps  
without proper authorization .... (see Mark Beardsley's message here dated 10/17 for  
clarification)  
I smell a lawsuit coming!!!

---

10/17/95 3:14 PM  
Re(3): CD-Emulator Problems  
Thomas Boyd  
John Brandwood  
CD

Let me know if you still have problems or cannot find the "blue chip." This will solve one  
problem, but maybe not all. I may be able to find an extra blue terminator if you can't find yours  
(I have given most of them away, but may have one left). T  
===== I'll check the boxes again, and let you know if we've somehow  
managed to lose this terminator.  
John.

---

10/18/95 3:03 PM  
Re(2): FYI  
chris m. coffin  
CD

Gee, I'm really sorry (NOT) Hope this helps Hope this helps Hope this helps Hope this helps  
Hope this helps Hope this helps Hope this helps Hope this helps Hope this helps :)

---

10/27/95 12:43 PM  
Re(2): Playing CD-DA on Playstation  
Mark A. Fong  
Thomas Boyd  
CD

1) I do use CdSearchFile and version 3.1 of the library. 2) This happens on all the CDs I cut. 3)  
No Pollhosts 4) linked with 2mbyte.obj  
What does CdSearchFile foul up? I call CdInit() before I play the DA and never call  
CdSearchFile again. Shouldn't that re-initialize anything CdSearchFile goofed up?  
Thanks, Mark A Fong

-----  
----- 1) Are you using CdSearchFile and an older version

of the library? This can cause probs. 2) Your CD may be cruddy enough to fail on the debugs weaker-than-usual CD drive. 3) You may have left pollhosts in. 4) You may not have linked with 2mbyte.obj -----

----- I can burn a bootable CD with DA and it will boot and play fine on the development system's CD-ROM drive. But when I run the disk on a Debugging Station it seems like it can't "find" the DA track to play. The disk spins but the head just moves up and down the disk like its seeking but not finding. Why is there a difference between the dev system's CD drive and the Playstation's?

Thanks, Mark A. Fong

---

10/27/95 2:50 PM

Re(3): Playing CD-DA on Playstation

Thomas Boyd

Mark A. Fong

CD

>1) I do use CdSearchFile and version 3.1 of the library.

I am pretty sure that this is the culprit. Can you switch to 3.2? (on the BBS and the new release CD) It is supposed to be repaired there. (but I am not convinced yet, see below).

>What does CdSearchFile foul up? I call CdInit() before I >play the DA and never call CdSearchFile again. Shouldn't >that re-initialize anything CdSearchFile goofed up?

One would think that, but you are not the first to be burned by <3.1 CdSearchFile. It hangs the game all the way when it goes bad. I think your code is hanging IN CdSearchFile, not the player. If you wanna test my theory to see, put a FntPrint or a screen color change after CdSearchFile to see if it ever gets there.

You might try hard coding your directory structure (this can be done with a CDGEN, and a little iteration, see the CD FAQ).

Tom

---

10/27/95 8:50 PM

Difference between debugging station and black cd rom

Dave Elton

CD

I cut a CD and found the audio used to play well on black cd-rom now loops when I do cd seeks. I am wondering there is any difference in cd seeking between debugging station and the black cd-rom.

I didn't use CdSearchFile() to open file during play, but I did use it to open all the files at the beginning and record the start location and then use these location data to direct my cd seeks. Could this be a problem? If so, how can I predict (or hard code) the starting position of all the files?

Simon ReadySoft Inc.

---

10/27/95 10:55 AM

Playing CD-DA on Playstation

Mark A. Fong

CD

I can burn a bootable CD with DA and it will boot and play fine on the development system's CD-ROM drive. But when I run the disk on a Debugging Station it seems like it can't "find" the DA track to play. The disk spins but the head just moves up and down the disk like its seeking

but not finding. Why is there a difference between the dev system's CD drive and the Playstation's?  
Thanks, Mark A. Fong

---

10/27/95 8:53 PM  
Fonts  
Dave Elton  
CD

I am trying to find some decent fonts for the text in my game. The default one looks too small when I set my screen to 512x240 mode. Is there anybody there know where I can find other fonts?  
Simon ReadySoft Inc.

---

10/27/95 11:55 AM  
Re: Playing CD-DA on Playstation  
Thomas Boyd  
CD  
Mark A. Fong

1) Are you using CdSearchFile and an older version of the library? This can cause probs. 2) Your CD may be cruddy enough to fail on the debugs weaker-than-usual CD drive. 3) You may have left pollhosts in. 4) You may not have linked with 2mbyte.obj -----

----- I can burn a bootable CD with DA and it will boot and play fine on the development system's CD-ROM drive. But when I run the disk on a Debugging Station it seems like it can't "find" the DA track to play. The disk spins but the head just moves up and down the disk like its seeking but not finding. Why is there a difference between the dev system's CD drive and the Playstation's?  
Thanks, Mark A. Fong

---

10/30/95 2:48 PM  
Re: Fonts  
R.Brett Butler  
CD

try using the Kanji typeface there seems to be plenty of support for it :) hehehhehe

---

10/30/95 10:38 AM  
Re: Difference between debugging station and black cd rom  
Thomas Boyd  
Dave Elton  
CD

>I cut a CD and found the audio used to play well on black cd-rom >now loops when I do cd seeks. >I am wondering there is any >difference in cd seeking between debugging station and the black cd-rom.

They are different drives, so there exist some differences in seek time, etc...

>I didn't use CdSearchFile() to open file during play, but I did use it to open >all the files at the beginning and record the start location and then use >these location data to direct my cd seeks. Could this be a problem?

Maybe. Maybe you could FntPrint the locs out to the screen and see if they are right.  
>If so, how can I predict (or hard code) the starting position of all the files?  
This is the best thing to do. Just set up a structure for all of your file positions, compile (even though you have the wrong positions), do a fake layout in CdGEN (you dont need to be hooked up to the burner to do this), and then find out where all of the files will land. (see the CD FAQ for more details).  
Tom

---

10/31/95 2:56 PM  
Errors on CdGetTOC() on PSX  
Mark A. Fong  
Thomas Boyd  
CD

One would think that, but you are not the first to be burned by <3.1 CdSearchFile. It hangs the game all the way when it goes bad. I think your code is hanging IN CdSearchFile, not the player. If you wanna test my theory to see, put a FntPrint or a screen color change after CdSearchFile to see if it ever gets there. -----  
-----

-----  
Actually, it was CdGetTOC(). On the dev system it returned the correct position info, but on the PSX it gave really bad info. On my dev system, it put the first Audio track at 1min, 25 sec, but on the PSX it said it was at 49min, 69 sec. So my program was seeking to the wrong place and never finding it so the music never played.  
Oh, also I am using 3.2. But do you know of any reason why CdGetTOC() would fail only on the PSX?  
Thanks, Mark A Fong

---

11/1/95 2:49 PM  
LoadExec() problems  
Mark A. Fong  
CD  
Angus

I'm trying to use LoadExec() but nothing seems to work. The call I've been using looks like this:  
LoadExec("cdrom:\\BALLS.EXE;1", 0x801FFFF0, 0);  
But all it does is hang. I've also tried LoadTest("cdrom:\\BALLS.EXE;1", &e); but this too hangs. When I didn't use the prefix "cdrom:" LoadTest() didn't hang, it just returned 0.  
I'm using Library 3.2. What am I doing wrong?  
Thanks,  
Mark A Fong

---

11/2/95 12:36 PM  
Re: LoadExec() problems  
Thomas Boyd  
Mark A. Fong  
CD

I am doing the exact same thing, and will have a decent answer later today. Tom

---



11/2/95 4:46 PM

how to use Exec() - the menu example working

Thomas Boyd

OS

Mark A. Fong

EXECMENU.ZIP 31K

CD Creation

Hi menu fans,

Here is the menu example in fine working order (attached). I took out anim, because I did not want to upload the movie. If you check out GOMENU.BAT and fix your path, you are set.

Seems the mysterious RET2.OBJ and BOOT.OBJ were missing.

Any questions? EMail me.

Tom

---

11/4/95 11:01 AM

Re(2): Difference between debugging station and black cd rom

Dave Elton

CD

I try to hard code all the start location of my files and seek to each file, still there is problem for the audio. Th weird thing is half of the time it appears OK and half of the time, the interrupt of SPU seems screwed up. But the same CD runs prfect each time from the black CD-Rom. Is it possible the SPU sampling rate is different in the blue debugging station and the black CD(or development system)?

I notice that there's a serial I/O and parallel I/O port behind the debugging station and I remember read from somewhere you can debug from debugging station, it this possible ? If so, how?

Thanks!

Simon ReadySoft Inc.

---

11/6/95 9:11 AM

Re(3): Difference between debugging station and black cd rom

Thomas Boyd

Dave Elton

CD

Are you using SsStart? (If you are playing the SPU on top of streaming movies, you must use SsStart2 instead if you are using SsTickMode60).

The SPU is the same on both systems.

Serial I/O is for link-cable. Parallel I/O is for forthcoming debugging hardware (late next quarter maybe). It is proprietary, and cannot be used by developers yet.

Tom ----- I try to hard code all the start location of my files and seek to each file, still there is problem for the audio. Th weird thing is half of the time it appears OK and half of the time, the interrupt of SPU seems screwed up. But the same CD runs prfect each time from the black CD-Rom. Is it possible the SPU sampling rate is different in the blue debugging station and the black CD(or development system)?

I notice that there's a serial I/O and parallel I/O port behind the debugging station and I remember read from somewhere you can debug from debugging station, it this possible ? If so, how?

Thanks!

Simon ReadySoft Inc.

---

11/6/95 4:14 PM

Re(4): Difference between debugging station and black cd rom

Dave Elton

CD

>Are you using SsStart? (If you are playing the SPU on top of streaming movies, you must use SsStart2 instead if you are >using SsTickMode60).

>The SPU is the same on both systems.

>Serial I/O is for link-cable. >Parallel I/O is for forthcoming debugging hardware (late next quarter maybe). It is proprietary, and cannot be used by >developers yet.

> Tom

I am playing audio by setting up interrupt for 2 identical audio buffers and keep swapping the buffer and feeding audio data into these buffers (by DMA). I didn'y use SsStart although I am not sure whether libsnd functions will use this function. The weird thing is it looks like in debugging station, SPU consumes audio data a little faster than the development system (the black CD-ROM) , so when the data DMA to the SPU and catches up the data played by SPU at the interrupt address, it triggerred the interrupt and swap the buffer at wrong time (the interrupt is supposed to be only triggerred by audio playing instead of by data DMAed from memory to SPU, but we know either input or output to/from SPU could trigger the interrupt at the preset interrupt address). Do we know exactly how many bytes ADPCM data will be consumed by SPU? I know VAG data is compressed audio and SPU is sampling at 44.1 kHz, but I want to find out the precise amount of audio data SPU consumes so I can control the timing of the audio interrupt. Any suggestions? Thanks!

Simon ReadySoft Inc.

---

11/6/95 5:14 PM

installing CDGEN

David W. Marshall

CD

Tom Boyd

I just downloaded the newest (I think) CDGEN software from the RELEASES folder. Now of course, the RELEASES folder seems to have a different CDGEN.ZIP file than the one located in this folder. I'm assuming that the one in the RELEASES folder is newer. Why is there a different version of CDGEN in this folder?

Anyway, I unzipped and tried to install the CDGEN software from windows. I got the old "unable to open ..\DISK1\... message" I thought this problem had been fixed.

How do you install the CDGEN software? Do I have the right version?

dave

---

11/7/95 5:06 PM

Re: CDMON and SelEMU

Thomas Boyd

CD

David W. Marshall

>1)Does CDMON work? Does it work from a full DOS window under Windows? >I can run the RCube demo, but if I load CDMON and then try the RCube demo, the demo never runs.

Yes, but only with CDBOOT2X.BIN where X is the rev you have (I recommend 7 today).

>2)How do you turn off SelEmu? Is there a SelPC I can load?

c:\>run selcd.cpe  
>3)How do you reset the CD Emulator?  
resetps 1 run snpatch run selemu  
>If I run the RCube demo and then try and run it again, I always get the "cannot connect to target" message. >If I power cycle the hard drive or run CDDISK, the message goes away. >Is the RCube demo leaving the CD in a bad state?  
The above strategy should work.  
>Once the RCube demo is ended, the green access light still blinks.  
This is good.  
>Running CDDISK causes the blinking to stop.  
This is OK

---

11/7/95 10:37 PM  
Re: installing CDGEN  
John Phua  
David W. Marshall  
CD

Hi David,  
Both are the same. We need to fix some of the folders in the conferences so that they point to the same item. The problem with the "unable..." still exist when the file is downloaded from the BBS. If CDGEN is installed from the released disk then you would not get the error. We provided on line to as additional method of distribution. Thanks for the info.  
Yes you have right version.  
John

~~~~~  
I just downloaded the newest (I think) CDGEN software from the RELEASES folder. Now of course, the RELEASES folder seems to have a different CDGEN.ZIP file than the one located in this folder. I'm assuming that the one in the RELEASES folder is newer. Why is there a different version of CDGEN in this folder?  
Anyway, I unzipped and tried to install the CDGEN software from windows. I got the old "unable to open ..\DISK1\... message" I thought this problem had been fixed.  
How do you install the CDGEN software? Do I have the right version?  
dave

---

11/7/95 5:36 PM  
Re(2): CDMON and SeLEMU  
David W. Marshall  
Thomas Boyd  
CD

So running selCD will allow me to work from the PC like the Emulator is not even there?  
I have CDBOOT28. When I run CDMON it says it is version 1.00. Some of the docs said that CDMON did not run under windows and a windows version was coming. Why would running CDMON cause the RCube demo to fail?  
I do the steps you suggest to try and reset the Emulator and nothing works. Resetps 1 takes about 8 seconds to return. Snpatch will usually load. Selemu never loads. I have the timeout set to /w30 for RUN. So I still have the basic problem that I can't run the RCube demo twice without using CDDISK on the Emulator in between to "reset the state" of the emulator.  
dave

---

11/7/95 3:58 PM

CDMON and SelEMU  
David W. Marshall  
CD

I'm just starting to do cdrom emulation, so hopefully someone can answer the following:  
1)Does CDMON work? Does it work from a full DOS window under Windows? I can run the RCube demo, but if I load CDMON and then try the RCube demo, the demo never runs.  
2)How do you turn off SelEmu? Is there a SelPC I can load? I can't seem to get rid on SelEmu once it has been loaded into the dev boards. I have to do a cold boot if I want to go back to running code off of the PC. Is this the only way to turn off SelEmu?  
3)How do you reset the CD Emulator? If I run the RCube demo and then try and run it again, I always get the "cannot connect to target" message. If I power cycle the hard drive or run CDDISK, the message goes away. Is the RCube demo leaving the CD in a bad state? Once the RCube demo is ended, the green access light still blinks. Running CDDISK causes the blinking to stop.  
thanks,  
dave

---

11/8/95 9:13 AM  
Re(3): CDMON and SelEMU  
Thomas Boyd  
David W. Marshall  
CD

>So running selCD will allow me to work from the PC like the Emulator is not even there?  
Selcd/selemu toggles between the external (black) CDROM (DTL-H2010) and the emulator for CD reading functions. To read from the PC hard drive, you must use PCRead, etc...  
>I have CDBOOT28. When I run CDMON it says it is version 1.00. >Some of the docs said that CDMON did not run under windows and a windows version was coming. >Why would running CDMON cause the RCube demo to fail?  
>I do the steps you suggest to try and reset the Emulator and nothing works. >Resets 1 takes about 8 seconds to return.  
uh uh. That is usually too long.  
>Snpatch will usually load. >Selemu never loads.  
If snpatch loads, but selemu loads, something is messed up. Is this that same emulator Monty was trying to install a few months ago? There is one of five things wrong (in exponentially decreasing order of probability). 1) your configuration is incorrect (interrupt conflict, SCSI addresses wrong, DMA conflict) 2) the emu card is bad 3) the DTL-H2000 cards are subtly bad 4) your emu drive is bad 5) your PC is bad Can you send the emu card to me to test?  
Tom

---

11/8/95 7:39 PM  
Re(2): Updates to CD Emulator  
John Phua  
Thomas Boyd  
Randy X. Thompson  
Hi Randy,

I don't know if you got the cover letter with the content list of what was sent, but there was a note indicating that the CD Emulator is a separate product therefore it is not part of the Programmer Tools CD. If you had purchased a CD emulator you should have received the disks with the software when the tool was actually ordered. If not you may download it from the BBS. Most likely there has been an update since the original disks.

Thanks, John

---

11/8/95 1:35 PM  
Updates to CD Emulator  
Randy X. Thompson  
CD

I recently received the Programmer Tools and Graphics Artist Tools CDs along with the printed documentation. The PSX directory found on the Programmer Tools CD has an empty CDEMU subdirectory that is commented in the README file as a "holding place for CD Emulator software." This is fine, but was I supposed to receive a CD Emulator CD (did you create such a thing?) so that I can copy latest emulator files into that directory? Or am I supposed to copy the files from my old PSX\CDEMU directory?  
-Randy

---

11/8/95 1:42 PM  
Re: Updates to CD Emulator  
Thomas Boyd  
Randy X. Thompson  
CD  
Randy

The emulator stuff is so small that you can dnload it from this BBS. There is no emulator CD yet. I do not know if there is a release plan for it.  
Tom ----- I recently received the Programmer Tools and Graphics Artist Tools CDs along with the printed documentation. The PSX directory found on the Programmer Tools CD has an empty CDEMU subdirectory that is commented in the README file as a "holding place for CD Emulator software." This is fine, but was I supposed to receive a CD Emulator CD (did you create such a thing?) so that I can copy latest emulator files into that directory? Or am I supposed to copy the files from my old PSX\CDEMU directory?  
-Randy

---

11/9/95 1:57 PM  
Need help installing CDEMU  
Colin Lewis  
CD

After looking through other messages and the archives, I see that I am not the only one having trouble installing a CD emulator board.  
Here's my story:  
I have a new Pentium 90 running Win 95. I am able to run the Balls demo on the dev boards. When I install the CD emulator card and the development board, I can still run the balls demo. I can run CDDISK and BUILDCD and get files onto the emulation hard disk. I run into trouble when I try to run SELEMU. After running SELEMU, the next RESETPS 1 takes about 10 seconds to run rather than the normal two seconds. Any subsequent attempts to RUN anything fail.  
To review, this is what I am trying to do:  
RESETPS 1 (works Ok) (pause) RUN \...\SNPATCH (Ok.) (pause) RUN \..\SELEMU (Ok.) (pause) RUN <anything> (Cannot connect to target.)  
I have tried swapping the dev boards and the CD emulator with a good system, The hardware

works fine in the other system.

I have checked all the cables. I have tried DMA 5-7 for the CDEMU board. I have confirmed (thru Win95 device manager) that no other device is using the same IRQ's as the boards.

Help!

-Colin Lewis

---

11/9/95 4:47 PM

Re: CD Emulator problem

Thomas Boyd

Pat Quinn

CD

SNPATCH.CPE 242K

CD Creation

The programmer's CD contains a special file called SNPATCHW.CPE. This should really be called SELFDESTRUCT.CPE. Use the new one from the BBS Alternatively, use the attached file that ALWAYS works for me (It may be out of date, but who cares?).

Tom

---

11/9/95 2:14 PM

Re: Need help installing CDEMU

Thomas Boyd

CD

Colin Lewis

>RESETPS 1 (works Ok) >(pause) >RUN \...\SNPATCH (Ok.) >(pause) >RUN \..\SELEMU (Ok.) >(pause) >RUN <anything> (Cannot connect to target.)

This is all correct

>I have tried swapping the dev boards and the CD emulator with a good system, >The hardware works fine in the other system.

You are telling me that all the hardware works in another PC. So there is a configuration problem or a physical problem in the setup with your PC. Are your ISA slots overheating? The addition of one board can do this. The dev boards are toasty. (I know two developers at least who have fans aimed at their system). You might want to try different IRQs anyways. - Do not trust Microsoft to find the right IRQs. What is the SCSI ID of your emu HD? (Use 3,4, or 5) Leave the SCSI ID of the board at 7. If you have a working soundblaster card, take it out and use that IRQ and DMA, since you will then know they are available. When none of this works, let me know.

>I have checked all the cables. >I have tried DMA 5-7 for the CDEMU board. >I have confirmed (thru Win95 device manager) that no other device is using >the same IRQ's as the boards.

---

11/9/95 4:12 PM

CD Emulator problem

Pat Quinn

CD

Hello gurus and fellow confused souls...

A few weeks ago I had successfully managed to get CD I/O working with the CD Emulator,

and I celebrated by installing Windows '95 and the new Programmer's Tools CD 1.5 (with rev.1.5.2 updates) on my machine. Since then, I have not been able to get the CD Emulator to work. I am not blaming my problems on Windows '95 or the Programmer's Tools CD, per se. It's just that my life has not been the same since those installs...

I shouldn't have tried making both installations at the same time, I realize, without fully exercising the PSX and CD Emulator between. Be that as it may, I have tried reinstalling old DOS and old PSX development directories and I'm still stumped.

The basic problem is, I believe, with the selemu.cpe utility. After using it, I always get "Cannot connect to target" whenever I try to download anything with run.exe, whether or not it is related to the CD Emulator. I have to completely power down my PC to reset the PSX in order to download again. If I use selcd.cpe instead -- even though I don't have the test CD drive set up -- I have no problems with run.exe.

Here's the sequence of events: I start out as prescribed in /cdemu/readme.txt and elsewhere  
resets 1 delay 5 run \psx\bin\snpatchw delay 5 run \psx\bin\selemu delay 5  
Up to this point, all seems well, with run responses like "Target 0 is R3000," etc. Then I follow with some command that "hits" the PSX, either resets 1 or run \psx\bin\snpatchw  
Again, everything seems ok. But after this last command, every attempt to use run.exe fails  
run \psx\bin\anything

It is as if the instructions in selemu downloaded to the PSX say, "Take one more command but then NO MORE!!!"

I have checked the settings on the CD Emulator board (in fact, we swapped for a completely new board). The hard drive we use is ok because cddisk works ok. I can't think of anything else.

I need real help here! And please, don't sum it all up with a simple "You can't use Windows '95." That is not an option...

Ok, here's the versions. All but the last came from the Programmer's Tools CD release 1.5:

dexbios.com v1.22 cdbios.com v1.03 resets.exe v1.03 run.exe v2.30

selemu.cpe v??? snpatchw.cpe v??? but I think I got the latest with the 1.5.2 update...

David Crain NuFX, Inc.

---

11/9/95 5:25 PM  
problem after selemu  
Mark D. Hirsch  
CD

Dear sir,

I am having a lot of problem to reset the programming board after "run selemu". The error message I got was "cannot connect to target".

I can reset the boards without problem until I run selemu. Any suggestion?

Thanks in advance.

---

11/10/95 12:13 PM  
Re: Everybody having SELEMU problems: read  
Angus  
Thomas Boyd  
CD

I tried it with cdboot17.bin and it worked fine. cdboot18.bin is bad it looks like.

angus

---

11/10/95 8:57 AM

Everybody having SELEMU problems: read

Thomas Boyd

CD

Mark D. Hirsch

GOODEMU.ZIP 348K

CD Creation

This problem is running rampant. I think it might be a tool upgrade that does not work (because it is happening to old and new boards alike). If you guys could help me out on this one, it would be great. I have tried to make this happen on my system with multiple tool combos, but it keeps on ticking.

First. DO NOT use the SNPATCHW.CPE or PATCHW.CPE on your dev CD. It is broken. Use the ones on the BBS.

Second, tell me the versions of the following you are using (if versions are not available, gimme the date and size):

CDBOOT CDBIOS BUILDCD SNPATCH / PATCHX / PATCHW / Whatever patch you use (date and size) SELEMU SELCD CDDISK

Third, tell me if you are in DOS, Windows, Win95, or some other operating system.

Fourth (extra credit), I have attached all the versions of the software that I am using that caused no trouble. You might try them and let me know if it still is busted.

Thanks,

Tom

----- Dear sir,

I am having a lot of problem to reset the programming board after "run selemu". The error message I got was "cannot connect to target".

I can reset the boards without problem until I run selemu. Any suggestion?

Thanks in advance.

---

11/10/95 1:12 PM

Re: Everybody having SELEMU problems: read

Mark D. Hirsch

Thomas Boyd

CD

Dear Thomas:

We are using all of the files from the latest Sony dev CD DTL-S2002 release 1.5, then we copied over all of the new files that you attached in this mail.

When we do so, our problem of "cannot connect to target" after running selemu goes away, however we still cannot view data on the partition after we build to it (we can see it building.) or run a program from it. The error says that the data is in an invalid form. It is not giving other errors like we had before that were DMA related (invalid sectors, etc..)

We are using CDBOOT 17, and SNPATCH (no W)...

- Mark

---

11/10/95 10:25 AM

Re: Everybody having SELEMU problems: read

David W. Marshall

Thomas Boyd

CD

Using your SNPATCH.CPE file I have been able to:

1)Run the RCube demo multiple times. 2)Run the RCube Demo and then do RUN MAIN on a



main.cpe the lives on my PC harddrive. That main program will boot, run, and do reads from the PC harddrive.

PROBLEMS: 1)CDMON will only work for me in DOS. If I try and run it from a full DOS window in Windows, it completely freezes my system and I have to do a power cycle reboot. 2)I run the RCube Demo, Run a Main.cpe from my harddrive, TURN OFF the Micropolis harddrive, try and run the MAIN.cpe from my harddrive again. I get "cannot connect to target" messages. The SELEMU is still in the dev boards trying to talk to the SCSI drive to boot from it. I would really like a SELRESET.CPE that would place the boards back to their power-on default state, so that RUN MAIN.CPE from my harddrive would work.

dave

---

11/13/95 11:24 AM

Pausing the CD during CD-DA play

David W. Marshall

CD

if CdControl(CdlPause,0,0) is used to pause the CD during CD-DA (redbook) playing of a track, how long will the head stay in "paused" mode? Will it eventually go from paused to stopped?

The emulator seems to stay in paused mode forever; or it is not emulating the spin up time for the CD when a CD has stopped.

thanks,

dave

---

11/13/95 3:08 PM

Result Array in CD Status Code

David W. Marshall

Tom Boyd

CD

The following code is from ...\\movie\\cddtuto\\tuto4.c, the CD-DA repeat test code.

```
/*-----*/
-----*/ static void cbready(long intr, u_char* Result)
/*routine is the sector callback function for playing redbook cdda data. Report Mode has been
turned on, so the kernel fills result array.
Result[0] Status Result[1] Track Result[2] Index Result[3] AMin Result[4] ASec Result[5]
AFrame Result[6] LevelH Result[7] LevelL
INPUT: unsigned char intr; execution status at that point in time unsigned char *Result;
newest return value at that point in time */
{ CdlLOC pos; u_char r0,r1,r2,r3,r4,r5,r6,r7;
if (intr == CDLDATAREADY) { r0 = Result[0]; r1 = Result[1]; r2 = Result[2]; r3 = Result[3];
r4 = Result[4]; r5 = Result[5]; r6 = Result[6]; r7 = Result[7];
if ((Result[4]&0x80) == 0) { pos.minute = Result[3]; pos.second = Result[4]; pos.sector =
0; CurPos = CdPosToInt(&pos); } if (CurPos > EndPos || CurPos < StartPos) {
cdplay(CDLPLAY); } } else { printf("cdRepeat: error:%s\n", CdIntstr(intr));
cdplay(CDLPLAY); } }
```

What is the following code trying to test for????????????? if ((Result[4]&0x80) == 0)

The sketchy docs say the Result[4] is ASEC, which I am assuming is Absolute Seconds. I could find no documentation on the format for ASec. What is the significance of testing the high bit?

dave

---

11/13/95 10:05 PM  
Success at what cost?  
Colin Lewis  
CD

OK, I managed to get my CD emulator working. First of all, I had neglected to load a boot file (Oops.)  
Second, I DISABLED the DMA and the IRQ in CDBIOS and left the jumpers off of the board. The question I have is, what do I lose by omitting the DMA and IRQ? I am able to : -transfer files to the CDEMU with BUILDCD -use CDDISK to change partitions, view contents, etc. - run my game. What else could a person want?

---

11/14/95 5:10 PM  
CD questions #1  
David W. Marshall  
CD

Tom Boyd

Here is my first batch of CD questions:

- 1)How often does CdReadyCallBack() get called when playing CD-DA data? Or, how often does the state change from CDLNOINTR for CD-DA data?
- 2)What does CDLMODEAP (autopause on/off) do? Does it work?
- 3)Does CDDisk allow you to look at anything else besides track 1? Is there any way to see CD-DA data with CDDisk?
- 4)Are there any docs or readme files for UpdateCD.exe?
- 5)Calls to CdControl() need a Result[8] for the return info. The callbacks just have a char\* as an argument. I am assuming that the CD library has its own space reserved that the callback is pointing at. Why doesn't CdControl() use this same area? Why must I provide a buffer for this call?
- 6)What does Sony recommend for using CdlStandby() vs. CdlStop()? Are the drives good enough to continue spinning for long periods of time?
- 7)Is there a way to stop a single callback and leave others active? StopCallback() seems to stop all callbacks.
- 8)What states stop the callback assigned to CdReadyCallBack() from being called? Are paused, standby, and stopped guaranteed not to call this callback?
- 9)Is there a known bug in CDGEN for trying to add files from a network drive? In DIRECTORY/EDIT/INSERT/ when you try and pick a file from the C: drive, you get a [...] option and can walk thru directories. When you try and open a directory on a network drive, CDGEN automatically adds every file in that directory. There is also no [...] option when looking at a network drive.
- 10)Is it still true that CDGEN will never be updated or fixed? A posting on the BBS said that the Japan programmers that wrote the tool are gone. It also implied that SCE will never put another programmer on this tool.

If these answers can be found in some manual, please list title and page of manual because I couldn't find this info anywhere.

thanks,  
dave

---

11/14/95 3:30 PM  
Re: Success at what cost?  
Thomas Boyd

CD

Colin Lewis

I bet you will have a slowdown with printf's and difficulty debugging. I must admit, I have not tried disabling DMA and IRQ. I will ask SN Systems what fate awaits you.

Tom

---

11/15/95 9:31 AM

Re(2): Success at what cost?

Thomas Boyd

CD

Colin Lewis

Here's the cost: ----- >What happens if DMA and IRQ is not installed at all with the emulator? >What are they used for? ----- DMA is used to transfer data between the PC and the SCSI device. Apparently no speed up is achieved by using it, so any problems then don't specify a DMA channel and let the PC do all the work.

IRQ (interrupt #) is only used by versions of CDBoot that send back information to the PC, currently CDBoot versions 2.5,2.6,2.7 & 2.8.

So in normal emulator usage (CDBoot v1.x), DMA & IRQ are not required.

Therefore, the only luxuries he is missing out on is the ability to use CDMon to monitor CD Q-code data and PSX CD commands sent to the emulator.

---

11/15/95 1:59 PM

Re: Result Array in CD Status Code

David W. Marshall

David W. Marshall

Tom Boyd

>>The following code is from ... \movie\cdtuto\tuto4.c, the CD-DA repeat test code. >> if ((Result[4]&0x80) == 0) >> { >> pos.minute = Result[3]; >> pos.second = Result[4]; >> pos.sector = 0; >> CurPos = CdPosToInt(&pos); >> } >>What is the following code trying to test for? >> if ((Result[4]&0x80) == 0)

Upon further testing, it appears that when the high bit in Result[4] is set, the data in Result is invalid or bad. When the high bit is off, the data in Result appears to be correct. Am I correct? I could not find this documented anywhere.

dave

---

11/16/95 7:11 AM

Continuing CD emulator problems

Pat Quinn

Thomas Boyd

CD

Tom

I have taken the files you included in GOODEMU.ZIP and used them, with only negligible improvement -- I no longer get the "Cannot connect to target" message. This is definitely a result of using the old snpatch in place of snpatchw. Note: snpatchw 1.5.2 works fine for NON-cd emulator stuff...

I have had success with the cd-emulator sanity check until I try to run it a second time. In order to get those balls up there again I need to:

1) power off & on my PC 2) reinit the emulation hard drive with cddisk -n, and then rebuild

the image using buildcd cdexec. 3) run resetps, snpatch, selemu and  
This problem, of course, is not limited just to the cd-emulator sanity check.  
We're really kind of stuck here so any more help would be appreciated.  
David Crain NuFX, Inc.

---

11/16/95 8:53 AM

Re: Continuing CD emulator problems

Thomas Boyd

Pat Quinn

CD

Here's one last idea on the emulator. According to my last post from SN Systems, you do not need DMA, so remove that jumper and don't set it up in CDBIOS. Additionally, install CDBOOT17.BIN (not 27) and remove the IRQ jumper (and do not set it up in CDBIOS). Now try, making sure to use the following sequence to reset:

RESETPS 1 RUN SNPATCH RUN SELEMU (only needed the first time) RUN CDEXEC

If it still doesn't work, I think it will be time to send it back.

Tom -----

Tom

I have taken the files you included in GOODEMU.ZIP and used them, with only negligible improvement -- I no longer get the "Cannot connect to target" message. This is definitely a result of using the old snpatch in place of snpatchw. Note: snpatchw 1.5.2 works fine for NON-cd emulator stuff...

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1) power off & on my PC 2) reinit the emulation hard drive with cddisk -n, and then rebuild the image using buildcd cdexec. 3) run resetps, snpatch, selemu and

This problem, of course, is not limited just to the cd-emulator sanity check.

We're really kind of stuck here so any more help would be appreciated.

David Crain NuFX, Inc.

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11/16/95 2:03 PM

Re: Continuing CD emulator problems

Roy Eltham

CD

I have just started using the CD emulator setup this week, and have been successful most of the time.

At first I had the problem of 'only working the first time from power up', but I found that if I used the 'selcd.cpe' program I could make things work more often than not.

What I do is this:

resetps 1 pause run selcd pause resetps 1 pause run snpatch pause run selemu pause run cdexec

I found the the pause time between running selemu and running cdexec needs to be long enough, but not too long. I other words if I wait too long after running selemu the running cdexec fails to work and I have to start over. However, you must wait a couple seconds between running them.

I also found the it's best to run selcd prior to running buildcd to put your image on the emulator drive. I found that if I didn't run selcd first that buildcd would put invalid info on the emulator drive. The result would be that cdexec would fail, and if I ran my own code (as a cpe) that tried to read the CD it would get diskerrors from the emulator.

Roy

p.s. This helps, I hope. (avoiding law suit ;)

---

11/16/95 11:29 AM  
BAD MASTER CD LOT #  
Dan Burnash  
CD

DO NOT use MASTER CDs from lot # AH5B1 Return them (call your AE for details).  
Tom (using Dan's acct)

---

11/17/95 9:18 AM  
Re(2): Continuing CD emulator problems  
Thomas Boyd  
CD  
Roy Eltham

Your setup is being unusually persnickety. You should be able to run buildcd any time without problem. You should not have problems waiting too long to exec. And it should work every time you do the following: resetps 1 (version 1.03) run snpatch (not the one on the development CD) pause (short) run selemu pause (short) run cdexec 0 I think something is broken or configured wrong. Try this (If you have not already):

1) take off the DMA jumper and take the /d# option out of your CDBIOS command line. 2) Install CDBOOT17.BIN (not 27) 3) take off the IRQ jumper and remove the /i## option from your CDBIOS command line

If it is still cranky

1) swap dev boards with another set (if you have more than one over there) - test 2) if still cranky, swap emulator card with another one (if you have more than one over there) - test 3) Swap emulator hard drive with another one - test

If it is still cranky, try it in a different computer. If you do not have extra boards and stuff, let me know.

Tom

-----  
What I do is this:

resetps 1 pause run selcd pause resetps 1 pause run snpatch pause run selemu pause run cdexec I found the the pause time between running selemu and running cdexec needs to be long enough, but not too long. I other words if I wait too long after running selemu the running cdexec fails to work and I have to start over. However, you must wait a couple seconds between running them.

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Roy

p.s. This helps, I hope. (avoiding law suit ;)

---

11/20/95 9:02 AM  
CCS from BUILDCD fix  
Thomas Boyd  
CD

Markus Breyer

OK, You really have to read this. I thought it was a joke at first, but it's not (amusing as it is). I will upload the new version ASAP. Tom ----- Paul,

>It has come to my attention that a .CCS file created with BUILDCD is correct >except for the header. If I replace the header of the .CCS file created with >BUILDCD with the header of any .CCS file created by CDGEN, it works. If I do >not, the burned CD works on a development station, but not on a debug station.

Tom ----- We have found similar things and I am told that this is due to what we have coined the "Tokyo only bug". This is that if you have a greenwich offset of anything other than 36 (Japan) then the CCS file may not work (but not in all cases!). This situation specifically applies to the creation date. Since I don't believe that anyone really uses these date features I would suggest that you get everyone to put a "GreenwichOffset 36" statement at the top of their cti files.

In the immediate future we could put out a new version of BuildCD & BCDflat that will force all PSX discs to have an offset of 36 for the creation date. If you would like this then please e-mail. Rgrds,  
Paul.

---

11/21/95 3:51 PM

Time counters during cd access

David W. Marshall

CD

What interrupts and timers are valid while CD access is taking place?

I was trying to use:

```
VSync(0); /*reset vsync counter*/ StartHLine = GetRCnt(RCntCNT1); if ( (FileSize = SysCDLoadFileByName(FILENAME,Buffer)) <= 0) { printf("\nError on CD Access = %d",FileSize); exit(1); }
```

```
StopHLine = GetRCnt(RCntCNT1) -StartHLine; /*Compute # of H-Scan lines used for processing */ Time = VSync(0);
```

to time how long it took to read a 1 meg file from the CD using CDSearchFile() and CDRead().

I was getting values like 61785 from VSync(0). And a H-Scan line count of 5317 or .20 seconds. So I am assuming that the CD access screws up the counters in the kernel. Is this true and are there any ways to time a CD read?

dave

---

11/21/95 12:35 PM

CdlSetLoc vs. CDlSeekL

David W. Marshall

CD

The docs aren't real clear about when you would want to do a CdlSetLoc and then a CdlRead vs doing a CdlSeekL and then a CDlRead.

Can CdlSeekL be used with the higher level CdRead() command?

I assume that the table on pg 46 of the Overview manual is incorrect since it doesn't list CdlSeekL as a command that needs arguments.

thanks,

dave

---

11/27/95 4:43 PM

Re: CdISetLoc vs. CDISseekL

Rob Vawter

CD

David W. Marshall

>>The docs aren't real clear about when you would want to do a CdISetLoc and then a CdIRead vs doing a CdIseekL and then a CDIRead.

They are interchangeable. As you know, CdIsetloc blocks and the head doesn't move, and CdIseekL repositions the head and pauses and doesn't block.

>>Can CdIseekL be used with the higher level CdRead() command?

Yes. I substituted the following lines of code in psx\sample\cd\tuto\tuto8 and got CdIseekL to work with CdRead: read\_test("\\PSX\\SAMPLE\\DATA\\MOV.STR;1"); /\* changed line 32 from read\_test("\\DATA\\MOV.STR;1"); so that the directory structure was correct. Tuto8 will NOT run without this change \*/

CdControl(CdIseekL, (u\_char \*)&fp.pos, 0); /\* Changed lines 101, 188, 200, 207 by replacing CdISetLoc with CdIseekL \*/

FntPrint("Use DTL-S2002 DISC FOR THIS TEST\n\n"); /\* Changed lines 108 and 139 to reflect the correct designated number of the PlayStation Programmer Tools disk - not critical \*/

CdReadCallback((void \*) cbread); /\*changed line 187 from CdReadCallback(cbread); Critical - Tuto8 will not compile without this change\*/

>>I assume that the table on pg 46 of the Overview manual is incorrect since it doesn't list CdIseekL as a command that needs arguments.

Correct.

---

11/27/95 6:43 PM

Using StSetStream

Borden Covell II

CD

I am trying to use the streaming library and would like to understand the correct usage of the callbacks that are available in the StSetStream routine. Am I correct in my understanding that the func1 callback is called when a new frame is available and that it can then call StGetNext to get the address of the data? Also, what is the correct value to return when the callback is done? The prototype for the StSetStream routine indicates that the func1 and func2 routines return int values but what are they?

Has anyone used these callback? Do they work? Any help would be appreciated.

Thanks

---

11/28/95 2:54 PM

CdControl, CdISetMode, CdIModeAP

Rob Vawter

CD

David W. Marshall

CdIModeAP (autopause) can be used as a quick and easy way to detect the end of a track.

When Autopause is set on, the DataReady Callback returns the following flag:

```
#define CdIDataEnd 0x04 /* End of Data Detected */
```

instead of the dataready flag:

```
#define CdIDataReady 0x01 /* Data Ready */
```

Hopefully, Japan will let me know why it is called autopause and whether or not there are any caveats.

---

11/28/95 4:58 PM

Re: CdControl, CdISetMode, CdIModeAP

David W. Marshall

Rob Vawter

CD

I tried this CdIModeAP bit with the CdReadyCallBack() and it did seem to work for knowing when a Redbook track ended. It even worked when trying to access the last redbook track on the disk.

Since this mode isn't really documented anywhere, I will feel much better when Japan says it is okay to use this and there are no hidden bugs.

dave

---

11/28/95 9:10 AM

more CD stuff

Thomas Boyd

CD

David W. Marshall

Goodies from the gods. ----- > 1) What is the difference between CdISetloc, CdISeekL, and CdISeekP? I know > CdISeekL uses the header of the sectors for location where as CdISeekP uses > the absolute sector position. > CdISetloc only set the location to seek, so the head doesn't move. SeekP seeks physically and SeekL seeks logically. > 2) When would you use CdISeekP and when would you use CdISeekL? > We use CdISeekP when the tracks are the CDDA tracks. We use CdISeekL when the tracks are the CDXA or DATA tracks.

> 3) What is the advantage of each one a) CdISeekL b) CdISeekP c) CdISetloc? > CdISeekL is useful for CDXA or DATA tracks because of its precise seek.

CdISeekP is the only way for CDDA tracks, not so precise.

CdISetloc is the position setting function for CdISeekL and CdISeekP.

> 3) What is the difference between CdISetloc and CdISeek\*? > CdISetloc only set the location, the head doesn't move unless CdIReadN or CdIReadS or CdIPlay or CdISeekL or CdISeekP etc. commands are called.

---

11/28/95 9:38 AM

CD Questions #2

David W. Marshall

CD

1) CdIReadN only takes a starting sector. How does it know when to stop? If you are counting down the sectors in software, when you determine that all needed sectors have been read in, what action do you need to take? Does the software need to "turn off" CdIReadN?

2) What is CdRead2() for? Was it created to fix a bug in CdRead()?

3) Does the CD have to be in a certain "mode" for CdIReadN to work correctly? Can you be playing RedBook and just switch modes and ask for a CdIReadN, or do you have to put the head in StandBy or Paused and then request the CdIReadN?

4) A 0 returned from CdControl() means failure. What failed?

5) What does CdIReset do and is it needed?

dave

---



11/29/95 5:20 PM  
Does CdlGetLocL work?  
David W. Marshall  
CD

I was trying to use the following code to look to see if the sector I asked for was the sector I got. I figured if I got the head's current position, it should be close to the sector I asked for. All I ever got from CdlGetLocL was 0 min 2 sec 0 sector. The head was already pre-seeked to the correct location using CDControlB().

Did I screw up something or does this call not work?

```
/*this code is from a blocking read routine, not a callback*/  
while (NumSects--) /*count down number of sectors left to read*/ { if (CdReady(0,0) !=  
CDLDATAREADY) /*wait for a sector to be ready*/ { return CDREADFAIL; }  
CdControl(CDLGETLOCL,0,Result); Pos.minute = Result[0]; /*load the absolute minute of  
the head position*/ Pos.second = Result[1]; /*load the absolute second of the head position*/  
Pos.sector = 0; /*zero out the sector????????????*/ SectorRead = CdPosToInt(&Pos);  
/*convert to sector location*/ PSYQpause(); SectorRead = Result[2];  
/*transfer data here*/  
} /*end while, numsects*/
```

thanks,  
dave

---

11/29/95 11:18 AM  
How to install your emulator II  
Thomas Boyd  
CD

RESETPS.EXE 2K  
CD Creation

THIS IS A CORRECTED POST (I screwed up the attachments the first time - now they are better) Tom ----- This is my troubleshooting guide to installing your emulator. It is in psuedo-spaghetti code.

InstallDevBoards(); // extern Remove your IRQ and DMA jumpers for now. Do not lose them. Check to make sure that the SCSI ID jumpers are set at the factory default of 7. Do not change it. // Pick a base address 10 Select a base address with the base address jumper. Lovingly cram emulator board into an open slot in your PC. Firmly attach white-ish cable between dev boards and emulator. Attach emulator Hard drive to emulator board and turn it on. Edit autoexec.bat to contain CDBIOS /a###, where ### is the base address you selected. Ex: CDBIOS /a388 will use base address 388 - which should match jumper on card. if (Computer does not boot || CDBIOS does not recognize emulator board) goto 10 and select a new base address. If (you try all base addresses and cannot get it to boot or find emu with CDBIOS) try any/all of the following { Press all the chips into their sockets harder. Be sure you are using CDBIOS version 1.02 or later. Maybe your computer is overheating. Check it out. } if (none of the above works) your emulator, dev boards, or computer may be malfunctioning. Call BBS for help. Return(-1).

// communicate with the emulator drive through the PC bus Set the SCSI ID on your harddrive to 3, 4, or 5. The manual says you can choose others. Don't. Run CDDISK -n #, where # is the SCSI ID you have set on your harddrive (above). Ex: CDDISK -n 4 will activate and format the drive with SCSI ID 4 for use. If (CDDISK does not run happily) { Be sure your emulator hard drive is turned on and the cables are connected. If so, goto 10 and select a new base address. If that does not work, call BBS. }

// install boot file While in CDDISK (above section), install the boot file. Use CDBOOT16.BIN or CDBOOT17.BIN (attached), DO NOT try any others yet.

// build an emulation image Detach BASIC.CTI and PSX.EXE from this memo for use in the next step. Run BUILDCD -s#:1 BASIC.CTI, where # is the SCSI address of the emulator hard drive (1 is the first partition). Ex: BUILDCD -s4:1 BASIC.CTI will build an image to partition 1 of SCSI ID 4 hard drive. Ignore warning 66 if it happens. If an error occurs, be sure CDBIOS is installed and your emulator hard drive is turned on with cables attached.

// run the image - communicating through the white-ish cable to the DTL-H2000 boards 20  
RESETPS 1 // verion 1.03 (attached) or later, NOT 1.02. If you use 1.02, you are a loser! It may fail big time. RUN SNPATCH // NOT the version from the CD, Use the most recent from the BBS (or the one attached). This will say "done" if it works, or "cannot connect to target" if it fails. If it "cannot connect to to target" goto 20 If it says "cannot open source file" you need to fix your path to find the file. RUN SELEMU This will say "done" if it works, or "cannot connect to target" if it fails. If it "cannot connect to to target" goto 20 If it says "cannot open source file" you need to fix your path to find the file. RUN CDEXEC This will say "done" if it works, or "cannot connect to target" if it fails. If it "cannot connect to to target" goto 20 If it says "cannot open source file" you need to fix your path to find the file.

If your emulator still will not work: 0) reboot 1) try different emulator boards to see if your board is bad. 2) try different sets of dev boards to see if your dev boards are screwed up. 3) try different hard drives to see if your hard drive is bad 4) try different brand of computer to see if your computer is incompatible 5) leave a message in the CD newsgroup of the BBS detailing your traumatic emulation experience. Be specific.

BONUS STUFF: Now you can advance to the following:  
1) install interrupt jumper, make ammendment to CDBIOS line 2) install CDBOOT18.BIN 3) install CDBOOT2#.BIN, this will pave the way for step 4 4) install CDMON (a TSR that spews info back at you from the emulator). 5) install DMA jumper, make ammendment to CDBIOS line

---

11/30/95 3:28 PM  
Re: Multi disk game  
Thomas Boyd  
CD

Yes, yes and yes. There are already multi-CD games in Japan, and we have several in development. Tom -----  
Is it possible to have a multi CD game? For example could you have half a games levels on CD 1 then have the game ask the player to swap disks when he reaches the second half of the levels. Or could you write a game on one CD then come out with an expansion CD later that has more levels on it?  
Greg C.

---

11/30/95 8:13 AM  
Re(2): CdControl, CdlSetMode, CdlModeAP  
Rob Vawter  
David W. Marshall  
CD

>>I tried this CdlModeAP bit with the CdReadyCallBack() and it did seem to work for knowing when a Redbook track ended. It even >>worked when trying to access the last redbook track on the disk.  
>>Since this mode isn't really documented anywhere, I will feel much better when Japan says it is okay to use this and there are no >>hidden bugs.

Okay, here is the word from Japan:

>>The CdlModeAP means "Auto Pause". >>The end of the track (CdlDataEnd) is reported regardless of the mode. >>But, it is cleared when the next track is played.

>>To detect the end of the track, you must detect the CdlDataEnd by using >>CdReady().

---

11/30/95 6:00 PM

CD Emulator Card

Chris E. Reese

CD

I need help on the Emulator cards! I have two CD emulator boards. On one machine that it is installed on it works fine. I am able to reset and run the sample program over and over without any problem. On the second machine that has an emulator card I am only able to get the demo to work every 10 or 20 times I do a resets and run CDEXEC. The hard drive light will blink and then soon after running CDEXEC go solid and the demo does not run. I have swapped the board from the machine that works and put it in the machine that doesn't work, thinking the CD emulator board is bad. I came up with the same exact results. You name it and I bet I have tried it. I tried everything that has been posted on this conference and have had no luck.

Can anyone help me out here? I really need to get this CD emulator working.

Chris Reese. Eidetic, Inc.

---

11/30/95 12:29 PM

Multi disk game

Greg D. Christensen

CD

Is it possible to have a multi CD game? For example could you have half a games levels on CD 1 then have the game ask the player to swap disks when he reaches the second half of the levels. Or could you write a game on one CD then come out with an expansion CD later that has more levels on it?

Greg C.

---

11/30/95 1:45 PM

Re(3): Does CdlGetLocL work?

David W. Marshall

Thomas Boyd

CD

>>>In your code, you did CdControl(CdlGetLoc,,) without a CdSync() later. this may be a >>>problem.

I put this in and it made no difference. See my second email regarding Head position vs. Laser position, I still think this is what I am encountering. The other strange thing about CdlGetLocL is that my PSX.EXE file starts at sector 23, but CdlGetLocL returns values that CdPosToInt() turns into a sector value of 0.

dave

---

11/30/95 11:57 AM

Re(2): Does CdlGetLocL work?

Thomas Boyd

David W. Marshall  
CD

In your code, you did CdControl(CdlGetLoc,) without a CdSync() later. this may be a problem. I have not had time to verify. I will mess with it and let you know as soon as I find out.

Tom ===== I was trying to use the following code to look to see if the sector I asked for was the sector I got. I figured if I got the head's current position, it should be close to the sector I asked for. All I ever got from CdlGetLocL was 0 min 2 sec 0 sector. The head was already pre-seeked to the correct location using CDControlB().

Did I screw up something or does this call not work?

```
/*this code is from a blocking read routine, not a callback*/
```

```
while (NumSects--) /*count down number of sectors left to read*/ { if (CdReady(0,0) !=  
CDLDATAREADY)/*wait for a sector to be ready*/ { return CDREADFAIL; }  
CdControl(CDLGETLOCL,0,Result); Pos.minute = Result[0];/*load the absolute minute of the  
head position*/ Pos.second = Result[1];/*load the absolute second of the head position*/  
Pos.sector = 0; /*zero out the sector????????????*/ SectorRead = CdPosToInt(&Pos);  
/*convert to sector location*/ PSYQpause(); SectorRead = Result[2];  
/*transfer data here*/  
} /*end while, numsects*/ ===== >>>I was trying to use the
```

```
following code to look to see if the sector I asked for was the >>>sector I got. I figured if I got  
the head's current position, it should be close to the sector I >>>asked for. All I ever got from  
CdlGetLocL was 0 min 2 sec 0 sector.
```

Upon further investigation, it seems that the problem might be with the description of this call in the manual. The manual states "Gets current position of the data sector being read". I thought this meant that you would get back the sector number of the sector waiting in the buffer.

CdlGetLocL seems to only return the physical sector location of the head and not where the laser is actually getting data from. I got sector location values of 23, 98, 173, 248. The value for CdlGetLocL would stay 98 for multiple sector transfers, until it was time to physically move the head.

Does any of this sound correct or wrong?

So I guess I will just have to trust the library when it gives me a sector that it has given me the sector that I actually asked for, since there seems to be no way to get that information.

---

11/30/95 10:41 AM

Re: Does CdlGetLocL work?

David W. Marshall

CD

>>>I was trying to use the following code to look to see if the sector I asked for was the >>>sector I got. I figured if I got the head's current position, it should be close to the sector I >>>asked for. All I ever got from CdlGetLocL was 0 min 2 sec 0 sector.

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Does any of this sound correct or wrong?

So I guess I will just have to trust the library when it gives me a sector that it has given me the

sector that I actually asked for, since there seems to be no way to get that information.  
dave

---

12/1/95 11:47 AM

Re: Crash Bug in CDDISK

Thomas Boyd

CD

David W. Marshall

I reported the bug to SN Systems.

The limit to the number of files in does mess with you on bootup. The ROM looks at SYSTEM.CNF to start your game which will start with the letter S. Your TOC will be in alphabetical order, so if there are too many files in the root directory that start with a letter before S, the boot rom will not find your file and your game will not boot. After that you are fine. -----

CDDISK will crash and reboot my machine if I have more than 32 files in a directory and try to open that directory under the VIEW PARTITION CONTENTS window.

I know that somewhere in the Sony manual, it gives some limit to files in a directory. Still, if you screw up when adding files and add too many, CDDISK shouldn't just crash and cause a reboot.

I am also under the impression that the 30+ file limit to a directory really only applies if you are using CdSearchFile() to access the files on the disk. If you are doing absolute sector addressing to get data, I don't see why it would matter how many files are in a directory. Is this true or am I missing something.

Either way I hope SN Systems can fix this crash bug.

thanks,

dave

---

12/1/95 11:03 AM

Crash Bug in CDDISK

David W. Marshall

CD

CDDISK will crash and reboot my machine if I have more than 32 files in a directory and try to open that directory under the VIEW PARTITION CONTENTS window.

I know that somewhere in the Sony manual, it gives some limit to files in a directory. Still, if you screw up when adding files and add too many, CDDISK shouldn't just crash and cause a reboot.

I am also under the impression that the 30+ file limit to a directory really only applies if you are using CdSearchFile() to access the files on the disk. If you are doing absolute sector addressing to get data, I don't see why it would matter how many files are in a directory. Is this true or am I missing something.

Either way I hope SN Systems can fix this crash bug.

thanks,

dave

---

12/1/95 2:52 PM

Re: CD Emulator Card

Colin Lewis

CD

I have had a similar experience. We determined that the CDEMU card would work with some motherboards and not with others. We were able to round up enough machines that did work. We had problems with a couple Pentium 90 machines. The machines that DO work here have DFI motherboards with a VLSI chipset. My personal guess is that the PC interface of the CD card has a timing flaw that just barely works on some machines and just barely doesn't work on others.

---

12/1/95 9:12 AM  
Re: CD Emulator Card  
Thomas Boyd

CD  
Chris E. Reese  
Sad as it may seem, I think there is a possibility that the emulator is having a conflict with that particular PC. If you followed all of the steps in the doc I posted recently (I saw you had dnloaded it), I cannot think of anything else that is not in that memo. I know you said you tried it all, but please confirm that you have tried the following:  
Swapped development boards in the troublesome PC. Swapped hard drives in the troublesome PC.  
Tom

---

12/1/95 2:36 PM  
Re(2): Result Array in CD Status Code  
David W. Marshall  
David W. Marshall  
Tom Boyd

>>>Upon further testing, it appears that when the high bit in Result[4] is set, the data in Result >>>is invalid or bad. When the high bit is off, the data in Result appears to be correct. >>>Am I correct? I could not find this documented anywhere.

I found the following in a CD document we got from Japan:

Regarding CD-Rom Report Mode ~~~~~  
To: License 1995.02.03 S.C.E  
CD-ROM Report Mode  
The following is the difference between the actual machine and the DTL-H2000  
As CD-Rom subsystem is DA Replay with report mode on, 10 time CDLDataReady occurs. You will obtain the current location, picking up these 10-time CDLDataReady with callback. Then, Result[] field has the following information:  
===== 0 1 2 3 4 5 6  
7 ----- - track index min sec frame levelL levelH -----

sec field's bit 7  
----- DTH-2000 | The absolute time from the  
beginning of the disk. -----+----- 0 the relative time from  
the beginning of the track -----  
Therefore please be cautious using the report mode.

---

So this appears to answer the question as to why bit 7 is being looked at to determine valid timecode data.  
dave

---

12/4/95 10:23 AM  
Re: CD Questions #2  
Thomas Boyd  
CD

David W. Marshall

>1)CDIReadN only takes a starting sector. How does it know when to stop? >If you are counting down the sectors in software, when you determine that >all needed sectors have been read in, what action do you need to take? >Does the software need to "turn off" CDIReadN? You shut it down. For example CdRead() uses CdlReadN. It sets the number of sectors to a global variable, kicks off the async read, then lets CdReadSync handle the countdown. When complete, it calls CdDataSync so you can use the CD for whatever you want to do next.

>2)What is CDRead2() for? Was it created to fix a bug in CDRead()?

CdRead2 supports CdlReadS. Just use CdRead2 all of the time.

>3)Does the CD have to be in a certain "mode" for CDIReadN to work correctly? >Can you be playing RedBook and just switch modes and ask for a CDIReadN, >or do you have to put the head in StandBy or Paused and then request the CDIReadN?

I do not know exactly what you mean, but just try what you want to do and it and see if it works.

>4)A 0 returned from CDControl() means failure. What failed?

CdlDiskError happened. Check result to see what happened.

>5)What does CDReset do and is it needed?

It is the core of CdInit. I do not know when you would want to use it outside of that.

---

12/5/95 8:51 AM  
Win95 & CD-ROM Generator  
Randy X. Thompson  
CD

If I remember correctly, I believe someone stated that the CD-ROM Generator software that comes with the Sony CDW-900E burner does not run under Windows '95. Is this true? If so, is it expected to be fixed (realizing, of course, that Sony does not officially support Win95 as a development environment of the PSX)?

-Randy

---

12/5/95 2:42 PM  
DiskError(23)  
David W. Marshall  
CD

I am using the following code to do a blocking CD read. After the read is done, I try to put the drive in CdlStandby mode. As soon as I issue that command, I get the following printed out in the message window: CdlStandby: DiskError(23) This message prints 4 times and then returns from the CdControl() routine. The 23 bit flags seem to say that it is Reading Data, In StandBy Mode, and an Error has been detected (at least from the flags listed in libcd.h). I looked thru all the docs but couldn't really find anything else to help.

Is there anything wrong with the code below? Anyone know why CdlStandby is complaining?

```
/*THIS CODE BLOCKS AND WAITS HERE UNTIL ALL DATA IS TRANSFERED*/ while
(ArgPtr->NumSects--) /*count down number of sectors left to read*/ { if (CdReady(0,0) !=
CDLDATAREADY)/*wait for a sector to be ready*/ { return CDREADFAIL; }
CdGetSector(ArgPtr->Buffer,SECTORTRANSSIZE);/*transfer 2k sector data to destination
buffer*/ ArgPtr->Buffer += SECTORTRANSSIZE; /*inc buffer pointer to next open space*/ }
/*end while, numsects*/
CdControl(CDLSTANDBY, 0, 0); /*put drive in standby*/ CdSync(0,Result); return
CDREADFINISHED; /*return OK code*/
thanks,
dave
```

---

12/5/95 2:00 PM  
Re: Win95 & CD-ROM Generator  
Rob Vawter  
Randy X. Thompson  
CD

>>If I remember correctly, I believe someone stated that the CD-ROM Generator software that comes with the Sony CDW-900E burner >>does not run under Windows '95. Is this true? If so, is it expected to be fixed (realizing, of course, that Sony does not officially >>support Win95 as a development environment of the PSX)?

Yes, you remember correctly; CDGEN does not function under Windows '95. Sony is working on the problem as we speak. Hopefully, there will be a fix soon. You have probably seen the Windows '95 Statement which lists tools and Windows '95 functionality. To find this post:Conferences\Releases\Product Releases\Help\Windows '95 Statement.

---

12/8/95 8:47 AM  
Re: DiskError(23)  
Thomas Boyd  
David W. Marshall  
CD

I will try it today. Tom

----- I am using the following code to do a blocking CD read. After the read is done, I try to put the drive in CdlStandby mode. As soon as I issue that command, I get the following printed out in the message window: CdlStandby: DiskError(23) This message prints 4 times and then returns from the CdControl() routine. The 23 bit flags seem to say that it is Reading Data, In StandBy Mode, and an Error has been detected (at least from the flags listed in libcd.h). I looked thru all the docs but couldn't really find anything else to help.

Is there anything wrong with the code below? Anyone know why CdlStandby is complaining?

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buffer*/ ArgPtr->Buffer += SECTORTRANSSIZE; /*inc buffer pointer to next open space*/ }
/*end while, numsects*/
CdControl(CDLSTANDBY, 0, 0); /*put drive in standby*/ CdSync(0,Result); return
CDREADFINISHED; /*return OK code*/
thanks,
dave
```

---



12/8/95 5:41 PM

Re: Disk Capacity

Thomas Boyd

CD

Karen Paik

$(71 \text{ min}) * (60 \text{ second/min}) * (150 \text{ kbytes/second}) = 639 \text{ Meg}$  ----- The CD-ROM generator manual says a 74 minute CD can hold about 660 megabytes and a 63 minute CD can hold about 540 megabytes. How much can we put on the 71 minute CDs?

---

12/8/95 11:19 AM

Disk Capacity

Karen Paik

CD

The CD-ROM generator manual says a 74 minute CD can hold about 660 megabytes and a 63 minute CD can hold about 540 megabytes. How much can we put on the 71 minute CDs?

---

12/8/95 8:46 AM

Re: Using StSetStream

Thomas Boyd

CD

Borden Covell II

Borden,

Sorry it is taking me so long to answer this. I am working on it today, but it may take me a while to get to your answer.

Tom ----- I am trying to use the streaming library and would like to understand the correct usage of the callbacks that are available in the StSetStream routine. Am I correct in my understanding that the func1 callback is called when a new frame is available and that it can then call StGetNext to get the address of the data? Also, what is the correct value to return when the callback is done? The prototype for the StSetStream routine indicates that the func1 and func2 routines return int values but what are they?

Has anyone used these callback? Do they work? Any help would be appreciated.

Thanks

---

12/10/95 6:19 PM

CdInit() and \_96\_init() questions

Mike Benna

CD

I'm having a few difficulties initializing access to the CDROM emulator and I'm hoping someone can bring together all the little pieces of information needed to make this work.

1) Must \_96\_remove() be called before \_96\_init()? The documentation doesn't seem to indicate this, yet the examples do. I found that \_sometimes\_ \_96\_init() will hang if \_96\_remove() isn't called first. Can someone clarify?

2) I found that I can call CdInit(0), then \_96\_remove(), then \_96\_init() and initialization seems to occur without problems, however read() then becomes unreliable. 2048 byte reads from 2048 byte boundaries \_sometimes\_ fail. If I comment out the call to CdInit(0) then read() works 100% of the time. What's the problem and how can I solve it?

3) According to the FAQ, CdSearchFile() is unreliable on the debug station and presumably on the production Playstation. Does this mean the open() call is also unreliable? If open() is unreliable then does that mean the file system cannot be used at all? Besides being an incredible hassle to hard-code file locations, having a file system is a great convenience; it would be very unfortunate if it could not be used. Thanks in advance for any information you can provide.

---

12/11/95 4:37 PM  
Re(2): Disk Capacity  
Dave Elton  
CD

Does anybody know what is in the Lead-in and Lead-out track and how much space they take? I cut a disc with 70 minutes 3 seconds ( according to CD-generator) of data and had lots of trouble in seeking to the location on CD. But when I reduced the data size to 67 minutes, everything works fine. The data are exactly the same because I was told the current CD-ROM system is not stable in seeking to the last 3 minutes of data so I added in 3 minutes of dummy data to the most outside track.  
Simon ReadySoft Inc.

---

12/11/95 3:16 PM  
Re: How to install your emulator II  
Greg G. Gibson  
CD

I am trying to get the CD emulator up and running.  
I have down loaded the instructions from 11/29/95 with the new files.  
I have a 2G Micropolis 4221 AV drive It is partition into 2 x 166500 sectors. I have put the 1.7 boot on the drive. I removed the DMA and IRQ jumpers. When I buildcd -s4:1 basic.cti (Hard drive ID is 4) everything appears good until I go back into cddisk and try to look at the first partition I get an invalid mode or form error on the first partition. I have put together my own control file and when I repeat the above operations I can see the files. I do not have the same problem with the second partition. I might think that the disk is bad, but for the fact that I can write my files to the partition.  
Any ideas ?  
Any chance of more complex examples of control files ?  
Thanks in advance

---

12/11/95 9:08 AM  
Re: CdInit() and \_96\_init() questions  
David W. Marshall  
CD

It was my impression that open() and read() were buggy and were not recommended to be used for CDROM reading. I also thought that CdSearchFile() had been fixed in the latest library and was now functional. I, however, use neither of these 2 functions now, so I may not be the best person to speak for their usefulness.  
dave

---

12/11/95 1:57 PM  
CdSearchFile Problems  
John Brandwood  
CD  
Thomas Boyd  
BUG.C 13K  
CD Creation

I'm having one hell of a time getting CdSearchFile to work reliably on the emulator. If it works once, then it will work for the rest of the debugging session, but often after a compile/resetps/snpatch/selemu/debug it just won't work. When it fails, then about 25% of the time a CdIReset will get it working again, leaving an unacceptable 75% chance of total unrecoverable failure.

Since there aren't any good examples of error recovery in the tutorial examples, I'm just checking the return codes, and if the CD routines fail, I try them again. If they fail twice in a row, I do a CdIReset, and then loop around to continue the retries.

If there is a better, or more official way to handle read errors, then I'd love to know about it. I've attached the source that I'm using.

First is the library initialization stuff that I've ripped out of my init code.

Then there's the routine ScanDisk() that I run just after initialization to find out the location of all the files on the CD. This is the routine that I'm having fail on me.

Then there's the file loading routine LoadFileLFPCD() that I use to load a file. This shows the current error handling that I use.

Anyone got any suggestions ?

John.

---

12/11/95 2:55 PM  
Re: CdSearchFile Problems  
John Brandwood  
CD  
Thomas Boyd  
Woops !

Forgot to mention that the error messages that CdSearchFile returns are always like ...

CD\_read: (CdIReadN) timeout Sync-Complete, Ready=NoIntr CdIPause: DiskError(43:80) CD read retry 6(00:02:16)

Hope this helps someone figure out what's biting me.

Thanks, John.

---

12/11/95 9:30 AM  
Re(2): CdIinit() and \_96\_init() questions  
Thomas Boyd  
David W. Marshall  
CD

>>Besides being an incredible hassle to hard-code file locations, having >>a file system is a great convenience; it would be very unfortunate if >>it could not be used.

>It was my impression that open() and read() were buggy and were not >recommended to be used for CDROM reading. I also thought that >CdSearchFile() had been fixed in the latest library and was now >functional. I, however, use neither of these 2 functions now, so I may >not be the best person to speak for their usefulness.

Avoid open, read and cdinitfilesystem. They never bring home the bacon. Use CdRead2 and CdGetSector instead. As for locations, Dave is 99% right. In lib3.3, CdSearchFile works now.... except right after streamed movies; and then it only bombs on a debug stn. So you can emulate your heart out with it, and save your hardcoding of the directory structure for when you begin debug debugging.

Tom

---

12/12/95 5:53 PM

Re(2): CdSearchFile Problems

John Brandwood

Thomas Boyd

CD

> Which version of the libs are you using? CdSearchFile will work most of the time in lib 3.3 (not after a >streaming movie occasionally), but will not work reliably in a lib before that.

Lib 3.3, so that's not the problem.

>You shouldn't really use CdSearchFile at all for your final game, because it is so slow. Hard code your file >locations instead and seek right to them, and your consumers will be much happier.

The way that I'm trying to get it to work is to perform a scan of the disk at startup using CdSearchFile, and store the locations of every file on the disk. Then during the game I can refer to this list to find the files without any further calls to CdSearchFile(), and keep the maximum of both speed and flexibility.

This should be fairly fast since CdSearchFile() only has to read the directory sector once for the whole directory, and the read should stay at the start of the disk for subsequent directories.

This also has the advantage of me not having to change hard-coded addresses each time I use BuildCD.

However, the method seems less than perfect since CdSearchFile sometimes doesn't want to work.

So back to you, Thomas ...

Why doesn't it work? When will it be fixed? And if either of these factors are unknown, will you post the specs of the directory information so that I can write my own version of CdSearchFile()?

Thanks,

John.

---

12/12/95 1:18 PM

Starting location for CD-DA track

David W. Marshall

Sound

CD

FROM PREVIOUS EMAILS >>>2) If you know the length in minutes of the track, you can convert that to a sector length >>>using the following macros (which are not so cleverly hidden in thelibcd.h file). Use btoi to >>>convert the start point of the song to an int. Add the length of the song on, reconvert using >>>itob to get an end point.

>>I noticed that when using this method (or the method in tuto4.c for looping CD-DA), the >>starting time listed in the TOC contains an >extra 2 seconds for the 2 second lead-in time.

>>Therefore, you get 2 seconds of dead time when you start a track.

>>I add 2 seconds to the start time before passing it to the redbook functions. Any problem >>with this?

>>Shouldn't be any problems with this.

I have been running off the Emulator and have been using the above method of adding 2 seconds to the start of the CD-DA data to get the track to start on the correct time. I just burned a CD and ran it on a Black Cd Box and noticed that my redbook track was starting 2 seconds into the song.

Using the debugger, I found that the Emulator version and the CD version were returning different starting times for the redbook track. Using: CdILOC Toc[10]; CdILOC TrackPos;

CdGetToc(Toc); TrackPos = Toc[2];

TrackPos for the emulator would equal 0,18,0. TrackPos for the CD would equal 0,20,0.

Anyone know why the different versions are reporting different start times? Are there layout commands in the CCS file that CDDISK pays attention to but that CDGEN doesn't.

thanks,

dave

---

12/12/95 10:12 AM

Re(3): Disk Capacity

Thomas Boyd

Dave Elton

CD

Total time = 71 min

lead in + PSX crud = 2 sec lead out = 1 sec pre-leadout dummy data = 3 min (you have to burn this yourself - and now you know what it's about)

You get 68 minutes left over (- 3 sec) ----- Does anybody know what is in the Lead-in and Lead-out track and how much space they take? I cut a disc with 70 minutes 3 seconds ( according to CD-generator) of data and had lots of trouble in seeking to the location on CD. But when I reduced the data size to 67 minutes, everything works fine. The data are exactly the same because I was told the current CD-ROM system is not stable in seeking to the last 3 minutes of data so I added in 3 minutes of dummy data to the most outside track. Simon ReadySoft Inc.

---

12/12/95 2:25 PM

Re(4): Disk Capacity

Dave Elton

Thomas Boyd

CD

>Total time = 71 min

>lead in + PSX crud = 2 sec >lead out = 1 sec >pre-leadout dummy data = 3 min (you have to burn this yourself - and now you know what it's about)

>You get 68 minutes left over (- 3 sec) -----

But what I found out is including the 3 min dummy data, my total data size is 70 minutes and 3 seconds, theoretically, this should work properly, and I found the CD I cut cannot seek properly and when I took out the 3 min dummy data ( so my total data size reduced to 67 min), everything works perfectly. I doubt something else besides lead in and lead out ( 3 seconds) is there (probably more than 53 seconds) and make my data overflow the disc limit.

Simon ReadySoft Inc.

---

12/12/95 11:30 AM

subdirectories with CDGEN  
David W. Marshall  
CD

My question concerns how to get CDGEN to burn a CD that has subdirectories in the disk layout.  
I make a disk layout .CCS file in CDGEN. I make a subdirectory called TIMS and put some tims in that directory. In the DIRECTORY section of CDGEN, it lists the SOURCE FILE for my TIMS directory as c:\cdgen\cdtmp\c0000617.dir  
When I am done in CDGEN and exit CDGEN, all these .\cdtmp\ files go away. When I later go back into CDGEN and try to record a CD, it tells me that it can't find "c:\cdgen\cdtmp\c0000617.dir"  
So am I doing something wrong? Will the CD burn correctly without these tmp files?  
thanks,  
dave

---

12/12/95 10:58 AM  
Re(2): How to install your emulator II  
Thomas Boyd  
Greg G. Gibson  
CD

PAUL\_XA.CTI        1K  
CD Creation

Try a different harddrive, then try a different emulator (if you do not have one, send it to me and I will test it). I can rummage up a slightly more complex control file for you to edit.  
(attached) Tom -----

I am trying to get the CD emulator up and running.  
I have down loaded the instructions from 11/29/95 with the new files.  
I have a 2G Micropolis 4221 AV drive It is partition into 2 x 166500 sectors. I have put the 1.7 boot on the drive. I removed the DMA and IRQ jumpers. When I buildcd -s4:1 basic.cti (Hard drive ID is 4) everything appears good until I go back into cddisk and try to look at the first partition I get an invalid mode or form error on the first partition. I have put together my own control file and when I repeat the above operations I can see the files. I do not have the same problem with the second partition. I might think that the disk is bad, but for the fact that I can write my files to the partition.  
Any ideas ?  
Any chance of more complex examples of control files ?  
Thanks in advance

---

12/12/95 11:06 AM  
Re: CdSearchFile Problems  
Thomas Boyd  
John Brandwood  
CD

Which version of the libs are you using? CdSearchFile will work most of the time in lib 3.3 (not after a streaming movie occasionally), but wil not work reliably in a lib before that.  
You shouldn't really use CdSearchFile at all for you final game, because it is so slow. Hard code your file locations instead and seek right to them, and your consumers will be much happier.  
Tom

---

12/13/95 6:12 PM  
libcd.lib strangness in lib 3.3  
Mark Slemko  
CD

I put in lib 3.3 from update 1.5.7 and the CD routine CdSyncCallBack doesn't work from a CdControl(CdlSeekL...) call.  
-Mark

---

12/13/95 9:24 AM  
Re(3): CdSearchFile Problems  
Thomas Boyd  
CD

John Brandwood  
>However, the method seems less than perfect since CdSearchFile sometimes doesn't want to work. >So back to you, Thomas ... >Why doesn't it work ?  
Bad code.  
>When will it be fixed ?  
Next library rev (soon).  
Tom

---

12/13/95 11:36 AM  
Re: subdirectories with CDGEN  
David W. Marshall  
CD

>>>When I am done in CDGEN and exit CDGEN, all these .\cdtmp\ files go away. When I later >>>go back into CDGEN and try to record a CD, it tells me that it can't find >>>"c:\cdgen\cdtmp\c0000617.dir"  
I found the reason for this problem. It is caused by that great tool known as CDGEN. When you create a subdirectory in CDGEN the Source line in the DIRECTORY window is blank (this is good). When you click on the REC button, CDGEN makes the temp files in cdtmp directory and fills in the Source line for each of the subdirectories. When you are done recording and exit CDGEN, it prints a message saying "LAYOUT.CCS has changed, do you want to save". Say NO. If you save it, it will save the source info for all your subdirectories. Next time you go to burn a CD with this new CCS file, you will get the "can't find" error message.  
If you do end up in this situation, you can edit the .CCS file and remove the source line for the directories from the CCS file.  
CDGEN is my favorite tool.  
dave

---

12/13/95 9:53 AM  
status byte  
Thomas Boyd  
CD

David W. Marshall  
Usefull info on Cd status byte ----- Forwarded  
Message

> - Often we see some messages from the DTL-H2000 : > Ready =Disk Error (23) > Ready =Disk Error (26) > > CdRead Disk Error (26) > > (something like this) > > Can you tell us what the numbers in the error output are ? >

Q1.

The number of Disk Error is the status of sub cpu. The meanings of each bits are follows.

7 Playing CDDA playing back 6 Seeking Head seeking 5 Reading Data Reading 4 Once Shell Open not command resets this bit 3 Disc Type Error Not the PLAYSTATION DISC 2 Seek Error Seek Error 1 Spindle Spindle moter is on 0 Commnad Error command error occurs

So for example, Disk Error(23) means data reading & spindle on & command error.

---

12/13/95 9:37 AM

Re: Starting location for CD-DA track

Thomas Boyd

Sound

CD

Dave,

The emulator and the CD are not exactly the same (as you have discovered). One of our developers has had success with the following method:

put a dummy track in track 2 (the first DA track) start actual tracks in track 3

like this:

```
AUDIO TRACK PAUSE 150 <<DUMMY.DA>> EMPTY 150
```

```
AUDIO TRACK PAUSE 75 <<HVY_MTL.DA>> EMPTY 75
```

etc...

There may be a better way to reconcile the two devices, but I have not had time to find it yet. So for now, I hope this hack helps you keep coding.

Tom -----

FROM PREVIOUS EMAILS >>>2) If you know the length in minutes of the track, you can convert that to a sector length >>>using the following macros (which are not so cleverly hidden in thelibcd.h file). Use btoi to >>>convert the start point of the song to an int. Add the length of the song on, reconvert using >>>itob to get an end point.

>>I noticed that when using this method (or the method in tuto4.c for looping CD-DA), the

>>starting time listed in the TOC contains an >extra 2 seconds for the 2 second lead-in time.

>>Therefore, you get 2 seconds of dead time when you start a track.

>>I add 2 seconds to the start time before passing it to the redbook functions. Any problem

>>with this?

>>Shouldn't be any problems with this.

I have been running off the Emulator and have been using the above method of adding 2 seconds to the start of the CD-DA data to get the track to start on the correct time. I just burned a CD and ran it on a Black Cd Box and noticed that my redbook track was starting 2 seconds into the song.

Using the debugger, I found that the Emulator version and the CD version were returning different starting times for the redbook track. Using: CdILOC Toc[10]; CdILOC TrackPos;

```
CdGetToc(Toc); TrackPos = Toc[2];
```

TrackPos for the emulator would equal 0,18,0. TrackPos for the CD would equal 0,20,0.

Anyone know why the different versions are reporting different start times? Are there layout commands in the CCS file that CDDISK pays attention to but that CDGEN doesn't.

thanks,

dave

---



12/13/95 11:24 AM  
Re(4): CdSearchFile Problems  
John Brandwood  
Thomas Boyd  
CD  
>>When will it be fixed ?  
>Next library rev (soon).  
Thanks, Tom.  
I'll look forward to that.  
John.

---

12/14/95 9:34 AM  
CD tools support from SN Systems  
David W. Marshall  
CD

I received the following email from SN Systems when I asked them about a problem I was having running UPDATECD from a full DOS window:  
--- Sorry, but the CD tools are DOS only and not designed to work under Windows 3.xx. You could try the 32bit version of BuildCD - BCDFlat - to see if it is more reliable, but isn't guaranteed to work under standard Windows. It's DOS or Win 95 only with the CD tools I'm affraid.  
We don't get much demand for Windows 3 support. Current and future development is concentratating with Windows 95 and NT, as we see this as being the future market.  
Best Regards,  
-- Duncan @ SN Systems  
----  
I was surprised and disappointed by the answer. I would hate to be forced to move to win95 just because SN Systems puts more support effort towards that platform.  
dave

---

12/14/95 6:26 PM  
Re(2): CdSearchFile Problems  
Roy Eltham  
John Brandwood  
CD  
I have had the same problem you have with the cdsearchfile error exactly as you listed. However, I have found that it's not really the code, but the emulator card. on my system more then half the times I resetsps/snpatch/selemu/cdexec it doesn't work, but when it does work it works completely.  
I have found that I often have to occasionally run selcd to get the system "unstuck". yet still other times I end up having to power down completely. It's very frustrating.  
Roy Eltham Regal Productions

---

12/14/95 7:01 PM  
Re(3): CdSearchFile Problems  
John Brandwood

Roy Eltham  
CD

>I have had the same problem you have with the cdsearchfile error exactly as you listed. >  
>However, I have found that it's not really the code, but the emulator card. on my system more  
then half the >times I resetps/snpatch/selemu/cdexec it doesn't work, but when it does work it  
works completely. > >I have found that I often have to occasionally run selcd to get the system  
"unstuck". yet still other times I end >up having to power down completely. It's very  
frustrating.

That sounds exactly like my problem. And it seems to be hitting me more and more.  
Perhaps Sony should always send out 2 emulator cards with each system, that way we could  
have a spare one around to use when the other one goes bad ;-)

But seriously, if it is just the dammed emulator card again, then perhaps its time to get yet  
another one.

John.

---

12/14/95 9:00 AM  
FYI - emulator disk-swap  
Thomas Boyd  
CD

Coming soon from SN Systems: ----- >Can a feature be added  
to the emulator where the PC can trigger the "door open" >flag of the CD status byte and then  
emulate inserting a new CD by toggling to  
>any partition on the emulator drive? > >This would be heavily usefull right now, as several  
game developers are doing  
>multi-CD titles. ----- Currently this very feature is in development  
and is ~95% complete. Infact currently on my system I have 2 SCSI harddisks chained together  
and can switch between them to select a new partition without resetting the emulator.  
Simultaneously the DEX cards are communicating with the emulator and can detect whether the  
door is open or closed.

It should be ready within a few days (hopefully).

Also, the encoded copy of CDBoot18.BIN I mailed you - did you have any luck with it. I need to  
know whether CDBoot18.BIN is unstable, since this new CDBoot I'm working on (with the door  
open/select new partition feature) is based heavily on the old CDBoot18 and I wouldn't want to  
release the new one with the old bugs remaining in it.

---

12/14/95 5:30 PM  
Re: status byte  
David W. Marshall  
CD

>>>So for example, >>> Disk Error(23) means data reading & spindle on & command error.  
While any info from Japan is better than no info, the response didn't really answer the WHY  
question. If Japan could supply a cause and resolution chart that would be of great help to  
figure out why the system was barfing.

Something like:

Disk Error(23) Cause: Issued a new command that conflicted with the current reading  
command. Resolution: Issue a pause or check that head is not reading before issuing new  
command.

dave

---

12/15/95 10:10 AM

Re(4): CdSearchFile Problems

Thomas Boyd

CD

John Brandwood

I am asking SN Systems what they think of this problem. In the meantime, do you guys have any hints on how to set up my card to fail on CDdSearchFile so I can see if it every emulator, or just broken emulators that have this problem.

Tom

---

12/27/95 1:46 PM

CD buffer

clearwater

CD

question - if you don't wish to stream audio off the CD, is there any way to make use of that lovely hunk of memory disguised as a CD-ROM buffer? - I can't seem to find any info in the docs about it. For instance, how efficient is the CD manager at buffering sectors?. My problem is a PC based conversion that likes to rummage around the CD during a game level. There's not a lot I can do about it unless I can figure out a way to 'cache' stuff I'll know it needs in the CD buffer.

thanks mick delaney (clearwater)

---

12/27/95 8:18 PM

Bootable CD Questions

David Vronay

CD

Help. How do you make a bootable CD? The docs I saw said that when use current libraries (later than 2.5), then cannot use cd emulator to test whether the thing will boot. We pressed one and it didn't work. Is there any more info we can get out of how it did not boot. What should be in the system area file. A file called system.cnf, or boot25.bin? Does case matter in the naming of files? What is this ;1 that usually appears after file names. If we have a system.cnf file, should it appear first, or anywhere. Does the boot = ourfile.exe in the system.cnf file actually work? and can ourfile.exe appear anywhere in the root directory? Is there a current example of a bootable CD .cti file with more than two files in it, including one that calls a LoadExec on one or more files.

Richard Maurer @ImaginEngine

---

12/27/95 10:12 AM

note on installing emu boards

Thomas Boyd

Andrew Gavin

CD

One more emulator tidbit:

There is no version of SNPATCHW.CPE that works with the emulator. Use that SNPATCH.CPE that I posted on the BBS in the CD conference.

Tom

---

12/27/95 2:56 PM

CD Emulator stopped working!

Dr. Cat

CD

(I tried to figure out how to send this in email, but I haven't used the BBS in months, and the email didn't give a clear indication of what address to send questions to in order to reach staff. My apologies to anyone who gets bored senseless by me posting this publically.)

I'm having some problems with my Sony development system, having just finished the Sega version of the product I'm doing and gotten back to working on the Sony code. I suspect it's the yellow CD emulator card, but I'll describe the symptoms and what I've tried, and you can tell me if there's anything else I should do...

Basically, I had set up the whole development system months ago, and everything worked at the time. I hadn't done anything with the actual CD emulator except run the "sanity test" that makes the RCUBE demo run off it, but that worked fine. The PC the system was in has been used for the last few months to run various Windows apps and stuff not related to the PSX development system, with the dev system basically sitting idle inside the machine. I haven't added or removed any other hardware or changed the autoexec.bat or config.sys in all that time. The problems I get now seem to have started to manifest spontaneously when I tried working with the system again.

Sometimes when I start up cddisk, I get a SCSI timeout error message. Sometimes it starts up, but I get long pauses before screens come up (I'm guessing also a SCSI timeout but at a point where the code doesn't print an error message for it). I can do a cddisk -n 0, since things seem to work sometimes, and create a partition. But after I try to use buildcd to put an RCUBE image on it, it doesn't boot and I can never successfully view the contents of the partition. I get a LONG pause with just the top few lines on the screen:

```
View Partition - Partition 1
```

```
System Id : [PSX          ] Volume Id : [PSXTEST          ]
```

The cursor just sits there for a while, then finally I get "This partition appears to be of an invalid Mode or Form and therefore it's contents cannot be displayed".

I tried swapping the SCSI drive from the Saturn CD emulator I was using. The one I had been using on the Sony I was able to successfully build a Saturn CD image and boot from, no problems. The drive from the Saturn I could view the old partition contents on using the Sony CD emulator card, but when I tried building on it I had the same problems I did with the first drive. So that rules out the drive having gone bad. Then I swapped the SCSI cables leading from the emulation drives to the cards, again same thing - Saturn dev system worked fine, Sony didn't. So it's not the cable. That leaves the emulator card, the two cards that emulate the PSX, my PC hardware, and the PC's software. I am assuming that the PSX emulator isn't involved in what's going on when you just run CDDISK - correct me if I'm wrong on that. There doesn't seem to be anything significantly wrong or different with my PC itself, so I'm thinking the card has gone bad somehow. I did try pulling it out, pushing down on all the chips to make sure they were firmly seated, and pushing the card firmly into its slot, that didn't help any either. Anything else I should try at this point, or should I just see about getting the card replaced?

-- Dr. Cat

P.S. I tried contacting SN Systems via email, and it bounced. Any word on whether they have a new address on the net?

---

12/28/95 9:32 AM  
Re: CD buffer  
Thomas Boyd  
CD

>question - if you don't wish to stream audio off the CD, >is there any way to make use of that lovely hunk of >memory disguised as a CD-ROM buffer?  
You cannot access it directly, because it is part of the CD-ROM subsystem, but you can use it in ways for which it was intended to stream other junk off of the CD. Examples: Streaming textures, terrain, data  
It buffers one data sector at a time, and the rest of the buffer is used for audio or something (exactly what it is used for has fallen out of my brain temporarily). I know this is not what you hoped to hear, but it is how the thing works.  
Tom

---

12/28/95 11:01 AM  
cd.cti creation  
cary hammer  
CD

Pre-apologies for such a greenhorn question, but how are cd.cti's created? By hand? By tool? By spirits from beyond? Thanks.

---

12/28/95 9:19 AM  
Re: Bootable CD Questions  
Thomas Boyd  
CD

David Vronay  
Read the CD mastering doc. (I will fwd it to you). Read the CD FAQ (ditto).  
>What should be in the system area file. A file called system.cnf, or boot25.bin?  
LICENSEA.DAT  
>Does case matter in the naming of files? Not for naming. (See page 17 of the overview).  
>What is this ;1 that usually appears after file names. Part of the CDROM file naming system  
>If we have a system.cnf file, should it appear first, or anywhere. Anywhere - but do not overflow the root dir file limit (45) or you will not boot. DA tracks are entered into the TOC, beware  
>Does the boot = ourfile.exe in the system.cnf file actually work? Yes, but you must fill all four lines of system.cnf in. Go get a released game, copy the system.cnf off of it with your PC CD drive, and start from there.  
>and can ourfile.exe appear anywhere in the root directory? Yes - but do not overflow the root dir file limit (45) or you will not boot  
>Is there a current example of a bootable CD .cti file with more than two files in it, including one that calls a LoadExec on one or more files. Yes, I will fwd it to you.  
Watch the 2MBYTE.OBJ stuff. Do not over malloc. Put the A in the mastering, license area Let me know if questions still remain unanswered after reading this post and all the other goodies I am sending to you.  
Tom

---

12/28/95 2:52 PM

Re: cd.cti creation

Thomas Boyd

CD

cary hammer

Most popular= (1) layout in CDGEN, (2) save to CCS file, (3) run CCS2CTI, and viola! you have a bouncing baby CTI file. You can also hit yourself on the head with a mental hammer by building them by hand if you want. T ----- Pre-apologies for such a greenhorn question, but how are cd.cti's created? By hand? By tool? By spirits from beyond? Thanks.

---

12/28/95 9:11 AM

FAQ: Emulator installation

Thomas Boyd

Dr. Cat

CD

RESETPS.EXE        2K

CD Creation

EMULATOR INSTALLATION FAQ ===== NEW  
INFO: There is no version of SNPATCHW.CPE or PATCHW.CPE that works with the emulator.  
Use SNPATCH.CPE that is attached to this message.

OLD INFO: This is my troubleshooting guide to installing your emulator. It is in psuedo-spaghetti code.

InstallDevBoards(); // extern Remove your IRQ and DMA jumpers for now. Do not lose them. Check to make sure that the SCSI ID jumpers are set at the factory default of 7. Do not change it. // Pick a base address 10 Select a base address with the base address jumper. Lovingly cram emulator board into an open slot in your PC. Firmly attach white-ish cable between dev boards and emulator. Attach emulator Hard drive to emulator board and turn it on. Edit autoexec.bat to contain CDBIOS /a###, where ### is the base address you selected. Ex: CDBIOS /a388 will use base address 388 - which should match jumper on card. if (Computer does not boot | | CDBIOS does not recognize emulator board) goto 10 and select a new base address. If (you try all base addresses and cannot get it to boot or find emu with CDBIOS) try any/all of the following { Press all the chips into their sockets harder. Be sure you are using CDBIOS version 1.02 or later. Maybe your computer is overheating. Check it out. } if (none of the above works) your emulator, dev boards, or computer may be malfunctioning. Call BBS for help. Return(-1).

// communicate with the emulator drive through the PC bus Set the SCSI ID on your harddrive to 3, 4, or 5. The manual says you can choose others. Don't. Run CDDISK -n #, where # is the SCSI ID you have set on your harddrive (above). Ex: CDDISK -n 4 will activate and format the drive with SCSI ID 4 for use. If (CDDISK does not run happily) { Be sure your emulator hard drive is turned on and the cables are connected. If so, goto 10 and select a new base address. If that does not work, call BBS. }

// install boot file While in CDDISK (above section), install the boot file. Use CDBOOT16.BIN or CDBOOT17.BIN (attached), DO NOT try any others yet.

// build an emulation image Detach BASIC.CTI and PSX.EXE from this memo for use in the next step. Run BUILDCD -s#:1 BASIC.CTI, where # is the SCSI address of the emulator hard drive (1 is the first partition). Ex: BUILDCD -s4:1 BASIC.CTI will build an image to partition 1 of SCSI ID 4 hard drive. Ignore warning 66 if it happens. If an error occurs, be sure CDBIOS is installed and your emulator hard drive is turned on with cables attached.

// run the image - communicating through the white-ish cable to the DTL-H2000 boards 20  
RESETPS 1 // verion 1.03 (attached) or later, NOT 1.02. If you use 1.02, you are a loser! It may fail big time. RUN SNPATCH // NOT the version from the CD, NO version of SNPATCHW.CPE works with the emulator This will say "done" if it works, or "cannot connect

to target" if it fails. If it "cannot connect to to target" goto 20 If it says "cannot open source file" you need to fix your path to find the file. RUN SELEMU This will say "done" if it works, or "cannot connect to target" if it fails. If it "cannot connect to to target" goto 20 If it says "cannot open source file" you need to fix your path to find the file. RUN CDEXEC This will say "done" if it works, or "cannot connect to target" if it fails. If it "cannot connect to to target" goto 20 If it says "cannot open source file" you need to fix your path to find the file.

If your emulator still will not work: 0) reboot 1) try different emulator boards to see if your board is bad. 2) try different sets of dev boards to see if your dev boards are screwed up. 3) try different hard drives to see if your hard drive is bad 4) try different brand of computer to see if your computer is incompatible 5) leave a message in the CD newsgroup of the BBS detailing your traumatic emulation experience. Be specific.

BONUS STUFF: Now you can advance to the following:

1) install interrupt jumper, make ammendment to CDBIOS line 2) install CDBOOT18.BIN 3) install CDBOOT2#.BIN, this will pave the way for step 4 4) install CDMON (a TSR that spews info back at you from the emulator). 5) install DMA jumper, make ammendment to CDBIOS line

---

12/28/95 7:54 PM

Re(2): CD buffer

clearwater

CD

>question - if you don't wish to stream audio off the CD, >is there any way to make use of that lovely hunk of >memory disguised as a CD-ROM buffer?

You cannot access it directly, because it is part of the CD-ROM subsystem, but you can use it in ways for which it was intended to stream other junk off of the CD. Examples: Streaming textures, terrain, data

It buffers one data sector at a time, and the rest of the buffer is used for audio or something (exactly what it is used for has fallen out of my brain temporarily). I know this is not what you hoped to hear, but it is how the thing works.

Tom

- thanks for the prompt reply, Tom - I had feared the worst in any case - however if you could take the time to explain how the streamed data ( assuming audio ) uses the sound buffer - or portion thereof, I would appreciate it. I posted a question in the sound conference, but havn't had a reply yet. What I really need to know I guess, is how much of the sound buffer is required if I'm streaming audio off the CD. The manuals say that sound buffer space is required, but don't specify how much. It appears to me that the machine is set up for redbook rather than midi since you can't really use the CD buffer except for streaming (based on your reply above) - am I correct or missing something???

mick delaney-clearishwater

---

12/28/95 9:05 AM

Re: CD Emulator stopped working!

Thomas Boyd

Dr. Cat

CD

>...and the email didn't give a clear indication of what address to >send questions to in order to reach staff. My apologies to anyone who gets >bored senseless by me posting this publically.) public is great. Then I do not have to answer the same question 8000 times.

>I suspect it's the yellow CD emulator card,  
very likely

[Emulator death throes read, studied, then omitted]

Read the post titled "how to install your emulator II" that I put on this BBS. It is way better than the sanity check doc. Do not set your hard drive to SCSI ID 0 (as your CDDISK -n 0 line implied). bad bad bad! If you installed newest software (from the new CD), you are getting reamed by SNPATCHW.CPE. It wont work.

>Anything else I should try at this point, or should I just see about >getting the card replaced? If you cannot get it going with my post I mentioned above, give me your phone #, and I will get and test your card, replacing it if need be.

>P.S. I tried contacting SN Systems via email, and it bounced. Any >word on whether they have a new address on the net?

snsys.com

Tom

---

12/29/95 9:09 AM

Re(3): CD buffer

Thomas Boyd

CD

I will look it up. I don't know this one off the top of my head, but will find out today or Jan 2. T

-----  
>question - if you don't wish to stream audio off the CD, >is there any way to make use of that lovely hunk of >memory disguised as a CD-ROM buffer?

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Tom

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mick delaney-clearishwater

---

12/29/95 7:26 AM

Re(2): Bootable CD Questions

Dave R. Scheele

CD

>> >> Is there a current example of a bootable CD .cti file with more >> >> than two files in it, including one that calls a LoadExec on one >> >> or more files.

>> Yes, I will fwd it to you.

Could you post it here as well, or if it has been posted remind me of the name? ;)

Dave

---



12/29/95 9:05 AM  
Re(3): Bootable CD Questions  
Thomas Boyd  
CD

EXECMENU.ZIP        31K  
CD Creation

>> >> >> Is there a current example of a bootable CD .cti file with more >> >> >> than two files in it, including one that calls a LoadExec on one >> >> >> or more files.  
>> >> Yes, I will fwd it to you.  
>> Could you post it here as well, or if it has been posted remind me of the name? ;)  
>> Dave ----- Here's my menu example: ----- Hi menu fans,  
Here is the menu example in fine working order (attached). I took out anim, because I did not want to upload the movie. If you check out GOMENU.BAT and fix your path, you are set.  
Seems the mysterious RET2.OBJ and BOOT.OBJ were missing.  
Any questions? EMail me.  
Tom

---

12/29/95 10:24 AM  
Re(4): CD buffer  
Thomas Boyd  
CD

Dan Burnash  
OK. This is the story of the CD ROM subsystem sector buffer:  
The CD-ROM subsystem sector buffer is currently 32K. It is located in the CD-ROM subsystem. It uses a sort-of tripple buffering system to read sectors in and make one (and ONLY one) sector available to the user.  
Common questions that spring to mind and their answers:  
Q: 32K - (2352 bytes/sector)\*(3 buffered sectors) = lots of leftover RAM! Can I use it? A: No. It is not accessible by anything but the CD-ROM subsystem.  
Q: How dissappointing. As consolation, can I be told what the extra memory is used for? A: The memory was going to be used for sound mapping, but (1) the system would be too slow, and (2) sound mapping is already done by the SPU. The current implementation of this memory is ... nothing. It is vestigial and will be cut out in future manufacturing cost reduction designs.  
Tom

---

1/4/96 8:47 AM  
CdReadN error  
Dave Elton  
CD

I am using CdReadN to read in my data, I know CdReadN will retry when error happens. But I am wondering whether CdReadN will stop retry after some times because I found the cd reading stops occasionally when CdReadN start retrying ( I can notice the CdReadN retries from the data throughput). Whenever the CdReadN stop reading, it will give a CdReadN(06) error. From the previous BBS message, I know it is a Cd seeking error. Is there any way to make the CdReadN keep retrying and reading when it gives CdReadN(06) error? I put 3 minutes dummy data at the end of my cd data, so there is no problem the Cd header will overshoot outside the leadout area. Any suggestions?

Thanks in advance!  
Simon ReadySoft Inc.

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1/5/96 10:21 AM  
Re: CdReadN error  
Thomas Boyd  
CD

>Is there any way to make the CdReadN keep retrying and reading when it gives CdReadN(06) error? Any suggestions?

I am finding out. Don't forget about the wonderful 8s delay when it fails to read after several tries.

T

---

1/9/96 3:04 PM  
CdInit()  
Mark D. Lyons  
CD

What's the status with the different levels of CdInit(). An old thread in this group talked about one program LoadExecute()ing another and doing a lesser CdInit() on the second program to save time. That was a couple of library releases ago.

Along those same lines the original thread made it sound as if a call to CdInit() did some hardware initialization of the CD system which could take up to 8 seconds. It would seem to me that since the operating system loads and executes our programs off of the CD that by the time our program is run the CD hardware has already been initialized. So just what does CdInit() do that takes time and how much of it can we avoid?

---

1/9/96 5:15 PM  
Re: CdInit()  
Angus  
CD

Call CdReset(int)

CdReset ( 0 ) does a CDInit. CdReset(1) does a CDInit and a CdInitVolume, which is an internal routine to turn on cd volume.

CdInit() calls CdReset(1) and sets the default callbacks.

CdReset(2) just calls cd interrupt init, which is what you need to call for the cd loading.

Angus

---

1/9/96 3:32 PM  
Where do I find the CCS2CTI utility?  
David R. Black  
CD

Where might I find the CCS2CTI tool mentioned previously in this conference? It does not appear to be on the Sony developer CDs, the SN Systems FTP site or the disc that came with my emulator card.

Thanks.  
David R. Black Senior Programmer, Presto Studios, inc.

---

1/10/96 3:36 PM  
Re: Where do I find the CCS2CTI utility?  
Thomas Boyd  
CD  
David R. Black  
CCS2CTI.EXE 20K  
CD Creation  
Its with cdgen in the releases folder. I attached it to this memo.  
T

---

1/10/96 4:19 PM  
Re: Burning PSX Resource Only CDs  
Thomas Boyd  
David R. Black  
CD  
This should work, especially on a dev system where CdSearchFile works reliably. Just be sure you do not put too many files in. Test your disk with a PC to be sure it is good. Verify disks after you make them with the burner. If it still fails, send one to me for an autopsy.  
T  
----- I am trying to burn a PSX cd with only resource files on it. (specifically, a movie and a half dozen TIM files) The problem is that the PSX CD-ROM drive on my development is not able to find any of the files on the disk using the CdSearchFile command. The drive can read files off commercial PSX disks with no problems, but refuses to see any of the files on my CD.  
I am using the Sony PSX CD Generator software with the 900E burner and a PnP Adaptec 1542 SCSI card. The only files I am placing on the CD are the data files, and they are divided into two sub directories, MOVIES and DATA.  
Am I missing something here?  
Thanks for your time.  
David R. Black Senior Programmer, Presto Studios

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1/10/96 1:32 PM  
XA audio & CdISetMode  
Sky Lounge  
CD

We are attempting to play XA audio and failing. Does anyone have any sample code they can share which plays a simple, non-interleaved XA audio file?  
We suspect part of our problem may be with the CdISetMode command (as issued by the CdControl function). We aren't convinced this is working for us, since when we use CdIGetLocL to read the mode value back (like it says to do on page 49 of the Run-Time Library 3.0 Overview), it always has a value of 0. What's going on? Are we failing to properly change the mode, or is the mode reporting not working correctly?

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1/10/96 4:21 PM

Re: XA audio & CdlSetMode

Thomas Boyd

CD

Sky Lounge

You HAVE to interleave your XA audio. Put blank in if you have no other tracks to mix with it. Tuto5.C in the CDTUTO directory plays XA, but they must be interleaved on a CD or emulator by creating a file with MOVPACK. Check out the help in MOVPACK. Let me know if you are still stuck, 'cause I can work with you on getting it working. T

----- We are attempting to play XA audio and failing. Does anyone have any sample code they can share which plays a simple, non-interleaved XA audio file?

We suspect part of our problem may be with the CdlSetMode command (as issued by the CdControl function). We aren't convinced this is working for us, since when we use CdlGetLocL to read the mode value back (like it says to do on page 49 of the Run-Time Library 3.0 Overview), it always has a value of 0. What's going on? Are we failing to properly change the mode, or is the mode reporting not working correctly?

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1/10/96 10:54 AM

Burning PSX Resource Only CDs

David R. Black

CD

Hopefully, someone out there can help me with this problem, so here goes.

I am trying to burn a PSX cd with only resource files on it. (specifically, a movie and a half dozen TIM files) The problem is that the PSX CD-ROM drive on my development is not able to find any of the files on the disk using the CdSearchFile command. The drive can read files off commercial PSX disks with no problems, but refuses to see any of the files on my CD.

I am using the Sony PSX CD Generator software with the 900E burner and a PnP Adaptec 1542 SCSI card. The only files I am placing on the CD are the data files, and they are divided into two sub directories, MOVIES and DATA.

Am I missing something here?

Thanks for your time.

David R. Black Senior Programmer, Presto Studios

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1/11/96 4:29 PM

Re(3): XA audio & CdlSetMode

Thomas Boyd

Sky Lounge

CD

>> You HAVE to interleave your XA audio. >Really? In that case, the documentation is very confusing. The CD Emulator book has a section called "XA Interleaved File Commands" >and a separate section called "File Commands" which includes lots of XA oriented functions. This makes it seem like non-interleaved >XA audio is an option.

I think it is assuming pre-interleaved XA. I have done this a bunch, and you pre-interleave with MOVPACK, then just add it to your .CTI as an XA Form 2 file.

>I haven't looked yet at MOVPACK nor in detail at the Tuto5.C source code, but I can immediately tell that there are 2 things I'd really like >to have: A sample CTI file that can be used with Tuto5.c, and a readme file for the CDTUTO directory that's in English.

Since I nuked my CTI file, here's a brief how:

Select your audio files to be interleaved (MOVPACK will supply blank data). Interleave to a new file following the help instructions in MOVPACK. Your output file should now be a multiple of the largest XA file you are interleaving. Add it to your CTI as Form 2 XA data.

T

---

1/11/96 4:22 PM  
Re(3): Burning PSX Resource Only CDs  
Thomas Boyd  
David R. Black  
CD

Any high quality will work for your test purposes (not submission). TDK seems to be popular. Some brands don't cut it though (ex: Kodak). T ----- Thomas,  
Thanks for the suggestions. I finally got it working by using one of the blank CDRs included with the dev kit. Do you know if we have to use the Sony provided CDRs for burning test discs, or can we use any high quality 74 minute CDRs?  
Thanks for your time.  
David R. Black.

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1/11/96 12:14 PM  
Re(3): XA audio & CdlSetMode  
John Phua  
CD

The translation that you asked for is in Release 1.5.13 of the Programmer tools CD release folder. It also has other translated files. Release 1.5.9 also contains additional translated files.  
LOCATION: Releases/Product Releases/Prog Tools/  
John

=====  
=====  
=====  
=====

I haven't looked yet at MOVPACK nor in detail at the Tuto5.C source code, but I can immediately tell that there are 2 things I'd really like to have: A sample CTI file that can be used with Tuto5.c, and a readme file for the CDTUTO directory that's in English.  
Thanks.

---

1/11/96 12:15 PM  
Re(2): Burning PSX Resource Only CDs  
David R. Black  
Thomas Boyd  
CD

Thomas,  
Thanks for the suggestions. I finally got it working by using one of the blank CDRs included with the dev kit. Do you know if we have to use the Sony provided CDRs for burning test discs, or can we use any high quality 74 minute CDRs?  
Thanks for your time.  
David R. Black.

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1/11/96 11:50 AM

Re(2): XA audio & CdSetMode  
Sky Lounge  
CD

> You HAVE to interleave your XA audio.

Really? In that case, the documentation is very confusing. The CD Emulator book has a section called "XA Interleaved File Commands" and a separate section called "File Commands" which includes lots of XA oriented functions. This makes it seem like non-interleaved XA audio is an option.

> Let me know if you are still stuck, 'cause I can work with you on getting it working.

I haven't looked yet at MOVPACK nor in detail at the Tuto5.C source code, but I can immediately tell that there are 2 things I'd really like to have: A sample CTI file that can be used with Tuto5.c, and a readme file for the CDTUTO directory that's in English.

Thanks.

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1/17/96 11:20 AM  
multichannel movies

Thomas Boyd

Art Tools

Jeff Davies

Here's the sample T -----

Hi Tom,

I will send source code for multi channel movie. It is an old sample. So, there may be some part which are not updated by later changes. They should just refer this sample to understand how to achieve multi channel movie playback.

Koji

P.S. I've not finished analyzing their data yet.

```
===== /* * SPSLibId: Runtime Library Versin 3.0S
*/ /* *   Movie Sample Program(Multi Channel) * * Copyright (C) 1994,5 by Sony
Corporation * All rights Reserved * * Version Date * ----- * 1.00
Jul,14,1994 yutaka * 1.10 Sep,01,1994 suzu *   1.20   Oct,24,1994 yutaka(anim
subroutine 1.30   Jun,02,1995 yutaka(AME_SIZEEr3.1*/
#ifdef EMULATE #define StGetNext StGetNextS #define StFreeRing StFreeRingS #endif
#define IS_RGB24 0 /* 0:RGB16, 1:RGB24 */
#if IS_RGB24==1 #define PPW 3/2 /* 1efine PPW 1 /* 1E 2 /* 16bit C dec; /* tch; /* CD/
ResetGraph(0); /* GPU V disp; DRAWENV draw; void strCallback(); /* * CD-ROM status */
CdLOC ppos, lpos; /* CD-ROM position */ CdFILE file; int fn; u_char param[8]; static
strInit(),strNextVlc(),strSync(); void strCallback(); /* { printf("file not found\n");
StopCallback(); PadStop(); exit(); } loc.minute = file.pos.minute; loc.second =
file.pos.second; loc.sector = file.pos.sector; printf("%x %x
%x\n",loc.minute,loc.second,loc.sector); /* 40); channel = 1; CdSetFilter(1,channel);
StSetChannel(channel); strInit(&loc,strCallback);
/* /* ing(); CdSetFilter(1,0); StSetChannel(0); channel = 0; } if (PadRead(1) &
PADRright) { StClearRing(); CdSetFilter(1,1); StSetChannel(1); channel =
1; } if (PadRead(1) & PADRdown) { StClearRing(); CdSetFilter(1,2);
StSetChannel(2); channel = 2; } if (PadRead(1) & PADRleft) { StClearRing();
CdSetFilter(1,3); StSetChannel(3); channel = 3; } /* dec.rect[id].w,
dec.rect[id].h); SetDefDrawEnv(&draw, dec.rect[id].x, dec.rect[id].y, dec.rect[id].w,
dec.rect[id].h);
#if IS_RGB24==1 disp.isrgb24 = IS_RGB24; disp.disp.w = disp.disp.w*2/3; #endif
PutDispEnv(&disp); PutDrawEnv(&draw); SetDispMask(1); /*);
CdControlB(CdlPause,0,0); }
```

```

/* * t imgbuf[16*PPW*240]; /* T(&dec->rect[1], x1, y1, 640*PPW, 240); setRECT(&dec->slice,
x0, y0, 16*PPW, 240); }
/* * static strKickCD(); DecDCTReset(0); /* MDEC { StCdInterrupt(); /* RGB24.x <
dec.rect[dec.rectid].x + dec.rect[dec.rectid].w) { /* dec.slice.y = dec.rect[dec.rectid].y;
/*DecDCTout(dec.imgbuf, dec.slice.w*dec.slice.h/2);/* } }
/* nt cnt = WAIT_TIME; u_long *next; static u_long *strNext(); while ((next = strNext(dec))
== 0) { /* get next frame */ if (--cnt == 0) return(-1); } dec->vldid = dec->vldid? 0: 1; /*
swap ID */ DecDCTvlc(next, dec->vlcbuf[dec->vldid]); /* VLC decode */ StFreeRing(next);
/* free used frame */ return(0); }
/* * dec; { u_long *addr; StHEADER *sector; int cnt = WAIT_TIME; static int width = 0;
/* { Rewind_Switch = 1; } /* ctor->width; height = sector->height; }
/* _long cnt = WAIT_TIME; while (dec->isdone == 0) { if (--cnt == 0) { /* timeout: id].x;
dec->slice.y = dec->rect[dec->rectid].y; } } dec->isdone = 0; }
/* * CDROM | CdlModeSpeed | CdlModeRT | CdlModeSF) == 0); }
CdSetFilter(file,chan) u_char file,chan; { CdlFILTER filt;
filt.file = file; filt.chan = chan; while(CdControl(CdlSetfilter,(u_char *)&filt,0)==0); }

```

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1/17/96 8:16 PM

Detecting the end of a movie

Chris E. Reese

CD

QUESTION: What are the best ways of detecting the end of a movie ("str" file) during streaming?

PROBLEM: 1) If I know a movie has 100 frames, I will know that I've reached the end of the movie when I retrieve frame #100 from the ring buffer (using StGetNext()); However, if the processing of the "str" data (and whatever other processes are taking place during streaming) lag behind the transfer of data from the CD to the ring buffer, the movie seems to skip frames when the ring buffer fills up and throws away unprocessed data.

This seems to be the case with our programs.

The real problem is when I miss the LAST frame, and therefore am not able to detect the end of the movie.

2) When the CD head reads past the end of the "str" file, it seems that even invalid stream data is read into the ring buffer and overwrites whatever valid data may still be sitting in the buffer unprocessed. Is this what happens?

Yet, it seems that StGetNext()--when it is called--performs a check on the data and returns 1 when it is looking at invalid stream data in the ring buffer.

In other words, (a) as I said above, I can't necessarily detect the end of the movie by looking for the last frame-- since the last frame may get overwritten--and (b) I can't detect the end of the movie just by determining if the CD is reading invalid frames-- since I don't seem to have a good way of distinguishing between when StGetNext() is in the process of retrieving the next frame of data and when StGetNext() is looking at "bad" data past the end of the movie (in both cases, StGetNext() returns 1).

3) If another "str" file comes after the one I'm reading, and I am not able to detect the end of the movie (missed the last frame), I would continue reading into the next movie.

NOT SO GREAT SOLUTIONS: 4) For the problem of unknowingly continuing past the last frame of a movie into the next movie, I can check to see if the number of the current frame is less than the number of the the previously read frame. For example, if a movie has 100 frames, and I read a frame #1 after reading frame #99, I have almost certainly read past the end of the movie. (This may not work in the rare-rare case of a short movie-- say, 2 frames. After reading frame #1 of the first movie, I may read frame #2 of the following movie.)

5) If I have continuously called StGetNext() for more than, say, 1 second without getting back a

valid frame of data, I could assume that I have reached the end of the movie.

6) Knowing the number of frames in the movie and the frame rate it should run at, I can calculate the length of the movie in time. I can then stop the playing of the movie when the time the movie takes to play has elapsed. (This assumes that the rate of transfer of each frame of data from the CD is the same as the frame rate of the movie.)

7) I can keep track of the position of the CD head (using CdControl(CdlGetlocL)), and knowing the end position of the movie file by knowing the file's start position and number of frames, I can know when the CD has read past the end of the file--at which time I would pause the CD and streaming in order to allow the data-processing to catch the last frame of the movie.

ARE THERE SIMPLER AND BETTER SOLUTIONS? PLEASE LET ME KNOW.

Chris Reese Eidetic, Inc.

---

1/18/96 9:09 PM

Screen Glitches when reading CDROM

Mike Benna

CD

I've run into a problem with the screen "glitching" (horizontal bands of garbage about 4 scanlines high which appear very briefly, scattered across the display, about 4 times per second) when I'm reading from the CDROM. As soon as I put the CD into pause mode, the problem goes away. I start reading again, the problem comes back. It happens on the emulator as well as the production PSX. It does not happen when reading from the PC's hard drive.

As near as I can tell there's some kind of interference happening between the CDROM subsystem and the video display subsystem. Does anyone have any ideas about the actual source of the problem and perhaps a suggestion on how to work around it? Thanks in advance for any tips.

---

1/22/96 10:00 AM

Re: Detecting the end of a movie

Thomas Boyd

Chris E. Reese

CD

1) standard movie problem 2) Yes 3) right 4) risky 5) this one takes time, and you could run into another movie unless you build your CD right. 6) good soln, but a pain to program 7) is one of my favorite solutions for this problem.

8) Another good solution is to "cap" the movie with a bunch of black frames and hex edit the frame number (by knowing the STR file header format - posted earlier in this conference) to be 1000 or something that will cause your ">=" test to stop in your while loop.

All in all, you have the right idea. There is no great way to detect the end. I think (7) or (8) your best option. If you come up with a better one, let me know.

Tom ----- QUESTION: What are the best ways of detecting the end of a movie ("str" file) during streaming?

PROBLEM: 1) If I know a movie has 100 frames, I will know that I've reached the end of the movie when I retrieve frame #100 from the ring buffer (using StGetNext()); However, if the processing of the "str" data (and whatever other processes are taking place during streaming) lag behind the transfer of data from the CD to the ring buffer, the movie seems to skip frames when the ring buffer fills up and throws away unprocessed data.

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3) If another "str" file comes after the one I'm reading, and I am not able to detect the end of the movie (missed the last frame), I would continue reading into the next movie.

NOT SO GREAT SOLUTIONS: 4) For the problem of unknowingly continuing past the last frame of a movie into the next movie, I can check to see if the number of the current frame is less than the number of the the previously read frame. For example, if a movie has 100 frames, and I read a frame #1 after reading frame #99, I have almost certainly read past the end of the movie. (This may not work in the rare-rare case of a short movie-- say, 2 frames. After reading frame #1 of the first movie, I may read frame #2 of the following movie.)

5) If I have continuously called StGetNext() for more than, say, 1 second without getting back a valid frame of data, I could assume that I have reached the end of the movie.

6) Knowing the number of frames in the movie and the frame rate it should run at, I can calculate the length of the movie in time. I can then stop the playing of the movie when the time the movie takes to play has elapsed. (This assumes that the rate of transfer of each frame of data from the CD is the same as the frame rate of the movie.)

7) I can keep track of the position of the CD head (using CdControl(CdlGetLocL)), and knowing the end position of the movie file by knowing the file's start position and number of frames, I can know when the CD has read past the end of the file--at which time I would pause the CD and streaming in order to allow the data-processing to catch the last frame of the movie.

ARE THERE SIMPLER AND BETTER SOLUTIONS? PLEASE LET ME KNOW.

Chris Reese Eidetic, Inc.

---

1/22/96 10:10 AM

Re: Screen Glitches when reading CDROM

Thomas Boyd

Mike Benna

CD

Are you playing movies at the time? This sounds strange (hardware?) to me. Can you tell me more about this - maybe send me your phone # so I can discuss it?

Tom ----- I've run into a problem with the screen "glitching" (horizontal bands of garbage about 4 scanlines high which appear very briefly, scattered across the display, about 4 times per second) when I'm reading from the CDROM. As soon as I put the CD into pause mode, the problem goes away. I start reading again, the problem comes back. It happens on the emulator as well as the production PSX. It does not happen when reading from the PC's hard drive.

As near as I can tell there's some kind of interference happening between the CDROM subsystem and the video display subsystem. Does anyone have any ideas about the actual source of the problem and perhaps a suggestion on how to work around it? Thanks in advance for any tips.

---

1/22/96 3:51 PM

Re(2): Screen Glitches when reading CDROM

Mike Benna

Thomas Boyd  
CD

Hmm.. I guess that means you haven't heard of this problem yet :( Feel free to telephone me to discuss the problem further; I can then provide you with all the answers to your questions. (604) 944-4997, 9am to 5pm Pacific time (I'm in Vancouver).

---

1/23/96 12:19 PM

Re(4): XA audio & CdlSetMode  
Sky Lounge  
CD

OK, I'm still failing to get XA audio to work. At this point, all I'm trying to do is create a simple 5 second sound in XA format and play it. I'm going to spell out in painful detail the steps I'm taking when trying to make this work. Hopefully, you'll see some mistake I've made and explain to me the error of my ways.

- 1.) First, I start on the Macintosh with a short sound file in AIFF format.
- 2.) I use RAW2XA to convert the audio file into an XA file. I save it out as a 18.9 kHz Mono format file.
- 3.) I take the file over to the PC where I used MOVPACK to create an STR file containing the audio. I put the file into channel 0, and leave the other 31 channels blank. (I'm changing total channels from the default of 4 to 32. I leave the subheader check box checked.)
- 4.) Next I use CDGEN to create a CCS file. I put the STR file I got from MOVPACK into the CD-ROM directory and then use the "File Type" command to set the file to the right type: Subheader file with Form 2 Sectors.
- 5.) I run CCS2CTI to convert the file created by CDGEN into a CTI file.
- 6.) I run BuildCD, passing along the resulting CTI file.

At this point, I should have a valid piece of audio in XA format on my emulated CD, right? So at this point, all I have to do it play it.

7.) I edit Cdtuto/tuto5.c slightly, recompile it, and run it. It plays silently.

Now, perhaps the problem lies, not with the CD layout process, but with the playback program. I've tried several modifications, but none work. Perhaps if I explain everything I've tried here, you can help me.

Before attempting to play the audio, the program does a CdSearchFile command on a specific filename. As provided, the program searches for this filename infinitely before playing it. I've never seen this command work.

- a.) I've tried commenting this code out, so that it plays sound at whatever track and sector it happens to be at.. No luck.
- b.) I've tried doing the above but also setting the minute, second, and sector to 0 so that it starts at the beginning of the disk, which in theory should work since the only thing on the disk is my 5 second sample. No luck.
- c.) I've tried changing the name of the file that is searched for to sample.str, where this is the name of the file created by MovPack and included (as inspection of the CTI file shows) in the CTI file. No luck.
- d.) I've tried changing the name of the file that is searched for to sample.xa, where this is the name of the file included in the str file by MovPack. No luck.

There. What have I done wrong?

---

1/23/96 5:14 PM

Re(5): XA audio & CdlSetMode  
Thomas Boyd  
CD

Sky Lounge

>1.) First, I start on the Macintosh with a short sound file in AIFF format. Fine

>2.) I use RAW2XA to convert the audio file into an XA file. I save it out as a 18.9 kHz Mono format file. Fine

>3.) I take the file over to the PC where I used MOVPACK to create an STR file containing the audio. >I put the file into channel 0, and leave the other 31 channels blank. (I'm changing total channels from >the default of 4 to 32. I leave the subheader check box checked.) Fine

>4.) Next I use CDGEN to create a CCS file. I put the STR file I got from MOVPACK into the CD-ROM >directory and then use the "File Type" command to set the file to the right type: Subheader file with >Form 2 Sectors. Good

>5.) I run CCS2CTI to convert the file created by CDGEN into a CTI file. OK

>6.) I run BuildCD, passing along the resulting CTI file. OK

>At this point, I should have a valid piece of audio in XA format on my emulated CD, right? So at this >point, all I have to do it play it. Should be true, but then step (7) would work...

>7.) I edit Cdtuto/tuto5.c slightly, recompile it, and run it. It plays silently. Not good

>Now, perhaps the problem lies, not with the CD layout process, but with the playback program. I've >tried several modifications, but none work. Perhaps if I explain everything I've tried here, you can help >me. >Before attempting to play the audio, the program does a CdSearchFile command on a specific filename. >As provided, the program searches for this filename infinitely before playing it. I've never seen this >command work. Are you on library version 3.3? Is the filename correct?

... OK, I have made this work, I will run through it button by button and write down what I did from front to back and see if you can catch what went wrong. This will take me an hour or so tomorrow.

Tom

---

1/23/96 8:17 PM

Re(3): Screen Glitches when reading CDROM

Mike Benna

CD

I've learned a little more about the video glitches I get when accessing the CDROM; let me outline everything I've learned so far:

1) I video taped the glitches to see what they look like when paused. They last for only one refresh (1/60th of a second), they span the entire width of the display, and they appear to contain mostly garbage but it's possible there is a little graphic information in there as well. They seem to cover about 8 scan lines. They seem to occur at all vertical locations on the screen, regardless of whether or not I'm drawing anything to those locations. The range in frequency from as fast as 5 per second to about 1 per 5 seconds.

2) I tried setting the display mode to 640x480 (this part of our game is normally 320x224) and the glitches continue to occur at all vertical locations and to span the whole width of the display.

3) I have a call to StoreImage() in my main loop which gets called many times while building a new frame. If I comment out this line of code, the glitches go away. The frequency of the glitches seems related to how much data StoreImage() processes each frame (i.e. the more data moved, the more glitches occur).

4) Calls to LoadImage() and MoveImage() which update the display area do not affect whether the problem occurs or not. Taking them out does not stop the glitches and leaving them in but taking out the StoreImage() does stop the glitches. I do not think they have anything to do with the problem.

5) As soon as the CDROM is put into pause mode and CdGetSector() is no longer being called, the glitches go away.

6) I tried putting a call to CdDataSync(0) before the StoreImage() call but it did not solve the

problem. It is possible (but not confirmed) that this change may have reduced the frequency with which the glitches appear.

7) The problem appears in exactly the same manner on the development system, the Debug Station, and a production Play Station.

8) Due to the complexity of the code, I didn't yet try taking CdGetSector() out of the callback. When I found the StoreImage() relationship I thought it might be best to take one of the CdGetSector() examples and add a StoreImage() to it and hopefully recreate the problem.

Thomas, can you do this for me? Thanks.

If I had to come up with an explanation at this point I'd say it looks like the StoreImage() DMA gets blocked by the CdGetSector() DMA but still holds onto the video bus, thus preventing the display hardware from reading the correct data while the StoreImage() DMA is blocked. I have no idea how the underlying hardware works so this description may be totally off base, but hopefully it helps to understand the way things are acting on my end.

---

1/24/96 5:14 PM

Re: CD tool upgrade

Thomas Boyd

David W. Marshall

CD

They (SN) say have built it. I will see where it is in the release queue.

T

A while back it was mentioned that SNSystems was working on a version of the emulator that would support generation of data errors on reading and would also emulate a "cd door open" state. Any news on these?

dave

---

1/24/96 1:48 PM

Can CdSearchFile handle ("\\Foo\\Bar\\Bar\\baz.txt")?

Sam Black

CD

CdSearchFile seems to always fail when I have a directory which contains a sub-directory of the same name. (Foo\\Bar is OK, Foo\\Bar\\Bar is not.) As far as I can tell, this is legal by ISO-9660, and the cdmmap file indicates that the file is getting written to the emulator, but my program always fails right there. Retrying doesn't work either. (as it occasionally does for other files.)

I'm eventually going to bag the whole CdSearchFile thing, but it would be nice if I could get it to work to put off that part of the project...

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1/24/96 1:32 PM

Re(4): Screen Glitches when reading CDROM

Dr. Cat

CD

> 7) The problem appears in exactly the same manner on the development > system, the Debug Station, and a production Play Station.

How are you testing code on a production PlayStation? I thought that was not supposed to be possible.

---

1/24/96 4:52 PM  
CD tool upgrade  
David W. Marshall  
CD

A while back it was mentioned that SNSystems was working on a version of the emulator that would support generation of data errors on reading and would also emulate a "cd door open" state. Any news on these?  
dave

---

1/25/96 9:26 PM  
Re: CD-ROM Generator crashing - More info on bug  
Dr. Cat  
Dr. Cat  
Bugs

I had the "Warning & Error Message" window mostly off-screen, so I didn't notice before - right when I click on the Record button, a bunch of messages like:

"C:\CDTMP\C0000365.DIR does not exist."

pop up in there.

I've also just tried re-installing the CDGEN software from floppy after deleting it all, and then trying to create a new CCS step by step. First I created all the blank directories and added my PSX.EXE file, save that as A1.CCS, click on Rec, the record dialog comes up ok. Fill up a few directories with files, save as A2.CCS, try to record again. Saving incremental versions so I'll theoreticall have one good one from just before I added enough stuff to crash. What happened was I got up to A5.CCS, it crashed with a bunch of the warning/error messages about missing files in C:\CDTMP. Then I tried going back to A5.CCS, and it crashed as well, wanting some of the same files that trying to make A5.CCS had apparently trashed!

Went back a bit later and tried A1 and then A2, they both worked... A3, A4, and A5 don't. But I could actually get to the record dialog box, it just wiped all the directories and left me with an image with NOTHING but the PSX.EXE file in it. The recording dialog indicated a recording time of 7 seconds, and closing it left me back in CDGEN with all my directory folders gone, and trying to exit or load another .CCS asks me if I want to save my changed file first.

This is really driving me up the wall...

---

1/25/96 9:50 AM  
Run Level Data Size  
Chris E. Reese  
CD

#### FINDING THE MAXIMUM SIZE OF THE RUN-LEVEL IN DECODING MOVIES

##### PROBLEM:

We want the size of the buffer for the run-level data (i.e., the output of DecDCTvlc()) to be only as big as it has to be.

##### QUESTION:

How do we determine what is "big enough" for the size of this buffer? In other words, knowing the number of sectors per frame in a movie, or the resolution and frame-rate of the movie, or whatever, is there a way to calculate the maximum size that the run-level for a frame of data can possibly be?

(DecDCTBufSize() tells us the size of the run-level only AFTER it has been generated, right?)

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1/25/96 2:29 PM

Re(5): Screen Glitches when reading CDROM

Mike Benna

CD

> How are you testing code on a production PlayStation? I thought that was not supposed to be possible.

The same way everyone on the internet is playing Japanese products on their American consoles. I use the "swap CD during the CD player screen" trick. For more info, find the Playstation FAQ on the internet.

---

1/25/96 8:14 PM

CD-ROM Generator crashing

Dr. Cat

Bugs

Ok, I've got most of the product I'm doing working now, on the CD emulator. I've burned earlier versions of it onto test CDs with no problem. But now... The project has gotten up to somewhere over 500 files. I have them in 22 subdirectories, and I have been careful not to put more than 30 files in any subdirectory. I think tops is 29, actually. As I said, it runs fine on the emulator. But when I pop into Windows and run the CD Generator...

Clicking on Rec gives a dialog "Some files are not found or size is changed. Update CD-ROM information?" This is fine, I've seen it before each time I add new stuff and go to burn, so I click on Yes. This gives the following two error dialogs:

CDGEN An error has occurred in your application. If you choose Ignore, you should save your work in a new file. If you choose Close, your application will terminate.

Then clicking on close pops up:

Application Error CDGEN caused a General Protection Fault in module CDGEN.EXE at 0002:1C9D.

I am using version 1.10 of the CD-ROM Generator, under Windows 3.11 on a 90 MHz Pentium with 24 megabytes of RAM.

I do have one other minor problem I'd had earlier and hadn't gotten around to reporting yet, if it might give any insight. In the dialog that pops up when clicking on Layout and then Master, the field labelled "Licence Area" where I have to put an "A" according to the documentation I have, that field does not seem to be saved. I have to re-enter it every time I burn a CD. I can enter it, click ok, and look at the dialog again and it's still there. But if I save the file and reload it, then look at the dialog, the field is blank again.

I had a theory that this happened because I originally created my .ccs file on a different machine with different directory layouts, brought that file to my machine, and deleted the files and re-added them from their locations on my machine (and changed the path to licencea.dat in Volume/Additional Information). So I thought that maybe my CCS file had some non-displayed fields that were somehow dependent on the layout of the first machine's directories and drives. But just now I tried to see if The Licence Area field would stay if I just booted CDGEN, entered an "A", and saved it as a new file. Same symptoms.

I can live with having to re-enter the A every time, but I do need some kind of fix or workaround for the General Protection Fault so I can burn the deliverable for my next milestone! Any ideas?

-- Dr. Cat

---

1/29/96 9:09 AM

CDBOOT30.BIN  
Thomas Boyd  
CD

CDBOOT30.ZIP        30K  
CD Creation

Although this will be official released in a couple days, I know a few of you want to test this out now. It is a CDBOOT that will allow you to simulate opening the CD lid and inserting other CDs.

Please give me your comments.  
Tom

---

1/29/96 9:36 AM

Re(2): CD-ROM Generator crashing - More info on bug

David W. Marshall

Dr. Cat

Dr. Cat

The c:\cdtmp\.... does not exist comes from how CDGEN handles subdirectories in the layout. In the directory window of CDGEN, when you make a subdirectory in your layout the SOURCE FILE line will be blank. When you click on REC to burn a disk, cdgen will create the subdirectories on your harddrive and fill in the SOURCE FILE line with c:\cdtmp\....

If you save this CCS file, you are now screwed and will get the "does not exist" error because you have saved this tmp SOURCE FILE reference into your CCS file. If you do this, you can hand edit the CCS file and remove these tmp file references and everything will work fine. I usually just make my basic CCS file and use that to burn. Every time it tells me that files have changed and I have to update, but everything still works fine.

At one point I tried using CDDISK to make a CCS file for me. If I used that CCS file, I would get the protection fault error messages from CDGEN and it would crash. So I just didn't use CDDISK to make a CCS file anymore.

dave

---

1/29/96 11:12 AM

Re: CDBOOT30.BIN

David W. Marshall

Thomas Boyd

CD

MultiCD might be better than having to burn disks for testing, but I was hoping for the following:

1)MultiCd as a TSR that would allow keyboard presses to trigger door opening and closing.

2)command line options MULTICD O MULTICD C to trigger opening and closing.

Basically I want to be in the debugger watching my code as the door opens and closes (like I can do with the blackcd drive). I just tried MultiCD to open/close while playing a redbook track and the results were different than when the code is run from a blackcd drive. I got

CD

Timeout: CD\_cw(CdlNop) Sync =NoIntr, Ready=DiskError

from multgcd. Since I can't be in the debugger until it's too late, I'm not sure what's going on.

Am I missing something on how to use MultiCd?

dave

---

1/30/96 6:27 PM

Re(3): Fwd: How many files can...

Blake E. Senftner  
CD

I still do not understand why one needs more than 2 files on a disc, if you're not using red track audio.

1 file for your executable. 1 file for all your game data. My game data file is 600 meg, and I just seek around and play sectors. No hassle, no CdSearchFile, no subdirectories...

When building less than a complete disc, I just do that, build a smaller data file.

I think the key is to have the data file specify the seek offsets within itself. That way the data file never refers to a seek location outside itself.

-Blake

---

1/30/96 3:15 PM  
How many files can...  
Borden Covell II  
CD

Could someone please clear up a question that keeps coming back again and again, i.e. exactly how many files can we put on a CD?

The OS Doc states that there are no subdirectories and an unlimited number of files. Well, we know that to be wrong.

The Library 3.0 /Overview doc states that there can be up to 8 levels of subdirectories and that the maximum number of "entries" is 45 and the max number of files is 30. Is entries the same as sub-directories? Can there really be 8 levels? Can each level have up to 8 sub-levels?

So what are the theoretical and real-world limits? Can you have 8 \* 8 \* 8 \* 8 \* 8 \* 8 \* 8 \* 8 directories? Can each of those have 30 files each?

Please clarify!!!!???

---

1/30/96 3:46 PM  
Re(4): Screen Glitches when reading CDRROM  
Mike Benna  
CD

It's been a week now since I posted my new information about the screen glitching problem and I have not heard back from anyone at all. Please respond so I know what to expect from here.

Here is a repost of my message from the 23rd:

I've learned a little more about the video glitches I get when accessing the CDRROM; let me outline everything I've learned so far:

1) I video taped the glitches to see what they look like when paused. They last for only one refresh (1/60th of a second), they span the entire width of the display, and they appear to contain mostly garbage but it's possible there is a little graphic information in there as well. They seem to cover about 8 scan lines. They seem to occur at all vertical locations on the screen, regardless of whether or not I'm drawing anything to those locations. The range in frequency from as fast as 5 per second to about 1 per 5 seconds.

2) I tried setting the display mode to 640x480 (this part of our game is normally 320x224) and the glitches continue to occur at all vertical locations and to span the whole width of the display.

3) I have a call to StoreImage() in my main loop which gets called many times while building a new frame. If I comment out this line of code, the glitches go away. The frequency of the glitches seems related to how much data StoreImage() processes each frame (i.e. the more data moved, the more glitches occur).

4) Calls to LoadImage() and MoveImage() which update the display area do not affect whether the problem occurs or not. Taking them out does not stop the glitches and leaving them in but



taking out the StoreImage() does stop the glitches. I do not think they have anything to do with the problem.

5) As soon as the CDROM is put into pause mode and CdGetSector() is no longer being called, the glitches go away.

6) I tried putting a call to CdDataSync(0) before the StoreImage() call but it did not solve the problem. It is possible (but not confirmed) that this change may have reduced the frequency with which the glitches appear.

7) The problem appears in exactly the same manner on the development system, the Debug Station, and a production Play Station.

8) Due to the complexity of the code, I didn't yet try taking CdGetSector() out of the callback. When I found the StoreImage() relationship I thought it might be best to take one of the CdGetSector() examples and add a StoreImage() to it and hopefully recreate the problem. Thomas, can you do this for me? Thanks.

If I had to come up with an explanation at this point I'd say it looks like the StoreImage() DMA gets blocked by the CdGetSector() DMA but still holds onto the video bus, thus preventing the display hardware from reading the correct data while the StoreImage() DMA is blocked. I have no idea how the underlying hardware works so this description may be totally off base, but hopefully it helps to understand the way things are acting on my end.

---

1/30/96 4:11 PM

Re(5): Screen Glitches when reading CDROM

Thomas Boyd

CD

Mike Benna

Mike,

I have tried to recreate your problem as you have described, but I cannot make it happen. I think you may be right about the DMA conflict, so I tried messing with that to force conflict - still zilch. Now my bag of ideas on your glitches is used up. I need you to make an example of this for me. If you do, I can find the cause. My time is so divided, it will take me longer than you to make the example happen at this point.

Tom ----- It's been a week now since I posted my new information about the screen glitching problem and I have not heard back from anyone at all. Please respond so I know what to expect from here....

---

1/30/96 4:03 PM

Re: Fwd: How many files can...

Thomas Boyd

CD

Borden Covell II

Borden,

It depends (you knew this would not be simple).

1) You need to keep the number of files in the root below 45, otherwise, the TOC lookup may fail to find your boot file on startup (bummer).

2) If you use CdSearchFile, you need to be aware that it has a 2K buffer. If your TOC is too big, it will overflow for that function. That is the reason for the following:

"The Library 3.0 /Overview doc states that there can be up to 8 levels of subdirectories and that the maximum number of "entries" is 45 and the max number of files is 30."

3) If you skip out on CdSearchFile (as everybody should, because it is slowwwwwwww) and hard code your directory structure, you can have a bizzillion files in subdirectories (nested only as deep as CDGEN will allow) and just seek directly to their locations regardless of your TOC

limitations.

4) remember that CDDA tracks need their own tracks (by definition), but CDGEN will put references to them in your track 1 TOC. You can erase these references or move them to a subdirectory if they add to many files to your root.

Tom -----

Could someone please clear up a question that keeps coming back again and again, i.e. exactly how many files can we put on a CD?

The OS Doc states that there are no subdirectories and an unlimited number of files. Well, we know that to be wrong.

The Library 3.0 /Overview doc states that there can be up to 8 levels of subdirectories and that the maximum number of "entries" is 45 and the max number of files is 30. Is entries the same as sub-directories? Can there really be 8 levels? Can each level have up to 8 sub-levels?

So what are the theoretical and real-world limits? Can you have 8 \* 8 \* 8 \* 8 \* 8 \* 8 \* 8 \* 8 directories? Can each of those have 30 files each?

Please clarify!!!!???

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1/30/96 4:31 PM

Re(2): Fwd: How many files can...

David W. Marshall

Thomas Boyd

CD

>>>3) If you skip out on CdSearchFile (as everybody should, because it is >>>slowwwwwwww) and hard code your directory structure, you can have a bizzillion >>>files in subdirectories (nested only as deep as CDGEN will allow) and just seek directly to >>>their locations regardless of your TOC limitations.

But, CDDISK will crash hard and reboot your system when trying to look into a subdirectory that has more than about 40 files. Still hoping that SN Systems will fix this bug.

dave

---

1/31/96 1:33 PM

CdRead problems

Geoffry R. Meek

CD

I'm trying to read in a file off of the CD, or CD-EMU, one sector at a time using CdRead & CdReadSync. The first sector is read okay, but subsequent sectors do not look like part of the file and are all the same. Some times it will read the first sector and then read the 5th sector.

I first do a CdSearchFile then a CdSetLoc, then read each sector in one at a time in a loop.

The date on my libcd.lib file is 12/4/95.

The file is written on the CD in Form1 data on an XA track. I tried other files with the same results.

Any help would be appreciated Thanx,

Ron Maxwell Virtual Music Entertainment, inc. ron@virtualmusic.com

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1/31/96 9:41 AM

Re(4): Fwd: How many files can...

David W. Marshall

CD

>>> still do not understand why one needs more than 2 files on a disc, if you're >>>not using red track audio.

If I have a game with 20 levels, 30 different model files, 20 different sound modules, I can update those model files and have updatedcd only write 100k to my cd drive. It seems with your method, wouldn't updatedcd have to write megs of data every time you needed to update something.

As Tom suggested, if data is accessed by sector location, you basically use the data as one flat file anyway. But, hey everybody does what they like to do, so party on.

dave

---

1/31/96 10:36 AM

Re(6): Screen Glitches when reading CDROM

Mike Benna

Thomas Boyd

CD

CDGLITCH.ZIP        6K

CD Creation

Tom writes:

>I need you to make an example of this for me. If you do, I can find the cause.

OK, here's an example. I modified the SAMPLE\MOVIE\CDTUTO\TUTO6.C program, as well as some minor changes in balls.c.

---

1/31/96 11:35 AM

Re(7): Screen Glitches when reading CDROM

Thomas Boyd

CD

Bleacchhhhh! I see what you mean. I will pursue....

T

---

1/31/96 1:40 PM

Re: CdRead problems

player 1

CD

Why are you using read with a loop when you can just do something like this?

```
CdRead((File.Size+2047)/2048,buf,mode);
```

That eliminates the loop and I know this works, as I have tried it.

Tom Ketola PSX Programmer Player 1, Inc.

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1/31/96 3:51 PM

Where can I find description of records in CCS file?

Geoffry R. Meek

CD

We've been told that using CdSearchFile() to find a file is unacceptably slow for a real product, and we've been advised that the best way is to hard-code file locations into our code. Since

there will likely be hundreds of files on the CD (the PC and Mac versions of our game contain 1000+ files), we need to come up with a way to automate the process of generating this data. It appears that the CCS file contains starting sector numbers for the files, but I may be mistaken. If that's the case, my problem is basically solved - once we have that info, we're all set. Is the layout of the CCS file available somewhere? I'd rather \*know\* and do the job correctly, than \*guess\* and write something that will break a few months down the road. If the CCS file is not the place, who does know this information? I know I can get it by burning a CD and finding out where everything got put, but I'd rather not do that. Thanks.  
Vernon Miller Virtual Music Entertainment Inc.

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1/31/96 2:38 PM  
Re(2): CdRead problems  
Geoffry R. Meek  
CD

In this particular case I don't want to have to allocate a buffer to hold the complete file. I want to read it a sector at a time.  
Ron

---

2/1/96 10:25 AM  
Re: Bootable CD problems  
Thomas Boyd  
CD  
Pat Quinn

>We've been having troubles getting our program to execute on the debug >station. We followed all the helpful hints from the CD conference (especially the >FAQ). We were able to get some programs to work on the debug station. If the >executable becomes too large it will not boot. Please answer the following >questions :

>1) Is there a limit to the size of the program (e.g. psx.exe) booted by the ROM? Other than fitting into 2Meg with all symbols and mallocs, no.

>2) More generally, is there a limit to the size of an executable file run by 'LoadExec'? LoadExec just loads into mem a sector at a time then runs at the start address. So I think there is no limit since it is just reading along using a pointer. Here is a piece of it: ... unsigned char \*p, \*q; ... p = (unsigned char \*)exec->t\_addr; // load here q = p + exec->t\_size; // end address for(;p<q;p+=2048) read(fd, p, 2048); ...

>3) Third question needs a bit of explaining. We had an executable that was about > 196,000 bytes in size and was working on the debug station. We added an > initialised array of 10,000 bytes to this program. The program no longer > worked. Has anyone had this type of problem? Any suggestions as to why > adding the 10,000 bytes would cause our program not to execute?

If you have time, the quickest way to get through this is to send me your phone number and I can call you back today. I also wanna know the following for starters when I call: Do you know if it starts loading? executing? Is this file your primary boot file or a file being launched by LoadExec by a shell program? If LoadExec-ing from a shell, are you using CdSearchFile to find the file you are LoadExec-ing? How many files are in your root directory? Be aware that CD-DA tracks sometimes are listed in the root. The best way to accurately find out is do DIR from a PC CD-ROM drive. (I know you said you only changed the EXE size, but I am just checking). Did you re-enter the "A" in the license area each time you re-booted CDGEN? Do you have a system.cnf, or is it still PSX.EXE? If worse comes to worse, I can analyse your CD here and find

out if it is a buss error, load error, or something.

>P.S. We did check to see if we were using memory beyond 2meg. And yes, >we are linking with 2mbyte.obj. Check your mallocs too.

>P.P.S. All our cd's (even ones with large .exe's) work on the cd drive attached >to the development board. OK

>P.P.P.S There are no pollhosts or any other type of PC I/O functions being >executed in our program. OK

---

2/1/96 7:26 PM

Re(6): Screen Glitches when reading CDROM

John Brandwood

CD

Mike Benna

Mike & Tom,

My FadeDown() routine does a StoreImage() call to get the current backscreen before doing a fade and I can definitely confirm that I get screen glitches when doing a FadeDown() whilst I am also doing CD loading in the background. These glitches don't occur when I move the FadeDown() call to a time when I am not doing any CD access.

When I move to lib 3.4 I'll change to using MoveImage() calls to sync the screens and hopefully this problem will go away. Unfortunately, when I tried moving to lib 3.4 a couple of days ago, the change brought out or maybe caused a crash bug that doesn't occur under lib 3.3.

John.

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2/1/96 10:29 AM

Re: Where can I find description of records in CCS file?

Thomas Boyd

CD

Geoffry R. Meek

>We've been told that using CdSearchFile() to find a file is unacceptably slow for a real >product, and we've been advised that the best way is to hard-code file locations into >our code.

It is not unacceptable, it is just slow and buggy. Sorry if I got carried away in bashing it.

>It appears that the CCS file contains starting sector numbers for the files, but I may be mistaken. >If that's the case, my problem is basically solved - once we have that info, we're all set.

You are correct. The number after the filename is the location. The conversion formula is in the CD FAQ somewhere.

>Is the layout of the CCS file available somewhere? I'd rather \*know\* and do the job correctly, >than \*guess\* and write something that will break a few months down the road.

No, but I know that that is the file location from experiment and looking at the CCS file in CDGEN (it lists locations too). Other developers have written similar utilities and they work. You have the right idea.

---

2/1/96 7:11 AM

Bootable CD problems

Pat Quinn

CD

We've been having troubles getting our program to execute on the debug station. We followed all the helpful hints from the CD conference (especially the FAQ). We were able to get some programs to work on the debug station. If the executable becomes too large it will not boot. Please answer the following questions :

1) Is there a limit to the size of the program (e.g. psx.exe) booted by the ROM? 2) More generally, is there a limit to the size of an executable file run by 'LoadExec'? 3) Third question needs a bit of explaining. We had an executable that was about 196,000 bytes in size and was working on the debug station. We added an initialised array of 10,000 bytes to this program. The program no longer worked. Has anyone had this type of problem? Any suggestions as to why adding the 10,000 bytes would cause our program not to execute?

Thanks in advance for your help,  
Gordon Read NuFX, Inc.

P.S. We did check to see if we were using memory beyond 2meg. And yes, we are linking with 2mbyte.obj. P.P.S. All our cd's (even ones with large .exe's) work on the cd drive attached to the development board. P.P.P.S There are no pollhosts or any other type of PC I/O functions being executed in our program.

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2/1/96 12:09 PM

Re(2): Where can I find description of records in CCS file?

Geoffry R. Meek

Thomas Boyd

CD

OK, thanks. I did the same research and came to the same conclusion as to where the starting sector was found - but I was hoping to get an "official" document that verified my belief. Oh, well...

Vernon

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2/1/96 9:43 PM

Re(7): Screen Glitches when reading CDROM

Roy Eltham

CD

You know it possible to do a fade down by just drawing a screen (or even just an area) sized solid block with the attributes (global in this case) set to the (third, I believe) subtractive semitrans mode (the one that takes 100% of the background and subtracts some % of the foreground from it). You can set the color of the solid block to 1,1,1 (R,G,B) for a slow fade out to black by repeatedly drawing the solid block to the screen.

As an added bonus you can use colors like 0,1,1 (R,G,B) to fade the green and blue parts of the background out and you will be left with a "shades of red" image.

Roy

p.s. haven't figured out any easy way to fade up the whole screen to an image (not solid color), but you can repeatedly load the source image and fade it down less and less before displaying each frame. (load image fade it down to near black in one step, then display, load image again and fade to near black (but brighter than last time) and display, repeat....)

---

2/1/96 10:56 AM

Re: CdRead problems

Thomas Boyd  
CD

Your method sounds good, this has worked for me. Can you send me a short sample so I can find out what's wrong?

Tom --

I'm trying to read in a file off of the CD, or CD-EMU, one sector at a time using CdRead & CdReadSync. The first sector is read okay, but subsequent sectors do not look like part of the file and are all the same. Some times it will read the first sector and then read the 5th sector. I first do a CdSearchFile then a CdSetLoc, then read each sector in one at a time in a loop. The date on my libcd.lib file is 12/4/95.

The file is written on the CD in Form1 data on an XA track. I tried other files with the same results.

Any help would be appreciated Thanx,

Ron Maxwell Virtual Music Entertainment, inc. ron@virtualmusic.com

---

2/2/96 2:25 PM

Re(8): Screen Glitches when reading CDROM

John Brandwood

Roy Eltham

CD

>You know it possible to do a fade down by just drawing a screen (or even just an area) sized solid block with the >attributes (global in this case) set to the (third, I believe) subtractive semitrans mode (the one that takes 100% of the >background and subtracts some % of the foreground from it). You can set the color of the solid block to 1,1,1 (R,G,B) >for a slow fade out to black by repeatedly drawing the solid block to the screen.

Sure, thats what I'm doing. Its just that I'm doing the drawing to a backscreen so that the raster doesn't catch the fade part way down the screen. This means that I need to have both the backscreen and forescreen start out with exactly the same image. Before the new MoveImage() call was added to lib 3.4, the easiest way to do this was to do a StoreImage()/LoadImage() combination.

>p.s. haven't figured out any easy way to fade up the whole screen to an image (not solid color), but you can repeatedly >load the source image and fade it down less and less before displaying each frame. (load image fade it down to near >black in one step, then display, load image again and fade to near black (but brighter then last time) and display, repeat And thats what I'm doing for a fade up.

The real challenge has been to do a 24-bit fade up and down.

I've written a software fade that can fade down a 24-bit screen at 20fps, but I've had to give up on trying to write a software fade up routine.

Does anyone know of a software/hardware trick to fade up/down 24-bit screens ?

John.

---

2/2/96 3:07 PM

Re(6): XA audio & CdSetMode

Sky Lounge

CD

Ok, after leaving you a phone message saying it didn't work, we've since gotten your samples to work. Part of the problem seems to be that the CdSearchFile call (at least as it is used in TUTO5.C) doesn't work. If we instead use the cd.map file to locate the second and sector values

for the start of the track and hard code them into the fp.pos structure, the sound will play. We're still having trouble getting sounds we create ourselves to play. At least we can now create noise that resembles our original sounds, which is a big step forward. It seems like the RAW2XA doesn't generate a good file, at least not with an aiff source. We're going to look into the PC based sound tools next.

---

2/5/96 7:34 AM

Re(3): CdRead problems

Sam Black

Geoffry R. Meek

CD

>In this particular case I don't want to have to allocate a buffer to hold the complete file. I  
>want to read it a sector at a time.

In my (admittedly limited) experience, in order to do that, I've been forced to do a seek before each read. (otherwise, I'd always get the same sector) It works for me, and I'm going to leave it until the DevCon, since my game doesn't access data on the CD during gameplay, so I don't really care (right now) how long the CD I/O takes.

---Jim Sokoloff

---

2/5/96 7:15 PM

CD Burner

Borden Covell II

CD

Not sure where to post this, so I'm throwing it in here and there.

Does any know of any reasonably priced S/W that runs can be used to burn CDs under DOS or Windows and that supports the Sony PSX CD-ROM burner???

Thanks!

---

2/5/96 8:48 AM

Re(7): XA audio & CdISetMode

Thomas Boyd

CD

Sky Lounge

Movie converter's WAV2XA conversion works all the time for me. (And it is very fast).

Tom ===== Ok, after leaving you a phone message saying it didn't work, we've since gotten your samples to work. Part of the problem seems to be that the CdSearchFile call (at least as it is used in TUTO5.C) doesn't work. If we instead use the cd.map file to locate the second and sector values for the start of the track and hard code them into the fp.pos structure, the sound will play.

We're still having trouble getting sounds we create ourselves to play. At least we can now create noise that resembles our original sounds, which is a big step forward. It seems like the RAW2XA doesn't generate a good file, at least not with an aiff source. We're going to look into the PC based sound tools next.

---



2/6/96 1:54 PM  
Re(8): Screen Glitches when reading CDROM  
Mike Benna  
CD

Well, it's been another week since I posted code to recreate the problem and the only thing I've heard back so far is "Blech... I see what you mean" (or words to that effect). Is anyone actively looking into this problem? We're getting very close to finishing our project and we need to get this problem resolved ASAP.  
We've also got the SPU streaming problem outstanding but I'll post about that in the sound conference.

---

2/6/96 2:37 PM  
CD software  
Thomas Boyd  
Borden Covell II

Borden  
Easy CDPRO multimedia by Incat Systems.  
It WONT make PSX disks, but it will do PC, etc...  
Tom

---

2/7/96 12:45 PM  
cpe file format  
David W. Marshall  
CD

I am trying to pad the end of my main.cpe file with 0's so main.cpe can grow and I won't have to rebuild my disk. Padding the file will keep the sector locations the same for both the emulator and CDGEN, since CDGEN does not process MINLENGTH or ADDLENGTH commands.  
I pad my main.cpe from 243712 to 450000. When I run CPE2X on main.cpe, it ignores the padding and returns a t\_size:0003b800 which is 243712 and creates a main.exe of 245760. So I assume that somewhere in the CPE file is the encoded file size. Can someone tell me the format of the CPE file so I can change the internal file size. Is there some other way I should be trying to do this?  
thanks,  
dave

---

2/7/96 3:38 PM  
Re(2): cpe file format  
David W. Marshall  
Dan Burnash  
CD

>>>I pad my main.cpe from 243712 to 450000. When I run CPE2X on main.cpe, it ignores the >>>padding and returns a t\_size:0003b800 which is 243712 and creates a main.exe of >>>245760. I ended up running CPE2X on main.cpe and then padding out main.exe to 450000. I was worried this might cause problems with the PSX loading main.exe from the system.cnf file, but everything seems to be fine.  
Just to waste keystrokes, I really, really wish someone at SCE would pickup and support

CDGEN so it could do things like handle MINLENGTH commands.

dave

---

2/7/96 2:45 PM

Re: cpe file format

Dan Burnash

CD

David W. Marshall

Would be nice. But I don't even know it.

If you want to pad the size on a CD, why not create a dummy data file that you vary the size of when the executable changes. This would essentially do the same thing as the minlength or addlength commands in buildcd. I realize that having the same mechanism for both would be nice, however, and I will let you know if I find a way to do it.

Dan Burnash

---

2/8/96 1:48 PM

latest licensea.dat

David W. Marshall

CD

Is the licensea.dat file from 10/4/95 the file to use?

thanks,

dave

---

2/8/96 1:45 PM

Re: CCS2CTI bug fix

David W. Marshall

CD

Also be aware that CDGEN can layout subdirectories incorrectly. CD FAQ section 4-4-2 shows the correct and incorrect way to have subdirectories in your disk layout. CDGEN can create an incorrect layout. Make sure you check your layout window in CDGEN, you might have to move the actual subdirectory down to where the files in that subdirectory start in the layout window.

dave

---

2/8/96 4:26 PM

BUILDCD request

David W. Marshall

CD

Can SN Systems modify BUILDCD to display a "% done" listing when running in batch mode (-l flag)?

Since BUILDCD often hangs when running from a DOS window, I can't really use the batch mode because I can't tell if it is running or if it is hung up.

thanks,  
dave

---

2/8/96 5:08 PM  
cd emu stuff and stuff  
R.Brett Butler  
CD

i noticed that in the rcude demo, that there are philes:  
cd.cti -> created from my game.ccs file (from cdgen layer prgm) cd.map  
is there a game.map builder/converter utility? is this file necessary for cdemulation &/or cd  
burning &/or game execution on either?  
\_\_\_\_\_ found-a bug in cd-gen (windows)  
when i'm in track layout mode, and i highlight a couple of files & hit [delete] to remove them, i  
get a system error. then if i hit [ignore] a few times it appears to work. is it working?

---

2/8/96 11:50 AM  
CCS2CTI bug fix  
Thomas Boyd  
CD

Dear CD newsgroup readers,  
Here is a (very) helpful tip that was discovered and reported by Markus:  
1) the last file in your layout has to be in the root directory for CCS2CTI to work. 2) all CD-DA  
tracks HAVE to be in your root for CCS2CTI to work right.  
Remember: your TOC will be alphabetized, but the LAYOUT will be what you specify in  
CDGEN by dragging and dropping files around.  
Tom

---

2/9/96 4:03 PM  
where is xa7v.xa  
jeffrey Hall  
CD

In one of the cd tutorials a cdx file is referenced (xa7v.xa). I've looked around and couldn't find  
it. Where is it? Thanks, Jeff Hall

---

2/9/96 4:19 PM  
Re: where is xa7v.xa  
Thomas Boyd  
CD  
jeffrey Hall  
There will be an xa8v.xa on the next CD, it is huge and not a fun download, so I suggest just  
making your own XA interleaved file for now.  
Tom

---

2/9/96 9:16 AM

Re: cd emu stuff and stuff

David W. Marshall

R.Brett Butler

CD

>>>cd.cti -> created from my game.ccs file (from cdgen layer prgm) >>>cd.map >>>is there a game.map builder/converter utility? >>>is this file necessary for cdemulation &/or cd burning &/or game execution on either?

cd.map is created by BUILDCD when making the EMU image. buildcd -s3:2 -mcdread.map cdread.cti

The .map file is then used by UPDATECD to determine if any of your files have changed and will update those onto your disk.

Not surprised that you are having problems with CDGEN. It is a terrible program that will never be updated. I am surprised that with the amount of developers that use CDGEN that SCE has not hired a contractor to redo CDGEN.

dave

---

2/9/96 4:08 PM

Re: BUILDCD request

Thomas Boyd

CD

David W. Marshall

I asked them. Tom -----

Can SN Systems modify BUILDCD to display a "% done" listing when running in batch mode (-l flag)?

Since BUILDCD often hangs when running from a DOS window, I can't really use the batch mode because I can't tell if it is running or if it is hung up.

thanks,

dave

---

2/10/96 7:16 PM

Re(2): Fwd: How many files ca

Mark Randell

CD

You say that CdSearchFile is slow. How slow? I'm having unexplained delays in the loading time and I wonder if CdSearchFile is the culprit. How long does CdSearchFile() take? Any info is appreciated. Mark

---

2/11/96 1:30 PM

cd emu Q's

R.Brett Butler

CD

{Q.1} i noticed in the cdemu data i received that the rcube demo contains files called "psx.exe" and "rcube.exe". [\cdemu\sample\rcube\]

what is "psx.exe"? do i need to include it in my game cdemu stage?

{Q.2} when i'm in CDGEN (directory view). do i need to include game.map and game.cti in my listing? do i just need to list my "game.exe" and all my (art/sound) data files?

{Q.3} the external HD i plugged into my cdemu card is an APS Drive. has anyone heard

anything about the reliability of this type with sony emulation? skipping sound? trippy movies?  
{Q.4} the dox say that all data goes in track 1 except XA files. XA files go on their own tracks.  
can too much data be assigned to track 1? if this happens can i assign data to track 2 and scoot  
my XAs? if i can assign data to track 2, then are there special settings or CD file I/O special  
situations that i will have to keep in mind?  
{Q.5} can i possibly have a life and get this game done :)

---

2/12/96 5:29 PM  
Re(2): where is xa7v.xa  
jeffrey Hall  
CD

Perhaps I'm just brain dead right now, but I'm having trouble using the movie tools to create xa  
data streams. movpack gives me an error message:  
XAMERGE caused a General Protection Fault in module KRNL386.exe at 0001:8f3e.  
I'm not sure just how these tools should work so I'd like to get more detailed instructions to  
take me from a raw 18.9kHz sample to a data file that your multi channel xa-audio  
example(tuto6) can use.  
Thanks for your help, Jeff Hall

---

2/12/96 9:33 AM  
Re: cd emu Q's  
David W. Marshall  
R.Brett Butler  
CD

Tom Boyd, the CD Master, can correct any of the following:  
>>{Q.1} >>what is "psx.exe"? >>do i need to include it in my game cdemu stage?  
The .exe file is created from CPE2X. You do need an .EXE file. Depending on what files your  
are running when you boot your emulator, if you call your program psx.exe, it will boot  
automatically. The correct way to do it is to use the SYSTEM.CNF file to specify the name of  
your boot file and then to modify CDEXEC.C to load your file. I think info on cdexex.c is in the  
FAQ.  
>>Q.2} >>>do i need to include game.map and game.cti in my listing?  
No, the CTI file is only for BUILDCD and the .MAP file is only for UPDATECD.  
{Q.4} >>>can too much data be assigned to track 1? Yes/No. Depending on how you are  
reading from the disk. If you are using CDSearchFile() then there is some limit to the amount of  
subdirectories and files in the directories you can have. If you are accessing data by sectors, you  
are only limited by the size of the 71 minute CD.  
>>>if this happens can i assign data to track 2 and scoot my XAs?  
No, the Sony disk is ISO standard. All your data must live in track #1 and only Redbook CD-  
DA data can live in tracks 2 - 99. Track #0 holds the TOC. I'm not sure about this part, but I  
think XA tracks are yellowbook sound files that must also live in track #1, Tom?????  
>>>{Q.5} >>>can i possibly have a life and get this game done :)  
Once the CD is up and running and you have the concept of how everything fits together, it is  
pretty painless. Note, the SN System CD tools (UPDATECD, BUILDCD) don't do well from a  
DOS window, they will sometimes hang. SN System's response to this was "these are DOS tools  
that were not guaranteed for running from a DOS window". I do have ways to do temp fixes on  
this problem, so if you work from windows, let me know.  
dave

---

2/14/96 9:24 AM

Re(2): cd emu Q's

Thomas Boyd

David W. Marshall

R.Brett Butler

>>>>if this happens can i assign data to track 2 and scoot my XAs?

>No, the Sony disk is ISO standard. All your data must live in track #1 and only Redbook CD-DA data can live in >tracks 2 - 99. Track #0 holds the TOC. I'm not sure about this part, but I think XA tracks are yellowbook sound files >that must also live in track #1, Tom?????

Dave is right.

Although, I have not tried it yet, I think you could scoot your XAs into another track and reference them by absolute location if you wanted to be a pioneer, but I do not know if Sony's CD player built into the PSX would handle the track2=data concept. It sounds dicey.

Tom

---

2/14/96 11:01 AM

Re(4): Fwd: How many files ca

David W. Marshall

Thomas Boyd

Mark Randell

>>>>The black CD box is 2X slower on loads.

I did not know this. Can I have a breakdown in relative load times when compared to a production unit for:

Blue PSX Black CD SCSI Emulator

Any special reason why the Black CD would be 2x slower?

thanks,

dave

---

2/14/96 9:37 AM

Re(3): where is xa7v.xa

Thomas Boyd

jeffrey Hall

CD

Make sure you have GUAGE.VBX and THREED.VBX in the movpack directory. I think this is the cause of the GPF.

Tom ----- Perhaps I'm just brain dead right now, but I'm having trouble using the movie tools to create xa data streams. movpack gives me an error message:

XAMERGE caused a General Protection Fault in module KRNL386.exe at 0001:8f3e.

I'm not sure just how these tools should work so I'd like to get more detailed instructions to take me from a raw 18.9kHz sample to a data file that your multi channel xa-audio example(tuto6) can use.

Thanks for your help, Jeff Hall

---

2/14/96 1:01 PM

movconv script capabilities

Geoffry R. Meek  
Documentation

movconv apparently has some sort of scripting capability. However, as far as I can tell, it's completely undocumented.

Since we have 1000+ videos to convert to STR format, knowing how this works would be EXTREMELY useful!

Can anyone out there help?

Vernon Miller Virtual Music Entertainment Inc.

---

2/14/96 9:30 AM

Re(3): Fwd: How many files ca

Thomas Boyd

Mark Randell

CD

It tacks on a second or so at worst. Unexplained delays in load time could be from the black CD box or CD emulator (with boot file 1.6 or earlier) because these have different timing.

CD emu version 1.7 and up has good timing. The black CD box is 2X slower on loads.

Tom ----- >You say that CdSearchFile is slow. How slow? I'm having >unexplained delays in the loading time and I wonder >if CdSearchFile is the culprit. How long does >CdSearchFile() take? Any info is appreciated. Mark

---

2/14/96 11:04 PM

Re: Hard Drive Failure

Dean M. Grandquist

CD

We have had the same problems, 4 devstations killed 5 gig drives over 8-9 months. We tried to stop the drive from spinning all the time (delay spinup response), but it made the emulator unusable. Our drive lights are also on all day and all night. My guess is that we are going past MTBF since that number assumes you stop reading for some amount of time. At least a gig is cheap 8-).

You can select the black box instead of the emulator hard drive while you are not using the PSX.

We tried this but it is too hard to remember to run a bat file before I leave 8-)

--DeanG

We have been experiencing a lot of problems with the emulator hard drives in the past month. We have had 3 drives go bad on us and another on its way. ... Has anyone else had these problems? Is this due to the fact that the head on the drive is constantly in motion to emulate the CD drive that spins nonstop? My only guess is that we are wearing out the drive by leaving them run for hours on end during the development cycle in a working day.

Is there a way in software to stop the hard drive, rather than resorting to physically turning off the drive when we leave at the end of the day?

---

2/14/96 10:56 AM

Re(3): cd emu Q's

David W. Marshall

Thomas Boyd

R.Brett Butler

>>>Although, I have not tried it yet, I think you could scoot your XAs into another track and >>>reference them by absolute location if you wanted to be a pioneer, but I do not know if >>>Sony's CD player built into the PSX would handle the track2=data concept. It sounds dicey. I don't think this will work. CDGEN will not allow you to put data files into other tracks. I tried to put main.exe into track #3. CDGEN looked like it put the file in track 3, but it just moved the file to the end of my track 1 layout. Since Sony disks are supposed to follow the ISO standards, I would assume that having more than one data track would cause the title to be rejected by QA.

dave

---

2/14/96 11:20 AM

Re(5): Fwd: How many files ca

Thomas Boyd

David W. Marshall

Mark Randell

Blue is 1:1

Black is 2X slower on loads

SCSI emulator with CDBIOS 1.7 or higher is 1:1, else it can be up to 3X slower on loads with 1.6 or earlier

Black CD is just a different drive, so it has different timing.

Tom ----- >>>The black CD box is 2X slower on loads.

I did not know this. Can I have a breakdown in relative load times when compared to a production unit for:

Blue PSX Black CD SCSI Emulator

Any special reason why the Black CD would be 2x slower?

thanks,

dave

---

2/14/96 5:02 PM

Hard Drive Failure

Chris E. Reese

CD

We have been experiencing a lot of problems with the emulator hard drives in the past month. We have had 3 drives go bad on us and another on its way. The drives work great at first and then we start to get a lot of read errors during loads. Sometimes the read errors will correct themselves during a retry, but in most cases it fails completely. In one case we had a drive that trashed the head mechanism. Once the drive starts to fail it will never work with the emulator again. Has anyone else had these problems? Is this due to the fact that the head on the drive is constantly in motion to emulate the CD drive that spins nonstop? My only guess is that we are wearing out the drive by leaving them run for hours on end during the development cycle in a working day.

Is there a way in software to stop the hard drive, rather than resorting to physically turning off the drive when we leave at the end of the day?

Chris Reese Eidetic, Inc.

---

2/15/96 6:44 PM

Re: movconv script capabilities

Dave Elton



CD

What we tried the same thing before is using windows or PcTools' macro script recorder to record all the mouse input and then batch the recorded script to load up MovConv and creating movies. It worked somehow.  
Simon ReadySoft Inc.

---

2/15/96 10:27 AM  
Re(2): Hard Drive Failure  
David W. Marshall  
CD

This is the first I have heard of this, so ignore me if what I am about to say makes no sense. My green light also blinks all day. I assume this is because the emulator is emulating the Sony production unit's infinite pause state. I noticed that if I do a CdlStop when I am finished with a read, the green light will go out. Of course this means my reads will take longer, since I now have to wait for the disk to spin up to speed.  
Any thoughts out there about using CdlStop to save my EMU drives?  
thanks,  
dave

---

2/15/96 9:39 AM  
Re: Hard Drive Failure  
Mike Heilemann  
CD

We have had the same sort of problems, I personally have had 4 drives go bad on me alone here, and we would also be interested in any possible way of saving drives...  
Mike Heilemann Sr. Programmer GameTek

---

2/15/96 6:40 PM  
Play Single speed XA movie  
Dave Elton  
CD

I am trying to play a movie at single speed I made from MovConv. The movie is created at single speed. But when I played it back, the movie is played twice as it is supposed to be. No matter whether I set the CdlModeSpeed in CdSetMode command or not, the movie still plays twice as fast. Is there any way to play back the movie at single speed? I thought the cd reading is default to single speed, but apparently it is not. Is it possible the hard drive emulation only emulates double speed? I am using the same code in cdemu\sample\movie directory.  
Simon ReadySoft Inc.

---

2/16/96 12:38 PM  
StSetChannel  
Geoffry R. Meek  
CD

I am trying to use StSetChannel to play a particular video in a packed STR file. I've converted and packed the file correctly, I believe, but no matter which channel I set I always get channel 0 audio. The video is correct, the audio is always channel 0.

Does anybody have any idea what is going on?

Thanx,

Ron Maxwell Virtual Music Entertainment, Inc.

---

2/16/96 12:01 PM

Re(2): movconv script capabilities

Geoffrey R. Meek

CD

Thanks. We did that already, but we figured that an actual supported script language that only required us to transport text files from system to system was preferable to having to set up an entire environment just to automate the video conversion. If you know what I mean.

However, one of my co-workers did find this morning in the "samples" area, that there is a file containing a couple sample scripts, along with comments that apparently show the syntax and arguments for the script commands.

I guess my mistake was not looking in the \*sample code\* area for instructions on running a development tool - I expected to find it in the \*documentation\* in the chapter on "movconv".

Silly me! :-)

Vernon Miller

---

2/20/96 12:51 PM

Re(6): Fwd: How many files ca

David W. Marshall

Thomas Boyd

CD

>>>Blue is 1:1 >>>Black is 2X slower on loads >>>SCSI emulator with CDBIOS 1.7 or higher is 1:1, else it can be up to 3X slower on loads >>>with 1.6 or earlier >>>Black CD is just a different drive, so it has different timing.

I just burnt a disk that would run on a blue PSX so I did some of my own timing tests and got different results.

To load all my data, it took:

Blue 7 seconds Black 8 seconds Emu 10 seconds

I am using CDBOOT30.bin and version 1.04 of CDBIOS. The previous message mentioned that version 1.7 or higher should be used. Version 1.04 is the version of CDBIOS given in the latest cd emulator release 1/25/96. So could someone either correct the previous message, correct the cdbios file in the release directory, or have sn systems correct the version number.

thanks,

dave

---

2/21/96 6:15 PM

Re(7): Fwd: How many files ca

Thomas Boyd

David W. Marshall

CD

Dave,

I have not timed CDBOOT30 yet.

Version 1.7 was referring to the CDBOOT1X.BIN program, not CDBIOS. I will clarify in the FAQ. Since the numbering scheme is goofy, I will list in chronological order:  
CDBOOT15.BIN / CDBOOT25.BIN Version 1.5 / 2.5 // does not work  
CDBOOT16.BIN / CDBOOT26.BIN Version 1.6 / 2.6 // works, but slowly  
CDBOOT17.BIN / CDBOOT27.BIN Version 1.7 / 2.7 // timing good for all but short seeks  
CDBOOT18.BIN / CDBOOT28.BIN Version 1.8 / 2.8 // timing good, but occasionally crashes (use 1.7)  
CDBOOT30.BIN Version 3.0 // multi CD functionality

So by "1.7 or later," I meant 1.7, 2.7, 1.8, 2.8, 3.0

Version 1.04 is the current version of CDBIOS.

I have tried 3 different black CD drives and get different results for each one. I was just posting my worst case results for CDBOOT16.BIN and my crummiest black CD.

Tom =====>>>Blue is 1:1 >>>Black is 2X slower on loads  
>>>SCSI emulator with CDBIOS 1.7 or higher is 1:1, else it can be up to 3X slower on loads  
>>>with 1.6 or earlier >>>Black CD is just a different drive, so it has different timing.

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thanks,  
dave

---

2/21/96 4:01 PM  
pollhost macro  
David W. Marshall  
CD

Here is a useful macro that will allow you to burn a CD that runs on a Blue PSX but still be able to access the debugger on the black cd if you need to figure out why your cd didn't work on a blue psx.

```
/*will only call pollhost() if debug stub has been loaded, i.e. we are running on the dev systems*/ #define POLLHOST if ( (0x0000ffff & (*(u_long *) 0x80)) == 0x00001fa0) { pollhost(); }
```

---

2/21/96 3:38 PM  
Play single speed movie  
Dave Elton  
CD

This is a repost of my old question last week. Can anybody give me some answer? I appreciated!

----- I am trying to play a movie at single speed I made from MovConv. The movie is created at single speed. But when I played it back, the movie is played twice as it is supposed to be. No matter whether I set the CdlModeSpeed in CdSetMode command or not, the movie still plays twice as fast. Is there any way to play back the movie at single speed? I thought the cd reading is default to single speed, but apparently it is not. Is it possible the hard drive emulation only emulates double speed? I

am using the same code in cdemu\sample\movie directory.  
Simon ReadySoft Inc.

---

2/21/96 8:22 AM

FAQ: Emulator installation

Thomas Boyd

CD

luis rivas

RESETPS.EXE 2K

CD Creation

EMULATOR INSTALLATION FAQ ===== NOTE:

There is no version of SNPATCHW.CPE or PATCHW.CPE that works with the emulator. Use SNPATCH.CPE that is attached to this message.

This is my troubleshooting guide to installing your emulator. It is in psuedo-spaghetti code.

InstallDevBoards(); // extern Remove your IRQ and DMA jumpers for now. Do not lose them.

Check to make sure that the SCSI ID jumpers are set at the factory default of 7. Do not change it.

// Pick a base address 10 Select a base address with the base address jumper. Lovingly cram

emulator board into an open slot in your PC. Firmly attach white-ish cable between dev boards

and emulator. Attach emulator Hard drive to emulator board and turn it on. Edit autoexec.bat

to contain CDBIOS /a###, where ### is the base address you selected. Ex: CDBIOS /a388

will use base address 388 - which should match jumper on card. if (Computer does not boot | |

CDBIOS does not recognize emulator board) goto 10 and select a new base address. If (you try

all base addresses and cannot get it to boot or find emu with CDBIOS) try any/all of the

following { Press all the chips into their sockets harder. Be sure you are using CDBIOS

version 1.02 or later. Maybe your computer is overheating. Check it out. } if (none of the

above works) your emulator, dev boards, or computer may be malfunctioning. Call BBS for

help. Return(-1).

// communicate with the emulator drive through the PC bus Set the SCSI ID on your

harddrive to 3, 4, or 5. The manual says you can choose others. Don't. Run CDDISK -n #, where

# is the SCSI ID you have set on your harddrive (above). Ex: CDDISK -n 4 will activate and

format the drive with SCSI ID 4 for use. If (CDDISK does not run happily) { Be sure your

emulator hard drive is turned on and the cables are connected. If so, goto 10 and select a new

base address. If that does not work, call BBS. }

// install boot file While in CDDISK (above section), install the boot file. Use CDBOOT16.BIN

or CDBOOT17.BIN (attached), DO NOT try any others yet.

// build an emulation image Detach BASIC.CTI and PSX.EXE from this memo for use in the

next step. Run BUILDCD -s#:1 BASIC.CTI, where # is the SCSI address of the emulator hard

drive (1 is the first partition). Ex: BUILDCD -s4:1 BASIC.CTI will build an image to partition

1 of SCSI ID 4 hard drive. Ignore warning 66 if it happens. If an error occurs, be sure CDBIOS

is installed and your emulator hard drive is turned on with cables attached.

// run the image - communicating through the white-ish cable to the DTL-H2000 boards 20

RESETPS 1 // verion 1.03 (attached) or later, NOT 1.02. If you use 1.02, you are a loser! It may

fail big time. RUN SNPATCH // NOT the version from the CD, NO version of

SNPATCHW.CPE works with the emulator This will say "done" if it works, or "cannot connect

to target" if it fails. If it "cannot connect to to target" goto 20 If it says "cannot open source file"

you need to fix your path to find the file. RUN SELEMU This will say "done" if it works, or

"cannot connect to target" if it fails. If it "cannot connect to to target" goto 20 If it says "cannot

open source file" you need to fix your path to find the file. RUN CDEXEC This will say "done"

if it works, or "cannot connect to target" if it fails. If it "cannot connect to to target" goto 20 If it

says "cannot open source file" you need to fix your path to find the file.

If your emulator still will not work: 0) reboot 1) try different emulator boards to see if your

board is bad. 2) try different sets of dev boards to see if your dev boards are screwed up. 3) try

different hard drives to see if your hard drive is bad 4) try different brand of computer to see if your computer is incompatible 5) leave a message in the CD newsgroup of the BBS detailing your traumatic emulation experience. Be specific.

BONUS STUFF: Now you can advance to the following:

1) install interrupt jumper, make ammendment to CDBIOS line 2) install CDBOOT18.BIN 3) install CDBOOT2#.BIN, this will pave the way for step 4 4) install CDMON (a TSR that spews info back at you from the emulator). 5) install DMA jumper, make ammendment to CDBIOS line

---

2/21/96 2:20 PM

Re(3): movconv script capabilities

David Minogue

CD

> I guess my mistake was not looking in the \*sample code\* area for > instructions on running a development tool - I expected to find it in > the \*documentation\* in the chapter on "movconv".

Silly me! :-)

Better than nothing, eh? Don't discourage them; I wouldn't want to have to wait for cool features until printed and bound documentation was available.

-- David Minogue, Acclaim Entertainment.

---

2/22/96 2:59 PM

Frequent disc errors during emulated XA playback

Sky Lounge

CD

When I play interleaved XA off of my emulation drive, CdSync often returns CdDiskErrors.

(a) Should I expect this given emulation? (b) Are there any established methods for debugging this situation?

Thanx

Andy H

---

2/23/96 1:14 PM

Re(2): pollhost macro

David W. Marshall

David Minogue

CD

I agree. I would never leave something like that in for the mastering stage.

Hopefully by then my disks will always work on a blue psx.

dave

---

2/23/96 10:36 AM

Re: pollhost macro

David Minogue

CD

Sounds risky! I did something similar on one of the 16-bit game systems and got burnt when the game failed its address checker test at turnover. Unless this (0x80) is some address which Sony has documented, I'd stay clear of it when it's time to master!  
-- David Minogue

---

2/23/96 4:13 PM  
Re: CD software  
Borden Covell II  
CD

We just went ahead and used the Sony S/W which generated ISO9660 disks. Seems OK.

---

2/26/96 2:21 PM  
CD Generator troubles  
Geoffrey R. Meek  
CD

We have been using CD Generator for a while and it has suddenly stopped working. The hardware is working fine. We have changed the system configuration, and I don't doubt that this could be the problem - but what is aggravating me is that the error messages we're getting are COMPLETELY WORTHLESS in helping us track down the problem! When we start CD Generator and try to record, we get the following dialog box:

Cannot execute Controller Dialog Box: 3

Real useful.

Running the Controller program by itself results in:

Starting up in diagnostic mode

which is a normal box, followed by:

The SCSI host adapter is incorrect

twice. Again, worthless by my standards - what does "incorrect" mean? And, what do I change to make it "correct"?

The SCSI bus is fine - it is terminated correctly, there are no duplicate units, etc.

Any suggestions?

Vernon Miller

---

2/27/96 11:43 AM  
Which form is MDEC .str file use?  
Dave Elton  
CD

I got several MDEC .str files using MovConv and when I burn a CD for these files, I don't know in the subheader file option, whether I should use FROM1 or FORM2 sectors, or even interleave sectors. The CD Generator manual doesn't clarify this. Can anybody give me a hint on which one I should use. I tried to cut 3 CD using either of the options, and all of them looks OK though.

Simon  
ReadySoft Inc.

---

2/27/96 9:42 PM  
Re: movconv script capabilities

Michael Koziniak  
Geoffry R. Meek  
Art Tools

>movconv apparently has some sort of scripting capability. >However, as far as I can tell, it's completely undocumented. >>Since we have 1000+ videos to convert to STR format, knowing >how this works would be EXTREMELY useful!

So, you've seen the samples. Just wanted you to see a script I wrote which works. Here is a typical AVI/WAV -> STR. So far this is the only way I've found to iterate.

```
Michael ### Script Begin  Avi2strMdecV(c:\_test\movies\movie1.avi,  
c:\_test\movies\test1.str,          x2,          15fps,          1,  
2);  
Avi2strMdecV(c:\_test\movies\movie2.avi,          c:\_test\movies\test2.str,  
x2,          15fps,          1,          2); ### Script End
```

---

2/27/96 10:50 AM  
Warning message in CDGEN  
Henrik Markarian  
CD

Once in a while I get the following warning message from CDGEN:  
"Warning: Output may be failed: 750"  
What does it mean? Is there a way to figure out which file it has the problem with?

---

2/27/96 12:37 PM  
Re(5): movconv script capabilities  
Geoffry R. Meek  
Thomas Boyd  
David Minogue  
Thomas:  
Thanks. The examples were adequate for our needs. Thanks for the contact name though, but for now he's off the hook :-)  
Vernon Miller

---

2/27/96 12:07 PM  
Re: Warning message in CDGEN  
Thomas Boyd  
CD

Your disk is so fragmented that CDGEN does not think it will keep up with the on-the-fly burn. (single speed seems to always work for me in this case, though. Just verify when you are done.)  
Tom

=====

Once in a while I get the following warning message from CDGEN:  
"Warning: Output may be failed: 750"  
What does it mean? Is there a way to figure out which file it has the problem with?

---

2/27/96 5:35 PM

Burn XA files on CD?  
Christopher Deel  
CD  
Mike Heilemann  
Is there anything special I need to do to put XA files on a CD when I burn?

---

2/27/96 12:24 PM  
Re(5): movconv script capabilities  
Colin Lewis  
CD

Uh, maybe I missed something, but how do you get MovConv to run those scripts?

---

2/27/96 12:31 PM  
Re(6): movconv script capabilities  
Thomas Boyd  
Colin Lewis  
CD  
1) Have a newer version of movconv 2) File-Open script 3) Execute  
Tom ===== Uh, maybe I missed something, but how do you get MovConv to run those scripts?

---

2/27/96 12:34 PM  
Re(2): CD Generator troubles  
Geoffry R. Meek  
Thomas Boyd  
CD  
Thomas:  
With your hint about the 154x and a similar hint from a fellow developer, the problem has been found.  
Believe it or not, the problem is that there must be an Adaptec 154x controller in the system. It doesn't matter if anything is actually CONNECTED to it...it just has to BE THERE!  
In our case, we have the CDW-900E connected to an Adaptec 2842, which is the primary SCSI controller. It has always been connected there and works fine. We also had a 1540 in the system also as a secondary controller, with nothing connected to it. So, I took it out so I could do something useful with it, like put it into another system.  
That's when the trouble started.  
Apparently, if there's a 154x controller in the system, CD Generator thinks everything is fine, regardless of whether the CD writer (or anything else) is actually hooked to that controller. If the 154x is not there, CD Controller refuses to work, even if the controller that the CD writer IS hooked to is OK and will work just fine.  
So, I now have a 1540B in the system doing nothing, and everything is working fine.  
By the way, I tried hooking the CDW-900E onto the 1540B but that doesn't work. Apparently, CD Controller doesn't bother looking for multiple controllers when it scans for the CD writer - if it's not on the primary controller, it gives up.  
Unbelievable.  
I suspect BTW that CD Controller isn't actually looking for the presence of the 154x controller but for the ASPI4DOS driver (which in my system isn't doing anything either).  
I did figure out the " Cannot execute Controller Dialog Box: 3" error box. It was because the path



in the CDGEN.INI file that pointed to CDREC.EXE was not correct.  
Vernon Miller

---

2/27/96 10:00 PM

Re(4): Hard Drive Failure  
Michael Koziniak  
Dean M. Grandquist  
CD

>My green light also blinks all day. I assume this is because the emulator is emulating the Sony  
>production unit's infinite pause state. I noticed that if I do a CdlStop when I am finished with  
a read, the >green light will go out. Of course this means my reads will take longer, since I now  
have to wait for >the disk to spin up to speed.

Note: Don't bump or move your drive after its on. My APS(OEM for micropolis) sounds like a  
jet turbine because of that. A friend of mine is a Sys Admin and he replaces these drives daily  
because of platter distortion.

Michael

---

2/27/96 12:16 PM

Re: CD Generator troubles  
Thomas Boyd  
CD

Geoffry R. Meek

Did you switch to Win95? (bad bad bad) Did you switch SCSI cards? (bad bad bad) What  
changed in your configuration? Are you low on memory?

>The hardware is working fine. We have changed the system configuration, and >I don't doubt  
that this could be the problem - but what is aggravating me is that >the error messages we're  
getting are COMPLETELY WORTHLESS in helping us >track down the problem!

I agree.

>When we start CD Generator and try to record, we get the following dialog box: > Cannot  
execute Controller Dialog Box: 3 >

Dunno what this means... I have asked SCEI, Japan, and expect a response.

> >Running the Controller program by itself results in: > Starting up in diagnostic mode

>which is a normal box, followed by: > The SCSI host adapter is incorrect t>wice. Again,  
worthless by my standards - what does "incorrect" mean? >And, what do I change to make it  
"correct"?

This is what I get with SCSI adapters that are not Adaptec AHA-1542CF cards.

---

2/27/96 12:28 PM

Re(3): Hard Drive Failure  
Thomas Boyd  
CD

I leave mine on perpetually and am still humming along at one year. I've got one of those  
Micropolis drives Sony loves. Is that the same brand that's croaking on all you guys?

Tom =====

This is the first I have heard of this, so ignore me if what I am about to say makes no sense.

My green light also blinks all day. I assume this is because the emulator is emulating the Sony  
production unit's infinite pause state. I noticed that if I do a CdlStop when I am finished with a  
read, the green light will go out. Of course this means my reads will take longer, since I now  
have to wait for the disk to spin up to speed.

Any thoughts out there about using CdlStop to save my EMU drives?  
thanks,  
dave

---

2/27/96 12:22 PM

Re(4): movconv script capabilities  
Thomas Boyd  
David Minogue  
CD

The sample scripts for movconv are all we have too ... well, almost all. We also have Koji, who wrote the thing. So if you have any more specific questions or scripting feature requests, let us know in this newsgroup.

Tom

PS Koji is in Japan till March 6, so not much will happen till then

---

2/27/96 12:06 PM

Re: Which form is MDEC .str file use?

Thomas Boyd  
Dave Elton  
CD

If they have sound, they are form 1 AND form 2. Check the subheader radio button and the Form 1 and Form 2 checkboxes.

Tom

PS: here's more:

```
===== STR  
With audio (without audio has no subheader): ----- TotalSector  
size 2336 bytes subheader 8 bytes sector header 32 bytes data 2016 bytes ECC 256 bytes  
Video header description: ----- subheader = (00 01 42 80 00 01 42  
80) in hex  
header =
```

```
BYTE format ID (0x60) BYTE format version (0x01) WORD undefstrformat (0x8001)  
WORD Current sector number in current frame WORD Total number of sectors in this frame  
DWORD Current frame number DWORD size of .BS frame in bytes WORD frame width in  
pixels WORD frame height in pixels DWORD HEADM = first DWORD of .BS frame DWORD  
HEADV = second DWORD of .BS frame DWORD ????? (0x00000000)
```

I assume that you want to just edit out frames from the STR files, which means that you will be taking out specific sector ranges.

You need to change the current frame numbers to be continuous after you cut sectors out. remember that the values are in reverse endian order (so frame one will be 0x01000000).

---

2/28/96 6:39 PM

Re: Play single speed movie

Michael Koziniak  
Dave Elton  
CD

> I am trying to play a movie at single speed I made from MovConv. The movie is created at single speed. But when I >played it back, the movie is played twice as it is supposed to be. No matter whether I set the CdlModeSpeed in > CdSetMode cammand or not, the movie still plays twice as fast. Is there any way to play back the movie at single >speed? I thought the cd reading is default to single speed, but apparently it is not. Is it possible the hard drive emulation >only

emulates double speed? I am using the same code in cdemu\sample\movie directory. I have gotten this to work ok. In tuto1 (\psx\sample\cd\movie) at the very end there is a call to CdRead2() which by default has the CdlModeSpeed. When I took the CdlModeSpeed out by god it played the movie at single speed. It is possible.  
Michael

---

2/28/96 4:40 PM

Re: Burn XA files on CD?

Thomas Boyd

Christopher Deel

CD

XA sound: Interleave them with MOVPACK (read the help in the app - it is clear). Check "subheader files, Form 2" in the file type dialog box in CDGEN.

Tom ----- Is there anything special I need to do to put XA files on a CD when I burn?

---

2/29/96 12:31 PM

CdControl(CdlPause,0,0) failure

Mike Benna

CD

PAUSEPRB.ZIP 7K

CD Creation

I've run into a serious problem with the CDROM subsystem. It appears that every once in a while a CdControl(CdlPause,0,0) fails for no apparent reason. I've put together an example of the problem by modifying the CD tuto6.c example. For me it dies after 1073 to 1079 commands with remarkable consistency. Any hints or workarounds would be tremendously appreciated. If you've got questions, please call me at 604-944-4997 (after 9am Pacific time).

---

3/1/96 7:37 AM

cdexec randomly hangs

John Woznack

CD

Has anyone else had their cdexec routine hang up randomly during the \_96\_init() call? If so, is there a solution?

The cdexc I'm using is simply:

```
main { _96_remove(); _96_init(); LoadExec(...); }
```

It seems that the \_96\_init() will randomly hang, causing me to do a resets, and try again.

-JWW

---

3/3/96 5:39 PM

Using ZIP drives with CD Emulator

Tim L. Lowery

CD

I know Sony recommends using AV gig drives with the CD emulator, but after reading all of those comments regarding abyssimally failing hard drives, I'm tempted to use a ZIP cart with my emulator rather than endangering precious gig drives. Has anybody tried this, or tried other

slower drives with the emulator? Maybe a SyQuest drive? I know it would be slower, but does that just result in slower access or does it make the CD Emulator unusable?  
Dave Howell Pablo Media

---

3/3/96 9:44 AM  
Re(2): Play single speed movie  
Dave Elton  
Michael Koziniak  
CD  
Thanks! I will try it and let you know.  
Simon ReadySoft Inc.

---

3/4/96 9:46 AM  
Re: Using ZIP drives with CD Emulator  
Thomas Boyd  
CD

I will ask sn systems if this will work. T

---

3/5/96 9:32 AM  
Re: Using ZIP drives with CD Emulator  
Thomas Boyd  
Tim L. Lowery  
CD

Tom at SN Systems replies about ZIP drives: ===== There is a certain overhead in CD emulation that forces a minimum spec drive. The emulator has to transfer CD sectors at a faster rate than the maximum output rate of CD data (max. is currently 1 CD sector @ 150Hz). It is also desirable that the emulator perform some function on this data before it is output. If the SCSI transfer rate falls below this minimum rate, then internal emulator buffer underflows will occur. This is when the output overtakes the data input rate. This shows up when using CDBOOT2.x/CDBOOT6.x and prints 'ERRORS xxxx' at the top of the DOS window, to the left of the Q-Code.

Using a slower drive would result in slower emulation, since underflows will occur, so the emulator will have to restart the data output just before the underflow occurred. The PSX software should detect this break in the data flow and should act accordingly. But if the playback is a movie then this break will be unwanted, the PSX code may not be able to re-sync the audio/visual playback and could easily crash.

Don't rely on manufacturer specs. to assess whether a 'slow' drive will be fast enough for the emulator. Also these cart based systems have seeks comparable with CDs - ie slow. So seek emulation would be invalid, since total seek time = cart seek + emulated seek (HD seeking is negligible). Don't assume that any drive with a minimum spec'ed data transfer rate over 300KBytes/Sec is fast enough - 300K/s is the transfer rate of a 2x Speed CD - the SCSI and emulator overhead need to be considered. The SCSI overhead is dependent on the drive type, so will be an unknown factor.

We have not tested the emulator with ZIP or SyQuest drives. My advice is to simply try them. Being SCSI devices, they will work; but its whether there performance is good enough. Let me know the results.

>I have a developer who wants to use ZIP drives for his emulator. >>Tom

>===== >>I know Sony recommends using AV gig drives with the CD emulator, but after >reading all of those comments regarding abysmally failing hard

drives, I'm >tempted to use a ZIP cart with my emulator rather than endangering precious gig  
>drives. Has anybody tried this, or tried other slower drives with the emulator? >Maybe a  
SyQuest drive? I know it would be slower, but does that just result in >slower access or does it  
make the CD Emulator unusable? > >Dave Howell >Pablo Media >

---

3/7/96 9:28 AM  
Re(4): Hard Drive Failure  
Chris E. Reese  
CD

We are using the Micropolis drives just like Sony suggested and we have had four of them go south. We now make it a habit to turn off our drives when we go home, which does seem to help. The most frustrating thing about these emulators is having them consistently come up with read errors and you have to restart the program 6 or 7 times before it will finally work. We have resorted to using the black CD drives and burning new CD's once each week. I can burn through quite a few CD's before I even come close to the cost we are incurring after buying a CD emulator card that seldom works and the GIG hard drives that burn out rather quickly!  
Chris Reese Eidetic, Inc.

---

3/15/96 1:06 PM  
Streaming errors  
John Harris  
CD

I am trying to play video+ADPCM sequences using the streaming library on the CD emulator. Sometimes the sequences play correctly, but other times there are intermittent failures where the video image turns to garbage. The developer who was working on this project before me (on a completely different development system) says that this did not happen to him, and that I might have some kind of hardware failure that is generating read errors. I don't yet have the ability to burn gold disks, and so I am hoping for some help in trying to determine whether I have hardware or software related problems. I'm not sure how to check for CDROM read errors when streaming, but I do have CDMON running. Here are some clues:

1. CDMON does not display any error messages when the corrupted videos play. It does occasionally display errors when the drive is in the idle state though at seemingly unrelated times.
2. ADPCM audio is not affected -- it always sounds correct.
3. Video garbage appears to be similar, and perhaps identical in each occurrence. Though it happens at different points, it seems like there may be a small number of fixed points where it occurs.
4. In situations where video garbage occurs, the streaming will usually not stop where it is supposed to, and ADPCM will play additional tracks on the disk.

Any and all help will be appreciated. If you can think of any techniques that can help track down the cause, please let me know.

Thanks,  
John Harris Tachyon Studios, Inc.

---

3/15/96 4:26 PM  
Burning CD for debug station  
Ted Morris

CD

The poorly presented CD Mastering session at the developers conference has me a bit confused. It was said that the CDGEN software is only necessary for making masters and that we can use any other software for making debug station discs. Is that true? Can we use any software and any burner? The impression I get from messages in this topic is no. If I can use our current setup, is there anything special I have to do?

---

3/18/96 11:01 AM

Re: Burning CD for debug station

Thomas Boyd

Ted Morris

CD

>It was said that the CDGEN software is only necessary for making masters and that we can use any other >software for making debug station discs. Is that true? >Can we use any software and any burner? >If I can use our current setup, is there anything special I have to do?

Sort-of true. \*IF\* you can figure out how to do this, you can. I know of two companies who have figured it out, because it was profitable for them to do so. You can eventually and painstakingly figure out how to burn testable (NOT masterable) CDs with other software by making an image and burning it, BUT nobody at Sony has done it or plans to figure out how. So you would be on your own.

Although this is conceptually an easy idea, most companies who have tried this have given up when they realized that buying the Sony eqpt was cheaper than flushing fistfulls of man-hours down the john figuring this problem out.

Only CDGEN can burn the secret, pre-image data required for a master, and only one (soon to be 2) burner is up to the task. AND only one scsi card will tie the two together (Adaptec AHA-1542CF), and only Win31 can cope with CDGEN (not Win95, yet...)

---

3/18/96 11:09 AM

Re: Streaming XA from RAM

Thomas Boyd

Dave Ross

CD

SpuStreaming (VAG streaming) is XA audio, and it works from RAM, check it out. You do not have to even pretend it is a CD.

Tom =====>I need to know if it's possible to stream XA-style compressed audio from RAM. >A couple things I've seen hint that it can >be done; first, the StSetEmulate() process which lets a RAM buffer >behave like a tiny CD file, and the following cryptic exchange in the FAQ:

>> [4-6-34]: Is XA-ADPCM decompressed in the CD-subsystem local >> memory? >> Yes, and XA-ADPCM stored as XA-ADPCM in local memory.

>Does this mean what I think it does (ie that RAM streaming is possible)?

>..Sean Igo >Sculptured Software

---

3/18/96 9:48 AM

Streaming XA from RAM

Dave Ross

CD

Hello.

I need to know if it's possible to stream XA-style compressed audio from RAM. A couple things I've seen hint that it can be done; first, the StSetEmulate() process which lets a RAM buffer behave like a tiny CD file, and the following cryptic exchange in the FAQ:

> [4-6-34]: Is XA-ADPCM decompressed in the CD-subsystem local > memory? > Yes, and XA-ADPCM stored as XA-ADPCM in local memory.

Does this mean what I think it does (ie that RAM streaming is possible)?

..Sean Igo Sculptured Software

---

3/21/96 7:07 PM

Re(2): Streaming errors

John Harris

CD

- The CD should give printf's for some errors (make sure mess1 and testmess are running) Thank you Thomas. I didn't know the errors were returned there. Here's the display I got when the streaming error occurred.

MDEC\_in\_sync timeout: DMA=(1,0), ADDR=(0x000eb674->0x001033f4)

FIFO=(1,1),BUSY=1,DREQ=(0,1),RGB24=1,STP=1

If this gives any further indications about what the problem is, please let me know. I also receive an error message like this (just the ADDR is different) for another MDEC movie that always plays trash. This one isn't intermittent, and I presumed the data was just garbled. Eventually, I was going rebuild that movie, but perhaps this is the same software error in a more reproducible form.

Thank you for your other suggestions as well. I had to do something else today, but I will check out everything else on Friday and report back with any new info.

John Harris Tachyon Studios, Inc.

---

3/21/96 10:32 AM

Re: Streaming errors

Thomas Boyd

John Harris

CD

CD\_BKGD.PPT 175K

CD Creation

initial thoughts:

- This is not typical behavior. - What version of the movie player sample are you using? /PSX/SAMPLE/CD/MOVIE/TUTO1.C is the best. - The CD should give printf's for some errors (make sure mess1 and testmess are running)

What is happening is that your audio continues to be sent directly to the SPU, so your sound still comes out right, but your video is crazed somehow. This makes me think that the emulator is running fine, and you have a software bug in your movie player code. Perhaps the streamer is getting out of synch or something. The fact that it plays the garbage means that you are not checking headm and headv before you play the frame. This makes me believe that you are on an old version of the streamer example.

In reference to (4), If the frames are goofed up in the ring buffer, your streamer will not stop (if it based on the example code) because you will never find a frame that is >= to the last frame in the movie. This is the exit condition most people use.

Try these things: 1) play back your movies with TUTO1.C (above) and see if they work there. 2) debug what is happening in the streamer and ring buffer. To do this, just follow the STR file format that I outlined at the conference and you can see exactly what went awry. I stuck my

presentation from the conference on this message so you can grab the formats from powerpoint. Lemme know what happens.

Tom =====

I am trying to play video+ADPCM sequences using the streaming library on the CD emulator. Sometimes the sequences play correctly, but other times there are intermittent failures where the video image turns to garbage. The developer who was working on this project before me (on a completely different development system) says that this did not happen to him, and that I might have some kind of hardware failure that is generating read errors. I don't yet have the ability to burn gold disks, and so I am hoping for some help in trying to determine whether I have hardware or software related problems. I'm not sure how to check for CDROM read errors when streaming, but I do have CDMON running. Here are some clues:

1. CDMON does not display any error messages when the corrupted videos play. It does occasionally display errors when the drive is in the idle state though at seemingly unrelated times.
2. ADPCM audio is not affected -- it always sounds correct.
3. Video garbage appears to be similar, and perhaps identical in each occurrence. Though it happens at different points, it seems like there may be a small number of fixed points where it occurs.
4. In situations where video garbage occurs, the streaming will usually not stop where it is supposed to, and ADPCM will play additional tracks on the disk.

Any and all help will be appreciated. If you can think of any techniques that can help track down the cause, please let me know.

Thanks,

John Harris Tachyon Studios, Inc.

---

3/22/96 6:00 PM

Re(3): Streaming errors

John Harris

CD

> What version of the movie player sample are you using? >

/PSX/SAMPLE/CD/MOVIE/TUTO1.C is the best.

It doesn't really use the sample code--it looks like the original programmer rolled his own.

Perhaps because it is playing partial insets into a 640x480 screen.

>The fact that it plays the garbage means that you are not checking >headm and headv before you play the frame. This makes me believe >that you are on an old version of the streamer example.

You're right, they aren't being checked. Tuto1.c doesn't check these fields either.

>Try these things: >1) play back your movies with TUTO1.C (above) and see if they work >there.

The intermittent videos play without any video garbage under TUTO1. They play at double the speed, and the audio sounds like it is pulling out every other frame or so. (It's fragmented with missing parts).

It turned out that the one movie which always played corrupted was caused by an error in the .STR file itself. Examining the file showed that there were two extra DWORDs at the very beginning. Both were 00014280, which happened to match the last DWORDs in the sectors. TUTO1.C played this movie corrupted as well, confirming that it didn't check headm and headv either. I'll rebuild that .STR.

>2) debug what is happening in the streamer and ring buffer. To do >this, just follow the STR file format that I outlined...

Unfortunately, the intermittent nature of the problem makes it difficult to know how to debug this. It can go from not happening at all, to happening in different spots. I'm hoping that the



MDEC\_in\_sync timeout error that I posted earlier can help identify what is going on, and that you can give me a better idea where to check in the code.

Thanks,

John Harris Tachyon Studios, Inc.

---

3/24/96 4:37 PM

Re(4): Streaming errors

John Harris

CD

I left out a potentially important piece of info. The program's code currently cannot be compiled with any libraries 3.0 or newer, due to the ResetGraph(0) crash described in the GPU conference. TUTO1.C does not compile with the pre-3.0 libs that the application is currently being built with. Thus, I don't have a pure comparison.

I tried a simple test, since it appeared that the one corrupted .STR file had eight extra bytes at the beginning, I just deleted those bytes and padded the end of file. The first frame then looked normal, had sector count 0 frame 1, and matching headm and headv bytes. The data at +2336 bytes was aligned and had sequential count fields. Interestingly, when I played this .STR file through both TUTO1 and the program's code, there were no graphics at all, and no sound.

After a pause equal to the time the initial movie should have taken, it played through additional selections on the CD emulator drive.

John Harris Tachyon Studios, Inc.

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3/25/96 10:38 AM

Re: cdexec randomly hangs

Rob Vawter

John Woznack

CD

Has anyone else had their cdexec routine hang up randomly during the \_96\_init() call? If so, is there a solution?

The cdexc I'm using is simply:

```
main { _96_remove(); _96_init(); LoadExec(...); }
```

It seems that the \_96\_init() will randomly hang, causing me to do a resets, and try again.

Sounds like it may be a problem with your emulator, or your boards, or LoadExec() [for example, if you had the wrong file name LoadExec() would hang]. I haven't heard of any problems within \_96\_init() before.

---

3/26/96 6:59 AM

Re(2): cdexec randomly hangs

John Woznack

Rob Vawter

CD

Sounds like it may be a problem with your emulator, or your boards, or LoadExec() [for example, if you had the wrong file name LoadExec() would hang]. I haven't heard of any problems within \_96\_init() before.

--- Actually, we found out that two of our three "new" cd emulator cards were actually toasted!

It threw me for a while, since I was swapping one bad board for another. Seeing no difference, I figured it wasn't the board(s). We're limping along on our third board, which occasionally hangs too, but can still be talked into running more often than not.

Thanks for the reply!

-JWW

---

3/26/96 4:33 PM

Optimum screen sizes requested

Mark D. Hirsch

CD

Rob,

Could you provide us info on optimal screen sizes for PSX movie STRs, i.e., what's the best aspect ratio/pixel size?

We're hoping we can go to 512 x 240 without choking the CD.

Joe Lyford, 47-Tek

---

3/27/96 4:13 AM

Playing Movies From CD

Yoram Berkowicz

CD

What is the latest and most up to date example of playing movies from CD? In the conference it was mentioned that there is something newer than tuto1.c but I can't find it.

On 21-Mar-96 Thomas Boyd wrote, in reply to "Streaming errors": > The fact that it plays the garbage means that you are not checking headm and headv before you play the frame. This makes me > believe that you are on an old version of the streamer example.

Where are these "headm" and "headv" fields described or defined? I could not find any such structures, fields or functions in the documentation. Furthermore, there are no examples that use these fields.

Thanks,

Yoram Berkowicz.

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3/28/96 2:45 PM

CD Generator error msg

Geoffry R. Meek

CD Creation

We are getting an error message (actually, a warning) from CD Generator. As seems to be the normal case with this program, the message is useless for actually figuring out what might be wrong.

The messages we are getting are:

WARNING: output may be failed: 2250 WARNING: output may be failed: 3000

I know they're just warnings but it'd be nice to know what we're being warned about! I also know that they do NOT mean that there is an actual I/O error on the disk drive or CD writer, and I also know that the messages aren't an indication that we're trying to put too much stuff on the CD (that operation doesn't generate any errors at all, it just makes the remaining time field go negative).

Any suggestions?

Thanks. Vernon Miller

---

3/28/96 5:55 PM  
Re: Error in CD Generator  
Dan Burnash  
CD Creation  
Geoffry R. Meek

>The messages we are getting are:  
>WARNING: output may be failed: 2250 >WARNING: output may be failed: 3000  
This warning is posted when cdgen does not think it can read the data from your hard drive fast enough to keep up with the cd burning process. Since cdgen burns on the fly, grabbing each piece of the disc image from wherever it is on your disc, it can have problems keeping up when lots of small files scattered over your disc are used in sequence. Usually when you burn at single speed there is no problem, even when the warning comes up. However, I recommend unfragmenting your disc, then loading the disc to see if that helps. Setting up a contiguous piece of your hard drive for the files to be burned may also help.  
Dan Burnash

---

3/28/96 12:45 PM  
Error in CD Generator  
Geoffry R. Meek  
CD Creation

We are getting an error message (actually, a warning) from CD Generator. As seems to be the normal case with this program, the message is useless for actually figuring out what might be wrong.  
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Any suggestions?  
Thanks. Vernon Miller

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4/3/96 2:11 PM  
Fwd: FAQ: Emulator installation  
Thomas Boyd  
CD Creation

RESETPS.EXE        2K  
CD Creation  
EMULATOR INSTALLATION FAQ ===== NOTE:  
There is no version of SNPATCHW.CPE or PATCHW.CPE that works with the emulator. Use SNPATCH.CPE that is attached to this message.  
This is my troubleshooting guide to installing your emulator. It is in psuedo-spaghetti code.  
InstallDevBoards(); // extern Remove your IRQ and DMA jumpers for now. Do not lose them.

Check to make sure that the SCSI ID jumpers are set at the factory default of 7. Do not change it.  
// Pick a base address 10 Select a base address with the base address jumper. Lovingly cram emulator board into an open slot in your PC. Firmly attach white-ish cable between dev boards and emulator. Attach emulator Hard drive to emulator board and turn it on. Edit autoexec.bat to contain CDBIOS /a###, where ### is the base address you selected. Ex: CDBIOS /a388 will use base address 388 - which should match jumper on card. if (Computer does not boot || CDBIOS does not recognize emulator board) goto 10 and select a new base address. If (you try all base addresses and cannot get it to boot or find emu with CDBIOS) try any/all of the following { Press all the chips into their sockets harder. Be sure you are using CDBIOS version 1.02 or later. Maybe your computer is overheating. Check it out. } if (none of the above works) your emulator, dev boards, or computer may be malfunctioning. Call BBS for help. Return(-1).

// communicate with the emulator drive through the PC bus Set the SCSI ID on your harddrive to 3, 4, or 5. The manual says you can choose others. Don't. Run CDDISK -n #, where # is the SCSI ID you have set on your harddrive (above). Ex: CDDISK -n 4 will activate and format the drive with SCSI ID 4 for use. If (CDDISK does not run happily) { Be sure your emulator hard drive is turned on and the cables are connected. If so, goto 10 and select a new base address. If that does not work, call BBS. }

// install boot file While in CDDISK (above section), install the boot file. Use CDBOOT16.BIN or CDBOOT17.BIN (attached), DO NOT try any others yet.

// build an emulation image Detach BASIC.CTI and PSX.EXE from this memo for use in the next step. Run BUILDCD -s#:1 BASIC.CTI, where # is the SCSI address of the emulator hard drive (1 is the first partition). Ex: BUILDCD -s4:1 BASIC.CTI will build an image to partition 1 of SCSI ID 4 hard drive. Ignore warning 66 if it happens. If an error occurs, be sure CDBIOS is installed and your emulator hard drive is turned on with cables attached.

// run the image - communicating through the white-ish cable to the DTL-H2000 boards 20 RESETPS 1 // verion 1.03 (attached) or later, NOT 1.02. If you use 1.02, you are a loser! It may fail big time. RUN SNPATCH // NOT the version from the CD, NO version of SNPATCHW.CPE works with the emulator This will say "done" if it works, or "cannot connect to target" if it fails. If it "cannot connect to to target" goto 20 If it says "cannot open source file" you need to fix your path to find the file. RUN SELEMU This will say "done" if it works, or "cannot connect to target" if it fails. If it "cannot connect to to target" goto 20 If it says "cannot open source file" you need to fix your path to find the file. RUN CDEXEC This will say "done" if it works, or "cannot connect to target" if it fails. If it "cannot connect to to target" goto 20 If it says "cannot open source file" you need to fix your path to find the file.

If your emulator still will not work: 0) reboot 1) try different emulator boards to see if your board is bad. 2) try different sets of dev boards to see if your dev boards are screwed up. 3) try different hard drives to see if your hard drive is bad 4) try different brand of computer to see if your computer is incompatible 5) leave a message in the CD newsgroup of the BBS detailing your traumatic emulation experience. Be specific.

BONUS STUFF: Now you can advance to the following:

1) install interrupt jumper, make ammendment to CDBIOS line 2) install CDBOOT18.BIN 3) install CDBOOT2#.BIN, this will pave the way for step 4 4) install CDMON (a TSR that spews info back at you from the emulator). 5) install DMA jumper, make ammendment to CDBIOS line

---

4/4/96 9:18 AM

Re: Optimum screen sizes requested

Thomas Boyd

CD Creation

There are many variables, almost all directly related to bandwidth:  
frame rate playback speed # of interleaved movie channels sound frequency, stereo/mono  
compressibility of content desired quality source movie size  
As a rule of thumb, 15fps, 320 X 240 with 44.1 kHz stereo audio will look decent if you start with  
a 24 bit source, or filter a lower bit-depth source to 24-bit.  
The compressor will crush whatever you ask it to down to size. It just may look miserable if you  
squeeze it too hard. Your idea of going to 512 should work, but it may look like heck. Try it,  
emulate it, and see. Be sure to use the latest movie player and  
/PSX/SAMPLE/CD/MOVIE/TUTO1.C

Tom

=====

Rob,

Could you provide us info on optimal screen sizes for PSX movie STRs, i.e., what's the best  
aspect ratio/pixel size?

We're hoping we can go to 512 x 240 without choking the CD.

Joe Lyford, 47-Tek

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4/4/96 1:08 AM

Using a memory-card to patch the game...

Steven Stadnicki

CD Creation

Greetings, Does Sony have any standard guidelines on recommended methods of using a  
memory card to do 'in-memory' patches of a game? Also, and I'll freely admit I haven't looked  
too deeply into this on my own yet, but any suggestions on ways to put patches and interesting  
updates to a game in a memory card and NOT have it copyable...? I.e. standard formats other  
than the normal 'save-game' oriented formats?

Mostly just a random question right now, but we've really been thinking about the option of  
using memory cards to supply enhancements, updates, interesting new features or even  
bugfixes for the games... If Sony has or plans to have a standard format for this sort of thing,  
it'd be good to know about...

-- Morgan/Steve

---

4/4/96 9:14 AM

Re: Playing Movies From CD

Thomas Boyd

Yoram Berkowicz

CD

>What is the latest and most up to date example of playing movies from CD? >In the conference  
it was mentioned that there is something newer than tuto1.c but I can't find it.

/PSX/SAMPLE/CD/MOVIE/TUTO1.C

Note: this sample has not changed since release 1.5

>On 21-Mar-96 Thomas Boyd wrote, in reply to "Streaming errors": >> The fact that it plays the  
garbage means that you are not checking headm and headv before you play the frame. This  
makes me >> believe that you are on an old version of the streamer example.

I have discovered that the newest sample does not check headv and headm, but I thought it did  
because I modified it. My apologies.

>Where are these "headm" and "headv" fields described or defined? I could not find any such  
structures, fields or functions in the >documentation. Furthermore, there are no examples that  
use these fields.

The old (outdated, please don't use it) anim() sample used to use these fields. Mentioned in

conference notes and old BBS posts. I will attach below:

===== Header info for XA  
movie STR files with sound:  
8 byte subheader: 00 01 43 80 00 01 42 80 (hex) 32 byte sector header BYTE format ID 0x60  
BYTE format version 0x01 WORD undefstrformat 0x8001 WORD current sector number in  
current frame (ex: 1, 2, 3, 4, 5, 1, 2, 3, 4, 1...) WORD total sector count for current frame (ex: 5,  
5, 5, 5, 4, 4, 4, 4, 5, 5, ...) DWORD current frame number (ex: 1, 1, 1, 1, 1, 2, 2, 2, 2, 3...)  
DWORD size of .BS in bytes (note: this seems to be six bytes smaller than entire .BS data)  
WORD frame width in pixels WORD frame height in pixels DWORD headm, first DWORD of  
.BS file DWORD headv, second DWORD of .BS file DWORD 0 (unused?)

---

4/4/96 1:49 PM  
PCI SCSI card  
Christopher Deel  
CD Creation

I just got a new pentium that has half PCI slots and half SCSI slots. I put in an Adaptec AHA-2940 PCI scsi card because I don't have enough slots for an ISA scsi card. The CDGEN software will not recognize the PCI scsi card. Is there anything I can do about this?

---

4/4/96 1:50 PM  
Re: PCI SCSI card  
Thomas Boyd  
Christopher Deel  
CD Creation

The only SCSI card that works with CDGEN is the Adaptec AHA-1542CF  
===== I just got a new pentium that has half PCI slots and  
half SCSI slots. I put in an Adaptec AHA-2940 PCI scsi card because I don't have enough slots  
for an ISA scsi card. The CDGEN software will not recognize the PCI scsi card. Is there  
anything I can do about this?

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4/4/96 2:20 PM

Re: Using a memory-card to patch the game...

Dan Burnash

SIO

Steven Stadnicki

>Does Sony have any standard guidelines on recommended methods of using a memory card to  
do >'in-memory' patches of a game?

No, and at \$20 each it doesn't seem worth selling one just to put your in memory game patch  
onto it.

> Also, and I'll freely admit I haven't looked too deeply into this on my >own yet, but any  
suggestions on ways to put patches and interesting updates to a game in a memory >card and  
NOT have it copyable...? I.e. standard formats other >than the normal 'save-game' oriented  
formats?

If you want to sell memory cards preloaded with information, it should be in the standard file  
format. You may be able to be given an exception to this rule if you are using the whole  
memory card for your "special" feature. If you want to pursue this, then contact Todd Colletti at

(415) 655 - 8133, as he handles some of the licensing issues at Sony.  
Dan Burnash

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4/6/96 7:31 PM

XA movie lose audio after SpuInit()?

Dave Elton

CD Creation

I had my XA movie ( interleaved with sound) played perfect before. But when I add in SpuInit() or SsInit() in my code before the movie playing code, the XA movie lost its sound. Video still OK, but there is no audio any more. I tried to use SsEnd(), SsSetTick(Ss\_Mode\_Tick60) and SsStart2() before movie playing (I got this from some BBS msg posted before), and still cannot get the audio in XA movie stream back. I am using Lib3.4 and stream library to play movie. Did I miss anything here?

Thanks for any advice!

Simon ReadySoft Inc.

---

4/8/96 9:54 AM

Re: XA movie lose audio after SpuInit()?

Rob Vawter

Dave Elton

CD Creation

Q: I had my XA movie ( interleaved with sound) played perfect before. But when I add in SpuInit() or SsInit() in my code before the movie playing code, the XA movie lost its sound. Video still OK, but there is no audio any more. I tried to use SsEnd(), SsSetTick(Ss\_Mode\_Tick60) and SsStart2() before movie playing (I got this from some BBS msg posted before), and still cannot get the audio in XA movie stream back. I am using Lib3.4 and stream library to play movie. Did I miss anything here?

A: Yes, you did miss something that a LOT of developers have missed in the past. 1) SsInit() calls SpuInit(). SpuInit() sets Cd volume back to zero. The correct order of initialization functions is CdInit() and then SpuInit() or SsInit(). 2) The CD decoder splits XA and DA data into left and right and sends it to the SPU, where it is input to the SPU section called Serial A and mixed with sound data output by the SPU

\_ libspu CD mixing

#include <libspu.h>

SpuCommonAttr attr;

attr.mask = (SPU\_COMMON\_MVOLL | /\* master volume (left) \*/

SPU\_COMMON\_MVOLR | /\* master volume (right) \*/ SPU\_COMMON\_CDVOLL | /\*

CD input volume (left) \*/ SPU\_COMMON\_CDVOLR | /\* CD input volume (right) \*/

SPU\_COMMON\_CDMIX); /\* CD input on /off \*/

/\* set master volume to mid-range \*/ attr.mvol.left = 0x1fff; attr.mvol.right = 0x1fff;

/\* set CD input volume to mid-range \*/ attr.cd.volume.left = 0x1fff; attr.cd.volume.right = 0x1fff;

/\* CD input ON \*/ attr.cd.mix = SpuOn;

/\* set attributes \*/ SpuSetCommonAttr (&attr);

\_ libsnd CD mixing

#include <libsnd.h>

/\* CD input ON \*/ SsSetSerialAttr (SS\_SERIAL\_A, SS\_MIX, SS\_SON);

/\* set volume to mid-range \*/ SsSetSerialVol (SS\_SERIAL\_A, 0x40, 0x40);

You can manipulate the volume of XA and DA via either of the above setups.

---

4/9/96 11:37 AM  
Cd Emulator acting flaky  
player 1  
CD Creation

I've been messing with my CD Emulator all day long. I've finally gotten it to a stage where I can actually run cdexec, and have it do something, but every single read I've done in any program will always fail. Usually the CD emulator will just lock up when a CdSearchFile gets called, but sometimes it will actually fail. Has anyone else experienced any similar problems and have a solution? Tom Ketola Player 1, Inc.

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4/9/96 10:16 AM  
Re: system area file  
Thomas Boyd  
Dave Elton  
CD Creation

> I tried to generat a .ccs file for CD Generator when I build the emulation disc image. But when I use this .ccs file to >cut cd, the system area file is blank event I set "SystemArea" to "licensea.dat". I tried to manually typed in the licensea.dat >Cd Generator gave me a general protection error. No mather I ignore or not, Cd Generator will freeze or close its window. >Has anybody there experience this problem?

Your message is a bit confusing, so my answer may be off:

It sounds like you are building the CCS file with the emulator tools. If you do this, you need to edit the times in the header of the CCS file, because they will be screwed up. This will cause a crash. Just replace the lines with 00:00:00:00 etc with carriage returns only.

> Also I cut a CD mixed with subheader (interleave) files(mostly XA movies) and standard files (mostly data files), for >some reason, the CD cut runs perfect on Black CD development system, yet when I tried it on debugging station, all >the movies played with streaming libraries get choppy and drop looooot of frames.

The drives are different. Perhaps your CD has a high error rate, but the black CD is good enough to recover. See if you can put your CD in an error checker. Also, burn at single speed for lowest error rate. Also, try several different debug stations and see if you get high error rate on all of them, or just one.

>Sometimes, it looks like read though >the standard files between subheader files and doesn't know when to stop. I have my stream movie frame counter >set up in my code, but looks like some times the streaming library just ignore all my frame counting and keeps playing >all the subheader files next to each other. Anybody has any idea what's going on about this? I am using lib3.4.

Your movie streamer is looking for the last frame. If the last frame is misread, then your while (current\_frame<last\_frame) line will never stop and it will keep reading past the end of the movie. (because current\_frame for the last frame is never read).

one solution: pad the movie with blank frames at the end that have higher frame numbers that will stop the streamer. There are many other solutions.

Tom

---

4/9/96 7:51 AM  
system area file  
Dave Elton  
CD Creation



I tried to generate a .ccs file for CD Generator when I build the emulation disc image. But when I use this .ccs file to cut cd, the system area file is blank even I set "SystemArea" to "licensea.dat". I tried to manually type in the licensea.dat Cd Generator gave me a general protection error. No matter I ignore or not, Cd Generator will freeze or close its window. Has anybody there experience this problem?

Also I cut a CD mixed with subheader (interleave) files (mostly XA movies) and standard files (mostly data files), for some reason, the CD cut runs perfect on Black CD development system, yet when I tried it on debugging station, all the movies played with streaming libraries get choppy and drop a lot of frames. Sometimes, it looks like read through the standard files between subheader files and doesn't know when to stop. I have my stream movie frame counter set up in my code, but looks like some times the streaming library just ignore all my frame counting and keeps playing all the subheader files next to each other. Anybody has any idea what's going on about this? I am using lib3.4.

Thanks for any advice!  
Simon ReadySoft Inc.

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4/10/96 1:38 PM  
CDRead sector by sector  
Jay Stelly  
CD Creation

Was the issue of reading a file sector by sector using CDRead() ever resolved?  
We are still having to do a CDControl(CdlSetLoc) after each CDRead() to get to the next sector. Is this the way it's always going to work? or is there a workaround? This causes our I/O to do many extra seeks. I would expect CDRead to update the position just like C's fread(). It isn't possible for us to read the entire file into memory at once.  
Thanks, Jay Stelly Tetragon, Inc.

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4/11/96 12:18 AM  
Re: Cd Emulator acting flaky  
Dave Howell  
CD Creation  
player 1

<< I've been messing with my CD Emulator all day long. I've finally gotten it to a stage where I can actually run cdexec, and have it do something, but every single read I've done in any program will always fail. Usually the CD emulator will just lock up when a CdSearchFile gets called, but sometimes it will actually fail. Has anyone else experienced any similar problems and have a solution? >>

We are having a similar problem. It looks like the sort of problem you would expect from corrupted data transmission, due to bad SCSI termination or a bad SCSI cable or an interrupt conflict or a badly seated board or something like that. We ruled out most of those possibilities by noting that, of our two emulator boards, both work fine in one development machine, while in another identical machine they fail about 90% of the time. That makes me think that the problem is related to Windows software setup. Maybe IRQ conflict. Does anybody have any good rules or procedures or utilities to recommend to try to avoid IRQ conflicts?  
Dave Howell Pablo Media

---

4/12/96 11:20 AM  
CD Emulation Problem  
Tim L. Lowery  
CD Creation

I'm having great difficulty getting CD emulation to work reliably on one of our machines. We have two PCs nearly identical running Windows 95, each with a CD emulator card. I'm using a Micropolis 4221AV external drive.

On the first PC we can run the RCube demo over and over again with no problems (using either emulator card and the same HD). On the second PC the CD emulation works less than 10% of the time. Shortly after running CDEXEC the hard disk activity light will stop blinking and stay on (and the demo doesn't run).

I've noticed similar reports in this conference, and maybe someone can suggest some corrective steps. I've reviewed the CD emulation FAQ and installation guide. I've swapped emulator cards, changed IRQ settings, removed IRQ and DMA settings, performed ceremonial rituals, etc.

The PCs are nearly identical (same motherboard, BIOS, components, etc), except that one has an ATI video card and the other has a Diamond. The only other difference we noted was that the IRQs differ with our 3COM Ethernet cards. We using the same CD emulator software and the same AV HD and SCSI cable. I've tried it with and without SCSI termination. We haven't swapped development boards yet, but I suppose I'll try that next.

So, what's the dealy-bop with the HD activity light staying on? • Tim Lowery Pablo Media

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4/14/96 11:05 AM  
Re: CD Emulation Problem  
Chris E. Reese  
CD Creation

From what I have experienced, if the hard drive light stops flashing then you the emulator board you have is bad. The only way I fixed the very same problem was to get in touch with Thomas Boyd and have him send me a replacement board. I went through two boards before the problem went away. The emulators seem to be working just fine and we have three of them, unless of course you consider burning up hard drives a problem. We are so frustrated with the failure rates of cd emulation that I just recently had my whole team get rid of their emulation cards and use CD's. We can burn a whole lot of CD's for the price of one emulator card!

Chris Reese Eidetic, Inc.

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4/15/96 8:23 PM  
Help w snd/movie interleave  
David W. Marshall  
CD Creation

I hope someone out there can help with, what I hope is, a very basic question. I want to interleave a silent movie with some XA audio and play a movie with sound. I looked all over and couldn't find any good documentation that made sense and explained what steps to follow and what tools to use.

The following is what I have, so any help would be appreciated:

1)A silent, 24bit uncompressed AVI file which was converted to a STR file using MOVCONV with the easy settings. I think it is 1 channel, 15fps, double speed, 5 sectors max frame size. This movie plays fine thru the sony.

2)A XA audio file which is stereo 38.????k

I figured I could just use MOVPACK to stuff these 2 items together, but I guess it's not that easy. I tried different things in MOVPACK, but nothing seemed to work.  
reply here or via email to DMarshal@nssi.com  
thanks,  
dave

---

4/15/96 12:55 PM  
BuidCD / emulator woes  
Dave R. Scheele  
CD Creation

Yesterday I could build an image of my hard drive directory structure onto the CD emulator without problems. I found that using CDDISK to delete the partition I wanted to re-BuildCD was necessary. I re-BuildCD'd the partition on my emulator hard drive many times.

Today, I've finished writing the code to actually read off the emulator in my game. Surprise, surprise it didn't work first time, and it seemed my file locations parsed from the .CCS file output from BuildCd using the -g option may have been incorrect, so I decided to re-BuildCD again, using the delete / recreate / re-BuildCd process that I used yesterday.

This time, the first two directory levels (\ and \IRONBLUD) look fine in CDDISK (view partition), but when I try to access a third level (\IRONBLUD\LUTHOR) the file names are totally corrupted. Most other directories crash CDDISK altogether.

I'm using the Sony-recommended Micropolis 4G drive, CDBoot30.bin etc. etc. ... the standard setup.

Anyone have any ideas what's up?? Why can't I re-"burn" a new emulator image anymore?

Looks like E3 is out of the question, until this gets resolved :(

Dave

p.s. then again, even if this does get resolved, there's still the problem in reading the files back .. it's gonna be a long week!!!

---

4/16/96 8:44 PM  
Re(3): BuildCD / emulator woes  
David W. Marshall  
Dave R. Scheele  
CD Creation

>>>>I had a directory with 39 files in it, including ..., and I thought this would be ok 'cuz the limit >>>>was 40.

I complained about this crash bug a long time ago. When using CDDISK to look at a subdirectory, if that subdirectory has more than 30+ files CDDISK will crash. It totally reboots my machine. Since nobody really uses CDSearchFile() to find files, the file limit doesn't apply to most games. SN Systems should make CDDISK display a subdirectory no matter how many files are in it.

dave

---

4/16/96 3:11 PM  
Re(2): BuildCD / emulator woes  
Dave R. Scheele  
CD Creation

By too many files altogether, do you mean in 1 directory, or total? I didn't know there was a max on total files on the disk. Is there?

I had a directory with 39 files in it, including ..., and I thought this would be ok 'cuz the limit was 40. However, when I moved half of them to another (sub)directory, and used cddisk -n to clean off the drive and re-partition it, I could make images again without incident.

So, folks, the word seems to be .. less than 30 files per directory, and/or re-build your emulation disk via CDDISK -n if you need to !

Thanks to all who helped ...

Now I've just got to figure out why my CD read only pulls data 20% of the time, and garbage the rest!! :(

Dave

---

4/16/96 2:45 PM

Re: Help w snd/movie interleave

Mike Fulton

CD Creation

>>I figured I could just use MOVPACK to stuff these 2 items together, >>but I guess it's not that easy. I tried different things in MOVPACK, >>but nothing seemed to work.

Can you be more specific about what you tried? And have you looked at the information starting on page 312 of the "Library 3.0 Overview" documentation?

It may be easier for you just to use Premiere (or whatever) to create a new AVI file with both video and audio, and then convert that.

Mike

---

4/16/96 8:50 PM

Re: Help w snd/movie interleave

David W. Marshall

David W. Marshall

CD Creation

For future reference, here is what I found.

1)Use MovConv not MovPack to interleave a sound and movie file together.

2)When using MovConv to make a silent movie that will have sound added to it later, you still need to check the SOUND box in the output menu to make the movie correctly. This is mentioned in the manual in one spot but I don't think it is mentioned in the help files. This was my problem.

3)Now that you have a silent movie and an XA track, use MovConv's Interleave-Sound-W-Movie option to make your new movie.

dave

---

4/16/96 6:44 AM

Further info on BuildCD / emulator woes ...

Dave R. Scheele

CD Creation

I've been wondering ....

People here seem to be using CDGEN (ugh!!!) to create CCS files, with File Manager and the drag-and-drop deal. I build a CTI file by hand, using the SourceDirectory command, as follows:

```
Hierarchy      XAFileAttributes Form1 Data      Directory IRONBLUD
SourceDirectory C:\IRONBLUD SubDirectories EndDirectory File PSX.EXE
```

Source C:\SONY\IRONBLUD\FIGHT.EXE EndFile EndHierarchy

This created the entire 2-level directory structure under \ironblud fine on Sunday, but not any more. I haven't added or changed any files in the entire tree. The one thing I DID do is change the source of PSX.EXE from FIGHT.CPE to FIGHT.EXE, which shouldn't do anything at all, I would think. (I'm not running it, it's just a placeholder).

Comments? Questions? HELP! ;)

Dave

p.s. respond here or to scheeled@iaa.org

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4/16/96 2:36 PM

Re: BuildCD / emulator woes

Mike Fulton

CD Creation

Is it possible that you have too many files altogether?

Mike

---

4/16/96 9:29 AM

More info, less insight on BuildCD / emulator woes

Dave R. Scheele

CD Creation

In our last episode, we got the hint that the SourceDirectory command in a CTI file may not work as documented ...

On that assumption, and some hints from friendly developers, I did the drag-and-drop thing with CDGEN. As I'm unfamiliar with Windows (I use Microsoft products as little as possible), this option would not have occurred to me. Is it documented somewhere and I've missed it?

Anyways, not surprisingly, the CCS file it created was very different from the one BuildCD created, even with the same source files. When I BuildCD'd an emulator image from the new CCS file, however, CdDisk won't even access the \IRONBLUD directory anymore, it just crashes.

Given that one of the things I'm testing here is my CD read routines (which are about 95% verbatim from the manuals, btw), is there any reliable way to see what data is being put on the CD emulator??

Dave

---

4/17/96 10:19 AM

CD Emulator woes RESOLVED!!!

Dave R. Scheele

CD Creation

Well, I found the problem .. seems I assumed the UNDOCUMENTED function CdGetSector() was not working the way I had originally assumed. If there was some DOCUMENTATION available for this function, and someone had fixed the bug in CDDISK that Dave Marshall reported MONTHS AGO I may not have wasted so much time and energy...

For what it's worth, the only value you can pass into CdGetSector()'s second parameter is the size of the full sector you are reading (2048/4 for Form1 data, 23xx something for Form2). You will always get a full sector's worth of data.

Dave

---

4/18/96 9:59 PM  
new cd emulator  
Lobotomy Software  
CD Creation

We just got our first CD emulator card, but not a drive for it yet.  
The manual lists two Ibm drives and one micropolis drive which are supposedly compatible, but we were unable to find any dealer who had heard of the micropolis model...  
What is the actual model number of the micropolis drive everyone uses for the emulator?  
also, how do you go about using cd data disks which have been pre-burnt with the correct data for the game, but do not contain an executable? How do I hook up both a hard drive and a cd rom and access them separately?  
Jeff Blazier

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4/19/96 6:56 PM  
Re(5): Streaming errors  
Michael Koziniak  
John Harris  
CD

>I tried a simple test, since it appeared that the one corrupted .STR file had eight extra bytes at the beginning, I just deleted those bytes and padded the end of file. The first frame then looked normal, had sector count 0 frame 1, and matching headm and headv bytes. The data at +2336 bytes was aligned and had sequential count fields. Interestingly, when I played this .STR file through both TUTO1 and the program's code, there were no graphics at all, and no sound. >After a pause equal to the time the initial movie should have taken, it played through additional selections on the CD emulator drive.  
Just a couple of thoughts.  
The first two extra dwords(00014280) are supposed to be at the beginning of the .STR file  
Could you brief me on the parameters of the movie? width, height, and fps.  
Can you upgrade to the newer libraries?  
Michael

---

4/23/96 6:48 PM  
Re: new cd emulator  
Michael Koziniak  
Lobotomy Software  
CD Creation

>We just got our first CD emulator card, but not a drive for it yet.  
>The manual lists two Ibm drives and one micropolis drive which are supposedly compatible, but we were unable to find any dealer who had heard of the micropolis model... > >What is the actual model number of the micropolis drive everyone uses for the emulator? > >also, how do you go about using cd data disks which have been pre-burnt with the correct data for the game, but >do not contain an executable? How do I hook up both a hard drive and a cd rom and access them separately?  
Our part number calls the drive: DTL-H4221-02  
I believe Micropolis calls it : 2GIG 422AV

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4/23/96 2:46 PM

Re: CDRead sector by sector

Thomas Boyd

Jay Stelly

CD Creation

Yes,

If you issue a seek, then a read, then you want to do another read, you are out of luck, because you must re-seek. The best alternative is to do something similar to the following:

CdCommand(CdlSetLoc, ...); CdCommand(CdlSeek, ...); CdCommand(CdReadN, ...);

And use CdGetSector as a callback system to pick up sectors as they are read. This way the system keeps reading until you tell it to do something else.

Tom =====

Was the issue of reading a file sector by sector using CDRead() ever resolved?

We are still having to do a CDControl(CdlSetLoc) after each CDRead() to get to the next sector.

Is this the way it's always going to work? or is there a workaround? This causes our I/O to do many extra seeks. I would expect CDRead to update the position just like C's fread(). It isn't possible for us to read the entire file into memory at once.

Thanks, Jay Stelly Tetragon, Inc.

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5/2/96 3:31 PM

CdlGetLocL Timing

David W. Marshall

CD Creation

Maybe this can save someone else some debugging time.

It appears that CdlGetLocL (the call that gets the head's current position) has different execution speeds when running on the emulator and running on a Blue PSX. The call seems to take more time on the Blue PSX.

I had some code that worked fine on the Emulator but would crash on the Blue PSX. Using CdlGetLocL during time critical stuff turned out to be the problem.

dave

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5/3/96 7:12 PM

Re(2): XA audio & CdlSetMode

David Vronay

CD Creation

Sky Lounge

What was the resolution to the CdlSetMode problem below, I have run into it recently and do not see later references.

We suspect part of our problem may be with the CdlSetMode command (as issued by the CdControl function). We aren't convinced this is working for us, since when we use CdlGetlocL to read the mode value back (like it says to do on page 49 of the Run-Time Library 3.0

Overview), it always has a value of 0. What's going on? Are we failing to properly change the mode, or is the mode reporting not working correctly?

Richard Maurer @ImaginEngine

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5/3/96 8:22 PM

Re(3): XA audio & CdlSetMode

David W. Marshall

CD Creation

David Vronay

>>>What was the resolution to the CdlSetMode problem below, I have run into it recently and >>>do not see later references.

One "feature" with CdlGetLocL is that it will only return valid information when the head is reading. If your head is not reading, you won't get valid information. So if you seek somewhere and then want to verify that the head actually got there, CdlGetLocL won't give you anything to use because the head hasn't started to read anything yet.

Not sure if this helps. Can you supply more info on what you are trying to do?

dave

---

5/7/96 11:29 AM

Re(4): XA audio & CdlSetMode

David Vronay

David W. Marshall

CD Creation

Thanks, I wanted to see if it was in slow speed or double speed and that's a place I saw to get that info. With a disk you can see it spin, but with the emulator, I have to ask the disk. So I understand the upshot is that I have to actually read something and wait before I can get back such mode info. Hmm. Is that right Sony? And the fastest way to get this info is to read the current location? which takes how long?

Richard Maurer @ImaginEngine

References below Richard wrote: >>>What was the resolution to the CdlSetMode problem below, I have run into it recently and >>>do not see later references.

We suspect part of our problem may be with the CdlSetMode command (as issued by the CdControl function). We aren't convinced this is working for us, since when we use CdlGetlocL to read the mode value back (like it says to do on page 49 of the Run-Time Library 3.0 Overview), it always has a value of 0. What's going on? Are we failing to properly change the mode, or is the mode reporting not working correctly?

Dave wrote: One "feature" with CdlGetLocL is that it will only return valid information when the head is reading. If your head is not reading, you won't get valid information. So if you seek somewhere and then want to verify that the head actually got there, CdlGetLocL won't give you anything to use because the head hasn't started to read anything yet.

Not sure if this helps. Can you supply more info on what you are trying to do?

dave (Marshall)

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5/10/96 12:15 PM

Re(5): XA audio & CdlSetMode

Mike Fulton

CD Creation

...I wanted to see if it was in slow speed or double speed...

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Why query the current speed mode? Why not just force it to the appropriate speed for what you want to do? Is there some reason why that would be a bad idea?

If you really need to know, then you can do a CdControl(CdlNop) to get the current status (playing, not playing, seeking, etc.). If you're in the middle of a read, then you can do a CdControl(CdlGetlocL) to get the current mode information. If you're not in a read, then the current speed mode isn't really relevant anyway. Just set the mode you want.

The reason that you can't get information with CdlGetlocL unless the head is reading is that a



new mode set with CdlSetMode doesn't actually take effect until you start a read.

Mike

---

5/12/96 4:12 PM

how to detect MDEC vlec error?

Dave Elton

CD Creation

I am trying to reading in MDEC frames from the movie built by MovConv. But when I use DecDCTvlc() functions, sometimes I will get MDEC vlec error or invalid vlc id error. As DecDCTvlc() doesn't return anything, there is no way to check out when the error happens so I can ReRead the data to feed in DecDCTvlc. Does anybody knows how to detect if DecDCTvlc() gets error?

Thanks for any advice!

Simon ReadySoft Inc.

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5/23/96 2:40 PM

Re: CD-GEN "Update" function

Mike Fulton

CD Creation

I'm not sure I understood correctly... what screen are you on when you select the "Update" function? And what is selected?

Is it possible the files are being added, but are placed at the very end of the list in the layout window?

Maybe "Update" won't do exactly what you want after all. In that case, the best idea is probably to completely delete the directory from your layout, and then add it in again so the new files are picked up.

Mike

P.S. Did you know that you were missing? At least according to Chris Crawford. The current issue of some magazine I just read includes a short article by him in which he mentions the "Hackers" book and some of the people in it, and according to him, you're working in a hotel these days or something goofy like that. I forget exactly what it said, but I'll dig it up and tell you exactly what magazine it was.

---

5/23/96 10:02 AM

CD-GEN "Update" function

John Harris

CD Creation

Does anyone have any tips for using the "Update" function of CD-GEN, or otherwise adding files into an already existing directory structure? I'll select a directory that I have added files into, and select the Update function. I then select "Add new files..." and click Okay. CD-GEN then redraws the directory window with my new files in place, but it doesn't really add them into the .CCS file. If I switch to the layout window, and look in the directory, the files aren't there. (Even though they still appear if I switch back to the directory window). If I save the .CCS file and reload it, the files won't be in the directory window either, and of course, they

don't get burned on the disk.

The only way I have found so far to add files, is to use the "Put Files" option. But this adds the files at the end of the disk, and I have to scroll through the layout window looking for where they were supposed to go, then use the Move function and type in the proper location for the newly added files. With 3800 files on the disk, this is a cumbersome procedure and I hope someone can enlighten me to a better way.

Thanks,

John Harris Tachyon Studios, Inc.

---

5/23/96 6:14 PM

Interleaving XA audio in CTI file

press start

CD Creation

i,

Other than using MOVCONV/MOVPACK how do I set up interleaved channels of audio using the .CTI file please. I've tried numeroud combinations of XAInterleaved, XAAttributes, Channel etc. but to no avail. Understand that I don't want to use a pre-interleaved file but want to interleave audio with data using the CTI structure.

Best Regards,

#6

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5/23/96 5:29 PM

Re(2): CD-GEN "Update" function

John Harris

Mike Fulton

>I'm not sure I understood correctly... what screen are you on when you select >the "Update" function? And what is selected?

I'm in the Directory screen, which is the only place the Update function appears. Hey Mike, \_you're\_ the one who told \_me\_ about the update function! :-) I select the directory on the left hand side that contains new files, and select Update -> Add new files. After the operation, the right hand file listing does display the new files that had been added to the directory since the last time I ran CDGEN. It's just that they don't stay there, nor do they really get saved into the CCS file. I greped the CCS file to be sure.

>P.S. Did you know that you were missing?

Yes, I saw that article. It's actually a fairly old article that was posted several years back in another publication, though I don't remember which one. Back then it was titled "A Grain of Sand, a Gust of Wind" or something like that.

He said he thought I was in advertizing! That's a bit of a stretch, even though the character generators I sold did get used by cable TV systems for advertizing purposes.

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5/23/96 6:20 PM

Re(3): CD-GEN "Update" function

Mike Fulton

John Harris

CD Creation

I'm in the Directory screen, which is the only place the Update function appears. Hey Mike, \_you're\_ the one who told \_me\_ about the update function! :-)

Yeah, I know, but the way you worded your message made me wonder if you'd found some option I'd missed.

Well, I looked at both the release version of CDGEN and the newer beta we got recently, and they both exhibit the problem. I'll report it, but in the meantime, the "delete the directory, add the directory" trick is your best bet.

Mike

---

5/24/96 10:05 AM

Re(4): CD-GEN "Update" function

John Harris

Mike Fulton

CD Creation

>Well, I looked at both the release version of CDGEN and the newer >beta we got recently, and they both exhibit the problem. I'll report it, >but in the meantime, the "delete the directory, add the directory" trick >is your best bet.

That's a problem too, because there are a lot of movie files in each directory, and some of them are silent movies in form 1, while others have sound and need to be set to form 2. Redoing all the file formatting would be a bummer.

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6/14/96 5:24 PM

Re(5): CDRead sector by sector

Rob Vawter

Lobotomy Software

CD Creation

Q: CdGetSector works fine, but now I seem to have problems reading files back to back. What method do I use to prepare the CD for a new location once the ReadN command has been tasking for a while?

Do I need to put the CD on standby, or stop it, or just issue a new location. Also, I do use fileSearch, could this have a problem following up a readN command?

Please don't stop the CD. This only increases load times as the CD needs to speed up to the proper rate again. Don't use CDSearchFile either. It's really, really slow at loading. It first does one seek to read the TOC, then successive seeks for each subdirectory, then a final seek to the file. Sloooooooooow. Use a direct seek by using CDCCommand(CdSetLoc...), CDCCommand(CDSeekL...) then a Read after hard-coding locations.

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6/14/96 2:54 PM

Re(4): CDRead sector by sector

Lobotomy Software

CD Creation

Okay,

CdGetSector works fine, but now I seem to have problems reading files back to back. What method do I use to prepare the CD for a new location once the ReadN command has been tasking for a while?

Do I need to put the CD on standby, or stop it, or just issue a new location.

Also, I do use fileSearch, could this have a problem following up a readN command?

-Jeff Blazier

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6/14/96 5:06 PM

boot problems

John Harris

CD Creation

I needed to rebuild my .CCS file from scratch, and after doing so the disk will no longer boot.

When booted from the black drive, the dev system shows the message:

No EXE-file ! Execute the boot file

The PSX.EXE file is on the disk though. What did I miss?

John Harris Tachyon Studios, Inc.

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6/14/96 11:30 AM

Re(2): CDRead sector by sector

Lobotomy Software

CD Creation

Does Anyone Know....

where is CdGetSector documented?

I found it in the header for libcd, but not in the manual... does \*madr mean the buffer I want the data copied to and shouldn't the other parameter usually be 2048 (or is it 512?) ?

also, If I do not call CdGetSector, will the CD trash the CD buffer or will it wait until I have called get sector first?

What effect will CdControlB have on a CdReadN command? Will it only read one sector then return or will it never return? If it does return, will it continue to read where I left off if I issue a readN again?

Thanks, Jeff Blazier

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6/14/96 2:22 PM

Re(3): CDRead sector by sector

Michael Koziniak

Lobotomy Software

CD Creation

>also, If I do not call CdGetSector, will the CD trash the CD buffer >or will it wait until I have called get sector first?

I think CdGetSector will wait until you call it and then when you do a sector buffer transfer that will move pointer which index's the sector buffer. Look at page 54 of the overview to see a use of CDGetSector.

-Michael

---

6/17/96 11:20 AM

Re(6): CDRead sector by sector

Lobotomy Software

CD Creation

I do not know the location of my files on the CD so I need to use CDSearchFile to find them... I do not care about the speed of search file yet, I just want the CD to work...

My question is: I have problems reading files back to back when I use CDIReadN. My first file reads fine, then after a user delay, the second file reads, then a third file tries to immediately read, but fails. Why is this?

```
my process is: open: CdSync(0, cdresult); fsresult = CdSearchFile(&fp, filename);
CdControlB(CdISetLoc, (u_char*)&fp.pos, cdresult); CdControlB(CdISeekL, 0, cdresult);
CdControl(CdIReadN, (u_char*)&fp.pos, cdresult);
read: while (CdReady(1, cdresult) != CdIDataReady); CdGetSector(sectbuff, 512); I call open
once and then call read many times per file until the data is read. How do I then SAFELY open a
new file (ie. seek to a new sector)?
what happens to the data being read into the buffer when I interrupt with a new Search, then
Seek?
-Jeff
```

---

6/19/96 12:03 PM  
CdDataSync  
Lobotomy Software  
CD Creation

Does anyone know if CdDataSync is documented in the new docs anywhere.  
I'm having a problem with CdGetSector that I think will be fixed if I just wait for the xfer to end,  
but I do not know if CdDataSync is the correct call to use to detect the end the xfer.  
thanks,  
Jeff Blazier

---

6/19/96 11:29 AM  
Fwd: cdboot2.8 problems  
Administrator  
CD Creation

We are trying to stream from the CD emulator for the first time, using the low-level CD library commands with our own ring buffer rather than the using the St\*() library, and are experiencing a serious hesitation at a critical moment that, despite all our efforts, we can't figure out. So I figured, now is the time to employ the CDMON program to see what the emulator thinks is going on.

In order to use CDMON, I needed to modify the CD emulation environment -- notably, turn on the CD emulator interrupt and use the cdboot28.bin boot program. From experience, I know that changes to that tenuous environment should be made one step at a time. I won't detail those steps, but I'll note the complete environment I used, guided by the various README and FAQ files and the manuals:

á Programmer's Tools release 1.6, with resetps.exe V1.03 á CD-Emulator release 1.5.1, with cdbios.com V1.03 á Either the snpatch.cpe supplied in the psx\bin directory of the 1.6 release, dated 4/8/95; or a version we got somewhere dated 12/20/95 (both are 247K bytes) á The following lines executed in my autoexec.bat file: lh c:\psx\bin\dexbios /a1340  
c:\psx\bin\resetps 1 lh c:\psx\cdemu\bin\cdbios /a398 /i7 /d7 The addresses, interrupt and DMA match those on the development and CD emulator boards and have been verified as unique by both the Windows '95 Device Manager and MSD. Same story with the emulator board's controller SCSI id, at the factory setting of 7, and the emulator's hard drive SCSI id of 3.  
á The following batch file run from either a Windows command shell or DOS command-prompt mode: resetps 1 delay 4 run \psx\bin\selemu delay 4 run \psx\bin\snpatch delay 5 run \psx\bin\cdexec

With the above environment, and with cdboot18.bin loaded on the CD emulator via CDDISK, I am able to successfully run. But I'm not all the way there yet... When I make one more change --

loading cdboot28.bin on the emulator -- I get that old "Cannot connect to target" message immediately upon attempting to run cdexec. After that, the target board is hosed and I have to power down & up to do anything else.

As far as I know, I've done everything right. Or have I? I won't be able to use CDMON until I get cdboot 2.8 working correctly, right?

By the way, cdboot30.bin from the CD Emulator release 1.5.3 works but cdboot60.bin (I was just starting to grok the numbering scheme...) doesn't, just like 2.8. I'm not using these later releases because the new buildcd.exe from the 1.5.2 release breaks the CdSearchFile() function...

David Crain NuFX, Inc.

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6/19/96 3:34 PM

Re: CdDataSync

Rob Vawter

Lobotomy Software

CD Creation

Q: Does anyone know if CdDataSync is documented in the new docs anywhere.

A: Not yet. It will be. Parameter: int mode indicates blocking (0) or non-blocking (1). Return values - 0 = transfer complete 1 = transfer ongoing -1 = error

Q: I'm having a problem with CdGetSector that I think will be fixed if I just wait for the xfer to end, but I do not know if CdDataSync is the correct call to use to detect the end the xfer.

A: It is.

---

6/24/96 10:11 AM

Re: boot problems

Rob Vawter

John Harris

CD Creation

I needed to rebuild my .CCS file from scratch, and after doing so the disk will no longer boot.

When booted from the black drive, the dev system shows the message:

No EXE-file ! Execute the boot file

The PSX.EXE file is on the disk though. What did I miss?

For those of you that may run across the same problem. This has to do with the file limits in the root directory. CdSearchFile will fail when it cannot find the specified file because there are too many files in a given directory or too many directories or too many levels of directories.

John thought he was sneaking around this limitation because he had the .EXE file located early on the disk. However, the Table of Contents (TOC) is alphabetized, and PSX.EXE was past the file per directory limit.

---

7/9/96 3:41 PM

Lobotomy Software

CD Creation

Does anyone know how to run a cpe file with the emulator, but have it read its data from the external CD-ROM drive?

How do I reset and run, etc. to make this happen?

When I do this now, the cd emulator seems to be receiving the CD commands and not the

external drive...  
thanks, Jeff Blazier

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7/10/96 12:12 PM

Re:  
Mike Fulton  
CD Creation

Does anyone know how to run a cpe file with the emulator, but have it read its data from the external CD-ROM drive? How do I reset and run, etc. to make this happen? When I do this now, the cd emulator seems to be receiving the CD commands and not the external drive...

thanks, Jeff Blazier

First of all, let's make a few clarifications. When you say "run a CPE file with the emulator" it's not clear what you mean. The only way to run a CPE file is from the "RUN" utility... you can't boot a CPE file. Do you mean to say "run an EXE file with the emulator" or "run a CPE file from the command line"?

I'm assuming the former, because if you were running a CPE file from the command line then I don't see why you'd have any problems reading anything from the external drive.

The SELCD.CPE file is executed to force the DTL-H2000 to use the external CD-ROM drive (this is the power-on default). The SELEMU.CPE file selects the emulator.

If you want to boot an EXE file from the emulator and then switch to using the CD-ROM drive, the way you'll have to do it is to make an EXE version of the SELCD.CPE file and execute it as a child process. After it finishes, you should be using the real CD-ROM instead of the emulator.

I'm curious about WHY you'd want to do things this way. It would be much more convenient to simply run your CPE files from the DOS prompt using the run utility. Are you having some problem in the boot stages that is prompting you to try booting from the emulator? If not, then it sounds like you're doing things the hard way. Please provide more details about your situation.

Mike Fulton

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7/10/96 7:47 PM

Re(4):  
Lobotomy Software  
Mike Fulton  
CD Creation

when will the new cd-gen program be released???

I just went out to get a 1542cp because I couldn't find a "cf", but now my whole system is messed up...

It would really be nice to restore it back to normal and have a software solution...

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7/10/96 4:10 PM

Re(2):  
Lobotomy Software  
Mike Fulton  
CD Creation

I want to use a .cpe and the ROM drive (not the emulator).

It now seems to work, I just question my cd burning ability now...

thanks...

Jeff Blazier

P.S. does anyone know if easy-cd pro mm burning software can be used to create data cds or do I need to use CD Generator from Sony?

easy-pro seems to find the burner through my generic adaptec controller which is different from the one sony requires...

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7/10/96 6:31 PM

Re(3):

Mike Fulton

Lobotomy Software

CD Creation

FYI: We're about to release CDGEN v1.3, which won't require a specific host adapter any more.

Mike

---

7/11/96 2:52 PM

CdRead after playing MDEC movies

Ted Morris

CD Creation

Is there anything special that must be done to get CdRead to work after playing MDEC movies? Our game works fine off the emulator when doing this, but it fails to run when played off a real CD on a debug station. If the movies are in, the movies play but the game fails to load. If the movies are not played, the game loads and runs.

Thanks, Jason Curtice Westwood Studios

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7/11/96 9:41 AM

Re(5):

Mike Fulton

Lobotomy Software

CD Creation

The new CDGEN will be available soon... hopefully within 2 weeks.

Mike

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7/11/96 6:43 PM

Re(4):

Dave Scheele

CD Creation

Mike Fulton

FYI: We're about to release CDGEN v1.3, which won't require a specific host adapter any more.

I'm currently using version 1.10 ... is there a version 1.2 that I can download somewhere right now? I don't recall hearing or seeing it anywhere, and I thought I've been keeping myself up to date with Sony's releases.

Dave

---

7/12/96 2:48 PM

possible bug with build cd and map files.

Jeff Davies

CD Creation



EXAMPLE.ZIP 13K

CD Creation

The example.zip contains two files cd.map (created with buildcd 1.23) and badmap.map (created with buildcd 2.28)

There are several things to note in the badmap.map file.

Line #166 There are two different sizes for the SPRITES directory between cd.map and badmap.map. the size for the directory in badmap.map is 2 frames but 3 sectors, this is bad. The file Continue.shp in the map is at position 108604 but in acutally at 108603 on the disc.

We have switched back to using the 1.23 version for now. Please let me know if there is any reason we should look for a newer version.

Thanks, -Jeff

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7/12/96 10:36 AM

Re(5):

Mike Fulton

Dave Scheele

CD Creation

FYI: We're about to release CDGEN v1.3, which won't require a specific host adapter any more. I'm currently using version 1.10 ... is there a version 1.2 that I can download somewhere right now? I don't recall hearing or seeing it anywhere, and I thought I've been keeping myself up to date with Sony's releases. -- Dave

No, we went directly to version 1.3.

Mike

---

7/12/96 3:56 PM

BuildCD control files

Matt Brown

CD Creation

In reading through the CD Emulator documentation, I have noticed that in the examples from appendix A, a few commands are used that I cannot find mentioned anywhere else.

Specifically, VolumePartition, BootRecord, and their associated commands. Are these documented anywhere, and if so, where can I find out about them?

Secondly, has anyone created an ISO9660 image file using BuildCD that can be burned onto a CD and booted on a production (gray) PlayStation? If this is possible, could someone please post an example .cti file (BuildCD control file) that would allow me do this?

Thanks in advance.

Steve Cox DreamWorks Interactive

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7/15/96 2:21 PM

Transferring CD builds between systems

David Minogue

CD Creation

Is there any chance that the new version of CDGEN will address the problems associated with moving a CD build from one machine to another? Here's the problem: as a publisher, we receive directory trees from developers containing all of the source images required to build a CD, along with a CCS file defining the disk layout. There are several difficulties in this process:

1. If we place the files on a different drive letter or in a different subdirectory than the developer used (say F: instead of C:), then we need to modify the references to all of the files. The best way we've found to do this is to edit the CCS file with a global search&replace, as it is least likely to cause any of the files to move.

2. If we receive an update from a developer, we have no way to verify that it was installed as intended (ie. in the correct subdirectory, or that we received all of the files we were supposed to). This leads to extensive testing on the wrong build - major problem.

We would be better able to address these problems ourselves if Sony would release a format specification for the .CCS file. Is this possible?

It would also be useful to be able to precompute a checksum before burning an image to verify that all of the correct files have been installed. This would be a huge benefit to us. It would also be nice if the checksum could be run on a burnt CD.

-- David Minogue.

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7/22/96 7:00 PM

Re: CdRead after playing MDEC movies

Mike Fulton

CD Creation

Is there anything special that must be done to get CdRead to work after playing MDEC movies? Our game works fine off the emulator when doing this, but it fails to run when played off a real CD on a debug station. If the movies are in, the movies play but the game fails to load. If the movies are not played, the game loads and runs.

Thanks, Jason Curtice Westwood Studios

Well, there's nothing "special" you have to do... you just have to do it right. A few questions: Does it ALWAYS fail from a real CD, or only sometimes. If only sometimes, what percentage? So far, it sounds to me like you are most likely not waiting for some CD operation to complete before you issue additional commands or try to transfer data. You should verify that you are using the proper CD\*\*\*\*sync() functions at the proper places. A common mistake is to do a loop where you check each time, except for the last time through.

When running from the emulator, the timing of some operations is different, so you may not have a problem there. But when you go to the real CDROM, these operations take a little longer and you end up stepping on something that isn't done yet.

Before you setup your CdRead() call, issue a CdReadSync() call and a CdSync() call to make sure any ongoing operations are complete.

Mike

P.S. If you try some changes based on these suggestions and the problem doesn't go away, please try to give me a reasonably detailed outline of the steps between the MDEC playback and when it tries and fails the subsequent read. Make sure to list all the CD-related functions that the code uses.

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7/23/96 8:23 AM

Re(6):

Dave Elton

CD Creation

Will the new CdGen1.3 works with win95 ?  
Simon ReadySoft Inc.

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7/23/96 10:48 AM

Re: Disc Changing code

Rob Vawter

Dave Elton

CD Creation

Does anybody there have some sample code for disc changing? I try to looping CdSearchFile until a right CD with the right file is found but it seems CdSearchfile() sometimes goes into a dead loop and gives CdDiskError when I open disc tray, it fails onefor a while. I am using lib3.4 which should fix the CdSearchFile problem in previous version. I hate to hard code the start location of the file I have to search otherwise I have to detect open and close of disc lid and alsoI won't be able to sense if a wrong disc is put in.

Check out new functions CdDiskReady() and CdGetDiskType() in lib 3.5. CdDiskReady() will detect whether the lid is closed and a disk has been detected, after which a short timeout must be taken until the system is stable again (check out change\_e.txt included with lib 3.5 for more info). It sounds like your error occurred because CdSearchFile() was called was the system was still unstable. So perhaps you could loop CdDiskReady() and then call CdSearchFile() once the disk is ready.

CdGetDiskType() basically returns a value which tells you whether you have a black disk (CdIcdRomFormat) or Cd-DA or other type of disk(?) (CdIOtherFormat).

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7/23/96 10:00 AM

Re(7):

Rob Vawter

Dave Elton

CD Creation

Will the new CdGen1.3 works with win95 ?

Yes, it will.

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7/23/96 8:41 AM

Disc Changing code

Dave Elton

CD Creation

Does anybody there have some sample code for disc changing? I try to looping CdSearchFile until a right CD with the right file is found but it seems CdSearchfile() sometimes goes into a dead loop and gives CdDiskError when I open disc tray, it fails onefor a while. I am using lib3.4 which should fix the CdSearchFile problem in previous version. I hate to hard code the start location of the file I have to search otherwise I have to detect open and close of disc lid and alsoI won't be able to sense if a wrong disc is put in.

Simon ReadySoft Inc.

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7/24/96 4:51 PM

Re: Buildcd map files

Mike Fulton

CD Creation

I'm having a little trouble with the .map file that buildcd.exe generates. Specifically, the directory information is incomplete and ambiguous. Would you include the full path name (on the CD) of each directory - Dir() - in the "Additional" section similar to the way the full path name of each file (on the PC) is included in the file information - File() - listing.

This is a high priority item for me, and would be a great help. Thanks in advance.

Steve Cox @ DreamWorks Interactive

The directory information is already available... it's just not repeated for each file, so it needs a little parsing to extract. For example:

```
Dir() File(SYSTEM.CNF) Dir(MOVIE) File(MOVIE.STR) File(MOVIE2.STR) Dir(DATA)
Dir(ALIEN) File(ALIEN1.DAT) File(ALIEN2.DAT)
```

References the files:

```
\SYSTEM.CNF \MOVIE\MOVIE.STR \MOVIE\MOVIE2.STR
\DATA\ALIEN\ALIEN1.DAT \DATE\ALIEN\ALIEN2.DAT
```

Mike

---

7/24/96 1:31 PM

Buildcd map files

Matt Brown

CD Creation

I'm having a little trouble with the .map file that buildcd.exe generates. Specifically, the directory information is incomplete and ambiguous. Would you include the full path name (on the CD) of each directory - Dir() - in the "Additional" section similar to the way the full path name of each file (on the PC) is included in the file information - File() - listing.

This is a high priority item for me, and would be a great help. Thanks in advance.

Steve Cox DreamWorks Interactive

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7/25/96 11:32 AM

Re(3): Buildcd map files

Mike Fulton

CD Creation

Mike -

In the example you give, the following directory structure will also give the same .map output:

```
\SYSTEM.CNF \MOVIE\MOVIE.STR \MOVIE\MOVIE2.STR
\MOVIE\DATA\ALIEN\ALIEN1.DAT \MOVIE\DATE\ALIEN\ALIEN2.DAT
```

Given the current contents of the .map file, it is impossible to tell if the structure on the cd is as listed above or below. I ask again, can this be addressed?

Steve Cox @ DreamWorks Interactive

No, it doesn't work that way because there were files listed between the different directory listings. You should reset back out to the root directory when you see a Dir() that isn't preceded by another Dir(). To get what you listed above, you'd need:

```
Dir() File(SYSTEM.CNF) Dir(MOVIE) File(MOVIE.STR) File(MOVIE2.STR) Dir(MOVIE)
Dir(DATA) Dir(ALIEN) File(ALIEN1.DAT) File(ALIEN2.DAT)
```

At least, that's my understanding of how it is supposed to work, and all the examples I've seen support this.

I'm having a little trouble with the .map file that buildcd.exe generates. Specifically, the directory information is incomplete and ambiguous. Would you include the full path name (on the CD) of each directory - Dir() - in the "Additional" section similar to the way the full path name of each file (on the PC) is included in the file information - File() - listing.

This is a high priority item for me, and would be a great help. Thanks in advance.

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The directory information is already available... it's just not repeated for each file, so it needs a little parsing to extract. For example:

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Dir() File(SYSTEM.CNF) Dir(MOVIE) File(MOVIE.STR) File(MOVIE2.STR) Dir(DATA)
```

Dir(ALIEN) File(ALIEN1.DAT) File(ALIEN2.DAT)  
References the files:  
\SYSTEM.CNF \MOVIE\MOVIE.STR \MOVIE\MOVIE2.STR  
\DATA\ALIEN\ALIEN1.DAT \DATE\ALIEN\ALIEN2.DAT

Mike

---

7/25/96 6:27 PM  
Re(5): Buildcd map files  
Mike Fulton  
CD Creation

It seemed unlikely to me that BuildCD would be updated for something like this, at least not quickly, so I was trying to find an alternate solution.  
I am still pretty sure that there is a way to figure this information out from the MAP file... it's just not as convenient as having the full path specified for each file. I remember this coming up once before, a few months back, and I think there was a solution, so I'm still looking into it.  
In the meantime, what exactly are you trying to do with the MAP file?

Mike

---

7/25/96 3:08 PM  
Re(4): Buildcd map files  
Matt Brown  
CD Creation

CD.CTI 2K  
CD Creation

Okay, this is getting a little tiring.

If you actually use buildcd, instead of just looking at examples, you'll see that what I claim is true. I've included my cd.cti file, cd.map output file and directory structure if you're interested in checking my work.

By the way, you can't have two MOVIE directories in the root directory of a single CD as you're suggesting below.

One more time: can the mapfile output from buildcd.exe be fixed to include the entire path of the directory on the CD, and if so, how long would such a change take?

Steve Cox DreamWorks Interactive

+ + +

Mike -

In the example you give, the following directory structure will also give the same .map output:

```
\SYSTEM.CNF \MOVIE\MOVIE.STR \MOVIE\MOVIE2.STR  
\MOVIE\DATA\ALIEN\ALIEN1.DAT \MOVIE\DATE\ALIEN\ALIEN2.DAT
```

Given the current contents of the .map file, it is impossible to tell if the structure on the cd is as listed above or below. I ask again, can this be addressed?

Steve Cox @ DreamWorks Interactive

No, it doesn't work that way because there were files listed between the different directory listings. You should reset back out to the root directory when you see a Dir() that isn't preceded by another Dir(). To get what you listed above, you'd need:

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```

At least, that's my understanding of how it is supposed to work, and all the examples I've seen

support this.

I'm having a little trouble with the .map file that buildcd.exe generates. Specifically, the directory information is incomplete and ambiguous. Would you include the full path name (on the CD) of each directory - Dir() - in the "Additional" section similar to the way the full path name of each file (on the PC) is included in the file information - File() - listing.

This is a high priority item for me, and would be a great help. Thanks in advance.

Steve Cox @ DreamWorks Interactive

The directory information is already available... it's just not repeated for each file, so it needs a little parsing to extract. For example:

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Dir(ALIEN) File(ALIEN1.DAT) File(ALIEN2.DAT)
```

References the files:

```
\SYSTEM.CNF \MOVIE\MOVIE.STR \MOVIE\MOVIE2.STR
\DATA\ALIEN\ALIEN1.DAT \DATE\ALIEN\ALIEN2.DAT
```

Mike

---

7/25/96 12:21 PM

Re: BuildCD control files

Michael Koziniak

CD Creation

Matt Brown writes: In reading through the CD Emulator documentation, I have noticed that in the examples from appendix A, a few commands are used that I cannot find mentioned anywhere else. Specifically, VolumePartition, BootRecord, and their associated commands. Are these documented anywhere, and if so, where can I find out about them?

Secondly, has anyone created an ISO9660 image file using BuildCD that can be burned onto a CD and booted on a production (gray) PlayStation? If this is possible, could someone please post an example .cti file (BuildCD control file) that would allow me to do this?

Thanks in advance.

Steve Cox DreamWorks Interactive

Matt,

I'm not surprised that you found a few that aren't documented. Those commands are included to fully comply with the ISO 9660 standard. Somebody must have thought that they would be rarely used.

Anyway according to the standard: 1. A Volume Partition Descriptor shall identify a Volume Partition within a Volume Space, its position and size and its attributes. (The contents are not defined by the ISO 9660 standard)

2. A Boot Record shall contain information which may be used to achieve a specific state in a receiving system or an application program.

Both of these are optional.

-Michael

---

7/25/96 5:34 PM

Re(5): Buildcd map files

Henrik Markarian

CD Creation

Hi Steve,

The buildcd utility is maintained by SN Systems, and a while ago I spoke with them about

changing the output so that it contains the complete path. It's unlikely that this change will take place, since the updatedcd utility relies on the current format of the map file to update the cd image.

You can get the information that you're looking for by parsing the CCS file. The file format is messy, but you can get the information that you're looking for without too much trouble.

Henrik Mindscape, Northridge

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7/25/96 9:21 AM

Re(2): Buildcd map files

Matt Brown

CD Creation

Mike -

In the example you give, the following directory structure will also give the same .map output:

```
\SYSTEM.CNF \MOVIE\MOVIE.STR \MOVIE\MOVIE2.STR
\MOVIE\DATA\ALIEN\ALIEN1.DAT \MOVIE\DATE\ALIEN\ALIEN2.DAT
```

Given the current contents of the .map file, it is impossible to tell if the structure on the cd is as listed above or below. I ask again, can this be addressed?

Steve Cox DreamWorks Interactive

+ + +

I'm having a little trouble with the .map file that buildcd.exe generates. Specifically, the directory information is incomplete and ambiguous. Would you include the full path name (on the CD) of each directory - Dir() - in the "Additional" section similar to the way the full path name of each file (on the PC) is included in the file information - File() - listing.

This is a high priority item for me, and would be a great help. Thanks in advance.

Steve Cox @ DreamWorks Interactive

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Dir() File(SYSTEM.CNF) Dir(MOVIE) File(MOVIE.STR) File(MOVIE2.STR) Dir(DATA)
Dir(ALIEN) File(ALIEN1.DAT) File(ALIEN2.DAT)
```

References the files:

```
\SYSTEM.CNF \MOVIE\MOVIE.STR \MOVIE\MOVIE2.STR
\DATA\ALIEN\ALIEN1.DAT \DATE\ALIEN\ALIEN2.DAT
```

Mike

---

7/31/96 2:05 PM

buildcd wildcard routine

Matt Brown

CD Creation

The wildcard matching routine in buildcd seems to be somewhat non-standard.

For example:

when using the SourceDirectory keyword IncludeWilds, \*.c will include a.c, b.c and c.c (as expected), but it also includes test.cti (not expected).

Is there a description somewhere of how the wildcard routine works?

Steve Cox DreamWorks Interactive

---

8/2/96 6:00 PM

Format of CCS

Dan Chang  
CD Creation

Is there a document specifying the format of a CCS file? I'd like to write a tool that outputs CCS.

If there is no document available, then is there a CTI2CCS?  
David Brickhill Boss Game Studios

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8/6/96 12:32 PM  
Re: Format of CCS  
Brian Dawson  
CD Creation

Dan,

In interation of the conversation we had on the phone today, the CCS format info is not currently available to developers, but a request will be made. In order to build a CCS file from a CTI, you must specify the -g switch with BuildCd when building an emulator image. As you stated this is inconvenient because it requires you to be building an image ot get the CCS output. I will notify you if at any time the CCS format becomes available.

Brian Dawson SCEA

---

8/7/96 1:29 PM  
cddisk question  
Dave Elton  
CD Creation

I am trying to initialize my 2Gig Seagate hard drive for emulation. I did a low level format first but when I try cddisk -n 3, The available size for drive is 0 and I cannot set any size for partition. I did the same routine for thousands of times before and never had such problem. The only difference is before I was using a smaller drive like 680M or 1G. Could it be possible the cddisk program cannot take more than 2G hard drive?

Thanks for any advice!  
Simon ReadySoft Inc.

---

8/7/96 1:58 PM  
different kernel?  
Dave Elton  
CD Creation

I am trying to convert our game to Japanese version. Our game is to play some 24 bit movies with video encoded in MDEC format. Everything works fine here but in Japan, some older units have video glitches when movies played. This does not happened in newer playstation units and only happened in older units. I remember we have a set of replacement development card from Sony America and I also observed the same glitches in video. we thought we the card was bad and sent it back for a new card , since then we never had any problem with the new card. This reminds me maybe some of DTL-H2000 dev boards have the same old kernel as the older version of playstation. I want to know whether this is true and if this is true, it there any such boards Sony still has and we can use to debug? Since there are so many old units out there in Japan, we cannot just ignore this problem. And bad enough, the same problem never shows up at here, either in dev system or debugging station. Hope somebody out there can enlight me on this problem. Thanks !



Simon ReadySoft Inc.

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8/7/96 7:01 AM

Re(8):

Dave Elton

CD Creation

Just to check out. Is the new CdGen() program, which is supposed to work under win95, out yet?

Simon ReadySoft Inc.

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8/7/96 4:34 PM

CDRead

Lobotomy Software

CD Creation

Is there a limit to the number of sectors a CDRead can handle on the development system? My CDReads work fine on a blue playstation, but gives a debug message of something like "cd read sync error cdsync okay status ready", or whatever... why does this happen?

-Jeff Blazier

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8/8/96 2:58 PM

Movie + XA creation

Tom Sloper

CD Creation

Ok, I'm daft. I can't seem to grok the exact step-by-step pathway from start to finish for converting a movie from AVI format to getting it to play on the PSX. So I'm going to ramble a bit and try and muddle my way through an imaginary AVI in the hopes that some kind soul will fill in the blanks for me.

Step 1:Generate an uncompressed AVI file of length T(in time), and F in frames and FPS in frames per second. Q1:I'm assuming that audio needs to be seperated because I always get a Divide by Zero error when trying to use MovConv. Is this true?!?

Step 2:Generate a WAV file that is 16bps, of sample rate SR. Q2:Does it matter what SR is at this point?

Step 3:Use MovConv to convert the WAV file of rate SR to an XA file with any of the 4 supported rates. Q3:Is it safe to assume that these rates corespond directly to the interleave values specied within MovPack(i.e. for double speed cd, 18.9 mono is interleaved in 1 out of every 32 sectors). Q4:Is the interleave value(i.e. 1 of 32 as above) in 2048 byte sectors or am I mixing apples and oranges?

Step 4:Convert the movie to an STR file. BIG QUESTION: Q5:What the hell do I do here? Do I select custom? If so, how EXACTLY do I know how many bytes to give to each frame?! What about if the source movie has odd frame rates, like 17 or 22 FPS? Will the "Interleave Video With Audio" menu option handle things for me?

Step 5:Combine the STR and XA file into one big movie STR file. Q6:As in Q5 above, is there anything special to do here. Will MovConv rewrite the STR file, or do I somehow need to make sure that there is space after the frames for XA data. If I do need to make space, what should have been the maximum size in bytes for the compressed video frames for the various sample

rates, FPS values(a formula is fine)...

Step 6:Create a CTI file. Q7:I have successfully gotten both plain XA to work, using the CDGen app and silent movies, using CDGen. One has a subheader and one does not. What do I do with a STR that has audio AND video? I assume that it needs a subheader so that the SPU can grab it, but what stops the SPU from grabbing the video data as well?!

Step 7:Use buildcd to make an image(assuming you are using the cd emulator) using the CTI file.

Step 8:Play the movie on the PSX. Q8:Can I use the silent movie example as is with a movie with audio? What changes need to be made? Will the SPU automagically pick up the special XA sectors? Do I get a callback for just the movie data, or the XA stuff as well(I assume the former)?! -----

I'm sure if I stared really hard at all the documentation, code, tech notes, messages here on the BBS, and learned how to read Japanese, I could figure this stuff out without a problem, but as it is, I need some help.

Thanks for any responses to any of Q1-Q8, in addition to any corrections to the steps!! verbose mode off

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8/8/96 6:04 PM

Re: CDRead

Mike Fulton

CD Creation

Jeff @ Lobotomy,

I need to know what version of the library you are using, and the EXACT text of the debug message you are seeing.

Generally, the "CdRead sync" error is printed by the CdReadSync() function if the CdRead operation does not complete within a reasonable amount of time. If you give it too many sectors to read at once and then call CdReadSync(), it may not finish within that time, so you would get the message.

However, the CdRead call changed a bit between library v3.4 and v3.5, so in order to look for the right stuff, I need to know more info.

How many sectors are you trying to read at once?

Mike

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8/8/96 7:22 PM

CD Gen 1.3 beta -- don't bother

Dave Scheele

CD Creation

Executive Summary:

If CD Gen 1.1 works for you, don't bother downloading 1.3 beta -- it breaks more than it fixes. If you need 1.3 to use the newer CD burners, good luck. I haven't tested it 'cuz we're using the old burner.

Details:

When I tried to install and use the 1.3 beta, I ran into so many problems that I've reverted back to 1.1.

1. The setup software forced me to execute it from a directory called "Disk1". There was no option for changing this, as there is in most every other setup I've seen. Yes, it's minor, but it is emblematic of the hard-coding that seems to be rampant in the update, as it was in the original 1.1.

2. I HAD to use the \CDTMP directory for temporary storage, even though I have a generic

temp directory already set up. The software did prompt for a temp directory, but it could not use it (I received messages saying the software could not read the temp files, even though they were there). Seems to me if the software can't use a different temp directory than it's hard-coded default, it shouldn't prompt for one.

3. It was nice to see the Master 'A' character finally being stored in the CCS file and re-loaded again. However, this new line in the .CCS file broke CCS2CTI.EXE. The new CCS files are thus useless to anyone using a CD emulator. This is the main reason why I had to switch back to 1.1 (ugh). It's easier to just remember to put in the A (now that I'm in the habit) than have to manually edit the .CCS every time. CCS2CTI.EXE needs to be updated to match CD Gen, and probably should be included with it as part of the package.

4. Lastly, when I finally got to the point where I tried to burn a CD, I got a Windows error message "Cannot find WINASPI.DLL". I believe this is some sort of SCSI driver, probably something the new software thinks it needs to access the new burners. I, however, have the old burner, so I guess the new software will not work with my configuration. I just hope that 1.3 does not DEMAND that this software exists, similar to 1.1 DEMANDING that we use a specific SCSI card ...

The just plain clumsiness of the user interface hasn't changed, either ... there's nothing to look forward to there as far as I can tell. For example, just try moving the bottom file of 250 to the top in the layout window...

Sony, please ensure that the above 4 numbered points are addressed before releasing the final 1.3 version.

Dave

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8/9/96 3:00 PM

Re: CD Gen 1.3 beta -- don't bother

Mike Fulton

CD Creation

Executive Summary: If CD Gen 1.1 works for you, don't bother downloading 1.3 beta -- it breaks more than it fixes. If you need 1.3 to use the newer CD burners, good luck. I haven't tested it 'cuz we're using the old burner.

Details: When I tried to install and use the 1.3 beta, I ran into so many problems that I've reverted back to 1.1.

1. The setup software forced me to execute it from a directory called "Disk1". There was no option for changing this, as there is in most every other setup I've seen. Yes, it's minor, but it is emblematic of the hard-coding that seems to be rampant in the update, as it was in the original 1.1.

Yes, I've seen that one myself. Fortunately this is not quite so "hard-coded" as you may think. It is simply a matter of changing the install script, so I'm planning to take a look at it myself when I get a chance.

2. I HAD to use the \CDTMP directory for temporary storage, even though I have a generic temp directory already set up. The software did prompt for a temp directory, but it could not use it (I received messages saying the software could not read the temp files, even though they were there). Seems to me if the software can't use a different temp directory than it's hard-coded default, it shouldn't prompt for one.

I haven't seen any problems like it not reading its TEMP files, but I'll try to reproduce it. The main reason it uses its own temp directory is that the files it may need to generate are potentially quite large, so you may not want to specify the same drive as your regular system temp directory.

3. It was nice to see the Master 'A' character finally being stored in the CCS file and re-loaded again. However, this new line in the .CCS file broke CCS2CTI.EXE. The new CCS files are thus useless to anyone using a CD emulator. This is the main reason why I had to switch back to 1.1

(ugh). It's easier to just remember to put in the A (now that I'm in the habit) than have to manually edit the .CCS every time. CCS2CTI.EXE needs to be updated to match CD Gen, and probably should be included with it as part of the package.

We told Japan about the need for a new CCS2CTI a few weeks ago so hopefully it won't be too much longer.

4. Lastly, when I finally got to the point where I tried to burn a CD, I got a Windows error message "Cannot find WINASPI.DLL". I believe this is some sort of SCSI driver, probably something the new software thinks it needs to access the new burners. I, however, have the old burner, so I guess the new software will not work with my configuration. I just hope that 1.3 does not DEMAND that this software exists, similar to 1.1 DEMANDING that we use a specific SCSI card ...

This message doesn't really have anything to do with CDGEN or the new burners, at least not directly.

ASPI is an acronym for Application SCSI Programming Interface... or something like that. Basically, it's a sort of a SCSI BIOS that applications use to access all sorts of SCSI devices in a way that is independent of the SCSI host adapter hardware. So as long as a proper ASPI driver is installed, it doesn't matter if your computer has a SCSI adapter built into the motherboard, an Adaptec plug-in card, a Future Domain plug-in card, or any other SCSI interface. The SCSI card comes with the ASPI driver that talks to the hardware and applications talk to the ASPI driver. Depending on your hardware and SCSI driver setup, you may or may not need to have WINASPI.DLL installed. You're probably getting this message because there is no proper ASPI driver on your system, or perhaps all the required components are not installed, so CDGEN is not able to talk to the SCSI adapter. There are DOS-level ASPI drivers and Windows-level ASPI drivers. You probably just need to make sure you have all the drivers for your SCSI adapter properly installed. What host adapter do you have?

The older version of CDGEN was designed to use ASPI, but did the additional goofy step of looking for a very specific ASPI driver to be installed. If it didn't find it, it didn't work. The driver it wanted was for the Adaptec 1540-series host adapters, and it didn't really care so much about the card as the driver. In fact, there have been a number of cards in Adaptec's line that will work with that particular driver, and the burner generally works with any these cards that the driver supports. The biggest problem was that the specific version of the driver that it wanted was not compatible with Windows 95. At least not without going through a tremendous amount of hassle. The result was that CDGEN didn't work under Windows 95. The goofy hardware-related thing is that the older burner doesn't support the full set of SCSI commands that it really should in order to be compatible with all ASPI drivers. This wasn't a problem with the older APSI driver that the older CDGEN was looking for, but it is a problem with some newer drivers and host adapters.

The just plain clumsiness of the user interface hasn't changed, either ... there's nothing to look forward to there as far as I can tell. For example, just try moving the bottom file of 250 to the top in the layout window... Sony, please ensure that the above 4 numbered points are addressed before releasing the final 1.3 version.

I doubt it would happen for a final v1.3, but perhaps for a future release we can catch some of the more annoying problems. Why don't you create a sort of bullet list of the most important items and EMAIL it to me and then we'll pass it along to the engineers working on the program. The more people that make the same suggestions, the more weight they carry.

Mike

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8/11/96 10:10 PM

Re: Movie + XA creation

David R. Black

CD Creation

Tom,

Here are some answers to your questions about Movie creation for the PSX. We have been doing quite a bit of it here lately, so if you have any more questions, drop me a message.

=====

Step 1: Generate an Uncompressed AVI File... Generate your AVI file with your desired frame rate, and audio with a 16-bit sampling rate. You may be able to keep your audio in your AVI file depending on your compression settings, but you will need to separate it for the compression stage. (see below)

Step 2: Generate a WAV file... Assuming your audio is already in your AVI file, simply extract it to a WAV file. Remember that your audio must be in 16-bit. The XA audio compressor requires 16-bit audio data. To extract the audio, use VidEdit (from Video for Windows 1.1) or Premiere for Windows. You should find what you need under the Extract selection on the File menus of both programs. You should also probably stick to 22.05 or 44.10 sampling rates to keep things simple.

Step 3: Use MovConv to convert the WAV... Check the library overview or reference book for specifics on sector usage of audio data. If I remember correctly, 16-bit, 44khz mono will use 8 sectors per second, 16-bit, 44khz stereo 16-sectors per second, etc... In terms of interleaving, simply remember when compressing your video to leave enough extra sectors for the audio. Also remember that you will stream 150 sectors per second in double speed, and 75 sectors per second in single speed.

Step 4: Convert the movie to an STR file... Ok, I am using the Beta 2.0 MovConv, so forgive me if the buttons differ slightly. Anyway, set your source and destination filenames, select MDEC for your output type, and click on the detail button on the main window.

Using the easy settings, simply set your frame rate and CD speed, and leave the number of channels at one unless you are interleaving two movies or custom data. If your source comes from a computer, uncheck the "Leap Sector" checkbox. This option will do correction for data captured from a recorded source such as video tape. As for odd frame rates, don't even think about it. Besides the fact that MovConv does not support them directly, you will need to worry about interleaving data evenly, as well as vertical refresh rates, and exactly when you will want to be rendering a frame to the screen. The only frame rates that are missing that would use are 12 and 24 FPS, and I may be writing a tool to get around this later this month. To leave room for the audio, select the audio checkbox, and select the sampling rate and channels for your audio file. This will leave enough room for the audio sectors in the final streaming file.

The custom options require more thought and research on your part. You will need to compute the number of sectors to use for each frame of the movie and enter that number (duh). I believe that the variable frame size option will allow you to use the frame size entry as a maximum number of sectors to use, but I have not used it personally, so I am not sure.

On a final note, the MDEC version dropdown should be left at 2 according to SCEA technical support. I seem to remember something about the version 3 compressor dropping frames or something.

Step 5: Combine the STR and XA file... Ok, this is a little confusing. In STR files you have Form1 (2048 byte) and Form2 (2336 byte) sectors. The MDEC frame data as comes from step 4 is in Form1 sectors. The XA audio data from step 3 is in Form2 sectors. After you interleave them, both the audio and video data will be in Form2 sectors in the final STR file. I have always used MovConv to do my interleaving, as I have usually been doing movies with single audio and video tracks. Once again, input the source filenames (MDEC and STR), and fill in your options. The same criteria applies to the Leap Sector checkbox here as previously. When you are interleaving your data using MovConv, if there is not enough space for the audio, it will tell you about it, but unfortunately it will not abort the interleaving operation. It will interleave the entire file, errors or no until it has processed all of the data.

Steps 6 & 7: I have not been using the CD emulator for a while, so I cannot offer you any help on these questions. Simply remember that the final interleaved file from MovConv contains interleaved, Form2, audio and video sectors. Also, you will need to flag these files as interleaved with Form1 and Form2 (don't ask me why) sectors when burning a CD with CDGen.

Step 8: Play the movie on the PSX I believe the silent movie example will work (have not looked at it in a while) with movies that have audio. I use the tuto1.c sample code to preview a movie, although it does leave a lot to be desired in flexibility and a/v synchronization, so I use my own code in our actual products. The audio data should be played automatically through the XA decoding hardware associated with the CD mechanism, never touching main memory or the memory of the SPU. You can set volume and panning for the XA channel separately if need be.

Well, that turned out to be longer than I thought, but I hope it helps. Again, if you have any more questions, post another message and I'll try and answer to the best of my abilities.  
David R. Black Senior Programmer Presto Studios, Inc.

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8/15/96 3:47 PM  
Buildcd Warning  
John Hamilton  
CD Creation

When I run buildcd I get the following Warning 223:  
A PSX XA disk definition requires all path tables to be defined and to be placed before the hierarchy definition. The path tables have been re-organized to follow this requirement. What does this mean and how can I fix the problem?

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8/15/96 5:30 PM  
Re: cddisk question  
Michael Koziniak  
CD Creation

Dave Elton writes: I am trying to initialize my 2Gig Seagate hard drive for emulation. I did a low level format first but when I try cddisk -n 3, The available size for drive is 0 and I cannot set any size for partition. I did the same routine for thousands of times before and never had such problem. The only difference is before I was using a smaller drive like 680M or 1G. Could it be possible the cddisk program cannot take more than 2G hard drive?  
Is your drive an AUDIO/VIDEO rated drive? 2G isn't a problem because we've sold 4GIG drives.  
-Michael

---

8/15/96 3:43 PM  
Simple question  
Ted Morris  
CD Creation

How much space on the CD can we use? Do we get the full 71 minutes or less? I have too much data and I need to know how much to cut out.  
Thanks, Jason Curtice Westwood Studios

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8/15/96 5:08 PM  
Re: buildcd wildcard routine  
Michael Koziniak

Matt Brown  
CD Creation

The wildcard matching routine in buildcd seems to be somewhat non-standard.  
For example: when using the SourceDirectory keyword IncludeWilds, \*.c will include a.c, b.c and c.c (as expected), but it also includes test.cti (not expected).

SNSystems is aware of this problem and say they will fix the problem for the next release of buildcd.

-Michael

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8/17/96 11:40 AM  
Re(2): cddisk question

Dave Elton  
Michael Koziniak  
CD Creation

I found the problem was caused by the cddisk program I was using is an old version. I downloaded a new version and it recognized the 2 gig size.  
Simon ReadySoft Inc.

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8/19/96 2:46 PM  
Re: Buildcd Warning  
Brian Dawson  
CD Creation

John Hamilton wrote:

When I run buildcd I get the following Warning 223:

A PSX XA disk definition requires all path tables to be defined and to be placed before the hierarchy definition. The path tables have been re-organized to follow this requirement.

What does this mean and how can I fix the problem?

Brian Dawson Responds:

This error occurs when the Lpath or Mpath keywords appear prior to the Hierarchy keyword. It is nothing to be alarmed about. As stated on in the CD Emulation Manual pg. 37, "Within a PSX disc definition the LPath will automatically be placed correctly." You may attempt to place the Lpath/Mpath path table definition yourself or can safely ignore the warning and let BuildCd do it for you. For futher information please read pages 18, and 36-38 of your CD Emulation Manual.

Brian Dawson@SCEA

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8/20/96 2:33 PM  
CdIGetTN?  
Geoffry R. Meek  
CD Creation

Has anyone heard of the CdIGetTN command used with CdControl procedure? What are the arguments passed and result returned?

Thanx, RSM

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8/20/96 6:13 PM  
Re: CdIGetTN?

Mike Fulton  
CD Creation

Has anyone heard of the CdlGetTN command used with CdControl procedure? What are the arguments passed and result returned?

Thanx, RSM

The "CdlGetTN" command for CdControl is not documented but it has to do with reading the low-level CD-ROM table of contents. I don't know if the undocumented status is intentional or an oversight so I've asked Japan for an OK to pass along info about it.

Mike

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8/21/96 7:51 PM

.MAP to .CCS

Christopher Deel

CD Creation

Administrator

I would like to make a request for a program to convert a .MAP file to a .CCS file. This would help me because I am not having much luck generating a good CCS file from BUILDCD. I am using the SourceDirectory command in my CTI file.

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8/21/96 9:36 AM

Re(2): CDRead

Lobotomy Software

CD Creation

Hey Mike,

It seems to give me the message on reads over 350 sectors...and I don't know what the message really was or what library I'm using. Is 3.5 better?

Anyway, I fixed the problem by reading only 300 at a time...

thanks,

Jeff Blazier

---

8/24/96 1:37 PM

Re: .MAP to .CCS

Brian Dawson

CD Creation

We do not supply a utility to convert a MAP file to a CCS file, but if you detail your difficulties with CCS files and BuildCD we may be able to provide an alternate solution or work around.

Brian Dawson@SCEA

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8/26/96 2:50 PM

Re: Burn Problems

Administrator

CD Creation

Chris E. Reese writes: We have been experiencing a lot of problems with burns lately. We are burning with the CDW-900E. We have 70 minutes of data on the disk. When we burn the CD



we usually get a lot of CD read errors and both our movies and audio skip a lot of frames when playing. This behavior is inconsistent we have found. We can burn 2 CD's, one right after the other, and one will work fine with no movie or sound problems and the other will not work. The CD's we are using are generic 74 minute media. We are burning at single speed. We have tried burning on a 71 minute CD (not a black disc) and have had the same results. Has anyone else experienced these kind of problems? Is there something else we can look at to help alleviate this problem?

Chris Reese. Eidetic, Inc.

There are numerous things to consider when CD burning. Have you optimized the hard drive? You are using an A/V hard drive, right? What brand of CD's are you using - there are inferior brands.

-Peter Developer Communications Coordinator

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8/26/96 2:29 PM

Burn Problems

Chris E. Reese

CD Creation

We have been experiencing a lot of problems with burns lately. We are burning with the CDW-900E. We have 70 minutes of data on the disk. When we burn the CD we usually get a lot of CD read errors and both our movies and audio skip a lot of frames when playing. This behavior is inconsistent we have found. We can burn 2 CD's, one right after the other, and one will work fine with no movie or sound problems and the other will not work. The CD's we are using are generic 74 minute media. We are burning at single speed. We have tried burning on a 71 minute CD (not a black disc) and have had the same results. Has anyone else experienced these kind of problems? Is there something else we can look at to help alleviate this problem?

Chris Reese. Eidetic, Inc.

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8/27/96 1:31 PM

Re(3): Burn Problems

Mike Fulton

CD Creation

Chris E. Reese writes: We have been experiencing a lot of problems with burns lately. We are burning with the CDW-900E. We have 70 minutes of data on the disk. When we burn the CD we usually get a lot of CD read errors and both our movies and audio skip a lot of frames when playing. This behavior is inconsistent we have found. We can burn 2 CD's, one right after the other, and one will work fine with no movie or sound problems and the other will not work. The CD's we are using are generic 74 minute media. We are burning at single speed. We have tried burning on a 71 minute CD (not a black disc) and have had the same results. Has anyone else experienced these kind of problems? Is there something else we can look at to help alleviate this problem?

Chris Reese. @ Eidetic, Inc.

There are numerous things to consider when CD burning. Have you optimized the hard drive? You are using an A/V hard drive, right? What brand of CD's are you using - there are inferior brands.

-Peter, SCEA Developer Communications Coordinator

We have optimized the hard drive and that does seem to help sometimes. We aren't using an

A/V hard drive. We just have that burner hooked up to a 486 66 and using an internal drive it has. The CD's we are using are as generic as you get. They don't even have a brand name imprinted on them. Are there certain brands you recommend? Should we be burning on black CD's?

Chris Reese. @ Edietic, Inc.

Obviously, we're going to recommend the Sony blank discs. But for non-mastering purposes, we're not going to try to specify what you use.

When burning a CD, remember that it doesn't take much of a shock to create an error. Don't do anything to shake the burner while the disc is being written. Go as far to avoid working on the same desk and walk gently when moving around.

There is no way for you to burn onto a black CD. They are no black CD-R discs (as far as I've heard).

Mike @ SCEA

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8/27/96 9:59 AM

Re(2): Burn Problems

Chris E. Reese

CD Creation

Administrator writes: Chris E. Reese writes: We have been experiencing a lot of problems with burns lately. We are burning with the CDW-900E. We have 70 minutes of data on the disk. When we burn the CD we usually get a lot of CD read errors and both our movies and audio skip a lot of frames when playing. This behavior is inconsistent we have found. We can burn 2 CD's, one right after the other, and one will work fine with no movie or sound problems and the other will not work. The CD's we are using are generic 74 minute media. We are burning at single speed. We have tried burning on a 71 minute CD (not a black disc) and have had the same results. Has anyone else experienced these kind of problems? Is there something else we can look at to help alleviate this problem?

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-Peter Developer Communications Coordinator

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Chris Reese. Edietic, Inc.

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8/29/96 10:49 AM

Re: Simple question

Michael Koziniak

CD Creation

Ted Morris writes: How much space on the CD can we use? Do we get the full 71 minutes or less? I have too much data and I need to know how much to cut out.

You get 71 minutes.

-Michael

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10/7/96 6:46 PM  
Re(2): Buildcd Warning  
Phil Weeks  
CD Creation

Add Optional Lpath and Optional Mpath commnads to the cti file and that will remove the warning.

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10/10/96 6:00 PM  
XA file format  
Rob Vawter  
Sound Programmers

Our technical writer still has not finished the graphical layouts yet, so I'm going to give you a non-graphic overview in the meantime. Look for the .PDF soon.

Two cases of XA file format:

Case 1) XA file containing data (and audio sometimes) Case 2) XA file containing audio only

Case 1: Mode 2 / Form 1

File Area (byte count)

Sync (12) [a repeating pattern to allow the laser to align the start of the sector]

Header (4) Mode (1) [would be "2" in this case] [the next 3 fields explicitly identify the sector by its position. 60 sec \ minute, 75 sectors per sec. Represent time taken to travers the disk during normal playback Sec (1) Sector (1) Min (1)

Subheader (8) File Number (1) [can be set to any value. should be unique within any given track] Channel Number (1) [can be set to any value from 1-32. distinguishes data within an interleaved file. Ex: in a movie the images and audio can be given different channel #s]

Submode (1) EOF (bit 7) 1 in last sector of file 0 in all other sectors RT (bit 6) 1 in real time sector 0 in all other sectors Form (bit 5) 0: Form 1 1: Form 2 Unused (bit 4) [Of the following three values, only 1 is set to "1". If all are "0", this sector is handled as a null sector]

Data (bit 3) Audio (bit 2) Video (bit 1) Unused (bit 0) Coding Info (1) Audio (bit 7) 0: Audio 1: Not audio Emphasis (bit 6) 0: Emphasis on 1: Emphasis off ADPCM level (bits 5- 2) 0000: level B (37.8KHz sampling rate) 0001: level C (18.9KHz sampling rate) Mode (bits 1-0) 00: Mono 01: Stereo

Repeat above 4 bytes again to complete subheader user data (2048) 32 byte header in here which I will break down sometime soon. <Sigh> EDC (4) [Error Detetction Code] ECC (276)

[Error Detetction Code]

Two cases of Mode 2 / Form 1 XA format: a) No audio, also known as no subheader from a CDGen standpoint. CDGen adds all bytes except user data area. b) Audio already interleaved. Subheader already exists, and user data size has been padded out to 2328. Check subheader box in CDGen. Sync and Header added by CDGen. EDC and ECC also added by CDGen, by overwriting the previously padded out area.

Case 2: Mode 2 / Form 2

Same as above except:

1) User data size is 2328 2) No EDC or ECC 3) Subheader created by RAW2XA 4) Sync and Header created by CDGen

Any questions?? Ow.

---

10/14/96 2:32 PM

Another CDGEN v1.3beta bug

David Minogue

CD Creation

Mike Fulton

Here's another bug in CDGEN v1.3beta (found by our amazing technical guru, Kevin Denehy) - When burning on a stack of CDW-900E writers, the software will attempt to burn a disk on all of the writers in the stack regardless of the selections made in the "CD RECORDING UNIT CONTROLLER" dialog. If any of the drives don't contain a blank disk, it will fail.

-- David.

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10/15/96 12:04 PM

Re: Another CDGEN v1.3beta bug

Mike Fulton

David Minogue

CD Creation

Thanks for the report, David. I've forwarded it along to SCEI.

Mike

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10/18/96 5:42 PM

Request for how to create a demo CD slides (from London  
nce) From:

John Hamilton

CD Creation

Administrator

During the April conference in London, there was a session about how to create a demo CD. Would someone at Sony please post the slides that were used?

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10/22/96 11:46 AM

CDGen Suggestions

John Hamilton

CD Creation

I have a few suggestions to improve CDGen. The easiest would be to add an option to CDGen to save an ISO standard image. This way we could use a CD burner of our choice after using CDGen to create an image. The best suggestion, but more drastic, would be to implement major changes to CDGen. The biggest problem with CDGen is that it only supports a VERY LIMITED number of CD burners. We're all familiar with the stone age setup of using the Adaptec 1542CF with a 16 bit DOS driver under Windows 3.1. In this case, you have to use the CDW-900E burner. The only other setup that works is if you use CDGen 1.3 under Windows 95 with a Sony burner that has a SCSI Name that starts with CDU-92. Other burners will not work. CDGen 1.3 is hard coded. I once tricked CDGen into recognizing my Yamaha burner by changing the hard coded ID with a hex editor. Of course, it didn't get much further in the process, because CDGen only knows how to burn with Sony CD burners that are almost impossible to purchase. I've called around and nobody I could find carries the CDU-92 series burners. According to the companies I talked to, those burners have been discontinued. Since it appears to be a major effort to add more burners to CDGen, the easiest solution would probably be for Sony to contract with a company that already makes a CD burner program. Since this new version of CDGen would be produced by a company that knows more about CD burners, we would enjoy support for a greater variety of burners and benefit from an improved user interface. At \$1800 for CDGen, I think we as developers should have something that is not such

a headache to use.  
John Hamilton Namco Hometek Inc.

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10/22/96 12:16 PM  
Re: Request for how to create a demo CD slides (from London  
nce) From:  
Mike Fulton  
CD Creation

During the April conference in London, there was a session about how to create a demo CD. Would someone at Sony please post the slides that were used? Can you be more precise about what was in the presentation? I've found one that talks about CD mastering, but it's not specifically for a "demo" CD.  
Mike

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10/22/96 3:52 PM  
Re(2): Request for how to create a demo CD slides (from London  
nce) From:  
John Hamilton  
Mike Fulton  
CD Creation

Mike Fulton writes: During the April conference in London, there was a session about how to create a demo CD. Would someone at Sony please post the slides that were used? Can you be more precise about what was in the presentation? I've found one that talks about CD mastering, but it's not specifically for a "demo" CD.  
Mike

The "demo" section might have been part of a larger session. Supposedly Europe has a greater demand for demo CD's and that prompted a session that talked about the guidelines for creating a "demo" CD. Since I wasn't there to attend the session, I don't the exact content.  
John

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10/24/96 2:15 PM  
Re(3): Request for how to create a demo CD slides (from London  
nce) From:  
Administrator  
CD Creation

Tomorrow I will post the acrobat file to the BBS that explains how to make a demo.  
-Peter

---

10/25/96 7:30 AM  
CD/XA Sector Formats  
Jason G. Andersen  
Sound Programmers

>\_\_\_\_\_ >>Two cases of XA file format: >>Case 1) XA file containing data (and audio sometimes) >Case 2) XA file containing audio only >>>Case 1: Mode 2 / Form 1 >>File Area (byte count) >>sync (12) [a repeating pattern to allow the laser to align the start of > the sector] >>header (4) > mode (1) [would be "2" in this case] > [the next 3 fields explicitly identify the sector by its position. 60 sec > \ minute, 75 sectors per sec. Represent time taken to travers

the disk > during normal playback > sec (1) > sector (1) > min (1) > subheader (8) > file number (1) [can be set to any value. should be unique within any > given track] > channel number (1) [can be set to any value from 1-32. distinguishes > data within an interleaved file. Ex: in a movie the images and audio can > be given different channel #s] > submode (1) > EOF (bit 7) > 1 in last sector of file > 0 in all other sectors > RT (bit 6) > 1 in real time sector > 0 in all other sectors > Form (bit 5) > 0: Form 1 > 1: Form 2 > Unused (bit 4) > [Of the following three values, only 1 is set to "1". If all are > "0", this sector is handled as a null sector] > Data (bit 3) > Audio (bit 2) > Video (bit 1) > Unused (bit 0) > coding info (1) > Audio (bit 7) > 0: Audio > 1: Not audio > Emphasis (bit 6) > 0: Emphasis on > 1: Emphasis off > ADPCM level (bits 5- 2) > 0000: level B (37.8KHz sampling rate) > 0001: level C (18.9KHz sampling rate) > Mode (bits 1-0) > 00: Mono > 01: Stereo >> Repeat above 4 bytes again to complete subheader > user data (2048) > 32 byte header in here which I will break down sometime soon. <Sigh> >EDC (4) [Error Detetction Code] >ECC (276)[Error Detetction Code] >>Two cases of Mode 2 / Form 1 XA format: >a) No audio, also known as no subheader from a CDGen standpoint. >CDGen adds all bytes except user data area. >b) Audio already interleaved. Subheader already exists, and user data size >has been padded out to 2328. Check subheader box in CDGen. Sync and Header >added by CDGen. EDC and ECC also added by CDGen, by overwriting the >previously padded out area. >>Case 2: Mode 2 / Form 2 >>Same as above except: >User data (2328) >No EDC or ECC >>Sync and Header created by CDGen. >>Any questions??

I appreciate it if anyone out there would answer a couple of questions for me.

Just for clarification, the channel number in the subheader, is it 1-32, or is it 0-31?

The big question is, if I have user data in (2048) byte increments, how do I generate the EDC (4), and the ECC (276) fields, so that I may create my own data. For example lets say I have my own tool that will weave XA data with important data (like code). Lets take it one step farther, and say when I compile the code, I want the makefile to invoke my tool, interleave the audio, and leave me with the result. This idea of automating the process is currently impossible with the currently supplied tool (MovPack).

Many thanks in advance,

Jason Andersen Tiburon Entertainment

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## CD Decompression

4/10/96 12:13 AM

Displaying Movies in Interlace Mode

Chris E. Reese

CD/Decompression LIB

We are playing movies in interlace mode (640x480) and wanted to know how we can make sure that we are only drawing to the draw buffer when we do a LoadImage of the decompressed image. Currently we are doing a LoadImage directly to the 640x480 area in VRAM which in interlace ends up drawing to both the DRAW and DISP buffers. This prevents us from overlaying sprites on the movie as they will flicker and we can also see the strips of decompressed data being drawn to the screen. All the movie examples on the developer CD show movies being played at non-interlace modes which is very convenient when needing to determine which area in VRAM to do a LoadImage. Is there a way to do draw movies correctly in Interlace mode?

Chris Reese Eidetic, Inc.

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4/15/96 8:23 PM

Help w snd/movie interleave

David W. Marshall

CD Creation

I hope someone out there can help with, what I hope is, a very basic question. I want to interleave a silent movie with some XA audio and play a movie with sound. I looked all over and couldn't find any good documentation that made sense and explained what steps to follow and what tools to use.

The following is what I have, so any help would be appreciated:

1)A silent, 24bit uncompressed AVI file which was converted to a STR file using MOVCONV with the easy settings. I think it is 1 channel, 15fps, double speed, 5 sectors max frame size.

This movie plays fine thru the sony.

2)A XA audio file which is stereo 38.???k

I figured I could just use MOVPACK to stuff these 2 items together, but I guess it's not that easy. I tried different things in MOVPACK, but nothing seemed to work.

reply here or via email to DMarshal@nssi.com

thanks,

dave

---

4/16/96 2:23 PM

CdReadyCallback

Byrt Martinez

CD/Decompression LIB

Hopefully someone out there can help. I'm trying to use the CdReadyCallback function, but the documentation for this is severely lacking. More precicely, the documentation and the sample code don't agree. The sample code defines the callback function as follows:

```
static void cdreadycallback( unsigned char inter, unsigned char *result)
```

The callback registration function is defined as follows:

```
unsigned long CdReadyCallback( (*func)() )
```

The problem, as you can see, is you can't call CdReadyCallback with a pointer to the other function without casting the function pointer. In C++, this seems to crash the linker. (Processor

exception 13 - please report!)

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4/16/96 8:50 PM

Re: Help w snd/movie interleave

David W. Marshall

David W. Marshall

CD Creation

For future reference, here is what I found.

1)Use MovConv not MovPack to interleave a sound and movie file together.

2)When using MovConv to make a silent movie that will have sound added to it later, you still need to check the SOUND box in the output menu to make the movie correctly. This is mentioned in the manual in one spot but I don't think it is mentioned in the help files. This was my problem.

3)Now that you have a silent movie and an XA track, use MovConv's Interleave-Sound-W-Movie option to make your new movie.

dave

---

4/17/96 11:04 AM

movie problem

Jeff Davies

CD/Decompression LIB

I'm having a problem with movie playback in 16 bit mode. I'm getting blocks (16x16) section of the image that appears to be data from somewhere else in the frame. I remember Koji saying something about this months ago, but I thought the problem was fixed.

Does this sound familiar?

-Jeff

---

4/18/96 6:33 PM

AVI with sound

Byrt Martinez

CD/Decompression LIB

Hopefully someone knows the answer to this one:

I'm trying to take an AVI with sound (recorded at 44kHz, 16-bit, stereo) and make it into a stream using MovConv (v1.98e). Here's the problem:

When running in Windows 95: If I run MovConv with the audio box checked, it goes through the whole process, then says it can't open "MOVTMP.xa" or something (not a filename I specified), you click ok, then it gives a divide by zero and crashes. The resulting .STR file is not usable.

When running in Windows 3.1: I can setup the file names and input/output types, but NO dialog boxes EVER come up. (No details, no interleave).

Has anyone actually gotten MovConv to work? Reliably? Under what version of Windows?

What version of MovConv?

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4/19/96 7:24 PM

Re: Displaying Movies in Interlace Mode

Michael Koziniak



Chris E. Reese

CD/Decompression LIB

>We are playing movies in interlace mode (640x480) and wanted to know how we can make sure that we are only >drawing to the draw buffer when we do a LoadImage of the decompressed image. Currently we are doing a >LoadImage directly to the 640x480 area in VRAM which in interlace ends up drawing to both the DRAW and DISP >buffers. This prevents us from overlaying sprites on the movie as they will flicker and we can also see the strips of >decompressed data being drawn to the screen. All the movie examples on the developer CD show movies being >played at non-interlace modes which is very convenient when needing to determine which area in VRAM to do a >LoadImage. Is there a way to do draw movies correctly in Interlace mode?

The problem surrounds the even and odd fields that are getting sent to the display area by LoadImage(). There are two possible work arounds that I know of.

1. Do a load image of your sprite to an available area in VRAM. Texture map the sprite to a polygon and display it.
2. This solution involves working around the even odd fields. You will need to do multiple load images to display area in VRAM. First send all of the even field rectangles of the sprite to display area before the first VBLANK. Next send all of the odd field rectangles with LoadImage before the second VBLANK. For example:

If you have a 16x16 sprite you would call load image with the following rectangles:

16x1, 16x3, 16,5 ...

Logically this should work.

-Michael

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4/19/96 9:08 AM

Re: movie problem

John Harris

CD/Decompression LIB

>I'm having a problem with movie playback in 16 bit mode. I'm getting blocks (16x16) section >of the image that appears to be data from somewhere else in the frame.

This sounds like the same problem I am having. Is your problem intermittant, or every time. Do these 16x16 blocks look pretty much the same? In my case, this only happens with movies that have no interleaved audio. Movies with sound play fine. Are you running MESS1 and TESTMESS? I get the following error message when the trash occurs:

MDEC\_in\_sync timeout: DMA=(1,0), ADDR=(0x000eb674->0x001033f4)

FIFO=(1,1),BUSY=1,DREQ=(0,1),RGB24=1,STP=1

I still haven't received an answer yet regarding what that message really means.

---

4/19/96 7:29 PM

\*\*\*\*\* ATTENTION \*\*\*\*\* Beta version of MovieConverter that

crash Win95 From:

Michael Koziniak

CD/Decompression LIB

Byrt Martinez

MOVCONV.ZIP 276K

CD/Decompression LIB

Many people have been getting errors during conversion, floating point error etc....

Please use this beta copy of the converter until we release an official version

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4/19/96 7:15 PM

Re(2): movie problem

Michael Koziniak

John Harris

CD/Decompression LIB

>I'm having a problem with movie playback in 16 bit mode. I'm getting blocks (16x16) section  
>of the image that appears to be data from somewhere else in the frame.

>This sounds like the same problem I am having. Is your problem intermittent, or every time.  
Do these 16x16 blocks look >pretty much the same? In my case, this only happens with movies  
that have no interleaved audio. Movies with sound >play fine. Are you running MESS1 and  
TESTMESS? I get the following error message when the trash occurs:

This problem occurred with the movie converter about 1 year ago. The fix is implemented in the  
cd\movie\tuto1.c sample. The problem was that blocks were appearing at the top of the screen.  
This is what Koji was referring to. How is the streaming with the new libraries and tuto1.c

-Michael

---

4/23/96 9:54 PM

Re(6): Streaming errors

John Harris

Michael Koziniak

CD/Decompression LIB

>Just a couple of thoughts.

>The first two extra dwords(00014280) are supposed to be at the beginning of the .STR file

Yeah, I found that out! :- ) (It wasn't on Tom's presentation slide though)

>Could you brief me on the parameters of the movie? width, height, and fps.

Movies are playing as partial insets on a 640x480 screen. W&H vary quite a bit, but are in the  
range of 150x280. Definitely not on boundaries of 16 (or even 2). They play at 15fps with the  
CD in NORMAL speed.

>Can you upgrade to the newer libraries?

I had some significant problems with memory allocation with the new libraries, but that  
appears to be solved now, and I am finally running correctly under lib 3.4. (with the help of  
PSXMEM3--Thanks John!!)

Running with the new libs did not change the problem though. :- )

John Harris Tachyon Studios, Inc.

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4/23/96 10:05 PM

Re(3): movie problem

John Harris

Michael Koziniak

CD/Decompression LIB

>This problem occurred with the movie converter about 1 year ago. The fix is implemented > in  
the cd\movie\tuto1.c sample. >The problem was that blocks were appearing at the top of the  
screen. This is what Koji >was referring to. How is the streaming with the new libraries and  
tuto1.c

TUTO1 plays the movies without any trashing. I'm not sure how much work it would be to  
adapt TUTO1 to play my movie needs, which include:

Partial insets on a 640x480 interlace screen. CDROM drive at normal speed. Different sound  
formats: None, interleave 16, interleave 32.

The trash I see occupies the entire rectangle that the movie is supposed to play in. It looks like a

checkerboard pattern of blocks, (or stripes) mostly solid colored, but sometimes it contains portions of the data. Once this pattern appears, it stays on the screen and no further updating takes place. (or else updating is very infrequent).

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4/25/96 10:29 AM

Re(2): Displaying Movies in Interlace Mode

Chris E. Reese

Michael Koziniak

CD/Decompression LIB

Michael Koziniak writes: >We are playing movies in interlace mode (640x480) and wanted to know how we can make sure that we are only >drawing to the draw buffer when we do a LoadImage of the decompressed image. Currently we are doing a >LoadImage directly to the 640x480 area in VRAM which in interlace ends up drawing to both the DRAW and DISP >buffers. This prevents us from overlaying sprites on the movie as they will flicker and we can also see the strips of >decompressed data being drawn to the screen. All the movie examples on the developer CD show movies being >played at non-interlace modes which is very convenient when needing to determine which area in VRAM to do a >LoadImage. Is there a way to do draw movies correctly in Interlace mode?

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If you have a 16x16 sprite you would call load image with the following rectangles:

16x1, 16x3, 16,5 ...

Logically this should work.

-Michael

Thanks for the long awaited response. The first solution unfortunately will not work for us as we do not have the VRAM space to spare since the movies I need to play happen during the course of the game.

The second solution I am not sure I understand fully. If I was to do a LoadImage on the odd/even fields how would I know if I am drawing to the back buffer or the display buffer? On another note. Is the hardware even able to execute the equivalent number of LoadImages to display the even or odd fields for a 640x240 image within a VSYNC? I just wonder since I haven't seen any examples of high res movies. Is there something you guys know about hardware/library limitations that I am going to learn very quickly?

Chris Reese Eidetic, Inc.

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5/21/96 10:13 AM

XA Audio Pause

Henrik Markarian

CD/Decompression LIB

I'm having trouble with pausing and restarting an XA audio file. There are several channels in the file, and when I pause (CdPause()) and then later on continue with (CdControl(CdlReadS,0,0)) sometimes the wrong channel starts playing. I've looked at the sample code supplied by SCE (CD\TUTO\TUTO5) and it also suffers from the same problem.

Any suggestions?  
Henrik Mindscape

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5/22/96 5:24 PM  
Re: XA Audio Pause  
Mike Fulton  
Henrik Markarian  
CD/Decompression LIB  
I'm having trouble with pausing and restarting an XA audio file. There are several channels in the file, and when I pause (CdPause()) and then later on continue with (CdControl(CdlReadS,0,0)) sometimes the wrong channel starts playing. I've looked at the sample code supplied by SCE (CD\TUTO\TUTO5) and it also suffers from the same problem. Any suggestions?  
Henrik Mindscape

By "several" channels I presume you mean some number higher than 2, so I am wondering how many channels you have, and what the data format is?  
Can you provide a more precise definition of the problem?

Mike

---

5/28/96 3:23 PM  
Re(2): XA Audio Pause  
Henrik Markarian  
Mike Fulton  
CD/Decompression LIB

I'm having trouble with pausing and restarting an XA audio file. There are several channels in the file, and when I pause (CdPause()) and then later on continue with (CdControl(CdlReadS,0,0)) sometimes the wrong channel starts playing. I've looked at the sample code supplied by SCE (CD\TUTO\TUTO5) and it also suffers from the same problem. Any suggestions?  
Henrik Mindscape ----- By "several" channels I presume you mean some number higher than 2, so I am wondering how many channels you have, and what the data format is?  
Can you provide a more precise definition of the problem?  
Mike ----- There are eight channels total, but (for now) only six contain data. The data is converted to XA format from RAW 16-bit audio source, using MovConv, and then the six files are packed using MovPack. All six piece play correctly, the problem is when I try to PAUSE and then RESTART a particular piece. At times, a piece other than the one that was paused will start playing. The sample code supplied by Sony (CD\TUTO\TUTO5.C) has the same problem.  
Henrik

---

6/5/96 8:15 PM  
Re(3): XA Audio Pause  
Mike Fulton  
Henrik Markarian  
CD/Decompression LIB

My guess is that when you pause, the next block of data being read isn't intended for channel 1, but it gets fed to channel 1 anyway.  
I don't know what you could do, except try to maintain some sort of sync to the channel 1 data. Maybe you need to backup or skip forward enough so you can restart in the right place to avoid the problem.

Mike

---

6/11/96 7:05 AM  
Fwd: CdGetSector  
Jason G. Andersen  
CD/Decompression LIB

I want to be able to load things into memory, that are less than 2k in length. So I'm using CdGetSector, and passing in a length less than 2048/4 to transfer out. According to the documentation in the library overview version 3.0. I must transfer the full 2K, it says it can be broken apart into multiple transfers. This seems to be accurate. So I'm asking for an officially endorsed location to dump my spill-over data, that's outside my RAM area. This way I don't have to give up 2k of precious RAM for this purpose. I'm sure that most PSX developers can understand how hard it is to fit everything you want to into ram.

I thought about dumping the extra data into my stack area, but my stack area is not large enough to guarantee the space will always be available. My scratch PAD ram is being fully utilized.

Basically I want permission to dump the extra data in the sector on top of the built in ROM in the PSX, since its ROM, it shouldn't hurt to write to it, and I don't have to worry about hitting any softswitches, or about some address range that doesn't exist getting remapped into a random location in my application RAM.

Please let me know Sony's stand on this issue.

Thanks in advance,  
Jason Andersen

---

6/14/96 1:24 AM  
Pausing movies  
Mark A. Fong  
CD/Decompression LIB

Does anyone know how to pause and un-pause streaming?

I need to be able to pause movies for an indefinite period of time. Currently, I'm calling StSetMask (1, 1, 0xFFFFFFFF) to pause and StSetMask (0, 1, 0xFFFFFFFF) to "un"pause the streaming (I've also tried StSetMask (1, 0, ...)). The pausing itself seems to work but upon un-pausing, the streaming starts up at a point much later on the CD (another movie following the current one). I've also tried calling CdIIPause along with StSetMask but that doesn't seem to help either.

Thanks!  
Masami Yamada

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6/15/96 11:10 AM

Re: Pausing movies

John Harris

Mark A. Fong

CD/Decompression LIB

Mark A. Fong writes: Does anyone know how to pause and un-pause streaming?

I need to be able to pause movies for an indefinite period of time. Currently, I'm calling StSetMask (1, 1, 0xFFFFFFFF) to pause and StSetMask (0, 1, 0xFFFFFFFF) to "un"pause the streaming (I've also tried StSetMask (1, 0, ...)). The pausing itself seems to work but upon un-pausing, the streaming starts up at a point much later on the CD (another movie following the current one). I've also tried calling CdIPause along with StSetMask but that doesn't seem to help either.

Thanks!

Masami Yamada

I know one way to do it. When you stop the movie, grab the number of the current frame.

Then to "unpause" start the streaming over again passing the frame number to restart at in the SsSetStream call.

John Harris Tachyon Studios, Inc.

---

6/18/96 10:31 AM

CdRead

jeffrey Hall

CD/Decompression LIB

In the lib 3.0 Reference it says or 'or the next sector after the last sector read by the last CdRead'. I do a read of a sector, I wait for completion, then I do another read and for some odd reason I get the same sector data. I'm not using callbacks, instead, I'm polling for completion using CdReadSync. Is this a bug? Am I doing something wrong?

Thanks, Jeff Hall Big Ape Productions Inc.

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6/19/96 4:58 PM

Interleaving data and XA audio

Ted Morris

CD/Decompression LIB

How do I got about interleaving my own data with XA audio? Basically, I want to have XA audio playing while I stream data off the CD. My attempts so far in interleaving the two files results in no audio being played while streaming the data. I've tried MOVPACK to interleave and even tried to have BuildCD interleave it for me, but I get nothing that works. If I interleave several XA files together, then it works fine, and MDEC movies with audio work fine too.

Thanks, Jason Curtice Westwood Studios

---

6/19/96 6:30 AM

Slow CD access

Pat Quinn

CD/Decompression LIB

We have been attempting to stream user data using our own ring buffer and data packer -- rather than using the St\*() functions & MovConv -- and have experienced two problems that

keep it from running smoothly. Each problem causes a halt or hesitation to varying degrees. I'll detail each problem in a separate post. This post will focus on the problem of slow CD access times.

With the goal of maintaining interactive options while not holding too many large animation frames in memory at one time, we have designed our CD access module to break animation sequences up into two groups of frames: the first having only two or so frames that would be readily available once we want to begin displaying the animation, and the rest in the second group which has streaming initiated at the same moment. At 300K bytes/sec double-speed CD rates, the first frame in the second group should be available in memory by the time we need to display it. A background function partially or completely reads an 11K frame from the ring buffer once every game loop, at a governed 20 fps (dont worry that rate is temporary).

We are encountering a data starvation problem, however, because that first frame from the second group is not completely available when we need it. Upon analysis of the CD I/O, we discovered that the problem is the surprisingly long time it is taking between the initiation of a `CdlReadS` (from a pause state) and the first asynchronous callback registered with `CdReadyCallback()`. This time which includes the seek & first `CdGetSector()` sector read -- varies between 180 to 380 milliseconds. Now I couldnt find a figure for it in the documentation, but the average access time of typical CD devices is 250 msec. However, in most cases, we are seeking forward by no more than two sectors! Doesnt this seem a bit excessive? At the Developers Conference, it was stated that forward seeks under 100 sectors are fast; but now Im wondering, compared to what?

Once that first sector is read, the others come in at the double speed rate we expect. Were timing with the CD emulator but we see the effect, a halt due to data starvation, on a real CD as well. I dont know much about CD mechanics, but I believe there is more going on besides the seek, things like synching with the grooves on the CD and rotational delays.

What we are trying to do is seek to and read a stream, pause after the callback gets the last sector, then later perhaps many seconds later seek and begin reading another stream that is usually just two sectors away from the beginning of the last sector read (our data packer program pads these stream starts on 4K-multiple offsets into the file). It doesnt seem to make a difference if the sequence of `CdControl()` commands involves a `CdlSetloc` or a `CdlSeekL` preceding the `CdlReadS`. And I dont believe pre-seeking to our next streams beginning sector immediately after the pause is going to help, since were only talking about moving two sectors. Also, I have not detected any seek or read errors, from the `CdControl()` commands or the callback.

We are able to mask this first-sector access problem by making at least six frames of animation available in memory before we start streaming the rest, but this solution almost defeats our whole reason for streaming because the entire animation at this stage of our development is only 10 frames long (and it likely wont get much longer). I would just like to ask for any other suggestions, or hear from others who implemented their own streaming and confronted this problem, before I settle on such an approach. Any help would be greatly appreciated.

David Crain NuFX, Inc.

---

6/19/96 6:32 AM

CD and memcopy

Pat Quinn

CD/Decompression LIB

We have been attempting to stream user data using our own ring buffer and data packer -- rather than using the `St*()` functions & `MovConv` -- and have experienced two problems that keep it from running smoothly. Each problem causes a halt or hesitation to varying degrees. I'll detail each problem in a separate post. This post will focus on the problem of copying data from one place in main memory to another place in main memory.

We are using the memcpy() function to copy data out of a statically allocated ring buffer to a particular item like an animation frame. In theory, we would like to copy as much data out of the ring buffer, and disburse it to individually malloc'ed items, as possible at one time so we will avoid a ring buffer overflow condition -- but we don't expect to be able to get more than 15K at a time. What is happening, though, is by the time one memcpy() operation completes, the asynchronous write-to-ring-buffer callback has been called many times. This produces either an overflow or, with a humongous ring buffer, a condition where our CD access code keeps dipping back into the ring buffer to process items all at once because it sees there is so much data available. In the latter case, this happens in one or two background (per game loop) calls rather than many, gathering up to 70K at a time. Each dip into the ring buffer -- i.e. each memcpy() operation -- slows the game down and in the meantime, the ring buffer fills up. The root of the problem, we discovered, is the memcpy() function. I timed each one and calculated a data rate, and the result was surprising: While the CD is streaming, memcpy() averages only 265K bytes/sec! That's slower than the CD! The maximum rate is only 413K bytes/sec, and the minimum is as slow as 24K bytes/sec (for comparison, when the CD is not operating, memcpy() averages 1.6M bytes/sec, and gets as high as 3.7M bytes/sec). It doesn't seem to help that memcpy() is implemented in the kernel.

We are speculating that this slow rate is the result of the priority that the CD's DMA access has to main memory. It seems memcpy() or any other ordinary RAM access is pretty much locked out when the CD is busy, which leaves the rest of the game high & dry.

If we are correct about this -- that DMA has a higher priority to RAM than the main process -- than this suggests we should also use DMA to read from the ring buffer. Is there a DMA function for moving data from one part of main memory to another, in place of memcpy()? If there is, I suppose it would have to work asynchronously to avoid contention with the CD DMA. Perhaps we should use VRAM as an intermediary, using the asynchronous DMA LoadImage() followed by the DMA StoreImage()...

I imagine a simplistic response to this problem would probably be to not copy data -- use it straight out of the ring buffer. But this is easier said than done. We would lose most of the flexibility that our CD access module (for data management) is designed to give us. I would just like to ask for any other suggestions, or hear from others who implemented their own streaming and confronted this problem, before I embark on such a radical course. Any help would be greatly appreciated.

David Crain NuFX, Inc.

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6/21/96 1:47 PM

Re: Slow CD access

John Harris

CD/Decompression LIB

Pat Quinn writes: Were timing with the CD emulator but we see the effect, a halt due to data starvation, on a real CD as well.

The only thing I have on first glance, is that short-seek timings from the CD emulator are significantly slower than that of a real CD.

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6/24/96 2:19 PM

Re: CdRead

Mike Fulton

jeffrey Hall

CD/Decompression LIB



Jeff Hall @ Big Ape Productions Inc. writes:

In the lib 3.0 Reference it says or 'or the next sector after the last sector read by the last CdRead'. I do a read of a sector, I wait for completion, then I do another read and for some odd reason I get the same sector data. I'm not using callbacks, instead, I'm polling for completion using CdReadSync. Is this a bug? Am I doing something wrong?

Any chance you could be a bit more specific about where in the library reference you're talking about? For now, I'm guessing you're talking about the entry for the CdRead() function.

By the way, if you're only reading 1 sector at a time, you're incurring a lot of extra overhead by using CdRead() to do it. You'd be better off going a little lower-level. Any special reason you're doing it that way?

How exactly are you using CdReadSync() to wait for CdRead to finish? What mode are you using?

Mike

---

6/25/96 11:46 AM

Re(3): CdRead

John Harris

CD/Decompression LIB

Solution to CdRead problem:

Before the second CdRead(), issue a CdControl(CdlSetloc, ...) function to set the position to the next sector.

It still sounds like CdRead() has a problem in the Sony library code, (or the documentation is wrong) but at least this work-around provides the intended functionality.

Thanks Mike,

John Harris Tachyon Studios, Inc.

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6/25/96 9:50 AM

Re(2): CdRead

John Harris

Mike Fulton

CD/Decompression LIB

Mike,

I had this problem with CdRead() also. I am trying to do the following:

I don't know how big a particular art object is until after reading the header on the front of the file. I know the size in sectors, but objects are compressed at varying amounts and I don't know the actual width and height of the object in order to allocate the right amount of memory for the final decompressed object. Thus, I do a CdRead(1, buf, CdlModeSpeed). Then a CdReadSync(0,0) to sync the data. After examining the object's header, I allocate the amount of RAM I need, and then I wanted to memcpy() the first sector (already read) to the start of that buffer and then CdRead(filesize-1, picbuf+2048, CdlModeSpeed). This doesn't work. As already mentioned, the second CdRead() starts over again at the first sector. I currently have to do either a seek to the next sector, or else do a full CdRead() of all the data (duplicating the first sector I already loaded).

**THIS IS CONTRARY TO WHAT THE DOCS DESCRIBE.** In 3.0 reference for the CdRead() function it does say that it will start at the position of the last CdlSeekL, or **THE NEXT SECTOR AFTER** the sector read by the last CdRead(). The way the function appears to behave, is that it always goes to the last seek position.

John Harris Tachyon Studios, Inc.

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6/26/96 2:58 PM  
CdInit hanging...  
tim m. edwards  
CD/Decompression LIB

Hey, Guys.  
As keepers of the source, can you tell me what might be causing a CdInit(0) call to hang?  
Thanks,  
-Erik Strickland.

---

6/27/96 1:28 AM  
CdIPause  
Mark A. Fong  
CD/Decompression LIB

I'm can't seem to get CdIPause to work. I call CdControlB (CdIPause, 0, 0) and assume that the CD is paused, but I don't think it is because it will eventually play back audio that lies in later sectors. Is there something else I need to do to get it working?  
Thanks!  
Masami Yamada

---

7/2/96 1:33 PM  
Re: CdInit hanging...  
Mike Fulton  
tim m. edwards  
CD/Decompression LIB  
...can you tell me what might be causing a CdInit(0) call to hang?  
Thanks, -Erik Strickland.

Can you provide info on what else is being done up to that point? Are you aware that CdInit() calls ResetCallback()? This could be affecting other parts of your code.  
Mike @ SCEA

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7/2/96 1:29 PM  
Re: CdIPause  
Mike Fulton  
Mark A. Fong  
CD/Decompression LIB  
I'm can't seem to get CdIPause to work. I call CdControlB (CdIPause, 0, 0) and assume that the CD is paused, but I don't think it is because it will eventually play back audio that lies in later sectors. Is there something else I need to do to get it working?  
Thanks!  
Masami Yamada

Can you please show the code that is previously used to access the CD? Are you trying to play CD-DA audio prior to the pause?

Why do you assume the CD is paused? Are you checking the return code of CdControlB()? Is it returning a success code?

Also, you are not specifying a location for CdControlB() to return status information (the 3rd parameter for the CdControlB() function is a pointer to an 8-byte array that, if non-zero, will receive CD system status info).

Mike @ SCEA

---

8/3/96 12:23 PM

Urgent- CdRead() infinite failure

John Harris

Developer Support

I'm already past the date when I was supposed to deliver final. I would appreciate a quick response. Thanks!

I am having a problem where CdRead() intermittantly gets stuck in a continuous failure mode, and my game locks up because I am retrying indefinitely.

I'm running with OS 3.5. A simplified code example is:

```
CdLLOC pos; CdIntToPos(file,&pos); do {
while (!CdControl(CdSeekL, (u_char*)&pos, 0)); while (!CdRead(numSectors, buffer,
CdLModeSpeed)); while ( (gReadStatus = CdReadSync(mode,0) > 0 ) { // do some stuff
to keep animations running } } while (gReadStatus);
```

I traced the code through one of these infinite loops, and in this case, the code did not need asynchronous processing and the parameter "mode" for the CdReadSync(mode, 0) call was set to 0. Stepping the CdRead() function call produced a long wait, and the following error message on the debug message screen: (I'm using the CD emulator)

```
CD timeout: CD_sync:(CdSeekL) Sync=Acknowledge, Ready=NoIntr DiskError: DiskError:
DiskError: DiskError:
```

It had the same result each time through the do {} while loop.

other variables:

```
file = 32022 pos = 7, 8, 114 // result of CdIntToPos() numSectors = 56
```

This code runs fine the majority of the time, with the same parameters. I can find no differences in the state of all the variables between the occasions where the code works versus where the code loops indefinitely. The previous OS v3.4 would lock up under this condition, printing only a portion of an error message such as "CD\_re".

Bottom line questions:

1. Any idea why this CdSeekL/CdRead() is failing? 2. Is there something I can put in the loop to recover from it?

John Harris Tachyon Studios, Inc.

---

8/6/96 3:42 AM

Streaming problems...

Crystal Dynamics

CD/Decompression LIB

I am using the St... family of calls to stream data off of the CD. I have written a tool that generates the necessary STR file format, and a routine that reads it in on the console. Everything was going along fine until I tried to burn a CD. On the CD, the first file I stream is corrupted. Specifically, the first time I call StGetNext, the pointers I return are to junk data.

After burning numerous CDs to isolate the problem, I have found that the solution is simple: if I

call CdRead2 at some point before attempting to stream data, the problem goes away. This call to CdRead2 can read anything -- it doesn't seem to matter. At this point, my CD initialization routines call CdInit, etc., then do the following:

```
CdRead2( CdlModeStream | CdlModeSpeed ); for ( i = 0; i < 15; i++ ) VSync( 0 );  
CdControlB( CdlPause, 0, 0 );
```

This makes the first streaming call work fine, but in my perusal of the library ( in the debugger ) I have found that this is very dangerous: because I haven't called StSetStream before this call, I'm causing one of the callbacks to write to 0x00000000 -- not a very nice place to write to. So, I'd like to get this hack out of there. Can anyone tell me what I need to do to get this to work properly?

To summarize: the first time I try to stream data off of the CD using CdRead2/StGetNext, the data returned by StGetNext is invalid. On all subsequent attempts, everything works fine. Inserting a spurious call to CdRead2 before the first attempt to read data makes the problem go away.

Extra information that may be of help:

\* This problem never occurs on the CD emulator HD. I didn't know that anything was wrong until I burnt a CD, because the routine ( and associated data ) have always worked fine on my dev. system. \* The problem is not with the data: Re-reading the file works fine, and once I've kicked things off, I can read the file ( and others generated with the same tool ) just fine. The problem is isolated to the first time I try to stream in data. \* I have patched out the CdRead callback ( ie. using CdReadCallback ) and the bulk of my data is read using CdRead. \* The data is NOT a standard STR movie but a special stream file created using a custom tool.

Accordingly, the code that streams the data off of the CD is nothing like the standard streaming code. To my mind, all of this would be suspect, but that a) it works fine on the dev. system, and b) it only has a problem with the first file -- once CdRead2 has been called once, everything works fine until I turn off the system.

This one really has me stumped. I'm sure I'm missing something, but I've been banging my head against the wall, burning CDs like they're going out of style, trying to get a handle on it, and am coming up with nothing. I guessing that I'm not initializing something properly, and that the extra CdRead2 is doing it for me, but I'm at a loss as to what that something is. Any assistance would be greatly appreciated.

Thanks,

--jonah

ps. Is there a "correct" order for calls to CdInit/ResetGraph/InitPad? With my current ordering, my CDs always boot fine -- with other orderings, I have about a 50% boot-success rate. Again, only a problem with real CDs, not with the dev. system.

---

8/6/96 7:13 PM

Re: Streaming problems...

Michael Koziniak

Crystal Dynamics

CD/Decompression LIB

What version of the Libraries are you using?

-Michael

---

8/6/96 7:06 PM

Re: Urgent- CdRead() infinite failure

Michael Koziniak

CD/Decompression LIB

```
John Harris writes:  CdIntToPos(file,&pos); do {
while (!CdControl(CdlSeekL, (u_char*)&pos, 0)); while (!CdRead(numSectors, buffer,
CdlModeSpeed)); while ( (gReadStatus = CdReadSync(mode,0)) > 0 ) { // do some stuff
to keep animations running } } while (gReadStatus);
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I traced the code through one of these infinite loops, and in this case, the code did not need asynchronous processing and the parameter "mode" for the CdReadSync(mode, 0) call was set to 0. Stepping the CdRead() function call produced a long wait, and the following error message on the debug message screen: (I'm using the CD emulator)

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CD timeout: CD_sync:(CdlSeekL) Sync=Acknowledge, Ready=NoIntr DiskError: DiskError:
DiskError: DiskError:
```

It had the same result each time through the do {} while loop.

other variables:

```
file = 32022 pos = 7, 8, 114 // result of CdIntToPos() numSectors = 56
```

This code runs fine the majority of the time, with the same parameters. I can find no differences in the state of all the variables between the occasions where the code works versus where the code loops indefinitely. The previous OS v3.4 would lock up under this condition, printing only a portion of an error message such as "CD\_re".

Try changing the "CdlSeekL" that you do before your read to a "CdlSetloc."

-Michael

---

8/7/96 1:58 PM

different kernel?

Dave Elton

CD Creation

I am trying to convert our game to Japanese version. Our game is to play some 24 bit movies with video encoded in MDEC format. Everything works fine here but in Japan, some older units have video glitches when movies played. This does not happen in newer playstation units and only happened in older units. I remember we have a set of replacement development card from Sony America and I also observed the same glitches in video. we thought we the card was bad and sent it back for a new card, since then we never had any problem with the new card. This reminds me maybe some of DTL-H2000 dev boards have the same old kernel as the older version of playstation. I want to know whether this is true and if this is true, is there any such boards Sony still has and we can use to debug? Since there are so many old units out there in Japan, we cannot just ignore this problem. And bad enough, the same problem never shows up at here, either in dev system or debugging station. Hope somebody out there can enlighten me on this problem. Thanks !

Simon ReadySoft Inc.

---

8/7/96 1:41 PM

Re: Streaming problems...

Dave Elton

Crystal Dynamics

CD/Decompression LIB

I had the same experience myself. The strange thing is I was loading a .TIM file and then start to stream-playing a movie. On my dev system, everything works fine. But when I burn a CD, after license.dat played, the first image is either corrupted or missing. After that the first movie will start to play. I am wondering whether the license file played will cause any problem in streaming library.

Simon ReadySoft Inc.

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8/8/96 6:37 PM

Re: different kernel?

Michael Koziniak

Dave Elton

CD/Decompression LIB

Dave Elton writes:

I am trying to convert our game to Japanese version. Our game is to play some 24 bit movies with video encoded in MDEC format. Everything works fine here but in Japan, some older units have video glitches when movies played. This does not happen in newer playstation units and only happened in older units. I remember we have a set of replacement development card from Sony America and I also observed the same glitches in video. we thought we the card was bad and sent it back for a new card, since then we never had any problem with the new card. This reminds me maybe some of DTL-H2000 dev boards have the same old kernel as the older version of playstation. I want to know whether this is true and if this is true, if there any such boards Sony still has and we can use to debug? Since there are so many old units out there in Japan, we cannot just ignore this problem. And bad enough, the same problem never shows up at here, either in dev system or debugging station. Hope somebody out there can enlight me on this problem. Thanks !

Simon ReadySoft Inc.

What do the video glitches look like?

-Michael

---

8/8/96 5:37 PM

Re: Streaming problems...

Mike Fulton

Crystal Dynamics

CD/Decompression LIB

I am using the St... family of calls to stream data off of the CD. I have written a tool that generates the necessary STR file format, and a routine that reads it in on the console. Everything was going along fine until I tried to burn a CD. On the CD, the first file I stream is corrupted.

Specifically, the first time I call StGetNext, the pointers I return are to junk data.

After burning numerous CDs to isolate the problem, I have found that the solution is simple: if I call CdRead2 at some point before attempting to stream data, the problem goes away. This call to CdRead2 can read anything -- it doesn't seem to matter. At this point, my CD initialization routines call CdInit, etc., then do the following:

```
CdRead2( CdlModeStream | CdlModeSpeed ); for ( i = 0; i < 15; i++ ) VSync( 0 );
```

```
CdControlB( CdlPause, 0, 0 );
```

This makes the first streaming call work fine, but in my perusal of the library ( in the debugger ) I have found that this is very dangerous: because I haven't called StSetStream before this call, I'm causing one of the callbacks to write to 0x00000000 -- not a very nice place to write to. So, I'd like to get this hack out of there. Can anyone tell me what I need to do to get this to work properly?

The problem here is that you haven't specified (as far as you've indicated) where CdRead2 should be placing the data it reads. Whenever you call CdRead2 with the CdlModeStream bit set in the mode parameter, it installs CdReadyCallback, which is responsible for moving the data out of the hardware sector buffer. The callback it installs is supposed to move the data into the streaming ring buffer, but if you haven't set up this buffer and told the system about it using the StSetRing function yet, then it will have a NULL pointer. It also calls CdDataCallback,

which increments the ring buffer pointers appropriately for the next sector to be read.

I am also curious why you are doing the loop with the Vsync(0) call? Is this just to wait for something to have happened with the CdRead2 function?

To summarize: the first time I try to stream data off of the CD using CdRead2/StGetNext, the data returned by StGetNext is invalid. On all subsequent attempts, everything works fine.

Inserting a spurious call to CdRead2 before the first attempt to read data makes the problem go away.

Extra information that may be of help:

\* This problem `_never_` occurs on the CD emulator HD. I didn't know that anything was wrong until I burnt a CD, because the routine ( and associated data ) have always worked fine on my dev. system. \* The problem is not with the data: Re-reading the file works fine, and once I've kicked things off, I can read the file ( and others generated with the same tool ) just fine. The problem is isolated to the first time I try to stream in data. \* I have patched out the CdRead callback ( ie. using CdReadCallback ) and the bulk of my data is read using CdRead.

What exactly does the CdRead callback have to do with your streaming? Are you using CdRead for streaming instead of CdRead2? That won't work. CdRead has more overhead and isn't really designed for streaming. Please outline what you're doing with CdRead.

The CdReadCallback is used to determine when a CdRead has finished reading the specific number of sectors you specified. This callback is NOT used for CdRead2.

Also, please note that the CdRead function has changed a bit in the new library v3.5 stuff. It may be that inserting a CdControl(CdlSetMode) in the right place(s) will fix the problem. If you're doing a CdSearchFile following or just before a CdRead function, it's possible that the mode is getting trashed and CdRead isn't resetting it. To fix this, insert a CdControl(CdlSetMode) after the CdSearchFile.

It's also possible that you are simply not waiting for some operation to complete with the proper Cd????Sync or Cd????Callback function, and this operation takes longer with a real CD than it does with the emulator, so you're getting an error. To be safe, you should always make sure to sync to the last operation you did. But make sure you use the right sync call. For example, you would not use CdSync to sync a CdRead, since CdRead does a lot of little CD operations internally which may be caught by the sync. Instead, use the proper CdReadSync function.

\* The data is NOT a standard STR movie but a special stream file created using a custom tool. Accordingly, the code that streams the data off of the CD is nothing like the standard streaming code. To my mind, all of this would be suspect, but that a) it works fine on the dev. system, and b) it only has a problem with the first file -- once CdRead2 has been called once, everything works fine until I turn off the system.

Again, I think it may have something to do with the way CdRead has changed in library v3.5. This is something that may not really have any effect on the emulator. Adding the CdControl(CdlSetMode) call should help.

This one really has me stumped. I'm sure I'm missing something, but I've been banging my head against the wall, burning CDs like they're going out of style, trying to get a handle on it, and am coming up with nothing. I'm guessing that I'm not initializing something properly, and that the extra CdRead2 is doing it for me, but I'm at a loss as to what that something is. Any assistance would be `_greatly_` appreciated.

Since you're not using our standard setup, it's very difficult to guess what may be wrong.

Please outline what CD---- and St---- library calls you are doing throughout your streaming process, as well as what CD calls you are doing immediately beforehand (to locate the movie on the CD, etc.)

Thanks, --jonah

ps. Is there a "correct" order for calls to CdInit/ResetGraph/InitPad? With my current ordering, my CDs always boot fine -- with other orderings, I have about a 50% boot-success rate. Again, only a problem with real CDs, not with the dev. system.

Do your InitPad after the ResetGraph. I would think CdInit could come anywhere after that.

We usually recommend that ResetGraph come first. Are you doing a ResetCallback also?

It's not real clear if CdInit/ResetGraph/InitPad was the order you used that worked best for you, or what. It may also depend on whatever else you may be doing.

If you want to send us the source for your startup for us to verify, you can do that via private MAIL if you don't want to do it publically.

Mike

---

8/9/96 3:37 PM  
Re(4): CdRead  
Craig Erickson  
CD/Decompression LIB

John Harris writes: Solution to CdRead problem:  
Before the second CdRead(), issue a CdControl(CdlSetloc, ...) function to set the position to the next sector.  
It still sounds like CdRead() has a problem in the Sony library code, (or the documentation is wrong) but at least this work-around provides the intended functionality.  
Thanks Mike,  
John Harris Tachyon Studios, Inc.  
Wait a minute. Does this mean that we have to issue a CdControl(CdlSetloc, ...) before each and every CdRead()?

---

8/9/96 3:11 PM  
Re: Interleaving data and XA audio  
Michael Koziniak  
Ted Morris  
CD/Decompression LIB

Ted Morris writes: How do I got about interleaving my own data with XA audio? Basically, I want to have XA audio playing while I stream data off the CD. My attempts so far in interleaving the two files results in no audio being played while streaming the data. I've tried MOVPACK to interleave and even tried to have BuildCD interleave it for me, but I get nothing that works. If I interleave several XA files together, then it works fine, and MDEC movies with audio work fine too.  
Thanks, Jason Curtice Westwood Studios  
Why don't you interleave audio with video data that is the same size as yours and then replace the video data with your streaming data?  
-Michael

---

8/11/96 10:27 PM  
Swapping CDs without rebooting...  
David R. Black  
CD/Decompression LIB

Can anyone help me with enabling my application to change CDs without rebooting the PSX? I am currently working on the disc swapping function for a 2 CD game, and am having some difficulty getting it to work. As suggested at the last developer seminar, I am checking for the Shell Open flag (door opened) using CdControl and CdlNop. Once the shell open flag is detected, I am waiting for it to go away (indicating the door has been closed), waiting for 10 seconds, and then checking to see if it is the disc I need.

One at a time, here are my questions/problems:

1) The CdlStatShellOpen flag (0x10) never seems to be returned from CdControl. It is not showing up in the result buffer or the return value from CdControl. Am I doing something



wrong? Here is a line of code for the first condition (door open) from my the developer conference binder:

```
while (!CdControl(CdNop, 0, 0) & 0x10); // wait for lid to open
```

2) Once the user has swapped the CD, do I need to call CdInit again to initialize the CD and get things going? (in anticipation of solving problem #1)

3) Is there an easy way to read the volume label of the CD currently in the drive? Right now I am using a data file on the CD to identify which CD is in the drive, but I would prefer to simply read the volume label instead. It would probably be much quicker than the former, and not require me to use space on the CD. (not that my Disc ID files are that big anyway)

Suggestions are greatly appreciated.

Thanks for your time.

David R. Black Senior Programmer Presto Studios, Inc.

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8/12/96 1:14 PM

Re(2): different kernel?

Dave Elton

Michael Koziniak

CD/Decompression LIB

The video glitches look like some corrupted video band, acrossing the screen once for a while. I tried to drop my video from 24 bit to 16 bit and it looks like the glitches are gone. It must have something to do with DMA conflicting.

I also have another question here to ask: when we put 3 minutes data at the end of CD to avoid cd seeking problem, does it have to be subheader file for the dummy data or just mode1 data? Because if it is subheader file, 3 minutes=  $3*60*75*2332$  bytes, while usually I choose 3 minutes= $3*60*75*2048$  bytes.

Simon ReadySoft Inc.

---

8/13/96 1:22 PM

Re(3): different kernel?

Mike Fulton

Dave Elton

Michael Koziniak

The video glitches look like some corrupted video band, acrossing the screen once for a while. I tried to drop my video from 24 bit to 16 bit and it looks like the glitches are gone. It must have something to do with DMA conflicting.

I've noticed that one of our samples has a call to the routine StCDInterrupt() which gets called only if the video mode is 24-bit and a certain flag is set. This routine is the data-transfer callback function used by the streaming routines, so perhaps it's trying to deal with the same sort of DMA issue. I suggest you take a look at the samples again.

I also have another question here to ask: when we put 3 minutes data at the end of CD to avoid cd seeking problem, does it have to be subheader file for the dummy data or just mode1 data? Because if it is subheader file, 3 minutes=  $3*60*75*2332$  bytes, while usually I choose 3 minutes= $3*60*75*2048$  bytes.

Simon @ ReadySoft Inc.

By the time they actually get onto the CD everything is 2352 bytes per sector anyway. The only real difference is how much data is generated by CDGEN for each sector and how much is taken from the file. In other words,

Regular Data File =  $3 * 60 * 75 * (2048 \text{ bytes from file} + 304 \text{ bytes ISO 9660 data, error correction data, \& subheader data generated by CDGEN} = 2352 \text{ bytes total per sector})$

Subheader File =  $3 * 60 * 75 * (2332 \text{ bytes from file} + 16 \text{ bytes subheader file generated by CDGEN} = 2352 \text{ bytes total per sector})$

These take up the same disc space. Therefore, just use plain-old 2048 byte regular data files... it

doesn't really make any difference, but 2048 byte sectors will require a smaller file on your hard drive.

Mike

---

8/13/96 3:27 PM

Re: Swapping CDs without rebooting...

Administrator

CD/Decompression LIB

David R. Black writes: Can anyone help me with enabling my application to change CDs without rebooting the PSX?

I am currently working on the disc swapping function for a 2 CD game, and am having some difficulty getting it to work. As suggested at the last developer seminar, I am checking for the Shell Open flag (door opened) using CdControl and CdINop. Once the shell open flag is detected, I am waiting for it to go away (indicating the door has been closed), waiting for 10 seconds, and then checking to see if it is the disc I need.

One at a time, here are my questions/problems:

1) The CdIStatShellOpen flag (0x10) never seems to be returned from CdControl. It is not showing up in the result buffer or the return value from CdControl. Am I doing something wrong? Here is a line of code for the first condition (door open) from my the developer conference binder:

```
while (!CdControl(CdNop, 0, 0) & 0x10); // wait for lid to open
```

2) Once the user has swapped the CD, do I need to call CdInit again to initialize the CD and get things going? (in anticipation of solving problem #1)

3) Is there an easy way to read the volume label of the CD currently in the drive? Right now I am using a data file on the CD to identify which CD is in the drive, but I would prefer to simply read the volume label instead. It would probably be much quicker than the former, and not require me to use space on the CD. (not that my Disc ID files are that big anyway)

Suggestions are greatly appreciated.

Thanks for your time.

David R. Black Senior Programmer Presto Studios, Inc.

Hi David,

Funny you should ask about CD swapping, I just got a technical note from japan about what you need to do when swapping CD's. The following is that tech note (which I will soon post as a file) :

1) Prior to CD Swapping

(MUST) Prior to CD swapping( before displaying the prompt message for CD swapping), set the CD subsystem to "Normal Speed Mode". (OPTIONAL) After setting the mode, stop the CD rotation using "CdIStop".

Example of "Normal Speed Mode" setting

```
: com = 0; CdControlB( CdISetmode, &com, result ); :
```

2) How to Detect Completion of CD Swapping Follow the two steps (A) Detect Open/Close status and (B) Detect spindle rotation, in this order to detect the completion of CD swapping. The command "CdINop" is used in both detection tests.

```
CdControlB( CdINop, 0, result ); /* char result[ 8 ]; */
```

(A)The Open/Close status of the cover is reflected to the Bit 4 (0x10) of result[ 0 ]. This flag is used to detect that the cover was opened and then closed and has the following states;

Cover being opened: Always 1 Cover was closed: 1 for the first detection, 0 after the first detection

Therefore, when the flag changes from 1 to 0, it can be assumed that the CD was changed.

(B) Wait till Bit 1 (0x02) of result[ 0 ] becomes 1 after issuing the "CdINop" command.

### 3) Immediately After CD Swapping

After CD swapping followed by the cover close, the CD subsystem starts reading the TOC data. During this read, do not issue any command except for "CdINop" and "CdIGetTN".

To detect the completion of TOC data read, use "CdIGetTN" command described below. After successful execution of "CdIGetTN", the CD subsystem finishes TOC data read and is able to issue standard command. Thus repeat issuing the "CdIGetTN" command till detect the completion of TOC data read.

| Name | Number | Execution Result | Description | type                             | -----       |
|------|--------|------------------|-------------|----------------------------------|-------------|
|      |        | CdIGetTN 0x13    | status      | Obtained number of TOC non-block | First Track |
| No.  |        | Last Track       | No.         |                                  |             |

### 4) PlayStation Disk Check

Check whether the CD placed is a PlayStation disk (black disk) by issuing the logical access command ( CdIReadS/N, CdISeekL, etc.)

Logical access to the disk that was not recognized as a PlayStation disk will result in a "Command Error". This "Command Error" differs from the ordinal DiskError in the following manner.

Right after DiskError, the bits below are set to 1;

Bit 0 ( 0x01 ) of result[ 0 ] Bit 6 ( 0x40 ) of result[ 1 ]

After detecting a "Command Error", any logical access will not be accepted. The reason for this error may be due to setting an incorrect type of CD (e.g. CD-DA etc.), or placing a CD improperly. The only way to recover from this "Command Error" is to open the cover and place the CD again. Thus display appropriate message and then repeat steps starting from Step 1).

When a logical access such as data load exists immediately after the data load, as game was designed, checking if the disk is a PlayStation disk or not can be done by issuing the logical access command. For other cases (e.g. playing DA), check the disk by issuing a dummy read.

Note 1) Since Step 1) through Step 3) can be successfully executed even for the CD-DA or other ordinal CD-ROM, make sure to check whether the disk is a PlayStation disk or not.

Note 2) Although ordinal CD-ROM is also recognized as a PlayStation disk on the Debugging Station, only the black disk is recognized as a PlayStation disk on the PlayStation.

### 5) Others

- Be sure to use the "Normal Speed Mode" throughout Steps 1)- 3).

- Be sure to detect the command completion using "CdControlB" during Step 1) through 3).

Although examples above are simplified for easy reading, be sure to include the execution result checking for each command. - Please display appropriate messages while checking CDs.

---

8/13/96 2:42 PM

Re(5): CdRead

John Harris

Craig Erickson

CD/Decompression LIB

Craig Erickson writes:

Wait a minute. Does this mean that we have to issue a CdControl(CdISetloc, ...) before each and every CdRead()?

What I found, is that you cannot assume that a second CdRead() will continue with the sector number after where the previous CdRead() left off. At least not with lib 3.4, and I didn't test it under 3.5. The second CdRead() began reading from the exact same sector as the first CdRead(),

and thus, yes, I had to issue CdControl(CdlSetloc...) before each CdRead().  
John Harris Tachyon Studios, Inc.

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8/17/96 8:04 PM  
Movie+XA interleave  
Dan Chang  
CD/Decompression LIB

I have successfully written a command line tool that converts a series of TIM files into an MDEC STR file. My STR file is exactly like the file produced by MovConv, except that I use a different lossless compression after the MDEC compression is done. I did this because the lib's lossless decompress is this lousy Huffman monster that takes up 70k if you link with it.

I am successfully playing these movies on the Playstation, using the method for playing STR movies illustrated in the sample code, except that I substitute my own lossless decompress for the DecDCTvlc at the appropriate time.

Now I want to include an XA audio track in my movie.

I have tried just taking my STR and then applying MovConv's "Interleave Video With Audio" function. When I try to play the resulting STR, I can hear the XA track playing, but the MDEC/STR processing chokes, and I usually get just one partially corrupted frame to display before processing stops.

I have tried modifying my tool so that it leaves extra space in the file, and then applying "Interleave Video With Audio," to no avail. I've tried both leaving the space at the end of each frame, and every nth sector, where if, say, I had 18KhzStereo, playing at double-speed, n would be 16. Neither has an effect that I can notice.

I have also tried interleaving using MovPack, but I can't figure out how to interleave an XA as 1 out of every 16 channels among the remaining channels from the STR. Seems like MovPack is only good for laying out XA channels.

In the past, I have used MovConv all the way through for Movies+XA, and it has worked.

My questions are:

- 1)What does my STR producing tool have to do differently in order to prepare the STR for interleaving by MovConv's "Interleave Video With Audio?"
- 2)Or preferably,how can my tool do the interleaving of XA itself? How do I construct a file that contains interleaved XA data so that the CD hardware will know which sectors are XA and which are Video data?

thanks!  
david\_brickhill@bossgame.com

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8/17/96 11:48 AM  
Re(4): different kernel?  
Dave Elton  
Mike Fulton  
Michael Koziniak

I understand no matter the whole sector size eventually will be 2352 bytes. But my question is whether the 3 minutes requirement is for for plain data file. I have a dummy file which is 3\*60\*75\*2048 bytes, but when I changed the file type to CDDA file in CdGen, my total disc file size shrinks from 70:07 minutes to 69 minutes. Obviously the CdGen is spreading the 2048 bytes per sector file into 2332 bytes per sector. In our case, since our data almost fill up the whole disc ( 71 minutes), this is critical. But I don't want to risk the possible cd header overshooting.

Another thing is I noticed that in layout mode, CDDA files is not showing up. How do we know where these files are located then?

Simon ReadySoft Inc.

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8/19/96 1:28 PM

Re: Movie+XA interleave

Mike Fulton

Dan Chang

CD/Decompression LIB

I have successfully written a command line tool that converts a series of TIM files into an MDEC STR file. My STR file is exactly like the file produced by MovConv, except that I use a different lossless compression after the MDEC compression is done. I did this because the lib's lossless decompress is this lousy Huffman monster that takes up 70k if you link with it.

The majority of the space used by the library Huffman decoder is for data tables so that things don't need to be calculated at runtime. It's a much faster method, but it does take more room.

I am successfully playing these movies on the Playstation, using the method for playing STR movies illustrated in the sample code, except that I substitute my own lossless decompress for the DecDCTvlc at the appropriate time. Now I want to include an XA audio track in my movie. I have tried just taking my STR and then applying MovConv's "Interleave Video With Audio" function. When I try to play the resulting STR, I can hear the XA track playing, but the MDEC/STR processing chokes, and I usually get just one partially corrupted frame to display before processing stops.

I think the most likely problem is that Movie Converter is trying to decompress the video data and choking on the different compression. Or more precisely, what it decompresses to isn't correct, so the data is corrupted when it recreates the movie. You may be able to get around this by setting the frame type code to something different from what a standard video frame would normally be, assuming you haven't done this already. This would require you to do a bit more work to read the data in, however.

I have tried modifying my tool so that it leaves extra space in the file, and then applying "Interleave Video With Audio," to no avail. I've tried both leaving the space at the end of each frame, and every nth sector, where if, say, I had 18KhzStereo, playing at double-speed, n would be 16. Neither has an effect that I can notice.

Once again, my guess is that after you changed the compression method, you made it so that the STR file wasn't REALLY an STR file any more, at least as far as proper operation of MOVCONV is concerned. As to "why does MOVCONV need to decompress anything" (and I'm not sure it does... that's just speculation) the answer is that it may need to adjust the compression in order to maintain the correct data rate. I don't know that it would recognize that you've left extra space in the file.

I have also tried interleaving using MovPack, but I can't figure out how to interleave an XA as 1 out of every 16 channels among the remaining channels from the STR. Seems like MovPack is only good for laying out XA channels. In the past, I have used MovConv all the way through for Movies+XA, and it has worked. My questions are:

- 1)What does my STR producing tool have to do differently in order to prepare the STR for interleaving by MovConv's "Interleave Video With Audio?"
- 2)Or preferably,how can my tool do the interleaving of XA itself? How do I construct a file that contains interleaved XA data so that the CD hardware will know which sectors are XA and which are Video data?

thanks! david\_brickhill@bossgame.com

My suggestion would be that you investigate the idea of using MOVCONV to create a final movie, and then have your tool reprocess it as required. The data rate would be the tricky thing to manage there.

What sort of compression are you using in place of the Huffman encoding?

Mike

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8/19/96 12:47 PM

Re(5): different kernel?

Mike Fulton

Dave Elton

Michael Koziniak

I understand no matter the whole sector size eventually will be 2352 bytes. But my question is whether the 3 minutes requirement is for for plain data file. I have a dummy file which is  $3*60*75*2048$  bytes, but when I changed the file type to CDDA file in CdGen, my total disc file size shrinks from 70:07 minutes to 69 minutes. Obviously the CdGen is spreading the 2048 bytes per sector file into 2332 bytes per sector. In our case, since our data almost fill up the whole disc ( 71 minutes), this is critical. But I don't want to risk the possible cd header overshooting.

The dummy space should be 3 minutes worth of 2352 byte sectors, regardless of how much comes from your file and how much is added in by CDGEN during the disc mastering process. If you tell CDGEN you have a data file, then the file needs to be 27648000 bytes long ( $3 * 60 * 75 * 2048$ ) and CDGEN will add in 4104000 bytes ( $3 * 60 * 75 * 304$ ) for a total of 31752000 bytes ( $3 * 60 * 75 * 2352$ ).

If you tell CDGEN you have a CD-DA file, then the file needs to be 31536000 bytes long ( $3 * 60 * 75 * 2336$ ) and then CDGEN will add in 216000 bytes ( $3 * 60 * 75 * 16$ ) for a total of 31752000 bytes ( $3 * 60 * 75 * 2352$ ).

Either way, the same amount of disc space is used.

The file is assumed to be 3:00:00 long when you tell CD-GEN it's a data file because it expects to use 2048 bytes from the file for each sector on the disc. When you tell CD-GEN that the same file is CD-DA, then it wants to use 2316 bytes from the file for each sector on the CD. That's 288 more bytes being used from the file for each sector on the CD, so the time duration is about 14% less.

By the way... please don't use a dummy data file and specify that it is CD-DA. That could cause speaker damage if the track is ever played as audio. Use a real sound file instead.

Another thing is I noticed that in layout mode, CDDA files is not showing up. How do we know where these files are located then?

Simon @ ReadySoft Inc.

You may simply have not realized that a file is moved to its own track when you specify that it is CD-DA. It's not immediately obvious and easy to miss unless you go looking around a bit. At the top of the layout window are a number of entries that correspond to the lead-in, lead-out, and data areas for each individual track on the disc. Your ISO directory layout is in track 1, and your CD-DA files probably start at track 2. I think if you select the entry for track 2, you'll see the first missing CD-DA file. Then select track 3 to see the next missing CD-DA file, and so on.

It's worth noting here that CDGEN is one of the only (THE only?) CD mastering program that allows you to place a reference to a CD-DA file within your ISO directory structure. (Assuming you add it to the directory structure and set it to CD-DA rather than add it directly to a new track yourself on the LAYOUT screen).

Mike

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8/23/96 1:49 PM

Starting XA audio

Ted Morris

CD/Decompression LIB

The following function is used in our game to start or restart audio. It works except it causes the entire game to pause briefly when the function is called. When played on a debug station, it sounds as if the pause coincides with a seek. I'm not sure what to do to get rid of the annoying pause. Any suggestions would be appreciated.

```
void PSX_Start_XA(void) { u_char param[8]; CdILOC pos;
/* Seek to the start of the file */ CdIntToPos(StartPos,&pos);
if (CdControlF(CdlSeekL, (u_char *)&pos) == 0) return;
/* Set channel */ if (CdControlF(CdlSetfilter, (unsigned char *)&Filter) == 0) return;
/* Set read mode */ param[0] = CdlModeSpeed | CdlModeRT | CdlModeDA | CdlModeSF; if
(CdControlF(CdlSetmode, param) == 0) return;
/* Start playing of audio */ if (CdControlF(CdlReadN, (unsigned char *)&pos) == 0) return; }
Thanks, Jason Curtice Westwood Studios
```

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8/26/96 2:52 PM

Re: Non blocking seek

Mike Fulton

David Goodenough

CD/Decompression LIB

This is probably a no-brainer, but I can't figure exactly how to do it. To get maximum performance from the CD, I'm planning on using libcd, using the CdSearchFile to get info on where my files are, and then issuing raw seek and read commands to get the data.

If you really want "maximum performance" don't use CdSearchFile. While it does offer convenience, it is SLOW compared to the alternative of compiling the position code of your files into your code.

Doing a read is easy: I just issue a CdRead, and then use CdReadSync and CdReadCallback to determine when it's done. This provides background reading, which is essential for the application here.

Why are you using both CdReadSync and CdReadCallback? These are designed to be used one or the other, not both. If you're using a CdReadCallback, it should not be necessary to do CdReadSync (for the same read, that is).

However, it's not immediately obvious how to do a non-blocking seek. As far as I can figure, I'm going to have to call CdControl to get it going, however the parameters to be passed in don't appear to be very well documented.

You can use CdControl(CdSetLoc,...) to set the position of the disc used by the next CdRead call.

The parameters are given on page 47 of the Library Overview documentation. Note that CdSetLoc can also be used to set the target position of a CdControl(CdSeekL or CdSeekP) command. See the documentation on pages 48-50 of the Library Overview document.

Can anyone provide any insight on how to do this? Thanks in advance, dg -- David Goodenough

Hope this helps... if not, let me know.

Mike Fulton

---

8/26/96 1:12 PM

Non blocking seek

David Goodenough

CD/Decompression LIB

This is probably a no-brainer, but I can't figure exactly how to do it.

To get maximum performance from the CD, I'm planning on using libcd, using the CdSearchFile to get info on where my files are, and then issuing raw seek and read commands to get the data.

Doing a read is easy: I just issue a CdRead, and then use CdReadSync and CdReadCallback to determine when it's done. This provides background reading, which is essential for the application here.

However, it's not immediately obvious how to do a non-blocking seek. As far as I can figure, I'm going to have to call CdControl to get it going, however the parameters to be passed in don't appear to be very well documented.

Can anyone provide any insight on how to do this?

Thanks in advance, dg -- David Goodenough

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8/27/96 4:08 PM

Re(2): Non blocking seek

David Goodenough

CD/Decompression LIB

I say: This is probably a no-brainer, but I can't figure exactly how to do it. To get maximum performance from the CD, I'm planning on using libcd, using the CdSearchFile to get info on where my files are, and then issuing raw seek and read commands to get the data.

Mike Fulton Replies: If you really want "maximum performance" don't use CdSearchFile. While it does offer convenience, it is SLOW compared to the alternative of compiling the position code of your files into your code.

We don't need \*THAT\* much performance. :) Since I'm only going to be doing three or four CdSearchFile's every time an "applet" starts up, it'll be OK. What I really want to avoid is the overhead of "open / close / read / seek".

I add: Doing a read is easy: I just issue a CdRead, and then use CdReadSync and CdReadCallback to determine when it's done. This provides background reading, which is essential for the application here.

Mike Replies: Why are you using both CdReadSync and CdReadCallback? These are designed to be used one or the other, not both. If you're using a CdReadCallback, it should not be necessary to do CdReadSync (for the same read, that is).

Mea Culpa. I should have added that for blocking reads I plan to use CdReadSync, but for non-blocking, I'll use CdReadCallback.

I further say: However, it's not immediately obvious how to do a non-blocking seek. As far as I can figure, I'm going to have to call CdControl to get it going, however the parameters to be passed in don't appear to be very well documented.

Mike replies: You can use CdControl(CdSetLoc,...) to set the position of the disc used by the next CdRead call. The parameters are given on page 47 of the Library Overview documentation. Note that CdSetLoc can also be used to set the target position of a CdControl(CdSeekL or CdSeekP) command. See the documentation on pages 48-50 of the Library Overview document.

AHA. \*THIS\* is what I'm interested in. I'd been looking in the "fat" book (Run Time Library Reference), page 81, which discussed CdSetLoc, but didn't appear to give much of a hint as to what to use for parameters.

I'll fool around with it and let you all know what I come up with.

> Hope this helps... if not, let me know.

Muchos Gracias. dg -- David Goodenough

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9/24/96 7:52 PM

Re: Low level data reads w/GetSector in lib 3.5

Mike Fulton

Sean P. Igo

CD/Decompression LIB



Hi,

We recently ...upgraded... to lib 3.5 from 3.2 and the low-level CD data read stuff seems to be different. It looks as though if you start a read with CdControl(CdReadN,...) and use a GetSector to grab data out of the sector buffer, there are twelve bytes of new stuff stuck on the front of the buffer and the data you meant to read is shifted down by twelve bytes. The mode I'm using is ModeSpeed | ModeRT | ModeSF in order to stream music.

Why does this happen? Currently everything we do with low-level CD stuff is broken and, where it isn't, it seems to be running significantly slower off the emulator (haven't tried a CD burn & don't plan to until bugs are fixed...)

sean

The twelve bytes at the start of the sector is probably the timecode information from the sector's subheader. However, you shouldn't be seeing this unless you are specifying CdIModeSize1 in your mode, which makes it return this extra information. I've looked through the CD library sources and cannot find anything to account for this.

Can you please show the exact code where you're doing CdControl(CdISetmode...). Include the code where you're creating the 'mode' parameter being passed in.

You shouldn't be seeing this, and we need to make sure we fix this the correct way, but in the meantime, you can strip this extra data off by doing a separate CdGetSector call, like this:

```
CdGetSector( &timecodedata, 3 ); CdGetSector( sectorbuffer, 512 );
```

The second of these should be replaced with whatever CdGetSector call you already have.

Mike

---

9/24/96 2:31 PM

Low level data reads w/GetSector in lib 3.5

Sean P. Igo

CD/Decompression LIB

Hi,

we recently ...upgraded... to lib 3.5 from 3.2 and the low-level CD data read stuff seems to be different. It looks as though if you start a read with CdControl(CdReadN,...) and use a GetSector to grab data out of the sector buffer, there are twelve bytes of new stuff stuck on the front of the buffer and the data you meant to read is shifted down by twelve bytes. The mode I'm using is ModeSpeed | ModeRT | ModeSF in order to stream music.

Why does this happen? Currently everything we do with low-level CD stuff is broken and, where it isn't, it seems to be running significantly slower off the emulator (haven't tried a CD burn & don't plan to until bugs are fixed...)

sean

---

9/25/96 9:20 AM

Re(2): Low level data reads w/GetSector in lib 3.5

Sean P. Igo

Mike Fulton

CD/Decompression LIB

Mike,

Thank you for your reply; I'll have a go at the temporary fix you suggested (and send you the code later on). I tried ORing a ModeSize0 explicitly on the read where this gives me the most trouble, but it didn't seem to change anything.

sean

---

9/25/96 1:09 PM

Re(4): Low level data reads w/GetSector in lib 3.5

Thomas Rolfs

Mike Fulton

Sean P. Igo

Mike Fulton writes:

Sean,

You do not want to specify CdlModeSize0 either. That would still give you larger than 2048-byte sectors. You need to do this:

```
mode = ( CdlModeRT | CdlModeSF | CdlModeSpeed );
```

Mike

I'm a little confused. I presume the above setting is for playing XA music? We do not use XA data so we have simply set:

```
mode = CdlModeSpeed;
```

I too encountered the extra sector data when moving to 3.5 from 3.2, but I just ignored it. You stated in a previous posting that these extra header bytes should not be visible. Could you expand on this? Ashamedly I have not check with the library update docs to verify this stuff, it probably is all explained there. If you could just set me straight on the how the CD subsystem has change from 3.2 up to 3.5.

Thanks,

Tommy @ VIE

---

9/25/96 5:26 PM

Re(5): Low level data reads w/GetSector in lib 3.5

Mike Fulton

Thomas Rolfs

Sean P. Igo

Mike Fulton writes to Sean P. Igo:

Sean, You do not want to specify CdlModeSize0 either. That would still give you larger than 2048-byte sectors. You need to do this:

```
mode = ( CdlModeRT | CdlModeSF | CdlModeSpeed );
```

Mike

-----  
Tommy @ VIE writes in response:

I'm a little confused. I presume the above setting is for playing XA music? We do not use XA data so we have simply set:

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mode = CdlModeSpeed;
```

I too encountered the extra sector data when moving to 3.5 from 3.2, but I just ignored it. You stated in a previous posting that these extra header bytes should not be visible. Could you expand on this? Ashamedly I have not check with the library update docs to verify this stuff, it probably is all explained there. If you could just set me straight on the how the CD subsystem has change from 3.2 up to 3.5.

Thanks, Tommy @ VIE

-----  
Mike Fulton @ SCEA responds:

Tommy, If you look back to Sean's original message, you'll see that he states:

```
"... The mode I'm using is ModeSpeed | ModeRT | ModeSF in order to stream music. ..."
```

So that was the mode I specified to him.

There should be no way either of you would be getting larger than 2048-byte sectors unless you have specified either CdlModeSize0 or CdlModeSize1 in your 'mode' parameter to either CdControl(CdlSetmode) or CdRead. If the read is being initiated via CdControl, then I don't

understand any reason for getting larger than 2048-byte sectors unless you asked for CdlModeSize0 or CdlModeSize1. That's why I need to see this code... so I can tell if something else is going on.

Is it possible that you're doing a CdControl(CdlSetmode) WHILE the playback is in progress? This would be BAD and probably the source of the problem.

Mike

---

9/25/96 10:54 AM

Re(3): Low level data reads w/GetSector in lib 3.5

Mike Fulton

Sean P. Igo

CD/Decompression LIB

Mike,

Thank you for your reply; I'll have a go at the temporary fix you suggested (and send you the code later on). I tried ORing a ModeSize0 explicitly on the read where this gives me the most trouble, but it didn't seem to change anything.

sean

Sean,

You do not want to specify CdlModeSize0 either. That would still give you larger than 2048-byte sectors. You need to do this:

```
mode = ( CdlModeRT | CdlModeSF | CdlModeSpeed );
```

Mike

---

10/1/96 1:00 PM

Re(6): Low level data reads w/GetSector in lib 3.5

Thomas Rolfs

Mike Fulton

Sean P. Igo

Mike Fulton writes: There should be no way either of you would be getting larger than 2048-byte sectors unless you have specified either CdlModeSize0 or CdlModeSize1 in your 'mode' parameter to either CdControl(CdlSetmode) or CdRead. If the read is being initiated via CdControl, then I don't understand any reason for getting larger than 2048-byte sectors unless you asked for CdlModeSize0 or CdlModeSize1. That's why I need to see this code... so I can tell if something else is going on.

Is it possible that you're doing a CdControl(CdlSetmode) WHILE the playback is in progress?

This would be BAD and probably the source of the problem.

Thanks Mike. I'll have to look over my code and try somethings out first. I did notice that the param field I am passing for CdlSetmode is only a byte wide. I'll get back to you with the code if I cannot correct this myself. Of course I'll let you know if I do fix it.

On another (similar) note. What are the guide lines for handling command errors? If I perform a CdControl() call and it returns false, how many retries should we retry or what retry timeout period is reasonable? Also assuming there is total failure, do we re-initialize the CD system (CdInit()) or is there a proper corrective action?

Also, I am assuming that the command sync callback is issued for ALL control commands and only if CdControl() returns true. I have a command dispatch handler that depends on this behaviour. Is this the case?

Sorry for the questions. If this has already been answer in a FAQ somewhere then I will personally tar and feather myself.

Tommy

---

10/2/96 9:32 PM

URGENT! CDDA plays too fast  
Adrenalin Entertainment  
CD/Decompression LIB

We are one week from beta and ran into the following problem:  
Playing CDDA tracks on the blue playstation plays them back at (what sounds like) twice their normal speed. This does not happen when I run the same disc on the black playstation.  
Here is some more info:  
Is there any significance to \*where\* on the disc the .DA files are stored? They live in \DA off the root and are layed out on separate tracks, beginning with track 2 (where track 1 is the data track).  
They are marked as CDDA tracks and have a musical note icon beside each and every one of them.  
Rob? Mike? HELP!

---

10/4/96 4:48 AM  
Re: URGENT! CDDA plays too fast  
Brian McGroarty  
Adrenalin Entertainment  
CD/Decompression LIB  
Adrenalin Entertainment writes:

We are one week from beta and ran into the following problem: Playing CDDA tracks on the blue playstation plays them back at (what sounds like) twice their normal speed.  
This does not happen when I run the same disc on the black playstation.  
It sounds like you're setting "CdIModeSpeed" for audio playback; if the CD-ROM is reading at double-speed, then you WILL get double speed music! (Fun, but not too practical!)

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10/10/96 2:14 AM  
double speed mode  
Lobotomy Software  
CD/Decompression LIB

Does anyone know why I would get diskError messages from the cd system when running in double speed mode when I do not see these same errors in single speed? These appear to be quite fatal (unrecoverable, endlessly reoccurring)  
also, does switching to double speed mode affect the CDIntToPos function? Will I still have the correct position or will double speed mess up my seeks?  
I hard code the positions of my files as sector numbers (from .ccs file) and use CdIntToPos to get a time to seek to..  
thanks, Jeff Blazier

---

10/10/96 6:00 PM  
XA file format  
Rob Vawter  
Sound Programmers

Our technical writer still has not finished the graphical layouts yet, so I'm going to give you a non-graphic overview in the meantime. Look for the .PDF soon.  
Two cases of XA file format:

Case 1) XA file containing data (and audio sometimes) Case 2) XA file containing audio only

Case 1: Mode 2 / Form 1

File Area (byte count)

Sync (12) [a repeating pattern to allow the laser to align the start of the sector]

Header (4) Mode (1) [would be "2" in this case] [the next 3 fields explicitly identify the sector by its position. 60 sec \ minute, 75 sectors per sec. Represent time taken to traverse the disk during normal playback] Sec (1) Sector (1) Min (1)

Subheader (8) File Number (1) [can be set to any value. should be unique within any given track] Channel Number (1) [can be set to any value from 1-32. distinguishes data within an interleaved file. Ex: in a movie the images and audio can be given different channel #s]

Submode (1) EOF (bit 7) 1 in last sector of file 0 in all other sectors RT (bit 6) 1 in real time sector 0 in all other sectors Form (bit 5) 0: Form 1 1: Form 2 Unused (bit 4) [Of the following three values, only 1 is set to "1". If all are "0", this sector is handled as a null sector]

Data (bit 3) Audio (bit 2) Video (bit 1) Unused (bit 0) Coding Info (1) Audio (bit 7) 0: Audio 1: Not audio Emphasis (bit 6) 0: Emphasis on 1: Emphasis off ADPCM level (bits 5-2) 0000: level B (37.8KHz sampling rate) 0001: level C (18.9KHz sampling rate) Mode (bits 1-0) 00: Mono 01: Stereo

Repeat above 4 bytes again to complete subheader user data (2048) 32 byte header in here which I will break down sometime soon. <Sigh> EDC (4) [Error Detection Code] ECC (276) [Error Detection Code]

Two cases of Mode 2 / Form 1 XA format: a) No audio, also known as no subheader from a CDGen standpoint. CDGen adds all bytes except user data area. b) Audio already interleaved. Subheader already exists, and user data size has been padded out to 2328. Check subheader box in CDGen. Sync and Header added by CDGen. EDC and ECC also added by CDGen, by overwriting the previously padded out area.

Case 2: Mode 2 / Form 2

Same as above except:

1) User data size is 2328 2) No EDC or ECC 3) Subheader created by RAW2XA 4) Sync and Header created by CDGen

Any questions?? Ow.

---

10/13/96 5:15 AM

Re: double speed mode

Mike Fulton

Lobotomy Software

CD/Decompression LIB

Does anyone know why I would get diskError messages from the cd system when running in double speed mode when I do not see these same errors in single speed? These appear to be quite fatal (unrecoverable, endlessly reoccurring).

What calls are you getting disk errors from? CdReady? CdSync? Something else? What operation are you trying? Reading, seeking, what?

Are you reading off a gold disc or the CD emulator? Can you be more precise about what you mean by "fatal"? Do you mean you cannot read the disc at all after that, or that the program is crashing? A truly fatal error would be quite odd.

Also, does switching to double speed mode affect the CDIntToPos function? Will I still have the correct position or will double speed mess up my seeks? I hard code the positions of my files as sector numbers (from .csc file) and use CdIntToPos to get a time to seek to...

Time codes do NOT change for double-speed mode.

Thanks,

Jeff Blazier

You're welcome,

Mike @ SCEA

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10/18/96 7:05 PM  
mac movie converter  
Andrew Ayre  
CD/Decompression LIB

is there a movie converter for the mac? like quicktime to .str?

---

10/20/96 6:16 PM  
Re: mac movie converter  
Mike Fulton  
Andrew Ayre  
CD/Decompression LIB  
Andrew Ayre asks:

Is there a movie converter for the mac? like quicktime to .str?

No, there is no movie converter tool for the Macintosh at this time. However, there are several tools available for Windows which can convert from Quicktime movies to the uncompressed AVI format that MOVCONV requires.

Mike @ SCEA

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## Development Environment

3/17/95 11:27 AM  
Threading problem  
Dave Feldman  
Development Env.

I really need a resolution on this threading problem(see previous mmessage) soon, is there someone in particular I should address it to? Kevin Seghetti at PF.Magic / Cave Logic Studios Ltd.

---

3/17/95 1:58 PM  
Re: Threading problem  
Bill "Angus" Guschwan  
Development Env.

It turns out OpenThread needs a 4th parameter. I should get it soon hopefully by Monday.  
Angus

---

3/20/95 4:32 PM  
Re(3): // comments in C ?  
Bill "Angus" Guschwan  
Development Env.

Dan,  
We had a slight posting mix-up. They should be up there by end of today.  
Angus

---

3/20/95 3:09 PM  
Re(2): // comments in C ?  
Dan Rosenfeld  
Development Env.

thank you thank you thank you thank you! (-comments-c++)

I guess I should ask the more general question, "where is the compiler documentation?". The printed overview is very limited, and the text files in psx\bin are mostly in Kanji.

Apologies for these less-than-deep questions; I'm new to the playstation and the sony bbs (and FirstClass).

One more quicky o gods of psx. I posted this question on the Art tools board: where can I get the bmp2tim, tim2bmp, etc. dos-based file converters? I know about the windows timutil.exe, but I want a command-line scriptable thing. I see these progs in the printed manual, but can't find any .exes.

Gotta go.... thanks again. (deader)

---

3/20/95 2:00 PM  
// comments in C ?  
Dan Rosenfeld  
Development Env.

How does one use // style comments in plain old C when running ccpsx ?

I want to write C, not C++ files, and have lotsa C code using // style comments. (not /\* ... \*/)

I know its not ansi-C, but most compilers are intelligent/flexible enough to allow this convenient comment style. But I can't seem to find any commandline option for ccpsx to allow this one simple feature.

Whats the deal here? I can't beleive gnu makes this a royal pain in the butt.

Any suggestions?

deader (David Eader @ HeadGames)

---

3/20/95 2:28 PM

Re(2): Threading problem

Borden Covell II

Development Env.

4th parameter????

help!!!!

---

3/20/95 2:07 PM

Re: // comments in C ?

Blake E. Senftner

Development Env.

just include the string "-comments-c++" in your compile command line.

-blake

---

3/21/95 1:36 PM

Some General Questions

Mark Beardsley

Development Env.

I'm still a bit new to this system and have some questions that hopefully some sage can assist with.

1. The Animation Tool wants VBRJP200.DLL and VBRUN200.DLL, do I need to buy Visual Basic for Windows to get these files? 2. When running a program inside the debugger, how can I restart the program from the beginning (just on the chance I had a bug) without exiting and re-loading (CPU reset command doesn't seem to help)? 3. How can I view/print the compiler docs? They seem to be in some type of special format (ACROBAT doesn't work either). 4. Why does PadInit always say that 1 controller is connected? Even the demo programs seem to read the second pad by shifting 16 bits from pad 1. 5. Is there some simple way to include a binary file (i.e. graphics data) into a C file (as in INCBIN for assembly) instead of doing an independant load operation?

Thanks for any help.

---

3/21/95 6:04 PM

Re(5): // comments in C ?

Administrator

Development Env.





Stepping in C works, just use  
ccpsx -g main.c -omain.cpe,main.sym  
Angus

---

3/22/95 7:39 PM  
size\_t declaration ANSI  
Administrator  
Development Env.

> From: Bill Guschwan <Bill\_Guschwan@sepc.sony.com> > Subject: [tech-support 71] header bug > > I just came across a subtle mistake in the psx header files (aside from the > obvious one which is they are incomplete, poorly organized, etc ;-). The > declaration of size\_t is wrong. It says 'typedef long size\_t' which results in > a SIGNED type, which caused me some problems (our memory tracking has a hashing > function which takes an address, casts it to size\_t, then mods it, and since > the psx ram addresses have the high bit set, the compiler thought it was > signed, and so the result was signed as well, which didn't lead to a very good > table index). To fix this, change the definition to 'typedef unsigned long > size\_t' in every header file it is declared in (there are several). > Kevin Seghetti @ PF.Magic His objection about `size\_t' is quite correct in the current C environment. In ANSI C standard document (from ANSI, approved Aug. 3, 1992):

7.1.6 Common defines <stddef.h> : : size\_t

which is the unsigned integral type of the result of the sizeof operator:

In older portable C (pcc) or K & R C (I don't have original document), `size\_t' was not defined. We implemented include files based on K & R C, so some definitions in our include files are something different from ANSI C.

On the other hand, `sizeof()' is implemented in C compiler (ccpsx) internal. The `size\_t' definition in ccpsx will be unsigned because ccpsx is still based on GCC that is ANSI oriented.

We will correct this `size\_t' definition and others to ANSI style (to be exact, GCC style). But in next version we will not be able to fix all definitions written in old fashion, I guess.

---

3/22/95 3:38 PM  
About Lib3.0  
Bill "Angus" Guschwan  
Development Env.

It appears libc2.h does not have anything in it but "ERROR: Can't open input file libc2.h That is an error on my end. We'll correct it. IN the mean time, just do a psylib /l libc2.lib and you can find all the functions and write your own headers. Pain huh?

Also remember to double click the file name and DO NOT click the Attach button. Strange huh?

Angus

---

3/22/95 7:47 PM  
How to increase compiler speed  
Administrator  
Development Env.

Since cc compiler creates many files on temporary disk space it would be nice to have many space for tmp directory. Our recommendation is to use "ramdrive" as well as "smartdrive". The size of the space depends on the size of program to be compiled. smartdrive is defined in "autoexec.bat" and "ramdrive" in config.sys.

---

3/22/95 7:45 PM  
ELF & other UNIX file formats  
Administrator  
Development Env.

From Okamoto-san (kernel guy):  
I am afraid to say you that we can not support plural object formats for UNIX developers now. I have checked the documentations of NEWS-OS and found the fact that the new release of NEWS-OS supports ELF format and we could change our UNIX release to ELF. But the 'new' release of NES-OS is come from SVR and current release which we are using is come from BSD. So the OS conversion will take much time. And of course the comaptibility of ELF format between NEWS-OS and SGI must be tested first. This wiil take time too. If many licensees in US want SGI environment and ELF format library, it may happen.

---

3/23/95 4:01 PM  
mathlib fun chat  
Bill "Angus" Guschwan  
Development Env.

Here's an online chat about the new math library and some issues a developer had. i am usually on line as angus or admin and most times you can chat with me. I'll post any conversations I get permission for. I can also schedule an "angus live in concert" on say mondays at 11 am. let me know.

angus Participants: B. Guschwan Scroll Lock Sounds  
Invite... Send B. Guschwan has joined the chat. L. Software: hi, I need help with my libs L.  
Software: can't seem to get the 3.0 libs to compile and I need info on floating point support B.  
Guschwan: add libc.lib to your psq.ini file B. Guschwan: printf is in libc.lib; i also posted in  
development env. to that effect. B. Guschwan: i don't know much about floating point L.  
Software: okay, how about floating point? B. Guschwan: it is in software B. Guschwan: so  
performance may be strange L. Software: I need to do a large divide L. Software: and i have  
problems compiling with doubles B. Guschwan: there is also a uk floating point in the  
Development env. libraries; I don't know how its performance is B. Guschwan: what problems  
L. Software: I 'm not sure where the error originates from but it does a dump something like L.  
Software: a stack dump and says: B. Guschwan: what code do you try L. Software: li.d  
0\5.000000000000000000e-01 unreconised op code L. Software: double i = -0.5 B. Guschwan:  
hold on let me try it B. Guschwan: double f -0.5; L. Software: what? B. Guschwan: i tried double  
f=-0.5; and it worked and compiled L. Software: my exact command was like (f + (d <0)? -  
0.5:0.5) L. Software: roughly B. Guschwan: what value is d L. Software: d is a double , f is a  
double, B. Guschwan: i have B. Guschwan: double f=-0.5,d; B. Guschwan: (f+(d<0)?-0.5:0.5); L.  
Software: what? B. Guschwan: it worked when I included libmath.lib L. Software: okay, lib  
math.lib B. Guschwan: and included libmath.h L. Software: one word... B. Guschwan:  
libmath.lib L. Software: the one other problem is where is the "limits" type file for floats and  
doubles? B. Guschwan: what is limits L. Software: tells me how big an int is a long, etc B.  
Guschwan: also, mind if I post this discussion to a conference? L. Software: no, kinda messed up  
thoughuop though L. Software: you may post it L. Software: thanks for the help! B. Guschwan:  
look in types.h in the sys folder inside the include folder B. Guschwan: you should include

#include <sys/types.h> L. Software: alright, bye L. Software has left the chat.

---

3/23/95 10:59 AM  
LIB3.0 is SLOW - why?  
Dave Ross  
Development Env.

I just converted over to the new 3.0 libraries and encountered two anomalies: 1) we find out how long our main loop takes to the screen and with 3.0 this doesn't appear till a couple of seconds have gone by (after it does appear, it looks like it updates every frame as before); and 2) more importantly, our run times increased by a full 10% just in going to 3.0!! Are you sure that the 3.0 libs were compiled with full optimizations turned on? Do you know of anything else that would cause the slowdown or is there anything different I should be doing?

---

3/23/95 10:14 PM  
dev  
Borden Covell II  
Development Env.

is there a doc that describes the changes/fixes/additions from v2.6 to 3.0?  
are the docs for the new libs available?

---

3/23/95 7:32 AM  
My General Questions  
Mark Beardsley  
Development Env.

I Guess that I wasn't clear in my previous message. When I try to step through my C code in the debugger (I am using -g when compiling), it takes four or five steps to go to the next line of C code. Each step seems to correspond to an assembly instruction (if I have a register window open, I can see each assembly instruction go by). This works, but it's a pain because it takes several mouse clicks to get past each C statement (especially since you never know exactly how many it will take). Is this just the way life is, or am I missing something?

Also, do you have any responses for my previous message (Some General Questions) ? I could really use some help.

Thanks,

Mark Beardsley

Absolute Entertainment

---

3/23/95 4:27 PM  
libc2 for v3  
Borden Covell II  
Bill "Angus" Guschwan

I am trying to upgrade to v3 and am having some problems. Our copy of libc2.h is trash. Can't we get the correct one without going through the painful process of entering it ourselves? Has anyone done this? Would you like to share?

I am getting an error when I compile. The error says that there is an error before the u\_int when

parsing line 658.  
help...

---

3/23/95 11:11 AM  
Re: LIB3.0 is SLOW - why?  
Bill "Angus" Guschwan  
Development Env.

Can you tell me what routines you are using in the core of your main loop? Maybe we can work from there. Any other developers having problems out there?  
Angus

---

3/23/95 11:20 AM  
where is printf  
Bill "Angus" Guschwan  
Development Env.

Printf is in the libc.lib or libc2.lib. Add that to psyq.ini. Bummer huh for 3.0?  
Angus

---

3/24/95 5:41 PM  
Re(2): LIB3.0 is SLOW - why?  
Dave Ross  
Development Env.

Okay, I've done a further study of where the 3.0 libs are slower. Most of the increase is in a loop where GsSortObject3 is called once for each of 100 pmd objects. For those 100 objects, lib3.0 is about 7.5% slower (314 scanlines vs. 292 scanlines). I've further isolated the slowdown to GSLIB(3.5%) and GPULIB(4%) - LIBGTE doesn't matter speed wise. I must guess then that the difference is in the routines in GSLIB and GPULIB that are called by GsSortObject3. Hopefully that helps find the culprit.

---

3/27/95 7:23 PM  
Re(3): LIB3.0 is SLOW - why?  
Bill "Angus" Guschwan  
Development Env.

I sent your question to Japan and they want the code for it. Aren't they lazy? Do you have something I can send. Thanks.  
Angus

---

3/27/95 9:57 PM  
"can not put a breakpoint error"?  
Administrator  
Development Env.

> 3) Some development stations will put up a dialog saying "Can not put a > breakpoint there" or something like that when you step through C source code. > If you hit the ok button, you can

still step through or over that function but > it is just that some C functions raise that dialog. Can you think why that > would happen? I am using Debugger 4.49a, dexbios 1.22, ccpsx 1.10, 2.6.3 > compilers.

No I haven't seen this and I can't think why it might happen. This was a problem with an earlier version of the debugger but I fixed it in version 4.32 up. I will check through my source code just to be sure but it would help if you can give me an example that causes the problem. It may be that I have a similar bug lurking elsewhere.

---

3/27/95 10:16 AM  
Re(2): My General Questions  
Dave Ross  
Development Env.

I don't know if it's required, but as a matter of superstition I make sure I compile with optimizations turned OFF when I know I'm going to be doing any significant debugging. C source level debugging works fine for us that way.

---

3/27/95 2:41 PM  
Re(3): My General Questions  
Mark Beardsley  
Development Env.

Thanks for the info. It seems that stepping using F7/F8 works fine in C, but using the mouse to click on the words at the screen bottom always seems to step in assembly. No big deal once you figure it out, but not exactly intuitive. Thanks Again.  
Mark Beardsley

---

3/27/95 7:22 PM  
Re: C++ Header Files  
Bill "Angus" Guschwan  
Development Env.

Unfortunately, Japan does not favor C++. Sorry.  
Angus

---

3/27/95 10:13 PM  
How To Do Hardware Breakpoints?  
Administrator  
Development Env.

> Do you have docs on HW breakpoints? I can't seem to get it to work. I don't > know how to turn off the breakpoint and how to set a mask and how to choose > read instead of write. Thanks.

I didn't document it (other than the key assignment) because it really is pretty minimal. However, you have a point there and have also reminded me to do some more work on the user interface. I'll edit this and add it to the next relevant readme file.

Alt-B brings up a dialog to set a hardware break. You must have a compatible downloader (version 4.02) installed to do this otherwise the debugger will give an error message.

The Hard Break dialog has two modes. It should default to the last mode it was used in (Hmm,

I'd better check that works OK).

In ASSEMBLY LANGUAGE mode the dialog will prompt you to enter a base address and a mask value. The mask should contain a 1 bit where you wish to compare the address bit. e.g. to detect a reference to one specific byte you would set a mask of -1 (\$FFFFFFF). To detect a reference to a word mask = -2 (\$FFFFFFE to ignore bit 0), etc

Note that because this is a base + mask detection rather than a range you can only detect a specific range if that range begins on a suitable boundary. e.g. bytes anywhere, shorts must be on even addresses, longwords must be on 4 byte boundaries etc

Specifically the block to protect must start at an address which is a multiple of the smallest power of two which is greater than the length of the range. But that's not a very convenient way to think about it - I prefer just to visualise the address bus bits in my head.

In C LANGUAGE MODE we hide the above from the developer and try to present something a bit more intuitive. Since the C compiler will always align shorts & words we do not have to worry about the above mentioned alignment restrictions for these sizes. So in C mode we can just accept a variable by name. No other parameters are necessary because the debugger will then calculate the address of the variable and assume a mask of -1, -2 or -4 depending upon the size of the variable. Working with something other than simple variables in C mode is a bit fiddly because internally we have to work with the hardware restrictions mentioned above. Aligning large data items like this is trivial in assembly language but not in C. Any suggestions for an alternative easy to use but flexible C programmer interface to this hardware would be very welcome.

In either mode you can turn a hard break off by clearing the flags for read and write detection. The read/write detection flags are simple toggles - just click on them with the mouse. I ought to have a keyboard interface for those too. I'll fix that up soon and add a clear button too (it would be redundant but is probably more intuitive).

-----  
As an aside, you may be interested to know that I have adapted the printf() stream handling in DEXBIOS to be better suited to the way in which the PSX uses it. i.e. it is now single rather than multiple streams and is character based. Because of this it can make much better use of buffer space and is much faster. It also supports a user definable buffer size and redirection of printf() output to a PC serial port. This is on our BBS as NEWMESS.ZIP I also will be adding a MS Windows version of the message stream soon.

This has shown up some PSX kernel instabilities, both in the ROM kernel and in the PATCHX kernel update. Certain kernel functions (e.g. stdout) do not always start-up correctly. I'm afraid this is beyond our control although there is a note about it in the README in NEWMESS.ZIP. It's definitely something deep in the kernel as I have tested the interface at this point by bypassing the kernel stdout and directing character output directly to the stdout comms handler - this works fine.

---

3/27/95 9:56 PM

How To Debug Code Overlays?

Administrator

Development Env.

> 2) developers need to get the debugger to support overlay debugging. Is > that possible and how soon?>

There is no standard method of handling this. At the moment you need to manually quit the debugger and re-execute it with the appropriate overlay symbol file(s) every time you switch overlays. We are working on an automated solution but it will require the developer to add small amounts of code to his source to cause his program to inform our debugger of the overlay switch so it can switch symbol files. This may not happen for 2 to 3 weeks.

---

3/27/95 10:01 PM

Mysterious Character in Corner  
Administrator  
Development Env.

> 1) Dbugpsxx version 4.49 is currently shipping with psx.zip. But, I have found > only  
dbugpsx.exe 4.49a to work with printing. So which version is supported?

> Also, mess1 seems to print in the upper left corner of the screen after you run > testmess. It  
prints just 1 character there.

Oops. Yes, I see now. I thought I had replaced the debugger in PSX.ZIP but it looks like I missed  
that one. The debugger checks the version Nos of installed PSYBIOS & MESS programs to see  
how to handle them. Unfortunately 4.49 checks for 1.00 (rather than 1. anything). I fixed this for  
4.49a (it was such an incredibly trivial change it barely warranted new version No).

BTW, the character in the upper left is sort of a debug feature. If the MESSX program's buffer  
overflows it increments the character in the top left of the screen. I left this in because it's pretty  
harmless and it's quite handy to know if you lose any characters. I guess I should have  
documented it or removed it.

---

3/27/95 9:58 PM

Hey Mon, CDMON  
Administrator  
Development Env.

> Second, do you actually use the interrupt for anything other than cdmon? > I can't seem to get  
the interrupt to work correctly. Can you > explain how the emulator uses the interrupt?

Currently only CDMON will make use of this interrupt. When you are using boot image 2.3 (the  
one that can drive CDMON) the emulator will regularly disconnect from the HD, connect to the  
PC, send CDMON info to the PC then disconnect from the PC). For this version of the boot code  
to work at all you must have a fast interrupt response - no response or a slow response (e.g. if  
running it under windoze) will not turn the SCSI bus around fast enough.

---

3/27/95 9:46 PM

Calling Assembly from C  
Administrator  
Development Env.

link.zip 3K  
Development Env.

Here's some information on calling assembly routines from C.

Angus

From : SCE SUPPORT (Support) To : TELSTAR PSX Subj : Assembler Numb : 128 of 312

Date : 20/02/1995 12:41pm Read : 20/02/1995 4:29pm Reference : 126 Conf : 1 -

PSX Common Private : NO

-> Could you give us a clue as to how to call a library function in as -> and also do we have to  
declare all the structures (i.e. POLY\_GT4, et -> assembler format ourselves or are there some  
more include files whic -> can use when programming in assembler?

Ok, when you call a library function in assembler, what you have to be careful of is what  
happens to the return address (ra) because the library function you call may well run off and call



something else and mess up the return address; then your routine will attempt to return somewhere silly.

The return address is usually stored in the ra register (which is fine if your routine calls no others, and none of the routines you call don't call any other either). But by and large you are best to save the ra on the stack where other routines can't get at it, and restore it when you go to do a return. At the end of assembler functions you usually see:

```
jr ra ; Jump to return address nop ; Don't do anything in the delay slot of the jump
```

In the disassembly of a C function you'll see the ra being stored on the stack at the start of the function, and restored before the code above, usually because other functions are going to be called.

Assuming you've stored your ra, to call a library routine, you just need to declare it as a xref so that the assembler knows it exists, and then just jump and link to the routine, eg:

```
jal RotTransPers
```

There's an example of assembling and linking an assembler routine on the BBS, in PlayStation Code, called link.zip. If you refer to an R3000 book (eg The MIPS Programmer's Handbook, Erin Farquhar and Philip Bunce, Morgan Kaufmann Publishing, ISBN 1-55860-297-6) it'll show you how to build a stack frame properly which you can stuff the ra in, or cheaper, you can disassemble a C function of your own and see what it does to build the frame.

As for structures, you'll have to build them, we don't have any pre-built assembler headers, sorry. I'd build them for you guys, but I'm incredibly busy so you'd never get them really. Sorry!

Hope this helps,  
Allan.

---

3/27/95 9:45 AM  
Re: My General Questions  
Dave Feldman  
Development Env.

Stepping in C: I have noticed that how stepping occurs depends on which window is the active one. If any window other than a file window with source in it (i.e. you pressed 'tab' in it) is active, then stepping is in assembly. If you step with the file window as the active window, then it will step to the next C line. Hope this helps, Kevin Seghetti @ PF.Magic / Cave Logic Studios

---

3/27/95 7:27 PM  
Re: libc2 for v3  
Bill "Angus" Guschwan  
Development Env.

I'll get this up and soon as I get libc2.h from Japan.  
Angus

---

3/27/95 6:18 PM  
C++ Header Files  
Michelle Feraud  
Development Env.

Are C++ compatible versions of the header files available or do I have to generate my own (grumble, groan)?

---

3/27/95 7:24 PM  
Re: dev  
Bill "Angus" Guschwan  
Development Env.

We're working on the docs. Yes there is a 2.6 to 3.0 but it is not out yet.  
angus

---

3/27/95 6:33 PM  
More Threading problems  
Kevin T. Seghetti  
Development Env.

THCRASH2.ZIP        3K  
Development Env.

I have incorporated the changes given into my threading program, which seemed to help, but I still cannot switch to more than 4 threads without crashing. I have attached an updated threading example, could someone pass this along to the guys in Japan so they could tell me what I am doing wrong? Any suggestions would be much appreciated, I have been trying to get this to work for weeks now. Kevin Seghetti at Cave Logic Studios

---

3/27/95 7:03 PM  
Re: More Threading problems  
Administrator  
Development Env.

Sent it to Japan.  
ANgus

---

3/27/95 9:57 PM  
How to debug off an emulator?  
Administrator  
Development Env.

> 1) How do you debug source code while running off cd emulator? Can you give me > an explanation and a sample? I heard you can use multiple symbol tables but I > am unsure of how.

I don't understand what you mean. There is no difference, the emulator does not interfere with debugging.

Do you mean if you boot from CD or emulator? In that case you must actually perform the boot yourself (Allan Murphy has a 5 line C program that does that).

You can use as many symbol files as you wish (subject to PC command line limitations) but I am not sure of the relevance of that, just type

    dbugpsx symfile1 symfile2 symfile3 ... etc

---

3/27/95 7:31 PM  
Re: Some General Questions

Bill "Angus" Guschwan  
Development Env.

VISBASIC.ZIP 448K  
Development Env.

>>1. The Animation Tool wants VBRJP200.DLL and VBRUN200.DLL, do I need to buy >> Visual Basic for Windows to get these files? They are attached. >>2. When running a program inside the debugger, how can I restart the program >> from the beginning (just on the chance I had a bug) without exiting and re-loading (CPU reset command doesn't seem >>to help)? Problem here is snpatch.cpe. You need to run it each time. You can load it from the File menu. Use F10 to get there. >>3. How can I view/print the compiler docs? They seem to be in some type of >> special format (ACROBAT doesn't work either). It is in that UNIX tool. I'm not sure how to print it. Anyone else know? >>4. Why does PadInit always say that 1 controller is connected? Even the demo programs seem to read the second pad by >>shifting 16 bits from pad 1. Does lib3.0 do this? >>5. Is there some simple way to include a binary file (i.e. graphics data) >> into a C file (as in INCBIN for assembly) instead of doing an independant >> load operation? Yes. This is a basic C question I only answer Playstation questions. I think you can just make things structs.  
Angus

---

3/28/95 2:56 PM  
Re(5): LIB3.0 is SLOW - why?  
Administrator  
Development Env.  
Dave Ross

Dave,  
It is not going to be fixed if we don't report the problem. Can you give me anything to help? The code with printf instead of fntflush would help.  
Angus

---

3/28/95 6:12 AM  
Re: Mysterious Character in Corner  
Dave R. Scheele  
Development Env.

Actually, I find that incrementing character in the corner kinda handy, for just the reasons you described, and it is fairly harmless. Please leave it in if you can.  
Dave

---

3/28/95 8:55 AM  
Re: More Threading problems  
Borden Covell II  
Development Env.

Angus suggested creating system.cnf in the root. Have you tried this???  
borden

---

3/28/95 2:09 PM  
Re(4): LIB3.0 is SLOW - why?

Dave Ross  
Development Env.

In the process of documenting a code fragment to send to you for SCE, I went back to my experiments to verify my numbers and found that if I use LIBGPU3.0, I don't get reliable FntPrint'ing (which I use to report the runtimes) - I have to move the FntFlush routine around in order to even see the debug output on the screen; but when I do that, one of the timers from a DrawSyncCallBack is really bogus. The only way I can get reproducible, viewable, and reasonable FntPrintf results is by using LIBGPU2.6. Using lib3.0 for everything else yeilds slower runtimes (as in the GsSortObject3 where most of my time is spent). Anyway, I've decided not to worry about it until 3.1 where hopefully I'll be able to use FntPrint's reliably again.

---

3/28/95 8:58 AM  
Re: Hey Mon, CDMON  
Borden Covell II  
Development Env.

Does this message mean that the CD-ROM emulator will not function under windows? Our whole development environment is set up for compiling and debugging using windows. Please tell me we can continue to do this after we get cd-rom emulator boards!!!  
borden

---

3/29/95 3:30 PM  
Re: dev  
Bill "Angus" Guschwan  
Development Env.

Look in Documentation conference for changes for 2.0 to 2.6.  
Angus

---

3/29/95 12:11 PM  
Various Patch Issues  
Mark Beardsley  
Development Env.

You suggested that I use SNPATCH instead of PATCHX. I can't seem to find snpatch.cpe posted anywhere (I'm sure it's somewhere here, probably inside some zip somewhere, but I've checked the obvious places and don't see it). Also, I've just installed my emulator system, so now I'm running CDBIOS also. Could you give me a quick primer on which patches do what and what the correct combinations should be? Thanks.

---

3/29/95 2:37 PM  
Re: How To Do Hardware Breakpoints?  
Christopher Deel  
Administrator  
Development Env.

Is it possible for me to get the source code to the files in NewMess.zip or at least the source to Testmess.exe?  
I would like to add some functions to it.

---

3/31/95 8:55 AM  
LIBPRESS questions  
Dave Ross  
Development Env.

Any idea when a more complete libpress library is going to be released? I'd really like to try using the Huffman encoding and decoding to see how fast/slow and how much compression is achieved for various types of data. As far as I can tell no huffman support is available in any of the revs including 3.0. Also, any idea if the huffman decoding is or can be done asynchronously?

---

3/31/95 8:58 AM  
Re(2): Some General Questions  
Dave Ross  
Development Env.

Re: the question of restarting your code in the debugger, we find that just executing the RELOAD command under the file menu restarts our code just fine (usually).

---

3/31/95 10:53 AM  
Threading working!  
Kevin T. Seghetti  
Development Env.

GOODTHR.ZIP        4K  
Development Env.

I have a threading example which works with more than 4 tasks. All 3 of the fixes discussed here need to be applied to the OS to get it to work. Thanks everyone for their efforts, I have enclosed the example so everyone else won't have to go through this. I hope these problems are solved in the long term, but for now I do have something that works. Kevin Seghetti at Cave Logic Studios

---

3/31/95 5:48 PM  
assembly guide  
Bill "Angus" Guschwan  
Lobotomy Software

If you want to know R3000 assembly, here's the book:  
Request the following book from FAX: 408 433 8989  
CW33300 Enhanced Self-Embedding Processor Core User's Manual Doc # MV72-000108-99 A  
This is a LSI Logic FAX #

---

3/31/95 10:55 AM  
PadInit and SNPATCH  
Mark Beardsley  
Development Env.

I've found an unusual anomaly with PadInit. If I'm using SNPATCH, PadInit seems to take about 4 seconds to return. If I use PATCHX and NEWDEX, it seems to return right away. Is this normal?

Also, PadInit always seems to report 1 controller connected (regardless of SNPATCH or PATCHX), and this occurs with both lib 2.6 and 3.0!

Even the various demo programs don't seem to use libetc as advertised. Are there new docs that would explain this, or is it a bug?

---

3/31/95 10:08 AM

Re: LIBPRESS questions  
Bill "Angus" Guschwan  
Development Env.

>>Any idea when a more complete libpress library is going to be released? It is complete as it ever will be.

>>I'd really like to try using the Huffman encoding and decoding to see how fast/slow and how much compression is >>achieved for various types of data. As far as I can tell no huffman support is available in any of the revs includeing 3.0. I asked about this. Our huffman encoding is tuned for jpeg compression, so they are reluctant and think it would not be so good for other types of data.

>> Also, any idea if the huffman decoding is or can be done asynchronously? It is not asynchronous. Don't know how useful that would be though since the CPU is doing the decompression.

angus

---

4/3/95 11:06 AM

Development Conference  
Mark Beardsley  
Development Env.

Are you still planning to have a help conference or something to help people get CD's burnt and stuff before E3? You mentioned it awhile ago and if it's on, I need to get airfare arranged, etc. Thanks.

---

4/3/95 11:52 AM

Re: Development Conference  
Kristine Severson  
Development Env.

Yes, the onsite consulting sessions are going on right now for E3. If interested in scheduling an appointment, please contact me at 415/655-8137. Typically, you should plan on spending a couple days at our Foster City office. Also, if you can send us any preliminary info or issues you wish to resolve, this will help us prepare for your visit and work more efficiently.

Kris

---

4/4/95 10:54 AM

Bugs in psylink  
Todd Blackburn  
Bugs

BUGINPSY.TXT 1K

Development Env.

In the attached file 'BUGINPSY.TXT' is a description of the psylink bug we found.

---

4/5/95 11:47 PM

Re: Threading working!

William Botti

Development Env.

Way to persevere! And thanks for sharing... WB Coding

---

4/6/95 5:51 PM

Re(6): LIB3.0 is SLOW - why?

Joe K. Burfoot

Development Env.

Angus,

Please don't drop this issue. I just converted over to 3.0 and have suffered a 70% \*gag\* reduction in my frame rate. I'm too busy to give you example code right now but I thought I'd put in my vote.

By the way this my optimized (-O2 & -O1) code. My non-optimized code changes little.

---

4/6/95 9:24 AM

Bug in ASMP5X

Todd Blackburn

Psyq Tools

Bugs

The same bug in PSYLINK appears in ASMP5X. Below is an example source file.

```
section .text label0 beq r0,r0,label1
```

```
section .data data dh 0,1,2
```

```
section .text
```

```
codetab dsw 40000
```

```
label1 jal label0
```

The above source file produces the following obj file. This was printed using DUMPOBJ.

Header : LNK version 2 46 : Processor type 7 16 : Section symbol number 418e '.text' in group 0

alignment 8 16 : Section symbol number 4191 '.data' in group 0 alignment 8 6 : Switch to section

418e 2 : Code 4 bytes

0000:40 9c 00 10

6 : Switch to section 4191 2 : Code 6 bytes

0000:00 00 01 00 02 00

6 : Switch to section 418e 8 : Uninitialised data, 160000 bytes 2 : Code 4 bytes

0000:00 00 00 0c

10 : Patch type 74 at offset 0 with (sectbase(418e)+\$0) 0 : End of file

The first instruction is the first 4 bytes of code. The offset portion == 0x9C40 which is a negative offset. ASMP5X should have reported a branch out of range.

---

4/7/95 4:32 PM

libc2.h

Robert w. Calfee

Development Env.

Hi Angus!

Say, do you have a corrected version of the libc2.h file? rwc

---

4/11/95 4:18 PM

Re(7): LIB3.0 is SLOW - why?

Joe K. Burfoot

Development Env.

OK. Forget the slow down -- It was my bonehead mistake.

Fonts still don't work though.

---

4/11/95 5:58 PM

Re(8): LIB3.0 is SLOW - why?

Bill "Angus" Guschwan

Development Env.

Fonts have a bug in them. Basically, the location of the sprites for the font is tx, ty, but the width and height is hardcoded as 128 and 32. Fair enough. But they made a mistake and put the Clut at y = ty +128, which means you are probably writing over the clut. To fix, try this:

1) Call FntLoad. It sets up some global variables. 2) extern u\_long font[]; extern u\_short clut; clut = LoadClut(font,tx,ty+33);

Let me know if it works. Also, remember, FntFlush calls DrawOTag on the sprites. So the location of the FntFlush is important. Finally, try calling SetDumpFnt(FntOpen()); FntFlush(-1).

Angus

---

4/14/95 11:27 AM

Message & TestMess

Christopher Deel

Development Env.

Bill "Angus" Guschwan

Is it possible for me to get the source for Mess1.com and TestMess.exe. I would like to add some features.

---

4/17/95 4:02 PM

Re: assembly guide

Lobotomy Software

Bill "Angus" Guschwan

Development Env.

Angus,

Got the book from LSI and was able to get the assembler working and linked in using sample code from a 2/20 message on the board.

However, I can't seem to get my debug font to work. Is there something special I need to do with the linker? I haven't changed any of the libraries I'm using or even the code that calls the font stuff. I did get the same old printf error when I first linked my program using a link file like the one in the message

including the libc file fixed this, but my debug font never came back...

Do I really need to use a specific link file (like in the 2/20 message) or can I just use the makefile as I was before (like it was in the Balls demo) and somehow link in the assembly code. I do not



really understand how the make and link programs are interacting in this system.  
Any help you could give me regarding the linker and the fntprint() and fntflush() routines  
would be great...  
Jeff

---

4/17/95 7:10 PM  
"Target did not respond" failures  
Dan Rosenfeld  
Development Env.

Is Psybios and/or the development hardware really flakey, or am I doing something reely  
stuped?  
Running the following .bat file:  
----- resetps 1 delay 2 (seconds) run patchx -----  
ten times, resulted in four "Target did not respond" failures. It may not be significant, but three  
of the failures occurred sequentially.  
Also, I was under the impression that in general (i.e. after a recompile) I should not need to load  
the patch or run resetps. However, just doing  
c:\blah> run program  
never works for me (at least I can't remember if it ever did), even if the program has exited  
normally via exit().  
The code is being loaded at \$80040000, if that matters.  
Thanks in advance,  
Dan

---

4/17/95 7:26 PM  
Re: "Target did not respond" failures  
BillË"Angus" Guschwan  
Development Env.

run snpatch

---

4/17/95 5:08 PM  
Re(2): assembly guide  
BillË"Angus" Guschwan  
Lobotomy Software  
Development Env.  
Send me code.  
Angus

---

4/18/95 4:15 PM  
Re(3): "Target did not respond" failures  
Dan Rosenfeld  
Development Env.

MarkB>run /w10 \patch\snpatch  
My version of "run" does not recognize the /w option, and it's not mentioned in the  
documentation. Is there a new version of run which implements this feature?

Thanks,  
Dan

---

4/18/95 7:09 PM  
Re(4): "Target did not respond" failures  
Christopher Deel  
Development Env.

You can get the latest version of Run off this system.  
Here is what I use.  
resetsps 1 run /w10 c:\psx\patch\snpatch run /w10 (program) mess1 testmess or DbugPSX  
mess1  
and for the CD:  
resetsps 1 run /w10 c:\psx\cd\_utils\selemu run /w10 c:\psx\patch\snpatch run /w10  
c:\psx\cd\_utils\cdexec mess1 testmess mess1

---

4/18/95 1:35 PM  
Re(3): assembly guide  
Lobotomy Software  
Bill "Angus" Guschwan  
Development Env.  
FONTHELP.ZIP 4K  
Development Env.  
Here is a sample of my makefiles, make1.mak and make2.mak  
make1.mak uses a link file and assembly (does not call the assembly, just makes it) and I lose my  
debug font  
make2.mak is my old makefile taken from balls demo. It does not use the link file, but does  
work with the debug font...  
my question is, how can I both assemble and use a debug font? what is wrong with my make1,  
lnk combo?

---

4/18/95 4:11 PM  
Re(2): "Target did not respond" failures  
Dan Rosenfeld  
Development Env.

Angus>run snpatch  
Thanks for your help; maybe I can coax just a few more words out of you.  
First, which problem is "run snpatch" a solution to? Is this something which will make  
subsequent invocations of "run MyProgram" more reliable?  
I don't believe I received a copy of snpatch with my development system. Where can I get it?  
Also, I'm still curious as to what the official line is on the need for resetting and reloading the  
patch code prior to every invocation of "run MyProgram".  
Thanks, Dan

---

4/18/95 11:03 AM  
Re(2): "Target did not respond" failures  
Mark Beardsley  
Development Env.

I had similar problems for a while. Try using run with a /w10 option. This will give a longer timeout value. example -> run /w10 \patch\snpatch  
If you use the /w on all run commands, you can remove the other delays completely (or at least I could)! It works 100% of the time for me now. If you still have problems, let me know, I'll be glad to help.

---

4/18/95 10:29 AM  
Re: "Target did not respond" failures  
Unni Pillai  
Development Env.

Also increase the delay delay 5(this works for me atleast 70% of the time) if this does'nt work do the following... a)resetsps 1 b)pause (PRAY HARD..) c)run {your path}\snpatch (or patchx) {snpatch is more reliable} d)pause d)psymake load e)pause f)run {your app}  
If this still does'nt work, increase the #of pauses.. GOOD LUCK!!

---

4/19/95 10:41 AM  
Stepping through code in dbugpsx  
Buzz Burrowes  
Development Env.

I know there was a short thread some time back about this, but I'm still having a problem... I'm runing dbugpsx version 4.49 and I'm trying to step through c source code. The problem goes like this...  
I set a breakpoint somewhere in my code using the mouse by highlighting the line in question and pressing the right mouse button. The code might look something like this...  
switch(type) { ... }  
I select [Go] from the menu and the program executes to that point.  
The program stops at the breakpoint highlighting the switch statement line.  
Now, I want to step through my code... but when I press F8 or F7 I get a string of "Unable to set breakpoint there" messages before the cursor finally moves to the next line of c code. At times I don't get this message but still have to press F8 several times before execution finally stops at my next line of code. It seems pressing F8 is stepping through assembly instructions.  
This is a real pain in the neck when you get a string of "Unable to set breakpoing there" messages.  
Is there a fix to this (or is it a feature :-)

---

4/19/95 9:09 AM  
Valid Memory Areas  
Mark Beardsley  
Development Env.

One of my programmers is having problems downloading TMD files to certain memory locations. He's using PQBLOAD to send a TMD file to \$80080000, and it seems to end up in other parts of memory instead. If he sends it to \$80090000 it seems to work fine. The file is about 200K. Is there some limitation on the destination address for PQBLOAD, or is this somehow outside the range of valid PSX memory? I would think that both these areas would be equally valid. Any Ideas?

---

4/19/95 8:02 PM  
Re: Stepping through code in dbugpsx  
Bill "Angus" Guschwan  
Development Env.

Try debugger 4.49a.  
Angus

---

4/19/95 3:36 PM  
Re: "Target did not respond" failures  
David R. Sullivan  
Development Env.

Dan,  
RUN /W5 PATCH // The /Wx param is a retry for x seconds (?) on error  
Only reset the PSX when the last program executed did not properly exit and you wish to reset  
and rerun a new or updated program.\

DaveS.

---

4/19/95 9:03 AM  
Re(5): "Target did not respond" failures  
Mark Beardsley  
Development Env.

SNPATCH can be found in the SIO conference with a message from Angus titled "New ROMS  
for ..." It took me a long time to find it also.

---

4/20/95 5:52 PM  
how do you make printf & testmess work?  
Alex Dommasch  
Development Env.

As I understand it, I am supposed to be able to see the output of printf's from the PSX on my PC  
screen.

I run MESS1 in my autoexec.bat, and I run TESTMESS after I run the PSX program. Is there  
more I am supposed to do? TESTMESS doesn't do anything but wait. Do I need an IRQ set in  
the dev. board? (It's not set now.)

Thanks, alex

---

4/20/95 10:34 AM  
Re: Stepping through code in dbugpsx  
Dean M. Grandquist  
Development Env.

I get the "Unable to set breakpoint there" message with 4.49a also. Is there a fix?

---

4/20/95 9:52 PM

Re: how do you make printf & testmess work?  
Borden Covell II  
Development Env.

we are able to use mess1 (in autoexec) and testmess on systems with or without interrupts. I guess you should make sure that all of your s/w is the latest version. good luck.

---

4/21/95 6:06 PM

Asm comments  
Bill "Angus" Guschwan  
Psyq Tools

> The following bug exists in the asmpsx assembler > ORG \$8001000 > Lable1 > dw 0 > dw 32  
> dw 35 > Lable2 > dw Label2 - Label1 <-- This evaluates to \$800100c, > it should  
evaluate to \$c > > The only way to make this work is to remove the spaces: > dw Label2-Label1  
> > David

It is standard for asmpsx to assume that a space in the operand field indicates the start of a comment. To override this you can use the ws option either as /ows+ on the command line or opt ws+ in your source code.

---

4/21/95 6:45 PM

Re(2): Stepping through code in dbugpsx  
Buzz Burrowes  
Development Env.

I've not only tried 4.49a I've tried version 4.49 of dbugpsxx.  
Still can't step through C code without wanting to shoot myself after about 4 lines :-)

---

4/21/95 6:01 PM

CCpsx bug: Tmpdir  
Bill "Angus" Guschwan  
Psyq Tools

There has been a small bug fixed in ccpsx.exe (now version 1.13 on our BBS).  
If the environment variable TMPDIR was set to C:\ then the previous version of ccpsx would crash.

---

4/21/95 6:03 PM

ccpsx fix: //  
Bill "Angus" Guschwan  
Psyq Tools

Hi all

I have fixed a problem that can occur when using c++ by modifying ccpsx. The problem was that if you compiled a file and specified the backslash ( \ ) character in the file name then this

would be doubled in the debugging information so the debugger would try to load a file called c:\prog.cpp for example.  
ccpsx will now translate all \ characters to / when calling the compiler. I'd be grateful if you could give it a test on regular C programs before distributing it.  
The new version is on our BBS in CCPSX.ZIP

---

4/21/95 6:46 PM  
Re(2): Stepping through code in dbugpsx  
Buzz Burrowes  
Development Env.

No optimizations?  
If you are successfully stepping through C code would you mind posting you switch settings on compile?

---

4/21/95 6:08 PM  
pqblob returns errors  
Bill "Angus" Guschwan  
Psyq Tools

> pqblob does not return error status to DOS when a load failure occurs, > making it's usefulness in make files limited. Will this be fixed? > Jim  
Here's a fixed version of pqblob that will return error level 1 if there's a problem and 0 if everything is OK.  
(It's also on our BBS in PQSTUFF.ZIP)

---

4/21/95 12:05 PM  
Location of Global Variables  
Mark Beardsley  
Development Env.

It appears that global variables (defined in C) are not part of the cpe image and are located outside of the memory area taken up by the code. I would have thought that variables not defined on the stack would be imbedded inside the code. How can one tell where the start of available memory is, since it extends far beyond the size of the CPE?  
This was part of the problem described in my message asking about valid memory areas. TMD data was being downloaded into the same area being used for global variables.  
Could someone explain the basic memory model used for the playstation when coding in C?

---

4/21/95 4:52 PM  
Re: Stepping through code in dbugpsx  
Dave Ross  
Development Env.

I don't know if it will help, but are you compiling the the code for use in the debugger with NO optimizations?

---

4/21/95 6:07 PM

Asmpsx fix  
Bill "Angus" Guschwan  
Psyq Tools

A developer contacted me today to report a small bug in ASMPSX/ASPSX.  
The assembler was not checking the displacement of a forward branch properly and was allowing branches in the range -32768 to +65535 words instead of -32768 to +32767 words.  
e.g. the program  
    beq r0,r0,lab  
    dsw 40000

lab:  
should have given an error on the branch instruction but didn't.  
This has now been fixed and the versions on our BBS have been updated.

---

4/21/95 6:07 PM  
Globals in C  
Bill "Angus" Guschwan  
Psyq Tools

The Mips compiler has an option to put small data items (e.g. <= 8 bytes) into special sections called .sdata and .sbss rather than the usual .data and .bss. The global register ( gp ) is set up at the start of the program to point to the base of these sections and variables are then accessed as offsets from this pointer rather than as absolute addresses. This can speed the code up considerably when you're accessing lots of global variables and also reduce the size of the code. This feature has been supported since early March (aspsx 2.09) but this information does not seem to have been distributed.

To use it you add the option -mgpopt to your ccpsx command line, e.g.

```
ccpsx -g -c -mgpopt main.c
```

By default, this will place any data item of size 8 bytes or less in the .sdata/.sbss sections. You can override this size with the -G switch, e.g.

```
ccpsx -g -c -mgpopt -G16 main.c
```

will place any item of size 16 bytes or less in the .s... sections.

If you specify -G0 then no data will be placed in the .s... sections and the optimisation will be disabled. ( Note : even if you do not specify the -mgpopt option the compiler may still place some variables in the .sdata/.sbss sections and the assembler will generate gp relative addressing modes to access them. It is therefore necessary to specify -G0 to completely disable this).

Because the size of an offset from the gp register is limited to 16 bits the total size of the .sdata and .sbss sections is limited too. If the sections grow too large then you will get "Illegal value" type errors at link time.

There is one problem in using this feature. Okamoto san has told me that in an event handler the GP register will be set to point to the kernel's data area instead of the main program's. This is for efficiency reasons to reduce the time taken to get into the event handler. It is therefore important to compile any event handler routines separately and to specify the -G0 option when you do so. Program overlays may also need to be compiled this way depending on the method used to achieve overlaying.

Call-backs should work properly since the GP register is set up before the call-back routine is called.

---

4/21/95 6:05 PM

Asm improvements  
Bill "Angus" Guschwan  
Psyq Tools

ASMPSX and ASPSX have been improved to implement all the macro instructions listed in the mips programmers guide including

- ulh, ulhu, ulw, ush and usw for unaligned load/stores (these are needed by aspsx when structures are packed)
- abs, neg, negu and not
- rol, ror

Macro instructions must be enabled and the at register is required by the assembler in order to implement these.

The new versions are available for download on our BBS.

The assemblers should now implement all r3000 instructions and standard macro instructions (except floating point of course). If you find anything is missing please let me know. If you have any suggestions to further improve the assemblers please pass them on to me.

If you think I've missed anyone off this mail message who should be told about this then please let me know.

Thanks

---

4/21/95 6:02 PM  
Psymake fixes  
Bill "Angus" Guschwan  
Psyq Tools

There is a new version of psymake on our bbs (file PSYMAKE.ZIP v1.11)

This fixes two bugs :

(1) The /b switch that forces all targets to be rebuilt was broken.

(2) In this example :

```
.c.obj: ccpsx -c -g $*.c
```

```
main.cpe: main.obj ccpsx main.obj
```

If main.obj existed then it would not be rebuilt even if main.c had been changed and had a later date.

---

4/21/95 6:09 PM  
more asmpsx/psylib/ccpsx issues  
Bill "Angus" Guschwan  
Psyq Tools

I have made revisions to a few tools today.

(1) ASMPSX and ASPSX - unfortunately there were some bugs in my previous modifications to support the ulh, ulhu, ulw, ush and usw instructions. I was rather tired when I was testing them and didn't notice that I had set them up for a big-endian Mips processor rather than a little endian one. Fixed versions of these are on the BBS. My apologies for the inconvenience.

(2) CCSH - this will now pass the -G command line switch to the compiler as well as the assembler. It was possible for the compiler to put an incorrectly sized object into the short data section.

There are still some problems to resolve with the use of the short data and bss sections which I hope Mr Okamoto will help me with shortly. Once I have all the information I will write a full explanation of how to use the gp relative addressing optimisation but at the moment there are some problems using it with interrupt/call-back routines.



(3) PSYLIB - a minor bug in psylib could cause it to run out of file handles when trying to extract multiple object files from a library.

---

4/25/95 5:04 PM  
abs() macro is WRONG!!!!  
Alex Dommasch  
Development Env.

In ABS.H, the absolute value macro is defined as:

```
#define abs(x) (x>=0)?x:-x
```

THIS IS INCORRECT! If x is a complex expression, or if the abs() is part of a larger expression, OPERATOR PRECEDENCE MAY GIVE YOU AN UNEXPECTED VALUE!

Parentheses must be added inside and out. The correct definition is:

```
#define abs(x) (((x)>=0)?(x):- (x))
```

I would recommend that everyone change this in their ABS.H, and that the official version be corrected also. I spent the better part of a day tracking down this bug. >:-(

- alex

---

4/25/95 3:55 PM  
Re(3): Stepping through code in dbugpsx  
Dave Ross  
Development Env.

```
#CFLAGS=-c -g -Xd -comments-c++ -O2 #when we want fastest code CFLAGS=-c -g -Xd -  
comments-c++ #when we want to debug LFLAGS=/c /g /m #link flags
```

---

4/26/95 9:16 AM  
Debugger Exception Vector  
Montgomery Singman  
Development Env.

According to the debugger docs, at \$80 the debug patch installs an exception vector so the debugger can get control of the system.

What value/address does the debug patch put at \$80?

I use this to tell at runtime whether I am a production version or a debugger version for doing things like error trapping.

---

4/26/95 1:51 PM  
Re: Location of Global Variables  
William Botti  
Development Env.

Hi Mark: I assume you have already checked the map file. I have also verified your finding. Until this gets resolved, we are using a "hack" to load code high, and data underneath, because at least we can guarantee the org of the code. Will B. Coding

---

4/26/95 6:09 PM  
Problems with new PSX.ZIP  
Dave Ross  
Bill "Angus" Guschwan

While looking for the new compiler that supports placing variables in a named program section (I still haven't found it) I came upon a recent copy of PSX.ZIP (in the tools folder of psyq tools). I installed the exe's from that zip, rebuilt my program and it quit working. Upon debugging it, I found that there was a reference to a global variable that was referenced as an offset from the GP register, but the GP register was zero: thus bad values were used. I don't know how or why (and I haven't turned on the mgpopt mentioned a few messages ago - in fact I changed nothing but executables). I replaced the executables from my most recent copy of PSX.ZIP, rebuilt everything and it worked. When I looked at the offending section of code, the global variable was referenced via a move into a register and the a load from an offset on that register. I like the speed of the new one if I could get it working. Any idea how I can get the new stuff to work?

---

4/27/95 10:21 AM  
Beware of ALL tool updates.  
Dave Berrisford  
Psyq Tools

The problem Dave Ross had with PSX.ZIP prompted me to send in this message of caution. Whenever you receive a set of 'new' tools in the form of a ZIP, don't just overwrite your old stuff with the new. I always unzip the new one to it's own directory and then compare version numbers and date stamps between old and new, in order to confirm which is truly the most up to date.

Previous experience I've had with PSY-Q also leads me to not trust version numbers alone. Some weeks ago, I downloaded PSYLINK2.ZIP containing PSYLINK.EXE v2.14 dated 8th March 95. Since then, PSX.ZIP has appeared containing another PSYLINK.EXE, this time v1.35 dated 8th April 95. The latter is clearly the newer in date terms, but the version numbers suggest otherwise.

As far as I am aware, the latest set of tools is PSX.ZIP (in the Tools folder of this folder), dated 20th April 95. Unfortunately this ZIP contains RESETPS.EXE v1.02, even though v1.03 is a great deal better in our experience (CDEMU15.ZIP dated 19th April 95). Hope this helps. Dave.

---

4/27/95 11:40 AM  
Re: Beware of ALL tool updates.  
Dave R. Scheele  
Dave Berrisford  
Psyq Tools

As a further note of caution, I've found the dates to be sometimes unreliable .. I think they "touch" the files, giving them a current date/time stamp without actually changing the contents. I've been manually comparing date, version number, and size to try and sort things out, relying mostly on version number. Hopefully I'm still doing ok!  
Dave

---

4/28/95 3:29 PM  
Fwd: PCread problems "solved"

Bill "Angus" Guschwan  
Development Env.

We can fix the PCRead problem under windows by disabling the 32-bit \_file\_ access option.  
Please pass this along.  
Borden

---

5/1/95 5:42 PM  
ccpsx add  
Bill "Angus" Guschwan  
Psyq Tools

At the request of a developer the following feature has been added to ccpsx :  
In the psyq.ini file in the [ccpsx] section you can add a line like  
flags=-g -mgpopt  
these options will then be automatically added to the front of the command line. e.g. if the  
command line was  
ccpsx -c fred.c  
and the previous flags example was in psyq.ini then ccpsx will act like the command line was :  
ccpsx -g -mgpopt -c fred.c  
ccpsx will now also convert any \ characters in the c\_include\_path and cplus\_include\_path  
entrys of psyq.ini to / characters.

---

5/2/95 10:38 AM  
Re: Globals in C  
Dave Ross  
Bill "Angus" Guschwan  
Psyq Tools

Bill, Regarding the globals relative to the GP register: How does the GP register get initalized?  
When I use the new assmebler in the new PSX.ZIP, it generates references to globals offset from  
the GP (which is good) but the GP register is always zero (which is bad). Is there some  
initialization I have to do or some C startup routine I need to call? I thought it my problem  
might have something to do with the missing compiler, but I downloaded and tried it this  
morning and got the same results (GP=0).

Also, while on the subject of GCC: In reading the latest UKBBS posting, there is confusion over  
there (as well as here) as to what levels of optimization are built into the current compiler. The  
online GCC docs I have (using the INFO program and which are for GCC 2.5) says that -O2 is  
the highest, yet that UKBBS posting says -O3 is. I tried -O3 (been using -O2) and my code  
actually ran \_SLOWER\_. I can't locate the GCC docs on the BBS: do you have updated ones?

---

5/2/95 1:10 PM  
Link Asm Adjacent 2 C  
Administrator  
Development Env.

DEMO.ZIP 5K  
Development Env.

Here is a demo that shows how to link assembly in the same block of code as c. It is good for  
getting your code to fit into the 4K icache.  
angus

---

5/2/95 10:42 AM  
Re: pqbload returns errors  
Christopher Deel  
Bill "Angus" Guschwan  
Psyq Tools  
Where is PQstuff.zip?

---

5/3/95 7:51 AM  
Re: PadInit  
Mark Beardsley  
Development Env.

I've had the same problem with padinit. It seems that most people are using initpad instead. I would rather use the libetc stuff if possible.

---

5/4/95 2:24 PM  
HELP! virtual memory exhausted?  
Mark Beardsley  
Development Env.

Suddenly, I seem to be getting an error message when compiling any of my code. It states "VIRTUAL MEMORY EXHAUSTED" in line xxx. The line it refers to varies, but always seems to be inside one of the library include files. Even code that compiled fine yesterday no longer compiles. Is this referring to PC memory? or to the 2meg PSX memory or what? I suddenly can't seem to get anything running at all. (PS. earlier today I tried to install a SCSI card in my PC to run the CD writer. After several frustrated hours, I gave up. My PC is now back to its original configuration. I don't know if this is related or not.)

---

5/5/95 3:08 PM  
Re: HELP! virtual memory exhausted?  
Dan Burnash  
Development Env.

The error refers to PC memory, not PSX memory. The C compiler is running out of memory. If you are running in a DPMI environment, such as Windows, you may need to increase your Windows swap file size. If you are under straight DOS, the virtual memory file should be created and expand to use all available disk space.

Another possibility. Make sure that the directory pointed to by the "GO32TMP" environment variable exists.

If the amount of available hard disk space has not changed since the compiler was working, check the hardware connections again. Make sure that everything is firmly in place, and that any terminators that you removed, have been replaced. Also verify that the dongle is in place. If you have a connector for an external CD ROM drive (black box), make sure the drive is attached.

Let me know if none of these ideas works.

Dan

---

5/8/95 8:55 AM  
A Feature Request  
Mark Beardsley  
Psyq Tools

I would like to be able to include BINARY data inside a source C file. There currently appears to be no way to do this. I can create a tiny assembler program that will include a binary file using INCBIN and then link this in, but it's not very convenient. If the compiler would support some type of binary include, then some simple data objects could easily be created as arrays or structures without having to read them from the disk. Please see if this would be feasible in the next release, or if there is another simple way of doing this, please let me know. Thanks.

---

5/8/95 10:50 AM  
Re: A Feature Request  
Dan Burnash  
Mark Beardsley  
Psyq Tools  
I will pass the request on.

---

5/8/95 10:10 AM  
LIBSN.LIB  
Chris E. Reese  
Development Env.

Is there a version of the LIBSN that has built for C++? The reason I ask is that I have been working with Reality Labs from RenderMorphics and they are using a version of LIBSN and header files for the Sony Libs that comply to C++. I have version 3.0 of the Sony libs currently installed.  
Chris Reese Eidetic, Inc.

---

5/15/95 10:19 AM  
better linking?  
Crystal Dynamics  
Development Env.

hi folks. I'm not sure how valid a question this is, but is it possible for psylink to be a bit more selective about what it loads in? my program right now is very large (including the data), but I notice in the map file psylink spits out that a lot of stuff I don't use at all (eg. most stuff that gets linked in from libgte) is still linked in. since I'm only using the 2d stuff in libgs I really wish it wouldn't link in code to do matrix transformations and what not. I also noticed that a lot of 2d and 3d stuff is mixed in together in the modules in libgs.lib, and so I can't figure out what I might be able to delete out of the libraries. if there's nothing that can be done about linking unused code into the program, would it be possible to provide a smaller "2d version" of libgs.lib? one that doesn't reference the gte library?  
right now we're struggling to squeeze 1.4 megs of animation into the game at once, and every bit of memory we get back counts!  
- Chuck Woo - Illusions Gaming Co. for Crystal Dynamics

---

5/15/95 10:52 AM  
Re: better linking?  
Dan Burnash  
Development Env.

Chuck Woo,  
The linker should only be linking in the modules that are referenced. However, it cannot break a module apart, so if any routine is used, the whole module gets linked. I don't know the reason why the modules were constructed as they are, so I don't know if they can easily be broken into smaller pieces. For now, you are stuck with the extra overhead. I will suggest to the developers that they break the modules into the smallest pieces possible to reduce the memory usage.  
Dan Burnash

---

5/16/95 11:05 AM  
Re: Version Control  
Dan Burnash  
Henrik Markarian  
Psyq Tools

We are working on setting up some version controls, and a better release process. I will pass your suggestions on to the person setting things up.

---

5/16/95 4:39 PM  
C++ new/delete problem  
Michelle Feraud  
Psyq Tools

Are there any other brave souls out there using C++?  
I've run into a problem with new and delete. I've caught new red-handed (so to speak) allocating memory on top of other (undeleted) data items. And yes, InitHeap has been called. Has anyone else had problems with new/delete or seen similar problems with malloc/free in C?

---

5/16/95 11:00 AM  
Version Control  
Henrik Markarian  
Psyq Tools

Is it possible to maintain an on-line document that contains the current version, date and size for all the psyq tools (including the compiler)? This information would be very usefull as anyone can quickly check to see if they're up to date with the latest versions of the tools. Furthermore, when tools are posted to the TOOLS folder, the name should contains some indication as to which version of tool is included (i.e. RUN\_103.ZIP).  
Thanks Henrik @ Mindscape

---

5/17/95 10:28 AM  
optimization  
Crystal Dynamics  
Development Env.

on a related note to my question about better linking, what general guidelines should I follow if I want to run optimization on my code (ie. using the -O flag in ccpsx)? are there certain ways I should declare globals and functions that are called during the vblank interrupt? are there limitations on memory or stack usage I should be aware of? etc etc. basically, every time I try to optimize my "psx-specific" code (part of which runs in the interrupt), the program fails to run at all. any help would be appreciated!

- Chuck Woo - Illusions Gaming Co.

---

5/17/95 11:59 AM

Dev Env. Differences

Bill "Angus" Guschwan

Development Env.

> In America, there is a problem that is the difference of Speed of LoadImage in > DEX-200 and in Debugging Station. > > I hear that the speed of LoadImage in DEX-2000 is triple slower than Debugging > Station. > > Do you have any information of that? > > If you have got the information, please send the detail information of that > problem. >

We have talked about this issue again and again, but I feel there needed to make it sure once again.

1) When using interruption, there occurred a lot of overhead associate with functions. It is under investigation now. Currently I found that there takes program 10 HSync to go setjmp() which is written in intr.c. Finally I'm going to investigate the dispatcher of ROM interruption more detail.

2) For what I have written, your program will be slow like MK3 when you transport 32x32 sized images into VRAM using LoadImage so many times. This is because there occurs 1 interruption by 1 request sending queued in DMA queue. But I think 128KB/sec is too slow, as MK3 team says.

3) The load for interruption will be 3 times as much as Debugging station's one when you use DEX-2000. This is because PSY-Q code is started automatically at the top of interruption. There are only 2 way to cut it off. One is changing your ROM on DEX-2000, the other is making new PATCHX.

4) The difference of loads between DEX-2000 and DebuggingStation makes the difference of speed associate with LoadImage(). Those two phenomenon are based on this problem.

1. Movie does not go on good frame rate when using DEX-2000.

2. There occurs some read error when using a lot of CdControl() while doing CdRead()

---

5/17/95 12:15 PM

Re: funky VECTOR struct

Bill "Angus" Guschwan

Development Env.

You can take out the PAD. Only some obscure function uses it.

Angus

---

5/17/95 11:50 AM

funky VECTOR struct

Blake E. Senftner

Development Env.

Is there a reason that the VECTOR structure:  
typedef struct { long vx, vy, vz, pad; } VECTOR;  
has the 'pad' field?

It is my understanding that the reason behind the various 'pad' fields is to insure 32-bit alignment... The VECTOR structure is composed of 32-bit elements, therefore it is automatically 32-bit aligned.

I realize that I can not just change my header, because the libs were compiled with that pad field inside structures...

So, any chance of this being changed in lib 3.1 or whichever is the next lib update?

-Blake

---

5/17/95 5:02 PM

Re(3): better linking?

Dan Burnash

Development Env.

>>>Is a module a source file?

What I meant by module was an object module, generally corresponding to a source file. The linker does not know how to break apart an object module, so must link in the whole thing if any routine in that object module is referenced in the program.

>>>Meaning that for our own code, we need to place routines into separate files that we want the capability of >>>linking out.

Yes.

---

5/17/95 11:14 AM

Re(2): better linking?

Blake E. Senftner

Development Env.

Dan:

Is a module a source file?

Meaning that for our own code, we need to place routines into separate files that we want the capability of linking out.

-Blake

---

5/17/95 1:51 PM

Re(3): better linking?

Crystal Dynamics

Development Env.

in this case I meant modules as in groups of functions within the \*.lib files, which may or may not have been put together from different source files and different .obj's. how are the \*.lib files built anyway?

- Chuck Woo - Illusions Gaming Co.

---

5/18/95 11:59 AM

Re: Dev Env. Differences

David R. Sullivan



Development Env.

It seems like some of these differences are very important, ie. timing of CD and Video, transferring top VRAM, etc. Can SN Systems/PsyQ or Sony provide a PATCH that runs in SOFTWARE (not a downloadable patch!) that we can execute when we are running while not under the debugger to "KILL" all PsyQ/SN Systems access. Also, same for SNPATCH, can we get a version that will link into our code to allow a module to SNPATCH itself when it starts up?

DaveS.

---

5/18/95 12:03 PM

Psyq Tools

David R. Sullivan

Psyq Tools

BillE"Angus" Guschwan

In speaking with PsyQ and SN Systems, I understand that there is a new debugger available that corrects the single step problem. Can someone place this up on the BBS?

---

5/18/95 2:29 PM

PSYMAKE quirk

Dave Berrisford

Psyq Tools

ERRMESS.TXT 1K

Development Env.

Why is it that PSYMAKE returns a 'Can't find how to execute....' error (see full version in the attached text) when the PATH environment variable is after the block of PSX/compiler environment variables?

We typically get this error when we've logged on to the network and the path has been appended with server drive aliases.

Dave.

---

5/18/95 11:57 AM

Re(2): funky VECTOR struct

David R. Sullivan

Development Env.

Which obscure fuction uses the pad in vector?

DaveS.

---

5/18/95 5:43 PM

Re: PSYMAKE quirk

Dan Burnash

Dave Berrisford

Psyq Tools

Check to see if your path got too long, greater than 128 characters, when the network drives were appended. it works just fine for me when my path is after the environment variables. However, extra semicolons in the path or trying to make a path >128 characters can cause strange problems. this might be one of them.

---

5/19/95 8:52 AM

Private E-Mail Form

Developer Support

Dan Burnash

Development Env.

\* All Fields must be completed for immediate response!

Name: Michael K. McCarty Company: Vortex Media Arts Telephone: 818-557-2922

Game Title: N/A

Host machine (supplier/model/type of hard drive): Pentium 100/1gig drive/32 megs ram...

Sony Playstation Development system

Library Version: 2.6

Priority (Urgent or Routine): fairly Urgent

Topic of Question: Loss of Polygons on 3d objects

Question: I am using 3d studio as well as Form-Z on the macintosh to create 3d objects and have noticed when incorporating them into my playstation program I will lose polygons.. It almost appears that it draws the polygon behind the foreground polygon on top... I have used all the options I could think of in the dxf2rsdw.exe program I have set the objects to double sided on conversion but still the same problem I have created a solid box and I do not have this problem only when it is a slightly more complex image. For example with form-z I created a flat horizontal plane.. Then a small distance above it and directly in the center I created a perpendicular plane. The surfaces generally appear ok at first then as I rotate the object , Polygons begin to drop away or are drawn over by the polygon behind.... Any suggestions or insight would be greatly appreciated.

---

5/22/95 12:47 PM

Re(3): PSYMAKE quirk

Dave Ross

Dave Berrisford

Dan Burnash

I don't have an answer to your PSYMAKE problem, but I've been using Borland MAKE from my Turbo C compiler with nary a problem.

---

5/22/95 9:50 AM

Re: Private E-Mail Form

Brian Greenstone

Development Env.

How do you like Form-Z? We're only using 3D Studio right now, but 3D Studio's modelling isn't the greatest in the world. How is Form-Z's?

-Brian

---

5/22/95 9:30 AM

Re(2): PSYMAKE quirk

Dave Berrisford

Dan Burnash

Psyq Tools

I think that I may have been a little economical with my description on the PATH/PSYMAKE problem.

Although the problem does indeed appear when I'm on the network, I think this is only because logging on to the network causes the PATH environment variable to be re-written after the rest of the environment variables. Editing my AUTOEXEC.BAT and manually placing the PATH after the rest of the environment variables also causes the problem to appear.

Any ideas anyone?

Dave.

---

5/24/95 11:09 AM

Micron Pentiums seem to not work with CM-Emulators

Sam Black

Psyq Tools

Several months ago, we posted that the CD-Emulators were not working on our new Pentium machines. (Micron brand.)

Others responded to say that it worked for them, so we ignored it for a while. Recently, it became an issue, so we swapped for Gateway brand Pentiums and the system worked just fine. I don't know if it something specific to Micron, to Pheonix BIOS (unlikely, otherwise many others would've been complaining by now) or just bad luck.

Symptoms were that WRITING to the CD-EMU drive would cause a machine lockup. When it didn't lockup, DOS was completely confused and couldn't do DIR, or anything else. READING worked fine.

I'd be happy to provide more information if anyone from SN needs it to reproduce and/or fix this problem. For now, we've just switched to new Gateway machines, so it no longer affects us.

---

5/24/95 11:04 AM

Too Many Modules psylink error: WTF?

Sam Black

Psyq Tools

In porting some code to PSX, I've gotten the code to compile and link cleanly.

As I begin to add PSX-specific functionality, I am now linking with the PSX libs, in addition to my own code.

Even with the /b switch to psylink, I get a "Too many modules to link" error, causing link to abort.

The machine has 32MB of RAM, tons of space in TMP, >550K conventional memory available, etc. Is there a hard-coded limit in the linker somewhere? If so, can we get a version with a higher hard-coded limit?

---

5/24/95 4:26 PM

Re(2): Private E-Mail Form

Michael K. McCarty

Development Env.

Form-Z is an excellent program.. I find it extremely functional and though it was a little difficult to learn at first. I have found that the detail of control it gives me over the model creation process is phenomenal.  
MM

---

5/24/95 12:26 PM

Re: Too Many Modules psylink error: WTF?

Dan Burnash

Sam Black

Psyq Tools

How many modules of your own are you trying to link?

---

5/25/95 10:08 AM

Re(2): Too Many Modules psylink error: WTF?

Sam Black

Dan Burnash

Psyq Tools

>How many modules of your own are you trying to link?

Due to the way our source code tree is shared among many projects on many platforms, we have many, many small C files.

We have 211 .c files in our Sony PSX NASCAR project. It links fine as PC-DOS code (using psylink, without any PSX function calls). (Meaning that although I tell it to inclib all of the PSX libraries, all of them except libc get dead-stripped.)

As soon as I insert a single call to any PSX specific function (PCOpen is the exact one, but it is ANY function which causes another library to be linked in) the link process fails with "Too many modules"

We have organized our project into 6 of our own "libraries" (grfx, snd, comm, dev, math, and one other that I can't remember right now) In addition to these "libraries" we have approximately 130 source files. (The libraries together comprise about 81 source files.)

I tried taking some 70 of those files and making another library out of it. The behavior did not change at all.

Is there ANY solution to this problem, short of concatenating C source files? What exactly is a "module" in psylink terms? A .obj file? Does a .lib file count as one module or the number of component .obj files? Can I use another linker? GCC's linker? Isn't psylink basically just gcc's linker? If so, where did this limit on the number of modules come in? Is it a memory problem? (Though I've got tons of memory in the machine...)

Thanks for ANY help you can provide. Thanks also for the QUICK response! ---Jim Sokoloff, Tech Lead, Papyrus Design, 617-868-5440x102

PS: Is there any way to do source level debugging without copying all of the source files into a single (flat) directory with the .cpe and .sym files? If not, it's no big deal, but if there is, I could eliminate the redundant cp from my makefile.

---

5/25/95 12:35 PM

PadInit

Mark Beardsley

Development Env.

A few weeks ago, there was a problem reported using PadInit (I had reported it a long time ago, but I think it got lost in the sauce). Has anyone looked into this? It was first reported in my

message here on 3/31, and I believe at least a couple of others have had the same or similar problems. I would like to get this cleaned up, (or at least a word that we should be using the lower level controller stuff instead). Thanks.

---

5/25/95 11:41 AM

Re(3): Too Many Modules psylink error: WTF?

Dan Burnash

Sam Black

Psyq Tools

I have passed your questions on to SN Systems, and will post the answers when I get their response. Some of the answers are below.

>>What exactly is a "module" in psylink terms? A .obj file? Yes.

>> Does a .lib file count as one module or the number of component .obj files? A .lib file counts as the number of component .obj files.

---

5/26/95 2:27 PM

Re(2): PadInit

Mark Beardsley

Dan Burnash

Development Env.

Yes, I am still having the 4 second delay problem (though I suspect that it only happens in the development environment, not on an actual disk). This delay started happening when I switched to SNPATCH. I never saw it happen with the old PATCHX, but I have not tried going back to PATCHX to re-verify this. Not only does PadInit always return a 1, but data from the 2nd joypad seems to show up in the high word of the 1st joypad data (not from a PadRead of the 2nd joypad). Even a couple of the old demos seemed to get their data from the 2nd pad by shifting the 1st pad data 16 bits to the right. P.S. I'm using Lib 3.0

---

5/26/95 11:50 AM

Re: PadInit

Dan Burnash

Development Env.

PadInit is definitely returning 1 regardless of what controllers are connected. I have asked SCE to fix it or tell us what is going on. I haven't noticed the 4 second delay you described. Are you still having this problem?

Dan Burnash

---

5/29/95 3:33 PM

JPEG/MPEG Compression

Dave Elton

Development Env.

I am considering about playing animation in JPEG/MPEG on the playstation. I am wondering whether the decoding functions in libpress.lib support third party JPEG/MPEG format, e.g. if I compress my data into JPEG/MPEG using tools like Alchemy on IBM PC, because it will be

awkward that I have to compress my data using the encoding functions supplied by libpress.lib, which needs to be run on playstation. I appreciate any guidance on this.

---

5/30/95 1:32 PM

Compiler crashes with optimizations

Mike Benna

Psyq Tools

When I run ccpsx with the -O2 option, it crashes on one of my source files. Is this a known problem? What shall I do about it other than compile that one module with -O1? Would more information be helpful?

---

5/30/95 1:25 PM

Debugger problems

Mike Benna

Psyq Tools

FREECPU1.ZIP 5K

Development Env.

The debugger keeps dying on me with divide by zero errors. The exact error message is "The system detected a divide-by-zero error." and I end up at the DOS prompt. This has begun happening quite regularly (nearly every time I run the debugger). Is there a work-around or a fix for this problem?

Also, I run under OS/2 and the debugger is quite a CPU hog. Is it possible to modify the debugger to release its excess CPU time to the operating system? I've attached source code and documentation for releasing excess CPU time to OS/2, Windows, DOS, Desqview, etc. It's a simple function call and should only take a few minutes to add in to the debugger.

---

5/30/95 2:47 PM

Tool Flags/Options

Paul A. Wilkerson

Psyq Tools

Administrator

I need more documentation for the different command line options for both CCPSX and ASPSX. I would like to use more of the GNU CC options, those that are provided are much too limited. Another option would be to open CCPSX by publishing source. Though I doubt very much that this will happen.

---

5/30/95 6:20 AM

Named Section in C

David Minogue

Psyq Tools

Are there any plans for supporting named sections in C? It seems odd that the linker has such robust support for manipulating the attributes of sections and groups, but the compiler has so little support for placing code/data into specific sections. When can we expect a version of the compiler which will give us the ability to redirect code/data/bss into specific named sections?

-- David Minogue, Acclaim Entertainment.

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5/30/95 3:00 PM

Re(3): Too Many Modules psylink error: WTF?

Dan Burnash

Sam Black

Psyq Tools

The response to your questions:

By default the linker allows up to 256 object modules to be linked. Each object module taken from a library counts as 1 module and so making one library with all the object files in it doesn't help. The way to get round the problem is to use the /n switch on the linker command line in order to increase the number of modules that can be linked.

e.g. to increase to 300 modules enter

psylink /n300 .....

if psylink is being called directly or

ccpsx -Xn300 .....

if ccpsx is calling psylink.

Re: the source level debugging. This should work fine with source files in other directories.

Could you ask the developer the directory structure he is using, which the current directory is when the code is compiled and which the current directory is when the debugger is executed ?

Also is the code C or C++ and which version of ccpsx does he have ?

Dan Burnash

---

5/30/95 2:27 PM

Assembly manual

Dave Elton

Development Env.

Does anybody there know where I can get or download the complete ASMPSX assembly instructions manual? I noticed that lots of directives used in the samples are not documented in Developers Reference Guide, like addi, je et.al. Actually, in this guide I cannot find the library docs for libspu.lib. Is there another documentation I don't know ?

---

5/30/95 1:27 PM

Re(3): PadInit

Mike Benna

Development Env.

The 4 second delay may be coming from the message window output that PadInit() emits. If your interrupts aren't set up properly on the DTL-H2000 then output only goes at about 15cps, therefore you get a 4 second delay. Fixing the interrupt setup solved my 4s delay from PadInit().

---

5/30/95 2:04 PM

Re(4): PadInit

Mark Beardsley

Development Env.

Perhaps this is my problem. I'm not using interrupts from the boards (I haven't needed them and saw many people reporting problems with it awhile ago). I thought that having the interrupts off would prevent messages from being sent at all. Is this true? or does it simply make the messages get sent slower (causing delays) ? Thanks.

---

5/30/95 2:29 PM

Re: Compiler crashes with optimizations

Dan Burnash

Mike Benna

Psyq Tools

How does it crash? If the compiler is crashing, then I would like to take a look at it. Upload the routine to me personally and I will try to get the problem fixed.

---

5/30/95 2:41 PM

Re: Debugger problems

Dan Burnash

Mike Benna

Psyq Tools

I have not been getting divide-by-zero errors from the debugger. Have other people been experiencing similar problems?

I will pass your information on freeing up excess CPU time on to the debugger expert.

---

5/31/95 2:06 PM

Re: Debugger improvements

Bill "Angus" Guschwan

Development Env.

If you use the + or - on the keyboard keypad, you can step into data structures of say a vars window or a watch window after a alt-g. Make sure you use the latest 4.52 i think debugger.  
angus

---

5/31/95 3:09 PM

Re(2): Debugger improvements

Brian Greenstone

Development Env.

One problem I've found is that if you're putting the stack into the d-cache (fast ram), then any local variables that get pushed onto the stack appear as 0x00 in the debugger. Apparently the debugger cannot access variables in the d-cache correctly.

Whenever I need to step through code that does this, I always have to temporarily define the variables as static in order for them to show up with the correct values in the debugger.

-Brian

---

5/31/95 7:40 AM

Debugger improvements

Carl Ferreira

Development Env.



(As if you didn't already know)

I would request that the debugger be capable of displaying structure elements. This business of finding the structure and then decomposing the hex display is absurd.

Carl Ferreira

---

6/1/95 6:13 PM

dcache debugger fix

Bill "Angus" Guschwan

Development Env.

To: Bill\_Guschwan @ sepc.sony.com (Bill Guschwan) @ Internet cc: (bcc: Bill Guschwan) From: andy @ snsys.com (Andy Beveridge) @ Internet @ WORLDCOM Date: 06/01/95 08:05:17 PM CDT Subject: Re: feature request

Hi Angus

>One problem I've found is that if you're putting the stack into the d-cache >(fast ram), then any local variables that get pushed onto the stack appear as

>0x00 in the debugger. Apparently the debugger cannot access variables in the

>d-cache correctly. >>Whenever I need to step through code that does this, I always have to

>temporarily define the variables as static in order for them to show up with >the correct values in the debugger.

Ah, that's because the debugger default 'accessible memory list' does not include the d-cache area. It's pretty easy to add it, you just need to edit the debugger config file (file DBUGPSX.C0\* is the current one, also SONY\_PSYX.CFG in the PSYQ executables directory is the default template to be used if no config file is found). This is just a text file, and you will see a section like:-

```
----- #readram0 00000000 007FFFFFFF 1FC00000
1FC7FFFF 80000000 807FFFFFFF 9FC00000 9FC7FFFF A0000000 A07FFFFFFF BFC00000
BFC7FFFF #writeram0 00000000 007FFFFFFF 80000000 807FFFFFFF A0000000 A07FFFFFFF #update
FF 0003 #video 03 50 32 #label level 02 7F 7F #colour attributes 17 1F 3E B0 4F 5E 0C 70 C0 87
8E 8E F0 90 4F 87 7C 0E 0A 28 2F 70 #mono attributes 07 0F 70 70 07 70 0F 70 01 07 0F 0F 70 0F
07 07 70 07 07 0F 70 #default tabs ASM 0F 17 28 30 00 00 00 00 S 0F 17 28 30 00 00 00 00 C
08 00 00 00 00 00 00 00 H 08 00 00 00 00 00 00 00
```

Just add the extra range to the readram and writeram tables. Note that these lists must be kept in order (i.e. sorted) so be careful to add the new entries at the correct point.

I can't remember the address of the D-cache off-hand. Is it \$1F800000 ? or is that something else?

If you confirm the address to me I'll add it to the debugger as a default on all future updates.

If you have any questions about the other stuff in the config file then let me know. Probably the only really relevant thing is the default tabs for different file types.

-- Andy Beveridge at SN Systems Limited (Andy@snsys.com)

---

6/1/95 10:14 PM

New Debugger

David Schwartz

Development Env.

When is the new version of the debugger going to be released. Is there is ver 4.52. If there is where is it?

David

---

6/5/95 4:02 PM  
Re(3): PadInit  
Christopher Deel  
Development Env.

" Not only does PadInit always return a 1, but data from the 2nd joypad seems to show up in the high word of the 1st joypad data (not from a PadRead of the 2nd joypad). Even a couple of the old demos seemed to get their data from the 2nd pad by shifting the 1st pad data 16 bits to the right. "

I noticed this does not match the documentation. Right now I am using this "feature" of the library to read from the second pad.

Is this the way things are going to stay?

---

6/5/95 12:49 PM  
Windows Messages  
Bill "Angus" Guschwan  
Psyq Tools

The MESS1.COM fast message handler is now version 1.02 Hopefully everyone already has this as it is in PSX.ZIP.

The update was required because the previous version (1.01) updated a screen character to signify if it's buffer overflowed. This apparently caused problems for some developers running under MS Windows. The screen character is good for seeing if things work. So if you don't have problems, you can use 1.01 and you will still get the character.

PS: As requested by Angus, we are about to make a Windows message handler available to developers. This will be mainly intended for the current MS Windows test program but it will also work with the current DOS based software running under Windows. It is loaded in Psyq Tools: Tools and is called MESSAGES.ZIP.

---

6/6/95 7:41 PM  
Re(2): Debugger problem  
David R. Sullivan  
Bill "Angus" Guschwan  
Matt S. Arrington

Debugger 4.52 does not fix all stepping problems. I have used it for a couple of weeks now and it is better, however, still buggy.

DaveS.

---

6/6/95 8:57 AM  
new snpatch (5/31/95)  
Thomas Boyd  
Psyq Tools

SNPATCH.ZIP 124K  
Development Env.

here is a new version of SNPATCH.CPE from SN systems. Read the .DOC file for revision history and new feature. Here is an excerpt from the document describing the change: -----

----- \*\*\* 31-May-95 SNPATCH 4.04:

A minor update on SNPATCH 4.03, this just adds one more handy break function to the debug stub:- BREAK \$0407 ...which pauses program execution at that point. Execution can be resumed by hitting f9 (RUN) in the debugger.

Remember that this will only function if the debug stub is hooked in. i.e. it won't work if you code is booted of CD using a RESETPS 0

This has also been added to LIBSN.H as a macro for use from C:-

```
#define PSYQpause() asm("break 1031") /* inline to keep variable scope */
```

Please copy the enclosed LIBSN.H file to your Playstation GNU include directory.

To use this in your C source add a line like:-

```
PSYQpause();
```

Note that the C local variable scope at the pause point is preserved if you are debugging.

---

6/6/95 12:57 PM

new libcard.h

Thomas Boyd

Development Env.

LIBCARD.LIB 3K

Development Env.

Forward: ----- SUBJECT: Notes for Creating Titles with Memory Card

(Problem on Debugging Station and PlayStation)

This document will give you the notes and explanations of a library to meet the problem of the memory card on DTL-H1000, the debugging station, and PlayStation.

\*Brief The problem of the memory card operation on DTL-H1000 has been reported. This is regarded as a bug caused by the boot ROM on it, and PlayStation has the same problem.

As for DTL-H2000(PS board), a patch program, patchx.cpe, reflects the original specifications.

Thus, the memory card operates appropriately on PS board with patchx.cpe, but not on the debugging station and PlayStation.

In order to meet this problem, a part of the specifications of the memory card library is changed, and a cause descriptor, HwCARD, is introduced.

This change will give the same appropriate operations to the debugging station, PS board, and PlayStation.

\*Modifications 1. A cause descriptor, HwCARD, is disclosed. Events related to the cause descriptor are cleared automatically every a vertical synchronous interrupt. Therefore, when testing the event occurrence by sandwiching the function which wait for the vertical synchronization like the Vsync() function, the event occurrence can not be searched.

2. A cause descriptor of an event which informs the completion of the asynchronous function, \_card\_clear(), is changed. The source of supply of this function is changed from libcard.lib to card.obj. However, since libcard.lib is given no changes, never forget to link card.obj.

```
old SwCARD new HwCARD
```

\*Summary We have described before that the problem above occurred only on the debugging station. However, after our investigation, it has become clear that the same problem occurred on PlayStation. This modification is essential to create titles with the memory card. We would like you to follow it.

You may find it helpful to refer to the following as a sample program for this modification:

```
psx\sample\etc\cman\cman.c
```

Please don't forget to link the card.obj.

---

6/6/95 11:49 AM

Re: Debugger problem

Bill "Angus" Guschwan  
Matt S. Arrington  
Psyq Tools  
Debugger 4.52 fixes that problem. It is in the psx.zip in psyq tools: tools folder.  
Angus

---

6/6/95 11:24 AM  
Debugger problem  
Matt S. Arrington  
Psyq Tools

I've got a really annoying problem with the debugger. When I press F8 to single step through a line of code, the chances are 50-50 that I will get a message saying, "Unable to set a break point there." If I press <esc> and keep re-trying eventually, it will execute the line of code. This problem occurs at the source level, and I don't know if the problem exists at machine level.  
Matt

---

6/6/95 9:49 AM  
Re: Assembly manual  
Thomas Boyd  
Development Env.  
Dave Elton

Download the 2.6 docs from the documentation conference for LibSPU documentation. As for the ASMPSX docs, I am still looking to see if there is anything else... Tom ----- Does anybody there know where I can get or download the complete ASMPSX assembly instructions manual? I noticed that lots of directives used in the samples are not documented in Developers Reference Guide, like addi, je et.al. Actually, in this guide I cannot find the library docs for libspu.lib. Is there another documentation I don't know ?

---

6/7/95 11:24 AM  
Re(3): Debugger problem  
Bill "Angus" Guschwan  
David R. Sullivan  
Matt S. Arrington  
What are the problems with debugger 4.52? We'll fix them if there are problems.  
Angus

---

6/7/95 10:06 PM  
floating point  
Alex D. Tyrer  
Development Env.

Has anyone successfully used floating point (ie float/double) automatic variables (ie in a function). I can create global variables of type float, and statically assign them values, but any use of floats/doubles INSIDE a function generates code which can't be assembled at all.

ie  
float a = 1.1; // This compiles/assembles float b = 3.0; // correctly  
void MyFunc (void) { float c;

```
c = a + b; // ASSEMBLER BARFS HERE!!! }  
It makes using libMath.lib impossible. Am I just missing something? Like a new assembler? The  
debugger don't understand floats/doubles either.  
++alex @ HeadGames
```

---

6/7/95 1:24 PM  
Debugger suggestions / problems  
Carl Ferreira  
Psyq Tools

Note: I am using dbugpsxx version 4.34 -- I am now downloading 4.52 (?)  
When using the PCxxx calls, the debugger slows WAY down. How can this be avoided?  
The debugger will not display an element structure referenced by a global pointer.  
Why cannot the printf() function display to a message window in the debugger?  
Why not use the (somewhat) usual function keys that Watcom and Microsoft use for their  
debuggers -- i.e. F5 is Run, F9 toggles a breakpoint, F8 to step into a function, F10 to step over a  
function, etc.?

---

6/7/95 1:06 PM  
Re(5): PadInit  
Mark Beardsley  
Development Env.

If PadInit is supposed to return nothing, how can we tell how many controllers are connected?  
Also, PadStatus supposedly tells whether the PadInit result has changed. If PadInit has no  
result, what does PadStatus do?

---

6/7/95 12:06 PM  
Re(4): PadInit  
Dan Burnash  
Development Env.

Surprise, PadInit is supposed to be a VOID function. The value that it is returning is never set,  
so is worthless. In the future, it will be documented and written as such, so go ahead and treat  
it as void.  
Since one PadRead works for both controllers right now, go ahead and use it that way. It is  
unlikely to change in the future, though I am definitely not going to guarantee it. If it does  
change in a future library, the change document should let you know.  
Dan

---

6/7/95 9:44 AM  
Re: VBlank Pos.  
Kirk Bender  
Development Env.

We found that Vsync(mode), mode >0 returns the number of scan lines since last vblank. If it  
goes over the total number of scanlines/frame (240 for example) you've missed the next vblank  
and you are running at 30fps or less. so fps=(60fps)\* ( max scanlines)/Vsync(0) Vsync(0) will

block and wait for the next vblank, but Vsync(1) will not and can be used to get time checks at different points in the loop.

---

6/7/95 8:04 AM  
VBlank Pos.  
David Foley  
Development Env.

Is there a way to get back a reliable measurement of how much time is left before vblank occurs? We are building a real time performance meter and need to be able to have a function that records where we are during the main loop and how much time has passed between measurements and how much time is left in the vblank.  
David

---

6/7/95 2:27 PM  
Re(6): PadInit  
Dan Burnash  
Mark Beardsley  
Development Env.

>If PadInit is supposed to return nothing, how can we tell how many controllers are connected? I expected that question, but don't have a good answer. Since PadInit didn't give it to you anyhow, at least you haven't lost something you had in a previous version. :-)  
>Also, PadStatus supposedly tells whether the PadInit result has changed. If PadInit has no result, what does PadStatus do? Have you tried PadStatus lately? It no longer exists, so you are likely to get an undefined symbol linker error if you try to use it. PadStatus is already out of the 3.0 docs, so when they are released, everything will be consistent.

---

6/8/95 5:48 PM  
Re(2): VBlank Pos.  
David Foley  
Kirk Bender  
Development Env.  
THanks for the info.  
David.

---

6/8/95 11:06 AM  
Re: Tool Flags/Options  
Dan Burnash  
Paul A. Wilkerson  
Psyq Tools  
Download the GCC 2.6.3 docs from the documentation conference. This is the best that we have right now. Check the documentation conference occasionally, as updates will be placed there.

---

6/8/95 11:17 AM  
Re(2): Compiler crashes with opt  
Chris J. Pink  
Dan Burnash

Mike Benna

err 1K

Development Env.

I have the same problem with the compiler crashing.

The enclosed file is the output from the compiler when it dies, hope this will help track the problem

---

6/8/95 2:07 PM

PSYLIB bug

Mark Beardsley

Dan Burnash

Psyq Tools

SEQ3.OBJ 28K

Development Env.

I've found a strange problem with PSYLIB. I have a library SCENE.LIB with about 6 modules in it. when I try to add a new module using {PSYLIB /u ..\pub\scene.lib seq3.obj} my pc will crash as the hard drive just chugs away forever. However, if I copy the library into the current directory and use {PSYLIB /u scene.lib seq3.obj} it will work fine. Sometimes it will work okay across directories, sometimes not. I've attached the library and an object file that will cause the bug, hopefully it will help in tracking it down.

---

6/8/95 3:20 PM

Converting to str movie format

Mike Bartholomew

Development Env.

Message from Polly Harris via Mike Bartholomew.

I am trying to write a converter for the sgi which creates str format movies. I think I understand the headers str uses, but I don't have much experience with data compression. Could someone explain the compression routines that the movie converter tool uses to create str movies, and how I can recreate them on an sgi in "C". Thank you.

Polly Harris SingleTrac Entertainment Technologies

---

6/8/95 7:00 PM

Re: floating point

Blake E. Senftner

Development Env.

I was having problems with floats, until I complained to Angus. He let me beta the new libmath.lib from lib 3.1 and it works perfect.

-Blake

---

6/9/95 10:07 AM

Pysq Tool versions

Henrik Markarian

Psyq Tools

I believe that the following are the latest and greatest versions of the pysq tools, but I just wanted to make sure:

RESETPS.EXE 1.03 RUN.EXE 2.30 ASMPXS.EXE 1.27 ASPXS.EXE 2.18 CCPSX.EXE 1.15  
DBUGPSX.EXE 4.52 PSYLIB.EXE 1.07 PSYLINK.EXE 1.35 PSYMAKE.COM 1.11 DEXBIOS.COM  
1.22  
Henrik @ Mindscape

---

6/9/95 9:18 AM

Re(7): PadInit

David W. Marshall

Dan Burnash

Mark Beardsley

I tossed all the pad calls in libetc because they seemed flaky.

I use the low level stuff in the kernel library

InitPad() StartPad() StopPad()

They seem to work fine. InitPad() takes a pointer to 2 buffers so by checking the data in each buffer you can always tell when connectors are un-plugged and plugged back in.

However, the button equates for the libetc stuff don't apply to the kernel stuff.

dave

---

6/9/95 2:35 PM

Re(2): Debugger Enhancements

Thomas Boyd

Mark Beardsley

Borden Covell II

I have forwarded your requests to SN systems. Tom

---

6/9/95 11:02 AM

Debugger Enhancements

Borden Covell II

Thomas Boyd

We have the following suggestions for changes to the debugger:

1. Use the "std" function keys as in MS/Watcom debugger
2. Provide a way to get control back when a program has not called pollhost for a while.
3. provide a stack trace command.
4. don't lose the contents of a message window when user switches away and comes back.
5. allow a type cast in a watch window. if a variable is defined as void but has been case in the program, allow the operator to specify a type cast in the watch window.

Thanks.

---

6/9/95 2:28 PM

Re: Debugger Enhancements

Mark Beardsley

Borden Covell II

Thomas Boyd

Two other features that would be nice:

1. some way of restarting the code from the beginning (without having to exit, resetps, download snpatch, and re-load the debugger).



2. have the compiler set the DOS errorlevel for warnings as well as errors. Perhaps level 1 could be set for warnings and level 2 for errors.  
Thanks.

---

6/9/95 8:45 AM  
JPEG/MPEG movie compression  
Thomas Boyd  
CD

> I have been asked the following: > ----- > I am considering playing animation in JPEG/MPEG on the playstation. I am > wondering whether the decoding functions in libpress.lib support third party > JPEG/MPEG format, for example: if I compress my data into JPEG/MPEG using tools > like Alchemy on IBM PC. (It will be hard to compress my data using the encoding > functions supplied by libpress.lib, which needs to be run on playstation). I > appreciate any guidance on this. > -----

We have no plan to support third party JPEG/MPEG format with libpress.lib now. But they can make their own tools like Alchemy, as long as they use it personally and they use our libraries. If they want to sell it or distribute it to anyone else they need to let us know. I think libpress.lib doesn't have encoding functions now while we have the documentation of them. So, I think it is impossible to implement Alchemy.  
Koji

---

6/12/95 8:56 AM  
Re(4): Debugger Enhancements  
Borden Covell II  
Thomas Boyd  
Thomas Boyd

Some comments on the reply:

1. When is the Windows Debugger due and will it be "better" (i.e. same/more functionality than current debugger)?
  2. putting pollhost into vbl callback has the following drawbacks: - must be taken out before burning CD. - does not help if the program crashes - not everyone has vbl callback
- Thanks
- 

6/12/95 9:37 AM  
More debugger enhancements  
Dave Ross  
Psyq Tools  
Bill "Angus" Guschwan

There must be a way to do this now, but I can't find any way in the debugger: Formatting the display of variables in a watch window....how can I display int's in HEX? (like Turbo C's var,x syntax)? Anyone know if it can be done?

---

6/12/95 5:40 PM  
Re: More debugger enhancements  
Borden Covell II  
Dave Ross  
Psyq Tools

I think you can press tab with variable highlighted. This cycles through various display modes.

---

6/12/95 3:17 PM  
bugs in 3.1  
Eric Knopp  
Development Env.

sprintf no longer works my vblank handler no longer works whats up???

---

6/12/95 10:47 AM  
Re(5): Debugger Enhancements  
David W. Marshall  
Psyq Tools  
Thomas Boyd

I have noticed the following problem in the debugger.

a) If I am in the debugger with the code running and press ESC, everything stops (which is what I want).

b) If I am in the debugger with the code running and set a software breakpoint, when the code hits that breakpoint not everything stops. The system VBL still seems to be running.

You can see this by turning UPDATE ON and setting a memory window at the joypad buffers that were set by the InitPad() kernel call.

When a) is done and I then step thru code, these joypad values do not change (which is what I want). When b) is done and I step thru code, the joypad values will change.

Am I using the debugger incorrectly? Is hitting a software breakpoint supposed to cause the system to behave different than pressing ESC? Is this a known bug in the dev env?

thanks,  
dave

---

6/12/95 8:00 AM  
Re(3): Debugger Enhancements  
Thomas Boyd  
Thomas Boyd  
Mark Beardsley

From SN Systems: ----- Thanks for the debugger suggestions. Here's some feedback for you

>1. Use the "std" function keys as in MS/Watcom debugger

I think this would upset a lot of developers that are used to Psy-Q. I'd like to put both keymaps into DBUGPSX but unfortunately user defineable keys doesn't fit into the currrect debugger structure very easily (though we've made sure we can do this easily in the Windows debugger). If I get time I would like to retro-fit user def keys but it's quite a low priority at the moment. If many other developers ask for this then please let me know.

>2. Provide a way to get control back when a program has not called pollhost for >a while.

The only reliable way to do this is an NMI but unfortunately the Playstation cpu doesn't have one. I'm currently examining possibilities of chaining one of the hardware ints that the developer is guaranteed to be using (so that we can do some kind of C-source profiler) but I'd question whether this is actually any more useful for debugging than just placing your pollhost() call inside a vbl callback.

>3. provide a stack trace command.

This should be happening quite soon.

>4. don't lose the contents of a message window when user switches away and >comes back.

Ah yes. I'll try to fix this for the next update.

>5. allow a type cast in a watch window. if a variable is defined as void but >has been case in the program, allow the operator to specify a type cast in the >watch window.

Martin is implementing this at this very moment.

>Two other features that would be nice: > >1. some way of restarting the code from the beginning (without having to exit, >resets, download snpatch, and re-load the debugger).

I'm looking at this now.

>2. have the compiler set the DOS errorlevel for warnings as well as errors. >Perhaps level 1 could be set for warnings and level 2 for errors.

Hmm. Martin says he will take a look at the compiler and see how easy it is to do this.

---

6/13/95 3:50 PM

Re: Pysq Tool versions

David R. Sullivan

Henrik Markarian

Psyq Tools

Note: Addition to version #'s

MESS1.COM is version 1.02

Dave.

---

6/13/95 9:26 AM

Re(4): Debugger Enhancements

Thomas Boyd

Thomas Boyd

Psyq Tools

>>2. have the compiler set the DOS errorlevel for warnings as well as errors.

>>Perhaps level 1 could be set for warnings and level 2 for errors.

>Hmm. Martin says he will take a look at the compiler and see how easy it is >to do this.

More news on this from SN Systems: ----- ...psymake (and most other make utilities) can be told to ignore error levels below a certain value but so it could ignore the warning level but stop on the error level. Asmpsx does in fact give an error level of 2 for warnings and 3 for errors but a number of customers have complained about this (because they didn't realise how to make psymake ignore the error level) so I think you're probably right in saying that we shouldn't make this change to the compiler.

---

6/13/95 2:37 PM

Re: Pysq Tool versions

Dan Burnash

Henrik Markarian

Psyq Tools

You have the latest.

---

6/13/95 5:46 PM

Re: C++ Style Comments

Bill "Angus" Guschwan

Mike Lamb

Psyq Tools

Well, first you should not be porting code from 3DO. We don't want it. Go away. Leave us alone.

Second, try `-comments-c++` on your `ccpsx` line.

Third, if you want to emulate the 3DO's inability to draw and compute at the same time, then shoot yourself in your head cause your game won't sell. All 3DO ports MUST draw and calculate simulataneously.

Angus

All implied humor intentionally implied.

---

6/13/95 5:28 PM

C++ Style Comments

Mike Lamb

Psyq Tools

Is there any way to use C++ style `//` comments in my C code ?

This is supported by every other compiler that I have used in the last 3 years, and it's making the port of our code from the 3DO an unpleasant task.

Thanks.

---

6/14/95 9:52 AM

Re(4): Debugger Enhancements

Mike Bartholomew

Thomas Boyd

Thomas Boyd

>>2. have the compiler set the DOS errorlevel for warnings as well as errors.

>>Perhaps level 1 could be set for warnings and level 2 for errors.

>Hmm. Martin says he will take a look at the compiler and see how easy it is >to do this.

Please note that 'psymake' will abort if one of the commands that it is running returns a non-zero exit status. The way the compiler currently sets 'errorlevel' is useful because 'psymake' will abort on a compiler error, but continue on warnings. If you change the compiler as recommended above, we will no longer be able to 'psymake' code that has warnings (I know that we want to have our code compile cleanly, but this is not always practical since we compile with '-Wall' to pick nits).

- Mike Mason using Mike Bartholomew's account.

---

6/14/95 7:01 PM

Re(2): C++ Style Comments

Mike Lamb

Bill "Angus" Guschwan

Psyq Tools

Thanks Bill,

But does the compiler provide a flag that I can set to shoot myself in the head, it's too much effort for me to do it myself ? :-)

---

6/14/95 9:56 AM

Re(5): Debugger Enhancements

Dan Burnash

Mike Bartholomew

Mark Beardsley

>>2. have the compiler set the DOS errorlevel for warnings as well as errors.

>>Perhaps level 1 could be set for warnings and level 2 for errors.

For now, at least, it has been decided not to implement this change.

Dan B.

---

6/14/95 11:21 AM

Re: Debugger div by 0 - more info

Borden Covell II

Mike Benna

Psyq Tools

we had a similar problem running under windows. turning of the 32-bit acces (disk and file) solved it.

---

6/14/95 9:27 AM

Debugger div by 0 - more info

Mike Benna

Psyq Tools

Here's some more information about the debugger dying from divide by zero errors:

- 1) It only seems to happen with any degree of consistancy when running under OS/2. I've fiddled with numerous session settings but none appear to have any effect. Under DOS 6.22 it happens very irregularly.
  - 2) The problem has begun occurring much more frequently since my project has grown to start accessing the disk more. The debugger crashes approximately 80% of the time when the PSX is heavily accessing the PC's hard drive. Often it will crash within the first quarter second of starting the PSX program, sometimes it will hold out for as much as 10s.
  - 3) If I put a 33ms delay (two VBLs) before and after each call to lseek() or read() the problem almost completely goes away (but of course disk access times are somewhat slower). A 17ms delay reduces the problem considerably compared to no delay but does not completely fix the problem.
  - 4) I have not seen it crash when the PSX is not accessing the PC's HD.
  - 5) It seems unaffected by the CPU or disk load under OS/2. I've tried it with a minimally loaded system as well as with several disk and cpu intensive tasks running in the background (compiles, etc.) but it does not appear to be related.
  - 6) I'm moving on to use the CD emulator in the hopes I can work around this problem.
  - 7) The debugger revision I'm using: "This version 4.49a assembled 16:36, Friday, 3 March 1995"
- 

6/14/95 7:07 PM

MultiEdit and PsyQ

Mike Lamb

Psyq Tools

If anyone is interested, and the management willing, I can upload the macro source to get MultiEdit to jump to the errors in a PsyQ compilation.

Plus some other macros to enhance MultiEdit's Brief emulation.

Anyone using MultiEdit out there ?

---

6/15/95 11:42 AM  
Re: bugs in 3.1  
Dan Burnash  
Development Env.

Try adding a "ResetCallback();" at the beginning of your program if it isn't there already. That might take care of the vblank handler problem.  
Send me sample code demonstrating the problems that persist.

---

6/15/95 11:19 AM  
Re: MultiEdit and PsyQ  
Eric Knopp  
Mike Lamb  
Psyq Tools  
Yes we use MultiEdit and would be interested in such a thing...

---

6/15/95 1:32 PM  
Re(2): bugs in 3.1  
Eric Knopp  
Development Env.

I've found that my error was due to the fact that I wasn't using the -G0 flag in my compilation...  
Now things work again. What, if any, are the needed reasons to use this flag when compiling?

---

6/16/95 12:44 PM  
3.1 ==> sample\sound\mutual not working  
Ian McGee  
Development Env.

This is kinda weird, but I can't figure out what's going on.  
I updated my system to the new lib 3.1 and various other utilities on the BBS. Most everything works fine.  
However, when I remake main.c in the sound\mutual directory and run it, it just blinks the TV screen. From then on, my windows system runs \*extremely\* slowly. If I do this from DOS I get the same thing (without the speed decrease), but if I then run windows it runs in slow motion. I tried running the old main.cpe that I compiled under the 3.0 libs and it works fine. My system appears to be running correctly for other programs. I tried going back to the cdbios I was using before the updates and didn't see any difference. Dexbios hasn't changed. Obviously libsn and several other things have changed, but I can't think of much that might cause this.  
Er, wait. The code kinda looks like it's trying to read files from the hard disk. Is it maybe that the 3.1 libraries are retrying over and over again to open the files, where the 3.0 libraries would have just failed the read and exited?  
Any ideas? Am I clueless, or really clueless?

---

6/16/95 9:24 AM  
Re(6): Debugger Enhancements

Mark Beardsley  
Dan Burnash  
Mike Bartholomew

One more chapter in the continuing saga of debugger enhancements:  
Would it be possible (or perhaps it is possible already and I don't know how) to be able to alter a variable's value from inside a var window and/or a watch window, instead of having to get the variable's address and then poke it in through a hex window?  
This would make PlayStationLand a happier place.

---

6/16/95 3:46 AM  
Re(2): MultiEdit and PsyQ  
Mike Lamb  
Eric Knopp  
Psyq Tools  
MEPSYQ10.ZIP 30K  
Development Env.

OK, here are the MultiEdit mods. I've only tested them on the DOS version, not the new Windows version.  
Good luck, John Brandwood (only pretending to be Mike Lamb until I can figure out how to change the account name).

---

6/19/95 11:22 AM  
PSYLINK bug  
Dave Ross  
Psyq Tools  
Bill "Angus" Guschwan

We're having a weird problem with the linker that hopefully someone has found a work around: we're using the new feature of the compiler to put variables into named sections and the ORG that section in our linker command file. All is well and good except that sometimes the linker puts those variables starting at zero instead of where our command file says to put it (and the map file shows the section org'd where it's supposed to but variables therein are not org'd there). The only fix I've found is to recompile and relink everything and sometimes it comes out right, sometimes it comes out wrong. We're using the latest tools in the RELEASE folder. Anyone have a fix for this???

---

6/19/95 4:07 PM  
C Compiler questions  
David Minogue  
John Phua

What is the most reliable documentation for the GCC compiler? Is there a way to print it out? It seems odd that I have such extensive documentation on the Assembler, which is used so little, and so little documentation on the Compiler, which is used so much.  
I downloaded the latest compiler from this section's library (gnu263.zip), but there was no associated readme file. Is this a stable version, or is a new one on the way. The only feature which I am currently lacking is the ability to direct code and data to named sections. Is this now supported, and if so, how?  
-- David Minogue, Acclaim Entertainment.

---

6/19/95 1:01 PM  
Re(7): Debugger Enhancements  
Borden Covell II  
Mark Beardsley  
Dan Burnash  
I agree wholeheartedly!

---

6/19/95 3:36 PM  
Re(8): Debugger Enhancements  
Dan Burnash  
Borden Covell II  
Mark Beardsley  
>Would it be possible (or perhaps it is possible already and I don't know how) to be able to alter a variable's value from inside a var >window and/or a watch window, instead of having to get the variable's address and then poke it in through a hex window?  
SN Systems is looking into this as I type. If all goes well, it MAY(no promises) be in the next version of the debugger.

---

6/19/95 10:48 AM  
Re: PSYLIB bug  
Dan Burnash  
Mark Beardsley  
Psyq Tools  
I have tested the files you sent me, running Psylib numerous times, but have been unable to reproduce the problem. Perhaps you have an older Psylib.exe, I am working with version 1.07. If you don't have this version, download the latest and test again. If the problem continues, please try to find out what key factor is causing the bug to surface.

---

6/20/95 4:25 PM  
Re: Compiler crashes with optimizations  
Dan Burnash  
Mike Benna  
Psyq Tools  
If you get a compiler error something like:  
>C:\PSX\BIN\ccpsx.EXE -O2 -c -g -o o\psxmodel.obj c\psxmodel.c >Stack Fault at eip=ce163  
>eax=000000bc ebx=000033c0 ecx=00336108 edx=00001778 esi=0017714c edi=00000000  
>ebp=0016c730 esp=0011b0f0 cs=ef ds=e7 es=e7 fs=e7 gs=ff ss=f7 cr2=0000cff4 >Call frame  
traceback EIPs: > 0x000ce163 > 0x000266d4 > 0x00015dd7 > 0x000073c1 > 0x000255f4 >  
0x00027bc1  
it isn't a compiler bug. The compiler has run out of stack space. This is presumably because the user is in a DPMI environment (e.g. windows or running something like QDPMI). To increase the amount of stack space you can set the dpmistack parameter in the GO32 environment variable. e.g.  
set GO32=dpmistack 500000  
The default size for the stack is 256k

---

6/20/95 4:11 PM  
Re: What is rdata



Dan Burnash  
Brian C. Lewis  
Psyq Tools

.text executable code .data initialized data .bss uninitialized data .rdata read only data(e.g. constants) .sdata small size initialized data\* .sbss small size uninitialized data\*

\*small - the size limit is configurable with the -G# compiler switch. The # represents the maximum byte size entity to put into sdata or sbss. Use -G0 for event handlers. The default is -G8, or an 8 byte limit for an item to be put into sdata or sbss.

---

6/20/95 5:57 PM

Re: C Compiler questions

Dan Burnash  
David Minogue  
Psyq Tools

Download the info263.zip file in Documentation->Latest Docs->gcc 2.6.3 docs for the latest. This is what we have for the gcc compiler.

The compiler you got from gnu263.zip is stable, so I recommend using it. I don't know when the next release will be.

It is now possible to direct code and data into named sections. However, we don't have documentation on how to do it yet. We are hoping it will arrive shortly. If it doesn't, I will put whatever I have into readable form and pass the information along.

---

6/20/95 3:17 PM

What is rdata

Brian C. Lewis  
Psyq Tools

Could someone please tell me what is put in each of the groups in the map file. In particular I am interested in rdata.

dand

---

6/20/95 4:32 PM

Re: PSYLINK bug

Dan Burnash  
Dave Ross  
Psyq Tools

I'm not sure what could be causing this. I really need a concrete example to work with in order to track it down. If you can put something together that at least irregularly reproduces the problem, please send it to me directly and I will forward it on to SN Systems.

---

6/21/95 10:16 AM

UpdtaeCD fails with 32-bit disk access

Borden Covell II  
Development Env.

Some time ago, when we were using PCRead, we found that we had to turn 32-bit files and disk accessing off if we wanted to be able to open files under windows. Now that we are using the CD emulators I decided to try to turn these features back on. Unfortunately, this causes UPDATECD to fail about 90% of the time.

Has anyone else seen this? Is there some way to run UPDATECD so that it does not fail? Will there be a fix for this?

While I'm here, I'd like to suggest that a command line switch be added to updatedcd to allow for fully automatic updating of the cd image. We make a chg to our program and then have to sit and wait for the updatedcd program to pop up and then press the 'y' key. Couldn't we get it to be completely automatic???

Thanks.

---

6/21/95 12:35 PM

Re: 3.1 ==> sample\sound\mutual not working

Dan Burnash  
Development Env.

Ian McGee

I had the same problem with lib 3.1. It is evidently less tolerant than the 3.0 libs. The example fails because cdrom access functions are being called. Comment out the WITH\_CDROM #define, and it will work correctly.

note: The "#define WITH\_CDROM" works fine on the cd emulator.

---

6/21/95 12:27 PM

Re: UpdtacCD fails with 32-bit disk access

David W. Marshall  
Borden Covell II  
Development Env.

I'd like to add to the request and ask that all the SN System disk utilities be accessible from DOS command line switches.

If I want to see all the files that are on partition 2 of my SCSI drive, I would like to give it some flags and have it print the info rather than having to go into the BuildCD screen interface to see them.

---

6/22/95 2:51 PM

Re(2): C Compiler questions

David Minogue  
Dan Burnash

Psyq Tools

Thanks. Any suggestions on printing a hardcopy of the GCC documentation?

-- David.

---

6/27/95 6:31 PM

InqPAD  
Jim Rogers  
Development Env.

What happened to InqPad()? It was the only way to check for disconnected pads using lib kernal pad access.

Jim R.

---

6/27/95 6:27 PM  
Re(2): bugs in 3.1  
Jim Rogers  
Development Env.

We've just upgraded to the 3.1 libs. We too found that The vblank handlers in each project using 3.1 stopped working. We are calling resetcallback before calling VSyncCallback( vblhandler ). vblhandler never gets called. Works fine with 3.0 libs. Anyone else have this problem and solve it?  
Thanks

---

6/27/95 9:26 AM  
PSYMAKE questions  
Mark Beardsley  
Dan Burnash

I'm trying to streamline my make process. I had been using simple batch files to re-build stuff as I need it, but now that my project is growing quickly, I need something better. I've been playing with PSYMAKE, but I can't seem to get it to do what I want. For Example : If I have two object files that I want to maintain in a library, I would think that I should do something like this:

```
LIBRARY.LIB: SOURCE1.C SOURCE1.H [command to compile source1.c] [command to  
add source1.obj to library.lib]
```

```
LIBRARY.LIB: SOURCE2.C SOURCE2.H [command to compile source2.c] [command to  
add source2.obj to library.lib]
```

However, this method produces "multiple rule definitions for 1 file" errors (it also causes "unrecognized command" errors, even though the commands are ok). It would seem that PSYMAKE wants the two sections combined into one, but that means that both source files get compiled even if only one has changed. This gets to be extremely annoying if you have a lot of source files in a library. Why does it matter that LIBRARY.LIB has more than 1 set of dependencies? Is anyone really using PSYMAKE? I'd rather not go to another tool, but it seems unusable this way. Thanks.

---

6/27/95 10:26 AM  
Re: PSYMAKE questions  
Dan Burnash  
Mark Beardsley  
Psyq Tools  
Try this style, it works for me.  
library: source1.obj source2.obj psylib /u lib.lib source1.obj source2.obj  
source1.obj: source1.c ccpsx -g -c source1.c  
source2.obj: source2.c ccpsx -c -g source2.c

---

6/27/95 10:26 AM  
Re: PSYMAKE questions  
Dan Burnash  
Mark Beardsley  
Psyq Tools

Try this style, it works for me.

```
library: source1.obj source2.obj psylib /u lib.lib source1.obj source2.obj
source1.obj: source1.c ccpsx -g -c source1.c
source2.obj: source2.c ccpsx -c -g source2.c
```

---

6/27/95 9:26 AM  
PSYMAKE questions  
Mark Beardsley  
Dan Burnash

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For Example : If I have two object files that I want to maintain in a library, I would think that I should do something like this:

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add source1.obj to library.lib]
```

```
LIBRARY.LIB: SOURCE2.C SOURCE2.H [command to compile source2.c] [command to
add source2.obj to library.lib]
```

However, this method produces "multiple rule definitions for 1 file" errors (it also causes "unrecognized command" errors, even though the commands are ok). It would seem that PSYMAKE wants the two sections combined into one, but that means that both source files get compiled even if only one has changed. This gets to be extremely annoying if you have a lot of source files in a library. Why does it matter that LIBRARY.LIB has more than 1 set of dependencies? Is anyone really using PSYMAKE? I'd rather not go to another tool, but it seems unusable this way. Thanks.

---

6/27/95 10:54 AM  
Re(6): Debugger Enhancements  
Dan Burnash  
David W. Marshall  
Psyq Tools

>I have noticed the following problem in the debugger. > >a) If I am in the debugger with the code running and press ESC, everything >stops (which is what I want). > >b) If I am in the debugger with the code running and set a software breakpoint, >when the code hits that > breakpoint not everything stops. The system VBL still seems to be running. > >You can see this by turning UPDATE ON and setting a memory window at the joypad >buffers that were set by the InitPad() kernel call. > >When a) is done and I then step thru code, these joypad values do not change >(which is what I want). >When b) is done and I step thru code, the joypad values will change. > >Am I using the debugger incorrectly? >Is hitting a software breakpoint supposed to cause the system to behave >different than pressing ESC? >Is this a known bug in the dev env? >----->

-----  
The response from SN Systems:

This is not a bug it's actually a feature - one that was quite tricky to support. This feature was added in debug stub version 4.02 because without it you can't debug certain types of multi-threaded code which depend upon interrupts e.g. anything using the CD streamer library. Such code requires that interrupts have a guaranteed response so if software breaks killed the interrupts then the library callbacks would fall too far behind the CD data flow and your program would die.

Actually, ESC should not stop interrupts either (although shift-ESC should). I will check this.

You can configure the debug stub to stop ints whilst in the downloader code if you want but you should \*carefully\* consider the effects this may have on certain library and kernel routines that are interrupt dependent. I would generally advise not to configure the debug stub like this unless you absolutely must:-

The configuration is only temporary - it will reset back to it's default when you reset the PSX or re-download SNPATCH so you should embed this code in your program - you probably want it at the start. I'm giving it here in ASMPSX assembly language form but you can in-line it using the asm("") syntax in your C source code if you like:-

```
li a0,$FFFFFFFC ;AND mask = $FFFFFFFC    move zero,a1    ; OR mask =
$00000000    break $0403
```

The AND mask will be ANDed with Status reg on entry to downloader. The OR mask will be ORed with Status reg on entry to downloader. (see MIPS RISC ARCHITECTURE book for more info on status register bits)

If you in-line this in your C code don't forget to use the GNU-C syntax of e.g. 0xFFFFFFFF for hex numbers. You may prefer to make it a little .S assembly source file and assemble it to .OBJ with ASMPSX and then declare it with a C external prototype if you don't like having this sort of mess cluttering up your C source.

---

6/27/95 9:47 AM

Re(2): PSYLINK bug

Dave Ross

Dan Burnash

Psyq Tools

The strange thing about the bug is it's non-reproducibility - for the last several days it hasn't happened: as soon as it rears it's ugly head again I'll get you data.

---

6/28/95 5:23 AM

Update to MultiEdit support for PsyQ

Mike Lamb

Psyq Tools

MEPSYQ11.ZIP 30K

Development Env.

I'm attaching an updated version of my MultiEdit macros for PsyQ.

The ERR\_PSYQ macro has been updated to support full path names in an error message.

Good luck,

John Brandwood (still unable to change the name on this message).

---

6/30/95 6:05 PM

Another update to MultiEdit support.

Mike Lamb

Psyq Tools

MEPSYQ12.ZIP 30K

Development Env.

Sorry for using up bandwidth with another update, but this one fixes the error macro to handle errors from the Psylink linker.

Good luck,

John Brandwood.

---

7/4/95 10:17 AM  
Re: C++ Header Files  
Yoram Berkowicz  
Michelle Feraud  
Development Env.  
Hi Michelle!

I've just started playing around with the programming environment, and am opted to using the C++ compiler. The GNU compiler seems to be working, but is having problems with libgpu.h and libgte.h. In contrast, other header files such as libsnd.h are fine.

Going through the archives, I've noticed you dated query and was wondering what's new... Have you found a solution, or have you sadly abandoned C++ development? Hope to hear the former is the case.

Cheers! Jonathan Owen

---

7/5/95 5:25 PM  
Psylink error question  
Crystal Dynamics  
Development Env.

hi folks. I have a question about an error I'm getting from psylink. when I compile a bunch of my modules using optimization (-O3) and try to link them, I get a "value (some number) out of range in instruction patch" error. what does this error mean? the psylink manual lists the error but doesn't give much in the way of explanation.

thanks - Chuck Woo - Illusions Gaming Co.

---

7/5/95 12:31 PM  
Re(3): C Compiler questions  
Dan Burnash  
David Minogue  
Psyq Tools

The simple answer: No, we don't have a simple method of printing these docs from a pc.

The more complete answer:

There are versions of the documents in TeX format. This can be printed as long as you have a TeX processor which for the PC means gathering together a number of share/free ware bits and pieces. The easiest way to do it is if you have access to a unix machine because these will normally have TeX installed.

---

7/6/95 4:02 PM  
Re: InqPAD  
Dan Burnash  
Development Env.  
Jim Rogers

When using InitPAD, the first byte is the connection status/reception result. If it is 0, all is well, if it is FF, the controller is disconnected. Those are the only two values I have seen. Using this mechanism is easier/better/faster then InqPAD, which no longer exists.

Dan Burnash SCEA

---

7/6/95 9:26 AM

Re: Psylink error question

Dan Burnash  
Development Env.  
Crystal Dynamics  
Chuck Woo,

Please send me the source code that is getting the psylink error, so I can find out what is causing it. The message doesn't sound familiar, so I need to look into it here.

Dan Burnash SCEA

---

7/6/95 9:35 AM

Re(2): Psylink error question

Crystal Dynamics  
Dan Burnash  
Development Env.

hi Dan, I don't know if it's feasible to send you the source code because the error only seems to happen when I do wholesale optimization on large parts of the source code. I found it also doesn't happen as soon if I compile a module without a -G0 flag (which I use for my interrupt code). I'll see what I can whip up and get back to you. thanks for your help!

- Chuck Woo - Illusions Gaming Co.

---

7/7/95 4:14 PM

Re(2): C++ Header Files

David Foley  
Development Env.

forget using c++ for now. we built a bunch of code in c++ but the compiler doesn't currently support constructor/destructors.

David

---

7/7/95 3:40 PM

Re(5): Psylink error question

Dan Burnash  
Crystal Dynamics  
Development Env.

SN Systems knows of the problem you reported. The mixed compilation of -G# option is indeed the culprit. A new aspsx is being readied to fix the problem. Here is more information on the problem.

When you get an error something like "T.OBJ : Error : Value (36988) out of range in instruction patch", here is why:

If they are using any of aspsx 2.17-2.20 there can be a problem with a gp register optimisation that was added in 2.17. This optimisation makes any access to external variables that are <= 8 bytes (or whatever -G... value is specified) use gp relative access. The problem is that the

libraries were compiled without gp relative optimisation and so all the external variables are placed in the .data and .bss sections rather than the .sdata and .sbss sections. These are too far away from where the gp register points to allow gp relative access and so the linker reports the errors as shown in your listing.

A new compilation of the libraries with the -G option turned on may be done. When I know for sure, I will post the information.

Dan Burnash SCEA

---

7/7/95 9:57 AM

testmess.com source code

Randy X. Thompson

Development Env.

Would it be possible for us to get the source code to the TESTMESS.COM program that redirects the development system's printf() output to the screen? I'd like to make it exit to DOS upon receiving a special character from the PlayStation (such as Ctrl-Z), instead of waiting for a keypress only.

-Randy Thompson

---

7/8/95 4:45 PM

How to inspect contents of enums in DBUGPSX?

Mike McAulay

Development Env.

I'm using version 4.53 of DBUGPSX. Variables that are declared as type enum show up in the debugger's Vars and Watch windows but it isn't possible to inspect their contents. E.g. in debugging the following code:

```
typedef enum {  ENUM_ONE = 1,  ENUM_TWO } my_enum;
```

```
main() {  my_enum anEnum;
```

```
  anEnum = ENUM_ONE; }
```

the contents of the Vars window will look like:

```
anEnum      enum
```

Note that the value of anEnum is not displayed. Clicking on the variable name does nothing, pressing enter does nothing, there doesn't appear to be any way to determine the value of anEnum without rummaging through raw memory. Ideally, the debugger should show the enumerated value, e.g. ENUM\_ONE in the above example. Barring this, it should at the very least show the integral value (1 in this case).

Am I missing something obvious? And if not (SCE), any chance of this getting patched up in the next debugger rev?

Thanks,

M.

---

7/10/95 6:49 PM

finding length of a bs file

Borden Covell II

Development Env.

We need to be able to determine the length of a BS file by looking at the bs file itself. It seems obvious that the length must be encoded in the file, but we don't know the format of the data.



Can anyone tell us???  
thanks!

---

7/10/95 12:12 PM

Re(6): Psylink error question

Crystal Dynamics

Dan Burnash

Development Env.

hi Dan, thanks a lot for your help! I just punted and compiled everything with -G0, but now I know why I did it ;)

- Chuck - IGC

---

7/11/95 1:46 PM

Re: Fwd: r3000

Dan Burnash

Development Env.

Andrew Summerfield

Try "The MIPS Programmer's Handbook", by Erin Farquhar & Philip Bunce. Published by Morgan Kaufmann. Isbn# 1-55860-297-6. I have not used it much personally, but have been told by others that it is a good choice.

Dan Burnash SCEA

---

7/11/95 9:12 AM

Fwd: r3000

Andrew Summerfield

Development Env.

Can anyone recommend a good R3000 assembly language book? Thanks.

Andrew Summerfield Silicon Knights

---

7/11/95 2:25 PM

debugger kills windows

David W. Marshall

Psyq Tools

I have found the following problem when running the PSYQ dev stuff under a DOS window.

1)Using printf's in code so that something is printed once a frame.

2)Do NOT go into the debugger, so therefore the text is not being dumped into the message window.

3)Wait a couple of minutes

4)reboot the sony by typeing RESETPS 1

Every time when I do this I get dumped completely out of Windows and am looking at a DOS prompt.

Is this a known problem? I am using version 4.49a of the DBUGPSX software. I am using version 1.01 of the MESS1.COM software.

Where do all the printf's go when they can't dump to the message window?

thanks,

dave

---

7/11/95 8:44 AM

Re: finding length of a bs file

Thomas Boyd

Borden Covell II

Development Env.

Each video STR (XA with sound) sector is 2336 bytes long on your PC HD. (Audio sectors are also 2336 bytes, but they are peeled off in the CD-ROM subsystem and never get to your ring buffer). (STR files without audio are only 2048 bytes and do not have subheader or ECC added). The first 8 bytes are a subheader. The next 32 bytes are a sector header. The next 2016 bytes are data. The last 280 bytes are ECC, so they are padded with blanks because ECC is position dependant and calculated on the fly.

Header info for XA movie STR files with sound: My examples are from a 30fps movie with 37.8kHz stereo sound.

8 byte subheader: 00 01 43 80 00 01 42 80 (hex) repeated for reliability - I do not know what these #s mean  
32 byte sector header  
BYTE format ID 0x60  
BYTE format version 0x01  
WORD undefstrformat 0x8001  
WORD current sector number in current frame (ex: 1, 2, 3, 4, 5, 1, 2, 3, 4, 1...)  
WORD total sector count for current frame (ex: 5, 5, 5, 5, 5, 4, 4, 4, 4, 5, 5, ...)  
DWORD current frame number (ex: 1, 1, 1, 1, 1, 2, 2, 2, 2, 3...)  
DWORD size of .BS in bytes (note: this seems to be six bytes smaller than entire .BS data in the STR. Hex dump and see!)  
WORD frame width in pixels  
WORD frame height in pixels  
DWORD headm, first DWORD of .BS file  
DWORD headv, second DWORD of .BS file  
DWORD 0 (unused? - I don't know)

Hope this helps, Tom ----- >We need to be able to determine the length of a BS file by looking >at the bs file itself. It seems obvious that the length must be encoded >in the file, but we don't know the format of the data. Can anyone tell us???

thanks!

---

7/11/95 10:43 AM

Windows 3.1 Version

Pierre J. Maloka

Development Env.

Dan Burnash

Can I use U.S.A. Windows 3.1 for art and programming tools? Manuals say that I must use Japanese version of Windows.

---

7/11/95 11:30 AM

Re: Windows 3.1 Version

Dan Burnash

Development Env.

Yes, Windows 3.1 will work. No need for the Japanese version. Occasionally you may find some text that is still in Japanese two byte character form, and it will show up as garbage characters. This won't cause the program to crash, but will make it hard to figure out what is meant. Let me know if you run into any of these cases, so we can have the tools changed.

Dan Burnash SCEA

---

7/11/95 12:56 PM

Re(2): Windows 3.1 Version

Pierre J. Maloka

Development Env.

Thanks for the FAST response, you guys are batting 1000 in that category!

---

7/11/95 9:12 AM

Re(2): finding length of a bs file

Borden Covell II

Thomas Boyd

Development Env.

Thanks for the info. Since we are not using the STR format and are using bare BS files, we are trying to get the info that we need from the BS file itself, not from the STR file or sector headers.

Do you know more about the two DWORDs that you referred to in your message:

DWORD headm, first DWORD of .BS file    DWORD headv, second DWORD of .BS file

Maybe the info we need is in there???

Thanks, Borden

---

7/12/95 7:50 AM

Dir. of Production Technology

Christopher C. Rywelski

Documentation

I am in the process of putting together a Dev PC with the DTL-H2000 boards, and a CD-ROM emulator board. (This hardware was on loan to another developer and came back to me without documentation).

I need to find the document that explains the installation of the OS for the DTL boards (to include directory and file structures). In addition, if there exists updates to this process (e.g. software and documentation) please point me to them.

Thanks, Christopher 212.846.6495

---

7/12/95 10:17 AM

Re(2): Fwd: r3000

Andrew Summerfield

Dan Burnash

Development Env.

Thanks Dan. I'll look for "The MIPS Programmers Handbook"

Andrew

---

7/12/95 3:29 PM

Re(3): Psylink error question

David R. Sullivan

Crystal Dynamics

Dan Burnash

Chuck Woo,

I know this isn't the answer you want, however, with the linker you said that your problem may have something to do withg the -G0 that you use for your interrupt stuff. Well, I wouldn't suggest using a -G0 for that, you may find it easier to set the GP register up in your interrupt or using an attribute function to place your interrupt vars in the data segment thus avoiding being access from the GP.

Example 1: to set the GP register you need to add an assembly routine to save, setup and restore the gp. from assembly you need to set the GP register like this "la gp,sect(.sdata)" this is

the default value used in LIBSN & NONE2 before calling main().  
Example 2: you can also use "int var \_\_attribute\_\_ ((section("data"))) = 0;  
This may help with your errors...

---

7/12/95 7:48 AM  
New compiler and conflicting types  
Mike Benna  
Development Env.

I just installed the new compiler and header files, but now I get numerous conflicting type error messages on built-in functions:  
In file included from f:/psx/include/strings.h:22, from f:/psx/include/string.h:19,  
from readshp.c:14: f:/psx/include/memory.h:20: warning: conflicting types for built-in function  
'memcpy' f:/psx/include/memory.h:22: warning: conflicting types for built-in function  
'memcpy' In file included from f:/psx/include/string.h:19, from readshp.c:14:  
f:/psx/include/strings.h:26: warning: conflicting types for built-in function 'strcmp'  
f:/psx/include/strings.h:28: warning: conflicting types for built-in function 'strcpy'  
f:/psx/include/strings.h:30: warning: conflicting types for built-in function 'strlen'  
Does anyone know what's up with this? How do I fix it or work around it?  
I believe the exact compiler version is "GNU C 2.6.3.SN.2 [AL 1.1, MM 40] Sony Playstation  
compiled by GNU C".  
Thanks in advance.

---

7/12/95 10:27 AM  
Re: Dir. of Production Technology  
John Phua  
Christopher C. Rywelski  
Documentation  
Hi Christopher,  
We have faxed you a copy of the installation sheet is shipped with the boards. This will give  
you some background on the boards. Also you can find the tools in the Release folder along  
with documentation of the software. However to get you started with the DTL and emulation  
board you should download the DTL and CDEMU releases. Enclosed in the cdemu release is a  
readme for basic setup and walk through to running a sample using the dtl and emulator  
boards.  
Hope this helps. John

---

7/12/95 10:48 AM  
Re(3): Fwd: r3000  
Brett Bourbin  
Development Env.

I use the mips RISC Architecture book, by Gerry Kane (isbn 0-13-584293-x).  
It talks about the r2000/r2010 and r3000/r3010 chips.  
-- Brett Bourbin, Z-AXIS

---

7/12/95 9:55 PM

Re: New compiler and conflicting types  
Mike Benna  
Development Env.

I posted earlier about the compiler not working because of some prototype conflicts... well I should have investigated more thoroughly before posting because it does not appear to be the compiler's fault, but rather the new prototypes in lib 3.1 seem to conflict with what the compiler expects.

I've worked around it by deleting the parameters from the prototypes but it should be fixed in the next library release.

---

7/13/95 11:16 AM  
Re: PSYMAKE questions  
Christopher Deel  
Mark Beardsley  
Dan Burnash

I am using Borlands make because I use it for all my PC development as well. I think it is a little better than psymake.

---

7/13/95 2:28 PM  
Changes to MultiEdit support macros  
John Brandwood  
Psyq Tools

MEPSYQ13.ZIP      31K  
Development Env.

Like Christopher Deel, we've also changed from psymake to Borland's make.

This is because psymake doesn't handle multiple implicit rules properly, nor does it seem to try to invoke an implicit rule when given a dependency without an explicit command line.

Borland's make handles both these conditions properly.

So I'm attaching a new copy of my MultiEdit macros that supports the fatal errors generated in Borland's make when it can't find out how to make a target.

Good luck,  
John Brandwood.

---

7/13/95 11:16 AM  
Re: PSYMAKE questions  
Christopher Deel  
Mark Beardsley  
Dan Burnash

I am using Borlands make because I use it for all my PC development as well. I think it is a little better than psymake.

---

7/17/95 12:05 PM  
Re(3): C++ Header Files  
Dan Burnash  
Development Env.  
David Foley

>forget using c++ for now. we built a bunch of code in c++ but the compiler doesn't currently support constructor/destructors.

SN Systems response: ----- Well the compiler certainly does support constructors/destructors. It would hardly be C++ if it didn't have these. If you could extract a sample of source code that they think doesn't work I'll take a look at it. -----

Let me know when you have a sample, and I will pass it along.

Dan Burnash

---

7/17/95 9:02 AM

C++ memory Model?

Geoffrey Sanders

Development Env.

Does the Sony have a equivalent large memory model to the Borland C++ on the PC?

---

7/17/95 8:17 PM

Another compiler bug

Mike Benna

Development Env.

I found another compiler bug and this one is much easier to reproduce. Create a file called test.c with these two lines:

```
struct TestStruct {long test __attribute__((packed));} Test; long TestFunc(void) {return Test.test;}
```

Then compile it with "ccpsx test.c". You'll get this as an output:

```
--- F:\TEMP\14091661(26) : Error : Op-code not recognised ulw $3,0($2) Errors during pass 1 - pass 2 aborted ---
```

The problem seems directly related to de-referencing a packed member from a structure. In theory the packed attribute should have no effect on the code generated, but for some reason it seems to generate different code which the assembler clearly cannot understand.

---

7/18/95 2:48 PM

Symbol Align in Asm

Mark Beardsley

Development Env.

It appears that TIM files must be aligned in memory (I get crashes when trying to load a 16-bit TIM file that is not 32 bit aligned). Is this so, or is something else going on? If so, is there some simple way of doing an align in the PSX assembler? I'm doing incbins of the tim files (and then linking these to my C code) and need to get them aligned. I looked in the docs for the assembler and found the alignment(x) function, but this only works on symbols already defined. I would like to do something like this :

```
tim1: incbin "tim1.tim" (align command) tim2: incbin "tim2.tim" (align command)
```

Is this possible ? Thanks.

---

7/18/95 6:11 PM

Re: unviewable code in debugger

David R. Sullivan

Development Env.

Well, not too helpful, but if you steer away from loading data at hard coded address' you may find that your problem goes away. Though by your numbers, all looks ok...

DaveS.

PS. Loaded at end of program memory, end of executable + vars is the end of the BSS segment (provided that you are not changing the order in your linker file).

---

7/18/95 6:05 PM

Re: Another compiler bug

David R. Sullivan

Development Env.

And Another, related to \_\_attribute\_\_

What is the difference between the two following declatations?

```
static int sDaveS __attribute__((section("data"))) = 0;      int gDaveS __attribute__((section("data"))) = 0;
```

sDaveS will be in the BSS section, overriding the attribute while gDaveS will be in the data section. Both will endup initialized to zero. This is a BUG, the compiler is being given an attribute to override the placement of the variable...and eventually ignoring that command.

DaveS.

---

7/18/95 1:00 PM

Re(2): Where'd the printf's go?

Blake E. Senftner

Development Env.

Same problem...

Someone please post any solutions they'd found.

-Blake

---

7/18/95 10:03 AM

Where'd the printf's go?

Brian Greenstone

Development Env.

Yesterday I got my CD emulator up and running. My app works fine, but for some reason, the debugger Message window no longer displays any printf's whether from me or the system. We can't figure out why. Nothing changed except that we're now including the CD libraries.

-Brian

---

7/18/95 1:39 PM

unviewable code in debugger

Russell A. Pflughaupt

Development Env.

I've having a problem displaying some of my source code in version 4.62 of dbugpsx (I'm new at this, so I have no idea if previous versions do the same thing). I've got 25 .c files averaging 1K lines each. All are compiled -g. Some source files are viewable through the debugger, but most are not. I've tried re-arranging the order of the .obj files in the .cf file used in the link line but

that didn't help.

I've got a sneaky suspicion that I'm clobbering the memory somehow. A 55K data file is loaded at 0x80040000, the 367K executable is loaded at 0x80060000, and I call InitHeap with (0x800E0000, 0x100000) just to have oodles of space. The dbugpsx.c00 has readram from 80000000 to 807FFFFF.

Any pointers?

Thanks, Russ

---

7/18/95 10:31 AM

Re: Where'd the printf's go?

Thomas Boyd

Development Env.

Brian Greenstone

The emulator does work with printf's. Mess around with your emulator board and software settings (carefully noting the original settings) to see if you can get them to show up.

Try changing DMA then interrupts.

I have been having a hard time finding the problem why printf's do not show up for some people, because I cannot duplicate the problem on my PC yet.

Jeff: did you get yours working? If so, what did you change?

Tom

---

7/19/95 10:47 PM

Re: New Developer Question

John Brandwood

Byrt Martinez

Psyq Tools

MAKEXMPL.ZIP 3K

Development Env.

Greg,

I've attached a file with an example of a make and link file combination that should allow you to do what you want.

The Psybios error sounds like it could come from you not resetting the Playstation card properly. The attached makefile gives a somewhat paranoid example of how to do this.

The samples have compiled fine for me, but I've stuck with the 3.0 libs as the 3.1 libs are marked as Beta, not release.

You should also make sure that you have the latest compiler & debugger, the diskettes that I received were already out-of-date when my system first arrived.

A final thought ... the kernel.h file seems to be missing the declarations of a lot of libapi functions, I have got around this by defining them myself where they are needed.

Good luck,

John.

---

7/19/95 11:31 AM

New Developer Question

Byrt Martinez

Psyq Tools



We just started psx development and am currently getting my environment setup. Anyway...

1. I would like to switch from using ccpsx command and link of the entire program to a form of building objects then linking. I have the make file working (well sort of). The make file will build all the objects, psylink will link them but the final .cpe file will not run on the development box. I get the following message: "Psybios reports: target is not in command phase/n. SCSI error while down loading." This appears to be a problem with timing of how I am downloading. But I don't think it is because when I switch one of the sample programs to the above makefile format, I will get the error; if I use the ready made makefile.mak the .cpe will run fine. The two versions generate identical .cpe file sizes. Anybody know what I'm doing wrong??

2. The out of the box samples won't build, they generate an undefined reference: "ERROR: symbol 'ChangeClearRCnt' not defined." I "stubbed" it out to get all the samples working; however, I think I need a longer term fix. I am assuming my libraries are not completely correct. I downloaded the 3.1 libs and I still get the same.

thanks in advance, greg kearney

---

7/20/95 6:44 PM

Re(4): New Developer Question

John Brandwood

Byrt Martinez

Psyq Tools

Wow, that's one hell of a convoluted makefile! You come from a Unix background don't you?

The thing that comes to mind after looking through it is that you haven't linked in the last object file that tells the startup code how much memory you are using.

If you look at my example again, you will see that after the INCLIB commands, there is a final INCLUDE of the 8mbyte.obj system file.

Good luck,

John.

---

7/20/95 3:22 PM

Re: unviewable code in debugger

Russell A. Pflughaupt

Development Env.

I figured out what my problem was. I tend to do most of my development on Unix systems.

When I pull the code over to the PC, it doesn't have the NL/CR and EOF marker that DOS likes.

Most editors are perfectly happy with the Unix format (as is ccpsx), but dbugpsx can't deal with it. The reason some code would show up is that I modified those files and saved them out using a DOS editor. Whoever maintains the debugger may want to let it understand Unix text files. It may help the next developer avoid the same problem.

Russ

---

7/20/95 8:55 AM

Re(4): C++ Header Files

David Foley

Dan Burnash

Development Env.

CPPTEST.ZIP 5K

Development Env.

Attached is an example of C++ code that doesn't work.

---

7/20/95 10:15 AM

Re(2): New Developer Question

Byrt Martinez

John Brandwood

Psyq Tools

Thanks for the response... I just downloaded the file. I'll be taking a look today.

thanks again.

---

7/20/95 3:02 PM

Re(3): New Developer Question

Byrt Martinez

John Brandwood

Psyq Tools

QUESTN.ZIP 2K

Development Env.

(I've attached a zip containing makefile, makefile.mak, & gotest.bat)

makefile: watcom make --> separate compile & link makefile.mak: psymake --> uses ccpsx

gotest.bat runs the cpe.

I checked out the sample you posted. I couldn't find any significant differences. The thing that confuses me about the setup error is that if I use the psymake w/ makefile.mak and run the cpe it will run fine; however, if I use the other makefile, it won't run.

appreciate any further assistance.

thanks, gk

---

7/20/95 12:32 PM

Re(4): C++ Header Files

Yoram Berkowicz

Development Env.

I've also posted some queries about using C++. Generally, the advice has been to avoid it.

I haven't given up - and since then, have overcome a few hurdles. I am now working with C++ with very nice results. One of the main things is to "wrap" all #include "\*.h" files (specifically, Sony's libXXX.h files) with the following: extern "C" { #include "libXXX.h" #include "libYYY.h" };

So far, so good. It would be interesting to hear of other developers successfully doing OOP.

Good luck! Jonathan B. Owen

---

7/20/95 6:19 PM

Re(2): unviewable code in debugger

David R. Sullivan

Russell A. Pflughaupt

Development Env.

Note:

When compiling my current .c file with CRLF all is well, I run a program to remove ALL LF's from my .c and .h code and guess what? The files are not processed correctly. Be aware, the PC versions of GNU C do not seem to properly parse without linefeeds.

---

7/24/95 10:15 AM  
Re: BuildCD BUG  
Thomas Boyd  
David Schwartz  
Psyq Tools  
Dave I fwded your message to SN Systems Tom

---

7/24/95 2:26 PM  
Re: debugger kills windows  
Dan Burnash  
David W. Marshall  
Psyq Tools  
The problem you are having, getting dumped out of Windows when printf's are in your program, is not happening for me. I have encountered strange behavior when using the mess1/testmess combination in a DOS box, but not on the scale that you document. Try using version 1.02 of the mess1.com utility, that is what I am using.

---

7/24/95 9:17 AM  
BuildCD BUG  
David Schwartz  
Psyq Tools

I am having problems with buildcd. It is not generating a correct map file. Everything was fine until I added a few new files to my CTI file. Now, when buildcd runs, the map file contains only half of the files that I built. I have over 300 files. I need this fixed as soon as possible, since without a correct map file I cannot use updatecd. This makes recompiling a 40 minute task instead of the 2 minute task.  
David

---

7/24/95 3:51 PM  
Re: Symbol Align in Asm  
Dan Burnash  
Development Env.  
Mark Beardsley  
I have asked SN Systems if there is a way of doing an align in the PSX assembler. I should have an answer for you by the end of this week.  
Dan Burnash

---

7/24/95 3:15 PM  
Re(2): Another compiler bug  
Dan Burnash  
Development Env.  
David R. Sullivan  
Thanks for the info on the bugs. I will let you know what responses/fixes I get from SN Systems.

---

7/25/95 8:00 AM  
Re(3): Symbol Align in Asm  
Randy X. Thompson  
Development Env.

>Dan, apparently the CNOP instruction is used for alignment. I found it with >the help of David Marshall. It seems to work fine.  
Yes, CNOP is the standard way to align data with most assemblers. It can usually be followed by a number (2, 4, 8, etc.) that specifies the size of the byte boundary that you want to align your data to. I would guess that the PSX's assembler defaults to a 4. Of course, I've never used it on the PSX assembler, but in 680x0 I used to use it religiously before the start of all my data tables.

-Randy

---

7/25/95 2:07 PM  
libmath.h -> math.h  
Alex Dommasch  
Development Env.

Two questions:

- 1) Could libmath.h be copied to math.h in the standard library release to be more like a standard C environment? (I'd rather not have to do it myself everytime I get updated libraries.)
- 2) Where are those mess/testmess programs on the BBS, and how exactly are they used?

Thanks, Alex

---

7/25/95 6:36 AM  
Re(2): Symbol Align in Asm  
Mark Beardsley  
Dan Burnash  
Development Env.

Dan, apparently the CNOP instruction is used for alignment. I found it with the help of David Marshall. It seems to work fine.

---

7/26/95 6:50 PM  
Re(2): Development System Wish List Thread  
Lord Angus  
Development Env.

Mark,

Try this,

\* There is no way to reset the machine to reload the program and begin again. LA: Try Alt R in 4.62. Then load the game using F10 and the download item in file menu.

Angus

---

7/26/95 2:37 PM  
Re: testmess source

Dan Burnash  
Development Env.  
Randy X. Thompson  
TESTMESS.ASM        3K  
Development Env.

Ask and you shall receive. It is being readied for release in the release folder. Until then, hear it is.

NOTE: This is a very small 8086 assembly language source file. It assembles with SLR's OPTASM but should need very few changes (probably just local labels) to assemble with MASM 6 or TASM. Alternatively - it should tell them everything they need to know to implement something in something like Borland Turbo-C.

---

7/26/95 2:05 PM  
Re: Development System Wish List Thread  
Mark Beardsley  
Development Env.

My largest complaint about the debugger is that you can't do a restart of your program. Quite often when I am debugging I find that I have stepped too far and have missed the bug. Currently I need to exit the debugger and reload everything. It would be much easier if I could just re-start the application from the beginning again. Thanks for the chance to add some input. I would also like to take a moment to say that I'm quite pleased with the attitudes of most of the developers using this BBS. They all seem willing to share their knowledge/discoveries (even though we are all competitors to some degree). It makes life worth living. Thanks to everyone.

---

7/26/95 12:14 PM  
Re: Development System Wish List Thread  
Carl Ferreira  
Development Env.

Well... since you \*asked\*...

What do you like/hate about the debugger?

There's not much to like about this debugger, but I will summarize what I appreciate: \* Print statements can print to a debugger window. \* It can optionally save your current configuration before exiting. \* Virtual paging is a nice idea. \* Pressing tab on a highlighted variable changes the display type (hex, decimal, etc.) \* DOS based. \* Being able to quickly see all the local variables is nice.

There is so much this debugger lacks that it's hard to know where to start... \* Structures do not display if they are global. \* Arrays (and pointers) only display the first element. \* There is no display of variables as strings. \* There are no watchpoints (e.g., break on this line if c > 56). \* When the debugger launches, it should automatically load the specified file (without the /e). \* In the absence of a configuration file, the source window should target on the main function. \* The function keys should be the same (or configurable) as those for Watcom, Microsoft, et.al. \* There is no way to break into the running program unless a breakpoint was reached. \* There is no way to reset the machine to reload the program and begin again. \* There is no way to easily change the instruction pointer to jump to a new source line. \* The function keys are window oriented instead of global -- i.e., pressing the STEP function key has no effect if the 'active' window is the watchpoint window. \* There is no mixed source and assembly display. \* There is no display of the calling stack (a tree of the calling functions up to a break point). \* The currently selected source line should not be a breakpoint without explicitly setting one. \* A run-

until-return operation is a nicety. \* Is there some way to set a break on condition (i.e. break when writing to a particular location). \* There is no way to see the processor status unless the register window is open (Step, Running, Bus Error, etc).

I'm sure there's more, but I can't remember just now.

Everything else that I have tried, I have found to work acceptably well. I would like to see some reasonable documentation on everything (like the linker).

The only other additional tool I would like (at this point) is a source code profiler which would indicate what percentage of the time is spent in which function calls / line numbers and how much is spent in synchronous system calls.

---

7/26/95 12:45 PM

Re(2): Development System Wish List Thread

Lord Angus

Development Env.

Carl,

Thanks. This is the start of a nice FAQ.

\* Structures do not display if they are global. LA: Please use a watch window, and hit Alt g \*  
Arrays (and pointers) only display the first element. LA: Agreed. \* There is no display of variables as strings. LA: Agreed. You can display chars. \* There are no watchpoints (e.g., break on this line if c > 56). LA: Agreed. \* When the debugger launches, it should automatically load the specified file (without the /e). LA: Write your own macro. \* In the absence of a configuration file, the source window should target on the main function. LA: 4.62 debugger does this. \* The function keys should be the same (or configurable) as those for Watcom, Microsoft, et.al. LA: Microsoft should die so I like sticking to the Brief standard. Reconfigurable might be nice. \* There is no way to break into the running program unless a breakpoint was reached. LA: Hit the ESC key. It will break at the closest pollhost(). If you don't have a pollhost, it won't work. This is a limitation on the R3000 and no NMI than it is the debugger. \* There is no way to reset the machine to reload the program and begin again. LA: Try Alt R in 4.62. \* There is no way to easily change the instruction pointer to jump to a new source line. LA: Try 4.62. Just type in the PC slot in Register window. \* The function keys are window oriented instead of global -- i.e., pressing the STEP function key has no effect if the 'active' window is the watchpoint window. LA: This is a human interface design choice. I think it's fine since stepping in an assembly window is different from stepping in a C window. \* There is no mixed source and assembly display. LA: Agreed. Would be nice. \* There is no display of the calling stack (a tree of the calling functions up to a break point). LA: Will be put in a future version. SN Systems is working on it now. \* The currently selected source line should not be a breakpoint without explicitly setting one. LA: Don't understand. Breakpoints are shown in RED. Light blue is current position. F6 runs to current position. F9 runs. F5 sets a breakpoint. \* Is there some way to set a break on condition (i.e. break when writing to a particular location). LA: Do a ALT-B in the DIS window. \* There is no way to see the processor status unless the register window is open (Step, Running, Bus Error, etc). LA: There is no way to see a dead bird until your eyes are open.

The only other additional tool I would like (at this point) is a source code profiler which would indicate what percentage of the time is spent in which function calls / line numbers and how much is spent in synchronous system calls. LA: Yeah, wouldn't it be nice.

Lord Angus

---

7/26/95 7:36 PM

Re(3): Development System Wish List Thread

David R. Sullivan

Lord Angus  
Development Env.  
Will Alt-R cause the changes made with SNPATCH to go away?  
If so, it is useless to most of us...  
DaveS.

---

7/26/95 3:34 PM  
Re(3): Development System Wish List Thread  
Carl Ferreira  
Development Env.

Carl,  
Thanks. This is the start of a nice FAQ.  
\* Structures do not display if they are global. LA: Please use a watch window, and hit Alt g  
Oh, Lord, I've been there; done that. No good. The comment stands.  
\* When the debugger launches, it should automatically load the specified file (without the /e).  
LA: Write your own macro.  
Yes, this is a work around. Still, this IS a wish list, after all.  
\* There is no way to break into the running program unless a breakpoint was reached. LA: Hit  
the ESC key. It will break at the closest pollhost(). If you don't have a pollhost, it won't work.  
This is a limitation on the R3000 and no NMI than it is the debugger.  
Why can't a check be inserted automatically by the compiler when the debug flag is set?  
\* There is no way to easily change the instruction pointer to jump to a new source line. LA: Try  
4.62. Just type in the PC slot in Register window.  
I SAID the source code line. How am I supposed to know what assembly address any given line  
is?  
\* The function keys are window oriented instead of global -- i.e., pressing the STEP function key  
has no effect if the 'active' window is the watchpoint window. LA: This is a human interface  
design choice. I think it's fine since stepping in an assembly window is different from stepping  
in a C window.  
I disagree (with an exception for source/assembly windows). There are enough keys in the  
world so that the variable windows could recognize AT LEAST the stepping and Run function  
keys. Preferably, all reasonable cross functionality (e.g. single step when F8 is pressed in the  
Message Window).  
\* The currently selected source line should not be a breakpoint without explicitly setting one.  
LA: Don't understand. Breakpoints are shown in RED. Light blue is current position. F6 runs to  
current position. F9 runs. F5 sets a breakpoint.  
Sorry. My mistake. I thought F6 was RUN. Disregard.  
\* Is there some way to set a break on condition (i.e. break when writing to a particular  
location). LA: Do a ALT-B in the DIS window.  
THANK YOU. THANK YOU. THANK YOU. THANK YOU.  
\* There is no way to see the processor status unless the register window is open (Step, Running,  
Bus Error, etc). LA: There is no way to see a dead bird until your eyes are open.  
I hate having to keep a quarter window open on the screen open when all I need is the single  
line for the processor status. The comments stands.  
Additionally, an on-line HELP would be very useful. Especially since the off-line  
documentation is so poor.  
Thanks,  
Carl

---

7/26/95 10:26 PM

Re: Development System Wish List Thread  
Mike McAulay  
Development Env.

The following would help our development effort tremendously:

- 1) Better debugger! How could the debugger be improved? Try using the debugger that comes with Watcom C++ 10.0 for an example of a nice, bug-free feature set. Probably the most irksome aspect of the current debugger is the way it sometimes balks at single-stepping over certain lines...sometimes this happens on a line (eg in a loop) that it successfully stepped over previously in the same session! And what's worse, when it does this it pops up a dialog box and forces you to click the mouse or press enter to continue. This leads to a rather ridiculous herky-jerky debugger dance that is both time-consuming and ultimately quite aggravating.
- 2) Better documentation! By now everyone knows about the political turmoil within Sony (oops, shouldn't have said that, now the Men In Black will come knocking...) and the fact that the whole open/closed architecture issue is somehow bound up with it. Dear Sony Higher-Ups Reading This: Give us the source code!!! We will make better games that way, in less time. Your competitors have already reverse-engineered the PlayStation, so there's nothing to be lost by making the info available. I can reverse-engineer the GTE libs myself if I have to, and eventually that is what I will be forced to do. Why not save me (and all the other developers separately going through the same hell) the considerable investment of time that will take?
- 3) As someone else mentioned, a source-level profiler would help tremendously. This is something else that developers are going to have to roll for themselves (again, at a significant cost in terms of time) if it is not provided by Sony/SN Systems/whoever.
- 4) Better support. I understand that you are under the gun with the push to get the initial group of products finished in time for launch. But Sony has a bazillion dollars, can't you hire more support folks? It is rather disconcerting to be told that your tech question won't be answered for several days.

If any of the above is especially ignorant or stupid, I apologize. That's just how I see it.  
M.

---

7/26/95 2:28 PM  
Re(2): Development System Wish List Thread  
David W. Marshall  
Development Env.

Can I offer "suggestions" about the CD stuff, even though it wasn't on the list?  
I'd like command line flags for BUILDCD and UPDATECD. I don't like having to go into the fake windows to make choices.  
With command line options, I can put all the build and update stuff in batch files and automate the process.

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7/26/95 9:48 AM  
Development System Wish List Thread  
Scott Berfield  
Development Env.

I want to start a thread in which we can talk about (bitch about?) the merits and problems with the current development system and tools as well as discuss possible alternatives and solutions.

Unless Japan hears lots of loud voices complaining (ina constructive way) about the current tools, they are unlikely to bother to correct the situation. this could be a good forum for making yourselves heard on the issue.



I will start this rolling with a couple of questions: 1) What do you like/hate about the debugger? 2) Is the current compiler satisfactory? Should it be faster/more efficient/work right? 3) Do you need Windows NT support in the tools? 4) What tools would be useful that we either don't supply or supply crappy versions of? 5) What do you hate most about the current system and what would make it better?

Feel free to mouth off and bitch and moan... but if you are going to criticize, try to have some constructive suggestions for at least a direction to investigate to solve the problem.

Thanks! -sb

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7/26/95 8:02 AM

testmess source

Randy X. Thompson

Development Env.

I know I've asked this before, but could anyone provide us developers with the source code to TESTMESS.COM? Would this anger the oracle?

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7/27/95 11:01 AM

Re(2): Development System Wish List Thread

Angus

Development Env.

Mike,

Thanks for the comments. There is a bit of misunderstanding/ poor communication on our part. Hopefully, I can clarify.

>> Try using the debugger that comes with Watcom C++ 10.0 for an example of a nice, bug-free feature set. They kind of have about 10 years engineering research and 10 version ahead of us. We're definitely getting better.

>>Probably the most irksome aspect of the current debugger is the way it sometimes balks at single-stepping >>over certain lines... This bug is fixed in the 4.62 version of the debugger. If it is not fixed, let us know.

>>2) Better documentation! Have you downloaded the latest docs from the Documentation area! We are providing a main thrust in getting out the docs to you. Also, I believe our SAMPLES are great and cover a large area that the docs can't. We're working on it.

>>By now everyone knows about the political turmoil within Sony (oops, shouldn't have said that, now the >>Men In Black will come knocking...) We are human, therefore there are politics. Nothing unusual there.

>>and the fact that the whole open/closed architecture issue is somehow bound up with it. This issue is NOT political. It is a business decision. We have a business model for success of the PSX, and this is part of the plan. Unfortunately, most developers only see a small part of the big picture, and tend to balk at the details. I assure you that the closed software and hardware is great in the long run.

>>Your competitors have already reverse-engineered the PlayStation, so there's nothing to be lost by making >>the info available. Of course, we know they have. But they are in legal difficulty with that information, and we are protected our agreements. Sony PSX needs to be a viable business in order to succeed, and we feel our business plan will succeed with the provisions we have in place.

>>3) As someone else mentioned, a source-level profiler would help tremendously. We have done much work in this area. Stay tuned.

>>But Sony has a bazillion dollars, can't you hire more support folks? We agree we can be better

in areas. But in general We think we are better than other video game companies. We also have 5 engineers from Japan who are behind the scenes for easy resolution. Also, the developer community provides a lot of support.  
Angus

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7/27/95 12:38 PM

Re(4): Development System Wish List Thread

Jay Stelly

Development Env.

>\* There is no way to see the processor status unless the register window is open (Step, Running, Bus >Error, etc). >LA: There is no way to see a dead bird until your eyes are open. >I hate having to keep a quarter window open on the screen open when all I need is the single line for the >processor status. The comments stands.

Keep it on a separate screen, then you can Alt-2 (3,4,... whatever) over to that screen to look at it. The debugger saves the multi-screen configuration for you so it's always available. I have several screens set up so I can bounce back and forth between them and keep a full screen source window open.

Jay

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7/27/95 11:57 AM

Re(3): Development System Wish List Thread

Mike McAulay

Development Env.

>>> Try using the debugger that comes with Watcom C++ 10.0 for an example of a nice, >bug-free feature set. >They kind of have about 10 years engineering research and 10 version ahead of us. We're >definitely getting better.

Of course! But this thread is about "things we'd like to see improved in the development environment." Heading my list is the debugger. This is not to say that you guys suck because yours isn't as mature as Watcom's.

>>>Probably the most irksome aspect of the current debugger is the way it sometimes balks >at single-stepping >>over certain lines... >This bug is fixed in the 4.62 version of the debugger. If it is not fixed, let us know.

Nope. On my system 4.62 is as bad as previous versions. It happens a \*lot\*! And it's driving me nuts.

>>>2) Better documentation! >Have you downloaded the latest docs from the Documentation area! We are providing a >main thrust in getting out the docs to you. Also, I believe our SAMPLES are great and cover >a large area that the docs can't. We're working on it. You're right. The latest batch of graphics samples are a vast improvement over the original batch.

>This issue is NOT political. It is a business decision. We have a business model for success >of the PSX, and this is part of the plan. Unfortunately, most developers only see a small part >of the big picture, and tend to balk at the details. I assure you that the closed software and >hardware is great in the long run.

Uh, okay. This from the man who has been making cryptic references to the "oracle" for the past week. Whatever.

"Information wants to be free." If Sony won't provide the info developers need then inevitably an underground info economy will arise. Which is fine, except that the process will be slow and inefficient, and consequently the first generation or two of products will suffer.

>>>But Sony has a bazillion dollars, can't you hire more support folks? >We agree we can be

better in areas. But in general We think we are better than other video >game companies. We also have 5 engineers from Japan who are behind the scenes for >easy resolution. Also, the developer community provides a lot of support.

I want to emphasize that I don't think you're doing a bad job. It's just that it seems like there aren't enough of you to go around.

Thanks for taking the time to respond.

M.

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7/27/95 2:57 PM

Re(4): Development System Wish List Thread

Kristine Severson

Development Env.

Mike McAulay

>>>But Sony has a bazillion dollars, can't you hire more support folks? >We agree we can be better in areas. But in general We think we are better >than other video >game companies. We also have 5 engineers from Japan >who are behind the scenes for >easy resolution. Also, the developer >community provides a lot of support.

>I want to emphasize that I don't think you're doing a bad job. It's just that it >seems like there aren't enough of you to go around.

We now have the budget to hire more support engineers, which we're in the process of doing.

It's just hard to find qualified people who can actually help you guys out! Angus, Tom, Dan, and John are real gems...but we'll try to seek out and hire more!

Kris

---

7/27/95 10:12 AM

Re(4): Development System Wish List Thread

Angus

David R. Sullivan

Development Env.

Alt R will run snpatch. We're dumb, but not dumber. (Of course, you could prove me wrong, and then I'd be dumbest).

Angus

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7/31/95 7:22 PM

Re(2): testmess source - ccpsx source

Paul A. Wilkerson

Development Env.

Releasing testmess.asm is a good start, how about releasing the sources to ccpsx. ccpsx version 1.15 suffers from the nasty MSDOS command.com problem of being only able to take in 128 characters. I would like to be able to modify ccpsx to support occ files and to better support my needs.

I don't want to spend my time reengineering ccpsx.

---

7/31/95 11:58 AM

open/closed architecture

Scott Berfield

Development Env.

The comment about the information on HW and SW getting out is totally on the money - I know of a heck of a lot of people whose products are being built on reverse engineered library code. Unfortunately, this is being done in a vacuum instead of with SONY support and knowhow - taking longer and costing more, as well as leading to less than predictable results. By not releasing details on the system we are unnecessarily hobbling PlayStation developers. And by telling those developers "don't worry about it, we know what's best for you" we are treating them like children rather than like business partners. Finally, the hacking that will go on in the absence of information is FAR more likely to produce incompatibility problems than the same sort of high-performance programming if it were done with SONY information and guidelines helping to avoid potential problem areas. Ignorance is NEVER the right approach. And if there is a good argument for the current system that makes any sense from a long or short term business view, then I have yet to hear it. I firmly believe that SCE is dead wrong on this issue. I also am convinced that we are going to get bitten by it sooner or later. All of the above aside, I freely admit that I have absolutely no power to change the situation. But I do reserve the right to rant about it.

-sb

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7/31/95 11:51 AM  
Compilers/debuggers  
Scott Berfield  
Development Env.

Someone mentioned the nice debugger in WatCom. Would it be of interest to you folks making games to be able to choose from different compilers/debuggers? Say WatCom, Greenhill, etc...? It seems to me that it shouldn't be that big a deal to get versions that could work with the PlayStation done. If we used some sort of standard binary file format instead of CPE, it would be even easier. Any suggestions?

-sb

---

7/31/95 5:16 PM  
getting started...  
cary hammer  
Psyq Tools

devsys.txt 2K  
Development Env.  
here's an attached list of questions...

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8/1/95 5:42 PM  
more set-up problems  
cary hammer  
Psyq Tools

We are having other development system set up problems in addition to those problems already posted. We really need answers as soon as possible.\

- 1) We are unable to get the CD emulator sanity check to work. Upon running cddisk -n 0, we bomb out with "Error in opening SCSI device 0, device not found."
- 2) We are unable to get dxf2rsd to work properly. The PC hangs after the routine seems to get through 75% of our .dxf input file.
- 3) We don't seem to have the windows version of dxf2rsd listed in the documentation as

dx2rsdw.

4) The animation tool bombs out looking for certain files. The documentation says the following files are required: -vbrjp200.dll -vbrun200.dll -grid.vbx

5) The on-line help files that came with the graphics tools are all in Japanese.

Thanks for your help.

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8/1/95 3:22 PM

Re(3): testmess source - ccpsx source

Carl Ferreira

Development Env.

>Releasing testmess.asm is a good start, how about releasing the sources to ccpsx. ccpsx version >1.15 suffers from the nasty MSDOS command.com problem of being only able to take in 128 >characters. I would like to be able to modify ccpsx to support occ files and to better support my >needs.

>I don't want to spend my time reengineering ccpsx.

I have been using ccpsx for compiling only and then use psylink for linking. Not only has this solved the 128 byte limit for me, but I also leave the .OBJ modules in my directory so that I don't recompile the world every time I change something.

If you need further information or an example, let me know.

Carl Ferreira

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8/2/95 3:52 PM

Re: getting started...

Dan Burnash

cary hammer

Psyq Tools

>We just installed the PSX development system. Following the steps in the file >"install.doc", we were able to get the sanity check routine >\psx\sample\graphics\balls\main to work.

>As this routine seemed to produce no sound, we tried running each of the >main files in \psx\sample\sound subdirectories following the instructions >in their respective readme\_e.txt files. It seems that none of the programs >worked -- the PSX monitor screen would go blank.

>When attempting to launch the program in \psx\sample\sound\basic via >the debugger: dbugpsx main /r50 /e and clicking on GO, the PSX screen >blanks, the register values change for a few seconds and then an error >window pops up saying: Target Did Not Respond.

Trying the Bus Abort >option doesn't fix the problem. After leaving the debugger, we get the >message: Error - Problems with Target Link. >The same debugger problems occur when we try to launch the known >working \psx\sample\graphics\balls\main from the debugger.

This happens when the External CDROM drive is not connected to the dev system board, and the blue terminator is not attached either. If you have the black cdrom driver(dtl-h2010), make sure it is connected. If not, connect the blue terminator to the slot on the board instead.

>Also, what is the reason for the 8-meg requirement on the pc? We're >running on a 4-meg system.

Once you start working with larger programs, you may run into problems with only 4 megs.

>Finally, it is not clear which version of "patch" software we >should use:

\psx\snpatch\snpatch OR the \patch\patch on the >DTL-H2000 Update disk #1 diskette included with the hardware. >The help files on this diskette were in Japanese.

Use snpatch, it is the latest.

>1) We are unable to get the CD emulator sanity check to work. Upon running >cddisk -n 0, we bomb out with "Error in opening SCSI device 0, device not found."

Use id 7 for the jumpers on the emulator card, and 3 or 4 for the hard drive itself. Other combinations may work, 0 not included, but these are the recommended settings.

>2) We are unable to get dxf2rsd to work properly. The PC hangs after the routine seems to get through 75% of our .dxf input file.

This may be a good reason to get more memory on your system. If you want me to test it on my system, send the model directly to me.

>3) We don't seem to have the windows version of dxf2rsd listed in the documentation as dxf2rsdw. >4) The animation tool bombs out looking for certain files. The documentation says the following files are required: >-vbrjp200.dll >-vbrun200.dll >-grid.vbx

Once the Artist Tools conference is restored, you should be able to download ALL of the latest files, those above included.

>5) The on-line help files that came with the graphics tools are all in Japanese.

You want to develop for the Playstation, and you don't know Japanese?!?!?!? :-). Check out the releases conference, in the docs section. It has all of the latest on-line docs, Artist Tools included.

---

8/2/95 10:32 PM

son of cd emulator start up problems

cary hammer

Psyq Tools

ud\_cdemu1.txt 2K

Development Env.

Thank you for the previous help with our initial getting started problems. Unfortunately, we still can't seem to get the cd emulator sanity check to work. Attached (hopefully) is our list of current questions.

Thanks for your help.

---

8/3/95 9:20 AM

Re: son of emulator startup problems

Thomas Boyd

CD

cary hammer

>The cd emulator installation and quick startup guide says to type: > CDDISK -n 0 >which of course was failing since the SCSI ID for the harddisk was 4. >I am now able to create the new partition by typing "cddisk -n 4". >Q1: Which bootbin should be loaded into the boot sector: CDBOOT15.BIN or > CDBOOT25.BIN? CDBOOT25.BIN is a wee bit slower because it spits back debugging info that can be viewed with CDMON from DOS. CDBOOT15.BIN does not spit out the debug stuff. Get it started with CDBOOT15.BIN and then when it works, switch to CDBOOT25.BIN to see if it poses any additional problems.

>I was able to get the buildcd to work by again substituting '4' for '0': > BUILDCD -m cd.cti -s4:1 >The load seems to work and a subsequent 'view partion' via CDDISK seems to show >PSX.EXE and several RUBE files on the hard disk. >I then type: > RESETPS 0 >and only get a sub-second flicker of harddisk active light but no running RCUBE OK, you did the right thing here. The "0" is the type of boot you wanna do on the DTL-H200 boards. RESETPS 0 means reset dev system and run PSX.EXE RESETPS 1 just resets dev system and waits for you to run something. RESETPS 0 seems like a great idea, except for the fact that it does not run the ROM patch. This works fine for RCUBE which does not cross paths with the ROM bugs. As a result, a better substitute would be the following: RESETPS 1 \\ reset DTL-H2000 and wait RUN (path)\SNPATCH \\ patch ROM bugs RUN SELEMU \\ select your emulator (don't need to

do this every time) RUN CDEXEC \ \ execute PSX.EXE on emulator All that being said, this is not your problem, since rcube will run with RESETPS 0. Since you can load the info to the drive, your problem lies in one of the following: Boot sector not loaded CDBIOS call does not match emulator board settings DMA channel on emu board is in conflict (change it around) ADDRESS of emu board (318... 388, etc) is in conflict SCSI jumpers on emu board must be set to addr 7 (drive left at 4) Quick explanation of SCSI ids: disk id = user set (use 3 or 4) card id = 7 (comm channel between card and PC bus address = 0 (channel between DTL-H200 and emu board) (The IRQ is most likely correct if you could start your PC and load data)

>Q4: The instructions say "After a long interval the colorbars on your NTSC > monitor disappear and the RCUBES demo appears on screen." About how > long is "long interval"? ~15 seconds

>Q5: Which RESETPS should I use? The older version in \psx\bin or the newer > version in \cdemu\psyq\_io? Should the former be used for ram starts and > the later used for CD ROM emulator starts? RESETPS v1.03 waits to return control of DOS back to user until the board actually is reset. This saves you from sending the next command too early and crashing it

>Alternating with both CDBOOT15.BIN and CDBOOT25.BIN, I try the bug fix >intructions at the end of the installation guide. I then did: > RESETPS 1 > RUN \CDEMU\EXEC\SELMU > RESETPS 1 > RUN \PSX\SNPATCH\SNPATCH > RUN \CDEMU\EXEC\CDEXEC >but this also didn't seem to work. Good idea (you do not need the second RESETPS 1 though - even though it will work) See above

>Q6: Is this the \*proper\* method for getting the emulator sanity check to work? > If not for the sanity check code, then when does this method need to be > used? You are doing all of the commands right (except resetps 4 is uncool). You have a setup problem. See above

>Q7: The installation guide makes mention of the CD-Emulator Manual v1.1 -- how > do we a copy of this manual? Download it from DOCUMENTION - DOCS - PROGRAMMER DOCS - EMULATOR DOCS on this BBS.

8/3/95 10:33 AM

Re: libmath.h -> math.h

Dan Burnash

Alex Dommasch

Development Env.

>1) Could libmath.h be copied to math.h in the standard library release to be more like a standard C environment? (I'd rather not have to do it >myself everytime I get updated libraries.)

```
IIIIIIIIFFFFFFFFFF YYYYYYYYYOooooooooUUUUUUU
WWWWWWAAAAAANNNNNTTTTTTTT YYYOOUUUURRRRRR
CCCCOOODDDEEEE TTTTOOOO GGGGOOOO FFFFAAASSSTTTT,,,,
DDDDOOOONNNN""TTTTT UUUSSEEEE TTTTHHHHEEEE
MMMMMAAATTTTHHHHH LLLIIBBBBBRRRRRAARRRRYYYY.
```

Since the hardware doesn't support it, and argument range checking is done to slow it down even further, avoid using this library if at all possible.

>2) Where are those mess/testmess programs on the BBS, and how exactly are they used? Check the releases folder and your documentation for these files, and there use. Basically, load the mess1 driver to enable output of printf's to your pc. Run testmess whenever you want to see what printf's are currently being output.

8/3/95 2:00 PM

Re(2): libmath.h -> math.h

Carl Ferreira

Development Env.

FYI -- I decided to try using a sin/cos function ONCE per frame and got the following result:  
x = (int)(sin((double)x \* 3.14) / 2048.0) \* 2048; x = (int)(cos((double)x \* 3.14) / 2048.0) \* 2048;  
The above two lines take up as much time as ALL other functions within the frame put together!!!!

Do NOT use the math library (at least not directly). Convert into 4.12 notation at the start of the program and use integer math.

---

8/3/95 11:03 AM

Re(2): Another compiler bug

Dan Burnash

David R. Sullivan

Development Env.

The response from SN Systems. \_\_\_\_\_

>> >> ----- >> 2. I found another compiler bug and this one is much easier to >> reproduce. Create a file called test.c with these two lines: >> >> struct TestStruct {long test \_\_attribute\_\_((packed));} Test; >> long TestFunc(void) {return Test.test;} >> >> Then compile it with "ccpsx test.c". You'll get this as an output: >> >> >> F:\TEMP\14091661(26) : Error : Op-code not recognised >> ulw \$3,0(\$2) >> Errors during pass 1 - pass 2 aborted >> --- >> >> The problem seems directly related to de-referencing a packed member >> from a structure. In theory the packed attribute should have no >> effect on the code generated, but for some reason it seems to >> generate different code which the assembler clearly cannot >> understand.

They must have an out of date version of aspsx. This was fixed a few months ago.

>> ----- >> >> 3. And Another, related to \_\_attribute\_\_ >> >> What is the difference between the two following declatrations? >> >> static int sDaveS \_\_attribute\_\_((section("data"))) = 0; >> int gDaveS \_\_attribute\_\_((section("data"))) = 0; >> >> sDaveS will be in the BSS section, overriding the attribute while gDaveS will >> be in the data section. Both will >> endup initialized to zero. This is a BUG, the compiler is being given an >> attribute to override the placement of >> the variable...and eventually ignoring that command.

I tried compiling this and it worked fine (i.e. both variables were in the data section).

Could you make sure they've got the latest versions of compiler/assembler/etc.

If that's not the problem could you get them to produce an assembly language output from the compiler by specifying -S and send that and the source to me.

\_\_\_\_\_  
The latest tools are in the release conference, so check and make sure you have the latest. Forward the assembly output to me, if needed, and I will pass it on.

---

8/9/95 11:01 AM

Editor?

Geoffrey Sanders

Development Env.

What type of editor are people using for the playstation?

Geoffrey Sanders Top Dog Software

---

8/9/95 11:37 AM

Re: Editor?

Thomas Boyd

Development Env.



EDLIN.COM (just kidding - I use codewright (windows only) or brief (DOS-o-rama)) You can use whatever you want, really. Tom ----- What type of editor are people using for the playstation?  
Geoffrey Sanders Top Dog Software

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8/9/95 2:40 PM  
Optimizations  
Mark Beardsley  
Development Env.

I'm trying to do some timing analysis and am playing with the optimization flags on the compiler. Would it be possible for the oracle to divulge the type of optimizations done (or not done) when using -O0, -O1, -O2 and -O3 ? It seems that for some sections of code -O2 runs faster than -O3. Are certain levels optimizing for space instead of speed ? Thanks.

---

8/9/95 2:15 PM  
Re(2): What am I missing for Source debugging?  
Angus  
Development Env.

On Debugger 4.62 and later, you do not need to do anything to load a sym file. TO suppress loading a sym file use /d.  
Angus

---

8/9/95 7:52 AM  
"Too many modules" error  
Thomas Boyd  
Psyq Tools  
William Botti  
You should be able to set the number of modules up to 32767, e.g.  
psylink /n1000 ...  
should be fine. The default is 256 in the current version of the linker. The version 2.xx linkers have no limit (other than physical memory) and will automatically expand their tables as needed. -- Martin Day

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8/9/95 12:19 PM  
What am I missing for Source debugging?  
Silas S. Warner  
Development Env.

I am compiling samples with CCPSX -g, then running them with DBUGPSX. I do not get C source code in the window, only assembly code. I presume I'm missing a flag somewhere, but I don't know where to find it.  
Silas Warner

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8/9/95 4:43 PM  
Re(2): What am I missing for Source debugging?

Silas S. Warner  
David R. Sullivan  
Development Env.  
Thanks. Got it. What I was missing was specifying module.sym to the debugger.  
Silas Warner

---

8/9/95 2:09 PM  
Re: What am I missing for Source debugging?  
David R. Sullivan  
Development Env.

You are not missing anything, CCPSX -g is it...now, go into the debugger with DBUGPSX /emodule.cpe module.sym, after entering the debugger you will have symbols and a disassembly (default from SN SYSTEMS), now press SHIFT-F1, select the FILE button (tab moves you to the right), press return (or click). At the filename prompt press TAB, press return (on OK button).

You will either return to a source window or a blank window. If blank, press CTRL-G, type main, press return.

You should now have a source window.

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8/9/95 2:46 PM  
Re: Optimizations  
Angus  
Mark Beardsley  
Development Env.  
look at the gcc docs. They describe it in detail.

---

8/10/95 6:28 PM  
Debugging in CD emulation  
Dave Elton  
Development Env.  
CD

I am having problem to debug my code in cd emulation. I know I can use dbugpsx to debug while I run my code from memory. But since I am using huge amount of data and I want to put them in a file (more than I could use pqbload to load into memory), I have to build disk image and run the emulation. In this case, is there anyway I can debug my code in emulation. Since the emulation uses .exe file instead of .cpe file. How can I debug it?

Another related question is: If I want to read a file in my code, is it possible to code and test this without going thru the cd emulation procedure? I know there are plenty of libapi and libcd functions there to open and read file, but to test this you will have to compile your code into .cpe file, convert them into .exe file and build disk image to run. Even in this way, I don't know how I can get all the printf messages, and check the variable values while I run the emulation. Maybe I am missing something very basic. Thanks for any advice!

Simon ReadySoft Inc.

---

8/10/95 7:45 AM  
Debug 4.64 structure display still sucks  
Carl Ferreira  
Psyq Tools

I downloaded the 4.64 version of the debugger and it still won't handle structures properly.  
I have a global structure: struct foo { VECTOR vector; MATRIX matrix; VECTOR point[4]; } \*foo;  
I have a function call: void FooManChu(struct foo \*pfoo) { ... }  
When I stop the debugger within the function, I cannot look (for example) at either foo (global pointer) or pfoo (local pointer). Nor can I look at pfoo->point[0].  
PLEASE FIX THIS #\*\$%@! PROBLEM.  
Furthermore, the debugger does not display arrays greater than 1. For example, you cannot examine the contents of a MATRIX variable without explicitly setting EACH ELEMENT in the watch window!!!!  
Carl

---

8/10/95 11:39 PM  
Re: Debugging in CD emulation  
Dean M. Grandquist  
Development Env.

> Maybe I am missing something very basic. Thanks for any advice!  
Try dbugpsx /e gamecode This loads the cpe and runs it. If you have run selemu then the cpe reads from the emulation drive.  
--DeanG

---

8/10/95 4:29 PM  
Re: Debug 4.64 structure display still sucks  
David R. Sullivan  
Carl Ferreira  
Psyq Tools

I cannot duplicate your struct problem, works for me. As for the array, use the left and right arrow for the element of the array. Example select the struct in the vars window, press the PLUS (+) key, cursor down to the array, press the plus (+) key again, cursor down one line to the element and use the right/left arrows to display each item.  
DaveS. EA.

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8/11/95 5:05 PM  
Re: PsyLink breaks FntPrint()  
David W. Marshall  
Psyq Tools

I got FntPrint to work. The problem is not with the linker but with the \*\*!\*@## libraries.  
Always use /c when linking to avoid this problem.  
See libgpu conference for followup.  
dave

---

8/11/95 4:41 PM  
PsyLink breaks FntPrint()  
David W. Marshall  
Psyq Tools

I seem to be having a problem with FntPrint() not displaying when using psylink.  
If I compile and link my program with only CCPSX, everything works fine and FntPrint()'s are displayed on screen. I let CCPSX use its default for linking of the libraries.  
If I compile using CCPSX and link with PSYLINK, the FntPrint()'s no longer show up on screen. I am using a linker command file to include the libraries.

text group ; group containing defined data  
bss group bss ; group containing uninitialised data

section .rdata,text ; sections created by C compiler  
section .text,text ; specifying them here is not strictly necessary  
section .data,text ; but does ensure that they appear in the correct

section .sdata,text ; order in the linked output file

section .sbss,bss ; the bss sections  
section .bss,bss

include main.obj

inlib "c:\psx\lib\libapi.lib" ; another library file from Sony  
inlib "c:\psx\lib\libetc.lib" ;

another library file from Sony  
inlib "c:\psx\lib\libgte.lib" ; another library file from Sony

inlib "c:\psx\lib\libgs.lib" ; another library file from Sony  
inlib "c:\psx\lib\libc.lib" ; another

library file from Sony  
inlib "c:\psx\lib\libc2.lib" ; another library file from Sony  
inlib

"c:\psx\lib\libgpc.lib" ; another library file from Sony  
inlib "c:\psx\lib\libsnd.lib" ; a library

file from the Sony standard libraries

Am I linking something in the wrong order? Both FntPrint() and FntFlush() are being called, but no text is displayed.

thanks,

dave

---

8/11/95 6:59 AM

Re(2): Debug 4.64 structure display still sucks

Carl Ferreira

David R. Sullivan

Psyq Tools

>I cannot duplicate your struct problem, works for me. As for the array, use the left and right

>arrow for the element of the array. Example select the struct in the vars window, press the

PLUS >(+) key, cursor down to the array, press the plus (+) key again, cursor down one line to

the >element and use the right/left arrows to display each item.

Try the following program:

```
struct foo { VECTOR vector; MATRIX matrix; VECTOR point[4]; }*foo;
```

```
void main(void) { foo = (struct foo *)malloc(sizeof(struct foo) * 10);
```

```
printf("foo allocated\n"); }
```

After foo has been allocated, try to examine foo using the watch window. foo shows up like this:

foo ????

Good Luck.

Carl

---

8/14/95 10:51 AM

Re: Debugging in CD emulation

Thomas Boyd

Dave Elton

I am having problem to debug my code in cd emulation. I know I can use dbugpsx to debug while I run my code from memory. But since I am using huge amount of data and I want to put them in a file (more than I could use pqload to load into memory), I have to build disk image

and run the emulation. In this case, is there anyway I can debug my code in emulation. Since the emulation uses .exe file instead of .cpe file. How can I debug it?

> put a breakpoint at the beginning of your executable, run it, start the debugger, then step over the breakpoint and keep on going.

Another related question is: If I want to read a file in my code, is it possible to code and test this without going thru the cd emulation procedure? I know there are plenty of libapi and libcd functions there to open and read file, but to test this you will have to compile your code into .cpe file, convert them into .exe file and build disk image to run. Even in this way, I don't know how I can get all the printf messages, and check the variable values while I run the emulation.

> emulator still sends printf messages to the debugger if set up correctly. > use updateCD to modify images fast.

> you can also put your data on the CD or emulator, and run the CPE from your PC.

---

8/14/95 11:36 AM

Re(5): C++ Header Files

Dan Burnash

Development Env.

Though the "true" fix will need to come from SCE, this answer should give you enough info to get around the problem.

Info from SN Systems:

\_\_\_\_\_ I assume the "compiler bug" referred to here is the fact that the linker complains about lots of undefined library routines. This is happening because the C++ compiler is being used to compile main.cc but all the Sony header files #included are set up only for C, not C++. The C++ compiler needs to be told that the library functions are C routines rather than C++ in order to stop it mangling the names and thus causing a problem for the linker. To achieve this the header files should be modified to contain the lines :

```
#ifdef __cplusplus extern "C" { #endif
```

at the start of each file and the lines

```
#ifdef __cplusplus }; #endif
```

( note two underscores in \_\_cplusplus )

at the end of each file. They will then work both for C and C++.

Let me know if you are getting any other C++ errors. I have already passed this on to SCE, so maybe they will add this to the header files.

---

8/14/95 9:17 PM

Check globals in dbugpsx

Dave Elton

Psyq Tools

Development Env.

This probably is a question already asked, since I cannot find answer from old Archives, here again:

Anybody know how can I check the values of global variables in debugger ? They don't show up in variable windows like local variables. Thanks for any advice!

Simon ReadySoft Inc.

---

8/14/95 9:17 PM

Check globals in dbugpsx  
Dave Elton  
Psyq Tools  
Development Env.

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Simon ReadySoft Inc.

---

8/15/95 8:59 AM  
Re(6): C++ Header Files  
Dan Burnash  
Development Env.

> I have already passed this on to SCE, so maybe they will add this to the header files.

Or maybe not. :-)

Here is teh SCE response:

Unfortunately, in Lib 3.2, it is impossible to change the header file to be the C++ compatible file. We are going to deal with this issue at the next release ro later, but the specific schedule has not been fixed yet.

---

8/15/95 7:02 PM  
Re(2): Check globals in dbugpsx  
Carl Ferreira  
Angus  
Dave Elton  
Alt-g still won't let you examine pointers to global structures.  
Carl

---

8/15/95 12:03 PM  
Re: Check globals in dbugpsx  
Angus  
Dave Elton  
Psyq Tools  
alt g in a watch window  
angus

---

8/15/95 7:02 PM  
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---

8/15/95 12:03 PM  
Re: Check globals in dbugpsx

Angus  
Dave Elton  
Psyq Tools  
alt g in a watch window  
angus

---

8/17/95 10:25 AM

dbugpsx: too much memory?

Paul C. Isaac

Psyq Tools

Development Env.

I got a new computer a Pentium 133 and could not get it to work with QEMM and DBUGPSX... until I pulled out some memory... I had 64M and reduced it to 32M and now everything seems to work fine...

a message said NOT ENOUGH MEMORY... maybe 64M + 640K wraps around in your world?

I think the extra memory was also causing CCPSX to crash sometimes too...

Note: removing QEMM made the problem go away... or more likely it didn't know that there all that memory was up there waiting to be used...

hopefully there is some tiny little bug that you guys could fix so I can use these extra sims that are now sitting on my desk?

(pci)

---

8/17/95 10:25 AM

dbugpsx: too much memory?

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(pci)

---

8/17/95 12:45 PM

Re: dbugpsx: too much memory?

David Minogue

Development Env.

I've seen similar problems with running Watcom C on a system with >32MBytes. I think it had something to do with the DOS extender they were using, but I don't remember the details.

-- David Minogue, Acclaim Entertainment.

---

8/17/95 11:02 AM

wish list #1

Paul C. Isaac

## Psyq Tools

after using DBUGPSX for just a little while... here is my wish list to make the interface a lot more comfortable

Note: I wish I had your source code so I could make some of these simple modifications myself!

DBUGPSX

= a universal help key... new versions can be hard to keep up with the changes... if I could type maybe '?' or a function key and it would show a simple little text window telling me what keyboard cmds are available from my current window and a one line description it would be outstanding... Select Window Type (ie. shift-f1)

= typing 'R'=reg, 'D'=dis, etc... PLEASE!

Watch window

= just typing would default auto to INSERT whatever you type

= space bar or backspace on an existing watch would let me edit the line

= if a LONG is TABed to display char format that it would display more than 1 char... EX. id

long \$41424344 in char display would become 'ABCD'

= if I could type in ranges it would be a miracle... Ex. long \*ptr; if I could type ptr[0..3] and it added 4 sequential lines ptr[0] ptr[1] etc... I would cry.

Disassembly

= I long to press ENTER and type a simple opcode register instruction and have it do something other than silently ignore me... little modifications to the code are a normal part of my debugging experience and fiddling with the HEX values is painful trying to figure out which 5 bits control which register etc...

= the disassembly of coprocessor cmds is a little yucky... I'd rather see "r2" than "EntryLo"... or maybe even "C2.r2"

= also instead of "lwc2 t2, (a0)" I'd rather see "lwc2 r10,(a0)"

That's all for now... please, please, consider making a few of these valuable improvements...

your developer community will love you for them! :)

(pci)

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8/18/95 9:31 PM

Just started-Help

Nimai Malle

Development Env.

Ive just setup and started using my dev. system and I have a number of questions, so Ill start with some basic ones:

1) I have the dtl 2010 CD drive hooked up, and its getting power since it opens and closes, but should I be able to boot and play a playstation CD on it? I cannot, this is why I ask.

2) When using dbugpsxx, I always get an error message "Target Did Not Respond" when I set something to "go". The code seems to execute correctly, after a pause, but this message shows, and forces me to exit dbug. Since the dtlh2000 comes w/out the IRQ/DMA set, must I set it?

Is this related to my debug problem?

All help is appreciated, Scott Hartin

---

8/18/95 8:36 AM

Re: Problem with BMP2TIM and PSYMAKE

Mark D. Hirsch

Mark Beardsley

Psyq Tools



Why not include a line at the beginning like the following, and see if this works.  
files.all: file1.tim file2.tim Echo I think this might work.

If it does solve your problem, then great. If not, I am sorry for wasting your time.

---

8/18/95 1:53 PM

Re: wish dbugpsx cursor visible in Windows

Mark Beardsley

david eader

Psyq Tools

I have other problems with the mouse cursor in dbugpsx. The mouse cursor will be visible when I'm actually moving the mouse. When the mouse stops, the cursor vanishes. Also, once in a while, it loses the mouse cursor completely and I have to reboot to get it back. It's not a big problem, just one of life's annoyances.

---

8/18/95 10:20 AM

Re: Problem with BMP2TIM and PSYMAKE

Dan Burnash

Mark Beardsley

Psyq Tools

adding

files.all: file1.tim file2.tim Echo I think this might work.

will solve the problem you are encountering with psymake. Since files.all becomes the first target, everything it depends on will be made (e.g. file1.tim and file2.tim) Makes in general only build the first 'target' they find, as a default. You could also try "psymake file2.tim" to just make the second target. Specifying the target to be made will work for any ordering of targets within the makefile.

>Also, in the windows tim utility it is possible to have a different output bit depth from the input bit depth. Could this feature be added to the DOS >version of BMP2TIM ?

I will pass along yoursuggestion.

Thanks for the input,

Dan Burnash

---

8/18/95 2:12 PM

wish dumplib,dumpobj, were useful.

david eader

Psyq Tools

david eader

Wish that the dumplib, dumpcoff, dumpsym, dumpobj tools were useful.

I think they all have but one option /c. They all in general generate tons of useless info that I don't want or need.

Some of the things I wish the dump utils would do: Generate list of all functions defined in given lib/obj Generate list of all external functions reference by lib/obj ditto for variables.

List only external syms, only internal (static) syms, etc. Disassemble named function from obj. i.e. dumpobj /p main main.obj

Etc.

Maybe the gnu compiler & risc architecture make some of these features impractical/impossible, deferring more tasks until linkage etc.

If so, would like an overview doc explaining the 'flow of symbols' in the compile environment.  
----- This issue arose while futzing with broken malloc(). It's really hard to tell what lib/obj the syms are even coming from. When I added malloc.obj to my link files, I saw my .cpe grow slightly, but I still cant really tell what the linker is doing, etc.

---

8/18/95 8:40 AM

Re: Problem with BMP2TIM and PSYMAKE

Mark D. Hirsch

Mark Beardsley

Psyq Tools

Mark,

Please see the other board, where I placed a possible solution for you.

---

8/18/95 1:47 PM

wish malloc worked

david eader

Psyq Tools

david eader

Malloc was broken a long time ago. It would sometimes return -1 when out of memory, and I think I read other bbs postings saying that it didn't coalesce freed blocks.

I upgraded to some lib and busied myself with more pressing problems and things worked ok and I never thought about it again until recently, when I merged some new code into my program.

Now the program crashes INSIDE OF malloc()!

My temp workaround was to write a wrapper for malloc().

On the first call it just mallocs one big (5 meg) chunk; subsequent calls just increment a pointer. This works fine, lame as it is. Eventually we'll implement a more sophisticated mem manager, so malloc is only a temporary need for me.

But I would like to know; why is it broken? Is malloc used internally by any libgs,libgpu,libgte (or other lib) routines?

I'd actually like to see a FAQ on malloc() bugs too.

---

8/18/95 1:54 PM

wish psylib documented

david eader

Psyq Tools

david eader

Wish I had better documentation for psylink.

I eventually figured out that the linker command file you pass to ccpsx for linking (ie ccpsx @ccpsx.lnk) is a completely different creature from the linker command file you pass to psylink (ie psylink @psylink.lnk).

I was wondering why all my commands in the ccpsx.lnk file were just treated as syntax errors. For those who don't know, looks like ccpsx.lnk is just a dos response file, or is munged into command-line args, while psylink.lnk is actually parsed & executed by psylink.

I've also noticed, by linking via ccpsx -v, that there are command line options to psylink that

I've never seen documented. I'd like a complete documentation of args for ALL the compile tools.

---

8/18/95 7:46 AM

Problem with BMP2TIM and PSYMAKE

Mark Beardsley

Psyq Tools

I'm trying to create a MAKEFILE for building my TIM files from BMPs, but psymake seems to have a problem.

My make file looks like :

```
file1.tim: file1.bmp bmp2tim -org 640 0 -plt 0 480 -b file1.bmp
```

```
file2.tim: file2.bmp bmp2tim -org 768 0 -plt 0 481 -b file2.bmp
```

It seems that psymake will try to build file1.tim if necessary, but will never build file2.tim, even if file2.tim doesn't exist. I don't know if this is a problem with psymake or with bmp2tim (I suspect psymake, even though it seems to be working fine with my c files). I'm using PSYMAKE 1.11 and BMP2TIM 2.1 (I believe these are the current versions).

Also, in the windows tim utility it is possible to have a different output bit depth from the input bit depth. Could this feature be added to the DOS version of BMP2TIM ?

Thanks.

---

8/18/95 4:34 PM

symbolic stack trace with dbugpsx?

Russell A. Pflughaupt

Psyq Tools

Is there some way to obtain a symbolic stack using dbugpsx? The docs seem to indicate that the only way to get this done is to alt-L on sp then inspect hex. Is this correct?

Thanks for any help,

Stacey Campbell (for Russ) +1 408 244 2095 stacey@anyware-fast.com

---

8/18/95 2:21 PM

Re(3): Check globals in dbugpsx

david eader

Carl Ferreira

Angus

I haven't experienced the dbugpsx bug described, where global struct ptrs are unrecognized by debugger. For me they work fine in the Watch window.

I also created a psuedo-typedef like this:

```
typedef struct DebugMatrix { // equivalent to MATRIX, but easier to examine in debugger.  
short m00, m01, m02; short m10, m11, m12; short m20, m21, m22; short pad; long t0, t1, t2; }  
DebugMatrix;  
struct DebugMatrix * dbgA, *dbgB, *dbgC; // examine these in Watch window.
```

Then, in my code I can set global ptrs to vars of interest, ie:

```
void Foo (MATRIX * m) {  
    dbgA = (struct DebugMatrix *) m; // now look at dbgA in  
    Watch window...  
    DoSomethingWithMatrix (m); // etc. }
```

Pretty lame, I admit. Obviously you can macrofy this stuff more cleanly. But it certainly helps to have the matrix elements expanded in the Watch window.

---

8/18/95 10:28 AM

Re: wish list #1

Dan Burnash

Paul C. Isaac

Psyq Tools

Thanks for the input, I will let you know what SN Systems thinks of your suggestions.

---

8/18/95 1:39 PM

wish dbugpsx cursor visible in Windows

david eader

Psyq Tools

david eader

Wish I could see the mouse cursor in dbugpsx.

It is visible when I launch it from dos, but not when I launch it from a dos box from within Windows.

The mouse driver works; if I click around eventually I hit the desired window. But I have no visible representation of the cursor.

Anyone encountered (and solved) this problem?

---

8/18/95 2:21 PM

Re(3): Check globals in dbugpsx

david eader

Carl Ferreira

Angus

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Watch window...
```

```
DoSomethingWithMatrix (m); // etc. }
```

Pretty lame, I admit. Obviously you can macrofy this stuff more cleanly. But it certainly helps to have the matrix elements expanded in the Watch window.

---

8/20/95 2:15 PM

Re: Debugger still can't single-step!!

Mike McAulay

Development Env.

I forgot a couple items.

My compiler arguments:

CMAINFLAGS = -c -g -comments-c++ -Xo\$80070000

My linker args:

LFLAGS = /c /o0070000

If there's anything else the Helpful Friendly Angel (tm) needs to know about my system I'll be happy to provide it.

M.

---

8/20/95 10:15 PM

Re(2): Debugger still can't single-step!!

Mike McAulay

Development Env.

Here's even more data about the debugger problem:

I switched my network card to IRQ 10 and my SoundBlaster to IRQ5, which enabled me to put /i15 on the dextbios command line (previously the machine would hang during boot if I tried to specify i15). No improvement.

I copied my directory structure onto a colleague's machine and was able to debug successfully.

I compiled the code on his machine and copied it and his entire PSX directory structure back onto my HD. No improvement.

From this I conclude the following: 1) The problem is occurring at debug time, not at compile or link time. 2) It is system dependent. There is something about my hardware or the way it is set up that is hosing the debugger. I have tried all the obvious things like matching my config.sys and autoexec.bat to his, but with no luck. (Note: they are not completely identical as he has a different video card and our directory structures are laid out a little differently). I am starting to wonder if there could be something wrong with the development cards themselves.

Once again, any help would be greatly appreciated,

M.

---

8/20/95 2:12 PM

Debugger still can't single-step!!

Mike McAulay

Development Env.

OK, I've posted about this before, but the problem persists even in the newest version of the debugger. On average, I'm finding that about 40% of my source lines are un-single-step-overable under DBUGPSX. At this rate my code will ship sometime in 1998 :-).

Here's what little data I have to offer about the problem in hopes that someone can provide a solution.

My dextbios line in autoexec.bat looks like:

```
lh c:\psx\bin\dextbios /a1340
```

And my invocation of the debugger is via a batch file which looks like:

```
resetps 1 run /w10 \psx\patch\snpatch sys\go95\dms 54 dbugpsx exdreams /e
```

I'm running on a Pentium 100 with 32M and about 615K of available low memory.

The symptom I'm seeing is this: I'll be single-stepping through the code when a dialog will pop up saying "can't set breakpoint there." At this point the responsiveness of the cursor drops dramatically -- there is a noticeable hesitation in cursoring up or down through the code. It almost feels like an out of memory situation where there's a buffer-thrash going on each time the cursor moves (Turbo Debugger used to have that problem back in the 16-bit days).

There are three ways I can proceed at this point. One is to go down a ways in the code and use the F6 key to run-to that location (not acceptable in all cases since I may be interested in the effect of the line I'm hung up on). Two is to sit there banging alternately on F8 and Enter

(needed to clear the dialog) ... and eventually it will work! No kidding. Sometimes it takes 20 or 30 bangs but it will eventually wake up to the fact that the line I want to step over is utterly innocuous and let me proceed. Three is to switch to a disassembly window and basically perform step 1 on a smaller scale. I can \*usually\* find an assembly instruction 2 or 3 lines below the offensive one and run-to it. I then return to the source window and press F8 to single step successfully and pray that I don't have the same problem on the next line...

Is anyone else having this problem??? Please post or email so I know I'm not losing my marbles. It's slowing me down so much that I suspect others are \*not\* having this problem, since if they were there'd be more whining messages like this one.

Angus reported in a past message that the problem was "supposed to have been fixed" in a previous build of the debugger, but I'm here to testify that it ain't working on my system.

Any help would be greatly appreciated!

M.

---

8/21/95 2:13 PM

Re: dbugpsx: too much memory?

Dan Burnash

Paul C. Isaac

Psyq Tools

Hmm, sounds like a DOS extender problem. This is likely to be a fault in the X32 extender itself or possibly in QEMM. Unfortunately, SN Systems doesn't have any PC's with 64 MB memory.

A couple of things SN Systems suggests trying:-

1) remove the QDPMI line from config.sys and let me know if that makes a difference.

2) I will see what I can find out regarding both the X32 extender and also QEMM.

If my suggestion to turn off QEMM DPMI (by removing the QDPMI line from config.sys) does not help then can you ask the guy to check the contents of bytes \$30.\$31 of his PC's CMOS RAM (pref with 64MB RAM installed in his PC) and tell me what they are.

(SN is checking for a PC BIOS bug that might upset the X32 DOS extender)

---

8/21/95 6:14 PM

Re: "Too many modules" error

William Botti

Thomas Boyd

Psyq Tools

Thank you Tom and Martin. Issue is resolved. BTW, the command line doc for psylink2 (type psylink2 and see) indicates spacing between the /n and the #. That confused me.

P.S. I saw a Playstation commercial yesterday on ESPN. Pretty cool!! -WB

---

8/21/95 1:25 PM

Re(4): Debugger still can't single-step!!

Mike McAulay

Development Env.

>Probably your system (like mine) can't interrupt the PSX through the IRQ line. >I don't know yet what causes this hardware incompatibility, but I suspect >that SNPATCH may have something to do with it, or possibly the bridge plug >put in when a CD emulator is not available.

>In order to keep the debugger "awake" if it can't interrupt the PSX, you need to >insert calls to

pollhost() in your C code.

I am calling pollhost once each iteration of my main loop. My problem is not in breaking into the debugger once it's running, but rather in single-stepping.

What do you mean your system can't interrupt the PSX through the IRQ line? How have you determined that's the case? And is it a problem with your system, or with the PSX boards?

Obviously I'm scratching around for any piece of potentially helpful data at this point...

M.

---

8/21/95 8:36 AM

Re: Just started-Help

Dan Burnash

Development Env.

Nimai Malle

>1) I have the dtl 2010 CD drive hooked up, and its getting power since it opens and closes, but should I be able to boot and play a playstation CD >on it? I cannot, this is why I ask. Yes, you should be able to boot and play a Playstation cd. The commands are: resetps 1 run

<path>\snpatch.cpe run <path>\cdexec.cpe

>2) When using dbugpsxx, I always get an error message "Target Did Not Respond" when I set something to "go". The code seems to execute >correctly, after a pause, but this message shows, and forces me to exit debug. Since the dtlh2000 comes w/out the IRQ/DMA set, must I set it? > Is this related to my debug problem?

You should set the IRQ on the dev system board, but not the DMA. This may help alleviate the problem, or you may need to add calls to the pollhost() routine to the code. This routine is found in libsn.lib/libsn.h.

Dan B.

---

8/21/95 9:50 AM

Re: wish dumplib,dumpobj, were useful.

Dan Burnash

david eader

Psyq Tools

>Some of the things I wish the dump utils would do: >> Generate list of all functions defined in given lib/obj Try "psylib // <libname>" for the libraries. You could even put a single obj into a lib to get the same functionality for objects.

Since most of what you want is already implemented as PART of the tools output, it would probably be easy to add options to only output what you want. I will check and see.

Dan B.

---

8/21/95 12:02 PM

Re: symbolic stack trace with dbugpsx?

Dan Burnash

Russell A. Pflughaupt

Psyq Tools

If you mean a call stack, SN Systems is working on it. It will be in a future version of the debugger.

Dan B.

---

8/21/95 9:21 AM

Re: wish psylib documented

Dan Burnash  
david eader  
Psyq Tools

I was told by SN Systems that they were working on upgraded docs, but don't know when/if it will happen. I will pass on your feedback.

---

8/21/95 12:00 PM

Can Color Registers be changed?

Geoffrey Sanders  
Development Env.

Can color registers be changed when using 16 bit color, and if so how?

Geoffrey Sanders Top Dog Software

---

8/21/95 5:35 PM

Re(5): Debugger still can't single-step!!

Chris E. Reese  
Development Env.

I have been running into a problem just recently where I will step into a section of code and the debugger will step through code that does not match the disassembly window. At first I thought I was having a stack problem because from the source level the debugger would sit on a line two or three statements beyond the first line in the beginning of a function and then would skip over a statement or two completely. After following it in the disassembly window I found that it actually was stepping through the code correctly and the addresses were right that it was jumping to.

Is it possible that this is some sort of pipeline problem where code is in the pipeline to be executed and the PC hasn't registered it in the debugger? It looks as though I can put a breakpoint on a line of code and the debugger will stop either on the line or close to it. The only problem is it might not be the actual line I am on, which is evident after looking at the disassembly window. Will pollhost() fix this problem or is there something else going on I don't understand?

Chris Reese Eidetic, Inc. creese@empnet.com

---

8/21/95 9:18 AM

Re: wish malloc worked

Dan Burnash  
david eader  
Psyq Tools

The fix to malloc and related functions is in the works. Check out the beta of the memory module in releases->programmer tools->library->lib 3.2 beta->memory module. Please post any feedback you have, so that SCE can put it into the final version.

Dan B.

---

8/21/95 12:13 PM

Re(3): Debugger still can't single-step!!

Silas S. Warner  
Development Env.



Probably your system (like mine) can't interrupt the PSX through the IRQ line. I don't know yet what causes this hardware incompatibility, but I suspect that SNPATCH may have something to do with it, or possibly the bridge plug put in when a CD emulator is not available.

In order to keep the debugger "awake" if it can't interrupt the PSX, you need to insert calls to pollhost() in your C code. (See the PSYQ manual for info on pollhost(): it's a macro defined in isbsn.h.) One way I do this is to define a macro like this:

```
#define VSYnc(x) pollhost();VSync(x);
```

This calls pollhost() whenever a VSync is done, as long as you remember to properly misspell VSYnc. (I added this macro to libs.h.)

This means that when you start a program free-running with GO, then hit STOP, it will always stop at the VSYnc call. You can then single-step to whatever is doing you dirt.

This is a really old-fashioned way of debugging, dating back to the first SNASMs which needed a similar call to keep them awake during full-speed running. Fortunately, unlike the old SNASM calls, pollhost() seems to take absolutely a minimum of time.

Silas Warner

---

8/22/95 10:39 AM

dbugpsx crash bug

david eader

Psyq Tools

dbugpsx consistently crashes my PC if I zoom a source or assembly window to full-screen, then mouse-click to set a breakpoint.

Setting a break point via the keyboard works fine.

When I say "crash" I mean that my PC immediately reboots. I usually work just in DOS, but I think I've had the same bug in a DOS box in WIndows.

I noticed this bug months ago, across many versions of dbugpsx. Shoulda posted this earlier, but I trained myself not to do it more than once a week.

---

8/22/95 5:50 PM

compiler crash

Eric Knopp

Psyq Tools

I have a crash bug from th compiler that i need to report... since I dont know how to attach files using this program I would like for someone to call me at 638-0800 x214 I will then explain the crash..

---

8/22/95 4:49 PM

Ports on back of Debug Station

David W. Marshall

Development Env.

Is there any documentation for the ports on the back of the Blue PlayStations (including the port that is covered by a plastic flap)?

Things like I/O port specs for getting data into or out of the Blue PlayStation.

thanks,

dave

---

8/23/95 2:31 PM  
F7 in FOR loops  
Silas S. Warner  
Psyq Tools

Single stepping does not quite work right when debugging FOR loops. When you reach the FOR statement, then hit F7 or F8, the cursor goes to the next line -- but does one full iteration of the FOR loop before it gets there. Thus, say, if I have  
> for(i=0;i<256;i++) { \*(ptr++)=i; } and I'm tracing i in the VARS window, I will equal 1 the first time I see it inside the loop.  
Silas Warner

---

8/23/95 1:04 PM  
Re(6): Debugger still can't single-step!!  
Dan Burnash  
Development Env.  
Chris E. Reese  
I would try adding calls to pollhost() as a first step. If that doesn't solve the problem, let me know and I will ask SN Systems.

---

8/23/95 4:28 PM  
Version (Was: F7 in FOR loops  
Silas S. Warner  
Dan Burnash  
Psyq Tools  
My debugger is version 4.62 compiled on July 6, 1995.  
Silas Warner

---

8/23/95 10:14 AM  
Re: compiler crash  
Dan Burnash  
Eric Knopp  
Psyq Tools  
>I have a crash bug from th compiler that i need to report... since I dont know how to attach files using this program I would like for someone to >call me at 638-0800 x214 > I will then explain the crash..  
Have you downloaded the FirstClass software? If not, go into the "New Users ReadMe" group, followed by the "BBS Software" sub-group, and download the software. The file menu within this software will allow you to attach a file.  
If this doesn't work for you, then simply detail the crash error you get in a message. If that is not enough, I will ask for the source causing the crash, and we can find some means for you to get it to me.  
The BBS is our primary support mechanism, however, so learning how to effectively use it will save you time on your project in the long term.  
Dan B.

---

8/23/95 1:24 PM  
Re: Ports on back of Debug Station  
Dan Burnash

Development Env.

David W. Marshall

The port covered by the plastic flap is not currently documented, and is not used by any peripherals. Therefore, pretend it doesn't exist. The link cable port is used for linking two playstations, and is documented in libcomb. There are no specs available for using these ports for other purposes, however.

---

8/23/95 4:20 PM

Padding to 64 bits in ccpsx?

Dean M. Grandquist

Psyq Tools

I am have some problems getting my ints to be packed together in ram. The ccpsx compiler is pading my ints to 64 bit not 32, is there any way to tell it not to do this? This is very important for some scratch ram variables that I am defining 8-).

Thanks --Dean

---

8/23/95 10:20 AM

Re: wish text documentation

Dan Burnash

david eader

Psyq Tools

I have moved any messages on this subject, that weren't already there, to the documentation conference, and deleted them from Psyq Tools. Please post any further documentation questions/info in that coference.

Thanks,

Dan Burnash

---

8/23/95 3:23 PM

Re: F7 in FOR loops

Dan Burnash

Psyq Tools

Silas S. Warner

I put together an example that used your loop, and it worked fine F8'ing through the loop.

Please send me an example, and le tme know what version of the libraries and debugger you are using.

---

8/24/95 7:34 AM

Re(3): Check globals in dbugpsx

Carl Ferreira

Psyq Tools

Angus

The problem that I've been having with the debugger is that it doesn't recognize variable names which are the same as structure names (at least globally).

For example:

```
struct foo { int a; } *foo;
```

```
struct Bugga { int a; } *foo;
```

In the first case, the variable foo is unrecognized, while it IS recognized in the second case (so long as struct foo was not defined).

Carl

---

8/24/95 4:13 PM

Re(3): InqPAD

David W. Marshall

Jim Rogers

Dan Burnash

This is what I use and it seems to work:

/\*MACRO for testing for a joypad. 1st byte of joypad data is 00 if a joypad is plugged into the port. 1st byte of joypad data is ff if a joypad is not plugged in.

Macro strips all bits of the passed in buffer, except for the lower byte. \*/

```
#define HAVEJOYPAD(x) (((x) & 0xff) == 0x00)
```

```
u_long JoyBuffer1, JoyBuffer2; /*buffers loaded by the kernel each vbl */
```

```
/*User kernel calls to do joypad stuff*/
```

```
InitPAD(&JoyBuffer1, MAXCONTROLLERBYTES, &JoyBuffer2, MAXCONTROLLERBYTES);
```

```
/*give buffers to kernel*/
```

```
if (HAVEJOYPAD(JoyBuffer1)) { ..... }
```

```
dave
```

---

8/24/95 7:34 AM

Re(3): Check globals in dbugpsx

Carl Ferreira

Psyq Tools

Angus

The problem that I've been having with the debugger is that it doesn't recognize variable names which are the same as structure names (at least globally).

For example:

```
struct foo { int a; } *foo;
```

```
struct Bugga { int a; } *foo;
```

In the first case, the variable foo is unrecognized, while it IS recognized in the second case (so long as struct foo was not defined).

Carl

---

8/24/95 1:31 PM

Re(2): InqPAD

Jim Rogers

Dan Burnash

Development Env.

>When using InitPAD, the first byte is the connection status/reception >result. If it is 0, all is well, if it is FF, the controller is disconnected. >Those are the only two values I have seen.

Using this mechanism is >easier/better/faster then InqPAD, which no longer exists.

I tried this and it does not seem to work. I check the first 4 bytes of the both pad buffers and the return status of InitPAD. All values were zero with Both controllers unplugged. I tested this with the DTL environment. Will it only work on a production/debug blue?

Here is the code I used to check the status:

```
/*Initialize and start reading of controller data during VBL */ status = InitPAD(gPadbufA, PAD_BUFLen, gPadbufB, PAD_BUFLen); ASSERTSTR(status, "Couldn't Initialize the Pad Controller");
```

```
printf("InitPAD returned %d\n", status); printf("Sys_InitControllers: Pad A status 0 -- 0x%x\n", gPadbufA[0]); printf("Sys_InitControllers: Pad A status 1 -- 0x%x\n", gPadbufA[1]); printf("Sys_InitControllers: Pad A status 2 -- 0x%x\n", gPadbufA[2]); printf(
```

```
"Sys_InitControllers: Pad A status 3 -- 0x%x\n",gPadbufA[3] ); printf( "Sys_InitControllers: Pad
B status 0 -- 0x%x\n",gPadbufB[0] ); printf( "Sys_InitControllers: Pad B status 1 --
0x%x\n",gPadbufB[1] ); printf( "Sys_InitControllers: Pad B status 2 -- 0x%x\n",gPadbufB[2] );
printf( "Sys_InitControllers: Pad B status 3 -- 0x%x\n",gPadbufB[3] );
status = StartPAD(); ASSERTSTR(status, "Couldn't start reading the Pad Controller");
```

We really need to detect an unplugged 2nd controller to prevent game crashes.

Thanks for any help

Jim R.

---

8/25/95 10:50 AM

Re(7): Debugger still can't single-step!!

Chris E. Reese

Dan Burnash

Development Env.

I tried adding PollHost() and that didn't seem to work. I am getting results from the debugger that are similiar to problems encountered when you forget to compile a module and when you go into the debugger the source lines don't match the actual code. The wierd thing is that only certain routines in that module are affected, everything else called works fine. I have stepped through the assembly code and it looks as though the code is correct and I don't believe there is a bug involving the stack in those routines or the routines calling them.

The interesting thing about this problem is that I can set breakpoints in the routines that have this problem by selecting the line of code that I want to break at. The breakpoint will actually get set somewhere else in the source file, usually three or four lines below the target line. I can work around it, but it sure makes stepping through code hard.

---

8/25/95 12:33 PM

Re(8): Debugger still can't single-step!!

Mark Beardsley

Development Env.

Sounds like you compiled some of your code with the optimizations on. Try making sure that you are using -O0 on all compiles. I know this sounds obvious, but I've made the same mistake a couple of times.

---

8/28/95 4:02 PM

Re(4): Check globals in dbugpsx

Dan Burnash

Psyq Tools

At least you have a simple workaround. I will see what SN has to say.

---

8/28/95 3:10 PM

Using Overlays and Binary Data Files

Mark Beardsley

Dan Burnash

We are trying to build an overlay system using the "\samples\modules\overmenu" system. However, one thing that we had been doing (before trying to use overlays) is linking our TIM files into our programs, by using the INCBIN comand in a simple assembly program. This gives us an .obj file which is our TIM data (and allows us to create a single disk file which contains the

code and TIM data). This works better in many cases than having several TIM disk files to read in separately. We would compile our code, assemble the TIM data, and link the two together (resulting in a single cpe file that could be run without requiring a CD emulator).

We would now like to be able to have some of these cpe files overlay each other (along with their TIM data). Unfortunately, we cannot see how to specify two object files to go into a single overlay section. Is there some way to make an overlay out of a library, or are libraries always placed in the main section? Another method might be to include the TIM data into our C code and compile it all together into a single obj file, but there is no simple way to include a TIM file into a C program. I guess we could convert the TIMs into a file containing a fixed data array in hex, but this seems a silly way to go.

Any Insights?

---

8/29/95 9:05 AM

Re(2): Using Overlays and Binary Data Files

David W. Marshall

Mark Beardsley

Mark Beardsley

OVERLAY.ZIP 4K

Development Env.

I haven't looked at the example that was referred to in the original email.

Here is an example of doing overlays that I got from another developer.

Not sure if it applies to what you are doing, but any info is better than none.

Dave

---

8/29/95 4:03 PM

Re(2): Using Overlays and Binary Data Files

Dan Burnash

Psyq Tools

Mark Beardsley

here's the scoop on what can be done, and how.

>1. How do you put multiple object files into the same overlay section? > With ccpsx, is it okay to specify the -Wa,s[name] with the same [name], for >multiple object files?

Yes

> Then the linker "include [objname]" for these objects would put them in the >same overlay?

Yes, that's right

> Is there any way to do this with libraries? As far as I can see, libraries >always go into the main section.

This isn't possible with libraries at the moment. We're currently looking at ways to improve overlay support and this is one of the things I'm considering. A major improvement that should be available in a week or two is that the debugger will be able to automatically detect which overlay(s) is/are loaded and select the appropriate symbols/source code.

>2. One developer wants to put TIM data into his assembler code, so is using >incbin, and asmpsx. how does he specify what group to put this in. Evidently >aspsx supports this, but not incbin, so he needs to use asmpsx. Is there a >".group [name]" directive supported within the assembler code?

In asmpsx you'd write :

```
groupname group
    section sectionname,groupname
    incbin "..."
```

This is a bit inconsistant for historical reasons. This should all be documented in the assembler manual.

Enjoy,  
Dan B.

---

8/29/95 4:28 PM  
Re: Debugging Station??  
Dan Burnash  
Development Env.

A burned cd may be run on the development system using the external cd rom drive, or on a debug station. The consumer unit will only run manufactured discs with the correct encryption on them, which the discs you burn yourself do not have. Be glad that they don't work, or your sales would drop in proportion to the number of write once drives on the market! :-)  
As for the price difference, it must be the blue dye.

---

8/29/95 10:59 AM  
Debugging Station??  
Byrt Martinez  
Development Env.

Is the debugging station the only device that will allow a CD we burn to be tested? Can we use production units for game testing? It's a pretty large price disparity between a \$1,300 debugging station and a \$300 production unit.  
-Byrt Martinez Maxis

---

8/29/95 8:57 AM  
Re: Using Overlays and Binary Data Files  
Mark Beardsley  
Mark Beardsley  
Dan Burnash

I have another question concerning overlays.  
My main game code is currently in several c files that are compiled separately and then linked together. I need this code to be one of the overlay sections (i.e. I need to be able to have multiple .obj files in a single overlay). Is this possible? The examples all seem to have a single .obj in each overlay.  
I can work around the binary data file problem by converting it into a C data array (grumble, grumble), but I don't really want to have to have all my game code in one huge C file (with one huge compile). Please tell me there is a way to get multiple object files into an overlay.  
Thanks.

---

8/29/95 4:15 PM  
Inline Assembly??  
stephen chaplin  
Development Env.

Is there a way to do inline (R3000) assembly with the C compiler? Or do I have to write external assembly modules and link them in? I would rather work with an in-line assembler for the few routines (math oriented) that I have to code!  
Thanks, Romesh Prakashpalan Celeris Inc.

---

8/29/95 4:34 PM

Re: Inline Assembly??

Dan Burnash

Development Env.

stephen chaplin

INFO263.ZIP 925K

Development Env.

Yes, inline assembly is supported by gnu c. Read the info docs for details. You should have them, but they are attached for convenience.

---

8/29/95 8:57 PM

Re(2): Debugging Station??

Roy Eltham

Development Env.

This may seem like a dumb question, but I haven't seen anything about it in the docs.

What kind of cdrom drive can be hooked up the the dev cards? Can I attach some standard off the shelf drive or do I have to spend a fortune on some proprietary drive made specifically for the dev card?

Also, can the dev cards, with the attach cdrom drive play any playstation game (like off the shelf stuff come september 9th)?

Roy Eltham Lead Programmer Regal Productions

---

8/30/95 3:21 PM

Re: Version (Was: F7 in FOR loops

Dan Burnash

Psyq Tools

Silas S. Warner

4.62 works for me, though you might want to try the latest version here on the bbs. If you want me to look into it further, send me a complete example, including makefile, so I have the best chance of reproducing your results.

---

8/30/95 2:24 PM

Re(3): Debugging Station??

Dan Burnash

Development Env.

You need the DTL-H2010 external cd rom drive available from us. Order through your account executive.

---

8/31/95 1:43 PM

Re: dbugpsx connect problems

Silas S. Warner

cary hammer

Psyq Tools

I can save the tech staff work on this one. The debugger requires a call that will keep it alive.

This call is pollhost(), found in libsn. If you are compiling something for the debugger, add the line pollhost(); somewhere it'll get called a lot: I usually use it right after VSync(0). You'll also



have to add `#include <libsn.h>` right at the start of your file. This `pollhost()` bit is a nasty kludge, dating right back to the earliest SNASMs, and it'll have to be removed from any production code. One way I do this is to make a `define` along the lines of `#define VSYnc(x) vsync(x);pollhost();` which can be redefined in the production version.  
Silas Warner

---

8/31/95 7:43 PM

How do I make function not cross 4K page?

Rusty Buchert

Psyq Tools

makefile.rsp 3K

Development Env.

As I understand, the i-cache works by 4K segments (pages), unlike the PC that uses, say, the most recently accessed 4K of memory.

So, I have one function that is taking a large amount of time, and it doesn't call any other functions, so I want to make sure that it doesn't cross a 4K page boundary.

The way I do it now is to use `dumpsym` to look at where the function is at, find the next function, and make sure that they don't cross a 4K page. If it does, I move it around in the source module until it doesn't.

So, is there a cleaner way to do this? I looked into Dan Burnash's suggestion of using the linker response file to place a module on a certain alignment, but for the life of me, I couldn't figure it out. Can anyone help me? I'm sure others would like to know this answer also...

I will attach my link response file if that helps any.

Thanks! John Slagel Parallax Software

---

8/31/95 10:40 AM

dbugpsx connect problems

cary hammer

Psyq Tools

We appear to be unable to get the debugger to work with any program other than `sample\sound\basic`. Making programs such as `sample\graphics\balls` with the `-g` compiler option, we are able to load and run the program from the debugger but a few seconds after starting the program, a menu-pops up stating: `TARGET DID NOT RESPOND` and gives us the choice between `RETRY` (never works) and `ABORT`. The program on the psx, however, does start and appears to properly execute. When we bail out of the debugger, we are greeted with the message: `Error - problem with target link`.

Can you help us? Thanks. - Mark Nicely @ Unexpected Development

---

8/31/95 1:42 PM

Strange Happenings

Mark Beardsley

Psyq Tools

I'm having some bizarreness. I'm developing one product, and another programmer (off-site) is working on another. My stuff is running fine (by itself) and his stuff runs fine for him. And if I run his demo `.cpe` that he sent me, it looks fine. BUT... If I then run my code again (after resetting and reloading `snpatch`, etc), the textures for some of my sprites are off (as though the `u,v`'s were not set correctly). My code hasn't changed, but now it looks messed up!!!

Stranger still, if I reset about a dozen times (and power on and off a bunch), eventually my stuff works fine again (without my changing the code at all).

Is there something in the development system that might be getting set/corrupted and cause my sprites to come out wrong? I'm at a loss to explain any of this.

Maybe I shouldn't have stopped taking that medication they said I needed.

Any Ideas?

---

8/31/95 1:54 PM

Re(2): dbugpsx connect proble

cary hammer

Silas S. Warner

Psyq Tools

Thanks for the advice! I really appreciate your help. Mark Nicely @ Unexpected Development

---

9/1/95 8:25 PM

Re: Strange Happenings

chris m. coffin

Mark Beardsley

Psyq Tools

>I'm having some bizarreness. Aren't we all :)

>I'm developing one product, and another programmer (off-site) is working on another. > My stuff is running fine (by itself) and his stuff runs fine for him. > And if I run his demo .cpe that he sent me, it looks fine. > BUT... > If I then run my code again (after resetting and reloading snpatch, etc), the > textures for some of my sprites are off (as though the u,v's were not set > correctly). > My code hasn't changed, but now it looks messed up!!!

>Stranger still, if I reset about a dozen times (and power on and off a bunch), eventually >my stuff works fine again (without my changing the code at all). >Is there something in the development system that might be getting set/corrupted >and cause my sprites to come out wrong? >I'm at a loss to explain any of this.

I've had the same problem a couple times.. I think the playstation memory is'nt cleared entirely sometimes leaving images in the frame buffer after reset. If you turn your machine off that will fix it obviously:) It hasn't happened to me for a while but may I suggest.....

I put a routine in my game that would let me pause my game and let me pan across the entire frame buffer with the controller which lets you visually see that your textures are loaded in the right areas of your v-ram. This little tool will save ya the hassle of wondering whether or not all your TIMs got loaded in the right place and stuff like that. Chow, Chris

---

9/5/95 4:41 PM

Re(3): Strange Happenings

chris m. coffin

Shaival Varma

Mark Beardsley

yeah... maybe :)

---

9/5/95 4:41 PM

Re(3): Debugging Station??

Thomas Boyd

Development Env.

Byrt Martinez

>Hmmm, Isn't there some sort of TSR program that can be used >on a production unit to bypass the security lockout, similar to >what "that other" company does to allow testing on production units?

No, sorry. The ROM is dead set on checking. Tom

---

9/5/95 10:58 PM

Re(9): Debugger still can't single-step!!

Mike McAulay

Development Env.

For what it's worth I solved my debugger problem by removing my network card and plugging it back in again. :-/ If anyone else is experiencing grievous debugger weirdness, I suggest fiddling with your hardware as it appears there can be conflicts of some kind between the dev boards and network cards.

I wish I could say something more definitive on the subject but as it is I'm just glad to be able to single-step through my code (finally!).

Thanks to all who helped!

M.

---

9/5/95 7:02 PM

Re(3): Strange Happenings

Mike Gomez

Psyq Tools

See Samples folder for VRAM viewing attachment.

---

9/5/95 4:28 PM

Re(3): Debugging Station??

chris m. coffin

Development Env.

>Also, can the dev cards, with the attach cdrom drive play any playstation game (like off the shelf stuff come september 9th)?

The DTL-H2010 when hooked up with the programmer boards will play playstation game CD's.

I play my japanese Ridge Racer and Tekken on it all the time.

You need to run the cdexec program in the exec directory of the samples that sony supplies so it will run the CD.

:)

---

9/5/95 10:51 AM

Re(2): Debugging Station??

Byrt Martinez

Development Env.

Hmmm, Isn't there some sort of TSR program that can be used on a production unit to bypass the security lockout, similar to what "that other" company does to allow testing on production units?

I understand the need for the encryption system for manufactured discs, but the development side is another story. Anyway, unless there is some sort of bypass, I guess my question is

answered.  
How much would they be without the blue dye? ;-)  
Byrt

---

9/5/95 1:01 PM  
Re(2): Strange Happenings  
Shaival Varma  
chris m. coffin  
Mark Beardsley  
sounds like a nice tool.

hint...hint... (:

---

9/5/95 9:40 AM  
C++ compilation  
Kirk Woller  
Development Env.

We have just started to work with the Sony C++ compiler rather than straight C, and not been able to get the C++ compiler to run correctly. We are running version ccpsx version 1.17 and get an error saying that it cannot find libcomb.h. We are not using the combat cable libraries and do not have them. In other instances, headers to graphics libraries are not found. Could someone help us out?

---

9/6/95 2:51 PM  
Re(2): Compiling demo programs  
Mark D. Hirsch  
Development Env.

I was wondering. In the last post, I saw libc2.lib was included in the .Ini file for auto linking. What is the difference between that library and the libc.lib. It was implied that the libc.lib is not to be used because of problems. Is this the case? Or did I miss something.

---

9/6/95 3:27 PM  
Re(3): Compiling demo programs  
Dan Burnash  
Development Env.  
Mark D. Hirsch  
LIBC contains jumps to ROM functions, while LIBC2 is the RAM replacement for these functions. Since ROM is slow, use libc2 whenever possible. Check out the Overview doc version 3.0 for details.

---

9/6/95 5:15 PM  
Re(4): Compiling demo programs

Dr. Cat  
Development Env.

Well, I put a reference to libc in, and sure enough I've gotten all the demo program running except for the ones that need to read the files from \psx\sample\data. I'll figure out how to copy those onto the CD emulator later. I'll worry about switching to libc2 and/or 3.2 libraries even later than that.

Sure would be nice to put libc or libc2 into the psyq.ini that ships out to new developers so the next batch of them won't have to puzzle this out before they can get up and running. :X)

---

9/6/95 12:20 PM  
Compiling demo programs  
Dr. Cat  
Development Env.

I'm just getting up to speed with my dev system, which only just arrived a couple of weeks ago. Someone told me that the only way to get the demo programs on the CD-ROM under the samples directory to compile is to modify the header files that are in the include directory. When I try running psymake using the makefiles, headers, and libraries provided, I get printf, memset, strcmp, setjmp, strlen, rand, and exit coming up as undefined symbols. I tried downloading version 3.0 and then 3.1 of the libraries and headers and I get the same thing (with bzero showing up as undefined also, at least under 3.0) I'm too nervous about the word "beta" to try 3.2 yet - especially as I haven't started developing code, and wouldn't know whether bugs were in my code or the libraries if something came up.

My question is - will the 3.2 libraries be fixed so that the demo programs will compile as-is? Or are they already, if I am willing to try working with betas?

Dr. Cat

---

9/6/95 12:40 PM  
Re: How do I make function not cross 4K page?  
Dave Ross  
Rusty Buchert  
Psyq Tools

This question begetws a more general question for me: in reading about the operation of the I-cache in our R3000 manula (IDT) and in the SONY hardware manual (has anyone ever read it and can anyone translate it into commonly used jargon?). The answer I really seek is: one an instruction cache miss, how much is then loaded (ie, what si the block size)? From the msg that this is a relply to, that author thinks it is 4K. Any answers?

---

9/6/95 12:43 PM  
Re: Compiling demo programs  
chris m. coffin  
Development Env.

All the errors you mentioned are functions in libc2 (Chapter 14 lib 3.0 reference) Check your psyq.ini file to make sure its included in there (same thing happened to me before too) your file should look like this....

```
[ccpsx] stdlib=libc2.lib libgs.lib libgte.lib libgpu.lib libetc.lib libapi.lib libsn.lib libspu.lib  
libsnd.lib compiler_path=C:\psx\bin library_path=C:\psx\lib c_include_path=C:\psx\include  
I use lib3.2 beta with reckless abandon and haven't had any problems with it yet. Meow! :)
```

---

9/6/95 3:28 PM  
Re(3): Compiling demo programs  
chris m. coffin  
Development Env.

I don't know of any difference I thought they were the same essentially the same thing. Using libc2.lib instead of libc.lib hasn't caused me any problems. I think libc is slower or something. :)

---

9/6/95 8:38 AM  
Re(10): Debugger still can't single-step!!  
Mark D. Hirsch  
Development Env.

One of our machines seems to be having conflicts also between the network cards, and the sony boards. So far, the only thing the programmer has lost, is his ability to go onto the net. (gee). At least in his case, he can still program.  
These boards don't seem to be very forgiving. They also seem to conflict with other hardware more then even the government would accept as reliable. (Scarry thought).

---

9/6/95 11:40 AM  
Problems with overlays  
Mark Beardsley  
Dan Burnash

Thanks to your help, we have our overlays working (sort of). We are having a problem which causes crashes ( the debugger reports "Bus Error on data access", in the assembly window). This happens consistantly in some overlay configurations, and never in other configurations. I suspect that data is trying to be read when it is not long-word aligned, but I don't know how the alignment could be getting trashed. The code all runs fine on its own. It only has problems when it is put into an overlay. The sample overlay stuff does not have mixed c and assembly, and I suspect this a big part of our problem. We have tried to step through the code using the debugger, but it seems that the debugger gets confused as to which overlay is being executed. I suspect that this is because it is just using the memory address to determine the source line to show (even when the code is running fine, stepping looks crazy). Is a new set of overlay support due soon (as was promised)? Any clever Ideas ?  
Thanks.

---

9/7/95 2:40 PM  
Re(4): Debugging Station??  
Byrt Martinez  
Thomas Boyd  
Development Env.

Okay, sounds clear enough.  
One last (I hope!) question. Are there different Debugging Stations for different territories or is there a single debugging station that can be used for US, Japan, Europe, etc.?  
We have a developer in Japan and they are requesting US debugging stations for testing, though they have already done developement for PlayStation Japanese titles. Is there truly such a thing as a US debugging station or can they use the ones they already have?

Thanks!  
Byrt

---

9/7/95 5:35 PM  
Running SLUS\_XXX.XX;1 on DTL2010  
David Minogue  
Development Env.

Hey Tom,  
Has anyone written a new CDEXEC.CPE which parses a SYSTEM.CNF file, if it exists, and runs the appropriate file from the CD? I've just been modifying mine each time I want to test a different game, but it would be more convenient if there were one which more or less emulated the ROM. (Hey, there's an idea...)  
- David Minogue, Acclaim Entertainment

---

9/7/95 3:10 PM  
Re(5): Debugging Station??  
Thomas Boyd  
Byrt Martinez  
Development Env.  
A US debug works great for Japan + US, but you need a separate PAL station for Europe (If you do PAL).  
A US debug station shows the american license screen on startup. The Japanese debug still runs American titles, but doesn't show the black license screen. Test depts are gonna want the US stations to see these screens with US titles for verification.  
Also, the on screen display stuff is also in english with the US debug. This means that the ROM is different. This is another reason test departments will want US debugs.  
Finally, we have had problems occur on US debugs that did not occur on Japanese debugs because of these slight ROM differences. This is rare, and always obvious at startup (or non-startup as the case usually goes). For this reason I strongly urge you to supply them with at least one US debug to check the license screen and bootability with the English ROM. It can be a nightmare otherwise.  
Tom ===== One last (I hope!) question. Are there different Debugging Stations for different territories or is there a single debugging station that can be used for US, Japan, Europe, etc.?  
We have a developer in Japan and they are requesting US debugging stations for testing, though they have already done development for PlayStation Japanese titles. Is there truly such a thing as a US debugging station or can they use the ones they already have?  
Thanks!  
Byrt

---

9/8/95 10:58 AM  
Re(6): Debugging Station??  
Byrt Martinez  
Thomas Boyd  
Development Env.  
Thanks! That helps a lot!  
-Byrt

---

9/8/95 8:42 AM  
Still More Overlay Problems  
Mark Beardsley  
Dan Burnash

We're seeing some unusual things with overlays, and I believe it may be a problem with the inclusion of libraries. We are having crashes when code in an overlay tries to execute SortFastBg(). This same code runs fine when it is not in an overlay. When we looking at our map files, we have noticed some strange things. Our Main section (the code that is always loaded) changes in size (in certain sections) based on what overlay(s) are built. I would have thought that the main section size would be constant, and that only the sizes of the overlays would change. I suspect that the change in size is due to what routines are pulled in from the sony libraries. How does the linker determine which routines are pulled in from the libraries when using overlays? Does it automaticall include all the routines? or does it check all the overlays and include code referenced from any of them? Also, could you tell me specifically what type of data goes into each of the sections (.rdata, .text, .data, .sdata, .sbss, .bss), the linker manual isn't very clear about this. We copied these sections from the overmenu example, but we don't really understand them.

This whole overlay stuff is getting frustrating. All our code works fine by itself, and most of it works fine in overlays, but some of it crashes in overlays and we can't see why.

---

9/11/95 10:25 AM  
dbugpsx CRASH bug  
david eader  
Psyq Tools

dbugpsx CRASHES if you mouse-click on a zoomed source window.

Try setting a breakpoint with the mouse on a full-sized (zoomed) source window. BOOM!!

Watch dos reboot.

I've mostly trained myself never to click on a fullsized window, but I'll invariably forget this rule when tracing the deepest of deep code threads. Uggh...

I reported this bug a few weeks ago, but it musta got lost in the mail. Can you please encourage SN to fix this one? It is a severe bug (reboots my PC), easy to reproduce, so I would think a top priority.

Thanks, deader

---

9/11/95 4:41 PM  
Re: dbugpsx CRASH bug  
Dan Burnash  
Psyq Tools

It has been sent to SN Systems to be fixed. I will post the update when it is available.

Dan B.

---

9/12/95 4:11 PM  
Win '95  
Randy X. Thompson



Development Env.

Does anyone have the PlayStation development software running under Windows '95? I'd like to install Win '95 on a couple of our PSX development systems, but I suspect there might be problems (I think I read about a couple here). What's the word?  
Randy Thompson Sierra/Dynamix

---

9/13/95 9:17 AM  
Re: Win '95  
Mark DeSimone  
Development Env.

We are sing Win95 w/o too many problems except: 1. Occasionally cdbuild or cdupdate will hang up. (You just need to retry)  
2. If using PCreads for development, we sometimes get MDEC errors. (We think the read from the hard disk really isn't finished, so we are trying to decompress garbage). To solve this you have to back out all the way to DOS.  
Glenn O'Bannon Rainbow America

---

9/13/95 9:53 AM  
Re: Win '95  
Chris E. Reese  
Development Env.

I have been running WIN95 for the past 4 months now and have only run into one other problem related to DEXBIOS. It seems that WIN95 doesn't like it and ends up causing Windows to have these annoying pauses. I was mostly experiencing pauses whenever I linked my program. To get around it I compile and link the program from a DOS shell that is created from my development environment. Now instead of loading DEXBIOS before Win95 begins I have the DOS shell execute DEXBIOS with one of the first things it does before running the executable.  
Chris Reese. Eidetic, Inc.

---

9/14/95 8:26 AM  
Re(2): Win '95  
Randy X. Thompson  
Development Env.

Thanks for the Win '95 info Mark and Chris. The problems don't sound too insurmountable -- I guess I'll give it a try.  
-Randy

---

9/14/95 5:57 PM  
Re(2): Win '95  
Thomas Boyd  
Development Env.

>We are sing Win95 w/o too many problems except: >1. Occasionally cdbuild or cdupdate will hang up. (You just need to retry) Those hang in Win 3.11 too  
>2. If using PCreads for development, we ssometimes get MDEC errors. > (We think the read from the hard disk really isn't finished, so we are >trying to decompress garbage). To solve this you have to back out all the way to DOS.

I am investigating a possibility that PCRead may actually be the problem. Stay tuned.

Tom

---

9/14/95 6:00 PM

Re(3): Win '95

Thomas Boyd

Development Env.

CD

I have had success with basic tools, movie converter, movpack, emulator, etc

The only problem has been CDGEN. Although it worked for building the CCS file, it failed when I tried to record. Everything was set up correctly, but no dice. Beware, ye burners of CDs

Tom

PS if anyone HAS successfully burned CDs in win95, please lemme know.

---

9/18/95 4:42 PM

prob with char declaration

David W. Marshall

Development Env.

when I have the following:

```
void Foo(char Num) { if (Num < 0) { printf("\n invalid id); }
```

```
GlobalID = Num;
```

```
}
```

The compiler tells me:

Comparison is always 0 due to limited range of data type.

If I make the argument a short or a long, the compiler does not complain.

Is there a reason why char cannot designate a signed number to use in a comparison?

I am using version 1.10 of ccpsx.

thanks,

dave

---

9/18/95 1:56 PM

Re(2): How do I make function not cross 4K page?

Dan Burnash

Psyq Tools

The simple answer is: You don't need to align the routine to a 4k boundary. As long as the routine fits into 4k, and no jumps out of the cache are made, the routine will be executed from the icache.

If only part of a routine is loaded into the cache originally, when a cache miss occurs, the rest of the routine will be loaded into the cache, NOT overwriting the first portion of the routine. The routine may not be in the cache sequentially(e.g. the top of the cache may contain the end of the routine, and the middle to end of the cache may have the beginning of the routine, but the whole

routine will be in the cache.

---

9/18/95 4:54 PM  
Re: prob with char declaration  
Mark D. Lyons  
Development Env.

The compiler must be defaulting char to unsigned char. Different compilers seem to default to different things, I forget which the psx compiler is defaulting to, I would assume unsigned by your problem.  
declare your variable as a signed char  
You can change the default signed/unsigned for char, but it's safest to always declare things as either unsigned char or signed char. If you do that and never use just char you will be safe with all settings on all compilers.

---

9/18/95 11:27 AM  
PAL/European development?  
Byrt Martinez  
Development Env.

What is the recommended setup for developing titles for the European market? Since there are power and video differences, how do you recommend we test titles here in the States? i.e. setting up a PAL TV, PAL Debugging Station, etc. using US power.  
Thanks,  
Byrt Martinez Maxis

---

9/19/95 11:35 PM  
Re: PATCHW.CPE  
John Phua  
Mark DeSimone  
Development Env.

Hi Mark,  
Was the version of snpatchw.cpe just down loaded from the new release area? (product release)  
Has anyone else had problems with the latest version?  
JohnHi Mark,  
Was the version of snpatchw.cpe just down loaded from the new release area? (product release)  
John

---

9/19/95 1:02 PM  
PATCHW.CPE  
Mark DeSimone  
Development Env.

Whenever I load SNPATCHW.CPE, I get the message "Starting target 0", but then I can't load anything after that. The message I get is "Cannot connect to target". The old SNPATCH.CPE works fine.  
Glenn O'Bannon Rainbow America

---

9/19/95 11:15 AM  
Re(2): Win '95  
Borden Covell II  
Development Env.

We have had the same two problems on plain old Windows (WFW3.11). The PCRead problem was "solved" by turning off 32 bit file access. I now exit windows whenever I am going to do a cb build but don't exit windows if i do an update. The update will sometimes seem to pause but it will usually recover and finish just fine.

---

9/19/95 5:50 PM  
How do I make function fit in 4K segments?  
Dave R. Scheele  
Dan Burnash  
Psyq Tools  
Dan said:

>> "You don't need to align the routine with on a 4K boundary"

Karen said:

>> This doesn't match the behavior I've observed. I had a case where >> the program ran slower when I commented out some code that wasn't >> being called. I figured that the difference must be that something >> was getting bumped out of the instruction cache.

Dan replied:

>> The code has to fit into the icache for this to work. Maybe your >> routine didn't fit, or called a nearby routine that was between the >> code you commented out and the primary routine.

I tend to side with Karen -- I've also had drastic performance loss simply by moving procedures around in a source file. I have procedures ProcA, ProcB, ProcC and ProcD, in that order. Each procedure contains 1 loop construct (either a for or a while). The only call that each procedure makes outside of itself is to the Sony library routines (GTE and GPU only). They don't call each other or anything else I wrote. My main loop is similar to:

```
Init(); (loop) ... ProcA(); ProcB(); ProcC(); ProcD(); .... (end loop)
```

If I change the order of the procedures in my source code to ProcA ProcC ProcD ProcB, I get a 20% performance decrease. This observation seems to support Karen's point. If the I-cache works as you (Dan) describe, simply re-ordering the source code (without changing the order in which procedures are called) shouldn't make any difference at all, should it?

Dazed & confused,  
Dave

---

9/19/95 9:28 AM  
Globals Optimization  
Angus  
Psyq Tools

Here is a performance increase tip that may help developers.

Angus

The Mips compiler has an option to put small data items (e.g. <= 8 bytes) into special sections called .sdata and .sbss rather than the usual .data and .bss. The global register ( gp ) is set up at the start of the program to point to the base of these sections and variables are then accessed as offsets from this pointer rather than as absolute addresses. This can speed the code up considerably when you're accessing lots of global variables and also reduce the size of the code.

This feature has been supported since early March (aspsx 2.09) but this information does not seem to have been distributed.

To use it you add the option `-mgpopt` to your `ccpsx` command line, e.g.

```
ccpsx -g -c -mgpopt main.c
```

By default, this will place any data item of size 8 bytes or less in the `.sdata/.sbss` sections. You can override this size with the `-G` switch, e.g.

```
ccpsx -g -c -mgpopt -G16 main.c
```

will place any item of size 16 bytes or less in the `.s...` sections.

If you specify `-G0` then no data will be placed in the `.s...` sections and the optimisation will be disabled. ( Note : even if you do not specify the `-mgpopt` option the compiler may still place some variables in the `.sdata/.sbss` sections and the assembler will generate `gp` relative addressing modes to access them. It is therefore necessary to specify `-G0` to completely disable this).

Because the size of an offset from the `gp` register is limited to 16 bits the total size of the `.sdata` and `.sbss` sections is limited too. If the sections grow too large then you will get "Illegal value" type errors at link time.

There is one problem in using this feature. Okamoto san has told me that in an event handler the `GP` register will be set to point to the kernel's data area instead of the main program's. This is for efficiency reasons to reduce the time taken to get into the event handler. It is therefore important to compile any event handler routines seperately and to specify the `-G0` option when you do so. Program overlays may also need to be compiled this way depending on the method used to achieve overlaying.

Call-backs should work properly since the `GP` register is set up before the call-back routine is called.

---

9/19/95 9:42 AM

Re(3): How do I make function

Karen Paik

Dan Burnash

Psyq Tools

>> "You don't need to align the routine with on a 4K boundary" This doesn't match the behavior I've observed. I had a case where the program ran slower when I commented out some code that wasn't being called. I figured that the difference must be that something was getting bumped out of the instruction cache.

---

9/19/95 11:35 PM

Re: PATCHW.CPE

John Phua

Mark DeSimone

Development Env.

Hi Mark,

Was the version of `snpatchw.cpe` just down loaded from the new release area? (product release)

Has anyone else had problems with the latest version?

JohnHi Mark,

Was the version of `snpatchw.cpe` just down loaded from the new release area? (product release)

John

---

9/19/95 1:02 PM

PATCHW.CPE

Mark DeSimone

Development Env.

Whenever I load SNPATCHW.CPE, I get the message "Starting target 0", but then I can't load anything after that. The message I get is "Cannot connect to target". The old SNPATCH.CPE works fine.

Glenn O'Bannon Rainbow America

---

9/19/95 9:28 AM

Globals Optimization

Angus

Psyq Tools

Here is a performance increase tip that may help developers.

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There is one problem in using this feature. Okamoto san has told me that in an event handler the `GP` register will be set to point to the kernel's data area instead of the main program's. This is for efficiency reasons to reduce the time taken to get into the event handler. It is therefore important to compile any event handler routines separately and to specify the `-G0` option when you do so. Program overlays may also need to be compiled this way depending on the method used to achieve overlaying.

Call-backs should work properly since the `GP` register is set up before the call-back routine is called.

---

9/19/95 12:54 PM

Re(4): How do I make function

Dan Burnash

Psyq Tools

Karen Paik

The code has to fit into the icache for this to work. Maybe your routine didn't fit, or called a nearby routine that was between the code you commented out and the primary routine.  
Dan B.

---

9/20/95 10:47 AM

PATCHW.CPE problem: example code

Ian McGee

Development Env.

Dan Burnash

BADPATCH.ZIP 113K

Development Env.

I've been having problems with my development system that I have finally tracked down (with Dan's help) to SNPATCHW.CPE.

It all started with a bit of demo code that ran fine on two development systems here, but didn't run on mine. As mine has all the latest stuff and we hadn't updated the other machines, it didn't take all that long to track down the problem.

The attached code should show a bit of landscape with a texture that look something like snow-capped mountains. If you run SNPATCHW.CPE, then the texture will be all messed up -- essentially random values. If you run with SNPATCH.CPE from a cold boot then you will see the proper texture. Everything is using standard library calls hacked from one of the sample programs.

The thing that made it hard to figure out, is that if you have run SNPATCHW.CPE at any time since cold boot, then it will not work, even with the correct (old) SNPATCH.CPE. I did however find that if I ran MAIN.CPE from SAMPLE\GRAPHICS\DIVIDE and then used SNPATCH.CPE it \*would\* work, even if I used SNPATCHW.CPE earlier.

My versions look like this: SNPATCHW.CPE 263,439 08-23-95 8:45p SNPATCH.CPE 247,796 05-31-95 8:16p

What I'm seeing is similar to what others have reported before, as far as a program working on one dev system but not another. Perhaps this is the same problem...

Any input or solution would be greatly appreciated. For now I'm back to the old SNPATCH.CPE. (Er, what problems can I anticipate by going back a version?)

---

9/20/95 5:46 AM

Re(2): PATCHW.CPE

Mark Beardsley

Development Env.

Yes, I've had problems with SNPATCHW also. I could connect to the target fine, but when I try to execute code from the debugger, it would crash inside ResetGraph(). The old SNPATCH still woks fine though. Should I be using SNPATCH, SNPATCHW, or PATCHW ? What's the difference between PATCHW and SNPATCHW?

---

9/20/95 1:51 PM

Re(2): How do I make function fit in 4K segments?

Dave R. Scheele

Mark D. Lyons

Psyq Tools

In Mark's previous message, the gist was:

>> if a procedure you are calling from a loop happens to fall >> on the same bounds as the loop your cache will thrash

i.e. if proc1 maps to the first 1K and proc2 ALSO maps there, thrash time! Thank you, thank

you!! That's the first explanation that made sense to me. I finally clue into what "direct mapped cache" means.

Now it seems to me that if I have a tight loop which calls, say, RotTrans, and my loop maps into the first 3K of the cache, I'd better hope that RotTrans maps into the last 1K or it's thrash time. I'd love to be able to make the cache 8K long, 'cuz then one would contain my code, and one would contain the library code, if necessary. Has anyone looked at the SN Systems startup code to see if the size can be adjusted?

>> Then again, I could be wrong.

Gads, that would mean starting this whole thread over again! Ugh!

Dave

---

9/20/95 1:46 PM

PATH and Environment Variables

Paul C. Isaac

Development Env.

I seem to be noticing a small annoyance...

if my environment look list this...

PSYQ\_PATH=... PATH=...

everything works usually fine...

but if things initialize differently and the PATH ends up before the PSYQ\_PATH variable, then psymake gets confused and can't seem to find anything?

Can't find how to execute command "ccpsx..."

the problem is slight erratic depending on the size of environment and how many other variables are defined... I'll see if I can come up with an exact case you could verify... BUT it does seem like there is a bug in the environment parsing code...

please investigate!

(pci)

but if PATH

---

9/20/95 9:54 AM

Re(3): PATCHW.CPE

John Phua

Mark Beardsley

Development Env.

Hi Mark,

>>Yes, I've had problems with SNPATCHW also.

I'm not quite sure what you mean by "with SNPATCHW also". I would if the problem your having is with the latest version in the product release area.

>>What's the difference between PATCHW and SNPATCHW?

Both the PATCHW.CPE and SNPATCHW.CPE has a 2M.OBJ style start-up and it does flush the cache and disable interrupts before starting the new kernel. The kernal image is different between the two.

John.

---

9/20/95 2:26 PM

Re: PATH and Environment Variables

Silas S. Warner

Development Env.



It sounds like you are running out of environment variable space after setting PATH, so that PSYQ\_PATH is never set.  
You can increase the space for environment variables in your \CONFIG.SYS file, by finding the line which reads SHELL=C:\COMMAND.COM..... and adding to it the parameter /E:800 or if you already have a /E parameter, increasing the number there.

Silas Warner

---

9/20/95 2:13 PM  
Re: PATH and Environment Variables  
Dan Burnash  
Development Env.

My default setup has the PATH before PSYQ\_PATH, and everything works fine. Let me know if you come up with any more specifics, there must be something else involved.

---

9/20/95 11:21 AM  
Re: How do I make function fit in 4K segments?  
Mark D. Lyons  
Dave R. Scheele  
Dan Burnash

>>If I change the order of the procedures in my source code to ProcA ProcC >>ProcD ProcB, I get a 20% performance decrease. This observation seems >>to support Karen's point. If the I-cache works as you (Dan) describe, >>simply re-ordering the source code (without changing the order in which >>procedures are called) shouldn't make any difference at all, should it?  
The cache is direct mapped I believe, so if a procedure you are calling from a loop happens to fall on the same bounds as the loop your cache will thrash. Sorry for the rhyme. Simply aligning a critical routine to a 4K boundry will not help at all if it calls another routine which also happens to map to a 4K boundry. The only way to insure that a critical routine fits in the cache is to keep the routine under 4K and keep it from calling other routines. The alignment of the routine itself doesn't matter so long as it's under 4K big. You can use the new inline functions in such loops to make sure the critical sections remain in cache. Then again, I could be wrong.

---

9/21/95 10:12 AM  
Re(2): PATCHW.CPE  
cary hammer  
John Phua  
Mark DeSimone  
We just loaded the latest snpatchw.cpe from the net yesterday and noticed that the following would FAIL: - resetps - run snpatchw - cdexec  
though the old standby would work - resetps - run snpatch - cdexec  
Mark Nicely Unexpected Development

---

9/21/95 2:31 PM  
Re(3): PATCHW.CPE  
Dan Burnash  
Psyq Tools

There appear to be several symptoms of the same problem, a bad version of snpatchw.cpe from SN Systems. A new version should be available soon, but until it is, USE SNPATCH.CPE, NOT SNPATCHW.CPE.

Dan B.

---

9/21/95 11:28 AM  
libsn.h / PQYQPause()  
cary hammer  
Psyq Tools

In the description with the latest snpatch(w) was references to a function PSYQPause() which is supposed to prototyped in libsn.h. Any idea where we would find these things? Thanks.  
Mark Nicely Unexpected Development

---

9/21/95 10:12 AM  
Re(2): PATCHW.CPE  
cary hammer  
John Phua  
Mark DeSimone

We just loaded the latest snpatchw.cpe from the net yesterday and noticed that the following would FAIL: - resetps - run snpatchw - cdexec  
though the old standby would work - resetps - run snpatch - cdexec  
Mark Nicely Unexpected Development

---

9/21/95 2:53 PM  
Re: libsn.h / PQYQPause()  
Dan Burnash  
Psyq Tools

No, I can't find it in libsn anywhere, but I will look into it and let you know.

---

9/22/95 12:12 PM  
Putting .OBJs in separate directories?  
Jay Stelly  
Psyq Tools

Has anyone had any luck getting GCC to output the .OBJ files to a separate directory from the source code? I'm trying to get it to put my .OBJ files in a subdirectory, but when ccpsx passes control over to aspsx, it puts them in the current directory anyway. Is there a way to override this? Should I (Can I) dump ccpsx and just call cc1psx and aspsx directly? The .OBJs really clutter up my directory. It's something I can live with, of course, but I'd rather have them in a subdirectory.

Jay Stelly Tetragon

---

9/22/95 4:09 PM  
Re(2): prob with char declaration  
stephen chaplin

Development Env.

The compiler does default to unsigned char.  
Romesh, Celeris Inc.

---

9/22/95 10:43 AM  
Memory models  
David W. Marshall  
Development Env.

What is the proper way to set a program to use the 2/8 mbytes of RAM?  
Some of the docs say to link with either 2mbyte.obj or 8mbyte.obj. Other docs say to use the  
\_RAMSIZE equate in the S.N. system stuff and not to bother with the .obj file.

thanks,  
dave

---

9/22/95 4:33 PM  
Memory Card & Psy-Q  
Joe J. Alemanni  
Psyq Tools

Attempting to run the Samples/Etc/Card/Max to inform myself re: the Memory card on Psy-Q.  
Does the Psy-Q emu handle this or do I need to actually plug in a Card ? If so, where & how ?  
Any Psy-Q docs on this ? (Henrik Jonson working with Joe A)

---

9/22/95 9:30 AM  
Linking with overlays  
Mark Beardsley  
Psyq Tools

When linking overlays (as in the OVERMENU example), how does the 2mbyte.obj file get linked  
in? The example does not show this. Is it put into the main section, or does it need to go with  
each overlay? right now we aren't linking with it at all, and everything seems to be okay. What  
does it really do anyway?

---

9/24/95 11:17 PM  
bss  
Gene Sewell  
Development Env.

Hi,  
We recently attempted to burn a CD that would run on a blue box. This was our first attempt  
to run on a standard system. We were very surprised to find that around 1/2 Mb of work ram  
was used up with .bss. Our budget for work ram was thus seriously screwed up.  
We need to understand how every byte of work ram gets used up. I have to play dumb here,  
because at this point, I have no idea how to get a handle on this .bss group.

How can we shrink or control this huge usage of work ram? Is it a matter of coding style, or a switch, or what? From the description of .bss, (which sounds like a FORTRAN common block) it doesn't sound like something which should grow without our knowledge. My first guess was that the libraries were declaring .bss, but 1/2 Mb seems way too huge.

Can you shed some light on .bss usage, please?

Thank you so much,  
Gene

---

9/25/95 9:25 AM

Re(2): bss

Mark D. Lyons

Development Env.

>>Did you use InitHeap()? Sometimes, if you do not, it will appear as if 1/2 meg is wasted. Would you expand on that please. That's a pretty scary statement to make without an explanation.

I believe the size of bss referred to here is the size reported in the map file. I wouldn't think that InitHeap() could have anything to do with that. I don't use malloc() at all, I therefore don't use InitHeap(). If some initialization is not being done because of this I would like to know exactly what that is.

There is a message or two posted in the archives here explaining what types of data all sections contain. They are the standard C section names.

>>.text executable code >>.data initialized data >>.bss uninitialized data >>.rdata read only data (e.g. constants) >>.sdata small size initialized data\* >>.sbss small size uninitialized data\* >>  
>> \*small - the size limit is configurable with the -G# compiler switch. >> The # represents the maximum byte size entity to put into sdata or sbss. >> Use -G0 for event handlers. >> The default is -G8, or an 8 byte limit for an item to be put into sdata or sbss.

---

9/25/95 7:11 AM

Re: bss

Mark DeSimone

Development Env.

Our executable seems to be much bigger than it should be as well, but I haven't had the time yet to analyze how things are being laid out in memory. I often find myself wishing for 4 meg. Oh well...

Glenn O'Bannon Rainbow America

---

9/25/95 11:42 AM

Re(3): bss

Roy Eltham

Development Env.

I have often wished for a more detailed map file than the one produced by the compiler from Sony.

When you sort the listing of externals by address and look at the range for BSS you will almost always find large gaps (32k) with no explanation of what's in them. My BSS is currently about 256k (with one gap of about 32k and a few others in the 4-8k range). I have been assuming that these gaps are filled with some form of non-externals, but local variables go to the stack so I

have no idea what's in them. Since there seems to be no way to get any more details into the map I've been stuck. Can any of you SONY guys/gals shed some light on this?  
Roy Eltham Regal Productions

---

9/25/95 11:08 PM

Re(2): bss  
Gene Sewell  
Thomas Boyd  
Development Env.  
Whoopie!

No I didn't. Oh I do hope this is the answer!

I'm used to being able to understand how every byte in a game is allocated. This is the first game I've done in C (not that I have a problem with C.)

I will let you know. Thanks

Gene

---

9/25/95 9:25 AM

.BSS

Thomas Boyd  
Development Env.  
Mark DeSimone

Here is what I know about the linker and the .BSS section: =====

We do not have protected memory architecture, but sections still exist.

Sections: .text = executable code .data = initialized data .bss = un-initialized data .rdata = read only data .sdata = small size variables initialized (def: 8 bytes or less) .sbss = small size variables un-initialized (def: 8 bytes or less) .ctors = C++ constructors (for calling before program is in RAM) (\_\_main is a routine right before main which calls the .ctors routines.) .dtors = C++ destructors (for calling before program is in RAM)

SN entry point is for zeroing out the .bss.

You can control the size of the filter for letting variables in the .sdata and .sbss with the Gp register optimization. EX: -G4 lets in vars of 4 bytes or less. If .sbss and .sdata go above 32K, errors happen.

You can customize create, and org your own groups of sections with the PSY-Q linker. This can be good for overlays sharing the same memory space.

Stay tuned for Part II: building your own groups. To be aired later today. (read: I have some typing to do to get it to you). Tom

---

9/25/95 8:57 AM

Re: bss  
Thomas Boyd  
Development Env.  
Gene Sewell

Gene, Did you use InitHeap()? Sometimes, if you do not, it will appear as if 1/2 meg is wasted.

Tom

---

9/25/95 9:11 AM

Re: Memory Card & Psy-Q

Dan Burnash  
Psyq Tools

You need to actually plug in a card to test it out on the dev system. This is done by using the dtl-h2080, which allows you to use the consumer unit controllers and memory cards. It converts your two 9 pin ports to two controller plus two memory card slots.

---

9/25/95 4:44 PM

Re: libsn.h / PQYQPause()

Dan Burnash

Psyq Tools

cary hammer

Here is the define, evidently it got lost in the latest revision of libsn.h

```
#define PSYQpause() asm("break 1031") /* inline to keep variable scope */
```

Dan B.

---

9/25/95 8:55 AM

Re(2): bss

Thomas Boyd

Development Env.

Mark Beardsley

Mark, I will retrieve this info. (I actually have it in some obscure notes I will look up). T  
===== Actually, I would be interested in knowing what types of data end  
up in all the sections (especially library code and data). We currently have .text, .data, .rdata,  
.bss, and .sbss sections and have very little understanding as to what types of code and data  
end up in them. There must be some method of declarations that determine what goes where  
(ie. STATIC variables go in rdata, code goes in text, etc.). I've asked this before, but gotten no  
response (is this proprietary info or does nobody know?).

---

9/25/95 5:54 AM

Re: bss

Mark Beardsley

Development Env.

Actually, I would be interested in knowing what types of data end up in all the sections  
(especially library code and data). We currently have .text, .data, .rdata, .bss, and .sbss sections  
and have very little understanding as to what types of code and data end up in them. There  
must be some method of declarations that determine what goes where (ie. STATIC variables go  
in rdata, code goes in text, etc.). I've asked this before, but gotten no response (is this  
proprietary info or does nobody know?).

---

9/26/95 10:27 AM

Re: Fwd(2): Memory models

Thomas Boyd

David W. Marshall

Development Env.

Either way.

linking with 2mbyte.obj or 8mbyte.obj is equivalent to setting the following two variables:

`_RAMSIZE` `_STACKSIZE` Just pick the easiest for you. Tom  
===== Any thoughts on this? ----- What  
is the proper way to set a program to use the 2/8 mbytes of RAM?  
Some of the docs say to link with either `2mbyte.obj` or `8mbyte.obj`. Other docs say to use the  
`_RAMSIZE` equate in the S.N. system stuff and not to bother with the `.obj` file.

---

9/26/95 8:16 AM

Re(3): `bss`

Thomas Boyd

Gene Sewell

Development Env.

OK, I now research more section lore. (I was out yester PM, but now continue). T

---

9/26/95 4:03 AM

Re(2): `bss`

Gene Sewell

Development Env.

Thomas Boyd

Hi again Tom,

Well... I tried adding `InitHeap()` to my program, and it didn't help. I guess I was assuming that a default heap of xxx (big #) was being allocated somehow.

I noticed that none of the sample code use the `InitHeap()` function. Just in case I might have made a wrong assumption, here's what I did:

```
char aBuf[50];
```

```
main() { /* .... */ InitHeap(aBuf, 50); }
```

I still don't understand who is grabbing this `.bss` memory. From what I've read, a module has to go out of it's way to use the `.bss` memory - it is not part of normal global variable pool. When I look at my link map (wish there were more link map options), I can understand just about everything except the `.bss` (`.sbss`) section.

More light please?

Thanks

Gene

---

9/26/95 4:03 PM

Non-Supported Peripherals

Mark D. Lyons

Development Env.

My game's PAL submission just got bonked by SCEE for failing to ignore input from non-supported peripherals. As per every bit of demo code I've ever seen from you guys I use `PadInit()` and `PadRead()` to read the joypads. How are we supposed to detect if valid joypads are connected.

---

9/26/95 2:09 PM

New Psyq debugger

Thomas Boyd

Psyq Tools

David Schwartz

DEBUGPSX.ZIP        68K

Development Env.

From Andy @ SN Sys This will be released formally soon, but I know some of you need it today.  
Tom ===== For those developers still sticking with the DOS debugger I have added a new feature which may be of interest.

By popular request this new debugger has the beginnings of a new call-stack browser. This allows you to unpick the C Call-stack to see the functions which called the current function and their parameters and local variables.

See the file README.TXT inside DEBUGPSX.ZIP for more details. Available via the SN BBS in the PSX area or by FTP from ftp.snsys.com

Although this feature is functionally quite stable, the user-interface is still being argued over (it's already been through several incarnations) so expect it to change in later versions. Once we are happy with this new feature it will be added to the Windows-95 debugger also. Any feedback on this new feature is very welcome.

Thanks - Andy

---

9/27/95 12:06 PM

Re(2): New Psyq debugger

Thomas Boyd

David W. Marshall

Development Env.

There is a win95 debugger under development at SN Systems. Tom =====  
For those developers still sticking with the DOS debugger I have added a new feature which may be of interest. ++++++

The above statement implies that a non-DOS debugger exists. Is this true? What ever happened to the Windows 3.1 version of the debugger?

dave

---

9/27/95 1:02 PM

Re: Non-Supported Peripherals

Dan Burnash

Development Env.

>>My game's PAL submission just got bonked by SCEE for failing to ignore input from non-supported peripherals. As per every bit of demo code >>I've ever seen from you guys I use PadInit() and PadRead() to read the joypads. How are we supposed to detect if valid joypads are >>connected.

What did they say when they bonked it? The Standard controller and NegCon are supported when using PadInit() and PadRead(). If a multitap is used, the first port on the multitap is read automagically, and the program will work without change. Any other controller should return zeroes for the pad information, which I assume your program ignores. Please give me more details of what the error report contained.

Dan B.

---

9/27/95 11:12 AM

Re: Non-Supported Peripherals

Robert w. Calfee

Development Env.



I've been having trouble with living up to the "Standards" Sony set for controls etc. too, It seems that I didn't have the latest document (sigh).  
rwc

---

9/27/95 12:05 PM  
Re: New SNPATCHW fails  
Dan Burnash  
Psyq Tools

I tested out your code, and do not get any errors. I am using version 4.69 of dbugpsx. What version are you using?

---

9/27/95 3:15 PM  
Re(2): New SNPATCHW fails  
Mark Beardsley  
Dan Burnash  
Psyq Tools  
we're using 4.64 of the debugger. I thought this was the newest.

---

9/27/95 9:39 AM  
New SNPATCHW fails  
Mark Beardsley  
Thomas Boyd

PSX.ZIP            212K  
Development Env.  
The new SNPATCHW (09-20-95) still crashes my game when running the debugger. The old SNPATCH (05-31-95) works fine.  
SNPATCHW causes a "BUS ERROR ON INSTRUCTION FETCH" immediately (and the pc is off in some invalid area of memory).  
I've attached my current .CPE and .SYM files. These work with SNPATCH, but not with SNPATCHW.  
If I'm doing something wrong, please inform, Thanks.

---

9/27/95 4:27 PM  
Re: Memory models  
Angus  
Development Env.

2mbyte.obj replaces the default snentripoint from libsn.lib. If you link in the 2mbyte.obj then that snentripoint runs and that 2mbyte.obj snentripoint sets 2mbyte as the size.  
Instead of replacing the libsn.lib snentripoint, you can just alter the external variable with the ramsize variable. This keeps the libsn.lib entripoint, but allows you to change the megabyte size beforehand.  
So, choose your poison.  
Third, you can use the libsn source and make your own snentripoint. Look in releases for the sn source code.  
The rule is: 1) If there is an .obj file with an snentri point it uses it. 2) If you use the libsn.lib entripoint, then you can change the externed variables.

Angus

---

9/28/95 11:20 AM

Re(4): New SNPATCHW fails

Mark Beardsley

Dan Burnash

Psyq Tools

Well, I tried the new dbugpsx and downloaded SNPATCHW again. It still failed. However, I found a bizarre thing that would make it work.

I used to have a batch file which did this `\bin\resetps 1 \bin\run /w10 \bin\snpatch \bin\run /w10 /h psx \bin\dbugpsx /d psx`

this worked fine for the old snpatch, and failed with snpatchw. However, if I change my batch to `resetps 1 run /w10 \bin\snpatch run /w10 /h psx dbugpsx /d psx`

with just the path names on the dos commands removed (letting the PATH find them), it works fine. And NO I don't have an old version of RUN or dbugpsx or resetps somewhere else on my system (I checked)!! And YES it makes no sense to me either, but it works. I suspected that maybe the new SNPATCHW needs longer to load (and so the Path search was giving it just enough more time, but enlarging the /w time didn't help). I can only get SNPATCHW only by keeping the path names off. Bizarre Huh?

---

9/28/95 9:40 AM

Re(3): New SNPATCHW fails

Dan Burnash

Psyq Tools

Mark Beardsley

DBUGPSX.EXE 110K

Development Env.

No. The latest is 4.69, and has been posted to the bbs. Here it is for your easier reference. In case you have the bad or corrupted snpatchw, I have attached it as well.

---

9/28/95 9:21 AM

Re(2): Non-Supported Peripherals

Mark D. Lyons

Development Env.

>>The Standard controller and NegCon are supported when using PadInit() and

>>PadRead().....Please give me more details of what the error report contained.

The bug report was entitled NegCon and it just said "Input from non-supported peripherals should be ignored." I have seen the NegCon, but never used it so I have no idea what it might be returning which I should be ignoring. I'll give them a holler to see exactly what the problem was, I keep missing them with the time difference though.

Mark

---

9/29/95 11:22 AM

Re(5): New SNPATCHW fails

Dan Burnash

Psyq Tools

The only time I get "bus error on instruction fetch" is when snptachw fails to load correctly. I tried using your run.bat file, but forgot to change it to load snpatchw instead of snpatch. Then I got the error as soon as I ran the program. I realise this is unlikely solution, but make sure all of the commands execute without error. Once I modified the batch file to use snpatchw, it worked for me with or without the pathnames given.

---

10/1/95 10:34 AM  
Problems Setting Up DTL-H2000 Boards  
Andy Sells  
Development Env.

Hello Everyone:

Apologies in advance if I've posted this in the wrong spot; I'm still trying to get a handle on how this BBS works.

We've received a development system for evaluation but I can't seem to get the boards working properly. After installing the two boards I installed the patch disk (mostly compiler stuff from the looks of it) then, as the docs instruct to do, typed 'run' to see if it found the hardware. Apparently it doesn't, since the message I get is "cannot locate target".

I've checked to make sure the boards are installed solidly and that the 100-pin connector is good. The CDROM 'stub' is installed on the PI02 board, and I've confirmed that the board is set to the default address of 1340. I tried setting the IRQ jumpers from the factory default to 10 but that didn't make any difference. I've explicitly stated both the address and IRQ on the DEXBIOS load in autoexec.bat without result.

Just for the heck of it, I also tried running the PSXCONS program. It comes up exactly right with perfect, textbook vaues, but when I hit [F9] [F10] to reset the PSX board and drop to its console it just hangs.

Steven

---

10/2/95 4:44 PM  
Re: wish dumplib,dumpobj, were useful.  
Dan Burnash  
david eader  
Psyq Tools  
DUMPERS.ZIP        37K  
Development Env.  
After many moons,here is the source+utils so you can modify them to your hearts content.

---

10/3/95 10:57 AM  
Psylink/Psylink2  
David W. Marshall  
Psyq Tools

I was using Psylink and was getting an "out of memory" error. I tried the /b option, but that didn't help. Per suggestion from Tom Boyd, I tried Psylink2 and it worked.

- 1)Why is there a Psylink and Psylink2?
- 2)I could find no documentation explaining the differences. Are there docs on this?
- 3)Why are there 2 versions? If psylink2 is the new rev, why not just call it psylink?

dave

---

10/4/95 10:11 AM  
Re: Psylink/Psylink2  
Dan Burnash  
Psyq Tools

1) Why is there a Psylink and Psylink2? Psylink uses real memory, and is faster. Psylink2 uses a DOS Extender, so suffers the usual load time penalty and slower I/O problems, but can handle larger and more complex links.

2) I could find no documentation explaining the differences. Are there docs on this? The summary above is the only difference I know about.

3) Why are there 2 versions? If psylink2 is the new rev, why not just call it psylink? There are two revs to allow those who don't need psylink2 to link faster, and those who need psylink2 to still be able to link.

---

10/5/95 4:01 PM  
Re(4): bss  
David Minogue  
Development Env.

In my opinion, in embedded systems it is better to make library functions which require large work spaces get that space from the application at initialization time rather than having them statically allocate memory. This way, at points in the game where that library is not being used, its memory can be put to better use (so long as it is reinitialized before it is used again). Also, it makes it possible for the memory usage to be scalable.

Just my 2 cents.

-- David.

---

10/5/95 9:16 PM  
floating point in debugger  
Pat Quinn  
Psyq Tools

Hi,

Call me crazy, but every once in a while I like to use a little floating point in my code. Nothing fancy, just a divide there and a few adds here. Things too simple to bother with fixed point...

It seems I have to coax floating point out of this compiler, though -- casting everything to float just to get it to work. There seems to be no automatic promotion of the rvalue to float or double like the MIPS compilers I've used on SGIs (Oops! The cat's out of the bag -- now you know why I'm used to floating point!).

Anyway, it works. However, it sure would be nice to debug it... But when I name a floating point symbol in debugpsx in the watch or vars window, all I get next to the name is "????". Is there something I'm not doing right, or is floating point just not handled by this debugger?

Thanx,

David Crain NuFX, Inc.

---

10/5/95 4:12 PM

Re(5): bss  
Angus  
Development Env.

David,  
We agree. We are working on the libraries to free up the buffers allocated by the libraries. Look for improvements in the libraries along these lines in the future.  
Angus

---

10/5/95 10:58 AM  
Remove Ian McGee's message please  
david eader  
Development Env.

There's an unreadable message from Ian McGee in this dir. Could you guys delete and/or make it readable so I can unflag it? Thanks.  
deader

---

10/5/95 1:03 PM  
Re: Remove Ian McGee's message please  
Ian McGee  
Development Env.

How dare you suggest that my message be removed! Why I oughta ....  
Er, nevermind. ;-)  
You can use Message --> Unread to get rid of the flag.  
The code was just an example of a problem with SNPATCHW, which has since been fixed.

---

10/5/95 1:49 PM  
Re(2): Remove Ian McGee's message please  
Angus  
Development Env.

I also approved the upload. IN the future, send a note to the admin to approve the uploads of any kind of data.  
Angus

---

10/6/95 7:18 AM  
Reading Controllers  
Mark Beardsley  
Development Env.

What is the method we should be using for reading the controller data? Should we be using LIBETC (PadInit, PadRead) ? Or should we be using LIBAPI (InitPAD, StartPAD) ? What are the advantages/disadvantages of each?

We plan to support only the standard controllers.  
Thanks.

---

10/6/95 2:53 PM  
capturing ccpsx error msgs  
cary hammer  
Development Env.

Sorry if this should have gone to the PsychoTools conference, but i'm not really sure the diff between dev and ptools...  
How does one capture the error messages from the ccpsx compiler? I can't find a switch to do this and dos redirection doesn't seem to cut it. (Bonus points awarded for answers not requiring Windows, Windows 95, mac, SGI, cray 3, etc.)  
Thanks. - Mark Nicely - Unexpected Development

---

10/6/95 10:28 AM  
Debugger n' stuff  
chris m. coffin  
Development Env.  
Angus

I've been using Lib 3.2 beta and was wondering if there is a newer version out?? I heard there was a new version coming soon. When is the Windows debugger coming out? Just wanted to make sure I'm using the most current stuff.  
Where can I get some docs/examples of the ROTMESH functions???? Thanks :)

---

10/6/95 6:31 PM  
Re: capturing ccpsx error msgs  
Silas S. Warner  
Development Env.

I am using BRIEF with the CCPSX compiler from DOS, and have no trouble returning error messages to BRIEF using the compile function. I simply set an environment variable:  
set BCC="ccpsx -c -g %s.c"  
(Note: my BCC variable also contains the directory of CCPSX, just in case.)  
To take full advantage of this, it's often a good idea to rewrite your MAKEFILE.MAK like this:  
all: main.obj data.obj makefile.mak ccpsx -g -Xo\$80080000 main.obj data.obj -  
omain.cpe,main.sym  
data.obj: data.c ccpsx -g -c data.c  
main.obj: main.c ccpsx -g -c main.c  
etc. The idea is to use CCPSX only to PSYLINK the completed CPE file, and separate lines to compile C files to OBJ files. That way, you can compile a C file in BRIEF and use the error message checking, then exit BRIEF, type MAKE, and have the OBJ files linked without recompiling the C files. Note also that the final linkage depends on MAKEFILE.MAK, so that if I add or delete OBJ files, the program will be relinked.

Silas Warner

---

10/6/95 12:39 PM  
Re(3): Remove Ian McGee's message please

Jay Stelly  
Development Env.

You can also just option-click the folder from the conferences directory to mark all messages as read if your on a mac. I'm pretty sure there's a windows equivalent, but since I run the BBS software on a mac, I'm not familiar with it.  
Jay Stelly Tetragon

---

10/6/95 4:06 PM  
Re: capturing ccpsx error msgs  
chris m. coffin  
Development Env.  
cary hammer

I'll have to forego the bonus point award and give you my 'windows answer' If you use codewright for windows you can capture the output to a file and have it come up in its own window also (very nice) You must be using brief eh?

---

10/6/95 8:38 AM  
Re: Reading Controllers  
Thomas Boyd  
Mark Beardsley  
Development Env.

>What is the method we should be using for reading the controller data? >Should we be using LIBETC (PadInit, PadRead) ? >Or should we be using LIBAPI (InitPAD, StartPAD) ? >What are the advantages/disadvantages of each?  
InitPAD is great. It gives you all the info, and all of the control. If you can do it, use InitPAD. (PadInit calls InitPAD and waters the info down). I know no advantage to using PadInit, besides having the pad buffer values "pre-chewed" for you.  
In the meantime, for people stuck with PadInit, Dan is requesting library support to find the controller ID.  
Tom

---

10/6/95 10:45 AM  
Re(2): Reading Controllers  
David W. Marshall  
Development Env.

I am using InitPad() and it works fine. Do I still need to call ChangeClearPad(0)?  
When I converted to InitPad(), Sony Tech support said the ChangeClearPad(0) was needed to keep the system from crashing.  
dave

---

10/6/95 2:39 PM  
-ansi flag  
David W. Marshall  
Psyq Tools

I want to turn on prototype checking in the ccpsx compiler. How do I do this? Is there a -prototype flag?  
I tried using the -ansi flag and came across the following problems:

1)pollhost() won't compile because it gets an undefined error on asm  
2)The preprocessor was expanding my variables V0 and V1 into \$2 \$3. Tracked the problem to the #defines in asm.h. For some reason, the -ansi flag is turning off the LANGUAGE\_C define. Are the libs setup for the -ansi flag?  
dave

---

10/6/95 10:29 AM

Re: floating point in debugger  
stephen chaplin  
Pat Quinn  
Psyq Tools

While you're at it, why doesn't the debugger like to look at the long long type (64-bit integer)? Virtual Pool uses a LOT of 64-bit math, and it is a pain to debug!  
Thanks, Romesh, Celeris Inc.

---

10/6/95 10:49 AM

Re(2): floating point in debugger  
chris m. coffin  
stephen chaplin  
Pat Quinn

I was wondering about that too since we do a lot of 32x32 multiplies getting 64 bit results and when you try to look at the result its either WRONG or just a bunch of ????. I just wrote the math stuff in asm and throw the Hi and Lo results into longs and look at it that way. Whats going on here?

---

10/6/95 8:30 PM

Re: capturing ccpsx error msgs  
David R. Sullivan  
cary hammer  
Development Env.

To capture the error messages you must redirect the stderr, from MSDOS this is NOT acheivable. From NDOS (Norton) you can. From Multi-Edit you can. From normal dos you would have to write some C code to close device stderr, and reopen it to your file.  
Hope this helps

---

10/9/95 3:31 PM

SNPATCHW problems  
Michael K. McCarty  
Psyq Tools

Wiith the 1.52 version of SNPATCHW I've been having problems with the CD Emulator after running it. The Emulator seems to have problems when I run snpatchw after running cdemu. This does not fail if I use the SNPATCHJ in the same manner. Any suggestions, fixes?  
M.McCarty

---

10/9/95 2:55 PM

Re: r3000 processor  
chris m. coffin



Development Env.

The book I suggest getting is:

IDT R30XX FAMILY SOFTWARE REFERENCE MANUAL (MAN-RISC-00044) available from  
Integrated Device Technology, Inc. 2975 Stender Way Santa Clara, CA 95054-3090 VOICE 1-800-  
345-7015 FAX 1-408-492-8674

Hope this helps :)

---

10/9/95 4:34 PM

Re: r3000 processor

stephen chaplin

Development Env.

An excellent book to get is:

MIPS RISC Architecture By Gerry Kane and Joe Heinrich ISBN #: 0-13-590472-2

Hope that this will help you, Romesh, Celeris Inc.

---

10/9/95 11:50 AM

r3000 processor

jeffrey Hall

Development Env.

I need documentation on the r3000 processor. There must be a manufacturers info sheet  
somewhere, but I can't find it. Thanks, Jeff Hall.

---

10/9/95 5:57 AM

Re: capturing ccpsx error msgs

Mark Beardsley

Development Env.

Here's the method I use for re-directing the ccpsx output (from DOS).

I put my ccpsx command in a batch file and call the batch file from my makefile.

```
MAKEFILE.MAK
```

```
program.obj: program.c compile program error 0
```

```
COMPILE.BAT ccpsx -g -c -comments-c++ -O%3 %1.c -o%1.obj>%2.err
```

This will direct the output from the ccpsx command to error.err (or whatever). This does not  
work unless it is done from a batch file (psymake will interpret the > itself and not give you  
what you want.

Give this a try, If it works for you, do I get the bonus points?

---

10/9/95 11:55 AM

Re(7): C++ Header Files

Ted Morris

Dan Burnash

Development Env.

Please, please please fix the library header files to work with C++ as soon as possible  
(preferably next release).

Since we work exclusively with C++, this can potentially screw up our development.

Ian Leslie

---

10/10/95 9:28 PM  
Re(8): C++ Header Files  
Dan Burnash  
Development Env.

I have passed your plea along to SCE. Hopefully they will hear and listen.

---

10/10/95 9:12 PM  
Re(3): Reading Controllers  
Dan Burnash  
Development Env.

You need ChangeClearPad(0) when using InitPAD. PadInit does the ChangeClearPad(0) internally. For an example using InitPAD, look at the get\_pad routine in my combat cable example attached to a 9/27/95 message in the SIO conference. Admittedly, this may be overkill, as it supports a variety of controller formats, but it is a good reference, and can be run even if no combat cable is present.

If you want to fully support anything but a standard controller, you will need to use InitPAD. For now, PadInit has one drawback for those supporting only the standard controllers. It tries to support the NegCon controller, and potentially other third party controllers, and returns whatever it can of the digital information. This may or may not be enough for what your game needs, or may be a different button config when a new controller comes out. If all you need is limited digital button info, PadInit may work, and automatically give you NegCon and other controller support. If you need more, you may get a partially working controller that doesn't quite work for your game, an ugly interface at best.

Dan B.

---

10/10/95 10:21 AM  
(SN)PATCHW problems  
Dan Burnash  
Psyq Tools  
News

The new SNPATCHW and PATCHW FAIL when using the CD emulation system. Eventually the boards stop responding once the (sn)patchw is loaded and selemu is run. For now, go back to using SNPATCH unless you need Kanji font support. If you need the added Kanji font support in (sn)patchw, then be aware that it will not work with the CD emulation system.

---

10/10/95 9:21 PM  
Re: Debugger n' stuff  
Dan Burnash  
Development Env.

>I've been using Lib 3.2 beta and was wondering if there is a newer version out?? >I heard there was a new version coming soon.

The lib 3.2 final is out. Notice the 9/18 post by John Phua, in the Releases conference. It

describes the final release.

>>When is the Windows debugger coming out? Win 3.1 or Windows 95?

>>Where can I get some docs/examples of the ROTMESH functions???? Examples are in the samples\graphics\zimen directory.

---

10/10/95 4:10 PM

Re(8): C++ Header Files

Byrt Martinez

Development Env.

PSXLIB.H 4K

Development Env.

We've been doing C++ development for a while. Worked out a system for upgrading the header files. I've enclosed the header file that does the brunt of the corrections. There are a handfull of others but the compiler will complain so suggest you fix 'em as you find them.

hope this helps.

Greg Kearney

---

10/11/95 9:36 AM

Re(2): Debugger n' stuff

chris m. coffin

Development Env.

Dan Burnash

>>When is the Windows debugger coming out? >>Win 3.1 or Windows 95?

Either one (WIN95 preferably) would be nice :)

---

10/11/95 10:52 AM

Re(3): Debugger n' stuff

Dan Burnash

chris m. coffin

Development Env.

The Windows 95 debugger is not yet released. It should become available in either late October or early November. There will undoubtedly be a posting on the bbs when it is available, so keep checking.

---

10/11/95 2:21 PM

Debugger: arrays in vars window

Silas S. Warner

Development Env.

A while back, an improvement was made in the debugger. The left and right arrow keys were used (if I remember correctly) to scan forwards and backwards through arrays. In other words, in the VARS window, you opened up an array with +, and you got a line reading [0]. Then pressing the right arrow changed that to [1] and so on for the length of the array, and pressing the left arrow reduced it back down toward [0].

In the new version of the debugger, the left and right arrows are used for stack tracing. What is used to scan through arrays?

Silas Warner

---

10/11/95 10:55 AM

Re(8): C++ Header Files

Dan Burnash

Development Env.

Ted Morris

The header files are now in the task list for version 3.3 of the libraries.

We don't yet have a release schedule, so don't ask when they will be released. :-)

Dan Burnash

---

10/13/95 11:16 AM

Re(3): floating point in debugger

stephen chaplin

chris m. coffin

Pat Quinn

When we do a debugging session with long long, all I ever get is: ?????, and not even a WRONG answer! I don't think that the PsyQ debugger knows anything about the long long type. If you look at the disassembly of the C code that the compiler produces (under -O2 optimization or better), it just does a MUL, and throws the HI and LO registers back, so nothing is gained by doing it in assembly (it actually might be slower due to the fact that you might have to call a procedure to do your muls). Have you gotten a response? This is a pain in the rear end to debug, and I usually have to have a pointer to the 64-bit long long (a structure with 2 longs) just to see what is going on!

Good Luck, Romesh

---

10/16/95 12:37 PM

ccpsx's assembler docs missing.

Dean M. Grandquist

Development Env.

Where are docs for the aspsx.exe compiler? I have the asmpsx.exe docs, but the compiler is calling the aspsx.exe assembler.

Thanks --DeanG

---

10/16/95 6:25 PM

breakpoints in the debugger

jeffrey Hall

Development Env.

It seems that the debugger can't remember my breakpoints when I Alt-x out of it. Also, perhaps it would be nice to have a breakpoint window as a feature allowing you to insert/delete/see them. Jeff Hall

---

10/20/95 3:07 PM

ASPSX V2.25

Henrik Markarian

Psyq Tools

It appears that there are bugs in version 2.25 of ASPSX.EXE. The same code that ran without problems with v2.21 crashes with v2.25.

Henrik

P.S. I'm using PSYLINK v2.30, ASMPSX v2.03, PSYLIB 2.01, and Compiler 2.6.3.SN.2

---

10/23/95 9:01 AM

Re(4): floating point in debugger

Dan Burnash

Psyq Tools

The new debugger, version 4.77, incorporates the following change. It has been released in our normal release directory, release 1.5.5.

>When we do a debugging session with long long, all I ever get is: ?????, and >not even a WRONG answer! I don't think that the PsyQ debugger knows anything >about the long long type.

The problem is not the debugger but the compiler. The compiler produces a source file which contains debug information including class and type information for the C variables. The compiler debug info (which is basically COFF but in source form) supports 16 basic data types and 'long long' is not one of them so the compiler just outputs type=0 (null) for unsupported types. I want to help though so I have modified the debugger so that when it sees a NULL data type it will now assume it is LONG LONG instead. However, note that \*all\* compiler unsupported types will now be displayed by the debugger as 'long long'. This is unlikely to be a problem as the others are quite rare although note that it is impossible to distinguish signed from unsigned long longs based upon the information produced by the compiler. I have therefore limited the display format to hexadecimal - the only one that makes sense for both types.

>If you look at the disassembly of the C code that the >compiler produces (under -O2 optimization or better), it just does a MUL, and

>throws the HI and LO registers back, so nothing is gained by doing it in >assembly

The compiler is pretty efficient at basic math even at optimisation level zero. The main difference at level 2 is that it will avoid copying the vars on and off the stack - but note that this can cause some debugging anomalies since the variables will not always be where the debugger expects them to be - O2 is therefore only recommended for final builds or very speed critical code.

In all cases the compiler will typically generate the sequence MULT, MFHI, MFLO. Note however that even at O2 it does not allow for the time taken by the 'mult' instruction. The way the compiler immediately loads the result \*will\* stall the pipeline. By writing in assembler you could assume typically 12 clocks for the multiply and gain that time by dropping 10 other useful instructions (or about two memory loads) between the 'mult' and the 'mfhi'. However, this speed increase is only likely to be significant if you do a lot of multiplies in a loop.

---

10/23/95 5:43 PM

Re: ASPSX V2.25

David R. Sullivan

Henrik Markarian

Psyq Tools

Assemblers ASPSX versions 2.23 through 2.25 are all very buggy, they appear to be having problems determining where a branch goes inbetween macro instructions. Stay with 2.21, which has a know bug (does not properly support chars or ints in a \_\_attribute\_\_ ("Packed")) definition).

All your other version numbers look ok.  
Dave.

---

10/24/95 4:16 PM  
DCache and Watch window  
David W. Marshall  
Psyq Tools

Is there any way to display DCache variables in the watch window?  
I define the DCache as follows:  
In a .S file DCACHE\_BASE EQU \$1f800000 ;dcache starts here rreset DCACHE\_BASE  
dc\_MatPtr rw 1  
In a .H file  
extern MATRIX\* dc\_MatPtr;  
If I look at dc\_MatPtr in the watch window, it gets the correct address in the dcache but resolves  
the variable as an unsigned long. I was hoping that it would use the extern to resolve the type  
of the variable.  
thanks,  
dave

---

10/24/95 7:34 PM  
Re: Padding to 64 bits in ccpsx?  
Blake E. Senftner  
Dean M. Grandquist  
Psyq Tools  
Was this ever resolved? -Blake

---

10/24/95 7:43 PM  
can't get psylib /l to work  
Blake E. Senftner  
Psyq Tools

I'm trying to get the "dump modules" functionality of psylib to work...  
I've used it before, but never on 3.2 libraries...  
I've tried "psylib /l lib\_filename" using both psylib versions 1.07 and 2.01 and I get the same  
error message:  
"Could not open/create library file lib\_filename"  
this message appears when I give the entire path to the file, or execute within the directory  
giving just the filename... I am specifying the filename right...  
any clues?  
If I do the same operation on library files from 3.1, it works correctly for both psylib.exe versions  
I have...  
-Blake

---

10/25/95 10:02 AM  
Re: can't get psylib /l to work  
Dan Burnash  
Psyq Tools

Blake E. Senftner

It works for me.

I execute: `psylib /l libgte.lib // this lists the modules. psylib /x ..\libgte // from the psx\lib\tmp directory, this extracts the objects.`

I am using psylib v2.01

Send me your command line and redirected output if this doesn't help.

Dan Burnash

---

10/25/95 1:15 PM

Re(2): Padding to 64 bits in ccpsx?

Dean M. Grandquist

Blake E. Senftner

Psyq Tools

Yes. It was me 8-) I had my `compiler_path` set to a very old version of the `aspsx` assembler. The newer versions have fixed this for me.

---

10/26/95 9:41 AM

debugger stepping (again)

clearwater

Development Env.

I've noticed there's been quite a few messages regarding stepping problems in the debugger, but my problem occurs when I want to use F6 to run to the cursor location.

Sometimes the debugger completely blows up - I mean windows, the works. If I step through the same code, it works fine, but its a pain.

My `cpe` file is approx 1.4Mb, and my `.sym` file is 8Mb. I'm crawling on a 486/66 with 8 megs.

I'm using the latest version of the debugger, with `dexbios` installed at default settings ie address 1340, no `irq`. Do I need to set the `IRQ` on the DTL-H2000 board? Whats the difference between `dexbios` and `psybios` anyway?

Sorry for rambling, any help please?

---

10/26/95 3:10 PM

Re: debugger stepping (again)

Dan Burnash

Development Env.

clearwater

Set the `IRQ` using `dexbios`, it should help.

---

10/27/95 1:22 PM

Re: debugger stepping (again)

David R. Sullivan

clearwater

Development Env.

>ve noticed there's been quite a few messages regarding stepping problems in the debugger,

>but my problem occurs when I want to use F6 to run to the cursor location.

Which version of the debugger?

>Sometimes the debugger completely blows up - I mean windows, the works. I>f I step through the same code, it works fine, but its a pain.

>My cpe file is approx 1.4Mb, and my .sym file is 8Mb. I>'m crawling on a 486/66 with 8 megs. An 8MB .SYM file, are you LABEL CRAZY? Sounds like you need to reduce the total number of or size of your symbols. Also, a 1.4mb .cpe would indicate a large amount of non-allocated storage. You may wish to malloc some of this and reduce your load time.

>I'm using the latest version of the debugger, with dexbios installed at default settings >ie address 1340, no irq. Do I need to set the IRQ on the DTL-H2000 board? >Whats the difference between dexbios and psybios anyway?

Set the IRQ.

>Sorry for rambling, any help please?

Hope that helps... DaveS. EA

---

10/29/95 12:53 PM

Re(2): debugger stepping (again)

clearwater

Development Env.

In reply to David Sullivan:

I'm using the\_bugger ver 4.69

It's a port - you should see the original code - looks like a novel

Thanks for the IRQ tip - it helps

While I'm on the subject, has anyone had much success sending the linker output directly to the target? I've got it to work, but it blows up a lot ie just hangs my system.

I'm using the borland IDE (crazy... yes) This allows me to invoke the compiler/linker from their tools menu, and redirect message output to a window. ( I hate brief) One more question - I thought I was losing my sanity last night when I discovered some interesting behavior by malloc, calloc, realloc - then I found mmgm.obj (Aug 15 zip) that explains all. Is this fix in the latest libs - I suspect some of my libs are out of date...

Again thanks .. Mick Delaney

---

10/30/95 12:34 PM

Path for inclib

David W. Marshall

Psyq Tools

In my current linker command file, I have:

```
inclib "c:\psx\lib\libgpu.lib"
```

Is there any way to have: inclib "libgpu.lib"

and use a SET to give the linker the path to search for the libraries?

The 3 pages in the manual on PsyLink had no information on this.

thanks, dave

---

10/30/95 3:24 PM

Re: DTL-H2010

Angus

Development Env.

YOU need to modify your cdexec.cpe to run the right .exe. The Japanese Toshinden probably is PSX.EXE whereas all American discs are different names. There was a copy of cdexec around



that parsed the name for you.  
Angus

---

10/30/95 3:14 PM

DTL-H2010

Craig Ewert

Developer Support

Development Env.

I just received a DTL-H2010 cdrom drive for the development setup, but I can't get it to run most of my disks. It runs a japanese copy of Toshinden, but not the "hot picks" disk that came with our American consumer unit, nor the Playstation Test Disk, containing that 50Meg airplane movie, that I got from a Sony conference some weeks ago. All three disks run in my Blue debugging station. I can also run a program through the pc that accesses files on the H2010. What's wrong?

---

10/31/95 1:22 PM

dbugpsx.exe

Paul C. Isaac

Psyq Tools

I seem to be noticing a bug in the debugger...

sometimes when I trace a function certain local variables do not show up in my "Vars" window... it seems to be the first local variable defined, and only seems to happen if the variables offset from the FP register is zero...

```
lw v0,(fp)
```

it doesn't show up a lot, because the compiler USUALLY uses this spot for preserving external registers, but if the function is small and doesn't have to save anything then it will rear its ugly head...

please pass this on to SN and get them to fix it!

(pci)

---

10/31/95 10:00 AM

Re(2): DCache and Watch window

David W. Marshall

Dan Burnash

Psyq Tools

I have already done that. Yes, without that READ/WRITE RAM statement the memory window and the watch window will only show zeros for the dcache area. That is not the problem I was complaining about.

The Watch window does not dereference the variable correctly when in is in the dcache.

Again,

If in the dcache.s I have something like

```
dc_Matrix rw 8 ;reserve 8 longs for a matrix.
```

If in the dcache.h header file I have, extern MATRIX dc\_Matrix;

When I add dc\_Matrix to the watch window, it dereferences to an unsigned long. I was hoping that the debugger would look at the extern and dereference it properly as a MATRIX.

thanks, dave

---

10/31/95 9:06 AM  
Re: 10/22/95 - Release 1.5.5  
Dave R. Scheele  
Development Env.

This release changed Psylink/lib as follows:

>> 3.1 PSYLINK and PSYLIB >> ~~~~~ >> The  
main change has been to the way that external BSS variables >> are treated. The behaviour  
now is : if a module in a library  
... and so on. SN Systems said:  
>> I'd recommend that all libraries are rebuilt with the new >> version of psylib to make this  
work properly. To do this simply >> extract all the modules from a library, delete the library  
and >> then rebuild it. e.g.  
>> psylib /x libgs.lib >> del libgs.lib >> psylib /a libgs.lib \*.obj >> del \*.obj  
My question is, was this done to the libs that are on the CD (I doubt it, since this was release  
1.5.5). If not, will you be doing it to all the libraries? I can do it to the ones I have, but if you're  
going to post updates that haven't been rebuilt, I'll just have to do it again, and again ...  
Also, if you're going to do it, and re-post all the libs, it'll save me doing it :)  
Dave

---

10/31/95 9:22 AM  
Re: Path for inclib  
Dan Burnash  
Psyq Tools

I don't know of a method of doing this, but have asked. It might be faster just to try a couple of  
environment variable names, like "set inc..." or "set include...", and see if they work.

---

10/31/95 9:30 AM  
Re: DCache and Watch window  
Dan Burnash  
Psyq Tools  
David W. Marshall

Sorry this took so long to dig up. I eventually found this in the Dev Env archive from June 1st.  
This should allow DCache variables to be viewed in a watch window. I believe that the  
sony\_psx.cfg file, mentioned below, can still be used, though it isn't on our new release disk.  
The message follows:

\_\_\_\_\_ >One problem I've found is that if you're putting the  
stack into the d-cache >(fast ram), then any local variables that get pushed onto the stack  
appear as  
>0x00 in the debugger. Apparently the debugger cannot access variables in the  
>d-cache correctly. >>Whenever I need to step through code that does this, I always have to  
>temporarily define the variables as static in order for them to show up with >the correct  
values in the debugger.

Ah, that's because the debugger default 'accessible memory list' does not include the d-cache  
area. It's pretty easy to add it, you just need to edit the debugger config file (file DBUGPSX.C0\*  
is the current one, also SONY\_PSX.CFG in the PSYQ executables directory is the default  
template to be used if no config file is found). This is just a text file, and you will see a section  
like:-

----- #readram0 00000000 007FFFFFFF 1FC00000  
1FC7FFFF 80000000 807FFFFFFF 9FC00000 9FC7FFFF A0000000 A07FFFFFFF BFC00000

BFC7FFFF #writeram0 00000000 007FFFFF 80000000 807FFFFF A0000000 A07FFFFF #update  
FF 0003 #video 03 50 32 #label level 02 7F 7F #colour attributes 17 1F 3E B0 4F 5E 0C 70 C0 87  
8E 8E F0 90 4F 87 7C 0E 0A 28 2F 70 #mono attributes 07 0F 70 70 07 70 0F 70 01 07 0F 0F 70 0F  
07 07 70 07 07 0F 70 #default tabs ASM 0F 17 28 30 00 00 00 00 S 0F 17 28 30 00 00 00 00 C  
08 00 00 00 00 00 00 00 H 08 00 00 00 00 00 00 00

---

Just add the extra range to the readram and writeram tables. Note that these lists must be kept  
in order (i.e. sorted) so be careful to add the new entries at the correct point.

---

---

11/1/95 8:32 AM

Re: dbugpsx.exe

Dan Burnash

Psyq Tools

Paul C. Isaac

Consider it passed on. I will let you know when the fix is available.

Dan Burnash

---

11/1/95 8:25 AM

Re: Path for inclib

Dan Burnash

Psyq Tools

I have checked, and currently this is not supported. SN Systems is looking into adding support  
in some form. No time frame for this was given.

---

11/1/95 2:42 PM

Re: dbugpsx.exe

Dan Burnash

Psyq Tools

Paul C. Isaac

SN's response:

I'm not aware of any such bug in the debugger. There was a bug like this in the very early  
versions of the GNU compiler. Can you please confirm what version of GNU he is using. Ver  
2.6.3 should be fine.

If it is 2.6.3 then is there any chance the developer can get me a small code example that  
demonstrates the problem ?

Tag, you're it. :-)

Dan Burnash

---

11/1/95 8:43 AM

Re(3): DCache and Watch window

Dan Burnash

Psyq Tools

David W. Marshall

I will let you know when I find out anything more.

---

11/2/95 10:06 AM

Re: Reset PSX/GPU ?? (help!)

Dan Burnash

Development Env.

david eader

This may also be a coding problem, where uninitialized memory suddenly has a defined value from a previous program run. We ran into that when switching between various patch? programs.

1. Make sure you are using snpatch.cpe. If you aren't, then this may be the problem.
2. Create a 2 meg - 64k data file which you can load into memory, clearing it out. Then continue with your normal load and run cycle.
3. Look for coding errors that trash memory.
4. Punt. Send me more specifics, and I will try to track it down.

Dan Burnash

---

11/2/95 9:45 AM

Reset PSX/GPU ?? (help!)

david eader

Development Env.

I have a bug thats killing me...

The first time I run my program, everything works fine.

The next time, and all subsequent times, my textures are darkened.

It's as if the gpu maintains some internal state, regardless of resetpsx, etc..

The only fix seems to be to recompile a certain module that deals with packet initialization.

Then, again, it runs properly only the first time...

Could this be the notorious code-cache-needs-to-be-flushed bug that I vaguely recall reading months ago?

Urrggghh, I cant help but say that it SUCKS to make hardware that cant be INITIAIALIZED to a WELL-DEFINED STATE !!!!!

(apologies, i'm really really frustrated...)

Anyone know any tricks for TOTALLY resetting the PSX ??? Or have a clue as to this kind of bug ???

Thanks in advance, deader

---

11/2/95 2:27 PM

Re(3): DCache and Watch window

Dan Burnash

Psyq Tools

David W. Marshall

This information will be more useful when get a new assembler that doesn't have bugs in it.

Until then, it may not work.

Hi Dan

Please excuse the delay - I had to think hard about this. This may like to copy this to other staff at SCEA (I have already cc'd Tom for his information) and maybe post it on your BBS. Please let me know if you have any problems with it.

>The following is a couple of messages on a problem viewing variables in a watch >window that are located in the dcache. Please let me know if there is a way to >get this to work.

The example given here...

> > \_\_\_\_\_message 1\_\_\_\_\_ >Is there any way to display DCache variables in the watch window? > >I define the DCache as follows: > >In a .S file >DCACHE\_BASE EQU \$1f800000 ;dcache starts here > rset DCACHE\_BASE > >dc\_MatPtr rw 1 > > >In a .H file > >extern MATRIX\* dc\_MatPtr; > >If I look at dc\_MatPtr in the watch window, it gets the correct address in the >dcache but resolves the variable as an unsigned long. I was hoping that >it would use the extern to resolve the type of the variable. >

... does not do what the developer was hoping for because the compiler does not generate any C variable debug info for external variables. If you think about it this is sensible - because that data would be provided by the symbol data in the external module; if this main module defined it too then you'd have two symbol definitions in the symbol file - the one from the external would be the correct one. In this case however the external module is assembler and therefore it does not have any C typing info.

The correct solution is to declare your dcache variables with a piece of C. This gets a bit fiddly because in order to put them at a specific address you need to use a linker control file that specifies the groups. You also need to compile the dcache section separately and rename it's sections so they will be distinct from those of the main compilation. Note also that although Psy-Q CPE format is quite happy to allow initialised data in this separately addressed dcache data section, the PSX .EXE file format does not allow this so if you wish to be compatible with PSX .EXE file format you must only put uninitialised data into the dcache section. We can easily tell PSYLINK the dcache size limit and bss restriction by putting that information in the group attributes for the dcache.

It's probably best if I stop woffling at this point and just give you an example; just snip between the lines and paste to the filename detailed at the top of each section. Just execute BUILD.BAT to build it. But before you do that it is important that you note the following:-

1) Note the use of

-Wa,sdcache1

on the cpsx command line to tell the ASPSX assembler to prepend "dcache1" to all of the section names and put them into a new group called "dcache1" Also note the dcache group definition in MAIN.LNK

2) note that the .LNK file defines the dcache group as having a limited size. The linker will raise an error if you exceed this size

3) You must have the latest PSYLINK (2.31) and ASPSX (2.26) in order to make use of features detailed in 1) above. You can get these from our BBS or FTP site if you don't already have them.

OK, here are the 5 files that make up this small example:-

```
----- FILE: MYTYPES.H ----- typedef struct _matrix { short a; short b;
short c;
short d; short e; short f;
short g; short h; short i;
} matrix;
----- FILE: DCACHE.C ----- /* this file DCACHE.C defines the vars in
dcache */
#include "mytypes.h"
matrix* MatPtr; matrix MyMatrix; int testint1; char* testarray1; /* this is OK because it
is uninitialised */
/* char testarray2[]="Test String"; this is *not* OK */
----- FILE: MAIN.C ----- /* this is a main source file that refers to the
dcache data */
#include "mytypes.h"
extern matrix* MatPtr; extern matrix MyMatrix;
int main() {
MatPtr=&MyMatrix; /* initialise it here cos can't have it already valid */
MatPtr->a=0; MatPtr->b=1; MatPtr->c=2; MatPtr->d=3; MatPtr->e=4; MatPtr->f=5;
MatPtr->g=6; MatPtr->h=7; MatPtr->i=8;
}
```

```
----- FILE: MAIN.LNK ----- org $80010000
text group bss group bss dcache group org($1F800000),size(1024),bss
section .rdata,text ;sections created by C compiler section .text,text ;specifying them here is
not strictly necessary section .data,text ;but does ensure that they appear in tyhe correct
section .sdata,text ;order in the linked output file
; section .ctors,text ;only needed for C++ ; section .dtors,text ;only needed for C++
section .sbss,bss ;the standard bss sections section .bss,bss
include "main.obj" ;my main program object file(s) include "dcache.obj" ;the dcache object
file
; and now the libraries I want to link to:- inclib "c:\gnumips\lib\libs.lib" inclib
"c:\gnumips\lib\libapi.lib" ; inclib "c:\gnumips\lib\libgpu.lib" ;other psx libs as required...
regs pc=__SN_ENTRY_POINT
----- FILE: BUILD.BAT -----
ccpsx -c -g -Wa,sdcache1 dcache.c ccpsx -c -g main.c psylink /c
@main.lnk,main.cpe,main.sym,main.map
----- END OF FILES -----
ENJOY!
Dan Burnash
```

---

11/3/95 1:04 PM  
Re: can't get psylib /1 to work  
Matt Brown  
Blake E. Senftner  
Psyq Tools  
I had the same problem, and discovered that when I copied the libraries from the CD, they had the read-only attribute set. Apparently psylib tries to open the library with write access, and when it can't, it just dies. Try using the "attrib" command to clear the read only attribute (attrib -R \*.lib) and it should work just fine.  
Steve Cox

---

11/6/95 6:41 PM  
Re(2): dbugpsx.exe  
Paul C. Isaac  
Dan Burnash  
Psyq Tools  
I wouldn't be surprised if I have an old version... but where exactly would I find 2.6.3... you guys are the epitome of my version number nightmares... I just looked up in PsyqTools - Programmer Tools - Compiler - Compiler Release and here is what I see... pick a number:  
---  
CONTENT: \*readme.txt Version 1.2 8/01/95  
asmpsx.exe 1.32 Assembler aspsx.exe 2.21 Assembler for C compiler output  
cc1plpsx.exe - Performs the C++ Compiler main pass. cc1psx.exe - ccpsx.exe  
1.17 Compiler/assemble/link program ccpsx.txt - Document on compiler.  
cpluspsx.exe 1.12 C++ Compiler cplusplus.exe - emu387 - See tech note.  
psylib.exe 1.07 PsyQ Librarian utility. \*psylink.exe 1.45 PsyQ Linker. \*psylink2.exe  
2.26 Flat model BETA version of PsyQ Linker. psymake.com 1.11 PayQ Make utility.  
technt1 1.0 Global Allocation technical note.  
--- Is this what I want?  
(pci)

---

11/7/95 5:04 PM

Re: Using the Debugger after PSYLINK...

Dan Burnash

Development Env.

Michael K. McCarty

Use the -v option when you are NOT using -c and check out the linker response file that is listed. You will need to undelete it. Compare it with yours, and hopefully the differences will show you why the debugger doesn't show you the source.

---

11/7/95 6:58 PM

Re(2): Using the Debugger after PSYLINK...

Michael K. McCarty

Development Env.

Thanks I got it working properly.

---

11/7/95 2:56 PM

Re(5): dbugpsx.exe

Kristine Severson

Paul C. Isaac

Dan Burnash

We send all tool updates to the original purchaser of the tools. (We have no way of knowing how EA distributes their purchases...they aren't required to give us this information.) SO, check with your contact at EA who originally gave you your development systems. If you can't get a resolution from EA, then send me private email and I'll see what can be worked out.

Kris

---

11/7/95 10:52 AM

Re(4): dbugpsx.exe

Paul C. Isaac

Dan Burnash

Psyq Tools

The only CD we have here at Origin is the Lib 3.0 that came with our dev stations... we have never received an update CD, we've always been trying to download the latest things... how can we get these update CD's sent to us direct... maybe you're sending them to EA (our parent co.) but that is not very useful for us down here in Texas.

thanx (pci)

---

11/7/95 9:53 AM

Re(3): dbugpsx.exe

Dan Burnash

Psyq Tools

Paul C. Isaac

>I wouldn't be surprised if I have an old version... but where exactly >would I find 2.6.3...

Use the -v compiler option, and the version number will be output. I believe 2.6.3 was on the CD that we sent out, so try that one first.

---

11/8/95 2:10 PM  
that vanishing debugger trick  
clearwater  
Development Env.

I have a problem with the debugger blowing up when it tries to open files on the host using PCOpen() It seems if I step through opening each file everything works okay. If I use F6 to run past the routine I get problems. without getting too mystical the following things seem to affect the problem 1) If the /d option is used in the debugger, it greatly speeds up the start-up time I thought, whohue I can just save the cursor pos and use F6 on startup to run quickly too my problem code. - this almost always causes a blow up (when opening a file) 2) If the /d option is not used the debugger appears to hang around a long time after loading the symbol file before it finally runs to main() - this doesn't blow up as often whats going on? - does the debugger do something different when I use F6 to start? -also (sorry about this) why does the start-up code in SNlib call intheap() with what appears to be a value of 0 for heap size?  
- by the way, thanks for the new manuals/cds - way better than anything the competition has to offer  
Mick Delaney (clearwater)

---

11/9/95 12:08 AM  
New replacement DOS and Windows text font  
John Brandwood  
Development Env.

DOSFONT.ZIP 15K  
Development Env.  
Hi everyone,  
Here's a couple of replacment text fonts that I've been using to make my DOS and Windows text screens more readable.  
Particularly nice for Brief or Multi-Edit to reduce eye strain but still show a lot of text (gives an 80x40 text mode).  
Instructions and DOS font loader programs included.  
Released into the public domain 8th November 1995 by the author (me).

---

11/9/95 12:14 AM  
New replacement DOS and Windows text fonts  
John Brandwood  
Psyq Tools

I've uploaded a file to the Developement Env conference that people here might be interested in.  
It contains a couple of new fonts for DOS and Windows text modes that provide a highly readable and low eye-strain 80x40 text mode.  
Useful for programmers using Brief or Multi-Edit, or anyone who hates their VGA card's text font or Microsoft's awful text fonts.  
Hope you like it,  
John.

---



11/9/95 3:38 PM

CPP bug  
Pat Quinn  
Psyq Tools

The latest version of the pre-processor cplusplus.exe no longer outputs to stdout when using the preprocessor flag -MM. This is the version ("No version number found," says version.com) that is part of the Programmer Tools CD release 1.5, found in /psx/bin. The old version I refer to below was previously found in /psx/compiler.

I use this routinely from a script to generate makefile dependencies, in a manner similar to the following:

```
cplusplus -E -MM -I./include.dir file_n.c >> makedep.inc
```

The -MM flag causes it to process all the #include "file.h" statements in the source file and all header files included, recursively.

According to the GNU cpp description, there should be an INFILE and OUTFILE argument on the cpp command line. Usage of "-" in place of OUTFILE should cause output to standard out. I've never seemed to need either OUTFILE or "-" to get any kind of standard out output from the older cplusplus -- it seemed to do it by default. Additionally, the options mentioned in the file cplusplus.txt include -E, which says to pre-process only and send the output to standard out in the absence of a specified output file.

With the new cplusplus, nothing works: Not OUTFILE, "-" nor -E. The command simply returns without any output. Not very useful for my dependency generation. As called from cplusplus, there seems to be no problem...

And wait -- there's more! My usage of cplusplus.exe also \*intermittently\* fails with a "General Protection Fault." I'm more suspicious of my newly-installed Windows 95 on this count, however...

So for now, I'm go to use the old cplusplus. Could this be a problem when used with the new cplusplus?

In lieu of version numbers, the following may help identify the old and new versions of cplusplus:  
/psx/compiler/cplusplus.exe 232292 bytes Apr 8 1995 /psx/bin/cplusplus.exe 163332 bytes  
Apr 11 1995

David Crain NuFX, Inc.

---

11/9/95 10:46 AM

Re(2): 10/22/95 - Release 1.5.5

Dan Burnash  
Development Env.  
John Phua

>>> I'd recommend that all libraries are rebuilt with the new >>> version of psylib to make this work properly. To do this simply >>> extract all the modules from a library, delete the library and >>> then rebuild it. e.g.

```
>>> psylib /x libgs.lib >>> del libgs.lib >>> psylib /a libgs.lib *.obj >>> del *.obj
```

>My question is, was this done to the libs that are on the CD (I doubt it, since this was release 1.5.5). If not, will you be doing it to all the libraries? I can >do it to the ones I have, but if you're going to post updates that haven't been rebuilt, I'll just have to do it again, and again ...

It has NOT been done. SN Systems and SCE have not synchronised their releases yet. We prefer to wait until SCE rebuilds the libraries with the new psylib, instead of doing it ourselves and adding yet another twist to our library releases. We may be forced to if SCE won't, but not right now.

---

11/10/95 2:51 PM  
/i option for linker  
Paul C. Isaac  
Psyq Tools

when I run PSYLINK.EXE with "/i" for the status information window if there are enough errors to make the screen scroll... not an uncommon problem... then the replacement of the text-background when the info window goes away gobbles up the error messages...  
I am using 50 line mode but don't think it matters  
please fix this, I like being able to use the status window.  
(pci)

---

11/13/95 3:55 PM  
Re: that vanishing debugger trick  
Dan Burnash  
Development Env.  
clearwater

I have asked for a solution to this problem, and will let you know when I get a response. I have worked with PCcreat and PCopen in the debugger without encountering a problem, so there may be something more specific to your application going on. If you come up with any more specifics on the problem, or a reasonably reproducible example, send them to me.  
Dan Burnash

---

11/13/95 10:59 AM  
Re: C++  
Dan Burnash  
Development Env.

The 3.3 libraries are supposed to support C++. If you have any problems, let me know what changes need to be made to get them to work for you.  
Dan Burnash

---

11/13/95 3:31 PM  
Re(2): C++  
Mitch M. Ueno  
Development Env.

I find that the new 3.3 library doesn't work for me. The compiler doesn't get past the includes such as libgte.h et. It finds a parsing error. It seems as though I'm doing something fundamentally wrong. Any ideas? Thank you

---

11/13/95 6:53 AM  
C++  
James C. Leiterman  
Development Env.

Please excuse a green-horn question. I'm just joined the ranks of the Sony Playstation Developers and wanted to know the status of C++. The compiler seems to support it as well as

the docs but the libraries or 'C' oriented and don't contain the extern "C" declarations.  
I'm typically a C/Asm prgmr but some of the original code I'm working with is in C++.  
Bottom line, is or isn't C++ supported?

---

11/13/95 12:05 PM

atof

Greg D. Christensen

Development Env.

The C function atof doesn't work. When I run the debugger and the program calls atof, the debugger stops with a "Coprocesor Unusable" error.

---

11/14/95 8:37 AM

Re(2): that vanishing debugger trick

Dan Burnash

Development Env.

clearwater

Here is the response from SN Systems \_\_\_\_\_ >A developer is having a problem with the debugger blowing up when it tries to

>open files on the >host using PCopen() >It seems if he steps through opening each file everything works okay. >If he uses F6 to run past the routine he get problems.

Hmm, sounds like it is speed related. What sort of file IO is he doing? Are his DEX board interrupts working correctly? If they aren't then printf() output will be very slow (about 18cps) - other fileserver ops would also suffer and F6 would be very slow if the code being stepped over took a significant amount of time \*AND\* use fileserver ops (since the debugger and the fileserver compete for the communication bus. There is code to cause the debugger to back down and slow up if it doesn't get a response within 10th second - I'll check it's all working correctly though.

In the meantime I suggest that he check his DEX interrupts are working OK and not clashing with anything else in his system.

> 2) If the /d option is not used the debugger appears to hang around > a long time after loading the symbol file before it finally runs to main()

/d just stops the debugger skipping straight to main(). If /d is not specified then at start-up the debugger will check to see if the PC is at \_\_SN\_ENTRY\_POINT and if it is then it will attempt to put a breakpoint at main() and immediately RUN. The start-up code will then clear the BSS section (should only take a fraction of a second) and then stop at main(). The debugger will however not see this until it next tries to scan the target. This will depend upon the update interval (Alt-I sets this, 18 is one update per second, smaller number is faster. 3 is default - I would suggest he tries setting this back to 3).

>Any idea why it blows up?

What does he mean by 'blow-up'? The above circumstances might reasonably cause it to appear to stop - whats actually happening is that the very slow fileserver access is being kicked off the comms FIFO by the fast debugger access when F6 is waiting for a quick response. I wouldn't expect it to crash though - can he be more specific?

Please let me know if his DEX card interrupt appears to be working OK.

I do have an idea for a fileserver safety mod that I will attempt to implement in the debugger. It should allow the debugger to cope better with such situations - allowing it to detect fileserver activity and causing it to back down and get off the bus as soon as it sees a fileserver op (rather than the current method where it just falls back to a slow scan rate if it doesn't see the breakpoint go off with 80 scans). The update will be available in a day or two but he should still check his DEX interrupts as if they aren't working they will seriously reduce fileserver performance.

---

11/14/95 8:33 PM

Urgent but stupid CCPSX question

Silas S. Warner

Developer Support

Development Env.

How do you continue a line in a makefile?

What I have to do is: ccpsx -g -X\$8008000 a.obj b.obj c.obj d.obj e.obj f.obj g.obj h.obj i.obj j.obj  
k.obj l.obj m.obj... ..o.obj p.obj q.obj r.obj s.obj t.obj u.obj v.obj w.obj x.obj y.obj z.obj  
oproduct.cpe.product.sym

where I have a huge bunch of obj files. How do I write that in a makefile so that all 35 or so obj  
files are included in the CCPSX line?

Silas Warner

---

11/14/95 3:22 PM

Symbol List Display File

Mark DeSimone

Development Env.

In the Third Party Test Procedure it states that we will need to submit a Symbol List Display  
File. How do we generate one and on what media does it get sent?

Glenn O'Bannon Rainbow America

---

11/15/95 3:15 PM

Re(2): can't get psylib /l to

Michelle Feraud

Matt Brown

Blake E. Senftner

While we're at it, could you try to get some intelligent behaviour into the /u option. See  
Microsoft's LIB.EXE with the "-+" option for an example of how it should be done.

My makefile rule for building libraries has to do three steps:

```
ccpsx .... psylib /a $*.obj psylib /u $*.obj
```

The first /a should not be needed if /u was a bit more intelligent: add the module if it's not  
already there, or update it if it is. Right now, what I have above works, but it's still rather gross.

The point is that /u fails if the module is not currently in the library, which will happen either if  
I'm adding a new module to the library, or if I'm deleting the .LIB to force a complete rebuild.

Thus I force the module in with a /a which is a step I shouldn't need to do.

Thanks in advance, dg

---

11/15/95 4:19 PM

Re(3): can't get psylib /l to

Dan Burnash

Psyq Tools

Michelle Feraud

I am using version 2.01 of psylib, and it does add a module to the library if it doesn't exist, even  
if the /u option is used. The only time it fails is if the /u option is used, and the library does  
not exist. I will ask and see if psylib can be modified to just create a nonexistent library even if

the /u option is chosen.

---

11/15/95 2:13 PM

Re: Urgent but stupid CCPSX question

Dan Burnash

Development Env.

Silas S. Warner

A \ at the end of a line will cause the next line to be a continue line. or

Try using macros. OBJ1 = a.obj b.obj c.obj... OBJ2 = n.obj o.obj p.obj... Then try ccpsx -g -X...

\$(OBJ1) \$(OBJ2)...

or If your command line is greater than 128 characters, use a linker response file. If the makefile tries to execute the command and it is longer than 128 characters, DOS won't be able to handle it. Compile with -v and use an existing linker response file as a template.

---

11/16/95 5:28 PM

Re(3): can't get psylib /l to

Dan Burnash

Psyq Tools

Michelle Feraud

PSYLIB.ZIP 25K

Development Env.

Here is a new psylib, which works when the /u option is chosen and the library does not exist.

Dan Burnash

---

11/16/95 11:03 PM

Re: atof

Dan Burnash

Development Env.

Greg D. Christensen

>The C function atof doesn't work. When I run the debugger and the program calls atof, the debugger stops with a "Coprocesor Unusable" error.

There appear to be several parts to this problem. First, the linker is linking in the wrong version of the routine. atof is defined in both libc.lib and libc2.lib. The version of the function that doesn't crash is in libc2.lib, but it is the luck of the link which one gets chosen to be linked into your executable. Admittedly, having duplicate functions in the same set of libraries isn't a great idea, but that is another problem. Since the one that doesn't crash is in libc2.lib, I recommend deleting the unwanted object module from libc.lib. C11 is the name of the module that contains atof.

Simply execute: psylib /d libc.lib c11

Secondly, I don't think that the version of the routine in libc2.lib is working correctly. If someone else finds out differently, let me know. I will pass all of this on to our library engineers, so hopefully all will be corrected.

Dan Burnash

---

11/16/95 2:10 PM

Re: Path for inclib

Dan Burnash

David W. Marshall

Psyq Tools

PSYLINK.ZIP 41K

Development Env.

>In my current linker command file, I have: > > `inlib "c:\psx\lib\libgpu.lib"` > >Is there any way to have: > `inlib "libgpu.lib"` > >and use a SET to give the linker the path to search for the libraries? > This feature has just been added to Psylink. \_\_\_\_\_ I've added a command line switch to psylink and an area in PSYQ.INI to do this.

Psylink 2.32 implements the following :

If you specify `/l <path>` on the command line then the linker will look in the specified path(s) for the library files if it can't find them as specified.

e.g. if the command is something like

`psylink /lc:\psx\lib;c:\mylibs ... @main.lnk...`

and main.lnk contains a line like

`inlib "libgs.lib"`

then psylink will first try to open `libgs.lib` (i.e. in the current directory). If that fails then it will try to open `c:\psx\lib\libgs.lib`. If that fails it will then try to open `c:\mylibs\libgs.lib`. If that fails then it will report an error.

It is also possible to specify the library path in PSYQ.INI. You should add lines like the following to the PSYQ.INI file :

`[psylink] library_path=c:\psx\lib.31;c:\mylibs`

The linker will then behave as if `/lc:\psx\lib.31;c:\mylibs` had been specified on the command line.

It is possible to combine library search paths from the psyq.ini file and the linker command line.

\_\_\_\_\_ The new linker is attached. Enjoy. It will be officailly released soon.

Dan Burnash

---

11/16/95 5:30 PM

Re(3): C++

Dan Burnash

Development Env.

Mitch M. Ueno

>I find that the new 3.3 library doesn't work for me. The compiler doesn't get past the >includes such as `libgte.h` et. It finds a parsing error. It seems as though I'm doing something

>fundamentaly wrong. Any ideas? Thank you

Send me your example, and I will figure out what is wrong. If you know what is wrong, send me the details.

---

11/16/95 11:53 PM

Re: Symbol List Display File

Dan Burnash

Mark DeSimone

Development Env.

>In the Third Party Test Procedure it states that we will need to submit a Symbol List Display File. >How do we generate one and on what media does it get sent?

The symbol file is created by the linker. If you are linking using `ccpsx`, something like the following command line should work to create the `.sym` file:

`ccpsx -Xo$80080000 test.c -otest.cpe,test.sym,test.map`

If you are linking separately, try something like:

`psylink.exe /c /q /o$80080000 /m @c:\TMP\BHDFAMCN,test.cpe,test.sym,test.map`

This can be submitted on a floppy disk or a CD, whichever you prefer, but must be generated at the same time your final master executable is created.

---

11/16/95 5:25 PM

Re: /i option for linker

Dan Burnash

Psyq Tools

Paul C. Isaac

Sounds like a good product suggestion. I have passed it on to SN Systems. If/when it is implemented, we will post it.

Dan Burnash

---

11/17/95 11:00 AM

Re: confused about new linker release

Dan Burnash

Psyq Tools

>So in my directory, I should erase PSYLINK2, change my makefiles to reference the new PSYLINK and everything will work as normal?????

You got it.

---

11/17/95 9:59 AM

confused about new linker release

David W. Marshall

Psyq Tools

Dan Burnash

I am confused about the docs explaining the new linker release. It says that PSYLINK2 was renamed to PSYLINK and there is only one PSYLINK now.

So in my directory, I should erase PSYLINK2, change my makefiles to reference the new PSYLINK and everything will work as normal?????

thanks,

dave

---

11/17/95 9:42 PM

debugger arrays

Paul C. Isaac

Psyq Tools

I have PAINFULLY noticed that the latest versions of DBUGPSX.exe have changed the meaning of the Left/Right arrows in Vars/Watch windows

previously if you '+' an array variable you could left right through [0]...[1]...[2] sequences very quickly and efficiently... please restore this or tell me how to do it in the new world...

also I wouldn't need to do this as much if it displayed character strings embedded in struct's better... currently only pointers will automatically show the full string... otherwise I'm stepping through character by char to try and read file names...

(pci)

---

11/20/95 7:22 PM  
debugger ENUM display  
Axel Brown  
Psyq Tools

the debugger does not show the Integer value when it displays ENUM labels... it also does not show the Text tag... it shows nothing but "enum" this is extremely NOT useful!  
(pci)

---

11/20/95 3:17 PM  
Re(2): /i option for linker  
Paul C. Isaac  
Dan Burnash  
Psyq Tools

>If this isn't good enough, let me know why.

I am aware of the redirection option... I just don't like it. I really do want to see the status window and see the warnings or errors as soon as they are generated so I can escape or whatever...

it seems like a trivial thing for them to fix...

```
save background while (compiling) { if (print) { restore background; print(); save  
background } }
```

(pci)

-----

>when I run PSYLINK.EXE with "/i" for the status information window >if there are enough errors to make the screen scroll... not an uncommon >problem... then the replacement of the text-background when the info >window goes away gobbles up the error messages...

The recommended method for solving this problem is to redirect the linker output to a file.

This can be done using psymake with: psymake >tmpfile or when using psylink directly(not in a makefile) with: psylink ... >tmpfile

If this isn't good enough, let me know why.

Dan Burnash

---

11/20/95 1:41 PM  
Re(3): /i option for linker  
Dan Burnash  
Silas S. Warner  
Psyq Tools

You are right, the following line does not work when it is within a makefile,

```
CCPSX a.obj b.obj c.obj -oproduct.cpe,product.sym >tmpfile
```

However, if you have

```
CCPSX a.obj b.obj c.obj -oproduct.cpe,product.sym
```

in your makefile, removing the >tmpfile, and execute

```
psymake >tmpfile
```

then everything, including the linker output, goes to tmpfile.

---

11/20/95 9:10 AM



Re: /i option for linker

Dan Burnash

Psyq Tools

Paul C. Isaac

>when I run PSYLINK.EXE with "/i" for the status information window >if there are enough errors to make the screen scroll... not an uncommon >problem... then the replacement of the text-background when the info >window goes away gobbles up the error messages...

The recommended method for solving this problem is to redirect the linker output to a file.

This can be done using psymake with: psymake >tmpfile or when using psylink directly(not in a makefile) with: psylink ... >tmpfile

If this isn't good enough, let me know why.

Dan Burnash

---

11/20/95 3:19 PM

Re(2): debugger arrays

Dan Burnash

Psyq Tools

Paul C. Isaac

SN Systems response. \_\_\_\_\_ >I have PAINFULLY nchange which array element is viewed when looking at globals in the watch window. Something may change soon to make both the var and watch windows work consistently. that the latest versions of DBUGPSX.exe have >changed the meaning of the Left/Right arrows in Vars/Watch windows That bad eh? Oops. Sorry about that.

This actually happened in September and was documented in the debugger readme file as "experimental". I asked a few developers (maybe not enough) what keys to use for the new "C callstack crawler" and all said the arrow keys. So I used the arrow keys for that and...

... I moved the array left and right to '<' and '>' (or comma and dot).

Since no-one complained over the next few versions I assumed it was OK. Maybe the developers I asked don't use the array browse stuff. If you \*really\* think I should swap them around then I will consider it.

The new use for the arrow keys in that window is very useful - please see the debugger readme files for details of the C callstack crawler in Var window and also the full C callstack display (complete with parameters) which is inserted one level beyond the top of the stack.

>also it would be nice to display character strings >embedded in struct's better... currently only pointers will automatically >show the full string... otherwise I'm stepping through character by char >to try and read file names. Maybe a toggle to do view as a single byte char >or a string would give us the best of both worlds.

Yes, I was thinking this myself earlier today. I think I will indeed do as you suggest.

I would also like to change the array browse stuff so you can still change the index into an array of pointers after you have opened an array element. This is quite a bit more work and may take a while but I think it may be worthwhile. \_\_\_\_\_

Dan Burnash

---

11/20/95 3:27 PM

Re: CPP bug

Dan Burnash

Psyq Tools

Pat Quinn

SN Systems response \_\_\_\_\_ I'm trying to work out where the output is going! I'm not sure what could have changed to cause this.

Using the old version of cplusplus.exe is probably no problem because it doesn't change much between releases.

I'll be building the 2.7.1 version of GNU-C soon anyway so I hope that will clear up the problem. As to the GPF - I run the gnu stuff under windows 95 all the time and I've never had this from cplusplus.exe. If he/she finds the cause please let me know.

\_\_\_\_\_ >The latest version of the pre-processor cplusplus.exe no longer outputs to stdout >when using the preprocessor flag -MM. This is the version ("No version number >found," says version.com) that is part of the Programmer Tools CD release 1.5, >found in /psx/bin. The old version I refer to below was previously found in >/psx/compiler. >>I use this routinely from a script to generate makefile dependencies, in a >manner similar to the following: >> cplusplus -E -MM -I./include.dir file\_n.c >> makedep.inc >>The -MM flag causes it to process all the #include "file.h" statements in the >source file and all header files included, recursively. >>According to the GNU cpp description, there should be an INFILE and OUTFILE >argument on the cpp command line. Usage of "-" in place of OUTFILE should >cause output to standard out. I've never seemed to need either OUTFILE or >"-" to get any kind of standard out output from the older cplusplus -- it seemed >to do it by default. Additionally, the options mentioned in the file ccpsx.txt >include -E, which says to pre-process only and send the output to standard out >in the absence of a specified output file. >>With the new ccpsx, nothing works: Not OUTFILE, "-" nor -E. The command >simply returns without any output. Not very useful for my dependency >generation. As called from ccpsx, there seems to be no problem... >>And wait -- there's more! My usage of cplusplus.exe also \*intermittently\* fails >with a "General Protection Fault." I'm more suspicious of my newly-installed >Windows 95 on this count, however... >>So for now, I'm go to use the old cplusplus. Could this be a problem when used >with the new ccpsx? >>In lieu of version numbers, the following may help identify the old and new >versions of cplusplus: >>/psx/compiler/cplusplus.exe 232292 bytes  
Apr 8 1995 >/psx/bin/cplusplus.exe 163332 bytes Apr 11 1995 >\_\_\_\_\_

---

11/20/95 11:01 AM

Re: debugger arrays

Dan Burnash

Psyq Tools

Paul C. Isaac

I have noticed the problem also, and asked SN Systems to clue me in on the new method, or fix the new bug.

Dan Burnash

---

11/20/95 11:35 AM

Re(2): /i option for linker

Silas S. Warner

Dan Burnash

Psyq Tools

>This can be done using psymake with: >psymake >tmpfile >or when using psylink directly(not in a makefile) with: >psylink ... >tmpfile

Unfortunately, this does not work when using PSYLINK through CCPSX and MAKE. Doing CCPSX a.obj b.obj c.obj -oproduct.cpe,product.sym >tmpfile results in the error message

CCPSX: cannot open >tmpfile

Is this a peculiarity of MAKE only, or of calling PSYLINK thru CCPSX?

Silas Warner

---

11/21/95 9:38 AM  
debugger request  
Paul C. Isaac  
Psyq Tools

here's a nice simple thing I'd like to see implemented...  
when displaying a LONG (or a short) in character format... it would be nice to see more than  
the bottom byte since that doesn't represent the entire value the variable contains... other bytes  
are zeroes...

a lot of people like to use 4-letter codes instead of enums...

Examples:

0x0000005A = 'Z' 0x44434241 = 'ABCD' 0x4241 = 'AB'

Thanks (pci)

p.s. I appreciate you guys being cooperative and listening... I'm not really a pest, just trying to  
help make your tools more useful so we can all make great games more easily so SONY can  
conquer the world...

---

11/21/95 2:59 PM  
Re: debugger request  
Dan Burnash  
Psyq Tools  
Paul C. Isaac  
I have passed on your suggestion to the debugger developer.

---

11/21/95 2:57 PM  
Re: debugger ENUM display  
Dan Burnash  
Psyq Tools  
Axel Brown  
I have passed on your suggestion to the debugger developer.

---

11/21/95 4:01 PM  
Re(3): debugger arrays  
Silas S. Warner  
Dan Burnash  
Psyq Tools  
> ... I moved the array left and right to '<' and '>' (or comma and dot).  
Sorry, you didn't. '<' and '>' are the upload and download request keys. NOTE: the left and  
right arrows work fine in the WATCH window, but not in the VARS window. If you MUST  
view an array, you can request it in the WATCH window even if it is a local var.  
Silas Warner

---

11/29/95 7:54 AM  
Win95 debugger

Kevin T. Seghetti  
Psyq Tools

A few months back I saw a reference to a Win95 version of the debugger being in beta, does anyone know what the current status of that is? Kevin Seghetti Cave Logic Studios, Ltd.

---

11/29/95 10:10 AM  
Re(4): debugger arrays  
Dan Burnash  
Psyq Tools  
Kevin T. Seghetti

>re: key bindings: I would suggest allowing key bindings to be changed by the developer using a simple debugger configuration file (NEXTVAR = CTRL\_A etc.), then no one could complain about what key does what, since they can change it.  
This would be nice, but there are other changes that have a higher priority. I will pass your suggestion along, however.

---

11/29/95 7:52 AM  
Re(3): debugger arrays  
Kevin T. Seghetti  
Dan Burnash  
Psyq Tools

re: key bindings: I would suggest allowing key bindings to be changed by the developer using a simple debugger configuration file (NEXTVAR = CTRL\_A etc.), then no one could complain about what key does what, since they can change it.  
Kevin Seghetti

---

12/1/95 6:28 PM  
aspx.exe in release 1.5.10  
Ted Morris  
Psyq Tools

I get the following error when using the latest version of aspx.exe  
C:\PSX\BIN\TMP\BCANBLAB(8336) : Error : Unknown stab directive - please report .stabs  
"\_\_CTOR\_LIST\_\_"  
I went back to a previous version of aspx and this error did not occur.

---

12/1/95 12:54 AM  
another dbug hassle  
Paul C. Isaac  
Psyq Tools

not to sound harsh, but, sometimes I wonder if the guys writing the tools are spending much time trying to use them as real world development tools  
DBUGPSX vars window:  
what's this "can't modify vars with derived types" business?  
I have a structure with a pointer inside it and I want to be able to manually modify it from the vars or watch window...  
struct CandyBar { int a,b,c; };  
struct PlasticWrapper { int xyzzy; // i can modify this... struct CandyBar

```
*chocolate; // cannot modify var with derived type!?!? char why; // i can
modify this... };
please let me access my candy bar...
this is a bug... please fix.
(pci)
```

Note: the names of the structures portrayed in this example were changed to disguise the identity of my data... any resemblance to actual tasty food items is completely unintentional.

---

12/2/95 10:09 PM

Compiler generating bad code

Mike Benna

Development Env.

BADCODE.ZIP 5K

Development Env.

I seem to have come across some C source code which causes the compiler/assembler to generate incorrect code. The problem is with assignment of structures. Here is the example output code from the program test.c which I have included:

```
ss.src_pt = {123,456}, ss.bounds = {123,-32767}
```

The second member of ss.bounds should be set to 456 but it is not.

Version numbers: ccpsx: 1.17 cc1psx: GNU C version 2.6.3.SN.2 [AL 1.1, MM 40] Sony

Playstation compiled by GNU C version 2.6.3. psylink: 2.34 aspsx: 2.08

If you have questions or need anything clarified, I can be reached much more quickly by sending internet email to Mike@MindSpan.com

Please let me know when it is likely a fix will be available for this problem; we've got a lot of code which may suffer from this problem and I don't want to try to find all the bugs it causes by hand.

```
---- test.c ---- #include <libs.h>
```

```
typedef struct Point2 { short x; short y; } Point2;
```

```
struct teststruct { Point2 bounds; short flags; Point2 src_pt; } ss;
```

```
void SetUpSS(void);
```

```
main() { SetUpSS(); ss.bounds = ss.src_pt; printf("ss.src_pt = {%d,%d}, ss.bounds =
{%d,%d}\n", ss.src_pt.x, ss.src_pt.y, ss.bounds.x, ss.bounds.y);
```

```
for (;;) pollhost(); }
```

```
void SetUpSS(void) { ss.src_pt.x = 123; ss.src_pt.y = 456; } ---- end of test.c ----
```

---

12/3/95 9:38 AM

Problems with OpenEvent() and ASPSX v:2.29

Mike Benna

Development Env.

I'm having a problem with the latest version of ASPSX (v:2.29) which version 2.08 does not suffer from. It seems that 2.29 references global variables using 16-bit signed offsets from the gp register, while 2.08 does it differently (I didn't note how).

This causes a problem when a function is called as an event handler, at which time the gp register does not contain the pointer into my global variables, but rather seems to contain a pointer into something in low memory (e.g. \$F460, when it should contain \$8002BF94).

The obvious consequence of this problem is that my event handlers do not have access to global variables, and that makes them quite useless.

I can't find anything in the documentation which tells me how to reload the gp register at the

start of an event handler so I'm posting here to see if there's something I'm missing. Version 2.21 (June 22/95) suffers the same problem as 2.29 (Nov 29/95). It seems 2.08 (April 8/95) is the only version which does not. Since 2.21 has been out for over 5 months I'm sure there must be a solution by now.

Thanks in advance for any information you can provide.

Mike Benna Mike@MindSpan.com

---

12/4/95 9:40 AM

Re(2): Problems with OpenEvent() and ASPSX v:2.29

Dan Burnash

Development Env.

The -G# compiler option will also help. The # is replaced by the maximum size variable to put into the sdata and sbss sections, which are accessed off the gp register. If you set it to -G0, then nothing will be put into these sections, and you don't have to worry about it. It is possible to compile different source files with different -G# options. Just make sure your handlers are compiled with -G0, and you should be okay. While executing event/interrupt handler code the gp cannot be counted on to be set correctly, but at all other times it should work correctly.

Dan Burnash

---

12/4/95 2:27 PM

Re: Compiler generating bad code

Paul C. Isaac

Development Env.

Mike Benna

I don't doubt that there is a compiler problem, but...

it does look like the problem is caused by bad structure alignment I imagine the problem would go away if you changed "flags" to a "long" instead of a "short"... this is something the compiler must be trying to do automatically (and perhaps is failing) to make sure your "src\_pt" struct is DWORD aligned...

the problem must be occurring when you tell it to do a structure copy on an unaligned structure... it must be getting off on the source pointer

ideally you would want to pair 2 shorts side by side to maximize your structure's memory usage...

(pci)

---

12/4/95 2:14 PM

compiler crashing while dev card is running

Paul C. Isaac

Psyq Tools

I am not exactly certain of this, but over the last few weeks since we've gotten the latest version of the compilers etc... if our game is running (ie. started game in dbugpsx, escape out with game still running) then try and compile the compiler fairly regularly crashes with a GP fault or generate bad files... I really don't think we could be doing anything in our code to newly cause this... so I assume something has changed with the new compiler...

is anybody else experiencing this?

initpsx is enough to allow the compile to work but we would prefer the problem get fixed.

(pci)

---

12/4/95 6:20 AM

Re: Problems with OpenEvent() and ASPSX v:2.29

Sam Black

Development Env.

The gp is being set with the kernel's gp, so it is useless for referencing your program's global variables. I don't know if it is the "answer," but I have found that defining the globals your interested in with the section attribute set to .data will prevent gp relative addressing of that variable, making it accessible by an event handler. For example:

```
int foo __attribute__((section(".data"))) = 0;
```

will prevent foo from ever being accessed with gp relative addressing.

Hope that helps.

---

12/4/95 10:05 AM

Re: Problems with OpenEvent() and ASPSX v:2.29

Dean M. Grandquist

Mike Benna

Development Env.

Mike B. Said: >I can't find anything in the documentation which tells me how to reload >the gp register at the start of an event handler so I'm posting here >to see if there's something I'm missing. Version 2.21 (June 22/95) >suffers the same problem as 2.29 (Nov 29/95). It seems 2.08 (April >8/95) is the only version which does not. Since 2.21 has been out >for over 5 months I'm sure there must be a solution by now.

Well no one posted a solution but you can write one or use something like this:

Begin ASM-----

```
SECTION .sdata SECTION .text
XDEF GetGp XDEF PutGp XDEF SetGp GetGp jr ra add
v0,gp,zero PutGp jr ra add gp,a0,zero SetGp jr ra la gp,sect(.sdata)
```

End ASM-----

The GP needs to be set back after an interrupt handler, I know very little about the event handler lib code.

Ta --DeanG deang@holobyte.com

---

12/4/95 11:14 AM

Re: Win95 debugger

John Phua

Kevin T. Seghetti

Psyq Tools

Hi Kevin,

We are working with SN systems with how we may support the new debugger. Please stay tuned.

Thanks, John

---

12/4/95 12:32 PM

Mess 3 & RS232 output

James C. Leiterman

Psyq Tools

I'm having a lot of trouble with MESS3.

I need to route printf() information to an externally viewing device such as a stripped down PC logging everything it receives to a screen and a file for later analysis. The NULL modem cable works properly. Using Mess3 works great with the...

\PSX\DOC\DEBUGGER\TEST\MAIN.CPE  
program. But doesn't work in our own. Recompiling and linking the supplied MAIN.C  
program doesn't work either!

Any helpful suggestions?

Also, I wanted to point out that the MESS3.COM program appears to be an unfriendly TSR. Friendly TSR's check to see if an IRQ interrupt was meant for them and if not passes control on to the interrupt vector that it replaced. If it handled itself it returns via an IRET.

In my loaded down system I was also attempting to share an interrupt between my internal Modem and the Serial port used by Mess3 and the modem lost!

---

12/5/95 4:44 PM

Re(2): Compiler generating bad code

Mike Benna

Paul C. Isaac

Development Env.

You're absolutely correct about the problem being related to an alignment problem. We're already going through our code fixing the alignment problems but with over 200,000 lines of code and lots of nested structures it's a large job. I'd prefer it if the compiler would just generate slower code for the instances we might miss.

---

12/5/95 4:41 PM

Re(2): Problems with OpenEvent() and ASPSX v:2.29

Mike Benna

Dean M. Grandquist

Development Env.

Thanks for the info.

---

12/5/95 3:34 PM

cpe2x failing

Craig Ewert

Development Env.

CRAIG.ZIP 171K

Development Env.

I have a problem with cpe2x. When converting my program, I get this message:

Sorry! CPE2X cannot convert this CPE file. Please use EXEHEAD.

and the output file size is 0. I have included the map, the cpe and cpe2x.exe. This has just begun happening, and I haven't yet found out at what exact point it began.

Craig Ewert (805) 781-6200

---

12/5/95 6:30 AM

Re(2): Compiler generating bad code



Sam Black  
Development Env.

>it does look like the problem is caused by bad structure alignment >I imagine the problem would go away if you changed "flags" to a "long" >instead of a "short"... this is something the compiler must be trying to >do automatically (and perhaps is failing) to make sure your "src\_pt" >struct is DWORD aligned...

Actually, gcc will not try to align this structure to a DWORD boundary unless you ask it to. My understanding is that it will align a structure such that the field of the structure with the largest alignment requirement is properly aligned. Since this structure is made up of 2 shorts, it should be O.K. to align the structure on a 2 byte boundary.

The problem could still be related to structure alignment (and I would certainly recommend placing both of the Point2 structures at 4 byte boundaries -- this will let you copy them as longs which will be faster). I would check the generated assembly to find out what the problem actually is. Use the -S switch to generate the assembly listing.

---

12/5/95 3:34 PM  
cpe2x failing  
Craig Ewert  
Development Env.

CRAIG.ZIP 171K  
Development Env.

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Sorry! CPE2X cannot convert this CPE file. Please use EXEHEAD.

and the output file size is 0. I have included the map, the cpe and cpe2x.exe. This has just begun happening, and I haven't yet found out at what exact point it began.

Craig Ewert (805) 781-6200

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12/6/95 11:21 AM  
Global Vars Watch  
David Vronay  
Development Env.

I often get All the global Vars in a watch window, and want to get rid of them, keeping only the ones I specifically typed in. Is there an undo to Alt-G?

Richard Maurer

---

12/6/95 10:21 AM  
Re: aspsx.exe in release 1.5.10  
David Vronay

Ted Morris  
Psyq Tools

Is there any documentation on ASPSX? We're looking for a way to define sections/groups right in our C code, and not having a lot of luck with it so far.

Any suggestions would be appreciated. Thanks.

---

12/6/95 11:33 AM  
See what's happening  
David Vronay  
Development Env.

Here's a lovely feature. That would improve our code greatly.  
A window, like the vars window, or part of the vars window that:  
(1) Shows the result of a line of code (2) Shows the values of variables used in the line of code.  
ie, if the line were `nGblNew = foo( iNum, status, pObj, nExtras, gblGoodies );`  
it would show you all in one immediate convenient place, whether they are global or local vars,  
the values of `nGblNew`, `iNum`, `status`, `pObj`, `nExtras`, `gblGoodies`. `nGblNew` would be  
shown both before and after.

Richard MaurerHere's a lovely feature. That would improve our code greatly.  
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the values of `nGblNew`, `iNum`, `status`, `pObj`, `nExtras`, `gblGoodies`. `nGblNew` would be  
shown both before and after.

---

12/6/95 2:19 PM  
Re: cpe2x failing  
Dan Burnash  
Development Env.

CPE2X.EXE 18K  
Development Env.  
You are using an old version of cpe2x. I tried the latest version, and it creates the executable  
correctly. I recommend downloading all of the latest software to get up to date on our tools.  
I have attached the version of cpe2x that works for me.  
Dan Burnash

---

12/6/95 11:33 AM  
Re: cpe2x failing  
Dan Burnash  
Psyq Tools  
Craig Ewert  
CPE2X.EXE 18K  
Development Env.

You are using an old version of cpe2x. I tried the latest version, and it creates the executable  
correctly. I recommend downloading all of the latest software to get up to date on our tools.  
I have attached the version of cpe2x that works for me.  
Dan Burnash

---

12/6/95 5:37 PM  
Re(2): aspsx.exe in release 1.5.10  
Dean M. Grandquist  
David Vronay  
Ted Morris

>Is there any documentation on ASPSX? We're looking for a way to define sections/groups > right in our C code, and not having a lot of luck with it so far.  
>Any suggestions would be appreciated. Thanks.  
Try these `ccpsx -Wa,smovie ....` this will prepend all sections with movie and put them in the group movie. `ccpsx -Wa,s-movie ....` this will prepend all sections with movie and not put them in any group.  
To use the latter you must declare the sections and groups in your link file.  
Hope this helps --Dean

---

12/7/95 10:29 AM

Re: aspsx.exe in release 1.5.10

Dan Burnash

Psyq Tools

Ted Morris

>I get the following error when using the latest version of aspsx.exe

>C:\PSX\BIN\TMP\BCANBLAB(8336) : Error : Unknown stab directive - please report >.stabs  
"\_\_CTOR\_LIST\_\_

>I went back to a previous version of aspsx and this error did not occur. Try compiling with the -S, to generate assembly, and send in the lines of assembly that cause the error. With that we should be able to pinpoint the problem.

Dan Burnash

---

12/7/95 7:50 PM

Re(4): aspsx.exe in release 1.5.10

Dean M. Grandquist

David Vronay

Ted Morris

Dean Said >>`ccpsx -Wa,smovie ....` >> this will prepend all sections with movie and put them in the group movie. >>`ccpsx -Wa,s-movie ....` >> this will prepend all sections with movie and not put them in any group.

>Let's say I create a group in my link file called 'mystuff'. I want a couple of different object files stuffed in there at a specific place in memory. I would >compile those sources something like this : >`ccpsx -Wa,smystuff -c data1.c -odata1.o` >`ccpsx -Wa,smystuff -c data2.c -odata2.o`  
>The linker would stuff those objects where I wanted them. ?

Well, just to be clear (and redundant 8-), the link response for the above would look something like: `org $80010000 include data1.o include data2.o inclib "t:\psx\lib\libgpu.lib" rdata group org($80010000) text group data group sdata group sbss group bss mystuff group bss group bss section mystuff.rdata,mystuff section mystuff.text,mystuff section mystuff.data,mystuff section mystuff.sdata,mystuff section mystuff.sbss,mystuff section mystuff.bss,mystuff section .rdata,rdata section .text,text section .data,data section .sdata,sdata section .sbss,sbss section .bss,bss regs pc=__SN_ENTRY_POINT`  
this would allow the malloc/realloc/free from Sony to work. If the bss group is not last then bad things start to happen.

>What we were actually looking for was a little different, but we could live with this. Is there >some way to tell the compiler you want your code in a specific section right in the code, >something like this... >\_attribute\_(section("mystuff"))

What exactly do you want to accomplish? I wanted to overlay just one of the sections from a large number of files with one section from a different set of files. Or in english, I wanted most of my game variables to be overlaid with most of my ui variables and my movie variables.

To do the overlay like I want Martin from SN added the `-Wa,s-mystuff` to put the sections into

special sections but not any group.

>Thanks for the help. Got any more ASPSX options up your sleeve you'd be willing to share?

I am still squeezing the Sony turnup.

--DeanG deang@holobyte.com

---

12/7/95 7:34 PM

PSYLINK error

Chris E. Reese

Psyq Tools

Development Env.

I have just recently run into a linker error that states: "Too many modules to link - increase number with /n switch" I did not add any modules and have been compiling with no problem until just a few minutes ago. The only changes I have made were adding a few line of code to a source file. I have tried setting the /n option as it states and it doesn't make any difference. I am using the latest linker, d/I'd it a day or two ago. Has anyone else run into this problem?

What can I do to resume work again?

Chris Reese Eidetic, Inc.

---

12/7/95 3:37 PM

Re(3): aspsx.exe in release 1.5.10

David Vronay

Dean M. Grandquist

Ted Morris

>Try these >ccpsx -Wa,smovie .... > this will prepend all sections with movie and put them in the group movie. >ccpsx -Wa,s-movie .... > this will prepend all sections with movie and not put them in any group.

>To use the latter you must declare the sections and groups in your >link file.

Not to be redundant, but let me see if I understand you correctly...

Let's say I create a group in my link file called 'mystuff'. I want a couple of different object files stuffed in there at a specific place in memory. I would compile those sources something like this :

```
ccpsx -Wa,smystuff -c data1.c -odata1.o ccpsx -Wa,smystuff -c data2.c -odata2.o
```

The linker would stuff those objects where I wanted them. ?

What we were actually looking for was a little different, but we could live with this. Is there some way to tell the compiler you want your code in a specific section right in the code, something like this...

```
_attribute_(section("mystuff"))
```

Thanks for the help. Got any more ASPSX options up your sleeve you'd be willing to share?

---

12/7/95 11:05 AM

Re: another dbug hassle

Dan Burnash

Psyq Tools

>not to sound harsh, but, sometimes I wonder if the guys writing the tools are >spending much time trying to use them as real world development tools

They are doing what they have time to do. Since they are shorthanded, aren't we all, they implement what is most requested, not always everything that is requested.

>DBUGPSX vars window:

>what's this "can't modify vars with derived types" business?  
>I have a structure with a pointer inside it and I want to be able >to manually modify it from the vars or watch window...  
struct CandyBar { int a,b,c; };  
struct PlasticWrapper { int xyzyzy; // i can modify this... struct CandyBar  
\*chocolate; // cannot modify var with derived type!?!?! char why; // i can  
modify this... };  
>please let me access my candy bar...  
Sorry, time to go on a diet. :-) Actually, Andy at SN agrees that this should be put in. He will take care of it when he returns to the office. Look for it in a debugger appearing within the next two weeks.  
Dan Burnash

---

12/7/95 3:15 PM  
Re(3): Compiler generating bad code  
Dan Burnash  
Development Env.

SN Systems will look into this next week, and I will let you know what they find.  
Dan Burnash

---

12/7/95 10:18 AM  
Re: See what's happening  
Dan Burnash  
Development Env.  
David Vronay  
Sounds nice. I will pass along your product suggestion to SN Systems.

---

12/7/95 10:28 AM  
Re: compiler crashing while dev card is running  
Dan Burnash  
Psyq Tools

What environment are you running in? DOS, WInDows, or WIn 95? Perhaps you have a bad mix of compiler parts. If this is possible, start with the 1.5 release disc, and download the updates to see if the problem goes away. If the problem persists, send me whatever you can documenting your working environment.  
Dan Burnash

---

12/7/95 2:53 PM  
Re: Global Vars Watch  
Dan Burnash  
Development Env.

>I often get All the global Vars in a watch window, and want to get rid of them, keeping only the ones I >specifally typed in. Is there an undo to Alt-G?

This will be implemented next week. Look for it in the next debugger.  
Dan Burnash

---

12/7/95 10:24 AM  
Re: Mess 3 & RS232 output  
Dan Burnash  
Psyq Tools

I am setting up my system to work with mess3, and will let you know how it goes tomorrow.  
>Also, I wanted to point out that the MESS3.COM program appears to be an unfriendly TSR.  
Friendly TSR's >check to see if an IRQ interrupt was meant for them and if not passes control on  
to the interrupt vector that >it replaced. If it handled itself it returns via an IRET.  
Sn agrees that it is an unfriendly tsr. They will try to make a couple of changes to improve it in  
the next couple of weeks.  
Dan Burnash

---

12/7/95 7:34 PM  
PSYLINK error  
Chris E. Reese  
Psyq Tools  
Development Env.

I have just recently run into a linker error that states: "Too many modules to link - increase  
number with /n switch" I did not add any modules and have been compiling with no problem  
until just a few minutes ago. The only changes I have made were adding a few line of code to a  
source file. I have tried setting the /n option as it states and it doesn't make any difference. I  
am using the latest linker, d/I'd it a day or two ago. Has anyone else run into this problem?  
What can I do to resume work again?  
Chris Reese Eidetic, Inc.

---

12/8/95 9:26 AM  
Fwd: Re: PSYLINK error  
Dan Burnash  
Development Env.

I don't have any other reports of problems like this, but below are some questions that might  
shed some light on the problem.  
How large an 'n' value did you try? Are you running low on hard drive space for a swapfile?  
Did you delete the tmp directory? How about changes to compiler options. How is your  
extended memory configured, and how much of it do you have?  
Dan Burnash

---

12/8/95 10:11 PM  
Windows NT  
Montgomery Singman  
Development Env.

Has anyone gotten Sony tools to work with Windows NT ? Is it possible but difficult ? Or Impossible ?  
I just installed ver 3.5.1 today, it won't run CDBIOS.EXE and RUN.EXE doesn't work as well, anyone got any idea ?  
Help !

---

12/8/95 9:22 AM  
Re: PSYLINK error  
Dan Burnash  
Psyq Tools

I don't have any other reports of problems like this, but below are some questions that might shed some light on the problem.  
How large an 'n' value did you try? Are you running low on hard drive space for a swapfile? Did you delete the tmp directory? How about changes to compiler options. How is your extended memory configured, and how much of it do you have?  
Dan Burnash

---

12/11/95 10:48 AM  
That Compiler & its version of C++  
James C. Leiterman  
Psyq Tools

I'm porting a project and stuck with its heavily written C++ architecture. So don't yell at me about why I'm using C++ but....  

```
class Zoo { public: Zoo() { a=3; }  
int a; }  
Zoo monkey;  
void foo( void ) { Zoo bear; Zoo *frog;  
frog = new Zoo; }
```

A curious thing about C++ classes. If using 'new' to construct a class as 'frog' above or defining it in as a stack argument such as 'bear' above the constructor gets called no problem. BUT if defining a class as global outside of a function such as 'monkey' above the memory is allocated for it but the constructor never seems to get called. This can be rectified with a call to monkey.Zoo() during initialization code but this is #\$\$&\$#!!!!

---

12/11/95 6:07 AM  
Re: Windows NT  
James C. Leiterman  
Development Env.

Windows NT is actually my favorite working environment but NT doesn't allow easy access to the hardware. Although it's alot more stable then Windows95 it requires a minimum of 32meg to develop with it. I haven't tried it at my current company but at the last one I used to develop Win95 applications using NT on my development machine network linked to a Win95 machine. In the Sony environment one could develop on a NT machine and test using a stripped down second computer with only the Sony Cards and enough memory to test the applications. (Network linked of course!)

The best of both worlds! Trouble is getting your company to go for it!

---

12/12/95 10:32 AM

Re: That Compiler & its version of C++

Dan Burnash

Psyq Tools

James C. Leiterman

I get a different error when using the latest compiler and assembler, but I think that is just a different symptom of the same problem. I have passed this on to SN Systems to get it fixed.

Thanks for the input,

Dan Burnash

---

12/12/95 4:48 PM

Re: Compiler generating bad code

Dan Burnash

Mike Benna

Development Env.

The compiler bug you found in your program, shown below, appears to be specific to the -O3 optimization switch. When I compiled the program with the default options, and added -g, the code worked correctly. This may help you move on, until the bug is fixed.

Dan Burnash

```
---- test.c ---- #include <libsn.h>
```

```
typedef struct Point2 {  short x;  short y; } Point2;
```

```
struct teststruct {  Point2 bounds;  short flags;  Point2 src_pt; } ss;
```

```
void SetUpSS(void);
```

```
main() {  SetUpSS();  ss.bounds = ss.src_pt;  printf("ss.src_pt = {%d,%d}, ss.bounds =  
{%d,%d}\n",  ss.src_pt.x, ss.src_pt.y,  ss.bounds.x, ss.bounds.y);
```

```
  for (;;)  pollhost(); }
```

```
void SetUpSS(void) {  ss.src_pt.x = 123;  ss.src_pt.y = 456; } ---- end of test.c ----
```

---

12/12/95 11:45 AM

Re(2): aspsx.exe in release 1.5.10

Ted Morris

Dan Burnash

Psyq Tools

MAIN.ZIP 14K

Development Env.

Here's the assembly output. The offending directive is on line 2287

---

12/13/95 6:07 PM

Optimizing routines that run in interrupt

Mark Slemko

Psyq Tools

We want to be able to run a variety of functions that are called from the vblank interrupt. At the same time we want them to have some optimization. They work fine when we use the optimization level -G0 but, is there a way to get the global pointer to stick around AND be able



to compile with -O2. If it is currently not supported in any way, can it be implemented?  
-Mark

---

12/13/95 6:18 PM  
Re(2): Windows NT  
Mark Slemko  
Development Env.

I am also curious about NT, I've successfully had full crashing problems compiling and running under Windows 3.11, Windows 95, and OS/2. DOS is the most stable environment so far. If you manage to get it going well under NT, let me know.  
-Mark

---

12/14/95 12:57 PM  
Re(2): Compiler generating bad code  
Dan Burnash  
Development Env.  
Mike Benna  
ASPSX.ZIP 44K  
Development Env.

This should be fixed with the latest aspx.exe, version 2.30, which I attached. It will be officially released soon.

---

12/14/95 11:18 AM  
Re: Optimizing routines that run in interrupt  
Dan Burnash  
Psyq Tools

>We want to be able to run a variety of functions that are called from the vblank interrupt. At the same time we want them to >have some optimization. They can be optimized, just not the gp optimization.  
>They work fine when we use the optimization level -G0 but, is there a way to get the global pointer to >stick around AND be able to compile with -O2. No.  
>If it is currently not supported in any way, can it be implemented? Not likely. What are you trying to do in the vblank interrupt? Perhaps there is a better way to do it.  
Dan Burnash

---

12/14/95 12:55 PM  
Re(3): aspx.exe in release 1.5.10  
Dan Burnash  
Psyq Tools  
Ted Morris  
ASPSX.ZIP 44K  
Development Env.

>I get the following error when using the latest version of aspx.exe  
>C:\PSX\BIN\TMP\BCANBLAB(8336) : Error : Unknown stab directive - please report >.stabs  
"\_\_CTOR\_LIST\_\_"  
This should be fixed with the latest aspx.exe, version 2.30, which I attached. It will be officially

released soon.

---

12/14/95 12:28 PM

Re(3): /i option for linker

Dan Burnash

Paul C. Isaac

Psyq Tools

A belated response from SN Systems.

\_\_\_\_\_ Just to follow up on this.

I'm not going to change the current linker. The future tools will have to be callable from windows applications without having a dos box to put any output in and so this option will be deleted at some point.

---

---

12/15/95 10:49 AM

linker problems w/ c++

Mark DeSimone

Psyq Tools

When using certain library routines in C++ code, I get the following linker errors. I do not get these errors when using them in C code. Any suggestions (other than not using C++)?

PSYLINK version 1.45

DISPLAY.OBJ : Error : Symbol 'RESETGRAPH\_\_FI' not defined DISPLAY.OBJ : Error : Symbol 'SETGRAPHDEBUG\_\_FI' not defined DISPLAY.OBJ : Error : Symbol 'SETDISPMASK\_\_FI' not defined DISPLAY.OBJ : Error : Symbol 'SETDEFDRAWENV\_\_FP7DRAWENVVIII' not defined DISPLAY.OBJ : Error : Symbol 'SETDEFDRAWENV\_\_FP7DRAWENVVIII' not defined DISPLAY.OBJ : Error : Symbol 'SETDEFDISPENV\_\_FP7DISPENVVIII' not defined DISPLAY.OBJ : Error : Symbol 'SETDEFDISPENV\_\_FP7DISPENVVIII' not defined DISPLAY.OBJ : Error : Symbol 'PUTDISPENV\_\_FP7DISPENV' not defined DISPLAY.OBJ : Error : Symbol 'PUTDRAWENV\_\_FP7DRAWENV' not defined DISPLAY.OBJ : Error : Symbol 'CLEAROTAG\_\_FPULI' not defined DISPLAY.OBJ : Error : Symbol 'PRINTF\_\_FPCE' not defined DISPLAY.OBJ : Error : Symbol 'ADDPRIIM\_\_FPVT0' not defined DISPLAY.OBJ : Error : Symbol 'DRAWOTAG\_\_FPUL' not defined DISPLAY.OBJ : Error : Symbol 'DRAWSYNC\_\_FI' not defined DISPLAY.OBJ : Error : Symbol 'CLEAROTAG\_\_FPULI' not defined DISPLAY.OBJ : Error : Symbol 'VSYNC\_\_FI' not defined DISPLAY.OBJ : Error : Symbol 'PUTDISPENV\_\_FP7DISPENV' not defined DISPLAY.OBJ : Error : Symbol 'PUTDRAWENV\_\_FP7DRAWENV' not defined

Linking completed. 18 error(s) in 1.4 seconds Total allocated : 121824

---

12/19/95 1:25 PM

sim:

David Vronay

Development Env.

What exactly is sim:

is it still supported? Is it the current disk on my PC or is it settable in some .INI file.

I want to say LoadExec("sim:\part2.exe", stack, 0);

Thanks Richard Maurer

---

12/19/95 11:36 AM

Re(2): Optimizing routines that run in interrupt

Mark Slemko

Dan Burnash

Psyq Tools

We have a variety of routines to control the sound driver timing that are called from Vblank interrupt. These routines want to access global variables, and should also be optimized.

-Mark

---

12/20/95 2:06 PM

Please stop DEBUGPSX from....

Silas S. Warner

Feature Requests

resetting the FILE window automatically as soon as a file is loaded. Please reset the pointer in the FILE or DIS window ONLY when the first instruction is done, or when the TAB or SHIFT-TAB keys are used.

Reason:

I am in the midst of debugging a piece of code deep in the game. I have my FILE window stepping through this source code and discover the line that's wrong. I exit the debugger, change the line and recompile. I then re-enter the debugger. My FILE window shows the line I wish to debug. Then the PROGRAM LOADED dialog box flashes up, and no matter what I do next, the FILE window resets to the first line in MAIN. I then have to reload my source code and step through it until I find the line I just had onscreen.

The only way to correct this is to remember to switch windows (to, say, the VARS window) before exiting the debugger. If I exit the debugger, and the FILE window is still up, I MUST lose my place when the debugger restarts.

---

12/27/95 10:54 AM

2mbyte.obj

Dan Burnash

Psyq Tools

Some info on 2mbyte.obj from SN Systems:

2MBYTE.OBJ is not from SN Systems. It is something that SCE made. The first we knew of it was when it appeared on the developer's CD. I don't know much about it except that it assumes 2 Megabytes of memory.

In particular note that it does not work correctly with C++ as it does not initialise global constructors and destructors.

The Psy-Q approved way for a developer to adjust a program for 2MB memory (or any other amount for that matter) is to set the `_ramsize` and `_stacksize` variables in his program and then just build their program as normal (ie. use the standard LIBSN startup module and `__SN_Entry_Point` entrypoint).

```
e.g. a program for 2MB memory:- ----- #include <libs.h>
int  _ramsize=0x00200000; // 2 Megabytes of main memory int _stacksize=0x00002000; // and
reserve 8K of that for stack
main() { ... } -----
```

If a developer requires something different from the start-up module then the recommended approach is for them to edit the source code for the `libs.lib` start-up module (`SNMAIN.S` provided with the Psy-Q tools) and derive their own start-up module from that code.

e.g. the standard SNMAIN module initialises the heap and stack and C++ stuff. It also executes a BREAK \$0001 after your main() function returns to the start-up code. It does this to cause your program to re-enter the Psy-Q downloader. This is not a problem for a developer's main game code since that would probably not wish to return to the kernel code that launched it. However, if your program launches other sub-programs using kernel exec() then you may wish those sub-programs to not re-initialise the stack or heap and to safely return to the program that launched them. These are fairly trivial modifications to the SNMAIN module.

SN were never informed of Playstation program start-up requirements otherwise we would have supplied suitable alternative start-up modules. Under the circumstances we decided that the best solution was for us to just provide the source code for our standard module so that developer's could easily customise it.

---

12/27/95 10:40 AM

Re: Please stop DEBUGPSX from....

Dan Burnash

Psyq Tools

Try using <alt> L, and typing in the line number you want to see.

---

12/27/95 12:33 PM

Re: 2mbyte.obj

Robert w. Calfee

Dan Burnash

Psyq Tools

Could you go over again \*in detail\* how we should start up the c++ if we're not to use 2mbyte.obj.

On a related note: does 8mbyte.obj also not work with c++?

rcw

---

12/27/95 10:28 AM

Re: linker problems w/ c++

Dan Burnash

Psyq Tools

Update to the 3.3 libraries. They have the proper include file declarations to keep the c++ compiler from mangling the names of the functions.

---

12/27/95 2:25 PM

Re(2): 2mbyte.obj

Dan Burnash

Psyq Tools

>Could you go over again \*in detail\* how we should start up the c++ if we're not to use 2mbyte.obj.

Put these two lines into your program.

```
int _ramsize=0x00200000; // 2 Megabytes of main memory
int _stacksize=0x00002000; // and reserve 8K of that for stack
```

>On a related note: does 8mbyte.obj also not work with c++?

Just change \_ramsize to 8 meg.  
int \_ramsize=0x00800000; // 8 Megabytes of main memory  
Dan Burnash

---

12/27/95 12:26 PM

Re: Please stop DEBUGPSX from....

Robert w. Calfee

Silas S. Warner

Feature Requests

Yeah, I hate it too...

if you hit F1 quickly after pressing return then you can change windows (to the registers for instance) before it resets to the top of main()

rwg

---

12/28/95 3:28 PM

currently suggested hard drives for CD Emulator

Mike Heilemann

Development Env.

What hard drives are you currently suggesting for use with the development systems for emulation? We have had some serious problems with the Micropolis 4221AV drives, out of 6 drives only 2 currently work. What are our alternatives?

Mike Heilemann Gametek

---

12/28/95 3:13 PM

Re: problems with audio on development system

Dan Burnash

Development Env.

We have had strange sound problems when the boards were set up incorrectly. If you have the external CD ROM drive, make sure it is connected correctly. If not, make sure the blue terminator is plugged into the boards. Recheck all of the cable connections on the board, and let me know if the problem changes or remains.

Dan Burnash

---

12/28/95 12:21 PM

problems with audio on development system

Dave Feldman

Development Env.

We currently have 3 development systems and are having a problem with being audio on 2 of them. The dip switches and jumpers seem to be identical on the systems and the card set which handles audio correctly works in different PCs whereas the ones which don't consistently don't - leading me to suspect a hardware problem rather than a software configuration issue.

For the cards which do not work correctly, we used to just not hear any sound when running with the released tools from the developer CD. With the latest libraries off the BBS, we now get an error "SPU: T/O [wait (reset) ]" then "SPU: T/O [wait (wrdy H -> L) ]" upon initializing the sound system using libsnd.

Can you suggest any other things we should be trying? Is this a common hardware problem? Would it be possible to swap back our cardsets for ones with working sound if the problem is with the cards? If so, it would be helpful to get the replacement system first before sending back ours as we are actively using the stations and can't really afford much downtime.  
Thanks.

---

12/29/95 9:01 AM

Re: currently suggested hard drives for CD Emulator

Dan Burnash  
Development Env.  
Mike Heilemann

>What hard drives are you currently suggesting for use with the development systems for emulation? We have had some >serious problems with the Micropolis 4221AV drives, out of 6 drives only 2 currently work. What are our alternatives?

We haven't changed our recommendations for hard drives, though if there is a common problem we want to know about it. However, any quality SCSI hard drive should work.  
Dan Burnash

---

12/29/95 7:16 AM

Re: currently suggested hard drives for CD Emulator

Dave R. Scheele  
Development Env.

Hi Mike ... how's things in GameTek land?

I'm using a Micropolis 3243AV drive in my emulator right now with no problems whatsoever.

It's a 4-gig'er and it's partitioned into several "CD-sized" partitions.

Dave

---

1/2/96 1:01 PM

Compiler, cache section, too many loads

Dave Ross  
Psyq Tools  
Thomas Boyd

One of our programmers is trying to speed up some code and is finding that using variables in the data cache via a section attribute cause the compiler to generate many unnecessary loads of the base address of the cache section. (it generates a load for every reference). This really negates the value of using the cache.

Are there any compiler directives or workarounds to minimize the number of these instructions generated?

Here's his full description:

Given these variable declarations in the data cache:

```
POLY_F4 *poly_f4 __attribute__((section("cachedata"))) = {0}; CVECTOR work_cvector  
__attribute__((section("cachedata"))) = {0}; screen_coord_defn screen_coord[4] __attribute__((section("cachedata"))) = {{0}};
```

this code fragment...

```
/* fill in color and vertex screen positions */
```

```

setRGB0 (poly_f4, work_cvector.r, work_cvector.g, work_cvector.b); *((long *) &poly_f4 -> x0)
= screen_coord[0].combined; *((long *) &poly_f4 -> x1) = screen_coord[1].combined; *((long *)
&poly_f4 -> x2) = screen_coord[2].combined; *((long *) &poly_f4 -> x3) =
screen_coord[3].combined;

```

this macro definition for setRGB0...

```

#define setRGB0(p, _r0, _g0, _b0) \ (p)->r0 = _r0,(p)->g0 = _g0,(p)->b0 = _b0
compiled with these compiler options...
COMPILE_FLAGS = -comments-c++ -g -Wall -O3 -c

```

produces this assembly code:

```

File Run Window Config CPU 80014248 12:37:50
+-----+
-----+
setRGB0 (poly_f4, work_cvector.r, work_cvector.g, work_cvector.b);
080014248>3C031F80 lui v1,$1f80 // poly_f4 08001424C 8C6300DC lw
v1,$dc(v1) 080014250 3C021F80 lui v0,$1f80 // work_cvector
080014254 904200C8 lbu v0,$c8(v0) 080014258 00000000 nop
08001425C A0620004 sb v0,$4(v1) 080014260 3C031F80 lui
v1,$1f80 // poly_f4 080014264 8C6300DC lw v1,$dc(v1)
080014268 3C021F80 lui v0,$1f80 // work_cvector 08001426C 904200C9
lbu v0,$c9(v0) 080014270 00000000 nop
080014274 A0620005 sb v0,$5(v1) 080014278 3C031F80 lui
v1,$1f80 // poly_f4 08001427C 8C6300DC lw v1,$dc(v1)
080014280 3C021F80 lui v0,$1f80 // work_cvector 080014284 904200CA
lbu v0,$ca(v0) 080014288 00000000 nop
08001428C A0620006 sb v0,$6(v1) 0
*((long *) &poly_f4 -> x0) = screen_coord[0].combined;
080014290 3C041F80 lui a0,$1f80 080014294 8C8400DC lw
a0,$dc(a0) 080014298 3C021F80 lui v0,$1f80
08001429C 8C42010C lw v0,$10c(v0) 0800142A0 00000000 nop
0800142A4 AC820008 sw v0,$8(a0) 0
*((long *) &poly_f4 -> x1) = screen_coord[1].combined;
0800142A8 3C021F80 lui v0,$1f80 0800142AC 8C420110 lw
v0,$110(v0) 0800142B0 00000000 nop 0
0800142B4 AC82000C sw v0,$c(a0) 0
*((long *) &poly_f4 -> x2) = screen_coord[2].combined;
0800142B8 3C021F80 lui v0,$1f80 0800142BC 8C420114 lw
v0,$114(v0) 0800142C0 00000000 nop 0
0800142C4 AC820010 sw v0,$10(a0) 0
*((long *) &poly_f4 -> x3) = screen_coord[3].combined;
0800142C8 3C021F80 lui v0,$1f80 0800142CC 8C420118 lw
v0,$118(v0) 0800142D0 00000000 nop
0800142D4 AC820014 sw v0,$14(a0) 0
+-----+
-----+
á | SONY_PSX4.03 | Stopped | Disasm: Go | Stop | Step | StepOver

```

This seems very inefficient, especially the setRGB0 section. Couldn't it be:

```

lui v2,$1f80 // data cache base address lw v1,$dc(v2) // poly_f4 address lbu
v0,$c8(v2) // load work_cvector red field nop sb v0,$4(v1) // save in poly_f4
structure lbu v0,$c9(v2) // load work_cvector green field nop sb v0,$5(v1) //
save in poly_f4 structure lbu v0,$ca(v2) // load work_cvector blue field nop sb
v0,$6(v1) // save in poly_f4 structure

```

For the screen coord copies, couldn't the compiler set v0 to the start of the screen\_coord array

and index off that, since it knows the size of the screen\_coord\_defn structure?  
In general, the compiler seems to reload the base address of the data cache a lot more than it needs to. This would be unnecessary if it reserved a register to always hold the data cache base address.

If you need them, here are the structures for defining screen\_coord[]:  
/\* for breaking a long sxy word into x and y \*/  
typedef struct { short x; short y; } sxy\_defn;  
/\* screen vertex coordinates are often treated as a long word instead of their component x and y values \*/  
typedef union { long combined; sxy\_defn sxy; } screen\_coord\_defn;

---

1/4/96 9:48 AM

Please fix 3 header files for C++ :-)

Travis Hilton

Development Env.

Angus

We are now using the C++ compiler heavily and have upgraded to the 3.3 libraries. Could you make a few minor changes to header files for the next library release?

1. Please add the line #include <stddef.h> to libgte.h. The C++ compiler doesn't see the typedef for u\_char without it.

2. Please add the line #include <libgte.h> to libgpu.h. The C++ Compiler doesn't see the struct SVECTOR without it.

3. Please add:

```
#if defined(_LANGUAGE_C_PLUS_PLUS) || defined(__cplusplus) || defined(c_plusplus)
extern "C" { #endif
```

to the top of libsn.h and

```
#if defined(_LANGUAGE_C_PLUS_PLUS) || defined(__cplusplus) || defined(c_plusplus) }
#endif
```

to the bottom of libsn.h. This is the only header file so far that does not have the C++ #define wrappers.

Thank you very much.

---

1/4/96 9:02 AM

Re: Compiler, cache section, too many loads

Thomas Boyd

Dave Ross

Psyq Tools

Dave,

I sent your question straight to SN Systems.

Tom

---

1/4/96 2:42 PM

Re: Please fix 3 header files for C++ :-)

Dan Burnash

Development Env.

Travis Hilton

>1. Please add the line #include <stddef.h> to libgte.h. The C++ compiler doesn't see the typedef for u\_char without it. Include stddef.h whenever you need libgte.h. Nesting includes will just



add to the confusion. I will make sure that this is documented in the future.

>2. Please add the line `#include <libgte.h>` to `libgpu.h`. The C++ Compiler doesn't see the struct `SVECTOR` without it. The overview docs state that `libgte.h` must be included if `libgpu` is used.

>3. Please add: `>> #if`

```
defined(_LANGUAGE_C_PLUS_PLUS) || defined(__cplusplus) || defined(c_plusplus) > extern  
"C" { > #endif >> to the top of libs.h and >> #if
```

```
defined(_LANGUAGE_C_PLUS_PLUS) || defined(__cplusplus) || defined(c_plusplus) > } >  
#endif >> to the bottom of libs.h. This is the only header file so far that does not have the  
C++ #define wrappers.
```

I will try to get this in lib 3.4, though it is already in beta.

Dan Burnash

---

1/4/96 3:55 PM

Re: Compiler, cache section, too many loads

Dan Burnash

Psyq Tools

Dave Ross

For now, here is SN Systems suggestion for getting the fast code you want. If I come up with any better ideas, I will pass them along.

The issues raised in the example are rather complex.

Here's one easy way to make efficient use of the data cache :

Declare a structure that holds all the variables you want to put in the data cahce, e.g.

```
struct dcvars { int x[4]; int y[4];  
    etc };
```

Declare a global structure of this type and specify that it should be in the data cache area, e.g.

```
struct dcvars dc __attribute__((section("cachedata"))) = {0};
```

Declare a global pointer to this structure, e.g.

```
struct dcvars *dcptr = &dc;
```

Make all references to variables through this pointer, e.g.

```
f() { dcptr->x[0] = dcptr->y[0]; dcptr->x[1] = dcptr->y[1]; dcptr->x[2] = dcptr->y[2];  
dcptr->x[3] = dcptr->y[3]; }
```

This will produce the efficient code they're after.

Another point to note : if you use the standard C function `memcpy` to copy blocks of memory then the compiler will automatically change this to in-line code when optimisation is enabled. It may therefore be more efficient to use this then to do several assignments.

Let me know if they have any further questions on this.

---

1/4/96 2:52 PM

Re(3): Optimizing routines that run in interrupt

David Minogue

Mark Slemko

Dan Burnash

Would it be permissible to correctly set the value of the gp register for the duration of the event handler, or would this create other problems? Of course you would have to get the value of the gp register, but I'm sure that something could be figured out for that. (Self modifying code anyone? No, just kidding...).

---

1/5/96 2:32 PM

Re(2): Lib 34 slower???

Dan Burnash  
Development Env.  
David W. Marshall

Do you have mess1 or mess3 loaded. It wouldn't surprise me to find out that there are more printf's in lib 3.4, since SCE decided it wasn't a good idea to remove them. this might be the cause of your slowdown. If there are specific calls that are slower, I can easily follow up with Japan. Let me know any specifics you dig up.

Dan Burnash

---

1/5/96 10:38 AM  
RotPMD calls in new lib  
David W. Marshall  
Development Env.

I just upgraded from Lib 3.2 to lib 3.4 and noticed that the RotPMD,SMD,RMD calls changed in lib 3.3. Questions:

- 1)Any docs that explain what the new clip args do and how to use them?
  - 2)The new headers are all the same for the PMD, RMD, SMD calls. Do these all call the same function now? The reason they had 3 versions to begin with was because of the clip flag. One version always clipped, one version never clipped, and one had a flag to turn clipping on and off. I assume they got rid of this and all functions now do the same thing.
- dave
- 

1/5/96 10:53 AM  
PSYQpause missing from lib34  
David W. Marshall  
Development Env.

The PSYQpause() macro is missing from libsn.h in lib 3.4  
Is this an oversight or are we not supposed to use this anymore?

dave

---

1/5/96 5:17 PM  
Re(5): Lib 34 slower???  
David W. Marshall  
Dan Burnash  
Development Env.

>>>Are you using the multitap? If not, THEN DO NOT LINK IN THAT LIBRARY. Only link it in if >>>you are supporting the multitap. >>>I expect it to be slower when using libtap.lib routines in place of the libapi routines. >>>However, if 3.3 of libtap is faster than 3.4 of libtap, then I want to know. >>>Please verify for me which case you are seeing.

We do have code in to support the multi-tap, so I do need to link with LibTap.lib.

I have verified that libtap.lib from 3.3 is faster than libtap.lib from 3.4. I currently link with the lib files in my .\lib34 directory. In that directory I copied the libtap.lib from my .\lib33 directory. The libtap.lib file I am using is dated 10/20/95 and is 9693 bytes in size.

>>>Since you have the test case set up, what are your improved timing numbers using

>>>libtap3.3 and everything else lib34?

There is no speed improvement over lib 3.3 that I can see. The numbers were back to being what I was getting using all of lib 3.3. So when I said "much better numbers" I was referring to

the timing change when removing the libtap.lib from 3.4. Sorry for the confusion.  
dave

---

1/5/96 3:43 PM

Re(4): Lib 34 slower???

Blake E. Senftner

Development Env.

David W. Marshall

David:

Since you have the test case set up, what are your improved timing numbers using libtap3.3 and everything else lib34?

-Blake

---

1/5/96 1:51 PM

Re: Lib 34 slower???

David W. Marshall

Development Env.

Here are some more numbers. Again, the only thing changing is the library I am compiling and linking with:

Lib 3.2: Poly create time 648 (RotPMD calls, etc) Total Time 767 (time = Vsync(0))

Lib 3.3 Poly create time 636 Total Time 754

Lib 3.4 Poly create time 657 Total Time 791

So Lib 3.3 shows that the new RotSMD calls are a little faster, but something has happened to lib 3.4.

dave

---

1/5/96 10:15 AM

Which patch are we using

David W. Marshall

Development Env.

Which patch are we supposed to be using?

I am using the SNPATCH from 5/31/95. There was an snpatchw that was released and then was not supposed to be used because it was bad.

The new lib34 release comes with a patchw and a patchj.

dave

---

1/5/96 10:28 AM

Re: Which patch are we using

Dan Burnash

Development Env.

Use the SNPATCH.CPE dated 5/31/95. SCE keeps sending us patchw and patchj's that don't work with the emulation system, so we dutifully post them and tell people not to use them. The snpatchw was based on patchw, so contained the same bug.

Eventually SCE may fix the patch program, but until then use snpatch.cpe.

Dan Burnash

---

1/5/96 1:52 PM

Re: PSYQpause missing from lib34

Dan Burnash

Development Env.

David W. Marshall

I noticed that the libsn.h file with lib 3.4 was old, and have asked SCE to update it. Since the libsn.LIB file hasn't changed, use the libsn.H file from lib 3.3 for now.

---

1/5/96 2:36 PM

Re(2): Compiler, cache section, too many loads

Jay Stelly

Psyq Tools

>Another point to note : if you use the standard C function memcpy to copy >blocks of memory then the compiler will automatically change this to in-line >code when optimisation is enabled.

It may therefore be more efficient to >use this then to do several assignments.

I have found that just using the = operator general produces the same thing, e.g.:

```
CopyPoly( POLY_FT4 *polyDest, POLY_FT4 *polySrc ) { *polyDest = *polySrc; }
```

would generate an inline memcpy even with optimization off. If you're copying blocks rather than structures (and you can't use a typedef) then you can't use this, but in general it seems to be optimal for structure copies.

Jay Stelly Tetragon

---

1/5/96 11:08 AM

Lib 34 slower???

David W. Marshall

Development Env.

I put lib34 into one dev system and left lib32 in the other. My times using lib34 are slower than lib32. Using the new RotSMD calls, it takes 5 more scan lines to process the data than in lib 32 (not a huge deal, but still slower. The lib 33 doc says that the speed has improved for these functions).

Just before I swap my buffers, I have a cnt = VSync(0); call. For the lib32 version I get a time of 768. For the lib34 version I get a time of 792.

Any thoughts,

dave

---

1/5/96 2:55 PM

Re(3): Lib 34 slower???

David W. Marshall

Dan Burnash

Development Env.

>>>Do you have mess1 or mess3 loaded. It wouldn't surprise me to find out that there are >>>more printf's in lib 3.4, since SCE decided it wasn't a good idea to remove them. this might >>>be the cause of your slowdown. If there are specific calls that are slower, I can easily >>>follow up with Japan. Let me know any specifics you dig up.

I have mess1 loaded. The slowdown is not caused by printf's because they would have to be

printing stuff on every tick, which is not happening.

By replacing lib files from lib3.3, I was able to verify that the slowdown is being caused by LIBTAP.LIB from lib 3.4.

I am now using all the 3.4 libs except for libtap.lib and I am getting much better performance numbers.

dave

---

1/5/96 3:48 PM

Re(4): Lib 34 slower???

Dan Burnash

Development Env.

David W. Marshall

Are you using the multitap? If not, THEN DO NOT LINK IN THAT LIBRARY. Only link it in if you are supporting the multitap.

I expect it to be slower when using libtap.lib routines in place of the libapi routines. However, if 3.3 of libtap is faster than 3.4 of libtap, then I want to know.

Please verify for me which case you are seeing.

---

1/8/96 5:32 PM

Fwd: BFA crashing.

Dean M. Grandquist

Psyq Tools

Hi All

I am getting some crashes in the Sony ROM that seem like my bug, but I have little if no way to trace how it is crashing.

My program will just stop, "target not responding" from the debugger. When I resets 1 then rerun the debugger with symbols only, I find the ra at BFA158FA and the pc is at BFA1B320.

That bit of code is a 0xbfa1b31c break \$1 0xbfa1b320 j \$bfa1b320

This is very strange that the ROM would lock up like this. Is this code part of the dev station, or PSX ROM? What does this code do? Can I get symbols for this area (just dreamin 8-).

Thanks --Dean G deang@holobyte.com

---

1/9/96 8:44 AM

Please provide a REAL profiler.

Carl Ferreira

Psyq Tools

I know this has been mentioned before, but could you please put a bug up someone's butt to provide an honest-to-God profiler which will indicate where the time is being spent (for both system/library calls and source). I know this is possible, but why should everyone spend a month creating something that is considered a system tool?

Sony, I think the ball falls squarely in your court on this one.

Thanks,

Carl Ferreira

---

1/9/96 10:17 AM

Multi-Tap really slow?

David W. Marshall  
SIO

Development Env.

I was doing some more performance measuring with the multi-tap and, unless I am doing something wrong, the multi-tap sucks. For the following tests, I turned off my code that parses the joybits that the kernel returns. So the only code that should be running for joypad data is the library code. Timing numbers were found using `Cnt = Vsync(0)`; before swapping the buffers. I am using `libtap.lib` from lib 3.3

a) With no multi-tap and a standard controller plugged into both ports, TIME = 760 b) With multi-tap plugged in port 1 (controller in port A on tap) and standard in port 2, TIME = 790 c)

With multi-tap plugged into both ports (controller in port A on both taps), TIME = 806

For `libtap.lib` from lib 3.4 the times were: a)796 b)814 c)829

Any thoughts on this? I'd really like to hear that I screwed up somewhere and that the multi-tap is really not that bad. I even tried putting the buffers that the kernel fills into the DCache. It made no difference.

dave

---

1/10/96 4:25 PM

Re: Fwd: BFA crashing.

Dan Burnash

Psyq Tools

Dean M. Grandquist

I don't know of any magic solutions. Memory must be getting trashed pretty good. Standard debug techniques, and some good luck are needed to solve this one. I wish I had a better answer to give you.

>Can I get symbols for this area (just dreamin 8-). Keep dreamin. :-)

---

1/11/96 1:19 PM

Re: Please provide a REAL profiler.

Dan Burnash

Psyq Tools

Carl Ferreira

>I know this has been mentioned before, but could you please put a bug up someone's butt to provide an honest-to-God profiler >which will indicate where the time is being spent (for both system/library calls and source). I know this is possible, but why >should everyone spend a month creating something that is considered a system tool?

>Sony, I think the ball falls squarely in your court on this one.

That depends on how badly you need it. I will try to get the ball rolling here. If you need it now, however, there is only one way to guarantee you will get it. That is to do it yourself.

Dan Burnash

---

1/11/96 9:28 PM

Re(2): Please fix 3 header files for C++ :-)

Dan Burnash

Development Env.

Travis Hilton

The updated `libs.h` file just released, version 1.5.15, should contain the C++ changes requested.

Dan Burnash

---

1/13/96 1:23 PM

Re(4): Optimizing routines that run in interrupt

Dan Burnash

Psyq Tools

David Minogue

I believe you can safely set the value of the gp during your event handler, as long as it is reset before leaving the handler. I have not confirmed this yet, but have written the macros to load and store the gp.

Here they are:

```
#define store_gp(addr) {__asm__("sw $28,%0" : "=g" (addr): );} #define load_gp(addr)
{__asm__("lw $28,%0; nop" :: "g" (addr) );}
```

They both take a long as an argument. Please let me know if this works for you.

Dan Burnash

---

1/14/96 10:16 AM

DBUGPSX Hardware breakpoints

Mike Benna

Psyq Tools

I noticed in the readme file for the recent versions of DBUGPSX that it talks about hardware breakpoints using the alt-B key. I've been unable to get these to work at all. I either lose contact with the host and have to abort the debugger or I get constantly stopped at lines of code which have nothing whatsoever to do with the breakpoint I entered.

Are hardware breakpoints really supported with the development boards or is this some future feature that none of us have access to yet? Any suggestions on making them work?

Thanks for any info you can provide. Reports of other people's success/failure would be appreciated.

---

1/15/96 12:32 PM

Re(2): Please provide a REAL profiler.

Sam Black

Dan Burnash

Psyq Tools

We have a "real" profiler, but it's not 100% polished.

It's a statistical sampling profiler; problem is that a lot of our samples are in areas "unknown" to our map files, so we only really see about 55% "hits" in our code. I didn't personally write it, but I know that we've been using it to run some profiling tests. I'll ask the engineer who wrote it how atomic it is.

If it's not too intertwined with the rest of our code, I'll post it. (If it's too much work, too restrictive, or we have to ship any "private" code, obviously I won't be able to post it.)

---Jim, Papyrus

---

1/15/96 2:38 PM

Re(5): Optimizing routines that run in interrupt

Dan Burnash

Psyq Tools

David Minogue

A couple of changes/additions to my previous email.

1. The macros need the volatile attribute so they are not reordered by the compiler. The new macros are:

```
#define store_gp(addr) { __asm__ volatile ("sw $28,%0" : "=g" (addr): ); } #define load_gp(addr)
{ __asm__ volatile ("lw $28,%0; nop" :: "g" (addr) ); }
```

2. There's a problem in load gp if the variable being loaded into the gp is not declared as being extern because the compiler will assume that it can be loaded relative to the gp ! In order to avoid this problem make sure that the variable being loaded into the gp is specified as extern, e.g.

```
extern int saved_gp;
```

...

```
void event_handler() { load_gp(saved_gp); ... }
```

3. It may be necessary to save/restore the value of the gp register on entry/exit of the event handler. If I find out positively either way I will let you know.

Dan Burnash

---

1/15/96 4:46 PM

Re: RotPMD calls in new lib

Dan Burnash

Development Env.

David W. Marshall

>I just upgraded from Lib 3.2 to lib 3.4 and noticed that the RotPMD,SMD,RMD calls changed in lib 3.3. Questions: >1)Any docs that explain what the new clip args do and how to use them? Not much. I will try to get more.

>2)The new headers are all the same for the PMD, RMD, SMD calls. Do these all call the same function now? The reason they had 3 versions to begin with was because of the clip flag. One version always clipped, one version never clipped, and one had a flag to turn clipping on and off. I assume they got rid of this and all functions now do the same thing.

The RotPMD calls don't appear to have changed. The RotSMD and RotRMD calls changed. The changes doc shows how to use them as before, but nothing on what each arg means:

Function Specification Changes:

```
RotSMD_RotRMD_ ! ! [Example] ! void RotSMD_F3(long *pa,u_long
*ot,int otlen,int id); ! | ! V ! void RotSMD_F3(long *pa,u_long *ot,int otlen,int id,
! int sclip, int hclip, int vclip, int nclipmode); ! ! To use this function as it
was used before, the description must be ! as follows: ! void RotSMD_F3(long
*pa,u_long *ot,int otlen,int id, 0, 0, 0, 1); ! The speed is never slower than before.
!
```

When I get more specifics on the args, I will pass them along.

Dan Burnash

---

1/16/96 2:15 PM

Re(5): Optimizing routines that run in interrupt

Dean M. Grandquist

Dan Burnash

Psyq Tools

We have been doing just this for 3 to 4 months.

It works 8-)

--Dean

---



1/16/96 4:31 PM  
alignment in ASMPSX  
David Vronay  
Psyq Tools

I am unable to decipher ASMPSX docs sufficiently to figure out how to do alignment of initialized data.

For instance, sometimes I want to word ( 4byte ) align a particular half word. How can I specify alignment? These .s files are inits for C structs and have to be inthe proper alignment to work.  
Tod Frye.

---

1/16/96 2:45 PM  
Re: DBUGPSX Hardware breakpoints  
Dan Burnash  
Psyq Tools  
Mike Benna

Check and make sure that you are using the latest version of the debugger, 4.83, and it should work correctly. I know of a few people that are using it successfully, so send me an example and steps that cause it to fail, if you continue to have problems.  
Dan Burnash

---

1/17/96 9:04 AM  
How to get data from DebugStation  
Mike Benna  
Development Env.

Is there any way for us to get data from a debug station to a development system? For example, a file stored on a memory card containing a replay of a bug?

The only thing I can think of is to build a special serial cable that can hook the PSX to a PC, then write special code for each side to be able to transfer the data to the PC. Does such a cable exist or would we have to design it ourselves?

Does anyone have any other suggestions on how to get memory card files onto a PC? Thanks.

---

1/17/96 11:03 AM  
Re: alignment in ASMPSX  
Dan Burnash  
Psyq Tools  
David Vronay

To align initialized data use the cnop directive. e.g.

```
cnop 0,4 ; align to 4 byte boundary achar db 'x'
```

In the cnop directive the second operand is the boundary to align to and the first is the offset from this boundary, e.g.

```
cnop 0,4 ; align on next 4 byte boundary cnop 3,4 ; align 3 bytes past the next 4 byte boundary cnop 0,2 ; align on next 2 byte boundary
```

Another alternative is to use the dsh and dsw directives with 0 as their operand. These will then align to the next halfword or word boundary, e.g.

```
dsw 0 ; force word alignment achar db 'a'
```

---

1/19/96 10:41 AM

Re: problems with audio on development system

Sam Black

Dave Feldman

Development Env.

We had been having the same problem with some board sets. The solution was to buy a black external CD drive and always hook it up. (The little blue plug seemed useless to solve the problem with the latest libs.)

The external drives cost sufficiently little in the big picture of things that we just bought them, even though we don't need them for all of our stations.

---

1/22/96 4:07 PM

Re(2): How to get data from DebugStation

Mike Benna

Dan Burnash

Development Env.

Dan writes: >Storing data in main RAM and then dumping it to a memory card should work fine, and is the easiest solution for >now. Then you can access them via a dev system, and save them using the pc file i/o calls.

I didn't know there was some way to connect a memory card to the dev system. Fortunately the data I want to extract will already be stored on a memory card so the ability to read a card from the dev system would solve my problem perfectly. Can you explain what I need in order to accomplish this?

Also, is there some way to emulate a memory card on a dev system? Presumably if a memory card can be connected to a dev system then I can do all my testing using a real memory card, but failing that some sort of emulation would be tremendously helpful.

---

1/22/96 5:10 PM

Re(3): How to get data from DebugStation

Dan Burnash

Development Env.

Order a controller box. A DTL-H2080, which takes your two 9 pin outputs from the dev boards, and turns them into two standard debug station controller ports and two memory card ports.

This is exactly as what you get on the consumer unit. So all development, even for alternative controllers & memory cards, can be done using the dev system.

Dan Burnash

---

1/22/96 9:43 AM

Re: How to get data from DebugStation

Dan Burnash

Development Env.

Mike Benna

>Is there any way for us to get data from a debug station to a development system? For example, a file stored on a >memory card containing a replay of a bug? Storing data in main RAM and then dumping it to a memory card should work fine, and is the easiest solution for now. Then you can access them via a dev system, and save them using the pc file i/o calls.

>The only thing I can think of is to build a special serial cable that can hook the PSX to a PC, then write special code >for each side to be able to transfer the data to the PC. Does such a cable exist or would we have to design it >ourselves? I would use the memory card for now, and not try to build your own cable. It would need a level convertor, among other things, so is not a simple pin connection. At some point we will have a better connection between Playstations and pc's which will let you do what you want, but not yet.  
 Dan Burnash

1/22/96 9:45 AM

Re(2): RotPMD calls in new lib

Dan Burnash

Development Env.

David W. Marshall

Here are the new docs you asked for. They should be posted officially soon.

\*14.SMD functions

\*\*14.1. RotSMD\_F3 RotSMD\_G3 RotSMD\_FT3 RotSMD\_GT3 RotSMD\_F4  
 RotSMD\_G4 RotSMD\_FT4 RotSMD\_GT4

```

  FORTMAT void RotSMD_F3(pa,ot,otlen,id,sclip,hclip,vclip,nclipmode) void
  RotSMD_G3(pa,ot,otlen,id,sclip,hclip,vclip,nclipmode) void
  RotSMD_FT3(pa,ot,otlen,id,sclip,hclip,vclip,nclipmode) void
  RotSMD_GT3(pa,ot,otlen,id,sclip,hclip,vclip,nclipmode) void
  RotSMD_F4(pa,ot,otlen,id,sclip,hclip,vclip,nclipmode) void
  RotSMD_G4(pa,ot,otlen,id,sclip,hclip,vclip,nclipmode) void
  RotSMD_FT4(pa,ot,otlen,id,sclip,hclip,vclip,nclipmode) void
  RotSMD_GT4(pa,ot,otlen,id,sclip,hclip,vclip,nclipmode) long *pa; /*head address
  of PRIMITIVE Gp*/ u_long *ot; /*head address of OT*/ int otlen;
  /*length of OT*/ int id; /*double buffer ID*/ int sclip; /*screen clip
  ON/OFF(ON=1)*/ int hclip; /*H direction clip([0,hclip]=display)*/ int
  vclip; /*V direction clip([0,vclip]=display)*/ int nclipmode; /*near Z clip mode
  (0=0,SCRZ/2=1) */

```

EXPLANATION Rotate & Transfer & Perspect the all polygons included in independent vertex type PRIMITIVE Gp and make GPU packets and link them to OT. if sclip=0 then all polygons are displayed. if sclip=1 then only polygons at least one of vertices are included in the square ([0,hclip],[0,vclip]) are displayed. if nclipmode=0 then polygons are far&near clipped by SZ=[0,2^16). if nclipmode=1 then polygons are far&near clipped by SZ=[h,2^16). (h=distance of eye to screen) All polygons are backface clipped.

RETURN NONE

\*\*14.9. RotSMD\_SV\_F3 RotSMD\_SV\_G3 RotSMD\_SV\_FT3 RotSMD\_SV\_GT3  
 RotSMD\_SV\_F4 RotSMD\_SV\_G4 RotSMD\_SV\_FT4 RotSMD\_SV\_GT4

```

  FORMAT void RotSMD_SV_F3(pa,va,ot,otlen,id,sclip,hclip,vclip,nclipmode) void
  RotSMD_SV_G3(pa,va,ot,otlen,id,sclip,hclip,vclip,nclipmode) void
  RotSMD_SV_FT3(pa,va,ot,otlen,id,sclip,hclip,vclip,nclipmode) void
  RotSMD_SV_GT3(pa,va,ot,otlen,id,sclip,hclip,vclip,nclipmode) void
  RotSMD_SV_F4(pa,va,ot,otlen,id,sclip,hclip,vclip,nclipmode) void
  RotSMD_SV_G4(pa,va,ot,otlen,id,sclip,hclip,vclip,nclipmode) void
  RotSMD_SV_FT4(pa,va,ot,otlen,id,sclip,hclip,vclip,nclipmode) void
  RotSMD_SV_GT4(pa,va,ot,otlen,id,sclip,hclip,vclip,nclipmode) long *pa; /*head
  address of PRIMITIVE Gp*/ long *va; /*head address of VERTEX Gp*/
  u_long *ot; /*head address of OT*/ int otlen; /*length of OT*/ int id;
  /*double buffer ID*/ int sclip; /*screen clip ON/OFF(ON=1)*/ int hclip;
  /*H direction clip([0,hclip]=display)*/ int vclip; /*V direction
  clip([0,vclip]=display)*/ int nclipmode; /*near Z clip mode (0=0,SCRZ/2=1) */

```

EXPLANATION Rotate & Transfer & Perspect the all polygons included in common vertex type PRIMITIVE Gp and make GPU packets and link them to OT. if sclip=0 then all polygons are displayed. if sclip=1 then only polygons at least one of vertices are included in the square ([0,hclip],[0,vclip]) are displayed. if nclipmode=0 then polygons are far&near clipped by SZ=[0,2^16). if nclipmode=1 then polygons are far&near clipped by SZ=[h,2^16). (h=distance of eye to screen) All polygons are backface clipped.  
 RETURN NONE

\*15.RMD functions

\*\*15.1. RotRMD\_F3 RotRMD\_G3 RotRMD\_FT3 RotRMD\_GT3 RotRMD\_F4  
 RotRMD\_G4 RotRMD\_FT4 RotRMD\_GT4

FORMAT void RotRMD\_F3(pa,ot,otlen,id,sclip,hclip,vclip,nclipmode) void  
 RotRMD\_G3(pa,ot,otlen,id,sclip,hclip,vclip,nclipmode) void  
 RotRMD\_FT3(pa,ot,otlen,id,sclip,hclip,vclip,nclipmode) void  
 RotRMD\_GT3(pa,ot,otlen,id,sclip,hclip,vclip,nclipmode) void  
 RotRMD\_F4(pa,ot,otlen,id,sclip,hclip,vclip,nclipmode) void  
 RotRMD\_G4(pa,ot,otlen,id,sclip,hclip,vclip,nclipmode) void  
 RotRMD\_FT4(pa,ot,otlen,id,sclip,hclip,vclip,nclipmode) void  
 RotRMD\_GT4(pa,ot,otlen,id,sclip,hclip,vclip,nclipmode) long \*pa; /\*head address of PRIMITIVE Gp\*/  
 u\_long \*ot; /\*head address of OT\*/ int otlen;  
 /\*length of OT\*/ int id; /\*double buffer ID\*/ int sclip; /\*screen clip ON/OFF(ON=1)\*/  
 int hclip; /\*H direction clip([0,hclip]=display)\*/ int vclip; /\*V direction clip([0,vclip]=display)\*/  
 int nclipmode; /\*near Z clip mode (0=0,SCRZ/2=1)\*/

EXPLANATION Rotate & Transfer & Perspect the all polygons included in independent vertex type PRIMITIVE Gp and make GPU packets and link them to OT. if sclip=0 then all polygons are displayed. if sclip=1 then only polygons at least one of vertices are included in the square ([0,hclip],[0,vclip]) are displayed. if nclipmode=0 then polygons are far&near clipped by SZ=[0,2^16). if nclipmode=1 then polygons are far&near clipped by SZ=[h,2^16). (h=distance of eye to screen) No polygons are backface clipped.  
 RETURN NONE

\*\*15.9. RotRMD\_SV\_F3 RotRMD\_SV\_G3 RotRMD\_SV\_FT3 RotRMD\_SV\_GT3  
 RotRMD\_SV\_F4 RotRMD\_SV\_G4 RotRMD\_SV\_FT4 RotRMD\_SV\_GT4

FORMAT void RotRMD\_SV\_F3(pa,va,ot,otlen,id,sclip,hclip,vclip,nclipmode) void  
 RotRMD\_SV\_G3(pa,va,ot,otlen,id,sclip,hclip,vclip,nclipmode) void  
 RotRMD\_SV\_FT3(pa,va,ot,otlen,id,sclip,hclip,vclip,nclipmode) void  
 RotRMD\_SV\_GT3(pa,va,ot,otlen,id,sclip,hclip,vclip,nclipmode) void  
 RotRMD\_SV\_F4(pa,va,ot,otlen,id,sclip,hclip,vclip,nclipmode) void  
 RotRMD\_SV\_G4(pa,va,ot,otlen,id,sclip,hclip,vclip,nclipmode) void  
 RotRMD\_SV\_FT4(pa,va,ot,otlen,id,sclip,hclip,vclip,nclipmode) void  
 RotRMD\_SV\_GT4(pa,va,ot,otlen,id,sclip,hclip,vclip,nclipmode) long \*pa; /\*head address of PRIMITIVE Gp\*/  
 long \*va; /\*head address of VERTEX Gp\*/  
 u\_long \*ot; /\*head address of OT\*/ int otlen; /\*length of OT\*/ int id;  
 /\*double buffer ID\*/ int sclip; /\*screen clip ON/OFF(ON=1)\*/ int hclip;  
 /\*H direction clip([0,hclip]=display)\*/ int vclip; /\*V direction clip([0,vclip]=display)\*/  
 int nclipmode; /\*near Z clip mode (0=0,SCRZ/2=1)\*/

EXPLANATION Rotate & Transfer & Perspect the all polygons included in common vertex type PRIMITIVE Gp and make GPU packets and link them to OT. if sclip=0 then all polygons are displayed. if sclip=1 then only polygons at least one of vertices are included in the square ([0,hclip],[0,vclip]) are displayed. if nclipmode=0 then polygons are far&near clipped by SZ=[0,2^16). if nclipmode=1 then polygons are far&near clipped by SZ=[h,2^16). (h=distance of eye to screen) No polygons are backface clipped.  
 RETURN NONE

---

1/23/96 9:23 PM  
Windows 95 Debugger  
David R. Sullivan  
Psyq Tools

What is the status of the Win95 debugger, and other Win95 utilities. I understand that the Win95 debugger from PsyQ is ready to use....is Sony going to make this available to us? A few months back there were a few messages asking for Win95 support on tools... what is coming of that?  
Dave.

---

1/24/96 6:49 PM  
C++  
Borden Covell II  
Development Env.

Hi. We're trying to leap into a C++ project and would appreciate any info we can get on setting up the PSX development environment to support C++. What compiler switches do we need? Are there extra header files that need to be available? What parts of std C++ are not supported? Any help is greatly appreciated, Thanks!

---

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---

1/25/96 8:20 AM  
Re: C++  
Travis Hilton  
Borden Covell II  
Development Env.

We have been using C++ successfully since October 1995. As far as setting up the development environment. Lib 3.3 worked just fine as is (accept the libsn.h needed C++ wrappers which is fixed in 3.4 beta).

One word of warning -> there are a lot of strange anomalies when compiling with just the -g option. These go away when compiling with -O and -g. This uses the first level of optimization while still allowing debugging symbols. Also be warned that automatic static variable initialization does not appear to work. We get around this by making an initialize member function for each class which is called explicitly.

Also not that SCEA has claimed that they will not support C++. I hope this will change. But other than that C++ appears to work fine.

---

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Borden Covell II  
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---

1/26/96 11:38 AM

Re(2): C++

Dan Burnash  
Psyq Tools  
Travis Hilton

>Also not that SCEA has claimed that they will not support C++. I hope this will change. But >other than that C++ appears to work fine. At one time SCE stated they would not support C++ in the libraries. All known problems have now been fixed, and any bugs discovered in the libraries will be fixed as well. Just send me the code that doesn't work.

>Also be warned that automatic static variable initialization does not appear to work. We >get around this by making an initialize member function for each class which is called >explicitly. The compiler has always supported C++, theoretically, so please send me your example that doesn't work, and I will forward it on to SN Systems to be fixed.

Dan Burnash

---

1/26/96 11:42 AM

Fwd: Re(2): C++

Dan Burnash  
Development Env.

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Dan Burnash

---

1/29/96 3:14 PM

Linker error: Value (800104EC) out of range in instruction  
expression in vo From:

player 1  
Psyq Tools

I'm getting a link error that prints out Value (800104EC) out of range in instruction patch (expression involves: .RDATA). Anyone have any idea what it means?

---

1/30/96 6:09 AM

Re: Linker error: Value (800104EC) out of range in instruction  
expression From:

Dean M. Grandquist

player 1

Psyq Tools

Looks like your group order is not correct. I am using: rdata group org(\$80010000) text  
group data group sdata group sbss group bss bss group bss

The bss needs to last and the sbss must be right before bss. The others just work for me 8-).

--DeanG

---

1/31/96 8:04 AM

Re(3): C++

Travis Hilton

Dan Burnash

Psyq Tools

Actually with the latest psyq tools debug only mode seems to be running just fine. Thanks for the feedback. I will look for any loop holes in the new compiler.

A stable C++ compiler is very important for us.

---

2/1/96 2:30 PM

Debugger stack tracing?

Carl Ferreira

Psyq Tools

I know I saw one version of the debugger trace up and down through the stack. I thought it would occur with the left/right keys in the Watch window, but I can't seem to get that to work anymore.

I am using version 4.69.

Any ideas?

Carl Ferreira

---

2/5/96 5:08 PM

Fast loads in ASMPSX

Alex Hastings

Psyq Tools

Does anybody know how to take advantage of the processor's ability to quickly execute a series of loads from main memory? Both the Sony docs and the MIPS docs say that the first load in a series takes five ticks while subsequent loads from the same memory page take only 1 tick. The code I'm using looks like this:

```
lw r8, 0(r4) lw r9, 4(r4) lw r10, 8(r4) lw r11, 12(r4)
```

Each of these loads is taking 5 ticks (they actually seem to average to 5.5 ticks for some reason).

Does anyone know what I can do to optimize this?  
Thanks, Alex.

---

2/5/96 4:16 PM

Re: Debugger stack tracing?

Dan Burnash

Psyq Tools

Carl Ferreira

Try the <> arrows, and/or the +- keys. I know SN switched the key mappings, but I haven't had a chance to test out the new mapping.

Dan Burnash

---

2/5/96 1:11 PM

new debugger

R.Brett Butler

Psyq Tools

new debugger sux. it doesn't step from line to line using [F7], it JUMPS around.

---

2/5/96 4:24 PM

Re: new debugger

Dan Burnash

Psyq Tools

R.Brett Butler

F7 jumps into subroutines, even library ones where you don't have the source. Maybe that is the problem. Try F8 to step over each line.

Also, make sure you don't have optimizations turned on, or the jumping you are experiencing is likely caused by the reordering of code, and will not change.

If this isn't what you are experiencing, send me a sample, and let me know what version of the debugger you are using.

Dan Burnash

---

2/5/96 7:15 PM

CD Burner

Borden Covell II

CD

Not sure where to post this, so I'm throwing it in here and there.

Does any know of any reasonably priced S/W that runs can be used to burn CDs under DOS or Windows and that supports the Sony PSX CD-ROM burner???

Thanks!

---

2/6/96 11:53 AM

Re(3): Debugger stack tracing?

Dan Burnash

Psyq Tools



Carl Ferreira

From the vars window, the <> keys trace the call stack in version 4.83 of dbugpsx.

---

2/6/96 10:23 AM

Re(2): Debugger stack tracing?

Carl Ferreira

Dan Burnash

Psyq Tools

Would you please find out definitively what the damn keys are????!!!!?! NOTHING seems to work on my system (version 4.69) to trace back and forward through the calling stack.

Thanks.

Carl Ferreira

---

2/6/96 8:37 PM

cpe2x never finishes

jeffrey Hall

Development Env.

When I run cpe2x.exe on my cpe file it just keeps doing whatever it is that it's doing. The drive lights on and I hear the hard disk accessing, but it just keeps going. It's not hung, because I can control-c to stop it. When I look at what it's been doing I see that it's created a huge .exe file that's much larger than my original cpe file. I don't get any messages except that it's created temporary files.

---

2/7/96 9:45 AM

Re(2): cpe2x never finishes

David W. Marshall

Sam Black

jeffrey Hall

>>>She indicates that org'ing vars in the DCACHE might cause cpe2x to break

I have variables in the dcache and have no problem with CPE2X. However, I use the assembler, RSSET, and RW for putting my vars in the dcache.

I assumed that all CPE2X did was pad the cpe to a 2k CD sector boundary, guess I was wrong.

dave

---

2/7/96 7:51 PM

Re(5): cpe2x never finishes

Sam Black

Development Env.

Same here, we've tried it in Win95 DOS boxes, Win95 DOS exclusive mode, OS/2 DOS Box, DOS 6.22; everything's the same.

Getting rid of variables which are assigned to the DCACHE by a section \_\_attribute\_\_ command in the C files allows our cpe2x problem to go away...

---Jim

---

2/7/96 9:20 AM

Re: cpe2x never finishes

Sam Black  
jeffrey Hall  
Development Env.

See Karen Paik's response to my exact question in the Bugs conference.

Summary: She indicates that org'ing vars in the DCACHE might cause cpe2x to break. We do ORG vars there, and haven't had time to move them, to see if that is the correct cause of the problem. Apparently, the sources to cpe2x are only in Japan at SCEE, so a quick fix is unlikely.

---

2/7/96 2:39 PM  
Re(4): cpe2x never finishes  
jeffrey Hall  
Development Env.

Unfortunately I'm running in a DOS environment so that's not the answer for me.

---

2/7/96 9:46 AM  
new dev system  
David W. Marshall  
Psyq Tools

Will SCEE be supporting the new PSYQ dev system that runs on a production playstation?  
dave

---

2/7/96 2:19 PM  
Re(3): cpe2x never finishes  
Blake E. Senftner  
Development Env.

We had a situation like that described, where cpe2x just kept on going and going...  
Running outside Windows, not just a DOS window, but from DOS stopped the problem.  
-Blake

---

2/8/96 10:29 AM  
Need debugger changes/fixes  
Carl Ferreira  
Psyq Tools

Could the debugger please be modified so that it will:

1) recognize memory above the 8 Meg limit 2) recognize variables stored within scratchpad memory.

These are very important areas. Could this be done ASAP?

3) Allow left/right arrows to work in the Watch window and Register windows (if not others!).

4) If a structure is expanded on an alternate work screen (i.e. Alt-3), could you leave it expanded as you switch between work screens?

These are major annoyances.

Thanks.

Carl Ferreira

---

2/8/96 9:06 AM

Re(2): problems with audio on development system  
Kevin T. Seghetti  
Development Env.

We hadn't started on audio until months into the project, we have 3 dev stations and one CD, I just happens the CD had been used in 2 of the 3 stations, so those never had the blue plug replaced (hadn't noticed they actually had a wire in them), anyhow, so our problem was solved by replacing the blue terminator. Kevin Seghetti

---

2/8/96 11:25 AM

Re: Need debugger changes/fixes

Dan Burnash

Psyq Tools

Carl Ferreira

>Could the debugger please be modified so that it will:

>1) recognize memory above the 8 Meg limit >2) recognize variables stored within scratchpad memory.

>These are very important areas. Could this be done ASAP?

I believe the capability exists already. Here are a couple of old posts that should help. They are long, so I am posting them at the end of this message.

>3) Allow left/right arrows to work in the Watch window and Register windows (if not others!). I will pass this request on.

>4) If a structure is expanded on an alternate work screen (i.e. Alt-3), could you leave it

>expanded as you switch between work screens? Yeah, I hate this too.

Let me know if you need more info then what is below.

Dan Burnash

\_\_\_\_\_ post 1 \_\_\_\_\_

\_\_\_\_\_ >One problem I've found is that if you're putting the stack into the d-cache >(fast ram), then any local variables that get pushed onto the stack appear as

>0x00 in the debugger. Apparently the debugger cannot access variables in the

>d-cache correctly. > >Whenever I need to step through code that does this, I always have to

>temporarily define the variables as static in order for them to show up with >the correct values in the debugger.

Ah, that's because the debugger default 'accessible memory list' does not include the d-cache area. It's pretty easy to add it, you just need to edit the debugger config file (file DBUGPSX.C0\* is the current one, also SONY\_PSX.CFG in the PSYQ executables directory is the default template to be used if no config file is found). This is just a text file, and you will see a section like:-

```
----- #readram0 00000000 007FFFFFFF 1FC00000
1FC7FFFF 80000000 807FFFFFFF 9FC00000 9FC7FFFF A0000000 A07FFFFFFF BFC00000
BFC7FFFF #writeram0 00000000 007FFFFFFF 80000000 807FFFFFFF A0000000 A07FFFFFFF #update
FF 0003 #video 03 50 32 #label level 02 7F 7F #colour attributes 17 1F 3E B0 4F 5E 0C 70 C0 87
8E 8E F0 90 4F 87 7C 0E 0A 28 2F 70 #mono attributes 07 0F 70 70 07 70 0F 70 01 07 0F 0F 70 0F
07 07 70 07 07 0F 70 #default tabs ASM 0F 17 28 30 00 00 00 00 S 0F 17 28 30 00 00 00 00 C
08 00 00 00 00 00 00 00 H 08 00 00 00 00 00 00 00
-----
```

Just add the extra range to the readram and writeram tables. Note that these lists must be kept in order (i.e. sorted) so be careful to add the new entries at the correct point.

\_\_\_\_\_ post 2 \_\_\_\_\_

Hi Dan

Please excuse the delay - I had to think hard about this. This may like to copy this to other staff

at SCEA (I have already cc'd Tom for his information) and maybe post it on your BBS. Please let me know if you have any problems with it.

>The following is a couple of messages on a problem viewing variables in a watch >window that are located in the dcache. Please let me know if there is a way to >get this to work.

The example given here...

```
> >_____message 1_____>Is there any way to display DCache variables
in the watch window? > >I define the DCache as follows: > >In a .S file >DCACHE_BASE
EQU $1f800000 ;dcache starts here > rset DCACHE_BASE > >dc_MatPtr rw 1 > > >In a .H
file > >extern MATRIX* dc_MatPtr; > >If I look at dc_MatPtr in the watch window, it gets the
correct address in the >dcache but resolves the variable as an unsigned long. I was hoping that
>it would use the extern to resolve the type of the variable. >
```

... does not do what the developer was hoping for because the compiler does not generate any C variable debug info for external variables. If you think about it this is sensible - because that data would be provided by the symbol data in the external module; if this main module defined it too then you'd have two symbol definitions in the symbol file - the one from the external would be the correct one. In this case however the external module is assembler and therefore it does not have any C typing info.

The correct solution is to declare your dcache variables with a piece of C. This gets a bit fiddly because in order to put them at a specific address you need to use a linker control file that specifies the groups. You also need to compile the dcache section separately and rename its sections so they will be distinct from those of the main compilation. Note also that although Psy-Q CPE format is quite happy to allow initialised data in this separately addressed dcache data section, the PSX .EXE file format does not allow this so if you wish to be compatible with PSX .EXE file format you must only put uninitialised data into the dcache section. We can easily tell PSYLINK the dcache size limit and bss restriction by putting that information in the group attributes for the dcache.

It's probably best if I stop woffling at this point and just give you an example; just snip between the lines and paste to the filename detailed at the top of each section. Just execute BUILD.BAT to build it. But before you do that it is important that you note the following:-

1) Note the use of

```
-Wa,sdcache1
```

on the cpsx command line to tell the ASPSX assembler to prepend "dcache1" to all of the section names and put them into a new group called "dcache1" Also note the dcache group definition in MAIN.LNK

2) note that the .LNK file defines the dcache group as having a limited size. The linker will raise an error if you exceed this size

3) You must have the latest PSYLINK (2.31) and ASPSX (2.26) in order to make use of features detailed in 1) above. You can get these from our BBS or FTP site if you don't already have them.

OK, here are the 5 files that make up this small example:-

```
----- FILE: MYTYPES.H ----- typedef struct _matrix { short a; short b;
short c;
short d; short e; short f;
short g; short h; short i;
} matrix;
```

```
----- FILE: DCACHE.C ----- /* this file DCACHE.C defines the vars in
dcache */
```

```
#include "mytypes.h"
matrix* MatPtr; matrix MyMatrix; int testint1; char* testarray1; /* this is OK because it
is uninitialised */
/* char testarray2[]="Test String"; this is *not* OK */
```

```
----- FILE: MAIN.C ----- /* this is a main source file that refers to the
dcache data */
```

```
#include "mytypes.h"
extern matrix* MatPtr; extern matrix MyMatrix;
```

```

int main() {
    MatPtr=&MyMatrix; /* initialise it here cos can't have it already valid */
    MatPtr->a=0; MatPtr->b=1; MatPtr->c=2; MatPtr->d=3; MatPtr->e=4; MatPtr->f=5;
    MatPtr->g=6; MatPtr->h=7; MatPtr->i=8;
}
----- FILE: MAIN.LNK ----- org $80010000
text group bss group bss dcache group org($1F800000),size(1024),bss
section .rdata,text ;sections created by C compiler section .text,text ;specifying them here is
not strictly necessary section .data,text ;but does ensure that they appear in tyhe correct
section .sdata,text ;order in the linked output file
; section .ctors,text ;only needed for C++ ; section .dtors,text ;only needed for C++
section .sbss,bss ;the standard bss sections section .bss,bss
include "main.obj" ;my main program object file(s) include "dcache.obj" ;the dcache object
file
; and now the libraries I want to link to:- inclib "c:\gnumips\lib\libs.n.lib" inclib
"c:\gnumips\lib\libapi.lib" ; inclib "c:\gnumips\lib\libgpu.lib" ;other psx libs as required...
regs pc=__SN_ENTRY_POINT
----- FILE: BUILD.BAT -----
ccpsx -c -g -Wa,sdcache1 dcache.c ccpsx -c -g main.c psylink /c
@main.lnk,main.cpe,main.sym,main.map
----- END OF FILES -----

```

---

2/8/96 10:30 AM  
 Re(6): cpe2x never finishes  
 jeffrey Hall  
 Development Env.

Must variables be assigned to the DCACHE implicitly? I'm not doing anything that I know of to get variables to go there. If that's the case, then the DCACHE is not the problem. Any help on this would be greatly valued.  
 -Jeff Hall-

---

2/8/96 10:49 AM  
 Scratch Pad memory doesn't always work  
 Carl Ferreira  
 Thomas Boyd

I have a situation where I am using the scratch pad memory as follows:  

```

struct ScratchPad { int x, y, z; /* Plus lot of other stuff, less than 200 bytes, though... */ };
register struct ScratchPad *scratch;
scratch = (struct ScratchPad *)getScratchAddr(0);

```

 The above seems to work OK when I compile with -O0 (that's Oh-zero), but when I compile with -O2 some things in the scratch pad do not always get set the same as before.  
 Any ideas?  
 Is this a bug in the compiler? I'm using version 1.17.  
 Carl Ferreira

---

2/8/96 10:31 AM  
 Re: new dev system

Dan Burnash  
Psyq Tools  
David W. Marshall

>Will SCEA be supporting the new PSYQ dev system that runs on a production playstation?  
Not right now. When/if it becomes an officially licensed product, that may change.

Dan Burnash

---

2/12/96 11:35 AM  
Re: CD Burner  
Jose R. Villeta  
Development Env.

Easy CD Software works mighty fine!! jose

---

2/12/96 9:04 AM  
how many registers  
Thomas Boyd  
Psyq Tools

>Martin, >How many register variables can you have in a routine? Currently using 6 (all  
>verified as being in registers). ===== Simple question but unfortunately there's no  
simple answer.

In a simple function you may get as many as 23 register variables. As the function becomes  
more complex (e.g. requires the evaluation of complex expressions or calls other functions) this  
will be reduced, possibly to none at all if the function is complex enough. Genrally 8 is a  
reasonable number.

If you compile with no optimisation ( -O0 ) then the compiler will only put those variables that  
you specify as 'register' into registers. All others are stored on the stack.

If you compile with optimisation ( O1 or more ) then the compiler will store all variables in  
registers that it can. It's not clear whether it will take any notice of the register keyword in this  
case so it may not be worth bothering with anyway.

---

2/14/96 10:08 AM  
libraries  
R.Brett Butler  
Development Env.

does anyone know what libraries the InitHeap and free calls have been defined in, in the last 6  
monthes?

i'm trying to go back to some older libraries and i'm getting InitHeap multiply defined 'libapi.lib'  
free multiply defined 'libapi.lib'

---

2/15/96 8:34 PM  
Re: libraries  
Dan Burnash  
Development Env.

>does anyone know what libraries the >InitHeap and free >calls have been defined in, in the last 6 monthes?

>i'm trying to go back to some older libraries and i'm getting >InitHeap multiply defined 'libapi.lib' >free multiply defined 'libapi.lib'

Try psylib /1 xxxxx.lib for each library, and you can make your own list.

Dan Burnash

---

2/19/96 10:18 AM

linker value error

David Vronay

Psyq Tools

I am also getting a linker error - "value out of range ..." w/ psylink v2.35 from the dos prompt it tells me which library and expression failed w/ psylink v2.35 from cpsx it tells me which file,line #, and expression failed.

I have tried specifying group order. Didn't help.

Does anyone know what causes this error ? How to avoid it ?

P.S. How to pass linker scripts from cpsx is not obvious. Can anyone tell me how to do this, or do I have to engage in yet more forensic engineering?

---

2/19/96 12:57 PM

that linker error

David Vronay

Psyq Tools

OK. Looking further I found a discussion of this sort of linker error on the development environment conference. look at around 07 05 95. this discussion focused on the GP and optimization.I cleaned out my .o and .lib files and recompiled with -G0 ( I have over 100 .o files and over 8 .lib files ). So- I've tried setting the group and section attributes, and tried recompiling with all -G0. No go.

A recent successful linking produced section sizes as follows: rdata 000aff2c text 000401b0 data 001b253 sdata 000001e0 sbss 00000130 bss 0003d79c

Are these sizes somehow related to this problem? Admittedly I am just shooting In the dark here.

---

2/20/96 1:47 PM

debugger memory trap

David W. Marshall

Psyq Tools

Is there any way (or can one be added) to get the debugger/debug stub to generate a "bus error on data reference" or some other error message when memory on the dev system is accessed outside the 2meg area.

I know that the debugger config file has the ReadRam and WriteRam lists. I was hoping to be able to leave these at 8 meg and have the psy-q software look at the \_ramsize to determine the valid memory areas.

thanks,

dave

---

2/20/96 1:57 AM  
Re: that linker error  
Dean M. Grandquist  
Psyq Tools

A recent successful linking produced section sizes as follows: rdata 000aff2c text 000401b0 data 001b253 sdata 000001e0 sbss 00000130 bss 0003d79c  
The sizes are only important if sbss and sdata get very big (>32K), and it should only complain if you are doing -Gn where n>0. I was getting this error when the order was not rdata text data sdata sbss bss  
--DeanG

---

2/21/96 6:42 PM  
GP problem  
Borden Covell II  
Thomas Boyd  
John Brandwood

I've been asking questions about the overlay examples. Today, due to the gracious help I received from Jay Stelly, I was able to get the example code to work. I now understand the basic mechanism.

However, I'm running into a new problem. It has to do with accessing global data. If I have global data defined in an overlaid module, the GP register points to the wrong place in memory at run-time and I wipe out other stuff.

I think I understand that I must declare all truly GLOBAL variables in a module that will be linked into the resident portion of the code. I can have static globals in each overlay. Is this true??

Thanks for all of your help, guys.

---

2/23/96 11:08 AM  
Overlays and the Debugger  
Borden Covell II  
Development Env.

Now that I have overlays working (finally found out about the -G0 option!). I'd like to find out the plans for getting the debugger to handle overlays. As I see it, there are two problems, both due to the fact that the debugger does not know about the loading of an overlay.

The first problem is that a breakpoint set in an overlay is lost when any overlay is loaded. Although I'm not positive, I think that the debugger stores a software interrupt instruction in memory when a breakpoint is set. However, when an overlay is loaded, the memory is overwritten with the overlay's data. The breakpoint is then lost. This may have some serious side effects in the debugger because it has kept a copy of the original instruction and might decide to restore it which would wipe out the new overlay.

The second problem is that the debugger does not know how to relate actual source code to the currently loaded overlay. The debugger gets very confused and will display the wrong source code as I step through an overlay.

Now, what is to be done? If the debugger was notified that an overlay was loaded, it could handle all of these problems. Perhaps there should be a macro (like PCOpen, etc.) that we could put into our overlay manager that would notify the debugger that overlay #X has just been loaded.

Is anyone interested in getting this fixed?? I sure hope so!!



---

2/23/96 4:02 PM

Re(2): Overlays and the Debugger

Borden Covell II

David W. Marshall

Development Env.

Thanks. As it turns out, I got that info from Andy at SN Systems today.

---

2/23/96 12:22 PM

Out of memory, linker aborting

David Vronay

Psyq Tools

We have two of the same machines, with nearly identical software and environments. One works fine, On the other, for the same files, we get:

Error: Out of memory, linker aborting. Total allocated 298432 ... Error 1

Three questions: 1) Out of which memory? low 640, disk, some fixed size internal buffer? 2)

Why fail on the machine that has more low memory, more disk space? mem/c reports that have largest executable program of 543K. Disk space is 111M free on development disk, 15M free on disk with Windows. 3) Is this due to the number of names, size of names, or size of cpe file? 4)

Could this be due to versions of intermediate programs that ccpsx calls?

We use Psylink v 2.35, ccpsx v1.17. The linker is called through ccpsx.

The linker works fine with 2 week earlier version of the program. Earlier we went to a

separate compile and debug prompt because of this out of memory, thinking it was due to the low 640 memory constraint.

Richard Maurer ImaginEngine

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2/23/96 1:23 PM

Re: Overlays and the Debugger

David W. Marshall

Borden Covell II

Development Env.

add a /v to your linker flags. This is the magic linker flag that you need to debug overlays.

dave

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2/27/96 8:25 AM

Re: Debugger Breakpoints?

Thomas Boyd

Carl Ferreira

Psyq Tools

Carl,

You have the coin-op system which requires a replacement ROM to support breakpoints. I will see about getting one for you.

Tom

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2/27/96 8:23 AM

Debugger Breakpoints?

Carl Ferreira

Psyq Tools

I would like to set a breakpoint when a variable is changed. Is this possible?

I have tried Alt-B, but I get the message "Hardware Break requires newer Psy-Q downloader". As far as I know, I'm using the latest version of everything. Is this feature not supported, or am I doing something wrong?

Carl Ferreira

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2/27/96 8:24 AM

The third parameter for hardware breakpoints

Thomas Boyd

Psyq Tools

>My specific question is: is there a way to reference the PC in an optional >expression. What I'd like to do is stop on a write to a certain location but >only if the PC is not in a range of values (which I could specify by and'ing >the PC and checking for the result being not equal to another value).

The expression is a general purpose assembly language expression and can include R3000 registers and labels (such as C function names or global static data). It is \*not\* a C expression (as you've probably noticed, the debugger has two separate expression evaluators) so cannot reference variable values or local data by name. Note register names are specified in \*lower case\* and watch out for register names that may clash with C or assembly language label values in your program - in this case the expression evaluator will return the register value rather than the label address.

If you want to try an expression out first just use the Alt-H calculator facility in assembly language mode (it has a button to switch modes).

an example expression might be:

```
(80010000<pc)&(pc<80020000)
```

logical ops evaluate to 1 if true or zero if false.

You can of course use C labels here instead:-

```
(func1<pc)&(pc<func2)
```

where func1 and func2 are C function names

>A more general question is: could I (and/or "we" - the collective SONY >developers) get a spec of what is allowed in the optional parameter - it is a >very powerful tool (as I mentioned it helped get us as far as we've gotten on >this bug so far) that everyone should know about. We find hardware >breakpointing indispensable and having more power in using them would be even >more helpful.

The Psy-Q tools manual should cover the information you require in the DBUGPSX section about expressions. I have cut the relevant section out and copied it below:-

Expressions At many points in the session, the Debugger will prompt for input - this can often take the form of an expression for evaluation. Expressions in the Debugger follow the same rules as the ASMP5X Assembler (see chapter 3), with the following exceptions:

\* Assembly language expressions may contain processor registers. \* The Debugger assumes a default radix of hexadecimal; to indicate a number is decimal, it is preceded by a # sign. \* Indirect addresses are indicated by square brackets [ ]. \* When the Debugger gets an indirect datum, it assumes a (32 bit) long word; this can be overridden by using the @ sign together with b or w, following the square bracket.

Hopefully that's everything you need to know. Let me know how you get on and if you need anything else.

Don't forget that

1) when using this facility that it's the PC that evaluates the conditional part, not the target. Therefore the target has to stop at the breakpoint, the PC has to notice this, evaluate the conditional expression and then restart the target if the result is false. So if your hardware

breakpoint is triggered often your code may run quite slowly.

2) If using this method (or conditions attached to regular breakpoints) with our Plug in cartridge dev kit for the production Playstation you should use the \*non\* interrupt driven downloader (version 5.09 is current). This is because the normal downloader (5.19) can work without pollhosts in your code - to do this it generates a PIO interrupt whenever the PC tries to contact the target. This is great for general debugging but to speed things up, when the debugger knows it has a conditional expression to evaluate it goes into rapid polling mode and this can generate enough interrupts at the target end to slow your program to a crawl even if the hardware break trap is not being triggered.

- Andy

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2/27/96 8:28 AM

Re(2): Debugger Breakpoints?

Carl Ferreira

Thomas Boyd

Psyq Tools

Tom --

I appreciate that!

By the way, I REALLY need an answer to the ApplyMatrixLV question (and I'm still online).

Carl ===== You have the coin-op system which requires a replacement ROM to support breakpoints. I will see about getting one for you.

---

2/27/96 8:29 AM

Re(3): Debugger Breakpoints?

Thomas Boyd

Carl Ferreira

Psyq Tools

I am reading about it now. I found your ALT-B post first...

T

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3/1/96 6:25 PM

Re: Fast loads in ASMPSX

David Vronay

Alex Hastings

Psyq Tools

Spent several hours investigating and came up with similar results. It takes 5 cycles to read all memory, not just the first one. Important, as CPU time is the major constraint now, with VRAM a close second.

I used the "optimized compile -O3r" which I assumed knew what it was doing, and it put the loads right in a row, even though there were register instructions available it could have put between them.

So Sony, are the docs correct, or is there 150ns ram here?

>>>Does anybody know how to take advantage of the processor's ability to >>>quickly execute a series of loads from main memory? Both the Sony docs and >>>the MIPS docs say that the first load in a series takes five ticks while >>>subsequent loads from the same memory page take only 1 tick. ...

Richard Maurer ImaginEngine

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3/1/96 8:41 PM

Re(2): Fast loads in ASMP5X

Dan Burnash

Psyq Tools

Alex Hastings

Some more info on I was able to dig up on the issue:

Hopefully it will answer more questions then it creates.

---

#### Main memory access

**Buffer memory** The following two types of buffer memory can be found between the CPU and main memory.

**I cache** The I cache (instruction cache) is used for reading instructions. The cache is divided into "lines" which are 16 bytes in length and correspond to four instruction words. Each line is assigned a 12-bit address and has an associated "tag" field that is used for cache management. The tag contains a "history" record that indicates whether or not an instruction is valid in the target line. The tag also saves the high order 20 bits of the effective address of the instructions that are valid in the line. When the CPU attempts to read an instruction at some effective memory address, it first checks the I cache to see if the instruction is present. It does this by checking the tag corresponding to the line at the same address as the low order 12 bits of the memory address, to see if it is valid. By matching the high order 20 bits of the effective address with those of the tag, the CPU then determines if the line contains the desired instruction. If the desired instruction is present, the CPU reads the instruction from the line in the I cache. This operation requires one clock cycle. If the desired instruction is not present in the line, the CPU reads instruction data into the line from main memory, then reads the target instruction from the line. When the instruction data is not present in the I cache, it can take from four to seven clock cycles to read the instructions into the line. Once the line is valid, it takes only one clock cycle to read from the line to the CPU. If the instruction address is not a multiple of 16 (i.e. not aligned on a line boundary) but is located somewhere in the line, the CPU does not read any earlier instructions at the beginning of the line as they are not likely to be executable.

**R buffer** The "R buffer" used for reading data consists of a single four-byte register. It takes four clock cycles to read from memory to the R buffer and one clock cycle to read from the R buffer to the CPU. Therefore, total latency for a data read is 5 clock cycles. The R buffer cannot be accessed in bytes or halfwords. The number of clock cycles that would be required for reading a word of data that is accessed in bytes or halfwords is the read instruction latency multiplied by five.

**W buffer** The W buffer is used for writing data. This buffer is a FIFO that consists of four 4-byte registers. Each register has a status flag that can be set as "free" or "not free." One register is used for each instruction write regardless of data length (byte, word, etc.). If there are no free registers when writing data, the CPU writes (to main memory) the contents of the register that was written to first in order to free the register. Then, the data is written to this free register. Each write operation to the W buffer requires one clock cycle. Therefore, data can be written out without having to wait for the CPU to finish writing to main memory. The CPU also frees the registers by writing the contents of the W buffer to main memory when it does not interfere with instruction execution. The timing of these write operations cannot be software controlled. When executing an instruction that causes data to be read from the address where the data in the W buffer will be written to, the write operation is executed first in order to avoid reading the wrong data. Although write operation timing is not generally guaranteed, it is possible to guarantee the completion of the write by issuing a read to the same address for which the write has been issued. Writing from the CPU memory to the W buffer requires one clock cycle per write operation, while writing from the W buffer to main memory requires four cycles per write operation. The W buffer cannot be accessed in bytes or halfwords. The number of clock cycles that would be required for writing a word of data as a byte or halfword is the write instruction latency multiplied by five.

**Page crossing** During successive read operations via the I cache, the first read operation to fill the line requires four clock cycles, but subsequent read operations require only one clock cycle.

Main memory is divided into 1-KByte sections called "pages." During a series of read operations, if the second or subsequent read crosses a page boundary, the first read after the page boundary will again require four clock cycles. If an entire series of writes is within the same page, only the first write in the series requires four clock cycles while all others require two clock cycles.

> [Kernel / PSX Hardware] >> - What speed is the D-cache in comparison to main RAM at writing data ? >> - What speed is the D-cache in comparison to main RAM at reading data ? >>  
> Thank you for your help. >> Allan. >

Dear Allan,

I must invert the question order, because the timing of data-writing in R3000 is not stable.

> - What speed is the D-cache in comparison to main RAM at reading data ?

Five times faster. It takes one CPU cycle to read from D-cache, and it takes five CPU cycles to read from main RAM.

> - What speed is the D-cache in comparison to main RAM at writing data ?

It takes one CPU cycle to write to D-cache from general registers. Writing to main RAM is the most complicated part of R3000 CPU. I should say that only GOD knows the exact number of cycles for writing data to main RAM!

R3000 CPU has "Write-buffer" between registers and main RAM. W-buffer is four step 32bit length fifo. It takes one cycle to write to W-buffer. But if there are no free register on W-buffer, CPU must flush W-buffer, write ALL the data on W-buffer to main RAM.

It takes one or four cycles to write a data on W-buffer to main RAM. If two or more write operations are done continuously, the first operation takes four cycles and the second and later operations take only one cycle.

And main RAM has 1KByte "pages". Any write operation on new page takes four cycles. And programmer cannot control or detect the W-buffer flush timing, and cannot know the status of it. R3000 has Bus-Snoop-Mechanism and I-cache. You cannot predict the start of flushing of W-buffer, even if you know the complete assembler codes.

So if you have good luck, it takes only one cycle to finish one store instruction. For the worst case, I can say nothing.

As the result, I can only say that writing to main RAM is VERY slower than writing to D-cache, and probably writing to main RAM is faster than reading from main RAM.

Best Regards,

\*\*\*\*\* okamoto \*\*\*\*\*

PS Each step of W-buffer is assigned to one store instruction. So if four Store-Byte-Instructions are executed, W-buffer becomes full.

---

3/6/96 7:24 PM

Problem with new patchw

John Harris

Development Env.

I just received and installed a new release of the developer tools CD (1.5 DTL-S2002), and the patchw and snpatchw patches don't seem to be working with the CD emulator. The patches work okay under SELCD, but if SELEMU is active, then loading the patch will lock out the CD emu drive. CDMON shows that it is trying to "SEEK 1 0 0 0 13 0 1 61".

I backed up my previous PSX directory, and installed everything fresh, but I guess I've got the wrong version of something somewhere. Any hints?

Thanks, John Harris Tachyon Studios

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3/6/96 11:42 AM

printf() stopped working ??  
Dave R. Scheele  
Development Env.

I've noticed that printf() has suddenly stopped working in my program. I've been using it now and then to dump out variables or other messages to myself. I use it in conjunction with Mess1 and testmess to dump the stream to my pc screen. I've been keeping up with all the releases posted here ... did one of them break printf? Does anyone have any ideas?  
Dave

---

3/6/96 9:56 PM  
Re: Problem with new patchw  
Dan Burnash  
Development Env.  
John Harris

Use SNPATCH.CPE, the one you already had. It works with all of the new stuff, and doesn't break the emulator.  
We know of the problem with snpatchw and patchw, but SN Systems and SCE each do part of the program, which makes it near to impossible to get it fixed.  
Dan Burnash

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3/6/96 2:58 PM  
Section order in CPE  
Kendall S. Harrison  
Psyq Tools

Is there any way in which the order of sections in a PSX program can be changed? The order always seems to be as shown in the following map file segment:  
Start Stop Length Section name 80010000 80011A97 00001A98 .rdata 80011A98 8005C10F  
0004A678 .text 8005C110 8005E24B 0000213C .data 8005E24C 8005E347 000000FC .sdata  
8005E348 8005E377 00000030 .sbss 8005E378 800AF27B 00050F04 .bss 800AF27C 800AF9AB  
00000730 code 800AF9AC 800AFABD 00000112 data1 800AFAC0 800B105D 0000159E hmm  
Is there a way that the .text and code sections could be made contiguous so that the large .bss section does not get included in the cpe file for example? Or, could the .text section be forced to be at the end say?  
Thanks in advance, Kendall

---

3/6/96 9:59 PM  
Re: printf() stopped working ??  
Dan Burnash  
Development Env.  
Dave R. Scheele

Don't run selemu or selcd after loading snpatch, as that causes strange results, including losing printf's.  
If that doesn't help, let me know what versions of all of the software you are using.  
Dan Burnash

---

3/7/96 5:07 PM

Re: Compiler/Linker problem

Kendall S. Harrison

Chris E. Reese

Psyq Tools

> When in the debugger I place a breakpoint the source line that ends up being >highlighted is several lines down and not the one I am currently looking at.

This happens if you've compiled using the -g and -O (or -O2 or -O3) options together. Try not using -O and the debugger should then behave properly, and when its all debugged you can put the -O back in again.

Kendall

---

3/7/96 3:37 PM

Compiler/Linker problem

Chris E. Reese

Psyq Tools

I have run into a fairly annoying problem that seems to be generated by either the compiler or linker. It seems that the source code lines no longer match up with the output from the compiler. When in the debugger I place a breakpoint the source line that ends up being highlighted is several lines down and not the one I am currently looking at. I know this isn't a debugger problem because my ASSERT failures will print line numbers that do not match the source code. It doesn't seem to be related to file size for the source modules that are not working, because I have some that are fairly large and ones that are very small. Has anyone else run into this problem?

Chris Reese Eidetic, Inc.

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3/14/96 7:20 PM

Resetsps problem

John Harris

Development Env.

I just switched to a new host PC, and I'm having trouble communicating with the boards (which were working on my previous system). I installed everything with the same settings and programs.

The "resetsps 1" command takes almost 11 seconds to return. The CD emu drive blips about a second after the comand is entered, and then there is a long pause before it finally returns "done." All subsequent commands give "cannot connect to target".

If I cold boot the system, I can send run commands to the boards, although they don't appear to execute. Once I resetsps however, run commands can no longer connect.

Any suggestions appreciated.

John Harris Tachyon Studios, Inc.

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3/15/96 11:17 AM

Re: Resetsps problem

Mike Fulton

Development Env.

It's really just a shot in the dark, John, but if you changed to a new system that was faster (like going from a 486 to a fast Pentium) then maybe changing your ISA bus speed will make a difference. You can usually do this somewhere in your BIOS setup.

I would suggest you try it and see if there are any settings that work better. Let me know what happens.

Mike

---

3/15/96 11:31 AM  
Re: Resetps problem  
John Harris  
Development Env.

I am up and running again. The new system had dual IDE ports, and used IRQ 15 which is where my CD emu board was configured. Thanks Rob and Mike for your suggestions.  
John Harris Tachyon Studios, Inc.

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3/18/96 12:55 PM  
PSX Debugger  
player 1  
Development Env.

I don't know if this is the right place to post this question, but I will anyway. Has anyone gotten the Windows 95 debugger from SN systems to work correctly? If not, has anyone figured out a way to make the debugger not lose track of the program counter? I keep running code and I have a random crash, yet the debugger just gets a timeout. Will setting the interrupt on the debugger fix this? I have a pollhost on almost every other line at this point and DBUGPSX still doesn't know what the hell is going on in my code.  
Tom Ketola PSX Lead Engineer Player 1, Inc.

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3/19/96 7:20 PM  
Re: Section order in CPE  
Michael Koziniak  
Kendall S. Harrison  
Psyq Tools

>Is there a way that the .text and code sections could be made contiguous so that the >large .bss section does not get included in the cpe file for example? Or, could the .text >section be forced to be at the end say ?

I have sound that if you change the order of the sections in the link file your sections will end up in different places. I have two questions. One why would you want to discard the bss file since that has your global data. Two, what advantage would this gain?

---

3/20/96 12:36 PM  
Disappearing #readram0 ranges  
David Vronay  
Psyq Tools

I set up my readram0 and writeram0 ranges as below, then used a hex window to change values at 1f800000. The new value prints momentarily and is replaced by 00. Then the debugger writes out a new dbugpsx.c05 with my 1f8 ranges removed. This is in both v4.82 and 4.86. Any suggestions? Thank you, Richard Maurer @ImaginEngine



P.S. Separate problem. When use source-file path, the correct file is shown, but it says insufficient data when I try to put a breakpoint anywhere. Yet I can put a breakpoint if I ask for the file with the full path name. Is this a bug or am I doing something wrong here?

#version 4.86 #source-file path

```
r:\base\eng\jas;r:\base\eng;r:\base\eng\hae;r:\pub\jas;r:\pub #readram0 00000000
007FFFFFFF 1F800000 1F8003FF 80000000 807FFFFFFF A0000000 A07FFFFFFF BFC00000 BFC0FFFF
#writeram0 00000000 007FFFFFFF 1F800000 1F8003FF 80000000 807FFFFFFF A0000000
A07FFFFFFF
```

---

3/20/96 12:51 PM

Re: Out of memory, linker aborting

Michael Koziniak

David Vronay

Psyq Tools

>We have two of the same machines, with nearly identical software and environments. One >works fine, On the other, for the same files, we get: > >Error: Out of memory, linker aborting. >Total allocated 298432 > ... Error 1 > >Three questions: >1) Out of which memory? low 640, disk, some fixed size internal buffer? >2) Why fail on the machine that has more low memory, more disk space? mem/c reports that >have largest executable program of 543K. Disk space is 111M free on development disk, 15M >free on disk with Windows. >3) Is this due to the number of names, size of names, or size of cpe file? >4) Could this be due to versions of intermediate programs that ccpsx calls? > >We use Psylink v 2.35, ccpsx v1.17. The linker is called through ccpsx.

Version 2.xx on uses a flat memory model so whatever memory is available will get used. How much memory is on your PC?

Michael

---

3/22/96 2:39 PM

Re(3): printf() stopped working ??

Dan Burnash

Development Env.

Dave R. Scheele

>Another interesting note -- I'm also trying to put sound into my game, and I've found out the sound is >not working either. It used to work fine, and again, I can't say when it stopped working 'cuz the last >time I ran the Balls demo was months ago (probably before I installed the CD emulator, though ....)

This is typical behavior when the blue terminator or black external cd rom drive is not connected to dev board set. It may also kill your printf's, I don't know, but it wouldn't surprise me at all.

Dan Burnash

---

3/28/96 10:57 AM

Re(4): printf() stopped working ??

Dave R. Scheele

Dan Burnash

Development Env.

>> Another interesting note -- I'm also trying to put sound into >> my game, and I've found out the sound is not working either

> This is typical behavior when the blue terminator or black > external cd rom drive is not connected to dev board set. > It may also kill your printf's, I don't know, but it wouldn't > surprise me at all.

Thank you, that was the problem with the sound -- I had thought that when you put in the CD emulator, you didn't need the blue plug anymore and had to take it out. Don't ask me where I got that impression from, though!! ;)

Unfortunately, the printf's are still not working. I'm working around it now by using PCwrite, but if you come across anything that will make them work again, it'd be nice! By the way, ALL printf's are not working, including the status message from ResetGraph() that was so nicely explained at the Dev Con (thanks! it wasn't that useful to me, but satisfied my curiosity!).

Dave

---

3/28/96 6:05 PM

Re(5): printf() stopped working ??

Dan Burnash

Development Env.

Dave R. Scheele

Check out your batch file to load/run your program, if you use one. If you are using selemu or selcd, make sure that this is done before you load your program. e.g.

```
run selemu resetps 1 run snpatch run foo
```

NOT

```
resetps 1 run snpatch run selemu run foo
```

Hopefully it will be that simple. If not, let me know what you are running, and in what order.

Dan Burnash

---

4/1/96 5:54 PM

Linker Error

Borden Covell II

Development Env.

We are getting an error message from the linker that we don;t understand. It only happens when we use overlays and seems to depend on the size of one of the objects (not the one referred to in the error message). The error is:

```
W:\PSX_CMN\XXX.C(246) : Error : Value (00008018) out of range in instruction patch  
(expression involves: .sbss ) W:\PSX_CMN\XXX.C(257) : Error : Value (00008004) out of range  
in instruction patch (expression involves: .sbss )
```

Line 246 in XXX.C is a comment!

When we remove one line of code from a module the error goes away. It seems to be that a negative 16 bit numbe is being used somewhere and this is causing an error.

Has anyone seen this? What exactly does the error mean. Any help is appreciated, as always!

Thanks.

---

4/3/96 12:17 PM

Re: Linker Error

David Vronay

Borden Covell II

Development Env.

You have probably seen the Re: that linker error sent by Grandquist. It sounds like you are going over 32K. If using -G0 makes the problem go away, then thats probably it.  
Richard Maurer @ImaginEngine

---

4/4/96 12:30 AM  
Notably odd problems...  
Steven Stadnicki  
Psyq Tools

Greetings, We've noticed some 'interesting' pointer problems (or that's what we guess they are) with the psymake program. Specifically it'll fail to recognize files to be recompiled SOMETIMES, depending on the programs you've run beforehand. Sometimes it'll just spam errors... Most of the time it works, but it's still annoying occasionally to have to stop, step back and try and make sure it's not a 'Make' problem first.

On a side note, we're having an odd problem compiling both .C and .CPP files in the same directory using psymake. It seems that it only recognizes the first compilation rule it finds... This has been extremely annoying as we've had to seperate modules which work together, solely because the 'Make' can't handle it.

We're considering using other Make programs... Can anyone say how their luck has been...?

--

Morgan/Steve

---

4/5/96 9:34 AM  
Overlays, and Libraries  
Jason G. Andersen  
Psyq Tools

What is the official way to take a sony library, and place it in an overlay group aside from main? Is there a tool available to that can patch the OBJ Modules, or a way to override the compile time setting?

Thanks in advance,  
Jason Andersen

---

4/6/96 7:40 PM  
Debugger for windows  
Dave Elton  
Development Env.

I saw someone was using a windows version PSX debugger before, the layout is a little different from the DOS one I am using. Does anybody know where I can find it ? Is it a SONY support tool or 3rd party tool?

Simon ReadySoft Inc.

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4/8/96 12:31 PM  
Re: Notably odd problems...  
david eader  
Steven Stadnicki

Psyq Tools

Greetings, We've noticed some 'interesting' pointer problems (or that's what we guess they are) with the psymake program. Specifically it'll fail to recognize files to be recompiled SOMETIMES, depending on the programs you've run beforehand. Sometimes it'll just spam errors... Most of the time it works, but it's still annoying occasionally to have to stop, step back and try and make sure it's not a 'Make' problem first.

On a side note, we're having an odd problem compiling both .C and .CPP files in the same directory using psymake. It seems that it only recognizes the first compilation rule it finds... This has been extremely annoying as we've had to separate modules which work together, solely because the 'Make' can't handle it.

We're considering using other Make programs... Can anyone say how their luck has been...?

--

Morgan/Steve ----- Psymake is a loser. It was one of the very first things we got rid of. Almost anything you try would be better. We've been using gnu make. Its ok. It has really powerful pattern matching, rules, and filename wildcard expansion. We use those features to generate our linker command files automagically. The downside is that, being a child of unix, all the slashes go the wrong way. Plus, the colon is used as the rules seperator, which dos uses for volume names. So we ONLY use rules to relate file in the current directory (no full paths in rules). (We cd to different dirs and build each lib in its own dir).

I've heard good things about opus make, and would guess many other dos-based makes handle file paths much better. I've worked with (been screwed by) so many flavors of make that I don't even bother trying to use all the nifty features provided by any particular implementation. (Like they say, KISS - Keep It Simple, Stupid).

deader

P.S. BeginFlame(); White-space grammars just plain suck. Stu Feldman is an idiot, in my humble opinion. EndFlame();

---

4/8/96 1:50 PM

Re(2): Debugger for windows

Dave Elton

player 1

Development Env.

Thanks!

Simon

---

4/8/96 12:00 PM

Re: Overlays, and Libraries

Mike Fulton

Jason G. Andersen

Psyq Tools

What is the official way to take a sony library, and place it in an overlay group aside from main?

Is there a tool available to that can patch the OBJ Modules, or a way to override the compile time setting?

We've been looking into your question, and so far we haven't come up with any easy way of placing a library into a different group.

The only non-easy way that comes to mind is to build your overlay separately from the main module, using its own specific link file, but then you have to manually deal with all the problems involved in resolving external references to your main module.

I presume that your motivation is that you have certain libraries which are used only with

certain overlays, and you want to avoid having these libraries loaded all the time, even when not required. At least that's the only thing that comes to mind.

I've asked some other people about this, so I'll let you know what response I get.

Mikeere is no "official" way to do what you are wanting, but there may be a method that will accomplish the desired results.

---

4/8/96 11:59 AM

Re: Debugger for windows  
player 1  
Development Env.

It is actually a Windows 95 debugger, don't think there's a regular windows version available, and you can get it from psy-q by contacting them at support@snsys.com I think. Just tell 'em you want the Win 95 playstation debugger.

Tom Ketola Player 1,Inc.

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4/9/96 5:25 PM

Re: Notably odd problems...  
Mike Fulton  
Development Env.

Can you post your MAKEFILE so I can take a look at it?

Mike @ SCEA

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4/9/96 5:27 PM

Re: Debugger for windows  
Mike Fulton  
Development Env.

The Psy-Q Debugger for Windows 95 is available from SN Systems, but it is not officially supported by SCEA.

Mike @ SCEA

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4/11/96 11:50 PM

Fwd: Re(6): CPE2X going mental  
John Phua  
Dan Burnash

Well, is anyone looking into this issue? We have to get something ready for E3, and Sony wants us to give them a demo of it by the end of this week. I have just run into this problem myself. Performance isn't acceptable if I move the vars out of the dcache to make cpe2x happy! Has anyone found a workaround for this problem? It seems as if this issue has gone unresolved for almost a month now. Surely other developers have run into this problem by now? Any help would be much appreciated!

---

4/11/96 11:50 PM

Fwd: Re(5): CPE2X going mental

John Phua  
Development Env.

Hello Dan, Have you gotten CPE2X fixed yet? I really need a workaround soon as E3 is coming up :( Also, Sony has requested that we send them a demo by the end of this week (well, I guess that won't be happening) so that they can show it at their booth. If you know of a way around this (it only happens when I have something linked into the DCACHE area) I would really appreciate it!

---

4/14/96 11:25 AM  
Command Line Limits / Makefile problems in PSYMAKE...  
David R. Black  
Development Env.

Does anyone have some suggestions on how to get around the command line length restriction when using Psymake with larger projects? Currently, two projects I am working on have too many source files to successfully compile and link properly. For example, here is one of my current makefiles: ----- MAKEFILE.MAK ----- OBJ =ps.obj pdb.obj pst.obj

```
pme.obj pmui.obj pf.obj pmd.obj
all: $(OBJ) ccpsx -O3 -Xo$80010000 main.c $(OBJ) -oppsh.cpe,ppsh.sym,ppsh.map
cpe2x /CA ppsh.cpe del ppshell.exe ren ppsh.exe ppshell.exe
ps.obj : ps.c ccpsx -O3 -c ps.c
pdb.obj : pdb.c ccpsx -O3 -c pdb.c
pst.obj : pst.c ccpsx -O3 -c pst.c
pme.obj : pme.c ccpsx -O3 -c pme.c
pmui.obj : pmui.c ccpsx -O3 -c pmui.c
pf.obj : pf.c ccpsx -O3 -c pf.c
pmd.obj : pmd.c ccpsx -O3 -c pmd.c -----
```

If I try and make any of my source filenames any longer (e.g. rename pst.c to pstream.c), or try and add another source file, CCPSX blows up when compiling and linking everything to main.c. The problem appears to be that the command line passes to CCPSX is too long for it to process properly. Ultimately, I need to split two of my source files into multiple smaller source files, and add 2 or 3 more source files beyond that.

I never was that great at writing creative makefiles, so might anyone have some suggestions on this problem?

Thanks.  
David R. Black Senior Programmer Presto Studios, Inc.

---

4/15/96 4:05 PM  
Re: Command Line Limits / Makefile problems in PSYMAKE...  
Mike Fulton  
Development Env.

The CCPSX program can accept a command input file, specified on the commandline by adding "@" in front of the filename. For example:

```
ccpsx @ccopts.txt test.c
```

Will place whatever is found in "ccopts.txt" into the commandline before "test.c". You can use this at the beginning of the commandline to list a long set of options. This is especially useful when you have a lot of options or macro definitions (i.e. something like -Dsomething=1).

You can also use it to specify a list of source code, object code, or library files to be included.

Plus, any white space or cr/lf in the file is ignored, so you can place each option or filename on separate lines if you find that easier to read.

This command input file feature `_is_` listed in the manual, but it's easily overlooked. Check out page 12 of the "Psy-Q Development Environment" book.

Besides that, there are other things you can do to shorten your MAKEFILE and make it easier to maintain. For one thing, your sample MAKEFILE has a separate listing and build rule for each source code file. It's far easier to make a generic rule that be used for all files with a particular extension. For example:

```
.c.obj: $(CC) $(COPTS) -c $*.c
CC = ccpsx COPTS = -g -comments-c++ -O -Xo$80040000
OBJ = poly.obj render.obj dumpinfo.obj
poly.cpe: $(OBJ) ccpsx $(COPTS) $(OBJ) -opoly.cpe,poly.sym,poly.map
```

In this example, the rule at the top will be used to build ".obj" files if there is a ".c" file that is newer. So if "dumpinfo.c" is updated, it will know it needs to run CCPSX to create dumpinfo.obj, which is part of the dependencies for the main target (poly.cpe). The nice thing here is, provided that your source code all uses the same options, you can use the same rule for everything. But if you do need to define a custom rule for a particular file, you can still do that. The overall result is smaller, easier to read MAKEFILES.

Mike @ SCEA

---

4/15/96 11:17 AM

Re: Command Line Limits / Makefile problems in PSYMAKE...

David Vronay

Development Env.

Replace the \$(OBJ) with @file.lnk

and put the list of the obj files in this file ( I put them on separate lines ).

The use of this indirect file is in a manual, the one with ccpsx and assembler stuff.

Richard @ImaginEngine

---

4/17/96 11:19 PM

Re: Overlays, and Libraries

Dean M. Grandquist

Jason G. Andersen

Development Env.

PREFSECT.EXE 12K

Development Env.

Here is a tool from the snsystems ftp site that will do just this.

--DeanG

----- What is the official way to take a sony library, and place it in an overlay group aside from main? Is there a tool available to that can patch the OBJ Modules, or a way to override the compile time setting?

---

4/18/96 8:41 PM

Re(2): Overlays, and Libraries

Jason G. Andersen

Dean M. Grandquist

Development Env.

Thank you very much for this utility, it does solve my problems.  
Jason

---

4/19/96 8:36 AM

Re(2): Command Line Limits / Makefile problems in PSYMAKE...  
David R. Black  
Development Env.

Thanks for the suggestions. I should have read the PsyQ environment book more carefully.  
David R. Black Senior Programmer Presto Studios, Inc.

---

4/20/96 8:31 PM

DEXBIOS +windows95 = problem?  
Dylan Cuthbert  
Development Env.

Hi there

I am using DEXBIOS in my autoexec.bat for Windows 95 (I can't load it individually for each shell because I am using the CRISP editor which creates a new shell for each compile and then closes it and I need DEXBIOS to be running after it's finished compiling in order to debug or use the PC load routines etc).

Anyway, when DEXBIOS is in the autoexec my SCSI card reports an error and I can't use my CD... oh, and my cursors stop animating(!). Does anyone have any ideas? I have changed the IRQ, IO port and DMA channel on the dev. kit several times and it doesn't make any difference so it can't be the hardware clashing. (the dev. kit has the CD-ROM emulator attachment)  
Dylan Cuthbert Senior Programmer Sony Interactive Studios of America.

---

4/22/96 11:39 AM

Re(2): DEXBIOS +windows95 = problem?  
Dylan Cuthbert  
Development Env.

Mike Fulton writes: Well, it sounds like you almost certainly have a hardware conflict of some type, even if you have switched around things several times. It may be hard to find, but I bet it's there.

hmm.. I'll try \*once\* more... is anyone developing a 32 bit or win95 compatible driver to replace DEXBIOS? It can't be that hard surely?

If you're using a newer Pentium system that has I/O built into the motherboard, then you need to be extra careful in examining the BIOS settings to determine what resources are being used.

It's a Pentium 166 so I'll also have a play with the BIOS settings.

The fact that you're getting an error with your SCSI card indicates you may have an I/O address conflict in addition to whatever problem there may be with interrupts. I suggest using address 1340 for your dev board, as this is unlikely to conflict with other hardware.

I only get the error when DEXBIOS is running and it might be because Windows disables some things when it detects DEXBIOS? Maybe some of the things that are disabled are required by the SCSI driver?

----

May I suggest you simply run a separate copy of the shell for the purpose of running the debugger and/or executing programs? You can run DEXBIOS in that shell, and not in the other ones. The only problem with this is that you cannot both compile & download in the same



MAKE or batch file, which may be more inconvenient, but otherwise it may work better. I'd prefer to survive without animating cursors and a CDROM than not have a quick compile-download cycle.

Dyl

---

4/22/96 11:19 AM

Re: DEXBIOS +windows95 = problem?

Mike Fulton

Development Env.

Well, it sounds like you almost certainly have a hardware conflict of some type, even if you have switched around things several times. It may be hard to find, but I bet it's there.

If you're using a newer Pentium system that has I/O built into the motherboard, then you need to be extra careful in examining the BIOS settings to determine what resources are being used. Try booting in SAFE mode and then run the MSD utility (open a DOS prompt then run "msd"). This is the Microsoft Diagnostic tool and it can tell you what your interrupts and i/o address stuff is. Keep in mind that it won't know about the interrupt for any hardware that doesn't have a recognizable driver installed, so it won't see your dev board. But you should be able to find an empty interrupt slot.

The fact that you're getting an error with your SCSI card indicates you may have an I/O address conflict in addition to whatever problem there may be with interrupts. I suggest using address 1340 for your dev board, as this is unlikely to conflict with other hardware.

----

May I suggest you simply run a separate copy of the shell for the purpose of running the debugger and/or executing programs? You can run DEXBIOS in that shell, and not in the other ones. The only problem with this is that you cannot both compile & download in the same MAKE or batch file, which may be more inconvenient, but otherwise it may work better.

Mike @ SCEA

---

4/23/96 12:46 PM

Re(3): DEXBIOS +windows95 = problem?

Mike Fulton

Development Env.

hmm.. I'll try \*once\* more... is anyone developing a 32 bit or win95 compatible driver to replace DEXBIOS? It can't be that hard surely?

While a native Win95 driver to replace DEXBIOS would be nice, it's not going to do anything at all to fix a hardware conflict. At most, it might make it easier to find what the conflict is.

The thing a lot of people don't consider about hardware conflicts is that the real problem is that you have more than one piece of software responding to the same interrupt or reading/writing data to the same I/O address. Very often hardware conflicts go unnoticed because there is no driver installed for one device or the other. An example is having both a soundcard and a printer port on IRQ 5 or 7. This often doesn't hurt anything because you normally don't have to worry too much about interrupts from the printer port, and there isn't usually a driver installed to handle them anyway.

The reason it looks like DEXBIOS is causing the problems is because when you load it, it has to compete with some other software driver that is trying to access the same hardware resources. But the problem isn't DEXBIOS, it's the conflict.

Also, don't rule out the possibility of a three-way conflict. You may change something and

make it a two-way conflict, but then when the trouble doesn't go away you think you still haven't found the problem.

I only get the error when DEXBIOS is running and it might be because Windows disables some things when it detects DEXBIOS? Maybe some of the things that are disabled are required by the SCSI driver?

It sounds to me like the conflict is probably with your SCSI card. What are your hardware settings for the DTL-H2000 cards and for your SCSI card?

Mike

---

4/23/96 2:57 PM

Re(5): DEXBIOS +windows95 = problem?

Mike Fulton

Development Env.

Why, also, would my cursors cease to animate?

Another possibility which I am usually not real quick to suggest is that you may have a virus. I usually hesitate to mention this because it really doesn't turn out to be the case that often, but I recently cleared one out of my home system and several little bits of odd behaviour that I wouldn't have attributed to a virus just went away completely.

Mike

---

4/23/96 1:51 PM

Re(4): DEXBIOS +windows95 = problem?

Dylan Cuthbert

Development Env.

The thing is, I have changed my IRQ to each of the free IRQs available on my machine and it hasn't made a difference (I've checked which IRQs are in use via the system->properties section in win95).

I've also set the board address to these, and I've tried combinations of this and above too.

Why, also, would my cursors cease to animate?

Dyl

---

4/24/96 9:47 AM

limit to size of overlays ???

Borden Covell II

Development Env.

Is there a 32k limit to the size of an overlay? As soon as our overlays got to be bigger than 32k we started getting linker errors (invalid patch value or something like that).

Is there a way to compiler or link that removes this limitation????

---

4/24/96 6:11 PM

Re(6): DEXBIOS +windows95 = problem?

Dylan Cuthbert

Development Env.

Mike Fulton writes: Another possibility which I am usually not real quick to suggest is that you may have a virus. I usually hesitate to mention this because it really doesn't turn out to be the case that often, but I recently cleared one out of my home system and several little bits of odd behaviour that I wouldn't have attributed to a virus just went away completely. It's a brand spanking new P166 so I doubt that - also, I have the latest Norton Virusscan installed on the machine. The problems only occur when DEXBIOS is run... I have installed different versions of DEXBIOS too but all to no avail.  
Dyl

---

4/25/96 10:09 AM  
Re(7): DEXBIOS +windows95 = problem?  
Jose R. Villeta  
Development Env.

If you want a sure thing, do not load DEXBIOS on your autoexec.bat, but add it to a DOS window shell on startup batch file entry. This is currently working at Black Ops without any problems. Make sure you are not sharing the IRQ with any other device because you might get slow TESTMESS and poor performance.  
Jose Black Ops

---

4/30/96 11:30 AM  
Re: reset without vram clear?  
Dan Burnash  
Development Env.

If the previous program terminates, you should be able to load the vram viewer into memory without resetting the system.  
Dan Burnash

---

4/30/96 12:27 AM  
reset without vram clear?  
Kirk Bender  
Development Env.

Is there a way to reset the DTL boards without clearing vram and putting up the color bars? I want to run the screen program and examine vram after a program crashes. thanks.

---

5/1/96 5:54 PM  
Re(2): reset without vram clear?  
Dave S. Akers  
Development Env.

I have found that if you exit your program with a return statement, then vram is not cleared (unfortunately, callbacks are not reset either, so this can cause lots of problems if you use callbacks). If you exit your program with exit(0), the everything seems to exit cleanly, but a portion of the vram is cleared and replaced with color bars.

- Dave

---

5/8/96 11:25 AM  
Direct Access to the Artist Board?  
John L. Walsh  
Development Env.

Hi,

I am currently writing a tool to allow our artists to view their 3d objects/data. I know it is possible for me to convert to the RSD/PLY/MAT/GRP/TIM files, but I was wondering if I could instead access the art board directly and dump my data in.. Are there documents describing this? or is it confidential? For us currently, it is easier/cheaper to use the art boards instead of setting up each artist with a programmer station.

thanks in advance,  
John Walsh

---

5/10/96 12:16 PM  
Re: limit to size of overlays ???  
Rob Vawter  
Borden Covell II  
Development Env.

Q:Is there a 32k limit to the size of an overlay? As soon as our overlays got to be bigger than 32k we started getting linker errors (invalid patch value or something like that).

Is there a way to compiler or link that removes this limitation????

A:(from Martin at SN Systems) This error normally occurs when code is compiled using the gp register optimisation but the variables end up in a section other than .sbss or .sdata. In order to avoid this compile overlays with the -G0 option and make sure that the main program does not try to access any variables in the overlay with gp register optimisation.

---

5/14/96 3:07 PM  
Re(8): DEXBIOS +windows95 = problem?  
Dylan Cuthbert  
Development Env.

I just got all the windows 95 Psy-Q debugger and filesaver software set up. It's too cool I'm afraid so everyone should try and get into their beta scheme for it - the more bug reports the better in my opinion.

I just love having a scrolling backlogged window with all my 'printf's in it... that and an easy to use source level debugger... what more could a programmer want?

Dylan Cuthbert Senior Programmer Sony Interactive Studios of America

---

5/14/96 7:36 PM  
CodeWarrior development environment  
Dave Howell  
Development Env.

Well, Metrowerks has announced that their latest Mac-based CodeWarrior IDE ships with a compiler and debugger plug-in for all MIPS processors, including R3000. Since rumor has it that there is a PCI-based development card in the works, is there even a bat's chance in hell that we will see a Macintosh-based PSX development system?

Dave Howell Pablo Media

---

5/15/96 10:52 AM

Re: CodeWarrior development environment

John Phua

Development Env.

Hi Dave,

We are developing a PCI based board as mentioned at our Developers Conference. At this time we are focusing on a PC based tool set. However, we are looking at all our options.

Thanks, John

---

5/16/96 3:18 PM

Excruciatingly slow debugger

Scott Osborn

Development Env.

Help, molasses has gotten into my P133! The debugger runs extremely slowly: Last night, it took 25 minutes to reach the break point I was interested in.

NOTICE that the slowdown is related to the dev station's IO: All printf()s and file IO bring the program to it's knees. I've tried: No interrupts vs Use interrupts, lots o' pollhost()s vs very few pollhost()s, New boards vs old boards, external (SCSI) hard drives vs internal (non-SCSI) hard drives.

In advance, thanks for any and all suggestions.

Scott Osborn

---

5/20/96 9:58 AM

Re: Excruciatingly slow debugger

Jay Stelly

Development Env.

Your IRQ is set wrong on the board. We've had this problem several times. You'll need to free up an IRQ and set it on the board and in your DEXBIOS line.

Jay Stelly Tetragon

---

5/20/96 11:46 AM

Re(2): Excruciatingly slow debugger

Scott Osborn

Development Env.

Jay,

>>"Your IRQ is set wrong on the board. We've had this problem several times. You'll need to free up an IRQ and set it on the board and in your DEXBIOS line."

Thanks! Will do....  
Scott Osborn

---

5/22/96 10:33 AM  
Dev station screen flashing  
Heather Barclay  
Development Env.

After returning from E3, one of our development systems (which was working fine before we left) started to misbehave. When we turn the machine on, we get a screen of color bars then a screen of what looks like white noise. This keeps repeating ad infinitum. We checked all of the connections and reseated the cards, but nothing worked. When we try to run anything, we get the old "Cannot connect to target." errors.

Has anyone else experienced this? Do we have a bad dev system card? Nothing (neither hardware or software) changed since the time the system was working before leaving for E3. The only thing unusual is that the computer was turned off for 4 days.  
Thanks, Heather

---

5/22/96 5:31 PM  
Re: Dev station screen flashing  
Mike Fulton  
Development Env.

It does sound like the dev system has died on you. You should contact your account exec and arrange for a replacement.  
How much time goes by between the color bars and the screen of white noise?

Mike

---

5/28/96 5:30 PM  
Re: Command Line Limits / Makefile problems in PSYMAKE...  
player 1  
Development Env.

This isn't the solution, but just wanted to make sure yo

---

6/4/96 8:45 AM  
CPE2X scratchpad bug  
Dave Scheele  
Development Env.

I'm defining scratchpad variables using the following C code:

```
// following variables are on the scratchpad  MATRIX  unitmat  __attribute__  
((section("cachedata"))) = {ONE, 0, 0, 0, ONE, 0, 0, 0, ONE, 0, 0, 0};  SVECTOR  zerovec  
__attribute__ ((section("cachedata"))) = {0, 0, 0};
```

and the following link file lines:

```
org $80010000 ; 64K system vars  
text group ; main text group bss group bss ; main data group cach group ;  
org($1f800000),size(400) ; scratchpad ram group - was 388  
section .rdata,text ; main sections section .text,text section .data,text section .sdata,text
```

section .bss,bss ; the bss sections section .bss,bss  
section cachedata,cach ; the scratchpad ram section  
as described in earlier messages on this bbs. It works great! Unfortunately, the CPE2X chokes big-time when trying to process the resulting .CPE file to an .EXE. It seems to be trying to create a memory image of the entire memory area defines in the link file, thus creating a gigantic .EXE file that is unusable.  
This bug has been reported many times. It makes the scratchpad significantly less useful and effective. Several people were complaining about this before E3. Is CPE2X going to be fixed?? If not, is there another CPE2X-friendly way of accomplishing the same thing?  
Dave

---

6/4/96 1:52 AM

bug STILL in float multiply function

Dave Howell

Development Env.

John Phua

There's a bug in the math library function `__mulsf()`. This is the function that is called when you do any kind of floating point multiplication. The following little program demonstrates the bug:

```
void main() { float a, b, c;  
  a = -1e-37; b = 0.01; c = a * b;  
  if (c < -100000.0) printf("I hate this math library.\n"); }
```

If you run this, c should be set to a very small negative number. Instead, it turns into a very large negative number. Specifically, it gets the special value NEGATIVE INFINITY. This is very bad. I reported this bug several months ago. Mark Kreuger reported it maybe a year ago.

Will this bug ever be fixed?

Dave Howell Pablo Media

---

6/4/96 9:23 PM

Re: bug STILL in float mult

Dave Howell

Development Env.

By the way, here's another example of the bug in `__mulsf`:

```
main() { float x = 0.0, y = -1.0, z;  
  z = x * y; if (z < -100) printf("z is wrong."); }
```

If you look at the bits in z in this example, they are 0x80000000, or negative infinity.

---

6/5/96 5:05 PM

Re: CPE2X scratchpad bug

Mike Fulton

Development Env.

SPAD.ZIP 5K

Development Env.

The attached ZIP archive contains two separate sample programs which demonstrate how you can set things up to use the scratch pad. Use "PKUNZIP -d spad.zip" to extract in order to preserve the folder structure of the archive.

Basically, the problem is not really with the CPE2X program, but rather with the way the program is being linked. This is something that can be fixed easily by changing a few things in your linker command file.

The program in the SCRPAD folder is about as simple as you could possibly imagine. It positions the variables into the overlay strictly through the commands in the linker file. It demonstrates the proper way to do this.

The program in the SCRPAD2 folder is a revised version of the Programmer's Tools CD \PSX\SAMPLE\CMPPLR\SCRATCH sample program. It demonstrates a few alternate techniques for positioning variables in the scratch pad. One method uses the "attribute" modifier of CCPSX, which doesn't work with older versions. So make sure you have a current version of CCPSX installed and you aren't pointing to any old versions in your environment variables.

The most transparent method of placing variables in the scratchpad is to use the linker file method shown by the first program. But the fastest method is the one in program #2 where you define a structure with all your scratchpad variables, and then declare a global const pointer to this type of structure that has the address of the scratchpad.

This must be done within each source file, but you can do it in a header file. This has the advantage of making CCPSX encode the combined base+index address value directly into the output code, instead of generating code that has to read a pointer then add the offset to the desired structure member. This is going to be an instruction or two less code generated for each access to any of these variables, compared to using a regular pointer. Additionally, within a function that will use this a lot, you can declare a register pointer and copy over the global const pointer to it. Then the compiler can generate code with a simple indexed read or store with a constant index value, for the ultimate in fast access.

Mike Fulton @ SCEA

---

6/6/96 10:55 PM  
Re(2): CPE2X scratchpad bug  
Dave Scheele  
Development Env.

Thanks Mike!! I noticed I had "org" in my link file instead of "obj" as your sample has it, and that did it.  
Dave

---

6/7/96 12:57 PM  
Compiling in a Win31 DOS box  
Dave Scheele  
Development Env.

This is a silly question, it's not an extreme need, but every now and then, in this mixed-environment development system Sony has provided, I'd like to compile up a program change in a dos box without exiting whatever Windows Sony tool I'm using. Whenever I (stupidly) compile in the DOS box, I get the following dump:

```
PsyMake version 1.12 copyright SN Systems Software Ltd 1993 C:\PSX\BIN\ccpsx.EXE -c -g  
FIGHT.c Stack Fault at eip=ca748 eax=00000018 ebx=00000020 ecx=00000010 edx=000ca742  
esi=0012e724 edi=00000060 ebp=0012d01c esp=0012d000 cs=af ds=a7 es=a7 fs=a7 gs=bf ss=b7  
cr2=0000cfe9 Call frame traceback EIPs: 0x000ca748 0x0010dc29 0x0010dde2 0x000ccc0f  
0x000ce533 0x000267b8 0x00015dd7 0x000073c1 0x000256d8 0x00027ca5 Bad return code -  
make aborted
```

Is there some secret Windows or compiler setting I can adjust so that I actually CAN compile



under Windows? I'm getting tired of jumping back and forth ;)

---

6/10/96 3:13 PM

Re: Compiling in a Win31 DOS box

Dan Burnash

Development Env.

Dave Scheele

Is there some secret Windows or compiler setting I can adjust so that I actually CAN compile under Windows? I'm getting tired of jumping back and forth ;)

Yes. You need to set an environment variable to increase the size of the compilers stack. SET GO32=dpmistack 500000

Specify whatever value you need to make it work. The stack needed depends on the size of your code and the optimization level used.

---

6/12/96 3:50 PM

Re: Compiling in a Win31 DOS box

player 1

Development Env.

Isn't that just your stack running out of space? If so, try setting the enviromental variable GO32 to "dpmistack <noofbytes for stack>", I have mine set to 900,000 bytes, but that's probably way more than you need, try setting it to 500,000 or so first...Anyway, good luck and I hope this helps...

Tom Ketola PSX Lead Engineer Player 1, Inc.

---

6/19/96 5:51 PM

2 sided polys in PMD

Borden Covell II

LIBGPU/GTE

Is there a way (using the existing tools) to get a TMD's 2-sided polygon data passed through to a PMD???

We want to use PMDs due to size constraints but need to have some polys that are 2-sided (i.e. no backface testing).

HELP???!!!

---

6/20/96 3:05 PM

Compiler/Debugger problems

Jay Stelly

Development Env.

For a while I've been building my current project with the -O1 compiler option. Recently I was having some problems debugging a particular routine and decided to disable optimizations, thinking it would help. Without the -O1 option, my project no longer links...

I get tons of errors like:

C:\GAME\FILE.C(150) : Error Value (0000AE70) out of range in instruction patch (expression involves gSomeGlobal)

If I turn -O1 back on, it links, but I'm unable to examine many local and global variables (they

either come up with the wrong type, or show 0 as their value).

What compiler, linker, or debugger settings could I have changed that could cause this?

Thanks, Jay Stelly Tetragon

---

6/24/96 2:43 PM

Re: Compiler/Debugger problems

Mike Fulton

Development Env.

Jay Stelly @ Tetragon writes, For a while I've been building my current project with the -O1 compiler option. Recently I was having some problems debugging a particular routine and decided to disable optimizations, thinking it would help. Without the -O1 option, my project no longer links... I get tons of errors like:

C:\GAME\FILE.C(150) : Error Value (0000AE70) out of range in instruction patch (expression involves gSomeGlobal)

If I turn -O1 back on, it links, but I'm unable to examine many local and global variables (they either come up with the wrong type, or show 0 as their value). What compiler, linker, or debugger settings could I have changed that could cause this?

- 1) Why are (or were) you using just "-O1" rather than "-O2" or "-O3" ?
- 2) Are you seeing this only when you compile certain files with "-O1" and are the missing globals in those functions?
- 3) Are you by any chance using very, very large source files? Or very, very large functions?
- 4) Can you provide an example of how one of the disappearing variables is declared and one of the lines which provides the error? Include declarations or prototypes for any other variables or functions used on the line.
- 5) Are you using inline assembly?

Mike

---

6/24/96 3:02 PM

Re(2): Compiler/Debugger problems

Jay Stelly

Development Env.

- 1) Why are (or were) you using just "-O1" rather than "-O2" or "-O3" ?

O1 usually provides better input to the debugger. I'll probably compile with -O3 as we get closer to shipping. Some modules are being compiled with -O3 already though... I haven't seen much in terms of performance difference between O1 and O3 on most of our code (and I have measured it).

- 2) Are you seeing this only when you compile certain files with "-O1" and are the missing globals in those functions?

The globals aren't missing, I'm just unable to examine them properly in the debugger. If I printf() them, they come out just fine.

The globals are not just in files I compile, some of them are in Sony libraries.. Take something like GsLIGHTWSMATRIX. When I have this problem it comes up as a unsigned long instead of a matrix.

- 3) Are you by any chance using very, very large source files? Or very, very large functions?

I would say no. The largest files in our project are 60-80K (and there are only 3-5 of those). Most of our files are less than 10K of source. Most of our functions fit on a page. A couple are big, but not more than 200 lines or so.

- 4) Can you provide an example of how one of the disappearing variables is declared and one of

the lines which provides the error? Include declarations or prototypes for any other variables or functions used on the line.

as I said above: extern MATRIX GsLIGHTWSMATRIX; sometimes comes up as an unsigned long. Other custom data types have this problem too. Some global integers display the incorrect value as well.

5) Are you using inline assembly?

I'm using inline gte calls, but all of the assembly is in separate source files.

I think I may have this problem solved though. Someone at Sony suggested that it may be GP optimization overflowing the maximum space which is either 64K or 32K. I eliminated this option on all of my non-game-loop code and it seems to be working now. I want to understand exactly why it happened though, so I can make sure it doesn't happen again.

Jay Stelly Tetragon

---

6/24/96 7:37 PM

Re: gte\_funtions (DMPSX) and overlays

Jose R. Villeta

Development Env.

I am having the same problem in my game. Any ideas, Sont tech gurus? Jose

---

6/24/96 7:36 PM

gte\_funtions (DMPSX) and overlays

Dave Scheele

Development Env.

I just finished overlaying my code, and the programs seem to be swapping fine. However, when my code hits a DMPSX gte\_function, it locks up. Before I pull what little hair I have left out over this, is there something about DMPSX and overlays that needs special consideration? Is anyone else out there overlaying code that is run through DMPSX?

Dave

---

6/26/96 11:34 AM

O3 crashes compiler

Kerry J. Ganofsky

Development Env.

TEST.CPP 9K

Development Env.

I haven't been able to use the -O2 or -O3 options for quite a while now. Many of my modules cause the compiler to crash with these options on.

The attached file causes the compiler to crash with -O3 turned on. I am using the latest version of the compiler (off of CD release 1.6).

Information on attached file and crashing: The crash goes away when the complexity of the switch statement is reduced. The code in this file has been pared down from a module in my project. Don't bother with the functionality of this example, after pulling out all non-compiler-crashing code, this function does nothing. Compiling with the -O1 option or with no optimization does not crash. The command line to make this crash the compiler is: ccpsx -O3 -c test.cpp -otest.obj

Information on attempts at fixing this: This problem is not isolated to one module in my project. It appears in at least 5 others, and tracking down what, exactly, is making the compiler crash seems impossible (it's not one line, or one construct, etc.) This file only causes problems when compiled as a C++ file. Compiling my project as C is not an option (this function was originally a member of a class). It doesn't seem to be a memory problem. This problem has been reproduced on different machines. My current machine is a Pentium 133 with Windows 95, 32 MB RAM. The problem seems to be that when optimizing complex code flow, the compiler hits a bug somewhere and crashes. One solution already attempted has been "make the code less complex" but this is not a good solution for me at this time, as it happens in a number of modules.

Please forward this information to PsyQ. I will attempt to do so myself as well.

Thanks, Scott Corley High Voltage Software

---

6/27/96 5:02 PM

Re: O3 crashes compiler

Erick S. Dyke

Development Env.

We have the same bug and haven't had the time to create a code fragment that has done it. Same symptoms, same types of code (case statements) seem to cause it.

Thanks for bringing it up Scott.

---

6/28/96 10:02 AM

Re(2): O3 crashes compiler

Kerry J. Ganofsky

Development Env.

(problem was: with -O3 option, compiler was crashing on complex modules)

PsyQ has given me the solution.

With heavy optimisation on, the compiler runs out of stack space. The default GO32 stack size is 256k. You can set it larger by putting the following in your autoexec.bat

```
set GO32=dpmistack 2000000
```

for 2 million bytes of stack. The dude from PsyQ says he has seen code that requires 4MB of stack space. 2 mil has solved the problem for me :)

Scott

---

6/29/96 1:50 PM

Re(2): gte\_funtions (DMPSX) and overlays

Dave Scheele

Development Env.

Jose R. Villeta

The new 3.5 library stuff says it's fixed this problem ... I'm still downloading it, so I haven't checked it out, but I'm hopeful!!!

Dave

---

6/30/96 1:19 PM

Can't compile new lib  
Dan Chang  
Development Env.

I just switched to lib 3.5 and include 3.5, and now when I compile I get the following compiler error:

Fault processing with : 0000277f

Then I get the following link error:

Error: File XXX.obj is not in PsyLink file format.

I am using the compiler from release Prog Tool CD 1.6. The problem happens when I try to compile example code as well. For example it happened when I did a psymake on the SAMPLE\GRAPHICS\JIMEN directory.

My dpmistack line is the following. set GO32=dpmistack 8000000

Please advise.

David Brickhill Boss Game

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7/1/96 8:05 AM

Re(3): gte\_ funtions (DMPSX) and overlays

Dave Scheele

Development Env.

Jose R. Villeta

The new 3.5 library stuff says it's fixed this problem ... I'm still downloading it, so I haven't checked it out, but I'm hopeful!!!

Silly me, I should have known better. The problem still exists. I cannot overlay code that uses the gte\_ macros via DMPSX. Should there be a new version of DMPSX.EXE, along with the new macros etc.?

I guess I'll just have to chase this one around some more :( Sony, any ideas????

Dave

---

7/3/96 7:08 PM

DMPSX overlay problem fixed!!!

Dave Scheele

Development Env.

Well, the new DMPSX and inline.tbl work fine in an overlaid section of code. My fps rate is back up to acceptable levels, and I've got a bunch more core memory available. Yay!!

Dave

---

7/3/96 1:25 PM

Re(4): gte\_ funtions (DMPSX) and overlays

Mike Fulton

Development Env.

Dave Scheele

Dave,

I've looked through my library 3.5 documentation and I don't see anything that mentions a fix regarding overlays and DMPSX. Where did you get the idea that version 3.5 of the libraries fixed some problem with this? Maybe I missed something, so can you direct me to where you found this info?

How are you determining that the program is locking up in the DMPSX macros? I'm pretty sure

that the debugger doesn't know how to step through them, because they are not R3000 code. Frankly, I don't know what would happen if you tried. My guess is that you'd have to set a breakpoint after one and then GO past the macro instead of tracing through it. What I'm getting at is, perhaps you saw that the program was locking up, and when you traced it to find out where, you determined that it was happening at the DMPSX macros. But maybe it's not really happening there, but someplace else.

Mike

---

7/3/96 5:39 PM

Re(5): gte\_ funtions (DMPSX) and overlays

Dave Scheele

Development Env.

I've looked through my library 3.5 documentation and I don't see anything that mentions a fix regarding overlays and DMPSX. Where did you get the idea that version 3.5 of the libraries fixed some problem with this? Maybe I missed something, so can you direct me to where you found this info?

Here ya go .. extracted from CHANGE\_E.TXT:

DMPSX -----

(blah, blah)

## Enhancement ~~~~~ o Now corresponds to the object file

compiled with the overlay option.

I could have misinterpreted the above, though ....

I'm going to try the new DMPSX and see what happens with that. I'll let you know.

Dave

---

7/3/96 4:28 PM

Re(3): Can't compile new lib

Mike Fulton

Dan Chang

Development Env.

Ok, I understand what's happening now. First of all, there's nothing wrong with the C compiler, the linker, or the library.

The problem lies with DMPSX. There's a new version (v2.06) on the BBS which should take care of the problem.

Mike

---

7/3/96 1:02 PM

Re: Can't compile new lib

Mike Fulton

Development Env.

Dan Chang

David Brickhill @ Boss Games,

In order to investigate your problem, more information is needed. For starters:

- 1) What is the C file you are trying to compile? What include files does it use?
- 2) What is the EXACT output of the C compiler. Please redirect the output to a text file or copy the text from the MSDOS prompt window if running from Windows.

- 3) What object module is giving the link error? Is it referring to something in the library or something in your own code?
- 4) Why do you have the "dpmistack" set to such a huge value? Unless you have truly humongous functions, massive switch statements or if/elseif/else blocks, and source code files, it shouldn't need to be so large.
- 5) What is your system configuration... how much physical RAM do you have?

Mike

---

7/3/96 2:42 PM

Re(2): Can't compile new lib

Dan Chang

Mike Fulton

Development Env.

1) The C file that I am trying to compile is "text.c" in the samples\graphics\jimen directory.

2) The exact output of the C compiler is as follows:

PsyMake version 1.12 copyright SN Systems Software Ltd 1993 C:\PSX\BIN\ccpsx.EXE -O3 -c

text.c text.obj C:\PSX\BIN\dmpsx.EXE text.obj DMPSX version 2.03

Copyright(C)1995 Sony Computer Entertainment Inc. All rights reserved.

Fault processing with : 000021bf C:\PSX\BIN\ccpsx.EXE -O3 -Xo\$80010000 main.c divide.c

text.obj -omain.cpe,main.sym TEXT.OBJ : Error : File text.obj is not in PsyLink file format Errors

during pass 1 - pass 2 abortedBad return code - make aborted

3) The object module that is giving the link error is "test.obj". It is from the sample code.

4) I tweaked my dpmistack value to the value it is at the first time I ran into compiler page fault crashes, and then left it alone. What does the value signify? Can such a large one cause this problem? If so, why does a new lib make a difference?

5)I have 32 megabytes of physical ram, and am compiling from a DOS window in Windows 95.

thank you,

David Brickhill Boss Game Studios

---

7/8/96 4:34 PM

"//" comments

Dan Chang

Development Env.

Anybody know how to enable comments using "/" in our compiler?

David Brickhill bossgame studios

---

7/8/96 5:15 PM

Re: "/" comments

Mike Fulton

Development Env.

Anybody know how to enable comments using "/" in our compiler?

David Brickhill @ bossgame studios

Simply include the option "-comments-c++" in your CCPSX command line.

Mike

---

7/10/96 12:24 AM

Monthly repost of unanswered math lib bug

Dave Howell

Development Env.

John Phua

I posted a message about a bug in the floating-point math libraries once last year, and again last month, and am still awaiting a response. Can somebody from Sony PLEASE PLEASE PLEASE at least look at it and tell me that you don't care and that it will never be fixed? Just respond so I know that I'm not invisible.

Here's the bug...

When you multiply two floats together as in the below example, the math lib function `__mulsf()` gets called. This function is buggy, and returns the value NEGATIVE INFINITY in various different cases. It really messes up our game because when we convert a float to a fixed-point number for the GTE, it is converted to a very large negative number and the GTE chokes on it and we freeze up. Trust me, it's bad.

Here's the test program...

```
main() { float x = 0.0, y = -1.0, z;  
        z = x * y; if (z < -100) printf("z is wrong."); }
```

If you run this in the debugger, and look at the bits in z in this example, they are 0x80000000, or negative infinity.

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7/10/96 12:04 PM

Re: Monthly repost of unanswered math lib bug

Mike Fulton

Dave Howell

Development Env.

When you multiply two floats together as in the below example, the math lib function `__mulsf()` gets called. This function is buggy, and returns the value NEGATIVE INFINITY in various different cases. It really messes up our game because when we convert a float to a fixed-point number for the GTE, it is converted to a very large negative number and the GTE chokes on it and we freeze up. Trust me, it's bad.

Here's the test program...

```
main() { float x = 0.0, y = -1.0, z;  
        z = x * y; if (z < -100) printf("z is wrong."); }
```

If you run this in the debugger, and look at the bits in z in this example, they are 0x80000000, or negative infinity.

I presume you are referring to the `__mulsf3()` function because there is no `__mulsf()`. Also, why do you say "Negative Infinity"? It looks like "Negative Zero" to me. Which is, of course, equally wrong.

Also, can you be more specific than "in various cases."? I've looked at the source for the function and it has a problem when multiplying negative values by zero. If you have other examples that involve other circumstances, then please let me see them ASAP.

I've put together a fix for the negative values problem and have sent it to the engineers at SCEI. If they say it's OK, then I'll pass it along as soon as I hear back from them.

Mike Fulton

---

7/17/96 12:44 PM

DBUGPSX / H2000 trouble

Adrian Jones

Development Env.



I've got a problem just installing the DTL-H2000. I can run "run" and I can start up DBUGPSX but I can't run anything. On the first line of any of the sample code provided I get "BUS ERROR ON INSTRUCTION FETCH". And I find that I am in some area of memory that appears to contain nothing but zeros. There are currently no visible hardware conflicts with the board. I am using IRQ 12 and DEXBIOS and the dip switches are set accordingly. When I first saw this error I immediately suspected a conflict so I did modify some stuff. When I was using address 1340, DEXBIOS apparently conflicted with my SCSI board. 1340 is referred to only as address. Not IO address (like 220) and not base address (like a000) but just address. So I tried changing the address on the board to 220 and removing my sound card. I also tried changing the address to 9340 just randomly. Neither had any effect on the error I got. Any help would be appreciated. Thanks AJ

---

7/18/96 4:30 PM

Re: breakpoints in wrong place  
player 1  
Development Env.

That's just left over crap from the optimizer. When the code gets compiled and optimized, it gets re-arranged and therefore breakpoints might not set correctly because that line doesn't exist or has been moved in the compiled code. Either turn off compiler optimization or deal with the problem to fix it :)

---

7/18/96 10:00 PM

Re(2): breakpoints in wrong place  
Chris E. Reese  
Development Env.

player 1 writes: That's just left over crap from the optimizer. When the code gets compiled and optimized, it gets re-arranged and therefore breakpoints might not set correctly because that line doesn't exist or has been moved in the compiled code. Either turn off compiler optimization or deal with the problem to fix it :)

It may be that you are having problems due to compiler optimizations, but there is also a compiler bug that will create the same problem. The problem I ran into was having a C++ style comment on the same line as a Macro. So, for example if you have the following:

```
#define FOO (x, y, z) bar (x, y, z)
```

and in your code you do the following:

```
foo (1, 2, 3); // This creates a compiler bug.
```

you will get the same symptom where breakpoints will no longer match source code. This problem also shows up when the compiler spits out an error and gives you a line number that does correspond to the source code. This bug drove me insane as it made debugging damn near impossible. Hope this info helps.

Chris Reese Eidetic, Inc.

---

7/18/96 2:45 PM

breakpoints in wrong place  
Floria Ross  
Development Env.

this ifs bob polaro from thq. is anyone out there having a similar problem with the msdos debugger and it's breakpoints? what happens is when you set a breakpoint the hilight ends up in the wrong place (usually a few lines ahead). when you then setp through it acts as if you are realy hilighting the code before the hilight.

---

7/19/96 1:45 PM

Re: DBUGPSX / H2000 trouble

Ayo A. Orimoloye

Development Env.

Adrian Jones

Adrian Jones writes:

On the first line of any of the sample code provided I get "BUS ERROR ON INSTRUCTION FETCH".

What parameters are you passing to DBugPSX? Are you trying to debug something that was compiled with the -O option or the -g option? Does it have a .SYM file of the same name or a .MAP file. Try it on the Sony examples and see what happens. Also try changing your compiler options to -g only (no -O s).

I am using IRQ 12 and DEXBIOS and the dip switches are set accordingly.

I noticed that the DTL H2000 doesn't seem to like any other settings apart from the defaults (a1340, i0, dma 0). Try again with IRQ off and DMA off and the default address, if possible. You might have to disable your SCSI board.

Good luck!

---

7/19/96 1:56 PM

Re(4): breakpoints in wrong place

Ayo A. Orimoloye

Development Env.

Floria Ross

Actually, what I meant to say was:

The problem you described also occurs when you have an updated .C or .CPP file, compile the program, the compilation FAILS (there's an error) but you don't notice that it failed and you run the debugger with the OLD (previous) .CPE and .SYM files. The symbol tables provide the name of the newly changed .C or .CPP (where the lines have been edited or moved around) but the executable is from the OLD .C file (which has been erased) so everything doesn't match up.....

---

7/19/96 1:49 PM

Re(3): breakpoints in wrong place

Ayo A. Orimoloye

Development Env.

Floria Ross

This problem also shows up when you are using the wrong .SYM file for the .CPE. That is, if you have an old version of the .SYM file from 2 or more compiles ago in the same directory as the current .CPE from the latest compile and you did not delete the old .SYM file. If the code has shifted around a bit in the latest version, you would have this problem. Try deleting all .CPE and .SYM files before compiling.

---

7/20/96 11:56 AM

Re: DBUGPSX / H2000 trouble  
Montgomery Singman  
Development Env.

the 1340 is an I/O address.  
do you run snpatch?  
i use 'dexbios /a1340 /i10 /b32'  
my run batch looks like : @echo off resetps 1 psxrun /w5 d:/psx/snpatch psxrun /w5 %1  
if you just type 'run', and dont get ' cannot connect to target', your boards are set right.  
are you sure your sample are org'ed right? is your pc reg init'ed right?  
if you like i could set you a simple test cpe just to see if you baord is alive. ( i can't believe that  
niether sony nor psygnosis has a simple ' yes i am alive ' test, or better yet a dev board  
diagnostic w/ ram test etc. )

---

7/22/96 8:57 PM  
Re(2): DBUGPSX / H2000 trouble  
Adrian Jones  
Development Env.

Thanks Montgomery,  
SNPATCH was the problem. So now I can "run" stuff. Unfortunately I still can't debug because I  
get an entirly new error shortly after I tell any one of the sample programs to "go". It says "target  
did not respond" and it offers me the opportunity to reset the bus or abort. Of these two options  
only abort seems to do anything.  
I feel like this is just a symptom of a larger problem, that is, I am missing some essential peice  
of updated documentation that will tell me how to set up the dev enviornment. And, Like  
Montgomery said, I could also probably use a test program or something to make sure that  
everything is working properly before I preceed. Any pointers in the right direction would  
really be appreciated.  
Thanks, AJ

---

7/22/96 9:02 PM  
Re(2): DBUGPSX / H2000 trouble  
Adrian Jones  
Development Env.

You said:  
"I noticed that the DTL H2000 doesn't seem to like any other settings apart from the defaults  
(a1340, i0, dma 0). Try again with IRQ off and DMA off and the default address, if possible. You  
might have to disable your SCSI board."  
What are the symptoms of the Sony board not liking any other settings ?  
I seem to remember that interaction with the board is supposed to slow down without an IRQ  
set. But the default is without an IRQ. So should I really abondon the idea of using an IRQ ?  
Thanks, AJ

---

7/23/96 5:26 PM  
Re(2): bug STILL in float mult  
Mike Fulton  
Development Env.

MULSF3.OBJ 1K

Development Env.

By the way, here's another example of the bug in \_\_mulsf3:

```
main() { float x = 0.0, y = -1.0, z;  
  z = x * y; if (z < -100) printf("z is wrong."); }
```

If you look at the bits in z in this example, they are 0x80000000, or negative infinity.

I've gotten a response from the Japanese engineers about this, and basically they are telling me that they don't consider this a problem because it works the same way on other MIPS machines and on Intel machines.... and I verified this with Visual C++ on my PC. They suggest that you check for "negative zero" when you convert from floating-point to fixed-point.

I've done a slight change to the "\_\_mulsf3" function myself. There was a check for zero where it was just setting the sign bit and exiting. I've changed it to set the value to zero with a clear sign bit, so "negative zero" won't happen. There is an object file with this revision attached to this message. Try using it and see how it works. I haven't tested it at all, so keep in mind there are no guarantees and this is a completely "unofficial" release.

Mike

---

7/23/96 1:39 PM

Re(3): DBUGPSX / H2000 trouble

Mike Fulton

Development Env.

I seem to remember that interaction with the board is supposed to slow down without an IRQ set. But the default is without an IRQ. So should I really abandon the idea of using an IRQ ?

Thanks, AJ

The IRQ is used when the PlayStation client (ie. the Playstation program) tries to talk to the rest of the PC via the various I/O functions like printf(), PCRead(), PCWrite(), etc. The main difference when you have an IRQ is that the response time is faster since the software running on the PC side can respond immediately instead of just taking a look every now and then to see if a request of some sort is pending.

So far as I've ever seen or heard, disabling the interrupt simply slows these things down. (By a really huge amount in some cases.)

The default I/O port address at 1340 is unlikely to conflict with ANYTHING let alone a SCSI card (which are typically using much lower addresses). It's not impossible, but it is unlikely. However, the IRQ setting and DMA channel (default setting or your own custom settings) can easily conflict with SCSI cards, Network adapters, floppy/hard disk controllers, etc.

Keep in mind that if you have a PLUG & PLAY system, the DTL-H2000 is not going to report its info. So make sure that the IRQ and/or DMA channel used by the DTL-H2000 card is set as "reserved" or "ISO legacy" in your PC's BIOS setup.

Also keep in mind that an IRQ conflict doesn't always show up until you have more than one software driver trying to service the interrupt.

Finally, keep in mind that you must always run SNPATCH (not SNPATCHW or SNPATCHJ) no matter what. Everytime you do a RESETPS, follow it with RUN SNPATCH. You should set up a batch file that does both together. (Use a PAUSE in between to make sure that the RESETPS has finished before it tries to RUN.)

Mike

---

7/23/96 11:24 AM

Re(3): DBUGPSX / H2000 trouble

Montgomery Singman

Development Env.

I seem to remember when i only got 'target did not respond'. unfortunately i forget the solution.

this is my debug bat: resetps 1 psxrun /w10 d:\psx\snpatch dbugpsx /e%1 /i10 %1

this works for me.

Interupts and dma do work fine - if they are set up properly.

fun isn't it?

BTW my name is tod frye, i use monte's account. ( he's my boss)

---

7/23/96 8:46 PM

Re(3): bug STILL in float mult

Dave Howell

Development Env.

Mike Fulton

Mike Fulton writes: main() { float x = 0.0, y = -1.0, z;

```
z = x * y; if (z < -100) printf("z is wrong."); }
```

If you look at the bits in z in this example, they are 0x80000000, or negative infinity.

I've gotten a response from the Japanese engineers about this, and basically they are telling me that they don't consider this a problem because it works the same way on other MIPS machines and on Intel machines.... and I verified this with Visual C++ on my PC. They suggest that you check for "negative zero" when you convert from floating-point to fixed-point.

Okay, so you're saying it's not a bug in \_\_mulsf3, but rather it's a bug in the function that performs type-casting from floating-point to integer. I'll buy that. But it's still a Sony Library Bug. Any chance that it can be fixed?

Incidentally, the debugger says a floating-point value of 0x80000000 is negative infinity, so this may be a debugger bug as well as a library bug.

Thanks very much for your reponse and for posting a fix. I've made my own fix, but my R3000 is worse than bad, so it could well be buggy.

Dave Howell Pablo Media

---

7/24/96 1:12 PM

Re(4): bug STILL in float mult

Mike Fulton

Dave Howell

Development Env.

Okay, so you're saying it's not a bug in \_\_mulsf3, but rather it's a bug in the function that performs type-casting from floating-point to integer. I'll buy that. But it's still a Sony Library Bug. Any chance that it can be fixed?

No, I'm saying that it follows the same behaviour as other popular systems, so regardless of whether it's a bug or not, it's not unique to the Sony library and so the library programmers have decided not to change it. It's not actually that big a change. I only changed a single line in the source for the fix I sent you.

There's something I don't quite understand, however. I tried a test program similar to the one you had posted:

```
#include <stdio.h>
```

```
void main() { float x, y, z;
```

```
    x = 0.0;    y = -1.0;    z = x * y;
```

```
    if (z < (-100))    printf("Z is wrong\n"); }
```

And I don't get the "Z is wrong" message as you indicated you did. If I dump the bits for "z" then the sign bit is set, but it doesn't seem to be affecting the comparison.

By the way... in this particular example, the C compiler handles the comparison by converting the 100 to floating point, not by converting Z to integer. Otherwise you would get bad results if Z was something like "-100.2".

Did you actually try the example you posted, or did you assume it would exhibit the same behaviour as something else you'd seen? Perhaps it would be better to post the actual code that you had a problem with.

Mike

---

7/25/96 6:04 PM

Re: Host PC wants to talk to DTL-H2000 and vice versa

Mike Fulton

Alexandre Jean Claude

Hi everybody.

1. I want to ask if anyone knows how to send/receive a message from the host PC to the DTL-H2000 card. I would like to establish a communication between a WIN95/DOS program and a PS/X program. Can that be done while the PS/X program is running ?

2. While we're at it, is the combat cable compatible with RS-232 ? Or does it have a private protocol ?

Thanks in advance

1) Well, there really isn't a API for doing something like that, but there is a fairly simple thing you could do. Use a simple file-based semaphore. Your PC program could write data to a specific file, and the PlayStation could use that file as a pipeline. Once the file is created (you cannot create a PC file from the PlayStation) you can use it to read or write information from either side. This would require that both programs poll the contents of the file on a regular basis. What sort of communications do you require? What sort of info do you need to exchange?

2) The combat cable is not RS-232.

Mike

---

7/25/96 11:43 AM

Host PC wants to talk to DTL-H2000 and vice versa

Alexandre Jean Claude

Development Env.

Hi everybody.

1. I want to ask if anyone knows how to send/receive a message from the host PC to the DTL-H2000 card. I would like to establish a communication between a WIN95/DOS program and a PS/X program. Can that be done while the PS/X program is running ?

2. While we're at it, is the combat cable compatible with RS-232 ? Or does it have a private protocol ?

Thanks in advance

---

7/26/96 4:18 PM

Re(2): Host PC wants to talk to DTL-H2000 and vice versa

Jay Stelly

Development Env.

1) Well, there really isn't a API for doing something like that, but there is a fairly simple thing you could do. Use a simple file-based semaphore. Your PC program could write data to a specific file, and the PlayStation could use that file as a pipeline. Once the file is created (you cannot create a PC file from the PlayStation) you can use [...]

PCCreat() works just fine for creating files from the PlayStation, BTW. I did all of our screen shots that way.

Jay Stelly Tetragon

---

7/26/96 9:23 AM

Re(2): Host PC wants to talk to DTL-H2000 and vice versa

Borden Covell II

Development Env.

Isn't it possible to achieve the PC to DTL-H2000 communications using the new SN Systems API and Windows 95 debugger?

---

7/26/96 9:48 AM

Re(3): Host PC wants to talk to DTL-H2000 and vice versa

Mike Fulton

Development Env.

Isn't it possible to achieve the PC to DTL-H2000 communications using the new SN Systems API and Windows 95 debugger?

Well, I don't know. These items are not really "official" at this point, as far as Sony is concerned. I haven't seen any API info. I suppose it's possible that the Psy-Q File Server program may offer some general communications capabilities, but you'd have to get that info from SN Systems since we don't do anything with the Windows debugger.

Mike

---

7/26/96 7:31 PM

Re(3): Host PC wants to talk to DTL-H2000 and vice versa

Mike Fulton

Development Env.

1) Well, there really isn't a API for doing something like that, but there is a fairly simple thing you could do. Use a simple file-based semaphore. Your PC program could write data to a specific file, and the PlayStation could use that file as a pipeline. Once the file is created (you cannot create a PC file from the PlayStation) you can use [...]

PCCreat() works just fine for creating files from the PlayStation, BTW. I did all of our screen shots that way.

Jay Stelly @ Tetragon

Whoops... that's right. I forgot that PCcreat() had been added to the library after the main docs were done.

Mike

---

7/27/96 3:42 PM

Re(4): Host PC wants to talk to DTL-H2000 and vice versa

player 1

Development Env.

The PCcreat thing only works if you don't crash, but if you have a crash bug you can't always close the file and therefore the information gets lost. What you could do is write a simple PSX program to do nothing but receive text through the combat cable and draw it onscreen using the built-in font, then write your printf in your real code to print through the combat cable. Set your testers up with 2 PSX's hooked up and a VCR on both, that way you can watch the tapes and correlate the times to see what is getting printed when....Works as long as you have less than a screenfull of text per frame...

Tom Ketola PSX Lead Engineer Player 1, Inc.

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7/29/96 9:26 AM

Re(2): Host PC wants to talk to DTL-H2000 and vice versa

Alexandre Jean Claude

Mike Fulton

Development Env.

Mike Fulton writes: Hi everybody.

1. I want to ask if anyone knows how to send/receive a message from the host PC to the DTL-H2000 card. I would like to establish a communication between a WIN95/DOS program and a PS/X program. Can that be done while the PS/X program is running ?

2. While we're at it, is the combat cable compatible with RS-232 ? Or does it have a private protocol ?

Thanks in advance

1) Well, there really isn't a API for doing something like that, but there is a fairly simple thing you could do. Use a simple file-based semaphore. Your PC program could write data to a specific file, and the PlayStation could use that file as a pipeline. Once the file is created (you cannot create a PC file from the PlayStation) you can use it to read or write information from either side. This would require that both programs poll the contents of the file on a regular basis. What sort of communications do you require? What sort of info do you need to exchange?

2) The combat cable is not RS-232.

Mike

Well, the information I want to exchange is camera position and other things like that. I just tested the file semaphore mechanism and it seems to be not so bad in terms of performance. Thanks for the info, I really appreciate. I guess that the main strategy will be to open a new thread which will poll the file and get/send the info and also to minimize the amount of bytes written and read from the file. I heard also that Sony is developing a protocol to allow messaging between the HOST PC and the DTL-H2000 called DECI. Have you heard about that ?  
Alex.

---

7/29/96 1:01 PM

disassembly

Tom Sloper

Development Env.

Is there a way to disasm one of my obj's without having to go through the debugger?

It would sure be nice if I could...

---

8/6/96 3:42 PM



Re(3): Host PC wants to talk to DTL-H2000 with Win95 beta  
From:  
Dylan Cuthbert  
Development Env.

Alexandre Jean Claude writes:

Well, the information I want to exchange is camera position and other things like that. I just tested the file semaphore mechanism and it seems to be not so bad in terms of performance. Thanks for the info, I really appreciate. I guess that the main strategy will be to open a new thread which will poll the file and get/send the info and also to minimize the amount of bytes written and read from the file. I heard also that Sony is developing a protocol to allow messaging between the HOST PC and the DTL-H2000 called DECI. Have you heard about that ?  
Alex.

PsyQ are developing an API for their new win95 debugger/file server. You should contact them and ask to join their beta-test program. It's a very stable system (I use it).  
Dyl

---

8/7/96 1:08 PM  
PCread function hangs  
Adrian Jones  
Development Env.

Does anybody know why a PCread function would hang a dev system ? I am using pollhost and PCinit and PCopen and all are working correctly. I have traced the hang to the actual break 105 instruction and at the time it is executed all of the registers are just fine. It just never returns from the break.  
Thanks, AJ

---

8/7/96 5:00 PM  
Re(2): PCread function hangs  
Adrian Jones  
Development Env.  
Ayo A. Orimoloye  
Hello,

Thanks for the rapid response. I do trap all the error conditions on on all the PCwhatever functions including PCread(). The problem is that I can never get to the PCread error trap because the entire system hangs (including the debugger). I have tried passing PCread invalid file handles and it behaves properly in that case. The only time I get a problem is when it has valid arguments.

I also tried removing PCinit, and got the same results.

Tell me is it possible that in order to use this function I have to enable the dma on the dev system?

Thanks, AJ

---

8/7/96 3:14 PM  
Re: PCread function hangs

Ayo A. Orimoloye

Development Env.

Adrian Jones

Adrian Jones writes:

Does anybody know why a PRead function would hang a dev system ? I am using pollhost and PCinit and PCopen and all are working correctly.

Try getting rid of the PCinit. It shouldn't be necessary with the latest libraries. Also, try error trapping the PCopen to make sure the file handle returned is valid, viz:

```
if ( (FileHandle = PCopen( "filename", FLAGS, PERMS)) == -1 ) { printf("FATAL ERROR!  
PCopen failed!\n"); return; }
```

Also make sure the parameter FLAGS is 0 or 2 and NOT 1 (write only!) :-). PERMS should be 0.

And if you're as paranoid as I am, you might also wanna try error trapping the PRead itself:

```
if ( PRead( FileHandle, Buffer, Size ) != Size ) { printf("FATAL ERROR! PRead failed!\n");  
PCclose( FileHandle ); return; }
```

where Size is the number of bytes you're reading.

When you run the program, do a "testmess" to see if any of the errors are printed.

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8/8/96 11:48 AM

Re: PRead function hangs

Mike Fulton

Development Env.

Does anybody know why a PRead function would hang a dev system ? I am using pollhost and PCinit and PCopen and all are working correctly. I have traced the hang to the actual break 105 instruction and at the time it is executed all of the registers are just fine. It just never returns from the break.

Thanks, AJ

Well, as we discussed on the phone, my guess would be that there is an interrupt conflict on the PC side. The symptoms sound very much like those that have accompanied this sort of problem in previous situations.

You should double check that nothing else uses the same interrupt as the dev boards... and do this at the hardware level by checking what each plug-in card or motherboard I/O item uses.

Just because Windows 95 doesn't detect a conflict doesn't mean there isn't one.

Secondly... I don't think we discussed this idea, but when running under Windows 95, make sure you never have more than one MSDOS console running with the Playstation DEXBIOS at a time. This has also been known to cause problems with PRead() and related functions. Don't install DEXBIOS or other PlayStation-related TSR programs in your global AUTOEXEC.BAT file. It's OK to set environment variables there, but don't do anything else. Run DEXBIOS or MESS1 or whatever else once you have opened a console to do some work.

Mike

---

8/8/96 10:58 AM

Re: disassembly

Mike Fulton

Development Env.

Is there a way to disasm one of my obj's without having to go through the debugger?

It would sure be nice if I could..

Unfortunately, we don't have any tools to disassemble object modules other than the debugger.

On the other hand, since our tools are a flavor of GNU and use industry-standard ECOFF format, it's quite likely there may be some other MIPS-targeted GNU tool out there that would

do what you want. I suggest you start hunting down stuff on the internet and see what you can turn up.  
Mike

---

8/8/96 8:33 AM

Re(3): PCread function hangs

Ayo A. Orimoloye

Adrian Jones

Development Env.

Adrian Jones writes:

I do trap all the error conditions on on all the PCwhatever functions including PCread(). The problem is that I can never get to the PCread error trap because the entire system hangs (including the debugger). Are you running from Windows or Windows '95? The fact that the ENTIRE system hangs could mean some other program was using the file you're trying to PCread. You might wanna try quitting from Windows (yep INCLUDING DOS shells) entirely. Tell me is it possible that inorder to use this function I have to enable the dma on the dev system?

I have been using PCread for over a year and never experienced any of the problems you mentioned. Might be a problem with the C: drive in your PC such as a bad sector or checksum error or something like that. Examine the file using something like DISKEDIT (Norton Utilities) or some other editor to make sure it's OK. The DMA setting on the dev system does NOT have any effect on the operation of PCreads as far as I know.

---

8/12/96 11:24 AM

Tracking down a crash bug

Ted Morris

Development Env.

We have a nasty little crash bug that we just can't seem to locate. The symptoms are that the main game loop stops being processed but all interrupts continue to work just fine. We're not sure if it's an infinite loop or what, but we can't seem to find where the problem is occurring when using the debugger. If we stop the execution, the debugger just stops at the pollhost we have in the VSync callback function. Is there any way to find out what function was being executed when the interrupt happened? We need to squish this bug ASAP.

Thanks, Jason Curtice Westwood Studios

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8/12/96 3:01 PM

Re(2): PCread function hangs

Adrian Jones

Development Env.

The problem is fixed. I had an embarrassing little == buig that set my file handle to 0. Apparently, a file handle of 0 is offensive to dexbios and it hangs the system when you pop the read interrupt.

Thanks for the help, AJ

---

8/13/96 12:18 PM

Re: Tracking down a crash bug  
Mike Fulton  
Development Env.

We have a nasty little crash bug that we just can't seem to locate. The symptoms are that the main game loop stops being processed but all interrupts continue to work just fine. We're not sure if it's an infinite loop or what, but we can't seem to find where the problem is occurring when using the debugger. If we stop the execution, the debugger just stops at the pollhost we have in the VSync callback function. Is there any way to find out what function was being executed when the interrupt happened? We need to squish this bug ASAP.

Thanks, Jason Curtice @ Westwood Studios

Let me make sure I understand... the program is crashing within the main game loop? Or at least, you think that's what happens? It's not crashing within an interrupt?

Looking at the interrupt context is going to be a problem when you're doing this from the debugger. Doing ANYTHING with interrupts is hard with a debugger, since they are wrapped up into interrupts in the first place and don't do certain things in real-time. However, it may be possible to have your interrupt routine store the interrupt context someplace where you can look at it with the debugger after the fact. That would be my suggestion on how to proceed next. That would give you the return address where the interrupt occurred.

If you don't have the book "MIPS RISC Architecture" by Gerry Kane and Joe Heinrich, get it. The information it has on exception processing in chapter 6 will be helpful. Specifically, it tells us that the EPC register contains the address where processing will resume after an exception is serviced. So what you want to do is save this register from within your interrupt so that you can check the value afterwards in the debugger.

Although there is some stuff in ASM.H and R3000.H that may apply, accessing the EPC register in your callback routine is most likely going to require assembly language. If you need help figuring that out, let me know. I'm no expert on R3000 assembly but I can probably help you muddle through on something relatively simple like this.

What do you mean when you say "if we stop the execution, the debugger just stops at the pollhost we have..."?

Stop the execution how, exactly?

What happens when you take the pollhost() function out of the callback? Are you doing pollhost() calls anywhere in your non-interrupt code? (I'm wondering if you are calling pollhost() from the interrupt while processing it from non-interrupt code... my guess is that would be BAD.)

---

8/13/96 11:57 AM  
Re(3): PCread function hangs  
Mike Fulton  
Development Env.

The problem is fixed. I had an embarrassing little == buig that set my file handle to 0. Apparently, a file handle of 0 is offensive to dexbios and it hangs the system when you pop the read interrupt.

Thanks for the help, AJ

Actually, I think that file handle 0 is used for the STDOUT console device... so you probably were doing the equivalent of a ton of printf() statements. I think it is possible to fill the buffer where this data goes so that your program may hang if the PC is not dumping the contents to free up space. (I've seen something along those lines before but was not really worried enough about it at the time to figure out the specifics.)

Mike

---

8/13/96 2:24 PM

Re(2): Tracking down a crash bug  
Craig Galley  
Development Env.

This has always been a bone of contention with me, if sony would only allow SN systems to let us get the plug in development systems it would help a lot because it has NMI support for stopping program execution. Anyway, you may find it useful if you examine the main TCB for the main process. It actually tells you where the pc currently is. The POLLHOST call in the majority of our applications is placed within the interrupt service routine which has a separate context from the main program. The TCB for the main program is located at 0xA000E1EC; I suppose this would vary depending on the number of tasks that are used. I found this by tracing the TCB list which is pointed to by location 0x100. Refer to pp26-27 of the Run-Time library overview for the register orders.  
Hope this helps.

---

8/15/96 3:46 PM

Re(3): Tracking down a crash bug  
Ted Morris  
Development Env.

Mike & Craig, Thanks for the info. Fortunately, with a bit of detective work and a lot of luck, we managed to track down the infinite loop. That explains why the interrupts were still working while the game had appeared to crash. Hopefully there won't be a next time, but if there is, your information might prove useful.  
Thanks, Jason Curtice Westwood Studios

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8/15/96 9:01 AM

I-cache and no I-cache compiling  
Christian F. Aubert  
Development Env.

How can i compile some routine in the same source file at the different address like 0xA0000000 for no i-cache and 0x80000000 for i-cache ?.

---

8/15/96 11:37 AM

Re: I-cache and no I-cache compiling  
Mike Fulton  
Development Env.

How can i compile some routine in the same source file at the different address like 0xA0000000 for no i-cache and 0x80000000 for i-cache ?

Really what you need to control is not how the function itself is compiled, but rather how references to that function are handled.

Within a C function, all branches are handled as a relative offset from some other position. Direct address references are typically only used when calling a different function. Therefore, the same function could be called at address 0xA0010000 and not be cacheable or it could be called at 0x80010000 and then be cacheable. The contents of the function probably don't matter.

So what you need to control is the address used when function A calls function B, and there's really no practical way to do this if both functions are in the same source module, because the linker will want to place all the code together at contiguous addresses.

What you need to do is place the functions into different source modules. Then you can use the linker control file to specify that a particular object module has a different origin address. This way, when function A in one file calls function B in another file, the compiler will simply generate an "external reference" that the linker has to resolve later.

Somebody was saying something recently about using the "\_\_attribute\_\_" keyword with function declarations, so maybe there's supposed to be some option there that might apply. This keyword is supposed to give you control over what program segment something goes into, so I guess the idea would be to create separate segments for cacheable functions and non-cacheable functions. You may want to look into that idea. I don't know how it would work, but personally I don't think I would recommend doing something like that instead of just having separate source modules and using the linker options. With the "\_\_attribute\_\_" keyword you'd still have to do the linker stuff, but you'd have to do stuff in all your source code too, so I'm not sure it would be the best way to go.

Mike

---

8/16/96 2:35 PM

Re(2): I-cache and no I-cache compiling

Jay Stelly

Development Env.

How can i compile some routine in the same source file at the different address like 0xAxxxxxxx for no i-cache and 0x8xxxxxxx for i-cache ?

I've never needed to make a function uncacheable except in the case of benchmarking/profiling, so I'll assume that's what your doing. In any case, the function IS already at 0xAxxxxxxx since 0x8xxxxxxx maps to the same memory address...

All you really need to do to the routine is call it at the appropriate address:

```
typedef void ( *VOIDFUNC ) ( void ); VOIDFUNC testCall; testCall = SomeTestFunction;
```

```
((uint32)testCall) |= 0x20000000; // No testCall() is not cacheable testCall();
```

Something like that has worked for me.

Jay Stelly Tetragon

---

8/17/96 11:34 AM

Re(5): bug STILL in float mult

Dave Howell

Development Env.

Mike Fulton writes: There's something I don't quite understand, however. I tried a test program similar to the one you had posted:

```
#include <stdio.h>
```

```
void main() { float x, y, z;
```

```
    x = 0.0;    y = -1.0;    z = x * y;
```

```
    if( z < (-100) )    printf( "Z is wrong\n" ); }
```

And I don't get the "Z is wrong" message as you indicated you did. If I dump the bits for "z" then the sign bit is set, but it doesn't seem to be affecting the comparison.

Very curious.

By the way... in this particular example, the C compiler handles the comparison by converting the 100 to floating point, not by converting Z to integer. Otherwise you would get bad results if Z was something like "-100.2".

Hmmm. I believe you're seeing the results you describe, but that's not what I was seeing. I compiled and ran this exact example in the debugger, and stepped into mulsf3, and watched the wrong result being returned, and then stepped through the comparison in an assembly window. And I watched the "Z is wrong" message appear in the MSG window. The only explanation I can offer is that maybe you're running a different version of the C compiler, or had some different optimization setting. I'll try it again with the latest compiler.

Did you actually try the example you posted, or did you assume it would exhibit the same behaviour as something else you'd seen? Perhaps it would be better to post the actual code that you had a problem with.

Yep. I copied that source code straight out of my test program. The only thing I changed was the spacing, converting tabs to spaces.

Thanks for looking at the problem; I'll try it again with the latest compiler and get back to you.

At this point, we have pretty much worked around the problem by (1) replacing mulsf3 with a dubiously hacked version, and (2) checking if our float multiplication results are less than -10000 (arbitrarily big negative number), and if so changing them to zero. There are still probably some mulsts that we've missed, but we're not crashing anymore from this.

Dave Howell Pablo Media

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8/27/96 8:50 PM

New development env. from Metrowerks

Dave Scheele

Development Env.

So, folks, now that Metrowerks has announced CodeWorks for the PlayStation, and promised several other goodies, I have to ask .. does anyone have any past experience with the above company and / or their products?? Whaddaya think, is this the light at the end of the tunnel, or just a flash in the pan?

Dave

---

8/27/96 12:23 PM

Bad prototypes in 3.5 .h files

Axel Brown

Development Env.

These library files have been around for a while now and I know that Sony have been made aware of the lack of compliance to ANSI C standards before, but they still seem to find their way into every new release.

Examples:--- // convert.h atoi() needs to take a const char \*

// kernel.h long delete(char \*); Why is this function included here AND it's inside an #if

define(\_\_cplusplus) block??? The C++ compiler vomits all over it!!

// strings.h char \*strcat (char \*, char \*); should be char \*strcat (char \*, const char \*); unsigned

int strlen (const char \*) should be unsigned int strlen (const char \*); char \*strchr(const char \*,

char); should be char \*strchr(const char \*, char);

strlen( /\* char \*\* \*/) /\* To avoid conflicting \*/ <-- What exactly is this supposed to mean? You

want to avoid conflicts by leaving out the argument altogether??? Yeah, C++ just loves this!

// memory.h The first parameter of memset() should be void \* memcpy() should take void \*,

void \*, int

Why define size\_t if you are not going to use it?

Is noone in Japan using C++ ??? The GNU compiler will find all these bugs! Axel Brown Origin Systems, Inc.

---

8/29/96 1:44 PM

Re: I-cache and no I-cache compiling  
Mike Fulton  
Development Env.

How can i compile some routine in the same source file at the different address like 0xAXXXXXXX for no i-cache and 0x8XXXXXXX for i-cache ?.

Something I forgot to mention before is that you can also use function pointers to access your routines, and then you can control if a function will execute from a cachable address each time you call it by setting the high nybble of the pointer accordingly. This gives a lot of flexibility.

Mike

---

8/29/96 2:04 PM

Re: Bad prototypes in 3.5 .h files  
Mike Fulton  
Development Env.

To date, SCEI has not placed a high priority on C++ support, but we've been trying to persuade them that it is important and it looks like the next version of the libraries and header files will have some changes. This will include things like renaming the library "delete" function so that it doesn't conflict with the C++ delete keyword.

By the way, there will probably be something in the header file to define "delete" as a macro pointing to the new function name ONLY if you're not using C++. That way, old C code using the "delete" library function will just use the new code and require no changes, while C++ code will use the new function name.

We were confused by of your comments regarding prototypes. Specifically, you said for STRINGS.H that:

unsigned int strlen (const char \*) should be unsigned int strlen (const char \*); char \*strchr(const char \*, char); should be char \*strchr(const char \*, char);

Both sides of "should be" appear to be the same... and neither matches the header file, which has the "to avoid conflicting" comment you mention later. What's the deal? Is this a typo or are we missing something?

Mike

---

8/29/96 10:41 AM

Re: New development env. from Metrowerks  
Buzz Burrowes  
Development Env.

Dave Scheele writes: does anyone have any past experience with the above company and / or their products??

I've been using CodeWarrior for MAC development for a while (writing sound tools for internal use) and have found it to be a VERY stable environment. They have a great program for recieving product updates, and have been very responsive to any questions I've had.



---

8/30/96 1:18 PM

Warnings in new Compiler (CD 1.7)

Jay Stelly

Development Env.

We've recently switched to the compiler on the 1.7 Programmer's CD. Now, the same compiler switches we were using generate additional warnings. While I don't want to disable warnings in general, there is one that I can't seem to work around:

Now, -Wunused generates a warning for unused parameters. Since we have many functions called via pointers, we can't get rid of unused parameters in some functions. I don't want to turn off -Wunused because of the other warnings it generates (unused stack variables, unused static variables). Is there any way to turn off the unused parameter warning? I've read the docs on the CD, and they don't even mention this new behaviour of -Wunused, so I suspect they're out of date.

I'd also like to turn off the comparison between signed and unsigned warning on some files, but I'll cast that one away if I have to.

Jay Stelly Tetragon

---

9/3/96 5:22 PM

Re(2): Warnings in new Compiler (CD 1.7)

Jay Stelly

Development Env.

Jay,

I haven't tried this on the PlayStation, but I've seen this trick used with other environments to get around the unused parameter warning:

At the beginning of your function, just place each of the unused parameters followed by a semicolon, like this:

```
void fn(int var1, int unusedVar2, int unusedVar3) { // dummy ref's to avoid compiler
warning... unusedVar2; unusedVar3;
// the rest of the function... }
```

I've used something like that in the past, usually with a (void) cast: (void)unusedVar;

If practical, however, you may wish to consider having these functions accept a single parameter which is a pointer to a structure or array with the real parameters. This will allow you to eliminate the warnings.

In many cases this would work, but in my specific case it wouldn't. We've got the stack in D-CACHE, and something like this would probably require us to put these parameter blocks on the stack whereas the parameters themselves are generally passed in registers... Also, some of the functions only have one or two parameters, so it really wouldn't help. Perhaps if there was a way to turn on C++'s notation for this:

```
int func( int /*unused*/, int used );
```

Thanks for the suggestions. I'll probably just stick with the old compiler for the rest of our cycle though since there's not much time left on our project.

Jay Stelly Tetragon

---

9/3/96 11:22 AM

Re: Warnings in new Compiler (CD 1.7)

Mike Fulton  
Development Env.

We've recently switched to the compiler on the 1.7 Programmer's CD. Now, the same compiler switches we were using generate additional warnings. While I don't want to disable warnings in general, there is one that I can't seem to work around:

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From what I see in the docs, it's my guess that this was supposed to work this way in the first place, and it is a fixed bug in this version, not a new feature. I don't know of any way to change it.

Let me make sure I understand "unused parameters" correctly. You have a function pointer that may point to either 'func1' or to 'func2' at various times, which are defined as:

```
int func1( int parm1, int parm2 ) { parm1 += parm2; return parm1; }  
int func2( int parm1, int parm2 ) { return parm1; }
```

And you get a warning for 'func2' since it does not use the 'parm2' parameter. Is that essentially it? If so, then like I said, I don't know any way to turn off the warning without turning off the other ones you want to keep.

If practical, however, you may wish to consider having these functions accept a single parameter which is a pointer to a structure or array with the real parameters. This will allow you to eliminate the warnings.

I'd also like to turn off the comparison between signed and unsigned warning on some files, but I'll cast that one away if I have to.

I don't know any way to do this except by casting either.

Jay Stelly @ Tetragon

---

9/3/96 6:07 AM  
Re: Warnings in new Compiler (CD 1.7)  
David Minogue  
Development Env.

Jay,

I haven't tried this on the PlayStation, but I've seen this trick used with other environments to get around the unused parameter warning:

At the beginning of your function, just place each of the unused parameters followed by a semicolon, like this:

```
void fn(int var1, int unusedVar2, int unusedVar3) { // dummy ref's to avoid compiler  
warning... unusedVar2; unusedVar3;  
// the rest of the function... }
```

If the compiler is doing its job, this shouldn't generate any code, and it explicitly documents that you are intentionally not using these variables.

-- David.

---

9/3/96 3:34 PM  
malloc / free  
David Goodenough  
Development Env.

Can 'o worms time :-)

Does anyone have a working malloc / free package that works with the 3.5 libs and the 1.7 compiler. The one that I had been using with the 3.2 / 1.5 pair generates "Bus Error on data reference" errors when I try to use it with 3.5 / 1.7.

To make matters worse, I'm doing C++ development, since I'm porting a C++ app written originally for the PC. Therefore malloc & free get used extensively for new / delete.

Yeah - I did skip the 1.6 compiler, for better or for worse. FWIW, 1.7 looks to be cool, I prefer getting all the warnings, since the more things that are wrong with my code that I get to hear about, the better.

---

9/3/96 11:36 AM

Re(2): Bad prototypes in 3.5 .h files

Axel Brown

Mike Fulton

Development Env.

Mike Fulton writes: To date, SCEI has not placed a high priority on C++ support, but we've been trying to persuade them that it is important and it looks like the next version of the libraries and header files will have some changes. This will include things like renaming the library "delete" function so that it doesn't conflict with the C++ delete keyword.

Excellent! Any ETA for the new libs? (I know "how long is a piece of string", right? Well, you can't blame me for trying :)

By the way, there will probably be something in the header file to define "delete" as a macro pointing to the new function name ONLY if you're not using C++. That way, old C code using the "delete" library function will just use the new code and require no changes, while C++ code will use the new function name.

Shouldn't be too much of a problem :)

We were confused by of your comments regarding prototypes. Specifically, you said for STRINGS.H that:

Eeeeeeeek! Busted! Yeah, those were typos. My apologies. I just wanted to give some examples of how easy it is to pick out these incorrect prototypes using the GNU compiler (well, it does come as part of the dev tools!! :).

Any idea why no importance has been put on C++ support? And how can I help you convince Japan that it is a high priority??

Axel

---

9/3/96 12:00 PM

Re(3): Bad prototypes in 3.5 .h files

Mike Fulton

Axel Brown

Development Env.

Mike Fulton writes: To date, SCEI has not placed a high priority on C++ support, but we've been trying to persuade them that it is important and it looks like the next version of the libraries and header files will have some changes. This will include things like renaming the library "delete" function so that it doesn't conflict with the C++ delete keyword.

Excellent! Any ETA for the new libs? (I know "how long is a piece of string", right? Well, you can't blame me for trying :)

Sometime in the fall is all I can guess.

By the way, there will probably be something in the header file to define "delete" as a macro pointing to the new function name ONLY if you're not using C++. That way, old C code using

the "delete" library function will just use the new code and require no changes, while C++ code will use the new function name.

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Eeeeeeeek! Busted! Yeah, those were typos. My apologies. I just wanted to give some examples of how easy it is to pick out these incorrect prototypes using the GNU compiler (well, it does come as part of the dev tools!! :)).

Any idea why no importance has been put on C++ support? And how can I help you convince Japan that it is a high priority??

Axel

First of all, I don't think that C++ is nearly as popular in Japan as it is here. Also, C++ has never really been a popular choice for console development because of the reputation it has for being inefficient and a memory hog. I don't know the background of our Japanese software engineers, but I'm sure that these combined to keep C++ a lesser issue as far as library support is concerned.

The inefficiency and memory hog issues really have more to do with C++ libraries than the language itself, so if you're not using a packaged class library they don't really apply. Plus, a lot of developers are porting games that were originally written in C++ for the PC. So a lot of developers have taken a second look at it.

I appreciate the offer of help in convincing Japan that C++ is important, and just a few months ago I would have taken you up on it. However, the situation has improved a lot recently. The difference in response regarding C++ issues from EMAIL messages earlier this year compared to the discussions we had when we visited Tokyo last month makes me very optimistic that we should get things mostly squared away in the v3.6 library release this fall.

Mike

---

9/5/96 10:26 AM

PCread file lock

Dan Chang

Development Env.

I just started using PCread to read in game data, and it works as advertised, with one weird side-effect: if I read a file in using PCread, and then later try to do something on my PC with the file I've read (like delete it, copy over it, rename it, etc.), I get a file sharing error, (the Abort, Retry, blahblah error).

Usually, all I need to is a RESETPS, and then I can manipulate the file on my PC, but sometimes I have to turn my computer off and on again to regain PC access to the file.

Ever heard of this? What can I do?

Here is the code I use to read the file:

```
#define BLK_VRAMSFX1 0x80400000 #define LEN_BLK_VRAMSFX1 854480 ... signed long file;
... file = PCopen("h:\\projects\\kt\\psx\\burn\\usa\\arctic\\vramsf1.blk",0,0); file =
PCread(file,(char*)BLK_VRAMSFX1,LEN_BLK_VRAMSFX1); PCclose (file);
```

Thanks,

David Brickhill Boss Game Studios

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9/5/96 12:16 PM

Re: PCread file lock

Mike Fulton

Development Env.

I just started using PCread to read in game data, and it works as advertised, with one weird side-effect: if I read a file in using PCread, and then later try to do something on my PC with the file I've read (like delete it, copy over it, rename it, etc.), I get a file sharing error, (the Abort, Retry, blahblah error). Usually, all I need to is a RESETPS, and then I can manipulate the file on my PC, but sometimes I have to turn my computer off and on again to regain PC access to the file. Ever heard of this? What can I do? Here is the code I use to read the file:

```
#define BLK_VRAMSFX1 0x80400000 #define LEN_BLK_VRAMSFX1 854480 ... signed long file;  
... file = PCopen("h:\\projects\\kt\\psx\\burn\\usa\\arctic\\vramsf1.blk",0,0); file =  
PCread(file,(char*)BLK_VRAMSFX1,LEN_BLK_VRAMSFX1); PCclose (file);
```

Thanks,

David Brickhill @ Boss Game Studios

I've tried to reproduce the problem you describe and cannot get it to happen. I've got a short sample program that demonstrates PCopen, PCread, PCwrite, PCseek, & PCclose, and I tried opening the file both with read-only access (mode = 0) and read/write access (mode = 2) but in neither case do I see the problem. I'm always able to edit the file, copy it, rename it, delete it, or whatever.

Are you sure that the file has been closed by the PlayStation code BEFORE you try to access it on the PC?

Are you certain the file has been opened only in one place by the PlayStation?

Finally, are you also sure that nothing else on the PC has been accessing this file?

What version of DOS and/or Windows are you running?

Mike @ SCEA

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9/5/96 4:46 PM

Re(2): PCread file lock

Dan Chang

Development Env.

I am sure that the file is closed before I access it on the PC (or at least I'm sure I'm calling PCclose). The code I gave you is exactly what I use. That is the only place I access the file in my Playstation code, and I'm sure nothing else on the PC is accessing the file. I'm running Windows 95.

Thanks for responding. I'll keep poking at it.

David Brickhill @ Boss Game Studios

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9/7/96 1:21 PM

Re: New development env. from Metrowerks

Peter Marx

Development Env.

> So, folks, now that Metrowerks has announced CodeWorks for the PlayStation, and promised several > other goodies, I have to ask .. does anyone have any past experience with the above company and / > or their products?? Whaddaya think, is this the light at the end of the tunnel, or just a flash in the pan?

> Dave

We've used their stuff since the company (metrowerks) was formed. It is certainly far and away the best dev. environment on the Mac and promises to be head and shoulders above the current system for the PSX.

Peter

---

9/9/96 11:48 AM

Re: PCread file lock  
Dylan Cuthbert  
Development Env.

Dan Chang writes: I just started using PCread to read in game data, and it works as advertised, with one weird side-effect: if I read a file in using PCread, and then later try to do something on my PC with the file I've read (like delete it, copy over it, rename it, etc.), I get a file sharing error, (the Abort, Retry, blahblah error).

Are you using Windows 95 or dos?  
If under dos then try running SHARE in your autoexec.  
Make sure you close the file after you read from it too.  
Dyl

---

9/10/96 12:16 PM  
Re: RAM - 2 megs vs. 8 megs  
Mike Fulton  
Development Env.

I am having problems with memory assignment. I assume that the CPE is stored at 0x80000000. Currently, my CPE is approx. 122K or 0x1DC90. I am placing 6 large textures into RAM at 0x8001DC90. They take up 0xE1000 (approx. 921K) amount of RAM. I then place some modelling data at 800FEC90.

How much do I have left? Do I have to reserve more room for the CPE or is it placed somewhere else?

My understanding is the developer's board for the PSX system has a total of 8 megs RAM for use by the developer, yet the PSX system itself has only 2 megs available to the developer. Can I place any piece of data into any section of this 8 megs? Is it one large chunk of RAM or is it split into several smaller segments?

Jesse B. Perrin

The 8mb of RAM is contiguous, extending from 0x00000000 to 0x007FFFFFFF. (That also maps to the logical address spaces of 0x80000000 to 0x807FFFFFFF and 0xA0000000 to 0xA07FFFFFFF.)

You can use the extra RAM however you want, but I think it would be a bad idea to place data here and use it directly. I would recommend you use it to hold data temporarily that gets copied to the regular 2mb of RAM when you need to use it, sort of like using a RAMDISK instead of reading the data from the CDROM.

The reason, of course, is that it would be very easy to get trapped into a situation where you're relying on having more than 2mb of RAM.

You don't specify how much space your model data takes, so I cannot determine how much room you have left. Prior to that, you have 0x101370 bytes remaining in the regular 2mb address space and 0x701370 bytes in the 8mb machine.

You'd probably be best off working from the top of memory down for your data, and from the bottom up for your program. That way you won't have any conflict so long as everything is small enough to fit.

Mike

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9/10/96 12:01 PM  
Fwd: RAM - 2 megs vs. 8 megs  
Mike Fulton  
Development Env.

I am having problems with memory assignment. I assume that the CPE is stored at 0x80000000. Currently, my CPE is approx. 122K or 0x1DC90. I am placing 6 large textures into RAM at 0x8001DC90. They take up 0xE1000 (approx. 921K) amount of RAM. I then place some modelling data at 800FEC90.

How much do I have left? Do I have to reserve more room for the CPE or is it placed somewhere else?

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Jesse B. Perrin

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9/10/96 12:24 PM

Re: Fwd: RAM - 2 megs vs. 8 megs

Brian Dawson

Development Env.

Dane wrote: I assume that the CPE is stored at 0x80000000.

The first 64k (0x10000) of memory is the system area. To avoid trashing this you must explicitly set the load (ORG) address beyond that area. This is done by passing the ORG address to CCPSX via a commandline parameter in the form -Xo\$80xxxxxx.

Brian Dawson

---

9/10/96 2:58 PM

malloc / free - a second time

David Goodenough

Development Env.

Guys - I am hurting \*BAD\* on this one - I am stalled till I get a resolution of the malloc free problem.

So again I ask:

Does anyone have a working malloc / free package that works with the 3.5 libs and the 1.7 compiler. The one that I had been using with the 3.2 / 1.5 pair generates "Bus Error on data reference" errors when I try to use it with 3.5 / 1.7.

Thanks in advance, dg

---

9/11/96 3:45 PM

Re(2): malloc / free - a second time

player 1

Development Env.

Well, since the malloc and free don't seem to work quite right in the Sony libraries (at least not in version 3.4 of the libraries), it's kind of a moot point to list it as an option. Tom Ketola PSX Lead Engineer

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9/11/96 9:46 PM

Re(2): malloc / free - a second time

Dylan Cuthbert

Development Env.

Mike Fulton writes:

Obviously, Sony has malloc & free functions built into the library and if you're not using those, then obviously you don't care for the solution we have available.

For some reason these either don't work or are too slow depending on which version of the libraries you are compiling with.

I use the 'other' sony endorsed memory management routines.. the ones in the directory /psx/beta/mmgm. These seem fast and more importantly they work (although for some \*unknown\* reason 'calloc' is ridiculously slow if you use snpatchj.cpe!!!??)

Dylan Cuthbert Senior Programmer Sony Interactive Studios America

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9/11/96 11:45 AM

Re: malloc / free - a second time

Mike Fulton

Development Env.

Guys - I am hurting \*BAD\* on this one - I am stalled till I get a resolution of the malloc free problem.

So again I ask:

Does anyone have a working malloc / free package that works with the 3.5 libs and the 1.7 compiler. The one that I had been using with the 3.2 / 1.5 pair generates "Bus Error on data reference" errors when I try to use it with 3.5 / 1.7.

Thanks in advance, dg

First of all, please don't call it "the 1.7 compiler", because that's not the right version number. The version numbers are 1.18 for the CCPSX shell and v2.7.2 for the compiler itself. I realize you simply meant the compiler on the 1.7 programmer's CD, but it has the potential for confusion.

Obviously, Sony has malloc & free functions built into the library and if you're not using those, then obviously you don't care for the solution we have available.

There are a few things on the BBS that other developers have posted. Sony doesn't endorse any of them, but you may wish to take a look. They are posted as attachments to messages (and you can find them by looking for the little file icons in the message list).

Have you tried fixing the malloc/free package you were using so that it works with the newer compiler? What is the problem, exactly? Is there some incompatibility with the 3.5 libraries, or is something in the new compiler? You may wish to double check the header files for anything used by the code to see what may have changed in the newer Sony stuff that would affect it.

I wouldn't expect it to be a library problem, because what library calls, aside maybe from memset, would a malloc/free package require?

And if it's just a compiler thing, then why not compile that module with the older version? And if it really broke just because of the new compiler, it's probably bad code that was slipping through the cracks before.

Mike

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9/12/96 9:14 AM

Re: malloc / free - a second time

Ayo A. Orimoloye

Development Env.

David Goodenough



David Goodenough writes:

Does anyone have a working malloc / free package that works with the 3.5 libs and the 1.7 compiler. The one that I had been using with the 3.2 / 1.5 pair generates "Bus Error on data reference" errors when I try to use it with 3.5 / 1.7.

I seriously don't think it's a malloc problem you're really having. I have used malloc and free for over a year with no problems on 3.5 and before. Usually when you get a "Bus Error on data reference" message, its because of a memory alignment problem. This occurs especially when you port a game from the PC (naughty!) . A structure like

```
typedef struct { char Works; long OnPC; }PCstruct;
```

could easily be 5 bytes on the PC depending on your compiler. One byte is used for the char, 4 bytes for the long. When compiled, the char is stored at address 0000 for example and the long at the next address 0001. On the PlayStation, all longs must be aligned so the structure SHOULD be 8 bytes. The long SHOULD be automatically stored at address 0004. Sometimes, it appears GNU C doesn't do this properly. In this case the long is erroneously stored at address 0001.

When any attempt is made to read this long, the Bus Error is generated. A good way to avoid this is to make sure ALL such structures are properly padded (looking at the sony structures such as TMDs, POLY\_FT4s, etc you will see how everything is explicitly padded so all shorts (2 bytes) are on even boundaries and all longs (4 bytes) are on word boundaries). Padding / alignment should not be left to the compiler. The above structure when porting to PSX becomes:

```
typedef struct { char Works; char now; /* pad 1 */ char on; /* pad 2 */ char psx; /* pad 3 */ long OnPC; }PCstruct;
```

This would never generate a Bus Error on any version of compiler or libraries.

---

9/13/96 12:57 PM

Forcing a stack frame

Thomas Rolf

Development Env.

Can anyone tell me the compiler option to force creation of stack frames for functions that would otherwise not create them? The reason: we would like to take advantage of the call stack browser in the debugger. Basically if a function does not have autovariables no frame is created and so you cannot walk up past that call.

Thanks in advance.

Tommy. VIE

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9/14/96 11:09 PM

Re: Forcing a stack frame

Mike Fulton

Development Env.

Can anyone tell me the compiler option to force creation of stack frames for functions that would otherwise not create them? The reason: we would like to take advantage of the call stack browser in the debugger. Basically if a function does not have autovariables no frame is created and so you cannot walk up past that call.

Thanks in advance, Tommy @ VIE

I don't think this feature exists in the MIPS version of the GCC compiler. The Advanced RISC Machine (ARM) version has the option "-mapcs" which is supposed to do the following: Generate a stack frame that is compliant with the ARM Procedure Call Standard for all functions, even if this is not strictly necessary for correct execution of the code.

But I don't think the MIPS version of the compiler has this same feature (or the equivalent using

a different option string). The manual does not say anything about such an option. Have you sent mail to SN SYSTEMS about this problem with call stack browsing?

Mike

---

9/16/96 12:05 PM  
Re(2): Forcing a stack frame  
Thomas Rolfs  
Development Env.

No, I have not contacted SN SYSTEMS, I thought someone else must have solved this already.  
Oh well.  
I'll contact andy and let you know what happens.  
Tommy.

---

9/17/96 1:15 PM  
Re(4): Forcing a stack frame  
Thomas Rolfs  
Development Env.

Brian Dawson writes: Your message was forward to SN systems, here is thier response: .... The C compiler should always create stack frames unless the -fomit-frame-pointer switch is invoked. We've tried a few experiments here to verify this, but if you could get us a sample of code plus the build sequence we'll investigate further.

Regards

Ian.

In addition to this information i have checked various documents on GNU CC and none list forces stack frame generation as an option for the MIP R3000. Have you verified the absence of stack frames for the pertinent functions?

We are using -fomit-frame-pointer for the Saturn version of our libraries (which I will be turning off the debug versions ) however for our PSX libraries we have never used that option. Still I will double check our stuff to make sure there is nothing I've missed. Maybe this is all related to the optimisation level? Eh maybe not, I just checked and we do not have optimisation on for the debug versions.

I'll get back to you if I find anything new.

Thanks for your help,

Tommy.

---

9/17/96 10:59 AM  
Re(3): Forcing a stack frame  
Brian Dawson  
Development Env.

Thomas,

Your message was forward to SN systems, here is thier response:

>>Can anyone tell me the compiler option to force creation of stack frames for >functions that would otherwise not create them? The reason: we would like to >take advantage of the call stack browser in the debugger. Basically if a >function does not have autovariables no frame is created and so you cannot walk >up past that call. >>Thanks in advance. > >>Tommy. > >If

you could provide me with an answer to this question it would be greatly >appreciated.  
Thanks in advance. >

The C compiler should always create stack frames unless the -fomit-frame-pointer switch is invoked. We've tried a few experiments here to verify this, but if you could get us a sample of code plus the build sequence we'll investigate further.

Regards  
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In addition to this information i have checked various documents on GNU CC and none list forces stack frame generation as an option for the MIP R3000. Have you verified the absence of stack frames for the pertinent functions?

Brian Dawson@SCEA

---

9/26/96 6:59 PM

You can look at D-Cache in the debugger  
Crystal Dynamics  
Development Env.

I was surprised to here at the developer seminar that people think that the debugger can't look at memory or variables in the D-Cache.

Just edit the dbugpsx.c00 file:

```
#readram0 add>> 1f800000 1f8003ff  
#writeram add>> 1f800000 1f8003ff
```

Adrian Longland Crystal Dynamics

---

9/29/96 2:51 AM

Re: You can look at D-Cache in the debugger  
Mike Fulton  
Development Env.

I was surprised to here at the developer seminar that people think that the debugger can't look at memory or variables in the D-Cache. Just edit the dbugpsx.c00 file:

```
#readram0 add>> 1f800000 1f8003ff  
#writeram add>> 1f800000 1f8003ff
```

Adrian Longland @ Crystal Dynamics

I must have missed that, because I don't recall anybody mentioning that during my talk on the program analyzer and optimization techniques. Was this during the GTE talk or one of the others? At any rate, I've asked SN Systems to take a look at this and add the scratchpad to the default allowable memory ranges, if that's not already the case.

Mike

---

10/1/96 12:07 PM

psx debugger  
Mark Harmon  
Development Env.

I am posting this message in regards to the debugger. Basically, I can not step through the source code when I am inside the debugger. When I try stepping through the source code, the register window(top) is responding, but the C source window(bottom) where my source code is located does not respond. The debugger also generates an error message "Target did not respond, Bus-Reset or Abort" when I use the "go" command. What do you think the problem is.

Everything seems to be responding including the monitor(it outputs graphics ) when I am stepping through the source code. But I just can not get the source code to respond. I would appreciate your response as soon as possible. Thank you very much!

---

10/1/96 12:32 PM  
psx debugger  
Brian Dawson  
Development Env.

Do you have a poll host call in your code? If not you should add one; preferably in your drawing/main loop. This allows the CPU and the debugger to sync more effectively. Also note: Pressing TAB while the FILE window is active, aligns the highlight to the current line. SN main is called before the program jumps to you main(), and while in SN main the executing code does not correspond to C source. You should specify your .SYM amd .CPE files as command line switches.

---

10/1/96 5:28 PM  
Re: psx debugger  
Montgomery Singman  
Development Env.

aslo- if you have selected some window other than the file window, single stepping etc. occurs at the assembly level.  
this means that you have to click on the file window for source level single stepping etc.

---

10/2/96 2:43 PM  
dmplx problems  
Bob Polaro  
Development Env.

i'm using the latest tool disk and when i try to psymake the sample program tuto5 in the sample\graphics\pmd directory i get the message  
dmplx undefined macro 000017ff  
i'm using version 3.01 dated 7/25/96

---

10/3/96 12:02 PM  
dmplx cont.  
Bob Polaro  
Development Env.

i also get an error : not in psylink file format - make aborted  
i can manually do dmplx tuto5.obj but not in the make file.

---

10/3/96 12:19 PM  
DMPLX problems

Jose R. Villeta  
Development Env.

I get the same errors as Bob Polaro and in addition I get another error: DMPSX: Too few DELAY SLOTS before the macro 00000d3f Any help!! Jose Villeta Black Ops

---

10/7/96 1:04 PM  
Windows Support  
Pat Quinn  
Development Env.

I notice there are some old messages talking about replacing DEXBIOS with native Windows drivers especially for Windows NT. I would love to see this. I prefer to run Windows NT as I have found it to be a much more stable environment. Also, we've noticed that even under Windows '95 putting DEXBIOS in our autoexec.bat causes us to have to run in MS-DOS compatibility mode meaning we lose our native SCSI driver support. If it is at all possible, this software should either migrate to Windows or be replaced with something that runs under Windows.

---

10/7/96 2:26 PM  
Re(2): DMPSX problems  
Brian Dawson  
Development Env.

Sounds like you guys aren't using the correct header/dmpsx combo. For DMPSX 3.01, you need to include inline\_c.h in C programs and inline\_a.h in assembly. You no longer need the inline.tbl file. I had some of the problems mentioned here when I compiled with the new DMPSX and the old 'inline.h' header file.

Jay Stelly Tetragon

I believe Jay has "hit the nail on the head" Give his suggestion a try. If that doesn't work either repost or send me an email. Thanks Jay.

Brian Dawson@SCEA

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10/7/96 12:49 PM  
Re: DMPSX problems  
Jay Stelly  
Development Env.

Sounds like you guys aren't using the correct header/dmpsx combo. For DMPSX 3.01, you need to include inline\_c.h in C programs and inline\_a.h in assembly. You no longer need the inline.tbl file. I had some of the problems mentioned here when I compiled with the new DMPSX and the old 'inline.h' header file.

Jay Stelly Tetragon

---

10/7/96 2:26 PM  
Re(2): DMPSX problems  
Bob Polaro  
Development Env.

thanks Jay. That seems to have solved the problem. I substituted inline.h with inline\_c.h and it works!

---

10/8/96 12:44 PM  
Re(5): Forcing a stack frame  
Thomas Rolfs  
Development Env.

Thomas Rolfs writes:  
I'll get back to you if I find anything new.  
Well, if anyone is interested, there is indeed a problem with the call stack feature of the debugger. SN Systems are looking into it though.  
Regards,  
Tommy @ VIE

---

10/8/96 10:38 AM  
Re: Windows Support  
Mike Fulton  
Development Env.

Pat @ NuFX writes:  
I notice there are some old messages talking about replacing DEXBIOS with native Windows drivers especially for Windows NT. I would love to see this. I prefer to run Windows NT as I have found it to be a much more stable environment. Also, we've noticed that even under Windows '95 putting DEXBIOS in our autoexec.bat causes us to have to run in MS-DOS compatibility mode meaning we lose our native SCSI driver support.  
If it is at all possible, this software should either migrate to Windows or be replaced with something that runs under Windows.  
Pat, cannot do much to help regarding the Windows NT thing, but I do have some information regarding Windows 95.  
The problem is that you are running DEXBIOS from the AUTOEXEC.BAT file under Windows 95. Because of the non-interrupt driven way it must communicate with the dev boards, it doesn't work.  
However, it is possible to make a setup that works fine under Win95. When running under Windows 95 you must execute DEXBIOS AFTER you run the DOS shell from the Windows desktop. Furthermore, you can only do this in one DOS shell at a time.  
We don't have a system setup with WinNT to try it, but maybe the same idea would work there.  
You might give it a try.

Mike @ SCEA

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10/8/96 10:15 AM  
Re: Windows Support  
Dylan Cuthbert  
Development Env.

Pat Quinn writes: I notice there are some old messages talking about replacing DEXBIOS with native Windows drivers especially for Windows NT. I would love to see this. I prefer to run Windows NT as I have found it to be a much more stable environment. Also, we've noticed that

even under Windows '95 putting DEXBIOS in our autoexec.bat causes us to have to run in MS-DOS compatibility mode meaning we lose our native SCSI driver support.

If it is at all possible, this software should either migrate to Windows or be replaced with something that runs under Windows.

Well, Psy-Q just went final with their windows 95 debugger/file server environment I think (version 1.5). Contact them to obtain a copy. It works very well indeed and gives you a nice scrollable output window for your printf's which is actually more useful IMHO than the debugger. It doesn't work very well with the CD emulator but it's fine for everything else.

---

10/9/96 1:58 PM

FlushCache() and overlays

Jay Stelly

Development Env.

At the developer's conference, it was suggested that we execute a FlushCache() before executing code in an overlay as follows:

```
SwEnterCriticalSection(); FlushCache(); SwExitCriticalSection();
```

We have been using overlays for several months. Adding this sequence to our overlay manager causes lockups in FlushCache(). Also, in the manuals it mentions that you should not call SwEnterCriticalSection() unless you are in a critical section (I assume this means you must call EnterCriticalSection() first). Adding this to our overlay code doesn't fix the lockups, and the printed example handed out at the conference doesn't call it either. Is it necessary? What is the correct way to flush the cache when loading/executing overlays ?

Jay Stelly Tetragon

---

10/9/96 2:59 PM

Re: FlushCache() and overlays

Brian Dawson

Development Env.

Jay Stelly Writes:

At the developer's conference, it was suggested that we execute a FlushCache() before executing code in an overlay as follows:

```
SwEnterCriticalSection(); FlushCache(); SwExitCriticalSection();
```

We have been using overlays for several months. Adding this sequence to our overlay manager causes lockups in FlushCache(). Also, in the manuals it mentions that you should not call SwEnterCriticalSection() unless you are in a critical section (I assume this means you must call EnterCriticalSection() first). Adding this to our overlay code doesn't fix the lockups, and the printed example handed out at the conference doesn't call it either. Is it necessary? What is the correct way to flush the cache when loading/executing overlays ?

We found that depending on it's placements, a call to EnterCritical- FlushCache would cause our test program to hang. Upon changing this call to SwEnterCritical, the code executed properly. We've been looking into this but we are still, as I stated at the Dev. Conference, not sure why. The difference between the two calls is that Sw.. implicitly disables interrupts by masking a Coproc 0 reg., while EnterCritical. generates an Syscall exception to turn off interrupts. Note that in our code, EnterCritical worked fine if called at the start of the child, anywhere else only SwEnter.. would operate successfully. Flushing the cache is suggested only to ensure that a call to overlay B, doesn't execute overlay A's code from the I-cache. Therefore if you take other steps to ensure the cache is invalidated between overlay calls, you needn't

worrying about flushing the cache. I apologize for my uncertainty about this issue, and will continue to look into it. If you find out more about this, or have any further question please contact me or repost to this section.  
Brian Dawson@SCEA

---

10/10/96 12:41 PM  
In-line assembly  
Dave Ross  
Development Env.

Hi-

I am trying to put some inline assembly in my C code and am having a hard time understanding the syntax. Here is an example of some code from Sony that puts the stack in D-cache:

```
__asm__ volatile("move $8,%0" ::"r"(addr):"$8","memory");\ __asm__ volatile("sw $29,0($8)" ::  
:"$8","memory");\ __asm__ volatile("addiu $8,$8,-4" :::"$8","memory");\ __asm__  
volatile("move $29,$8" :::"$8","memory");\
```

What do the ::, (addr), "memory", etc. all mean? Is there a document that explains the syntax?  
Thanks-

---

10/13/96 4:55 AM  
Re: In-line assembly  
Mike Fulton  
Development Env.

Hi-

I am trying to put some inline assembly in my C code and am having a hard time understanding the syntax. Here is an example of some code from Sony that puts the stack in D-cache:

```
__asm__ volatile("move $8,%0" ::"r"(addr):"$8","memory");\ __asm__ volatile("sw $29,0($8)" ::  
:"$8","memory");\ __asm__ volatile("addiu $8,$8,-4" :::"$8","memory");\ __asm__  
volatile("move $29,$8" :::"$8","memory");\
```

What do the ::, (addr), "memory", etc. all mean? Is there a document that explains the syntax?  
Thanks-

The GNUCC.TXT file on your programmer's CD should give this information, although it is scattered and difficult to follow. The main explanation is at around line 20880 or so. It's not something I'm an expert on, but I think I can give at least a basic explanation using one of these macros as an example:

```
#define SetStackAddr(addr) { \ __asm__ volatile ("move $8,%0"  ::"r"(addr):"$8","memory"); \  
__asm__ volatile ("sw $29,0($8)"  ::      :"$8","memory"); \ __asm__ volatile ("addiu $8,$8,-4"  ::  
:"$8","memory"); \ __asm__ volatile ("move $29,$8"  ::      :"$8","memory"); }
```

Let's walk through the macro first so we know what everything does. The actual assembly language is the obvious part of each line. The remainder of each line is used to tell the compiler certain things about what the assembly language was doing, so that it integrate this information into its code generation.

The first line grabs the address passed to the macro as the 'addr' argument. The second line takes the current stack pointer, contained in register \$29, and saves it to the address specified for the new stack. The 3rd line subtracts 4 from the new stack address to make room for the value it just saved. The 4th value sets the stack pointer to the result/

Again, using the first line as an example, the actual assembly language instruction here is the first part within the quotes: "move \$8,%0". Note that %0 is a placeholder for a parameter.



We'll get back to that in a moment.

The position after the first colon is used to list any outputs of the operation. These 4 instructions have no outputs (in this regard) so the second colon follows immediately afterwards. Whenever there are no outputs, the 2nd colon must come immediately after the first one.

The position after the 2nd colon is used to list the parameters. These are shown as C expressions preceded by a quoted code that indicates what type of parameter it is. So where it says (addr) is referring to the macro argument. I think (again, I'm no expert) that the following quote codes can be used:

"r" means a register is required "f" means a floating point register is required "g" (I don't know... but it's used in documentation examples) "0" means same thing as previous argument, one is input, other is output.

The position after the 3rd colon is used to specify the registers and memory which are modified by this operation. The "\$8" means register \$8 is modified. The "memory" shown here means that some portion of memory is modified (in this case, the top of the stack, where we're storing the old stack address).

Mike

---

10/21/96 4:47 PM

Linking libraries to overlays

Frank Shepenson

Development Env.

PREFSECT.ZIP 23K

Development Env.

Despite the information we received from Japan, this IS possible. A developer at the Chicago conference pointed us in the right direction. SN provides a utility, PREFSECT, which allows you to attach a prefix to sections of object modules and prevent them from being linked into the main text group. These unattached sections can then be placed in the group of your choice using the SECTION directive in your linker file. For overlays, the object module will be one or more PSYLIB extractions and the sections will go in the specific overlay group that needs them. This makes the parent program smaller and the overlay larger.

A question was asked specifically about LIBPRESS, so that's what is used in this example. Using the source code for overlays on the developers CD, take the following steps:

1. Use PSYLIB to extract libpress.obj, table.obj, and vlc.obj from libpress.lib
2. Place PREFSECT.EXE in your PSYQ directory
3. Replace the makefile and linker file with the attached files
4. Run PSYMAKE

You will now notice that overmenu.exe is about 70K smaller, since LIBPRESS has migrated to anim.bin. For more detail, compare the new map file to the old one. This is a pretty extreme example, and unless you happen to have some very large overlays, perhaps not very useful. It all depends on how you decide to allocate space between your parent and your overlays. I also split out LIBGS and linked it to rcube, although because of the sheer number of modules involved, it was more time-consuming. The steps were the same, the makefile and linker file were just a lot more ugly. The space saved there was about 16K.

Frank ps This utility was so obscure no one in the office knew of it, but it should be on the next CD

---

## GPU/GTE

3/17/95 12:54 PM

Re: texture cache question

Carolyn Wales

LIBGPU

My understanding of the texture cache, from extensively questioning some of the engineers from the UK, is that VRAM is divided up into 32 byte groups, and the group (starting with the pixel on a 32 byte boundary) is placed into the cache as a whole. So no, the missed pixel does not end up as the first pixel in the line.

hope it helps.

--Carolyn

---

3/17/95 10:26 AM

texture window (how do I repeat a texture over a polygon?)

Sam Black

LIBGPU

I've seen the sample code to set up a texture window, but I haven't seen anything on how to use it. What I need to know is how to specify U,V coords for a polygon in order to make the texture in the window wrap n times over a single polygon.

---

3/21/95 4:04 PM

Re(3): more on fog

William Botti

Scott Berfield

LIBGS

The PlayStation is an awesome game system with tons of features and library support. If you've ever actually programmed on the SNES,Genesis, etc. you would count your blessings to work on PSX. Make a game. Will Botti @black\_ops.com

---

3/21/95 4:04 PM

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3/22/95 5:27 PM

TMD2PMD code meanings

Bill "Angus" Guschwan

LIBGTE

>>The problem I'm having is when I look at the "code" field of the rendering >>packets. These PMD models have a "code" value of 0x2f when a POLY\_FT4 should >>have a code value of 0x2c. It appears that the lowest two bits are set, >>and I can't figure out why. The "code" value of a PMD file created by tmd2pmd.exe is just only copied from a TMD file. I read a "test.tmd" what you send to us. The TMD file contains four primitives and each primitive contain same "mode" field. The "mode" value is 0x2f030709. 0x2f is the "code" value. By the way, the tmd2pmd.exe has a option -notge for force set to zero the TGE bit in a PMD file.

---

3/22/95 8:02 PM  
GPU Clipping  
Administrator  
LIBGPU

> Subject: [tech-support 66] GPU polygon clipping > > Dear Kaol, > > Perhaps you can help me with this GPU question. > > [GPU] > > - Can you tell me the exact conditions in which a polygon clipped by > the GPU will not be displayed at all? > > - How does the GPU decide when to not draw a polygon? > > Thank you for your help. > > Allan.  
Condition in which a polygon will not be displayed at all: (x,y) ----- | | |  
Drawing | | Polygon |h | | | | ----- w  
if (w > 1023 || h >= 511 || abs(x) < 1023 || abs(y) < 1023 || abs(x)+w < 1023 || abs(y)+h < 1023) { polygon is fully clipped; }  
=

---

3/22/95 8:01 PM  
What is RotSMD & RotRMD?  
Administrator  
LIBGTE

> Subject: [tech-support 81] Re: [answer 41] Re: MargePrim & GPU > > Allan, > > here are my notes on rmd & smd. > > angus > > RotRMD calls RotTransPers and an AverageZ3 on the PMD data, as well as a sort > and add to the order table. > > RotSMD calls RotTransPers, NormalClip (for backface clipping), and AverageZ3 on > the PMD data, as well as a sort and add to the order table. > > RotPMD calls RotTransPers, NormalClip (for backface clipping), and AverageZ3 on > the PMD data, as well as a sort and add to the order table, but it only does a > NormalClip if you pass a fifth parameter as 1 into it. > > The R3000 only supports 4 registers, the fifth goes to the stack. Stacks are > bad: they take memory hits you know, and they are slow. We don't want slow > games. So they wrote these 2 routines, I surmise, to give you a backclip > version and a non backclip version of the RotPMD routines. So you don't really > need RotPMD anymore.  
RotPMD, RotSMD, RotRMD are usually used for a block data which has many polygons. It means these functions loops many times in it. Therefore the overhead of stack read/write for arguments is not heavy. The main reason of speed up is elimination of conditional branch. RotSMD, RMD speed up 5% from RotPMD. If you want small codes than 5% faster codes, Please use RotPMD.  
> There is a PMD folder in the Graphics folder that Unni is putting on the BBS > that shows how to do this. They can look at TUTO0.c. > > angus

---

3/22/95 7:42 PM  
Even more margeprim  
Administrator

LIBGPU

> Thank you for the interesting news about MargePrim(). > However, I have even more questions about this process. (!) > > [GPU Hardware] > > - Are you certain that the GPU has only 16 words of buffer? > > I have used MargePrim() to put together 5 SPRT\_16. > This combined primitive has a length (with getlen()) of 19. > However, these 5 sprites draw ok onscreen. > But, when I combine 6 SPRT\_16, the sprites do not draw properly. > 6 SPRT\_16 have a length of 23. > > - I looked at the source code for MargePrim() and it checks > the combined size of primitives is not more than 32, not 16. > Is this 32 words?

Sorry, Source code is not correct. FIFO is 16 long words ^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^

Even if the 19-words primitive works, it's because you are just lucky.

> - Does the 16 words on the GPU include the tag words (PRIM\*) > of the primitives? Yes.

> - MargePrim() sets the tag word of the primitives which have > been added zero. Is it possible to miss out these zero words > in the packet of data that goes in the GPU buffer? >

> Eg with MargePrim(), the packets are like this: > > Prim 1 Tag > Prim1 data (SPRT or whatever) > Prim 2 Tag (== 0) > Prim2 data (SPRT or whatever) > Prim 3 Tag (== 0) > Prim3 data (SPRT or whatever) > .. > .. > .. > > But could you construct the packet like this and have the GPU > draw it ok? > > > Prim 1 Tag > Prim1 data (SPRT or whatever) (no tag) > Prim2 data (SPRT or whatever) (no tag) > Prim3 data (SPRT or whatever) (no tag)

It will not work in some cases.

---

3/22/95 5:28 PM

Re: TMD2PMD code meanings

Bill "Angus" Guschwan

Bill "Angus" Guschwan

LIBGTE

Hi, Angus.

I asked in Japan about ABE bit of PMD.

noda --- > Is there -noabe flag?

There isn't -noabe flag. But ABE bit is a semitransparency flag. If you want to set 0 to this bit, you should change the attribute of original RSD file. Then ABE bit of PMD file will be 0.

Actually, TMD file that you sent to me was semitransparency.

---

3/28/95 2:10 PM

Re: Unreadable msg in this conference

Ian McGee

LIBGPU

Not the answer you're looking for (probably), but you can select the message and then use the menu Message Unread option to clear the red flag.

---

3/28/95 11:08 AM

Unreadable msg in this conference

Dave Ross

LIBGPU

I hate to be nit-picky, but there's been a msg in the conference since 1/31 from Christopher Deel that I can't read because it hasn't been approved by someone there...so even if there are no new

msg's I get the little red flag indicating that there's still an unread msg. Can you approve that so I can turn off the msg flag?

---

3/28/95 2:41 PM

Re: Unreadable msg in this conference  
Administrator  
LIBGPU

Fixed it.  
Angus

---

3/29/95 3:49 PM

GPU Thread with Suzu  
Bill "Angus" Guschwan  
LIBGPU

Here is a thread about gpu. Hope it provides some insight. Read through it all because I make some statements that are wrong and are corrected by Suzuoki-san.

Angus

QUESTION 1 RESPONSE 0 Suzu > >Can we get a new libgpu command called ProcessNextQueueItem? We basically want >to have a straight call to Exeque. Currently, only LoadImage and DrawSync call > exeque. Thanks. >

Your request is because of slow LoadImage(), isn't it? If LoadImage() is slow because of slow interrupt, it will be faster when you flush command queue and call GPU\_exeque straight.

But in this case, when you write:

LoadImage(rect0, p0); LoadImage(rect1, p1); LoadImage(rect2, p2); LoadImage(rect3, p3);  
the 2nd LoadImage have to wait until 1st LoadImage is over. Is it OK? I think it is ok since it is a 2D-type game and overhead of CPU is not so problem.

If so, it is no problem to add the following function:

1) flush all queue to suppress interrupt that occurs when the command ends 2) execute LoadImage directory not using command queue

But basically I have some questions.

I suppose the team uses so many sprite patterns that all texture patterns can't be on Frame Buffer at the same time. If so, they have to swap the texture patterns between Frame Buffer and Main Memory. But they find LoadImage() is very slow, and they ask you, and you ask me why. Then I answer it is because of slow interrupt handler. At that point I didn't know anything about the 2d game, so I guess simply that some users want to draw a dot (1x1) or something using LoadImage() and complain the speed of it.

If I write a program such as a 2d game, I will swap the image data by texture page size.(64x256 if 4bit). In this RECT size, the overhead of interrupt is not so large. In this case, even if they call exeque() directly, the speed may not be so faster.

Worst case is that there is any other reasons of slow LoadImage, and that these effort turns out no means.

So if you have more detail information about this, please send me. It will help us very much.

I want to know is: \*Do you want to use exeque() because of LoadImage is slow? \*How is the image size you translate by LoadImage at 1 time. (8x8 or 256x256 or 1x256 or 256x1 .. etc)

It is easy to add functions that control queue directly. but it may not be a solution.

RESPONSE 1 Angus \*\*\*\*\* \*Do you want to use exeque() because of LoadImage is slow? I) My answer is YES and NO.

1) I don't want exeque for this developer because LoadImage is slow. I want it because of the following scenario. If you have a large image followed by 4 smaller images in the GPU queue, then the large image might finish and you won't load the rest of the images until the DrawSync

is called. Like the following, a) Large character b) Medium image c) Small image d) Small image e) Small image f) Small image

So you waste all the time until the DrawSync when all 4 of those images could have been drawn before the DrawSync. That is why: he is wasting CPU time. There are also other situations where it would help.

2) However, a second developer needs to know if you make LoadImage faster. Can you tell me if LoadImage slow interrupt will be fixed? Can I get the "flush queue/suppress interrupt/loadimage" directly for them?

3) Also, how fast is a LoadImage? Can it copy 60 Meg / sec? They can only move about 128k/s.

RESPONSE 2 Suzu 1)\*\*\*\*\* Thank you for your reply. But I have some more questions.

If you want to load all data, you can write as follows:

```
RECT rectA; /* for Boss character in mkIII */ RECT rectB; /* for 160x160 Character like Kano */
RECT rectC; /* for 40x44 blood flying */ RECT rectD; /* for 40x44 blood flying */ RECT
rectE; /* for 40x44 blood flying */ RECT rectF; /* for 40x44 blood flying */
LoadImage(&rectA, pA); LoadImage(&rectB, pB); LoadImage(&rectC, pC);
LoadImage(&rectD, pD); LoadImage(&rectE, pE); LoadImage(&rectF, pF);
All LoadImage() is queued and there is no lock. If you flush the queue each time, this sequence
is as same as:
```

```
LoadImage(&rectA, pA); DrawSync(0); LoadImage(&rectB, pB); DrawSync(0);
LoadImage(&rectC, pC); DrawSync(0); LoadImage(&rectD, pD); DrawSync(0);
LoadImage(&rectE, pE); DrawSync(0); LoadImage(&rectF, pF); I think it takes much CPU
time.
```

And If you have a large image followed by 4 smaller images in the GPU queue, then the large image might finish and you won't load the rest of the images until the DrawSync is called. you can write such as: LoadImage(&rectA, pA);

```
/* CPU executes other process * (during LoadImage is running in background) */
/* when you want to load another 4 images */ DrawSync(0); LoadImage(&rectB, pB);
LoadImage(&rectC, pC); LoadImage(&rectD, pD); LoadImage(&rectE, pE);
LoadImage(&rectF, pF);
```

2\*\*\*\*\*

I am afraid it takes time to fix the slow interrupt. Therefore in this case (worst case):

```
load_many_dots(void) { RECT rect; u_short p[2][2];
rect.w = 2; /* 2x2 very small rect */ rect.h = 2; for (rect.y = 0; rect.y < 512; rect.y++) for
(rect.x = 0; rect.x < 1024; rect.x++) LoadImage(&rect, &p); DrawSync(0); }
```

In this example 1 interrupts occurs by calling 1 LoadImage() (total 1024x512 times). But each LoadImage() loads only 4 pixels, So interrupt overhead appears to be very heavy.

In last my mail I said that I will add the flush-queue-function, but if we can flush all queues, I find "load\_many\_dots()" is slow yet, because interrupts occurs even if all queue is empty.

Therefore I think what you need is to kill the all queue function instead of controll queue itself. Is it right ?

For example:

```
ChangeGraphQueue(0); /* disable queueing */ LoadImage(); /* No queueing */ LoadImage();
/* No queueing */ LoadImage(); /* No queueing */ LoadImage(); /* No queueing */
ChangeGraphQueue(1); /* enable queueing */
```

Then 4 LoadImage() never incurs interrupt and interrupt overhead will be vanished. (But 2nd LoadImage is suspended until 1st LoadImage() is finished.)

3\*\*\*\*\* The speed of LoadImage is average 60 MB/sec. But since LoadImage is running when Main Bus is idle, it may take more time if CPU is running with heavy memory access.

128k/s means 128KB/sec ? That's incredible. If so, it is too slow. it is about 10 times slower than what we image. It must be some other reason. Please send me the program if you have. It will help us much.

RESPONSE 3 Angus From what I understand, the exeque function is only called when you call DrawSync or LoadImage or when DMA is finished. If you call LoadImage on a large image, the next image will not be executed until you call DrawSync. Is that correct? If that is true, then

DMA is idle until you call the next DrawSync(). I need a detailed explanation of how the GPU works.

\*\* What exactly happens when LoadImage() is finished? Is the next queue element executed immediately, or does it need to wait for an exeque?

We have 3 cases:

1) DMA time is lost; CPU time is full. Example: LoadImage(&rectA, pA); LoadImage(&rectB, pB); LoadImage(&rectC, pC); LoadImage(&rectD, pD); LoadImage(&rectE, pE); LoadImage(&rectF, pF);

All LoadImage() is queued and there is no lock.

2) DMA time is full; CPU time is lost Example: LoadImage(&rectA, pA); DrawSync(0); LoadImage(&rectB, pB); DrawSync(0); LoadImage(&rectC, pC); DrawSync(0); LoadImage(&rectD, pD); DrawSync(0); LoadImage(&rectE, pE); DrawSync(0); LoadImage(&rectF, pF);

3) DMA time is full; CPU time is full LoadImage(&rectA, pA); ExecuteNextQueueElement(); if previous LoadImage is going return else start next dma

RESPONSE 4 > >>From what I understand, the exeque function is only called when you call > DrawSync or LoadImage or when DMA is finished. If you call LoadImage on a large > image, the next image will not be executed until you call DrawSync. Is that > correct? If that is true, then DMA is idle until you call the next DrawSync(). > I need a detailed explanation of how the GPU works.

If you call LoadImage on a large image, the next LoadImage will be executed immediatly after the 1st image translation is done.

> \*\* What exactly happens when LoadImage() is finished? Is the next queue element > executed immediately, or does it need to wait for an exeque?

The next queue element is executed immediatly because exeque() is called by callback of end of the Memory-GPU translation. > > 3) DMA time is full; CPU time is full > LoadImage(&rectA, pA); > ExecuteNextQueueElement(); > if previous LoadImage is going > return > else > start next dma >

This is automatically done in default.

---

3/31/95 3:15 PM

ratan2

Brian Greenstone

LIBGTE

This is probably a stupid question, but what does the function ratan2 do? It takes x & y as input. Does it return the angle of the vector x/y?

On a related note, what is ccos if rcos is arc-cosine? Is it just normal cosine?

-Brian

---

3/31/95 3:13 PM

\_NOM info

Dave Ross

Bill "Angus" Guschwan

We've investigated using the NEW-FAST! \_NOM calls that first appeared in lib2.6 and have decided we'd have to do expend an enormous amount of enery and time to try to figure out how to use them (things like what registers hold the results). You must have some doc's on these things by now. No?

---

4/1/95 7:25 PM

Re: ratan2

Jim Guerard

Brian Greenstone

LIBGTE

1: rcos, rsin() The rsin() and rcos() functions are the normal sine and cosine functions, not arc-sine and arc-cosine. These functions return unit values ranging from -1 to +1. Many applications must multiply the return values to get meaningful results, and that is often the radius of a circle. So a good way to think of it is that the 'r' in rcos() stands for radius. Also, for faster execution, these routines use fixed point arithmetic. The full unit value returned is not really 1, but 1 shifted up 12, or 4096, so return values are shifted down 12 AFTER they are multiplied by some scale factor. Here is a simple example of how to use these routines to make a display object (in this case the letter 'h') follow a circular path on the screen. The radius is 40, and the center is at 50, 60. This is called once per frame.

```
static int test_angle;
```

```
void test_circle(void) { int x,y;
```

```
    test_angle += 16;
```

```
    x = (40 * rcos(test_angle)) >> 12; y = (40 * rsin(test_angle)) >> 12;
```

```
    display_text(x + 50, y + 60, "h"); }
```

2: ccos() and csin(). These routines seem to do the same thing as rcos() and rsin().

3: ratan2(). This routine is the normal arc-tangent function, which returns an angle given the x, y coordinates. For example if a game AI knows the delta X and delta Y between a good guy and bad guy, it can calculate the angle between them with arc-tangent(y/x). Remember that arc-tangent takes y/x, not x/y as you stated. It really doesn't matter as long as you pass the parameters in the correct order ... ratan2(y, x). This routine returns the angle ranging between -2k and +2k. If you prefer you can mask the result with 4095, to get a full circle of angles from 0 to 4095.

Mike Gomez @ PF. Magic1: rcos, rsin() The rsin() and rcos() functions are the normal sine and cosine functions, not arc-sine and arc-cosine. These functions return unit values ranging from -1 to +1. Many applications must multiply the return values to get meaningful results, and that is often the radius of a circle. So a good way to think of it is that the 'r' in rcos() stands for radius. Also, for faster execution, these routines use fixed point arithmetic. The full unit value returned is not really 1, but 1 shifted up 12, or 4096, so return values are shifted down 12 AFTER they are multiplied by some scale factor. Here is a simple example of how to use these routines to make a display object (in this case the letter 'h') follow a circular path on the screen. The radius is 40, and the center is at 50, 60. This is called once per frame.

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---

4/3/95 2:44 PM

Dividing Polygons

Brian Greenstone



LIBGTE

Anyone gotten the DivideF3, DivideFT4, etc.etc. routines to work yet? Got any ideas what all the parameters are?

-Brian

---

4/4/95 10:23 AM

Re: MIME Overview

Robert w. Calfee

Bill "Angus" Guschwan

LIBGTE

The guys from England were suggesting that the MIME operation could be used to interpolate angle data for animating skeletons. Is there a tool for extracting angled motion from animated 3d figures and storing it in a MIME usable format.

rwg

---

4/4/95 1:18 PM

Re(2): MIME Overview

Bill "Angus" Guschwan

Robert w. Calfee

LIBGTE

There are a few tools.

One is mimefilt which will allow you to get the data out of it that you need. It is a dos tool and is primitive.

The other tool is a nichimen graphics SGI tool which is supposed to be very robust and cool for doing MIME.

Angus

---

4/5/95 11:33 PM

Re(4): MIME Overview -- Tools list request

William Botti

Dave R. Scheele

Bill "Angus" Guschwan

Count me in on the Mime SGI tool distribution list. Sounds like a tool I'd actually enjoy writing.... SURE IT DOES! (interpret in Jerky Boy mode) WB Coding

---

4/5/95 6:55 AM

Re(3): MIME Overview -- Tools list request

Dave R. Scheele

Bill "Angus" Guschwan

LIBGTE

AG> There are a few tools. AG> One is mimefilt ... AG> The other tool is a nichimen graphics SGI tool ...

Is there a list somewhere of all the tools available from third parties, for all platforms (PC, SGE, etc.)? I seem to be missing out on some things which could be a great help. Can you make such a list if there isn't one available? (and if you could spare the time!)

Dave

---

4/6/95 10:30 AM  
is there a funtion that ...  
Sam Black  
LIBGTE

Is there a libgte function which will transform a point, do perspective conversion, and return the 2D screen coordinates AND the 3D transformed coordinates? This would be an EXTREMELY useful function. Alternatively, is there any way I can use RotTransPers and still get the non-perspective converted 3D point from the GTE?

---

4/8/95 6:30 PM  
TMD or AddPrim  
Gene Sewell  
LIBGPU

I'm just getting started on a game on the Playstation, and would like some basic advice. I'm creating polygonal terrain. As the player moves through the world, I will be creating a new set of polygons with each frame. There is no single TMD type model. My question is, when I'm creating all these new polygons, should I be creating a TMD structure or PMD structure - allowing me to use LIBGS, or should I stay at the level of AddPrim doing all the low level work myself. I am interested in both the question of speed of rendering, and in general power. The high level functions in LIBGS are attractive, but the overhead (and hassle) of creating these encoded structures must add a lot of overhead. I anticipate these rendering lists (TMD or PMD) will be rather large.

What would you suggest?  
Thanks  
Gene Sewell

---

4/11/95 7:26 PM  
Ask libgte q's now!  
Bill "Angus" Guschwan  
LIBGTE

If anyone has hard gpu questions, oka-san (libgte software engineer from Japan) is here this week so go ahead and ask them. It has to be this week or miss out. The person who asks the best question will get absolutely nothing. Well, maybe we'll give you a tshirt or something.  
angus

---

4/11/95 7:25 PM  
Hard GPU Questions  
Bill "Angus" Guschwan  
LIBGPU

If anyone has hard gpu questions, suzuki-san (libgpu software engineer from Japan) is here this week so go ahead and ask them. It has to be this week or miss out. The person who asks the best question will get absolutely nothing. Well, maybe we'll give you a tshirt or something.  
angus

---

4/12/95 9:24 PM

Texture mapping support

Jim Guerard

LIBGPU

Suzuoki-san,

We would like to discuss the infamous texture mapping problem, and with regards to that, possibly make a humble request for addition library support.

1: Three sided polygons - The problem with 3 sided texture-mapped polygons is that the entire surface of the destination display poly is mapped from the source texture poly with the same scale factor throughout. For example, consider a polygon with its base horizontal and its height vertical, the initial (texture-source to display-destination) scale factor would be set according to the ratio of the bottom horizontal sides of both (source and dest) polys. This scale is only correct for the bottom horizontal scan of the triangles. An accurate approximation for texture mapping would necessitate changing the scale factor for each successive horizontal line. This would give very good results without having to actually interpolate for overlapping pixel colors.

2: Four sided polygons - Apparently the Sony Playstion hardware does not actually support 4-sided polygons. The library software separates each 4 sided polygon into two 3-sided polygons. When a 4-sided rectangular polygon is rotated about the X or Y axis, it gets perspective scaled, and is no longer composed of two similar triangles. The quadrangle should get texture mapped starting with a scale factor at one side, smoothly changing to completion with the scale factor of the opposite side. Of course what really happens is that the quadrangle is broken up into two triangles, again each with a (different) single scale factor throughout. Somewhere in the bowels of the Sony system lies the ability to apply a scale factor to a single horizontal line of source texture, and map that between a pair of arbitrarily oriented 2d destination points. Only the Sony engineers can tell us how deeply this functionality is embedded in the hardware, and only the Sony engineers can provide better texture mapping library routines. Even if every last detail is done in hardware, it is still possible to provide this support. The worst case would be for every single line of a triangle to be independantly scalable by converting that line into a polygon that has two of its three points equal.

We would like to request a set of auxilary routines, which would be slower, but more accurate than the existing routines. We would then be able to use the faster routines for certain polygons, and the accurate routines for a subset of high profile polygons and polygons with straight lines. This would be a tremendous help to us and certainly many other developers. This would also be a great advantage to Sony as well, because higher quality games would directly support the hardware platform.

Thank you for your consideration,

Mike Gomez - PF. Magic

---

4/12/95 3:01 PM

Re: Hard GPU Questions

Blake E. Senftner

LIBGPU

Suzuoki-san:

This question has been getting a series of different answers, depending upon who is being asked. Therefore, I'm going to word the question very carefully:

This question concerns the operation of the GPU texture cache.

Lets assume that I have a POLY\_FT4 that I want to render. This primitive has been initialized to a texture page, and has U,Vs that range between the values of 7 and 17. For this primitive, it does not matter what the bit depth is, because the 7 to 17 U,V range is small enough to be less then texture cache sized for any bit depth.

When rendering this primitive, the first pixel that needs to be rendered is at texture page location 7,7.

My concern is when the texture cache is filled, only a limited number of operations can be taking place:

1) will the texture pixel at 7,7 become the left most pixel in the texture cache?

2) will VRAM scanline 7 of the texture page be loaded? (the data loaded contains the desired pixel, but for optimized loading, VRAM data is loaded along some word/long-word/scanline boundary.)

Additionally, texture cache has always been described as a 2D rectangle of space:

4 bit 64 by 64 texture pixels 8 bit 64 by 32 texture pixels 16 bit 32 by 32 texture pixels

When the above POLY\_FT4's 1st texture pixel is loaded, as described above, is texture pixel 7,8 automatically loaded also? Much like my question number 2, when texture data is cached, is there a vertical boundary that is maintained?

Another wording of question 2 would be:

If the POLY\_FT4 in question is using the 8-bit texture mode, the use of cache boundaries for loading of data might cause texture data from 0,0 to 63,31 to be loaded into the cache for the rendering of data with U,Vs in the range of 7 to 17. Is this correct?

While another wording of question 1 would be:

If the POLY\_FT4 in question is using the 8-bit texture mode, when the 1st texture pixel located at 7,7 is cached, the area 7,7 to 70,38 is loaded into the texture cache. Is this correct?

Finally, the described POLY\_FT4 will be rendered from a single VRAM read, correct? All the needed texture pixel data is loaded with the first read, so no further reading is required, correct?

I thank you for your quality GPU design, and look forward to using the answers to these questions so that I may use the Playstation to limits of its capabilities.

-Blake

---

4/12/95 10:48 AM

Re: Hard GPU Questions

Dean M. Grandquist

LIBGPU

How does the texture cache work, in detail? What is the cache line size? Is it direct mapped? ect

...

Thanks --Dean Spectrum HoloByte deang@holobyte.com

---

4/14/95 6:33 PM

Re: TMD or AddPrim

Dave Ross

LIBGPU

I'd like to see the general question of GSLIB speed (TMD & PMD) vs. addprim... added to the list of LIBGPU-expert questions. So far, in our tests, the GSLIB PMD routines have been faster than parsing a PMD and making calls to addprim. We haven't exhausted our efforts in this regard, but early indications favor the LIBGS routines. Does the LIBGPU expert have any comments?

---

4/14/95 6:27 AM

Re: Ask libgte q's now!

Sam Black

LIBGTE

Well, I still have some questions pending both here and in the gpu conference...  
Also, any information which is available concerning the speed of the ClipXXX family of gte functions would be very valuable.

---

4/19/95 2:25 PM

Re: \_nom routines

Dan Burnash

Brian Greenstone

LIBGTE

Try using read\_sxxy0 if all you want is the first value. read\_sxxy0, read\_sxxy1, and read\_sxxy2 are all defined in libgte.h so you can pick and choose which values to read. You won't see as much of a speed improvement because you are using the d-cache for your stack, but this way you won't use the stack at all. If you don't have these macros defined in your libgte.h, get the 3.0 library files and look again.

---

4/19/95 7:55 PM

Re(3): \_nom routines

Bill "Angus" Guschwan

Brian Greenstone

Dan Burnash

You need to use gnu in line assembly.

```
asm("read_sxxy");
```

angus

---

4/19/95 4:58 PM

Re(2): \_nom routines

Brian Greenstone

Dan Burnash

LIBGTE

The read\_sxxy0 call is an assembly macro, not a C function. My routines are all in C, so I need to use the C function ReadSXSXYfifo, and the only option is to return 3 values, 2 of which are garbage. This also applies to the ReadSZfifo call to get the OTZ value. It too returns 3 values even though I'm only calculating 1 coordinate.

-Brian

---

4/19/95 11:02 AM

Polygon Clipping

Mark Slemko

LIBGPU

Has anyone encountered a situation where mathematically the camera is quite far from an axis aligned vertical polygon, yet the polygon is entirely clipped out? I am unsure, but it seems to be a problem with the fore clipping plane set too far away. I have used GSForeClip to set the fore clipping plane to 1 but this seems to have no effect. If I set the fore clipping plane to 0 strange things understandably begin to happen. Is there a solution? Do the polygons have to be made smaller? Help!

Alex Garden @Radical Entertainment.

---

4/19/95 10:30 AM

\_nom routines  
Brian Greenstone  
LIBGTE

If I do a RotTransPers\_nom, I should only get back one XY value, but there is only one call - ReadSXSyfifo - and it returns 3 XY values. Is it really going to be faster to call RotTransPers\_nom, then call ReadSXSyfifo which returns unnecessary data, than it would be to just call good ole' RotTransPers??? I'm really not sure where the speedup is supposed to be coming from with the \_nom routines especially if my stack is in the d-cache.  
-Brian

---

4/21/95 3:58 PM

Re(6): \_nom routines  
Brian Greenstone  
Bill "Angus" Guschwan  
Dan Burnash  
Ummm.... Is it really a good idea to tell it to ignore level 2 warnings? Sounds like a bad idea to me.  
-Brian

---

4/21/95 6:57 PM

Re(7): \_nom routines  
Administrator  
LIBGTE

Martin Day will be here next week from SN system. Please propose an alternative to -2 ccpsx.  
Angus

---

4/21/95 6:39 PM

Re: Texture mapping support  
Administrator  
LIBGPU

We are supplying perspective mapping in the next version of the library 3.01. Look for that. It will be slower, but as you say, it gives you the option. As for scaling, that is interesting and I gave it to them. I will try to find out about the hardware on that point. Cool.  
Angus

---

4/21/95 6:43 PM

Re: Polygon Clipping  
Administrator  
LIBGPU

The World Coordinate system is 32 bit. The object coord is 16 bit. You have to do an absolute object coordinate transform from object to world. You can not do a relative object coordinate transform or clipping to the 16 bit world will occur. This is a common developer error. The largest object is 16 bit, but the placement in the world is 32 bit. That is why RotTrans is a 16 bit

rot, and a 32 bit trans.

For 2D clipping, 1024 is the magic number. If your poly is greater than 1024 or the y or x plus object size is greater than 1024, you will get clipping. Check bits 13, 14 of flag for that. I paste the flag bit talk below.

Flag return from RotTransPers....() Functions. -----

--

There follows a description of the flag bits returned from certain GTE routines, such as perspective transform functions. Flag can be used for clever clipping and so on. In short, the flag tells you if certain GTE operations overflow or underflow. If the flag is not 0, then there is an error somewhere in the GTE. Simple, huh?

To understand the flag, you need to understand how the GTE works. Effectively, the GTE is coprocessor which consists of 3 MACs in parallel (MAC1-3) and a final MAC (MAC0) which is responsible for doing perspective divisions and translations. The 3 MACs run in parallel, perform the vector multiplies and divides, and have 12 bit precision. Their inputs are registers which you set with SetRotMatrix etc. MAC0 has 32 bit precision.

For example, to perform a RotTransPers, you load up the Rot and Trans matrices, then you call the RotTransPers. In the GTE, the 3 parallel rotations are performed and the intermediate results are written out to intermediate registers (IR registers). Then, these IR registers are fed into the MAC0 to perform the perspective division. Because you have a sort of pipelining going on, you have various intermediate statuses of the GTE. The flag stores the intermediate statuses of the GTE.

Flag is a 32 bit value, which contains 32 unique statuses of the GTE. Some of these have extremely vague descriptions - its extremely difficult to tell what they are (in particular 15,16, 19-21, 25-30). The exact conditions for bit 31 though are well known. A negative flag value means one or more of the flag bits have been set. Often, you can just check for a negative flag and you know your GTE operation failed.

Probably the most useful stuff is the z clipping flag #17. In particular, it tells you if  $Sz < h/2$  or  $h/Sz > 2$ , which lets you tell when to clip polygons intersecting with the viewing plane. Other useful flags are : 1) 22,23, and 24 which limits the 3D coordinates for any transformed point to  $+2^{15}$ . 2) 13,14 which clip the 2D area to  $\pm 1023 (2^{10})$ . 3) 31 which indicates any error at all occurred.

If you find anything out yourselves, please tell me ! Hope this helps .

| Bit  | Mask       | Meaning if set                                                                                   | --- | ---- | -----                                                  |
|------|------------|--------------------------------------------------------------------------------------------------|-----|------|--------------------------------------------------------|
| 0-11 | N/A        | Reserved                                                                                         |     |      |                                                        |
| 12   | 0x00001000 | p limiter: The p value is outside the range (0 - $2^{12}$ ).                                     |     |      | (p is the interpolation value for fog/depth queueing). |
| 13   | 0x00002000 | Screen Y limiter: Screen Y coordinate after perspective transform outside ( $-2^{10}, 2^{10}$ )  |     |      |                                                        |
| 14   | 0x00004000 | Screen X limiter : Screen X coordinate after perspective transform outside ( $-2^{10}, 2^{10}$ ) |     |      |                                                        |
| 15   | 0x00008000 | Underflow of MAC0 during calculation ( $< -2^{31}$ )                                             |     |      |                                                        |
| 16   | 0x00010000 | Overflow of MAC0 during calculation ( $\geq 2^{31}$ )                                            |     |      |                                                        |
| 17   | 0x00020000 | The z coordinate after perspective transform is smaller than $h/2$ .                             |     |      |                                                        |
|      |            | (h is the distance from the eye point to the screen)                                             |     |      |                                                        |
| 18   | 0x00040000 | limiter of MAC3 The z value is outside the range (0 - $2^{16}$ )                                 |     |      |                                                        |
| 19   | 0x00080000 | limiter of MAC3 The output value exceeds (0, $2^8$ )                                             |     |      | 20                                                     |
|      | 0x00100000 | limiter of MAC2 The output value exceeds (0, $2^8$ )                                             |     |      |                                                        |
| 21   | 0x00200000 | limiter of MAC1 The output value exceeds (0, $2^8$ )                                             |     |      |                                                        |
| 22   | 0x00400000 | limiter of MAC3 The (z eye) output value exceeds ( $-2^{15}, 2^{15}$ )                           |     |      |                                                        |
| 23   | 0x00800000 | limiter of MAC2 The (y eye) output value exceeds ( $-2^{15}, 2^{15}$ )                           |     |      |                                                        |
| 24   | 0x01000000 | limiter of MAC1 The (x eye) output value exceeds ( $-2^{15}, 2^{15}$ )                           |     |      |                                                        |
| 25   | 0x02000000 | Underflow of MAC3 during calculation ( $< -2^{43}$ )                                             |     |      | 26                                                     |
|      | 0x04000000 | Underflow of MAC2 during calculation ( $< -2^{43}$ )                                             |     |      |                                                        |
| 27   | 0x08000000 | Underflow of MAC1 during calculation ( $< -2^{43}$ )                                             |     |      |                                                        |
| 28   | 0x10000000 | Overflow of MAC3 during calculation ( $\geq 2^{43}$ )                                            |     |      |                                                        |

```
29 0x20000000  Overflow of MAC2 during calculation (>= 2^43)
30 0x40000000  Overflow of MAC1 during calculation (>= 2^43)
31 0x80000000  (30) | (29) | (28) | (27) | (26) | (25) | (24) | (23) | (18) | (17) | (16) |
(15) | (14) | (13) | (11)
```

Example:

```
/* If coordinates of the point are less than h/2 or greater than 2^16, or exceeds the resolution
of our order table, or otz is less than 0, throw out the primitive and don't render it. */ if (
(flag&0x00060000==0) && (otz>0) && (otz<OTSIZE) ) { AddPrim(OT+otz, &packet); }
```

Graphically speaking, the above code translates into:

```
*****flag17*****flag18
eye__h/2__screen_____2^16 OT[0]-----
-OT[OTSIZE-1]***|<-----AddPrim----->|*****
```

Any questions? Didn't think so.

Angus

---

4/21/95 6:58 PM

Re(2): Ask libgte q's now!

Administrator

LIBGTE

Don't use the CLIPxxx functions because the 3D clipping on textures will be dynamic and cause horrendous texture distortion. Use polygon subdivision or the 3.0.1 perspective division.

Angus

---

4/21/95 6:17 PM

How to stitch

Emmanuel M.a.a. BERRIET

LIBGPU

if you use quads (POLY\_FT4 for example) and you subdivide (to avoid the deformation due to the use of two triangles) one of two adjacent quad you get small holes along the common edge. To avoid this holes we need to know how the GPU build the edges of a primitive so we can place our intermediate point well.

Tricky Huh?

Thank You

---

4/21/95 7:00 PM

Re(5): MIME Overview -- Tools list request

Administrator

LIBGTE

>>Count me in on the Mime SGI tool distribution list. Sounds like a tool I'd actually enjoy writing.... >>SURE IT DOES! (interpret in Jerky Boy mode) >>WB Coding

Go to the Game Developers Conf. on Monday to see the Nichimen Mime tool. Also, I will post some macros to do MIME from Caligari Truespace. It's easy to do mime.

Angus

---

4/21/95 7:01 PM

Re(4): MIME Overview -- Tools list request



Administrator  
LIBGTE

>>AG> There are a few tools. >>AG> One is mimefilt ... >>AG> The other tool is a nichimen graphics SGI tool ...

>>Is there a list somewhere of all the tools available from third parties, for all platforms (PC, SGE, etc.)? I seem to be >>missing out on some things which could be a great help. Can you make such a list if there isn't one available? (and if > >you could spare the time!)

>>Dave

See the documentation area for a tools catalog.  
ANgus

---

4/21/95 6:59 PM

Re: is there a function that ...

Administrator  
LIBGTE

>>Is there a libgte function which will transform a point, do perspective conversion, and return the 2D screen >>coordinates AND the 3D transformed coordinates? This would be an EXTREMELY useful function. Alternatively, is >>there any way I can use RotTransPers and still get the non-perspective converted 3D point from the GTE? Use RotTransPers\_nom and call readsxyfifo and readszfifo to get the screen coords and 3d point respectively. You can use RotTransPers but it is slower.

Angus

---

4/21/95 7:21 PM

Re(2): Libgpu LoadImage bug

Administrator  
LIBGPU

The fix for the bug is to consolidate your LoadImages into 1 big block to avoid multiple interrupts. Please contact Kris Severson for your ROM request.

Angus

---

4/21/95 6:22 PM

Libgpu LoadImage bug  
Bill "Angus" Guschwan  
LIBGPU

LoadImage is 2 to 3 times slower on the development station than it is on the debugging station. This is because the debugging stations have new ROMs which fixes a kernel bug where the interrupt for LoadImage was not handled quickly.

Angus

---

4/21/95 6:56 PM

Re(2): TMD or AddPrim

Administrator  
LIBGPU

Dave Ross

Performance of GTE goes like this, from slowest to fastest. 1) GsSortObject2 is slowest because it uses RotTransPers AND has the general GS overhead. 2) RotTransPers is slow because it use C functions which both use more than 4 parameters which get pushed to the stack, and it gets pushed out of the instruction cache. 3) RotTransPers\_nom is better because it avoids the stack hit because it only supplies input values as C parameters and uses Asm functions or macros to read out of the gte. 4) GsTMDDiv is a GTE function. It was pulled out of Gs library for general use. It is faster because it fits into the instruction cache unlike the \_nom functions. 5)GsSortObject4 is faster because it does not do the polygon subdivision but it lives in libgs. 6) GsTMD is faster because it does not have Gslib overhead. It is a gte function. STOP: GsTMD and GsPrst are poorly named. They are GTE functions, pulled out of GS Library for Your code to hardcode and make great games. 7)GsSortObject5 presets data and so it faster. Presetting data is faster: you double buffer your packets so you can read while GPU writes. It takes more memory IF you have multiples like a basketball game. 8) GsPrst is the GTE equivalent and is faster because it has no GS overhead.\ 9)GsSortObject3 is faster because it NEVER updates the U,V coordinates in the packet information. It cuts in half the amount of data to update. But you can not do shading. 10) RotPMD is faster because it does not have libgs overhead. 11) RotRMD hardcodes to avoid backclipping. 12) RotSMD hardcodes to ALWAYS backclip. 13) RotMesh minimizes the vertices. It takes a vertices approach and not a polygon approach. It will be in lib 3.0.1  
Angus

---

4/21/95 6:34 PM  
Re(2): Hard GPU Questions  
Administrator  
LIBGPU

>> 1) will the texture pixel at 7,7 become the left most pixel in the texture cache? The line beginning at the 0,7 will be loaded. The texture cache is just like an instruction cache.  
>> 2) will VRAM scanline 7 of the texture page be loaded? (the data loaded contains the desired >> pixel, but for optimized loading, VRAM data is loaded along some word/long-word/scanline boundary.) Set your textures on the boundaries of the texture cache for best performance.  
>>When the above POLY\_FT4's 1st texture pixel is loaded, as described above, is texture pixel 7,8 automatically loaded >>also? Much like my question number 2, when texture data is cached, is there a vertical boundary that is maintained? Yes there is a vertical boundary.  
>>If the POLY\_FT4 in question is using the 8-bit texture mode, when the 1st texture pixel located at 7,7 is cached, the >>area 7,7 to 70,38 is loaded into the texture cache. Is this correct? No. The aligned texture cache would be read, 0,0 to 63,31.  
>>Finally, the described POLY\_FT4 will be rendered from a single VRAM read, correct? All the needed texture pixel >>data is loaded with the first read, so no further reading is required, correct? No. The texture must be aligned.  
Transparency is done with a read modify write. 1) You read in your texture, or foreground. 2) You do a read on the background, modify it with the foreground, and write it back out.  
Angus

---

4/21/95 6:44 PM  
Re: How to stitch  
Administrator  
LIBGPU

Look at the TMDView samples. They have a GsSortObject5 call and if you set the fourth parameter to 0x1f800000 and set the attribute field of GsDOBJ5 to an OR of GsDIV3, then it will

do polygon clipping for you. Look at that for an example.  
Angus

---

4/21/95 7:17 PM  
Re: Libgpu LoadImage bug  
Blake E. Senftner  
LIBGPU

Angus:  
Will replacement ROMs be available for the development systems? This timing difference will greatly affect my title, and I'm sure many other people. Basically, what you're telling us is that the new roms are critical to operations that require constant loading into VRAM, such as playing an MDEC stream...  
-Blake

---

4/21/95 10:46 AM  
Re(4): \_nom routines  
Brian Greenstone  
Bill "Angus" Guschwan  
Dan Burnash  
I'm having problems getting the in-line assembly to work. Here's basically what I've got:  
/\*\*\*\*\* THE ROUTINE \*\*\*\*\*/  
void TheRoutine(void) { SVECTOR tVert; register long temp1;  
    RotTransPers\_nom(&tVert);    asm("read\_sxxy0(temp1)");  
}  
Unfortunately I get a "UNRECOGNIZED OPCODE" when I try to compile this.  
If I get rid of the macro and do the assembly by hand...  
    asm("mfc2 temp1,\$12; nop;");  
... I get ILLEGAL ADDRESSING MODE.  
Whether I force temp1 to register or not I can't get it to compile. Any suggestions?  
-Brian

---

4/21/95 1:47 PM  
Re(5): \_nom routines  
Bill "Angus" Guschwan  
Brian Greenstone  
Dan Burnash  
Try -2 ccpsx  
The -2 tells the aspsx to ignore any level 2 warnings.  
Angus

---

4/24/95 9:01 PM  
Re(2): Texture mapping support  
Jim Guerard  
LIBGPU

Great work! (Perspective texture mapping in V3.01) Don't be surprised if you find droves of developers kissing your feet when this happens.  
Also don't worry about the scaling. With perspective texture mapping we probably won't need



calls after non-block functions. 3. Used ClearOTagR instead of ClearOTag.  
Is there a list of which GPU functions are block and which are non-block? Why does DrawSync(1) return a 1, even when I do a DrawSync(0) just before calling it? Are there other ways to optimize the GPU?  
Thanks, HB

---

4/26/95 3:48 PM  
Re: Optimizing GPU  
Blake E. Senftner  
LIBGPU

Heather:  
Break your textured polys such that the texture being applied is never larger than the texture cache. You'll get the largest speed increase of all your previous optimizations.  
-Blake

---

4/26/95 2:06 PM  
Re: Transparency  
William Botti  
LIBGPU

To verify, your the TP bit, load your tim into the sprite editor. If your image is > 256x256, the pixel data might look weird, but the palette will be correct. The PSX transparency works. Also, note for sprite editor, put your windows display in 256 color mode. Hope it helps... WBC

---

4/26/95 9:25 AM  
Need complete info on Vsync()  
Montgomery Singman  
LIBGPU

The manual I have defines vsync as void vsync(mode). With mode being either 0 or 1.  
The sample demos do things like:  
cnt = vsync(0); //cnt seems now to be equal to some type of scan line count  
TotalVBlanks = vsync(-1); //the -1 option seems to somehow return the total # of vblanks since the program started.  
cnt = vsync(2); //not sure what the 2 makes vsync do  
I have looked thru the whole manual trying to find this stuff documented somewhere. Did I miss something?  
Are these new features? Can someone give me the full definition for vsync().

thanks,  
dave

---

4/27/95 3:42 PM  
Re(6): MIME Overview -- Tools list request  
David Foley  
Administrator  
LIBGTE

where are you going to post the mime macros for truespace?  
David

---

4/27/95 3:43 PM  
Re(3): Ask libgte q's now!  
David Foley  
Administrator  
LIBGTE  
when will we get the 3.01 libraries?  
David

---

4/27/95 4:13 PM  
2D sprites and pixel dropout  
Craig Ewert  
LIBGPU

Help:

I am trying to display some 2D Images on the PSX, with occasional X and Y Flipping. However, the PSX never seems to display just the pixels in the picture. It always adds or subtracts a vertical line, sometimes both.

Using the code fragment below, I have been using ax,ay,aw and ah to adjust the texture and / or the POLY\_FT4 dimensions in an effort to correct or avoid the problem, but no value works.

```
int ax,ay,aw,ah;
ULONG * pOrderTable;  UWORD tpage;  int ww,hh;  int u0,v0,u1,v1,u2,v2,u3,v3;
POLY_FT4 * pPoly;
ww = GridPicture.nWidth;  // GridPicture is a 50x50 checkerboard  hh =
GridPicture.nHeight;
ax=ay=ah=aw=0;
tpage = GetTPage (0, 0, 320, 0);
SetPolyFT4 (pPoly);  SetSemiTrans(pPoly, OFF);  SetShadeTex(pPoly, ON);
pPoly->tpage = tpage;  pPoly->clut = GetClut (0, 480 );
u0 = 0;  v0 = 0;  u1 = u0 + ww+aw;  v1 = v0;  u2 = u0;  v2 = v0 + hh+ah;  u3 = u1;
v3 = v2;
setUV4(pPoly, u0,v0, u1,v1, u2,v2, u3,v3);  setXYWH(pPoly, 50, 50, ww+ax, hh+ay);
AddPrim(pOrderTable, pPoly);
```

Please let me know if you have any solution to this problem.  
Craig Ewert

---

4/27/95 3:54 PM  
Re(8): \_nom routines  
Brian Greenstone  
Administrator  
LIBGTE

In speaking to the Japanese engineers today, they seemed to believe that the "asm" instruction for C was not implemented and that the asm macros will only work from assembly, not from C. So, just in case they were wrong or we misunderstood them, has anyone out there successfully

written in-line assembly with C or C++. If so, how did you get it to work, cuz all I get are compile errors?  
-Brian

---

5/1/95 6:45 PM  
Texture Cache in detail (via SCEI)  
John Phua  
LIBGPU

TCACHE.DOC           6K  
LIBGPU/GTE  
Attached is translated description from SCEI on the texture cache. There are still some Kanji characters.  
John Phua

---

5/1/95 5:52 PM  
\_nom bug  
Bill "Angus" Guschwan  
LIBGTE

----- Forwarded Message  
RotAverageNclip3\_nom RotAverageNclipColorDpq3\_nom RotAverageNclipColorCol3\_nom  
These 3 nom-functions doesn't set correct normal-clip-value(OPZ) in GTE. Therefore, 'read\_opz' macro can't read correct OPZ from GTE after these nom-functions. This bug will be fixed in next library version.  
----- End of Forwarded Message

---

5/2/95 11:06 AM  
Re: Texture Cache in detail (via SCEI)  
Bill "Angus" Guschwan  
LIBGPU

Here is the tcache.doc pasted in.  
Angus

About Texture Cache -----in detail-----  
1995/04/20 S.C.E

\*\* \$B%F%/%9%A%c%-%c%C%7%e (B \*\* TEXTURE CACHE

The speed of Drawing Polygons with texture mapping or drawing Sprites is usually depends on how many peixels do you 'read' from frame buffer. For that reason, GPU has 'Texture Cache' inside it and draw Polygons without reading texture-mapping-data from frame buffer if the cash works efficiently.

'Texture Cache' is capable to have those size of data in itself.

===== mode size ----- 4bit 64x64 8bit 32x64 16bit 32x32  
-----

It may be enough for you only to consider about size of texture datas if you don't be so nervous or you don't have to worry about drawing speed of GPU.

But if you need more speed for drawing, you need more knowledge bout 'Texture Cache'. Now we show you how 'Texture Cashe ' works in detail.

This explanation will be no use for those programs that rather CPU or GTE holds the speed back than GPU do .

\*\* CACHE BLOCK





(71,8).

Those pixels which are not set serially will be on cache at the same time if there are no Entry-confliction as follows.

(u,v) = ( 0, 0)-(15,15) (u,v) = (80,64)-(95,79)

\*\* DIFFERENCE BY MODE

The size of Cach Block and Cash Entry is different for each modes. But total Entry is always 256.

```

=====
MODE |BLOCK TOTAL BLOCK ENTRY TOTAL ENTRY -----+-----
----- 4 | 64x64 16 16x1 256 8 | 32x64 32 8x1 256 16 | 32x32 64 4x1 256
-----

```

5/8/95 2:37 PM

Re(2): Need complete info on Vsync()

BillE"Angus" Guschwan

LIBGPU

It is called

Vcount

Get the case right and it should work.

Try

extern volatile int Vcount;

Angus

5/8/95 10:28 AM

Re: 2D sprites and pixel dropout

Dan Burnash

LIBGPU

The text, an old reponse to this problem, documents what has been named the half-pixel problem. This is what you are encountering. Hopefully the following text will help make it more understandable.

Dan Burnash

Thursday, March 02, 1995 03:54:37 PM March Archive Item From: BillT4 horizontally, often there > is a vertical line of bad pixels on the left hand side ?

That is called UV-PROBLEM.I show this problem in detail.

----- Q1.

When drawing 16x16 size polygon with 16x16 size texture, with setting location such as (0,0)-(15,0)-(0,15)-(15,15), strangely the bottom line and right edge could not be displayed. Why ?

Q2.

When using POLY\_FT4, GPU draws more 1 line on bottom and right edge. Why?

(x,y)=(0,0)-(16,16), (u,v)=(0,0)-(16,16) correct (x,y)=(0,0)-(17,17), (u,v)=(0,0)-(16,16) correct  
..... (x,y)=(0,0)-(31,31), (u,v)=(0,0)-(16,16) correct (x,y)=(0,0)-(32,32), (u,v)=(0,0)-(16,16)

added 1 line to display

Q3.

Using POLY\_FT4, you can not set the texture pattern's location on the right edge and bottom 1 line of texture pages. Why?

<Answer and Explanation>

Because it is GPU's drawing rules, you can not draw right edge and bottom 1 line when using POLY\_\*. as follows:

```

drawn
----- | : drawn | : not drawn |.....:
not drawn

```

Because, if there drawn all lines of polygons, something might trouble with. For example, if you want to draw polygons like plain tiles, you will draw the edges twice. GPU does not draw the edges to avoid this.

```

----- | P0 | P1 | |-----+-----|<--this line is drawn twice | P2 | P3 | -----
^
this line is drawn twice

```

When you want only plain texture polygons, perhaps you think this system so silly. But when semi-trans polygons, this system will work quite right.

Examples:

[ The case is :draw SQUARE using POLY\_FT4, (x,y) = (0,0)-(8,8), (u,v) = (0,0)-(8,8)]

```

POLY_FT4 ft4; ft4.x0 = 0, ft4.y0 = 0; ft4.x1 = 8, ft4.y1 = 0; ft4.x2 = 0, ft4.y2 = 8; ft4.x3 = 8,
ft4.y3 = 8;

```

```

ft4.u0 = 0, ft4.v0 = 0; ft4.u1 = 8, ft4.v1 = 0; ft4.u2 = 0, ft4.v2 = 8; ft4.u3 = 8, ft4.v3 = 8;

```

At this case, texture datas will be map as follows:

```

0 1 2 3 4 5 6 7 8 ----- 0|00|01|02|03|04|05|06|07|08| |-----+-----+
+-----+-----+ | 1|10|11|12|13|14|15|16|17|18| |-----+-----+-----+
2|20|21|22|23|24|25|26|27|28| |-----+-----+-----+ ..... ..... |-----+-----+
+-----+-----+ | 7|70|71|72|73|74|75|76|77|78| |-----+-----+-----+
8|80|81|82|83|84|85|86|87|88|<-(u,v)=(8,8) -----

```

The number in the matrix is the location of texture data which will be copied to. The order is (v,u) (not u,v) for agreement with flame-buffer's addressing.

Then, applying the rule of GPU which I wrote before, the right edge and bottom can not be drawn, so the actual display is follows:

```

0 1 2 3 4 5 6 7 ----- 0|00|01|02|03|04|05|06|07| |-----+-----+
+-----+-----+ | 1|10|11|12|13|14|15|16|17| |-----+-----+-----+ 2|20|21|22|23|24|25|26|27|
|-----+-----+-----+ ..... ..... |-----+-----+-----+
7|70|71|72|73|74|75|76|77| -----

```

In this example the polygon which location is (0,0)-(7,7) will be correctly drawn with texture (0,0)-(7,7)

Next example, when you set the location of (u,v) such as

```

(u,v) = (0,0)-(7,7) (#In last example the u,v setting was (0,0)-(8,8))

```

the texture data will be mapped as follows:

```

0 1 2 3 4 5 6 7 8 ----- 0|00|00|01|02|03|04|05|06|07| |-----+-----+
+-----+-----+ | 1|00|00|01|02|03|04|05|06|07| |-----+-----+-----+ ..... .....
|-----+-----+-----+ | 8|70|70|71|72|73|74|75|76|77|<-(u,v) = (7,7) -----
---

```

Because of the rules of GPU the right edge and bottom line cannot be drawn so the display will be follows:

```

0 1 2 3 4 5 6 7 ----- 0|00|00|01|02|03|04|05|06| |-----+-----+
+-----+-----+ | 1|00|00|01|02|03|04|05|06| |-----+-----+-----+ ..... .....
+-----+-----+ | 7|60|60|61|62|63|64|65|66| -----

```

On this case the 2 pair of line H[0,1] and V[0,1] are same. and significant H8 line and V8 line are gone.(not drawn) so the display will be somewhat curious.

So if you want to use this functions for not specialized use, apply the location as follows:  
(x,y)=(0,0)-(8,8), (u,v)=(0,0)-(8,8)

When using POLY\_FT for 3D objects and so on, each polygon uses its characteristic texture data.( each uses each, perhaps) But when BG, the each CELL does not use for each.

Sometimes the 2 CELLS located side-by-side use same texture datas, there occurs many cases like that. So there will happen such problems as follows:

1) Rotated or Flipped textures

Let's think about the case that the polygons we last see above are flipped to turn right into left (RotateXY = 180 )as follows:

ft4.x0 = 8, ft4.y0 = 0; ft4.x1 = 0, ft4.y1 = 0; ft4.x2 = 8, ft4.y2 = 8; ft4.x3 = 0, ft4.y3 = 8;

This case (using POLY\_FT4) the location of (u,v) are not changed. Yes, only (x,y) are changed. At this case the texture pattern will be mapped as below. The numbers in the matrix box means the location of (v,u).

```

0 1 2 3 4 5 6 7 8 ----- 0|08|07|06|05|04|03|02|01|00| |-----+
+-----+-----| 1|18|17|16|15|14|13|12|11|10| |-----+
2|28|27|26|25|24|23|22|21|20| |-----+ ..... |-----+
+-----+-----| 7|78|77|76|75|74|73|72|71|70| |-----+
8|88|87|86|85|84|83|82|81|80|<-(u,v) = (0,8) -----

```

Because of the rules of GPU the right edge and bottom line cannot be drawn so the display will be follows:

```

0 1 2 3 4 5 6 7 ----- 0|08|07|06|05|04|03|02|01|<-we suppose that
(u,v)=(0,0) |-----+ data will be here but 1|18|17|16|15|14|13|12|11|
really here comes |-----+ (u,v) = (1,0) data. 2|28|27|26|25|24|23|22|21|
|-----+ ..... |-----+
7|78|77|76|75|74|73|72|71| -----

```

This problem will happen when you flip textures vertically or rotate datas over 90. It is often seen those cases:

```

===== Rotate degree texture pixel -----
----- -45 SB!k (B - 45 SB!k (B (0,0)-(7,7) 45 SB!k (B - 135 SB!k (B (0,1)-
(7,8) 135 SB!k (B - 225 SB!k (B (1,1)-(8,8) 225 SB!k (B - 315 SB!k (B (1,1)-(8,8) -----
-----

```

## 2) Scaling textures

Let's think about the case that you want to scale the polygons as large as twice. Setting location as follows:

(x,y) = (0,0)-(16,16), (u,v)=(0,0)-(8,8)

The textures will be mapped as follows:

```

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 -----
0|00|01|01|02|02|03|03|04|04|05|05|06|06|07|07|08|08| |-----+
+-----+-----| 1|00|01|01|02|02|03|03|04|04|05|05|06|06|07|07|08|08| |-----+
+-----+-----+-----+-----+-----+-----+-----+-----+
2|10|11|11|12|12|13|13|14|14|15|15|16|16|17|17|18|18| |-----+
+-----+-----+-----+-----+-----+-----+-----+-----+
3|10|11|11|12|12|13|13|14|14|15|15|16|16|17|17|18|18| |-----+
+-----+-----+-----+-----+-----+-----+-----+-----+
14|70|71|71|72|72|73|73|74|74|75|75|76|76|77|77|78|78| |-----+
+-----+-----+-----+-----+-----+-----+-----+-----+
15|80|81|81|82|82|83|83|84|84|85|85|86|86|87|87|88|78| |-----+
+-----+-----+-----+-----+-----+-----+-----+-----+
16|80|81|81|82|82|83|83|84|84|85|85|86|86|87|87|88|78| -----
-----

```

(notice: GPU makes 0.5 into 1.0)

Applying the rules of GPU, the right edge and bottom line cannot be drawn so the display will be follows:

```

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 -----
0|00|01|01|02|02|03|03|04|04|05|05|06|06|07|07|08| |-----+
+-----+-----| 1|00|01|01|02|02|03|03|04|04|05|05|06|06|07|07|08| |-----+
+-----+-----+-----+-----+-----+-----+-----+-----+
2|10|11|11|12|12|13|13|14|14|15|15|16|16|17|17|18| |-----+
+-----+-----+-----+-----+-----+-----+-----+-----+
3|10|11|11|12|12|13|13|14|14|15|15|16|16|17|17|18| |-----+
+-----+-----+-----+-----+-----+-----+-----+-----+
.....
14|70|71|71|72|72|73|73|74|74|75|75|76|76|77|77|78| |-----+
+-----+-----+-----+-----+-----+-----+-----+-----+
15|70|71|71|72|72|73|73|74|74|75|75|76|76|77|77|78| |-----+
+-----+-----+-----+-----+-----+-----+-----+-----+
16|80|81|81|82|82|83|83|84|84|85|85|86|86|87|87|88| -
-----
^ the pixel u=8 remains

```

here

Expanding the size of polygon gradually, this problem occurs just from twice the length of polygons side.

3) Set the textures location at bottom and right edge.

For same reason, you can not display the bottom and right edge ((u=255 or v=255) of texture pattern.

When you want to display the right and bottom 8x8 area of texture pages, you must set the locations as follows: ft4.u0 = 248, ft4.v0 = 248; ft4.u1 = 256, ft4.v1 = 248; ft4.u2 = 256, ft4.v2 = 256; ft4.u3 = 248, ft4.v3 = 256;

But (u,v) are restricted on character degree( 8bit ).So you have to approximate those members as follows:

ft4.u0 = 248, ft4.v0 = 248; ft4.u1 = 255, ft4.v1 = 248; ft4.u2 = 255, ft4.v2 = 255; ft4.u3 = 248, ft4.v3 = 255;

As the last example we have seen says, the line (u = 255, v = 255) will not be drawn. Only when you scale the polygon size twice you can see this line.

Same problem will occur when you rotate the polygons to turn left into right.

<Countermeasure>

(1) You can avoid all those problem if there is not anything trouble with to set the location (u -1 ,v - 1). But the right edge and bottom line will not be displayed. The texture pattern which size is 16x16 will be display 16x15, 8x8 will be 8x7. So take care about making texture patterns.

(2) If you want to display correctly, correct (u,v)'s location by its angle. It will be accomplished by replace setUVWH() with such function as follows: SetUVWH(POLY\_FT4 \*ft4, int u0, int v0, int w, int h) { int dx = ft4->x3 - ft4->x0; int dy = ft4->y3 - ft4->y0; if (dx < 0) { /\* If flipped to X ,move u0 \*/ if (--u0 < 0) /\* if u0 < 0, move w instead of u0 \*/ u0 = 0, w--; } if (dy < 0) { /\* If flipped to Y, move v0 \*/ if (--v0 < 0) /\* if v0 < 0,move h instead of v0 \*/ v0 = 0, h--; } if (u0+w > 255) w--; /\* correcting W, H \*/ if (u0+h > 255) h--; setUVWH(ft4, u0, v0, w, h); /\* set location \*/ }

When the polygons sit side by side like mesh, the condition of the CELL's rotation will be same. So the program can be made so as to run somehow faster. But unfortunately enough, we can not avoid all the trouble by using this method.

-----  
> - Is the previous error a hardware bug ?  
No, That is not BUG, that is the spec of GPU.

---

5/8/95 2:28 PM

Re: Need complete info on Vsync()

Brian Greenstone

LIBGPU

At the PSX thing several weeks ago, they mentioned that there was a global variable called VCOUNT which was equivalent to VSync(-1). I have been unable to get that to compile tho. Anyone know how to make it work?

-Brian

---

5/10/95 4:15 PM

RotMatrix, RotMatrixC

Lobotomy Software

LIBGTE

What does the speed and table memory difference in RotMatrix and RotMatrixC mean to me as a programmer. Wouldn't I always want to use the faster function... What is the table memory?

Where is it?  
Jeff Blazier

---

5/11/95 1:08 PM  
Screen Size  
Mark Beardsley  
LIBGPU

When the screen height is set to be 240, are all 240 pixels really useable? I am putting up a screen full of text (8x8 font, in 640x240) and it seems that I can only get 29 rows of text instead of the 30 that I expected (I have my monitor adjusted so that I know that I'm seeing the whole screen). It also seems that the top row of pixels on the screen is not at y-position 0 but at 7 instead (i.e. to put a character at the top left corner of the screen, I need to put it at (0,7) instead of (0,0)). I am not using the fnt routines, I am simply putting up SPRT8's with character texture maps. Is there some y offset involved with SPRT8's, or am I confused (again)? Hope y'all are having fun at E3, some of us have to keep working!

---

5/16/95 11:12 AM  
GsDrawOT  
Bill "Angus" Guschwan  
LIBGPU

GsDrawOT calls DrawOTag. If you set a debugging level with SetGraphDebug(), then DrawOTag will be done by IO. It will block. In this case, it will sit in a loop and call DrawPrim. Else, it will use DMA.  
Angus  
To: Bill Guschwan cc:  
Is GsDrawOT a blocked function??? My profiler tells me that it is...

---

5/17/95 2:23 PM  
RotTransPers  
Lobotomy Software  
LIBGTE

I seem to only get zeros back in the P value of RotTransPers. Isn't the function supposed to return the average z value in P? I do get the z/4 value correctly from the return value. What is the P value for and when does it change?

---

5/23/95 4:34 PM  
Re: what does OuterProduct() do??  
Bill "Angus" Guschwan  
Montgomery Singman  
LIBGTE

OuterProduct gives you the right angle vector of two vectors as input.  
Angus

---

5/23/95 12:24 PM  
Re: what does OuterProduct() do??

Thomas Boyd  
Montgomery Singman  
LIBGTE

>Could someone please explain what OuterProduct() actually does and what it returns. > I would also like the same info for VectorNormal(). >I could not find any math book that had a definition of an outer Product.

OuterProduct() returns the cross product of two vectors, effectively a normal to the plane the two vectors lie in. The difference between OuterProduct0() and OuterProduct12() is in the format of the arguments. These formats are summarized in the lib2.6 document on the GTE, ABSTRACT.TXT, under \*libgte argument format.

NormalClip returns a Z value from the normal to the surface of your polygon. This can tell you if it is facing towards or away. RotNclip, RotNclip3, RotNclip4, RotAverageNclip3, RotAverageNclip4, RotAverageNclipColorDpq3, and RotAverageNclipColorCol3 all do the same calc and have shortcuts included to bypass backward poly calcs.

VectorNormal() returns a unit normal in the same direction as the original vector. example: VectorNormal([0,37,0]) = [0,1,0] It returns the sum of the squares of the components, because it calculates those as a divisor. Once again, the difference between the two VectorNormal calls is in the format of the arguments. Tom

---

5/23/95 9:22 AM  
what does OuterProduct() do??  
Montgomery Singman  
LIBGTE

Could someone please explain what OuterProduct() actually does and what it returns. I would also like the same info for VectorNormal().  
I could not find any math book that had a definition of an outer Product.  
thanks,  
dave

---

5/25/95 2:47 PM  
SetGraphDebug  
Borden Covell II  
Thomas Boyd

How does one get SetGraphDebug to output information about any errors that it finds? I have set up a DumpFnt and set the debug mode to 2, but I get nothing in the message window or on the tv.

---

5/25/95 4:53 PM  
Meaning of DumpOTag Info  
Borden Covell II  
Thomas Boyd

Can anyone explain to me the meaning of the display produced by DumpoTag?  
I get ?-S for each active entry in the OT. It should be a DR\_MODE followed by SPRT.  
Borden

---

5/26/95 4:01 PM  
Proper Inputs to LoadImage  
Mark Beardsley  
LIBGPU

Could you please explain the proper way to specify the width for the RECT passed to LoadImage if you have either a 4 or 8 bit texture? It is working fine for me with 15bit direct color (since it has a 1to1 relationship to vram). But when I try to use a smaller texture, the image appears squashed. I've tried specifying half the width (and double) and I can't seem to get an image that makes sense. If my image should be 320x240 (8bit), what do I put into the RECT.w parameter? Thanks.

---

5/30/95 10:54 AM  
Clipping stuff: Part I, 2D  
Thomas Boyd  
Alex J. Garden  
Bill "Angus" Guschwan  
Clipping stuff:

Part I: 2D----- 2D clipping simply takes vertices that are out of bounds (-1024 to 1023 for x and y) and clips the out of bounds values to the edge, making a "squashed" poly. example: BEFORE: poly vertices x y 1 345 1342 2 1000 1000 3 670 800 AFTER: poly vertices x y 1 345 1023 2 1000 1000 3 670 800 This is not a problem if the poly is not on the screen (small), but big polys will show up distorted. To avoid this, you must clip in 3D. Additionally, the GPU goes from left to right when it is clipping 2D polys to the screen. If you have a poly that shows partially on the left hand side of the screen, the GPU will waste time working from the left till it gets to the part in the window. However, if you have a poly that is partially showing on the right, the GPU stops when it gets to the edge of the window. The GPU also goes from top to bottom, making partially visible polys on top take more time than polys on the bottom in a similar manner. It is therefore faster to subdivide large polys to avoid computation waste on top and left partially visible polys. Close polys get huge in 2D. if a poly gets too big, it is clipped, even if part of it is visible. A loose interpretation of the clipping algorithm is as follows: if  $(W \geq 1024 \mid \mid H \geq 1024 \mid \mid y \geq 1024 \mid \mid x \leq -1024 \mid \mid y \leq -1024 \mid \mid (x+w) \geq 1024 \mid \mid (y+h) \geq 1024)$  then the poly is clipped. It is therefore important to clip these large polys if you want to see them.

---

5/30/95 3:52 PM  
Re: Proper Inputs to LoadImage  
Sam Black  
LIBGPU

You will have to (as far as I understand things) LoadImage that image to VRAM and use a texture mapped primitive to blit your 8-bit image to the screen. (The display is always in 15 or 24 bit mode...)

---

5/30/95 10:54 AM  
Clipping stuff: Part I, 2D  
Thomas Boyd  
Alex J. Garden  
Bill "Angus" Guschwan

Clipping stuff:

Part I: 2D----- 2D clipping simply takes vertices that are out of bounds (-1024 to 1023 for x and y) and clips the out of bounds values to the edge, making a "squashed" poly. example: BEFORE: poly vertices x y 1 345 1342 2 1000 1000 3 670 800 AFTER: poly vertices x y 1 345 1023 2 1000 1000 3 670 800 This is not a problem if the poly is not on the screen (small), but big polys will show up distorted. To avoid this, you must clip in 3D. Additionally, the GPU goes from left to right when it is clipping 2D polys to the screen. If you have a poly that shows partially on the left hand side of the screen, the GPU will waste time working from the left till it gets to the part in the window. However, if you have a poly that is partially showing on the right, the GPU stops when it gets to the edge of the window. The GPU also goes from top to bottom, making partially visible polys on top take more time than polys on the bottom in a similar manner. It is therefore faster to subdivide large polys to avoid computation waste on top and left partially visible polys. Close polys get huge in 2D. if a poly gets too big, it is clipped, even if part of it is visible. A loose interpretation of the clipping algorithm is as follows: if  $(W \geq 1024 \mid \mid H \geq 1024 \mid \mid y \geq 1024 \mid \mid x \leq -1024 \mid \mid y \leq -1024 \mid \mid (x+w) \geq 1024 \mid \mid (y+h) \geq 1024)$  then the poly is clipped. It is therefore important to clip these large polys if you want to see them.

---

5/31/95 10:32 AM

Re: Clipping stuff: Part I, 2D

Thomas Boyd

Alex J. Garden

Sorry, my last clipping post had an error. The logic for fully clipping a poly is actually:

```
if (w > 1023 || h >= 511 || abs(x) > 1023 || abs(y) > 1023 || abs(x)+w > 1023 || abs(y)+h > 1023) {
    polygon is fully clipped;
}
```

---

5/31/95 10:32 AM

Re: Clipping stuff: Part I, 2D

Thomas Boyd

Alex J. Garden

Sorry, my last clipping post had an error. The logic for fully clipping a poly is actually:

```
if (w > 1023 || h >= 511 || abs(x) > 1023 || abs(y) > 1023 || abs(x)+w > 1023 || abs(y)+h > 1023) {
    polygon is fully clipped;
}
```

---

5/31/95 9:10 AM

Library support for the \_NOM routines

Montgomery Singman

LIBGTE

Where is the rest of the library support for the \_NOM routines? The libraries have ReadSXSyfifo() but where is the ReadP(), ReadOTZ(), etc...

The libgte.h has some assembly macros for this, but they are #ifdef'ed out. Besides, the macros just put a value into a register and are not very helpful in my C code.



Another email asked for \_NOM sample code. Is any available yet?  
Another email mentioned that the RotAverageNClip3\_NOM routines had a bug for returning the correct OPZ value. Was this fixed in Lib 3.0?  
thanks

---

6/1/95 10:10 AM  
Re: Fwd: texture cache  
Bill "Angus" Guschwan  
Eric Knopp  
LIBGTE  
it's 64x32  
angus

---

6/1/95 8:58 AM  
Fwd: texture cache  
Eric Knopp  
Bill "Angus" Guschwan

Angus, I have seen and heard different values for what size the 8bit textures can be in the texture cache....  
is it 32\*64 or 64\*32???

---

6/5/95 2:15 PM  
Terrain Library  
Bill "Angus" Guschwan  
LIBGPU

----- forwarded message  
Dear developers:

This is preliminary announcement for you that we are under prototype development of terrain library. The terrain library will be used to draw terrain/ground easily.

First English version will be released by early/mid July and it will support the active subdivided polygon according to Z value. Also supports the lap-round function at the border of map data.

However, the first version will NOT support (1) Fog function (2) Definition and decode of map data (3) 3D terrain which the height value is added (4) Mesh-type data structure

Currently we are doing the first stage of speeding up. As soon as we finalize the first version, we will add the fog functions and the definition and decode of map data. Then we will release it as a first version. The first version will release as the source level. The reason why are as follows,

(A) The first version will be still prototype level. And it is far from completion.

(B) For this reason, it makes possible for programmers to modify the program when the program has some functional defect.

(C) No low level function which we should be care of is used in the sample.

After the first version is released, we will implement all functions mentioned above and will review the specifications. Hopefully the second version will be released in the mid of July as a new library.

---

6/5/95 12:39 PM

Re(2): Proper Inputs to LoadImage  
Christopher Deel  
LIBGPU

LoadImage uses 16bit VRAM coordinates. When loading an 8 bit image divide the width by 2.  
2 x 8 bit pixels = 1 x 16 bit pixel.

---

6/7/95 2:57 PM  
How to do PAL? v. 1.1  
Administrator  
LIBGPU

PAL Mode in PlayStation ver.1.1 May 30, 1995

1) Overview of PAL mode in PlayStation \*\*\*Modifications for PAL mode Some modifications are required to reproduce the present PlayStation applications on a PAL mode TV, because they have been designed for NTSC video signals.

\*\*\*Differences between NTSC and PAL mode There are 2 big differences between them.

|                     | NTSC  |                     | PAL      |          |
|---------------------|-------|---------------------|----------|----------|
| Field rate          | 60 Hz | 50 Hz               | Standard |          |
| vertical resolution | 240   | 288 (TV resolution) | 262/263  | 312/313) |

The PAL TV can display only 50 frames per second to the maximum because the field rate is 50 Hz. Also, the vertical retracing interrupts take place only 50 times per second. If the synchronization in programs is carried out by the vertical retracing, the apparent moving rate on the screen is reduced to five sixth.

The vertical resolution reproduced on the standard PAL TV is higher than that on the NTSC TV. Therefore, in the case of displaying in a full screen on the PAL TV, more display areas are required in the frame buffer. If using the same display area as the NTSC mode, black areas will come out on the top and the bottom of the screen in the PAL mode. 2) PlayStation Hardware \*\*\*Hardware capability of PAL mode PlayStation PAL mode PlayStation contains the same hardware as that of NTSC mode PlayStation except for a quartz crystal, a basic video clock. Therefore, no hardware capability differences can be seen.

3) Modifications in a program for PAL mode The programs designed for the NTSC must be modified for the PAL system as below:

- a) Initial setting of the PAL flag
  - b) Adjustment of the display initial location
  - c) Adjustment of the time scale
  - d) Adjustment of the display area
- a) and b) are essential. c) and d) depends on the application necessity.

The libraries version 3.1 or later are required to carry out the following settings.

\*\*\*\*Setting of the PAL flag Initialize the NTSC/PAL mode with the SetVideoMode(long VideoMode) function of libetc. When setting VideoMode at the beginning of the application, libgpu and libsnd operate according to the VideoMode.

NOTE: Carry out the VideoMode setting before initializing all libraries once.

\*\*\*\*Adjustment of the display initial location and the display area In the standard settings, the vertical resolution of the display area is 240. When the display area with this setting is sent to the PAL TV, the area comes out on the upper position of the screen. The alternation of the default value of the screen member of DISPENV structure enables the area to be located in the middle of the screen. 0 255 0 255 +-----+ 0 +-----+ 0 | | |-----

-----| 24 | Display | | | Area | -> | Display | |-----  
---| 240 | Area | | | |-----| 264 +-----+ 287 +-----+

287

DISPENV disp;

disp.screen.x = 0; /\* same as NTSC \*/ disp.screen.y = 24; /\* (288-240)/2 \*/ disp.screen.w = 256; /\* same as NTSC \*/ disp.screen.h = 240; /\* same as NTSC \*/

PutDispEnv(&disp);

\*\*\*Adjustment of the time scale VSync interrupts occur only 50 times per second in the PAL mode. Some programs carry out the time control with the vertical synchronous interrupt (VSync()), and it reduces the operation speed. Thus, the time scale of the programs which control the time with the vertical synchronization must be increased to six fifth.

\*\*\*Adjustment of the time scale at the sound playing The parameters of the SsSetTickMode() function of libsnd have been changed and added for the sound playing rate setting. The briefs are as follows:

Parameter Resolution (added) SS\_TICKVSYNC VSync period according to VideoMode NTSC : 1/60 second PAL : 1/50 second (changed) SS\_TICK60 1/60 second (fixed regardless of the NTSC/PAL mode) (added) SS\_TICK50 1/50 second (fixed regardless of the NTSC/PAL mode)

As for the sound playing, the parameter settings described above can ensure the playing tempo without changing the data.

The differences in quantization sometimes cause a slight change of impression, and produce a different image. In this case, the data must be quantized so that they will be played perfectly.

\*\*\*Adjustment of the time scale at the movie playback The reading speed of images and music from CD-ROM is equal in either mode (NTSC/PAL) at the movie playback. The data from the CD-ROM at a constant speed is stored in the ring buffer once, and then displayed on the screen in accordance with the video display processing speed. In other words, the difference in the NTSC/PAL mode at the movie playback only takes place when displaying in accordance with the video display processing speed. The synchronization with the video display is supported by the library. Thus, the NTSC movie data can be used in the PAL mode with no change.

For example, suppose that the movie is reproduced at 15 frames/sec. The data is read in at 15 frames/sec from the disks. Since the speed is 60 fields/sec in the NTSC mode, the frame display is switched every 4 fields. On the other hand, since the speed is 50 fields/sec in the PAL mode, the data is read every 3.3 fields, and the frame display is switched in the order of 4, 3, 3, 4, ... fields according to the timing of the field switching.

|      |        |        |        |        |        |   |   |   |
|------|--------|--------|--------|--------|--------|---|---|---|
| DISC | -----+ | -----+ | -----+ | -----+ | -----+ | 1 | 2 | 3 |
| 4    |        |        |        |        |        |   |   |   |
| NTSC | -----+ | -----+ | -----+ | -----+ | -----+ | 1 | 1 | 1 |
| 2    | 2      | 3      | 3      | 3      | 3      | 4 | 2 | 2 |
| PAL  | -----+ | -----+ | -----+ | -----+ | -----+ | 1 | 1 | 1 |
| 2    | 3      | 3      | 3      | 4      |        | 2 | 2 |   |

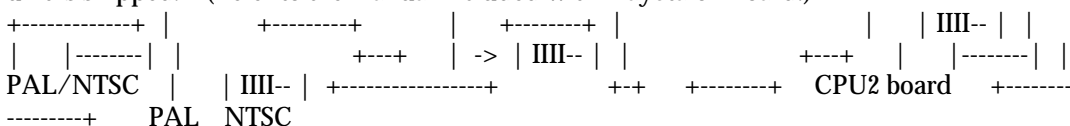
The timing to switch the frame display depends on the mode (NTSC/PAL). However, this difference will not be recognized on the screen at all. The music data reproduction is originally independent of the timing of the video display, so the data will be reproduced at the same tempo in either mode.

As a result, in order to port from the NTSC data, the above method is considered the simplest and the most appropriate, because there are few differences in the NTSC/PAL mode.

However, if the complete constant movie reproduction is desired, the re-encoding of the movie data and the adjustment of the frame numbers are required. Refer to the following.

- (1) Creating the material with 12.5 frames/sec and then creating the movie data with 12.5 frames/sec.
- (2) Converting the NTSC STR data with 15 frames/sec to the movie data with 12.5 frames/sec by enlarging.

3) Development tool for PAL mode \*\*\*Setting of the PAL mode Adjust jumper pins of PlayStation Board (DTL-H2000) to the PAL mode. The pins are set at the NTSC mode when the unit is shipped. (Refer to the manual included with PlayStation Board.)



The programs which operate in this mode can be carried out in PAL mode PlayStation. A

PAL mode debugging station is prepared.

---

6/7/95 1:14 PM

3D texture warping (etc.)

Carl Ferreira

LIBGPU

Why is it that when I display a texture mapped quad poly (GT4) that the texture seems to be warped as though two triangles are being drawn? How do I eliminate this warpage?

If a polygon is totally off-screen or even completely behind the viewpoint, at what point is it (or should it be) clipped?

What is the format of the Order Table structures? Is there any way I could write a sort routine to sort this table in place (e.g. quicksort)?

I have had no luck getting the Order Table to operate properly. It seems that no matter what I do, many of my world's polygons are displayed in the wrong order. Any ideas?

---

6/7/95 1:09 PM

World movement (etc.)

Carl Ferreira

LIBGTE

Apparently RotTransPers (and similiar calls) perform rotation, then translation -- effectively moving the object within the world. How can I perform translation FIRST -- effectively moving the viewpoint?

The GTE has functions to perform RotTransPers on one, three, and four points. Which is directly supported by the hardware (and therefore the fastest)? I ask so that I can perform matrix transformation on all vertices as fast as possible.

BTW: MulMatrix documentation (version 2.0) is incorrect. The result is stored in the second parameter, not the first! Also, could you please explain what the Outer Product is which is referred to in several places? Is this the Cross Product? How can some routines such as OuterProduct() return a vector, while others, such as NormalClip() returns only a long?

---

6/8/95 9:27 AM

Hardware vs Software functions

Carl Ferreira

LIBGPU

Some operations and structures are directly supported by the hardware, and others are partially or entirely software oriented. Could you provide information regarding which functions are hardware based (and therefore, I assume, faster), and which use software in whole or in part.

For example, Is the TMD structure something which is processed through a hardware call or calls, or is it something which was designed for use by software only functions?

It would help tremendously to know which functions should be used for fastest response and which we might be able to acheive faster results by bypassing.

Thanks,

Carl Ferreira

---

6/9/95 6:53 PM

Re: World movement (etc.)

Karen Paik  
Carl Ferreira  
LIBGTE

To translate first and rotate second you can create a transform matrix for each and then use CompMatrix to combine them. (CompMatrix multiplies the transform matrices as if they were 4x4 matrices.)

```
VECTOR transform_vec; SVECTOR transform_ang; MATRIX temp1, temp2, final;  
RotMatrix( &transform_ang, &temp1 ); temp1.t[0] = 0; temp1.t[1] = 0; temp1.t[2] = 0;  
RotMatrix( &zero_ang, &temp2 ); temp2.t[0] = transform_vec.vx; temp2.t[1] =  
transform_vec.vy; temp2.t[2] = transform_vec.vz;  
CompMatrix( &temp1, &temp2, &final );
```

The vector is multiplied on the right of the matrix ( $M*v$ ) so the transform temp2 will be done first, then the transform in temp1.

---

6/9/95 10:08 AM

Screen matrix  
Carl Ferreira  
LIBGTE

Apparently, all rotation/translation functions (e.g. RotTrans) perform matrix math based on TWO matrices. The first -- the local->world matrix -- is set using SetRotMatrix. How is the screen matrix set?

Carl Ferreira

---

6/9/95 10:50 AM

Re: Screen matrix  
Carl Ferreira  
Carl Ferreira  
LIBGTE  
Never mind.

---

6/9/95 10:55 AM

Matrix math  
Carl Ferreira  
LIBGTE

Alright. I've finally got it through my head that you folks are multiplying vectors by matrices different than the rest of us.

Instead of multiplying  $V[0]$  by  $M[0][0]$ ,  $M[1][0]$ , and  $M[2][0]$ , you are multiplying  $V[0]$  by  $M[0][0]$ ,  $M[0][1]$ , and  $M[0][2]$ .

Now I'm not a math major; could someone PLEASE explain to me what effect this has on the transformation???? I know that RotMatrix places the components in the expected locations of the matrix.

Please Help.

---

6/12/95 10:38 AM

Can't get OpenTMD() to work

David W. Marshall  
LIBGPU

OpenTMD() only seems to work for TMD files made up of one object.  
The info for this function says that you give it a pointer to your tmd file and a number for which object inside that TMD you want to open.

No matter what number I give OpenTMD(), I always get pointed to the first object in the file.

```
NumPrims = OpenTMD(&MyTMD, 5); /*this should point to object 5 in my tmd file and return the number of prims inside object 5*/
```

Am I using this routine incorrectly?

Is this a known bug?

Will this routine be fixed to handle multi-object TMD files?

thanks,

dave

---

6/13/95 2:32 PM

Re(3): World movement (etc.)

Karen Paik

Gene Sewell

LIBGTE

When I said that CompMatrix multiplied the matrices as if they were 4x4 I was referring to the translation. The following code does the same thing CompMatrix does: `MulMatrix0( in1, in2, out ); temp.vx = in2->t[0]; temp.vy = in2->t[1]; temp.vz = in2->t[2]; ApplyMatrix( in1, &temp, (VECTOR *) &(out->t) ); out->t[0] += in1->t[0]; out->t[1] += in1->t[1]; out->t[2] += in1->t[2];`

CompMatrix is very useful for implementing a sequence or hierarchy of transformations.

---

6/13/95 5:28 AM

Re(2): World movement (etc.)

Gene Sewell

Karen Paik

LIBGTE

Hi,

I was wondering if you could explain any difference between using CompMatrix (which I didn't know about) and MulMatrix0?

I'm just now working on chaining matrix operations using MulMatrix and would like to hear about CompMatrix.

You said CompMatrix acts as if the matrix were 4x4. Are you referring to the translation part of the matrix.

I was doing the following:

```
RotMatrix(1stangle, 1stmatrix) RotMatrix(2ndangle, 2ndmatrix)
```

```
MulMatrix0(1stmatrix, 2ndmatrix, compositmatrix)
```

```
TransMatrix(compositMatrix, translation) SetRotMatrix(compositmatrix)
```

```
SetTransMatrix(compositMatrix)
```

thanks

Gene Sewell

---

6/13/95 2:42 PM

Re: SubPol

Karen Paik

Carl Ferreira

LIBGTE

I've gotten DivideF4 to work for subdividing polygons. I haven't tried it on textured polygons yet.

There is also a function called RCpolyF4 that I haven't tried. Could someone from Sony explain why there are three different subdivision functions and which one is recommended? What do the Gs functions use? Karen

---

6/13/95 7:49 AM

SubPol

Carl Ferreira

LIBGTE

I have not been able to get the SubPol4 function to work. I am trying to split a GT4 poly. I set up all fields in the POL4 structure (I set sz to the screen distance -- what SHOULD this be set to?) and set code to 8 for GT4. I then pass the address of this structure along with the address of a large array of SPOLs (25) with the following call: SubPol4(&pol4,&spol[0],1); The function never returns. What is going on? Is there a better way to split a polygon? There MUST be!

Carl Ferreira

---

6/13/95 11:15 AM

SetGraphDebug(1) output questions

Borden Covell II

Thomas Boyd

I have updated to v3.1 and am getting the same results from the DrawOTag routine.

Can anyone explain to me the meaning of the display produced by DrawOTag?

I get ?-S for each active entry in the OT. It should be a DR\_MODE followed by SPRT.

Does the '?' mean that there is an error or that it does not understand the DR\_MODE command?

Borden

---

6/14/95 7:40 AM

Re(2): SubPol

Carl Ferreira

Karen Paik

LIBGTE

I tried to get DivideGT4 to work and it just hung my system. Do you have any suggestions -- any 'tricks' that you discovered that were, of course, poorly documented?

I am having difficulty in drawing textures because they tend to warp (PSX only draws triangles). Do you have this problem too? If so, how are you addressing it?

At this time, I'm writing my own routine to split the polygons when they get too close. I'm not certain whether or not this will work... I'll just have to try it and see!

Carl Ferreira Time Warner Interactive

---

6/15/95 4:16 PM

Re(3): SubPol

Thomas Boyd

LIBGTE

Karen Paik  
MAIN.C 19K  
LIBGPU/GTE  
here's an example from japan. T

---

6/18/95 4:32 PM  
DR\_MODE  
Gene Sewell  
LIBGPU

Hi,  
I'm not sure there's an answer, but I view DR\_MODE as a Pandora's box. I'm doing this to change the way textures are mapped into polygons.  
My observation is, once you start to insert DR\_MODE packets into the display list, you are in for potential trouble.  
What would be nice is a PushDrMode PopDrMode kind of primitive, so that you could insert one or two DR\_MODE packets, but then resort to the "default" DR\_MODE.  
My question is, is there any way to get the default DR\_MODE, so that once things are disturbed, you can put things back?  
I'm worried that I may end up inserting a DR\_MODE primitive for almost every polygon I draw, because some of them will be texture mapped in special ways.  
Any comments?  
Thanks  
Gene Sewell

---

6/20/95 10:43 PM  
Re: 3D texture warping (etc.)  
Jim Guerard  
LIBGPU

By now you have probably figured out about two triangles in a quad, texture warping, poly clipping, and the ordering table. If you still have any questions - ask again.  
With regards to polygon ordering, the Playstation orders an entire polygon based on its Z position. There is no pixel level ordering. It is possible for a small polygon with the same Z as a larger one to get fully obscured, and same size polys can have sections coming in front of and then behind their neighbors.  
On the Playstation the largest allowable ordering table size is 4096. Primitives are put in the ordering table based on their Z value shifted down twice. The effective Z range for world coordinates is 16K, but the precision of Z ordering is 4 instead of 1.  
If you cannot force the shapes and sizes of your polys so that they display properly, you can fudge their Z values a little (ie. lower the Z value of the poly you most want to see).  
You can also leave the world Z value steady, and fudge the value passed to the ordering table. Just make sure that you carefully check the range of the synthesized OT value so that it fits within the size of your OT array.

---

6/21/95 9:35 AM  
Re(2): 3D texture warping (etc.)



David W. Marshall  
Jim Guerard  
LIBGPU

Where did the statement "the largest OT size is 4096" come from?  
The demos use 1<<14 or 16384 for an OT size.

---

6/26/95 12:43 PM  
Re(3): 3D texture warping (etc.)  
Jose R. Villeta  
LIBGPU

OT Size 4096 applies to Gs Library Objects. Primitives can have up to 16384. The difference is the top 2 bits for overflow on Gs jose

---

6/26/95 9:54 AM  
3.1 Samples?  
Scott Berfield  
LIBGTE

When will samples be available which demonstrate new features of 3.1 libraries such as "Perfect Perspective Texture Mapping"?  
-sb

---

6/26/95 12:18 PM  
RotMesh and GsTMDFast in lib 3.0  
David W. Marshall  
LIBGTE

Does the RotMesh stuff work yet? A document at one time said that RotMesh would be in the Lib 3.0.1 rev?????????????????  
Any sample code or docs explaining how to use RotMesh or generate the data needed for a RotMesh call?  
Any docs or sample code for all these GsTMDFast....() calls? These calls reference data types like TMD\_P\_G3. What are these? They are not defined in the libs anywhere.  
thanks,  
dave

---

6/26/95 9:54 AM  
3.1 Samples?  
Scott Berfield  
LIBGTE

When will samples be available which demonstrate new features of 3.1 libraries such as "Perfect Perspective Texture Mapping"?  
-sb

---

6/27/95 9:19 PM  
Explicit linking breaks debug printing?!

Mike McAulay  
LIBGPU

Hey. I've got a little demo program that prints to the screen successfully using FntPrint, FntFlush, etc., when I compile via ccpsx. But when I compile and link in a two-part process, my text no longer appears on the screen!

Here's the syntax that works:

```
ccpsx -g -Xo$80070000 ..\code\main\main.c -o..\execute\foo.cpe,main.sym -l\psx\lib\libc.lib
```

And here's the syntax that's broken:

```
ccpsx -c -g -comments-c++ -Xo$80070000 ..\code\main\main.c -omain.obj psylink /m
```

```
@foo.lnk,..\execute\foo.cpe,foo.sym,
```

foo.lnk looks like:

```
org $80070000 include c:\foo\code\main\object\main.obj inclib c:\psx\lib\libs.n.lib inclib  
c:\psx\lib\libapi.lib inclib c:\psx\lib\libetc.lib inclib c:\psx\lib\libgte.lib inclib  
c:\psx\lib\libgpu.lib inclib c:\psx\lib\libc.lib text group bss group bss regs  
pc=__SN_ENTRY_POINT
```

Can anyone clue me in as to why this is occurring? It's driving me absolutely nuts. Remember, it's the exact same piece of code in both cases, and it appears to run normally in all other respects.

Thanks in advance,

M.

---

6/27/95 10:45 AM

screen clipping?

Bruce Plotnick

LIBGPU

Does SetDrawEnv work correctly for dynamically changing screen clipping boundaries while executing an ordering table. There are no examples in the sample code and I can't even get the following sequence to behave properly:

```
DR_ENV testDrEnv; DRAWENV testDrawEnv;
```

```
testclip(u_long *ot) { GetDrawEnv(&testDrawEnv);
```

```
SetDrawEnv(&testDrEnv,&testDrawEnv); AddPrim(ot,&testDrEnv); }
```

I would have expected this sequence of commands to do nothing since I've read the current DRAWENV and reloaded it. However, my drawing environment gets damaged somehow by this sequence. Any idea what's up.

Am I correct in assuming that the following sequence should alter the clipping boundaries without causing any side effects:

```
GetDrawEnv(&testDrawEnv);
```

```
SetDefDrawEnv(&testDrawEnv,NEWCLIP_X,NEWCLIP_Y,NEWCLIP_W,NEWCLIP_H);
```

```
SetDrawEnv(&testDrEnv,&testDrawEnv); AddPrim(ot,&testDrEnv);
```

Are there any samples available which alter screen clipping? Thanks.

---

6/27/95 12:15 PM

NormalColorCol : Scaling Convention

Dan Chang

LIBGTE

I'm having difficulties trying to understand what the function 'NormalColorCol' is doing to get the resulting color vector. Apparently, there are three calculations that are done to achieve the final result :

1. ARG1 ( SVECTOR\* ) gets multiplied by CONSTANT LIGHT MATRIX ( LLM ). This calculation makes sense, since both the argument AND the matrix are formatted with (1.3.12) values. Hence, the resulting vector ( call it LLV ) should also be in (1.3.12) format.

2. LLV gets multiplied by CONSTANT COLOR MATRIC ( LCM ). The resulting vector ( call it NCV ) is added to BK. Here is where the first ambiguity lies. When loading up the LCM via the LIBGTE function 'SetColorMatrix', there is no specifier as to the range these values should be in. I will assume that the values that are being loaded into the LCM will be in the range from 0 - 4096, with 4096 == 1.0. Thus, the integrity of the multiplication between LLV and LCM should hold. But... what about BK? Assuming that the LIBGTE call 'SetFarVector' sets up the 'ambience' color, and since these values are being set in a range from ( 0 - 255 ), is NCV scaled down to match the range of BK, or is BK scaled up to match NCV? I'm assuming that NCV is scaled down to match BK, since the next calculation involves

3. ARG2 ( CVECTOR\* ) gets multiplied by result from (2). Final result is placed in ARG3 ( CVECTOR\* ). I'm going to assume that the returned value NEEDS to be scaled to fit the range of 0 - 255. This final color gets used to to portray the polygons shading characteristics.

From above, there are clearly too many ambiguities to say that these steps are taking place. Furthermore, nowhere in the calculations does it accomodate for the fact that the normals passed in go from a range -1.0 to 1.0, but the resulting color vector goes from 0 - 255. When, in the calculations, is this shift in range accounted for?

If someone could please post the calculations that are occurring in this function, scaling and shifting included, I would REALLY appreciate it! I've been trying different combinations of numbers for each data structure, and haven't been succesful in finding a consistent range.

Thanks SOO MUCH!!!

Peter Giokaris

Boss Games Studios

---

6/28/95 11:08 AM

Re: Explicit linking breaks debug printing?!

Mike McAulay

LIBGPU

Okay, thanks to the able assistance of Dan B. I solved the Case Of The Mysterious Disappearing Text. The trick is to include the /c (case sensitive) option on the linker command line.  
M.

---

6/29/95 12:43 PM  
Triangle Vert ordering  
David W. Marshall  
LIBGPU

How do the vertices of a triangle need to be ordered for backfacing to work properly?  
The manual states that triangles must be ordered in the following manner:

0 2 1

This could also be interpreted as clockwise.

However, a triangle in the form :

2 0

1

does not seem to backface properly, even though it is still clockwise.

This problem seems to be showing up when using 3D-Studio to build large models by taking smaller pieces and rotating and flipping them into the big model.

If the library is using a true cross product to do backfacing, then as long as all the triangles are in a clockwise order everything should work fine.

Am I missing something?

Am I just clueless?

thanks,  
dave

---

6/30/95 1:35 PM  
Re: Triangle Vert ordering  
Jim Guerard  
LIBGPU

Yes, if a surface is clockwise 012, then it will also be clockwise 120 and 201. You need to give us more information about what the coordinates are, how you rotate them etc., and how you display them.

---

7/3/95 5:41 PM  
Re: Explicit linking breaks debug printing?!  
Lobotomy Software  
LIBGPU

I've had the same problem with my debug font. Eventually after Angus couldn't solve the problem, I just wrote my own version using sprintf to create the strings and (for ease of use) poly's to plot the font from the same vram location as the debug font would have used. From the docs, it looks like the library does roughly the same operations, so this method should not be a big speed hit...  
Jeff Blazier

---

7/11/95 5:30 PM

InitClip and Clip4F routines..  
stephen chaplin  
LIBGTE

Hello, I was wondering if anyone has gotten the InitClip and Clip4x routines to work? If so, is it possible if I can get an example? The syntax of the two commands seem rather confounding.  
Thanks

---

7/11/95 5:30 PM  
InitClip and Clip4F routines..  
stephen chaplin  
LIBGTE

Hello, I was wondering if anyone has gotten the InitClip and Clip4x routines to work? If so, is it possible if I can get an example? The syntax of the two commands seem rather confounding.  
Thanks

---

7/12/95 12:41 PM  
Fwd: Re: InitClip and Clip4F routines..  
Bill "Angus" Guschwan  
LIBGTE

Stephen,  
The Clip routines were a hack at 3D clipping routines, and they do not work well because they will cause distortion of texture maps due to the method of clipping that the GTE/GPU uses. If you use flat shaded or gouraud shaded polys it might be useful. Let me know if you still interested.  
Angus

---

7/12/95 11:19 AM  
Re: InitClip and Clip4F routines..  
Bill "Angus" Guschwan  
LIBGPU

Stephen,  
The Clip routines were a hack at 3D clipping routines, and they do not work well because they will cause distortion of texture maps due to the method of clipping that the GTE/GPU uses. If you use flat shaded or gouraud shaded polys it might be useful. Let me know if you still interested.  
Angus

---

7/13/95 4:29 PM  
Where are the docs?  
Sam Black  
LIBGTE

We were given beta 2.6 to 3.0 difference docs way back in April. Here it is, the middle of July, we've got lib31, and we still don't have any new docs. I can't even find any samples which use the new libs. If they exist, will someone please point me to them? If they don't, why not? 3.1 is supposed to add some important features (I've heard rumors of perspective correct tmapping --

I'd settle for (mapping correct clipping) but without any info on how to use them, they're less than entirely useful. Can something be done about this?

---

7/13/95 3:38 PM

Re: Fwd: Re: InitClip and Clip4F routines...

stephen chaplin

Bill "Angus" Guschwan

LIBGTE

Hello Angus, Yes, we would still be interested in the clipping routines and a better description of how they work.

Thanks for your time

---

7/14/95 9:22 AM

Re: Where are the docs?

Dan Burnash

Sam Black

LIBGTE

If you are still using the 2.6 docs, start downloading. The 3.0 docs have been showing up in online form for the last month or more. Some new samples were posted yesterday, so get those as well. Check the bbs regularly if you want to keep up with the latest software and documentation releases.

Dan Burnash SCEA

---

7/14/95 5:18 PM

Real World Poly Counts

Lace Ravel

LIBGPU

Does anyone have real-world benchmark figures for the number of polys the PSX can push? I'd be interested in numbers of textured, gouraud shaded, flat, etc polys.

Ballpark figures are fine, eg "2-3 hundred 8bit textured polys".

Thanks, - Lace

---

7/17/95 8:14 PM

fractional math routines

Russell A. Pflughaupt

LIBGTE

I'm just starting work on porting a title from the 3DO system to PSX. The 3DO has a rich set of fractional math routines that I've been unable to find equivalent functions for in the PSX docs or header files. The big routine that seems to be missing is a fractional divide. Does anyone know how to do this on PSX?

Thanks, Russ

---

7/18/95 10:47 AM

Re(2): fractional math routines

Russell A. Pflughaupt

Bill "Angus" Guschwan

LIBGTE

The ideal fractional divide for my needs would compute  $c = a/b$  where  $a, b, c$  are all 1.15.16 fractional numbers. Fractional divides using other decimal point placements (for example 1.19.12) may still be useful, but the utility goes down the further away they are from 1.15.16. If source is available, I'd be more than happy to hack it to work with the precision I need.

Thanks, Russ

---

7/18/95 9:29 AM

Re: Real World Poly Counts

Scott Berfield

LIBGPU

I have seen textured poly counts in the 120,000 to 150,000 poly per second range, depending on the complexity of what you are doing. One project I am working on can hit 160,000 with minimal textures, but when the textures are turned on the way we want them to look (i.e., made to look good), the performance drops to a worst case of 85,000 per second. This is probably due to the texture cache limits. I think that TohShinDen is running 90,000 a second at 30 fps. Tekken claims 120,000 per second at 60 fps. So basically, I guess between 85,000 and 150,000 is a good bet.

-sb

---

7/18/95 9:55 AM

Re: fractional math routines

Bill "Angus" Guschwan

Russell A. Pflughaupt

LIBGTE

Please post the equations and we can see what we can do. Fractional divides is kind of general, specifics will help greatly.\

Angus

---

7/19/95 9:42 PM

Re(2): Real World Poly Counts

Lace Ravel

LIBGPU

>performance drops to a worst case of 85,000 per second

Are you running at 30 or 60 fps?

Thanks a lot, Lace

---

7/20/95 2:03 PM

d cache

David W. Marshall

LIBGPU

Is the d cache guaranteed not to be used by kernel and free for the program to use however it wants to?

thanks,

dave

---

7/20/95 12:33 PM

Re(3): Real World Poly Counts

Lord Angus

Dave R. Scheele

LIBGPU

Orcs and dorks are always challenging my power. That is why I employ mighty winged monkeys (also known as lawyers) to protect the emerald city. I do fear Dorothy though.

The oracle says:

numbers for texture mapped is 240,000 polys/sec and for a Gouraud it is twice as long so it is 120 k poly/sec.

L.A.

---

7/20/95 9:17 AM

Re(3): Real World Poly Counts

Scott Berfield

LIBGPU

We are locked at 30FPS. -sb

---

7/20/95 11:10 AM

DrawPrim Revealed.

Bill "Angus" Guschwan

Alexis Kasperavicius

If so, how many primitives can the GPU FIFO hold? The GPU FIFO is 16 long words. The size of the primitives is listed at the top of libgpu.h in words. When you call DrawPrim, it COPIES the primitive to the FIFO and you can do what you want to the PRIM. Normally, you just copy 1 prim to the FIFO. You can call MargePrim to put together more than 1 prim. BUT don't make the margeprim prim bigger than 16 words. Normally, people use margeprim for a drmode,sprt,drmode, where the drmode changes the current texture page. If you look in libgpu.h, drmode,sprt, and drmode adds up to 16 words, perfect for the fifo. If it is greater than 16 words, the last primitive will be broken. The gpu executes through the FIFO. Primitives are basically instructions to the GPU.

Is the reuse of the primitive always guaranteed even if the FIFO is full? I would guess, yes, but you never know... DrawPrim calls DrawSync(0). DrawSync waits for the command queue to be empty. The command queue is a 64 GPU command list and a copy of the FIFO. After the command queue is empty, DrawSync waits for the FIFO to be empty. Once the GPU is IDLE (that is it is not drawing), DrawPrim will copy via I/O mode the PRIM over to the FIFO. When you get control back, the PRIM will be gone.

As far as sound make sure you are aligned on a 64 byte boundary for sound. You must also wait for the completion of the transfer by calling SsVabTransCompleted. The SPU uses memory mapped I/O. But it runs at 44kHz. The R3000 runs at 33 MHz. You might be writing a new command to the I/O when SPU hasn't had the time to process the 1st command. Send me a snippet of the code and I can try it.

ANgus

---

7/20/95 12:45 PM

GPU & Callback

Lord Angus



LIBGPU

I wanted to finish more GPU discussion.

GPU knows how to do 3 things on a high level:

1) Draw primitive based on what is in FIFO (Bus is free while drawing). 2) Request DMA for new primitives to FIFO 3) Perform DMA from main memory to FIFO (Bus is taking a hit) 4) Generate callback at end of DMA 5) Callback goes to 1

It cycles through this process. There is a callback at the end of the DMA. GPU OS adds a call to the execute queue routine (called exeque) which causes the code to go to step 1 again. Thus, the callback ensures the asynchronous processing of commands that are queued up.

If the command queue becomes empty, the DMA Callback is cancelled if you have not added a DrawSyncCallback. This is because processing of interrupts on PSX is round robin, and avoiding interrupts whenever possible is a good thing. This brings up the point that if you don't need a DrawSyncCallback, don't add it.

Lord Angus

---

7/20/95 6:25 PM

Re(2): Real World Poly Counts

Erick S. Dyke

LIBGPU

Preach on Lord Angus!

---

7/20/95 12:27 PM

Re(2): Real World Poly Counts

Dave R. Scheele

LIBGPU

O Great Oracle,

(genuflect)

please bend thine ear to this, thy humble servant's question ... are those numbers with or without light source shading (specifically the texture-mapped ones), or is there no difference?

Dave

p.s. be warned, o Great One, there's some shady guy in the back alley selling copies of the source code & hw specs ... maybe you ain't so great after all??

---

7/20/95 2:48 PM

Re: d cache

Lord Angus

LIBGPU

Dcache is always for user program.

LA

---

7/20/95 12:08 PM

Re: Real World Poly Counts

Bill "Angus" Guschwan

LIBGPU

Hello,

I am Lord Angus, the deity who communes with the gods through the oracle. The oracle to lay men is pronounced "GPU specifications." In other words, I get paid to communicate to you the source code and hardware specifications.

(Can you look at the source code or hw specs? No, because then I would not have a job. If there is no Lord Angus, then the world will be in disequilibrium, the Overfiend will show up, and all will be naught.)

The hw specs on the poly count and doing nothing else says:

Flat Shaded Triangle 10x10 pixel 360 k poly/sec Texture Mapped Tri. 10x10 pixel 240 k  
poly/sec Sprite 8x8 pixel 240 k poly/sec line 10 pixel  
1650 k line/sec

The factors affecting performance are myriad. I think an ideal GT3 at 10x10 will be around 120k poly/sec. But, you have to do other things so it drops to 80 to 90 k or so.

New developments makes life a little better. Using the d cache for certain elements, fitting in the i cache, getting better compilations, getting a better os, using meshes, fitting the texture cache may improve this number slightly higher. Thus, the ideal number of 120k will be approached asymptotically as life goes on.

The oracle has spoken. Members of my PSX fiefdom, continue thy good work (and ship on time). Or whatever comes first.

The oracle is now closed, Lord Angus

\* The oracle is open for operations Monday through Friday, 8 am to 7 pm PST.

---

7/21/95 10:44 AM

Re: Another GPU question...

Lord Angus

Dave R. Scheele

LIBGPU

Dave,

Welcome to the oracle.

GPU timeout:que=1,stat=4004060a,chr=01000401,madr=0027184c GPU

timeout:que=1,stat=4004060a,chr=01000401,madr=002b757c GPU

timeout:que=1,stat=4004060a,chr=01000401,madr=0027184c GPU

timeout:que=1,stat=4004060a,chr=01000401,madr=002b757c

GPU has a timeout of 4 seconds on all instructions. If the timeout occurs, then the printf spits out this diagnostic. Of course, we don't tell you what this means, but I Lord Angus will decrypt this message by conferring with the oracle.

The oracle says: que = 1 means there is 1 command in the command queue.

Stat is the GPU status. Here it means DMA mode is 16 word, your resolution is 512x240, dtd & dfe is on, and texture page is hazy because the crystal ball is unclear.

chr is channel control register. It tells use here that DMA again is 16 word, DMA is ON, DMA is slice mode (which means a LoadImage or MoveImage is on), and direction is from memory to I/O device.

Which, through conferring with my almight wisdom (and looking at the source code), leads me to believe it is a LoadImage problem. The memory address is bad too, so maybe you are passing a bad loadimage address.

All my power derives from the oracle. I hate the fact that developers don't have access to the oracle. Until the oracle is overthrown, I remain

Lord Angus

---

7/21/95 9:09 AM

Another GPU question...  
Dave R. Scheele  
LIBGPU

Since you're on a roll, GPU-wise ...  
I have a program that displays 3 high-poly-count objects with nice textures, etc. and it works very nicely. However, when I add a 4th high-count object, I get these:  
GPU timeout:que=1,stat=4004060a,chr=01000401,madr=0027184c GPU  
timeout:que=1,stat=4004060a,chr=01000401,madr=002b757c GPU  
timeout:que=1,stat=4004060a,chr=01000401,madr=0027184c GPU  
timeout:que=1,stat=4004060a,chr=01000401,madr=002b757c  
I've looked through the docs (that I have) and haven't been able to find out what that stuff means. Can you tell me, or point me to where I can find out myself?  
Dave

---

7/21/95 11:15 AM  
Re(3): fractional math routines  
Lord Angus  
Russell A. Pflughaupt

> The ideal fractional divide for my needs would compute  $c = a/b$  where a,b,c are > all 1.15.16  
fractional numbers. Fractional divides using other decimal point > placements (for example  
1.19.12) may still be useful, but the utility goes down > the further away they are from 1.15.16.  
If source is available, I'd be more  
> than happy to hack it to work with the precision I need. > > Thanks, > Russ > \*\*\*\*\* > >  
Angus >  
"c" has (1,15,16) fractional format, so the "a" should be 16bit left shifted before divide. It means  
this fractional divide is equivalent to 48bit/32bit integer divide. But to simplify the estimation I  
will compare by 32bit/32bit integer divide.  
The procedure to use GTE divisor is as below. -----  
1)Set GTE Rotation Matrix 0. (load x5= 10clock) 2)Set GTE Screen/Eye distance 1. (load x1=  
3clock) 3)Set GTE Transfer Vector "a","b". (load x2= 14clock) 4)Execute GTE command.  
(14clocks) 5)Read "c" from GTE register. (store x1= 4clock) -----  
----- 45clock This estimation is 16bit divide.32bit divide will need more than twice of  
16bit. And if you need to Push/Pop the Rotation Matrix then much more clocks is necessary.  
CPU divisor needs 35clocks for 32bit divide.But during the divide CPU can execute another  
work.  
So,using GTE divisor for this 32bit fractional divide has no advantage comparing to use CPU  
divisor.  
Regards.

---

7/24/95 11:12 AM  
Re(3): Another GPU question...  
Lord Angus  
LIBGPU

Blake,  
Hey ho how's it going?  
Any specific questions from the output of the GPU library we can answer. Generalize  
expression of the oracle is a bit dangerous. As you know, we have certain orders to follow as  
regards generalized access to oracular info (ie source & hardware). We are trying to lighten this

place up by reading whatever we can from that "holy" place. We empathize with developers' predicament and we don't envy it ourselves. We have, to a great extent that no one sees, gone and yelled at the "gods" to let out the information. I am using the metaphor of Lord and oracle as a way to better communicate with developers. Like the wizard of Oz, I am ineffectual when the emerald city (ie the oracle) is taken down. At heart I am a Marxist, "power to the developers." So go ahead and ask specific questions and we will be able to answer those. I think I answered the previous question very specifically.

LA

---

7/24/95 11:48 AM

Re(4): Another GPU question...

Blake E. Senftner

LIBGPU

Lord;

As life would have it, just yesterday (yes, I work on sundays) I started to get this message:

GPU timeout:que=4,stat=56040000,chr=01000401,madr=00000003

This is occuring during my first render, blocking something... I had to comment out a

"ClearScreen(x,y,w,h,r,g,b)" to get the application to run...

This is beginning to sound like a clip problem... but I need the oracle's advice, Lord Angus...

What is the meaning of my PSX timeout riddle?

-Blake

---

7/24/95 10:49 AM

Re(2): Another GPU question...

Blake E. Senftner

LIBGPU

Lord Angus;

Could you summarize the oracle's knowledge of decrypting the GPU printouts?

-Blake

---

7/25/95 10:46 AM

\_NOM routines

Dave R. Scheele

LIBGTE

I've been looking into using the \_nom routines in GTE, and getting nowhere fast. I thought I'd check out the archives to see if there's any old gold in the messages, but all I found was questions. Since the message posted seems to never have been responded to, and I have the exact same questions :- ) I thought I'd try again:

>> Where is the rest of the library support for the \_NOM routines? >> The libraries have ReadSXSyfifo() but where is the ReadP(), ReadOTZ(), etc...

>> The libgte.h has some assembly macros for this, but they are #ifdef'ed out. >> Besides, the macros just put a value into a register and are not very helpful in my C code.

>> Another email asked for \_NOM sample code. Is any available yet?

>> Another email mentioned that the RotAverageNClip3\_NOM routines had a bug for >> returning the correct OPZ value. Was this fixed in Lib 3.0?

How about it folks? Anyone using \_nom and have a quick & easy answer for these?

Dave

---

7/25/95 10:51 AM

Frame Rate Synchronization for PlayStation Application

Administrator

News

LIBGS

To all the licensees, July 5, 1995 S.C.E

Frame Rate Synchronization for PlayStation Applications

With PlayStation, display area updating on the frame buffer like double buffer swapping and the video frame rate (1/60 sec) can be performed asynchronously. However, the display switching at inconstant rate, not integral multiple of 1/60 sec, would not be carried out during the vertical blanking synchronous period, and would cause flicker of a display screen. This may be misunderstood by users as application malfunction.

In order to avoid this, buffer swapping must be performed in accordance with the vertical blank (V-BLNK) in usual processing. In example (A), buffer swapping takes place depending on slower processing in either drawing or displaying, and will be asynchronous with V-BLNK. Thus, unless expecting special effects intentionally, synchronization with VSync(0) is needed when swapping the buffers.

```
(A) (B) while (1) { while (1) { .... DrawSync(0); DrawSync(0); VSync(0);  
swap_buffer(); swap_buffer(); DrawOTag(ot); DrawOTag(ot); } }
```

However, if swapping is forced to synchronize V-BLNK, in a case where the processing is finalized around at 1/60 sec, the frame rate will be often switched between 1/60 sec and 1/30 sec, and movements of objects will look unnatural. This may be also the cause of user complaints.

In such cases, the frame rate should be fixed at 1/30 sec with VSync(2).

```
while (1) { ..... DrawSync(0); VSync(2); /* Fixed at 1/30 sec */ swap_buffer();  
DrawOTag(ot); }
```

As far as the circumstances permit, the frame rate should be kept constant by executing VSync(n).

Use VSync(3) if the frame rate is 20, and VSync(4) if the rate is 15.

This function will solve the frame number variation caused by the difference of the processing time between the frames.

However, in some applications the lowest frame rate should not be adapted to by others. In this case, instead of counting buffer swapping, the absolute counters like VSync(-1) or RCnt3 must be used as a clock within a program.

```
(A) (B) while (1) { while (1) { .... DrawSync(0); DrawSync(0); VSync(0); VSync(0);  
swap_buffer(); swap_buffer(); frame++; frame = VSync(-1); DrawOTag(ot);  
DrawOTag(ot); } }
```

If counting up the frame counter as in example (B), the internal counter will not be delayed even if calculation or drawing overflows, and it causes a moment's frame rate reduction. If this counter is used for updating the object location, the movements will be kept looking natural even in the case of the frame rate reduction.

In particular, as for the MoveImage() execution for a rectangle of which width is 16 dots or less, or drawing a polygon with short width, their processing time tends to vary because a page break often occurs. When such processing is often used, strict time management not to depend on the drawing speed will be required.

Moreover, in interlaced mode both calculation and drawing must be terminated at 1/60 sec. Thus, V-BLNK must take precedence of the termination of drawing (DrawSync(0)) when swapping the buffers. In order to achieve this drawing must be reset during the processing in accordance with V-BLNK. If the drawing time should overflow, the occurrence of screen confusion specific to the interlaced mode will be reduced.

In order to keep the quality of applications for PlayStation, you are requested to take the measures described above. We would appreciate your corporation.

---

7/25/95 11:14 AM

Re: \_NOM routines

Blake E. Senftner

Dave R. Scheele

LIBGTE

I've been using the routines for quite some time...

I do a:

```
RotTransPers3_nom( &sector0, &svector1, &svector2 ); ReadSXSyfifo( &xy0, &xy1, &xy2 )
```

to get the screen transformed points...

That's all I use it for.

-Blake

---

7/26/95 12:50 PM

Re(5): Another GPU question...

Lord Angus

LIBGPU

chcr=01000401 is indicative of a DrawOTag dma problem. 01000201 would be a LoadImage/StoreImage problem. A memory address of 3 is BAD! Remember FntPrint calls DrawOTag.

Angus

---

7/27/95 2:21 PM

Lord Angus is gone, but I still need info from the oracle ...

Dave R. Scheele

LIBGPU

Of course, right when LA goes AWOL, I get the following GPU timeout:

```
GPU timeout:que=1,stat=40040600,chcr=01000401,madr=0002aed0
```

and I need someone to interpret it for me. I don't think it's the LoadImage/MoveImage thing because I'm not using any texture maps in this test case, they're all just G3 polys. Whaddaya say, Angus, are you as good as the roaving baron??

Dave

(as if I didn't know already ...)

---

7/27/95 4:58 PM

Re: Lord Angus is gone, but I still need info from the oracle

om:

Angus

Dave R. Scheele

LIBGPU

The DMA is setup to do a source chain copy. The GPU uses source chain DMA to copy the polygon information over. There is 1 command in the queue.

Angus

---

7/31/95 9:34 AM

Speed diff btwn DrawPrim and DrawOtag?

Rusty Buchert

LIBGPU

To do all my drawing, I just do a DrawPrim after I build up my primitive. Am I taking a speed hit by not using the DDrawOtag list? I know the order of my render is correct, so I have no use for the list unless I gain speed.

John Slagel Parallax Software

---

7/31/95 7:33 AM

DOS-based documentation for 3.0 Library

Carl Ferreira

LIBGTE

CHECK.ZIP 153K

LIBGPU/GTE

The attached program is a utility I created to obtain information quickly from the DOS prompt regarding the 3.0 library functions. This is a bastard conversion of the Acrobat information, so the format while generally usable is not perfect.

For example, to obtain information about the AddPrim function, just type "check AddPrim" from the command line and the information is immediately displayed!

You can perform keyword searches, view a keyword list, or perform forward or backward text searches. There are 10 bookmarks, fast topic locations and history backtrace. All searches are case sensitive at this time.

All this for the low, unheard of price of... FREE!

Feel free to send me comments and suggestions regarding this. I'm certain you will find it to be as useful as I. Let's all help each other and perhaps tech-support will be able to spend their time on the really gnarly problems that we can't solve.

Carl Ferreira

---

7/31/95 10:12 AM

Re: Speed diff btwn DrawPrim and DrawOtag?

Angus

LIBGPU

The problem with DrawPrims is it calls DrawSync everytime. Therefore, you lose some CPU time. With DrawOtag, you gain some CPU time since DrawOtag does it asynchronous.

Definitely, you should use DrawOtag. If you only do a few DrawPrims, then DrawPrim might be ok because of the DMA setup for DrawOtag.

ANgus

---

7/31/95 7:33 AM

DOS-based documentation for 3.0 Library

Carl Ferreira

LIBGTE

CHECK.ZIP 153K

LIBGPU/GTE

The attached program is a utility I created to obtain information quickly from the DOS prompt regarding the 3.0 library functions. This is a bastard conversion of the Acrobat information, so the format while generally usable is not perfect.

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Feel free to send me comments and suggestions regarding this. I'm certain you will find it to be as useful as I. Let's all help each other and perhaps tech-support will be able to spend their time on the really gnarly problems that we can't solve.

Carl Ferreira

---

8/2/95 3:36 PM

Re: \_NOM routines

David W. Marshall

Dave R. Scheele

LIBGTE

As far as I can tell, the \_NOM routines are no longer being supported and have been replaced by the GTE\_ macro calls. I guess these macro calls are going to be part of the 3.2 library. (The macro samples can be found in the Release conference)

If you like nested macros and hardcoding addresses and instructions, you'll love how the GTE\_() routines work.

dave

---

8/3/95 10:17 AM

FAQ Format?

David Foley

LIBGPU

Does anyone know what format the FAQ .DOC files are in. Word 6.0 can't open them. Are these actually .PDF files?

David

---

8/3/95 1:56 PM

Re: Does tex. orientation affect speed?

Angus

LIBGPU

The biggest consideration for the PSX is to make sure the texture fits in the texture cache. It must be 32x32 16 bit 64x32 8 bit 64x64 4 bit

For each pixel the GPU draws, it checks the GPU cache first. If it is not in the cache, it reads in a line. Thus, with a straight image and straight texture, you will read a line for the 1st pixel and then read the cache til the end of the line. With a rotated image and straight texture, you will read a line for each pixel in the first line of the rotated image. But, for the rest of the image, you will be reading from the cache. So, it's a different way of getting the same performance results.



If your texture are bigger than the cache, then you might get better performance with the 2 images. If it is, and you have a rotated image and a straight texture, you will read a whole line for each pixel.

So, if your textures fit in the cache, then don't worry about dual images. if your textures don't fit in the cache, you can probably see a performance increase, but I think it would be better if you divided your polygon to fit in the cache.

Angus

---

8/3/95 12:15 PM

Geometry Calculation

Alex J. Garden

LIBGTE

Hi didele ho neighbours...

I have been trying to replace the LIBGS "rendering" libraries with some reasonable facimilie using LIBGS. On page 87 of the LIBGTE library overview, there begins an explination of the derivation of the math used in coordinate conversion on the PS-X. I am going to walk through the math as I understand it and I would like anyone to correct my misunderstandings as I am missing something and I don't really know what.

(Vx, Vy, Vz) a theoretical point in local object space. (Wx, Wy, Wz) a theoretical point in world space. (Sx, Sy, Sz) a theoretical point in screen space.

I assume that screen space refers to eye space, such that, points projected from screen space map into points on the screen?

The manual refers to the first important matrix as WL (World Local) that is composed of a rotation (WLij) and a translation (Paralell Transfer) (WLx, WLy, WLz). According to the manual, points can be taken from local space to screen space when a function such as RotTransPers is used. A final matrix Rij and a final translation vector TRx, TRy, TRz are set using SetRotMatrix and SetTransMatrix respectively to use this function.

The derivation of Rij is  $[Rij] = [SWij] * [WLij]$

I am assuming SWij is the inverse camera rotation matrix and the negative amount of camera paralell transfer. Is this right?

I am assuming WLij is the cumulative modeling rotation including my current node of hierarchy but NOT including the camera. Is this right?

Okay so at this point I have Rij and I set it using SetRotMatrix.

Now I need TRx, TRy and TRz. I get these using

$(TRx, TRy, TRz)^{\wedge} = [SWij] * (WLx, WLy, WLz)^{\wedge} + (SWx, SWy, SWz)^{\wedge}$

Here I am assuming SWij is the inverse camera matrix again, and SWx, y, and z are the negative paralell transfers of the camera. I am assuming that WLx, y, z are the cumulative amounts of paralell transfer including this level of heirarchy but not including the camera translation. Is this right? I set this matrix using SetTransMatrix then I render and I get some wacky results. The world looks okay, but I do not get my objects moving relative to the camera correctly. Please correct my mistakes.

Thanks in advance.

Alex Garden@Radical Entertainment.

---

8/3/95 10:10 AM

Does tex. orientation affect speed?

Mike McAulay

LIBGPU

Hey.

In the texture mapping work I've done on the PC it has often proved advantageous to keep two copies of a source texture in RAM where one is a rotated image of the other. This way, whatever the orientation of the destination poly in screen space, I can guarantee I am stepping through texture space in a positive direction. The advantage derives from the fact that this is very cache-friendly whereas stepping through RAM in a negative direction makes Mr. Cache do the Big Frown.

So my question: is this a consideration on the PSX?

M.

---

8/3/95 5:29 PM

Re: Geometry Calculation

Angus

Alex J. Garden

LIBGTE

Please post some code so we can look at it. I understand C better than English.

Angus

---

8/4/95 11:25 AM

Re(2): FAQ Format?

David Foley

LIBGPU

The problem is that if you download them with a MAC they are getting stored as Microsoft Word for MAC files and thus are getting corrupted. Maybe you could ZIP these up when posting, because of so many different platforms corruption of data is always a problem when using BBS etc to transfer files.

---

8/4/95 12:20 PM

Re(3): Geometry Calculation

Karen Paik

Alex J. Garden

Angus

SetRotMatrix and SetTransMatrix set the local to world transform (WL) The world to screen transform is basically the perspective projection. It also offsets the coordinates to get (0,0) in the right place.

So, local to world is the RotTrans part of RotTransPers and world to screen is the Pers part of RotTransPers.

---

8/4/95 10:17 AM

Re(2): Geometry Calculation

Alex J. Garden

Angus

LIBGTE

Perhaps I was too vague in phrasing the question. I am not interested in fixing a particular problem. However, I am interested in understanding the explanation of how the PS-X hardware performs its geometry calculations. On page 87 and 88 of the library overview, there are some mathematical derivations that list the geometry calculation process. However, they do not explain the significance of (SW<sub>wj</sub>, SW<sub>wx</sub>, SW<sub>wy</sub>, SW<sub>wz</sub>) and (WL<sub>wj</sub>, WL<sub>wx</sub>, WL<sub>wy</sub>, WL<sub>wz</sub>). My question is

very simple. What are these. I understand they are matrix transforms applied to a vertex followed by a vector addition. Sony does not derive the matrices or the vectors. That is all.

Thanks again....

Alex Garden@Radical Entertainment.

---

8/4/95 11:18 AM

Re: FAQ Format?

John Phua

LIBGPU

Hi David,

The FAQ files are of WORD 6.0 format. I just downloaded it on a PC and it ok. However some of the files are just templates and may not contain any information except for the beginning outline. The developer support team will be updating them as time progresses.

Thanks, John

---

8/4/95 5:33 PM

Re(3): Geometry Calculation

Angus

Alex J. Garden

LIBGTE

Alex,

Karen is right.

Also, the whole SWij is confusing.

(SWij, SWx, SWy, SWz) and (WLij, WLx, WLy, WLz) WL just rotates the object to the world coordinate system. SW just rotates the world coordinate system to your view or camera. The Rotation matrix is the product of those 2 matrices.

Matrices look like WS11,WS12,WS13 1,0,0 cos y, 0, sin y cos z,sinz, 0 WS21,  
WS22,WS23 = 0,cosx,sinx 0,1,0 -sinz,cosz,0 WS31,WS32,WS33 0,-sinx,cosx -  
siny,0,cosy 0,0,1

SW looks like that too.

I can give you some theses about the PSX transformation philosophy:

1) There is the world, local and screen. To go from local to world, you need to do a rotation for alignment purposes. The rotation is 16 bit and is done in hardware. 2) To place the object into the world, you need to do the translation. The translation is 32 bit, so your world is thus effectively 32 bit. 2b) The screen coordinate system is 16 bit. So you need to do the transform to it, which is the SW tranformation. 3) Objects needed to be transformed always relative to the world. (What I call absolute transformations). I understand that some 3d packages perform hierarchical transformations, where objects are transformed relative to one other and the world is at the pinnacle. Hierarchical transformations don't work because the cumulative error of fixed point math in the GTE accumulates. 4) Lights are ALWAYS in the world coordinates system. 5) As a math trick, PSX multiplies the light vector times the local to world matrix even though the light vector is already in world space. When you multiply the normal times this "local light matrix," the math comes out in the wash.

Angus

---

8/7/95 3:03 PM

Re(4): Fwd: Re(3): Geometry Calculation

Angus

Carl Ferreira

LIBGTE

Carl, >SW just rotates the world coordinate system to your view or camera. SW is handled by you and is up to you to do. It's your 3d world.

Angus

>>The Rotation matrix is the product of those 2 matrices. >Rotation Matrix = SW \* WL. So there is nothing to set.

>>Matrices look like >>WS11,WS12,WS13 1,0,0 cos y, 0, sin y cos z,sinz, 0 >>WS21,WS22,WS23 = 0,cosx,sinx 0,1,0 -sinz,cosz,0 >>WS31,WS32,WS33 0,-sinx,cosx -siny,0,cosy 0,0,1

>>SW looks like that too.

>But still no information on how to set the SW matrix!

How do you set the SW Matrix? I KNOW that the Rotation Matrix = SW \* WL. WL is the Local to World Matrix, but what is SW (the world to screen matrix). HOW IS THIS SET?

Carl

---

8/7/95 12:14 PM

Using AddPrims

Pat Quinn

LIBGPU

I'm attempting, with little success, to effect prioritization of sub-ordering tables into a primary ordering table.

I have a double-buffered ordering table for each object I read in from a PMD file. Each of these sub-ordering tables is dimensioned variously from `u_long sub->ot[2][44]` to `sub->ot[2][1532]` (the secondary dimension is the total number of primitive packets in the PMD file). For now, I transform my primitives with the `RotPMD_*` routines in `libgte` (I don't plan on using `libgs...`). As you know, these transformation routines also register the primitives in the ordering table -- in this case, each object's own sub-ordering table.

After this is done, I then add each sub-ordering to the main ordering table -- which is dimensioned something like `u_long MainOT[2][30]` -- using `AddPrims`. This works fine. The thing is, I can't get the effect of prioritization to work by specifying an offset into the main ordering table when I register each sub-ordering table.

I have something like this:

```
/* this is the primary ordering table and double buffer index */ main_ot = buffer->ot; id =
buffer->id;
/* clear the primary ordering table */ ClearOTag( main_ot, OTSIZE ); <== OTSIZE is 30;
/* for each PMD object (let's assume a single primitive group in each) */ for( i=0; i<nPMDobjs;
i++) { /* this is the PMD object and it's unique ordering table */ obj = PMDobj[i]; sub_ot =
obj->ot[id];
/* clear the object's ordering table */ ClearOTag( sub_ot, obj->nPackets );
/* transformation stuff... */ PushMatrix(); SetRotMatrix( &world ); SetTransMatrix(
&world );
RotPMD_SV_FT3( obj->pgrpPtr, obj->sVerts, sub_ot, obj->ot_length, /* z-sorting in
sub_ot */ id, 0 );
PopMatrix();
/* now add sub_ot to main_ot in an established priority order */ AddPrims( main_ot + obj-
>priority, sub_ot, sub_ot + obj->nPackets - 1 ); }
```

The problem with the last statement is, it doesn't appear to matter what the priorities the objects have relative to each other -- they still all seem simply z-sorted.

I'd appreciate any insight you might have into this problem. Thanks.

David Crain NuFX, Inc.

---

8/7/95 2:01 PM

Re(2): Fwd: Re(3): Geometry Calculation

Angus

Carl Ferreira

Thomas Boyd

>The Rotation matrix is the product of those 2 matrices. Rotation Matrix = SW \* WL. So there is nothing to set.

Angus

Tom --

Yes, I did just read this...

>(SW<sub>ij</sub>, SW<sub>x</sub>, SW<sub>y</sub>, SW<sub>z</sub>) and (WL<sub>ij</sub>, WL<sub>x</sub>, WL<sub>y</sub>, WL<sub>z</sub>) >WL just rotates the object to the world coordinate system. >SW just rotates the world coordinate system to your view or camera. >The Rotation matrix is the product of those 2 matrices.

>Matrices look like >WS<sub>11</sub>,WS<sub>12</sub>,WS<sub>13</sub> 1,0,0 cos y, 0, sin y cos z,sinz, 0 >WS<sub>21</sub>,  
WS<sub>22</sub>,WS<sub>23</sub> = 0,cosx,sinx 0,1,0 -sinz,cosz,0 >WS<sub>31</sub>,WS<sub>32</sub>,WS<sub>33</sub> 0,-sinx,cosx -  
siny,0,cosy 0,0,1

>SW looks like that too.

But still no information on how to set the SW matrix!

Carl.

---

8/7/95 2:30 PM

A stitch in time...

Carl Ferreira

Thomas Boyd

What conditions cause stitching (that dotted-pixel-sort-of-line between polygons) and what prevents it?

\* Does stitching ever occur between two flat shaded (non-textured) polygons? \* What is the best way to prevent stitching between textured polygons?

Carl

---

8/7/95 2:26 PM

Re(3): Fwd: Re(3): Geometry Calculation

Carl Ferreira

Angus

LIBGTE

>>The Rotation matrix is the product of those 2 matrices. >Rotation Matrix = SW \* WL. So there is nothing to set.

>>Matrices look like >>WS<sub>11</sub>,WS<sub>12</sub>,WS<sub>13</sub> 1,0,0 cos y, 0, sin y cos z,sinz, 0 >>WS<sub>21</sub>,  
WS<sub>22</sub>,WS<sub>23</sub> = 0,cosx,sinx 0,1,0 -sinz,cosz,0 >>WS<sub>31</sub>,WS<sub>32</sub>,WS<sub>33</sub> 0,-sinx,cosx -  
siny,0,cosy 0,0,1

>>SW looks like that too.

>But still no information on how to set the SW matrix!

How do you set the SW Matrix? I KNOW that the Rotation Matrix = SW \* WL. WL is the Local

to World Matrix, but what is SW (the world to screen matrix). HOW IS THIS SET?  
Carl

---

8/7/95 3:22 PM  
SetPoly Calls  
David W. Marshall  
LIBGPU

Can someone dust off the oracle and tell me what the TAG and CODE are set to by each of the SetPoly..() calls?  
thanks,  
dave

---

8/8/95 9:40 AM  
Lib 3.1 Problems?  
Scott Berfield  
LIBGS

Has anyone moved to 3.1 libs? If so, how severe was the size increase in your executable? Also, did you see performance hits due to the printf's embedded in each function?  
-sb

---

8/8/95 4:52 PM  
Re(4): Geometry Calculation  
Alex J. Garden  
Karen Paik  
Angus

I understand the concept of the projection taking 3D data into 2D space. In 3D rendering systems, there are typically 4 "spaces" local space, world space, eye space, and screen space. In the sony manuals, they call eye space screen space and they call screen space screen space. In fact, at one point in the overview, they say screen space ---> projection calculations ---> screen space!! A bit of an interesting problem no? Anyway, I am assuming that SW is the matrix that takes objects from world space into eye space where they can be projected into screen space. This would make SW effectively the camera matrix (or inverse camera matrix).

... Thanks...  
Alex Garden@Radical Entertainment.

---

8/8/95 9:40 AM  
Lib 3.1 Problems?  
Scott Berfield  
LIBGS

Has anyone moved to 3.1 libs? If so, how severe was the size increase in your executable? Also, did you see performance hits due to the printf's embedded in each function?  
-sb

---

8/8/95 12:39 AM  
Re: SetPoly Calls  
Dean M. Grandquist

LIBGPU

The .h file has this info.  
Ta --DeanG

---

8/8/95 10:06 AM

Re: Lib 3.1 Problems?

Angus

Scott Berfield

LIBGS

3.1 is 14k bigger overall. Of course, the impact on your project depends on what you link in.

Angus

---

8/8/95 5:00 PM

Re(4): Geometry Calculation

Alex J. Garden

Angus

LIBGTE

Angus...

Thanks for the reply....

I am pretty clear on the matrix math involved in 3D rendering systems. In general implementations, I tend to use 4x4 homogenized RTS matrices. As the PS-X only has 3 multiply and accumulate registers on the GTE, they are forced to implement a 3x3 matrix + a rotation vector. This I understand. I was more concerned with the math described in the GTE overview in the manual. They derive the math with the exclusion of the SW matrix. In general terms, this matrix could be the camera matrix, the inverse camera matrix, or some bizzare coordinate conversion matrix. (Quaternians maybe? :) anyway, any help would be appreciated. Oh and by the way, the accumulated error involved in traversing a modeling heirarchy on the PS-X is not too heinous. There is a little object shimmy, but only if the objects in the hierarchy are really small. So am trying to avoid rendering any particle systems. It works fine for bad guys tho!

Thanks...

Alex Garden@Radical Entertainment

---

8/8/95 10:06 AM

Re: Lib 3.1 Problems?

Angus

Scott Berfield

LIBGS

3.1 is 14k bigger overall. Of course, the impact on your project depends on what you link in.

Angus

---

8/9/95 9:59 AM

Re(5): Geometry Calculation

Angus

Alex J. Garden

Karen Paik

You got it. SW is both eye space and screen space in your terminology.

Angus

---

8/9/95 2:15 PM  
Re(4): SetPoly Calls  
David W. Marshall  
Angus  
LIBGPU

I am still using lib 3.0 and see the following in my .H files

```
#define setPolyF3(p) setlen(p, 4), setcode(p, 0x20)  
void SetPolyF3(POLY_F3 *p) ;
```

The bits that SetPoly() sets in the Tag field for the GPU is what I am interested in.

dave

---

8/9/95 11:15 AM  
Re(2): SetPoly Calls  
David W. Marshall  
Dean M. Grandquist  
LIBGPU

the .h file has the macro calls for setPoly..(), notice small s.

I wanted info on the actual library calls SetPoly..(), notice big S.

I need the info for the library calls. I also want to see if the macro and library calls do the same thing. If they do, why do they both exist?

thanks,  
dave

---

8/9/95 11:41 AM  
Re(3): SetPoly Calls  
Angus  
LIBGPU

>>I wanted info on the actual library calls SetPoly..(), notice big S. If you look, you'll notice SetPoly is defined as setPoly. SetPoly just sets some bits in the tag to identify what type of polygon it is to the GPU.

>>If they do, why do they both exist? For compatibility. They weren't there originally and now they are. Are you a philosopher?

Angus

---

8/10/95 4:25 PM  
Re(3): A stitch in time...  
Rusty Buchert  
Carl Ferreira  
Thomas Boyd

Hmmm... I don't know if your diagram didn't make it thru ok or if I don't understand it... I think you drew a T-shaped intersection of 3 polys, which would cause cracking. Could you send me a better description of your diagram?

John Slagel Parallax Software

---

8/10/95 4:29 PM  
Relationship btwn TWIN and UV's ???



Rusty Buchert  
LIBGTE

This is a problem I have been struggling with since the first day I unpacked my PSX dev station, and I would like to get it resolved! I am wondering about the relationship between the following items: Texture Windows, Texture UVs, and Texture pages. Lets say that I have a 64x64 4bpp texture at TX,TY in VRAM, where TX is on a 16 pixel boundry and TY is on a 64-pixel boundry. Remember, TX and TY in this example can be anywhere as long as they fall on these boundries. They will never cross TPAGE boundries, but they can lie anywhere within a tpage as long as they're on the correct 16-64 boundries. Then, I want to draw this texture to the screen, and I want it tiled 4 times in each direction. So I do this: 1. Set upper-left uv's of texture primitive to (0,0) 2. Set lower-right uv's of texture primitive to (255,255) 3. Set texture page to be GetTpage(0,0, TX, TY) 4. Set texture window to ((tx\*4)%256,ty%256) with width=height=64 5. DrawPrim(texture) Should this work?? If my 64x64 texture is an 'A', then it should draw: AAAA AAAA AAAA AAAA The reason I ask is that it doesn't seem to work... So I guess my questions are: Are the UV's offset from the Texture window or the texture page, or some other thing? Can you tile up to 4 times using uv's?? OR, IN THE WORST CASE, can you only tile 4 times if your 64x64 texture is located at position 0,0 in the texture page. Thanks for any help!

---

8/10/95 9:28 AM  
Re: A stitch in time...  
Rusty Buchert  
Carl Ferreira  
Thomas Boyd

This is usually caused by dividing one texture and not the other, which we call T-joints. Never split one texture edge unless you split that same edge on all polygons that share that edge. Here is a ascii diagram:

V1            V2            -----V3-----            |            |

In other words the edge v1,v2 wasn't split on the top poly, but was split on the lower poly, which usually wont draw exactly like the straight edge.

-John Slagel Parallax Software

---

8/10/95 2:57 PM  
Re: 4x4 Transforms?  
Angus  
Carl Ferreira  
LIBGTE  
CompMatrix performs as documented in 3.0. So what is it that you need?  
Angus

---

8/10/95 9:10 AM  
Some GTE questions  
Sam Black  
LIBGTE

I was reading the stuff on what the flag bits from the GTE calls mean, and one thing caught my eye. An error is returned in the flag bits (bit 31 == 1) if  $Z < h/2$ . Can this be right? In our coordinate system, 1 unit is 4 inches. Our screen is 384 x 218 with the planes  $X=Z$  and  $-X$

= Z defining the right and left edges of the screen, so I have to set  $h = W/2 = 192$ . Now you're telling me I have to clip anything closer than  $h/2$ ? That puts my near clip plane about 30 feet out. This is completely unacceptable. Will someone please tell me that the GTE is not this brain dead, and that it will still do the perspective divide, even if  $Z < h/2$  (I don't care if it still flags an error, as long as it actually does do the divide). And if not, why not, and can we get it fixed? Second, how fast are the ClipXXX functions? Do they use the GTE for doing the divides? I know that we've been told not to use them, but can someone tell me anyway (or tell me what I'm supposed to use instead -- not subdivision -- and where the docs for it are)?

---

8/10/95 2:14 PM  
4x4 Transforms?  
Carl Ferreira  
LIBGTE

Is there any routine which performs true 4 x4 matrix multiplication?

CompMatrix does NOT.

The equivalent code for CompMatrix's t values is:

```
for (j = 0; j < 3; ++j) { dest->t[j] = src2->t[j]; for (k = 0; k < 3; ++k) dest->t[j] += (src2->m[k][j] * src1->t[k]) >> 12; }
```

What it SHOULD be doing is this:

```
for (j = 0; j < 3; ++j) { dest->t[j] = src1->t[j]; // Note -- src1, not src2 for (k = 0; k < 3; ++k) dest->t[j] += (src1->m[j][k] * src2->t[k]) >> 12; // Note -- src1/src2 swapped // Also matrix indices flipped ((j)[k] instead of [k][j]) }
```

Is there any built-in routine to perform the correct function? If so, what is it? If not, WHY NOT!!!!!!!!!!!!?

Carl

---

8/10/95 5:04 PM  
Re: Relationship btwn TWIN and UV's ???  
Angus  
Rusty Buchert  
LIBGTE  
texwin.zip 3K  
LIBGPU/GTE  
Here is a texture window example. Let me know if it helps. ANgus

---

8/10/95 1:26 PM  
Re(2): A stitch in time...  
Carl Ferreira  
Rusty Buchert  
Thomas Boyd

> This is usually caused by dividing one texture and not the other, > which we call T-joints. Never split one texture edge unless you split > that same edge on all polygons that share that edge. Here is a ascii > diagram:

```
V1          V2 -----V3----- |          |
```

> In other words the edge v1,v2 wasn't split on the top poly, but was > split on the lower poly, which usually wont draw exactly like the > straight edge.

Have you noticed any other causes for stitching, assuming that all vertices are shared?

Especially, would the following texture mapped situation cause a stitch?

```
| | Non-textured polygon | ----- | 32 x 32,  
16 color | 129 x 51, 16 bit texture | texture |
```

Carl

---

8/10/95 2:34 PM

4x4 Transforms? (correction)

Carl Ferreira

Carl Ferreira

LIBGTE

What it SHOULD be doing is this:

```
for (j = 0; j < 3; ++j) { dest->t[j] = src2->t[j]; for (k = 0; k < 3; ++k) dest->t[j] += (src2->m[k][j] * src1->t[k]) >> 12; }
```

The equivalent code for CompMatrix's t values is:

```
for (j = 0; j < 3; ++j) { dest->t[j] = src1->t[j]; // Note -- src1, not src2 for (k = 0; k < 3; ++k) dest->t[j] += (src1->m[j][k] * src2->t[k]) >> 12; // Note -- src1/src2 swapped // Also matrix indices flipped ([j][k] instead of [k][j]) }
```

---

8/10/95 9:41 AM

Speed diff btwn DrawPrim and DrawOtag

Rusty Buchert

LIBGPU

I previously asked whether to use DrawPrim or DrawOtag. When I use DrawPrim with a primitive that is stored in the fast scratch pad RAM, I get the same speed as when I use DrawOtag. The advantage to me is that DrawPrim with scratch pad memory uses no RAM, while the drawotag method requires that I keep a copy of each primitive in RAM along with the RAM from the primitive list.

So, for me, DrawPrim is the clear winner, same speed, no memory wasted on packets.

I think that this method is faster for me, because I fill in my primitive structures ewach time I draw a poly, which is taking a large chunk of CPU time. By keeping these primitive structures in fast scratch pad RAM, it speeds up the process of filling in the x,y,u,v,r,g,b fields, which seems to take more time than the actual drawing takes.

I hope these results help someone else...

John Slagel Parallax Software

---

8/11/95 6:49 AM

Re(2): 4x4 Transforms?

Carl Ferreira

Angus

LIBGTE

>CompMatrix performs as documented in 3.0. So what is it that you need?

>Angus

As I stated in my previous message, CompMatrix does NOT perform a 4 x 4 multiplication.

What I need is a 4 x 3 Matrix Multiplication. Is there (will there be) such a thing or do I need to roll my own?

Carl

---

8/11/95 12:05 PM

Re(3): 4x4 Transforms?

Blake E. Senftner  
Carl Ferreira  
Angus  
Carl,

Try GsMulCoord3( mat0, mat1 ). This performs a matrix concatenation much like a 4x4 concat. I'm assuming that you want to concat mats for your own heirarchy structure. This is the routine that I use for mine, and it works just like my UNIX 4x4 matrix routines.  
Oh yeah, the result of concat is returned in mat0. The operation is  $mat0 = mat0 * mat1$ ;  
-Blake

---

8/11/95 2:47 PM  
gte\_xxx macros  
Sam Black  
LIBGTE

I found the new gte\_xxx macro stuff in the 3.2 beta forum. This looks like it could be very useful, but the documentation is just a little bit less than I'd like. In particular, what is the "universal" register, and where are long vectors (VECTOR) returned (in things like RotTrans -- without the Pers). Also, if possible, can we have something which will do \*just\* the perspective divide? I.e., given a VECTOR (or even an SVECTOR) it will just do the divide by Z.

---

8/11/95 4:33 PM  
Re: gte\_xxx macros  
Angus  
Sam Black  
LIBGTE

I can request the Pers. I think there were some GTE divide routines which use the divisor in the GTE.  
Usually, SXS2 is where things are returned for RotTrans. Also, I don't know what the universal register is. I'll look into it.  
Angus

---

8/11/95 5:09 PM  
FNTFLUSH vs FntFlush  
David W. Marshall  
LIBGPU

I just discovered that there are 2 fntflush routines, FNTFLUSH() and FntFlush(). If you happen to link your code without the /c option (for case sensitive link), the linker will link with the FNTFLUSH() routine. This routine doesn't seem to work since all my debug info disappeared.  
Can FNTFLUSH() be removed from the libs.  
thanks,  
dave

---

8/11/95 12:58 PM  
Re(2): Speed diff btwn DrawPr  
Rusty Buchert  
LIBGPU

We handle Z-sort for objects by using a 3d-bsp tree. Then, we draw the walls from back to front, by traversing our mine "tree". We already had all this code working for the PC version of our game, Descent, so for us, it is the simple method, although it wasn't simple the first time we wrote it! The problem with BSP trees is that they don't handle animation very well for objects, so for a lot of games, they're not a good solution. But for Descent, the robot limbs don't move enough to invalidate our BSP tree, so we are lucky. Anyway... John Slagel Parallax Software

---

8/11/95 4:31 PM

Re(5): Geometry Calculation

Angus

Dave R. Scheele

LIBGTE

Well, this is just an example. But if you are using this, then listen to my post. It is from the hardware specs.

Angus

---

8/11/95 2:16 PM

Code demonstrating SPRT uv weirdness...

Rusty Buchert

LIBGPU

sprt.c 2K

LIBGPU/GTE

Okay... I am trying to write code that will draw a 16-color sprite stored anywhere in VRAM to the display. Theoretically, this code should work, but it doesn't! I have a feeling it is because either I am confused about the TWINS, TPAGES, and UV's, or else things just don't work like they're documented.

So, if anyone knows anything about this stuff, could you take a look at this code snippet that I have attached and see what I'm doing wrong?

Right now, to get around this problem, I use MoveImage to move the data to a location in VRAM that is at 0,0 in a TPAGE and then draw it. This is wasting time, and isn't pretty, but it works. I hope this isn't the final solution!

Thanks! John Slagel Parallax Software

---

8/11/95 6:51 AM

Re(4): A stitch in time...

Carl Ferreira

Rusty Buchert

Thomas Boyd

> Hmm... I don't know if your diagram didn't make it thru ok or if > I don't understand it... I think you drew a T-shaped intersection of >3 polys, which would cause cracking. Could you send me a better > description of your diagram?

That's right, I DID send a T shaped intersection. But note that the top polygon is flat shaded, while the bottom two polygons are texture mapped, although with different sizes and resolutions.

Question: Would I see a crack between the top polygon and the others? Would I see a seam between the two texture mapped polygons which share vertices?

Thanks, Carl

---

8/11/95 10:50 AM

Re: Speed diff btwn DrawPrim and DrawOtag  
Dave R. Scheele  
LIBGPU

>> So, for me, DrawPrim is the clear winner, same speed, no memory wasted >> on packets. Your method sounds interesting. I'm constantly running into the 2 meg memory limit. How are you handling the z-sort problem?  
Dave

---

8/11/95 2:59 PM

Re(3): Speed diff btwn DrawPr  
Dave R. Scheele  
LIBGPU

>> We handle Z-sort for objects by using a 3d-bsp tree... >> The problem with BSP trees is that they don't handle animation very >> well for objects, so for a lot of games, they're not a good solution.  
Ahhh I see. Consider yourself fortunate, then, to have avoided one of the PSX's hidden challenges. Unfortunately, our objects are animating themselves all over the place, so your solution won't work for us. Figures! ;-)  
Dave

---

8/11/95 9:28 AM

Re(5): A stitch in time...  
Rusty Buchert  
Carl Ferreira  
Thomas Boyd

If you have a T-shaped intersection of 3 polys, then you need to split the edge of the top poly to share the vertex that the two lower polys share. Otherwise, you will for-sure-definitely see cracks. Never draw "unjoined" t-joints, and you won't see cracks. Flat-shading, textured, 15bpp, 4bpp polys will always line up correctly as long as they share the same vertices. For sure.

We got around this problem by: When you subdivide an edge of a poly, make sure that you subdivide that edge based on its delta-z. That way, any polys that share that edge will get subdivided at the same location, eliminating cracks. Doing it this way means that you can't use Sony's method of subdivision, which is, if you have a quad that needs to be divided, split it into 4 quads. This \*will\* cause cracking because the next quad that is a bit deeper in Z and is connected to the split poly won't have its connecting edge split, which means you will see cracks. Check out Ridge Racer for examples of this cracking.

John Slagel Parallax Software

---

8/11/95 3:03 PM

Re(4): Geometry Calculation  
Dave R. Scheele  
Angus  
LIBGTE

Angus, a little while back you wrote:

```
>> Matrices look like >> WS11,WS12,WS13    1,0,0    cos y, 0, sin y  cos z,sinz, 0 >>  
WS21, WS22,WS23 = 0,cosx,sinx  0,1,0    -sinz,cosz,0 >> WS31,WS32,WS33    0,-  
sinx,cosx -siny,0,cosy  0,0,1
```

and I just went & checked the manuals (2.x, 3.x) and they have something different. I can't recall the exact differences now, but they involved the sign of some of the terms -- i.e. -sinz instead of sinz and so on. Who's right, you or the manuals?

Dave

---

8/14/95 11:34 AM

Re: Speed diff btwn DrawPrim and DrawOtag

Carl Ferreira

LIBGPU

> I previously asked whether to use DrawPrim or DrawOtag. When I use >DrawPrim with a primitive that is stored in the fast scratch pad RAM, I >get the same speed as when I use DrawOtag. The advantage to me is that >DrawPrim with scratch pad memory uses no RAM, while the drawotag method > requires that I keep a copy of each primitive in RAM along with the RAM > from the primitive list.

> So, for me, DrawPrim is the clear winner, same speed, no memory wasted > on packets.

> I think that this method is faster for me, because I fill in my primitive > structures ewach time I draw a poly, which is taking a large chunk of CPU > time. By keeping these primitive structures in fast scratch pad RAM, it > speeds up the process of filling in the x,y,u,v,r,g,b fields, which seems > to take more time than the actual drawing takes.

Two points I'd like for you to clear up, if you may -- 1) What exactly do you mean by fast scratch pad RAM? Is this something other than 'normal' RAM? 2) When you use DrawPrim it buffers the drawing in an asynchronous list of 64 requests. If you exceed this list, you are effectively performing the drawing synchronously. Do you typically use relatively few polygons in your display? Or is this something that you had not considered?

Thanks, Carl

---

8/14/95 2:02 PM

Re(2): FNTFLUSH vs FntFlush

David W. Marshall

Dan Burnash

LIBGPU

I found a FNTFLUSH by using the debugger and stepping into my printdebug() routine to figure out why FntFlush() wasn't working. When stepping thru the disassembly window after linking with /c, the FntFlush() call would branch to a FntFlush: label and the messages would display.

When linking without /c, the FntFlush() call would branch to a FNTFLUSH: label and the messages would not display.

I am still using lib 3.0 so it could be possible that it has been removed from the 3.2.1.0.1 or whatever library we are on now.

dave

---

8/14/95 3:18 PM

Re(3): FNTFLUSH vs FntFlush

Dan Burnash

David W. Marshall

LIBGPU

I believe what you are seeing is the same routine being called, but the linker has uppercased everything, so it looks different. I can't find an external symbol "FNTFLUSH" anywhere in the libraries. I am not surprised that linking without case sensitivity failed. I thought only Fortran programmers wanted everything single case? :-). Why do you need it? If you do, I will pass it along as "a feature request".

Dan B.

---

8/14/95 12:28 PM

Re: FNTFLUSH vs FntFlush

Dan Burnash

LIBGPU

David W. Marshall

Where are you finding FNTFLUSH()? I didn't find it. What library is it in? What version, size, and date?

Dan B.

---

8/14/95 4:25 PM

Re(4): FNTFLUSH vs FntFlush

David W. Marshall

Dan Burnash

LIBGPU

It can't be the same routine because it DOESN'T work if I link without /c. It also goes to a different location in memory to process the code.

I was just trying to point out that Sony Japan had 2 routines in a library that had the same name. Someone there was obviously switching between routines by changing a compiler switch.

I don't really need anything except maybe to make sure that Sony Japan is not doing this as a standard coding practice.

dave

---

8/14/95 12:53 PM

Re(2): Speed diff btwn DrawPrim and DrawOtag

John Brandwood

LIBGPU

>> I previously asked whether to use DrawPrim or DrawOtag. When I use >>DrawPrim with a primitive that is stored in the fast scratch pad RAM, I >>get the same speed as when I use DrawOtag. The advantage to me is that >>DrawPrim with scratch pad memory uses no RAM, while the drawotag method >> requires that I keep a copy of each primitive in RAM along with the RAM >> from the primitive list.

One thing that you may not be aware of is that DrawOtag method just needs a linked list of sprites. You don't actually need the primitive list itself if you link the primitives together yourself with a catPrim() macro call. The only requirement that you need for this to work is for you to create the primitive list in depth order, something that you are already doing.

You still need buffer memory for the packets though.

>> So, for me, DrawPrim is the clear winner, same speed, no memory wasted >> on packets. As for the speed, are you sure that you're not just doing test timings for DrawPrim calls that fit into the 64 request buffer, and then actually blocking in practice when you run the real code and overflow the request buffer?

I just find it hard to believe that the GPU takes less time to draw a textured polygon than the



CPU takes to fill in a 40 byte structure.

To get the fastest possible drawing speed you could have 2 buffers that you fill with lists of primitives, and then draw from one buffer whilst the CPU is busy filling in the next frame's worth of commands in the other buffer. The big downside of this method is of course the memory used.

Good luck,  
John.

---

8/15/95 10:21 AM

Object -> Camera transformations (Help)

Carl Ferreira

LIBGTE

AAAAaaarrrrgggghhh! I give up! I thought I understood this stuff.

If anyone can \*please\* help, I would GREATLY appreciate it.

I do not want to use LIBGS (don't ask why).

I have objects within a world. They have a rotation and position in world co-ordinates. The objects have points in local co-ordinates. I have a camera which also has a rotation and position in world co-ordinates.

Here is what I'm doing (in pseudo-code):

```
MATRIX local, camera, final, scale; VECTOR object_position, object_rotation, dest;
```

```
  IdentityMatrix(local); // Create an identity matrix for local transforms
```

```
  Translate(local,object_position); // Translate as a 4x3 matrix  Rotate(local,object_rotation); //
```

```
  Rotate object as a 4x3 matrix
```

```
  IdentityMatrix(camera); // Create camera matrix  Rotate(camera,camera_rotation); //
```

```
  Rotate camera  Transpose(camera); // Transpose camera matrix
```

```
  ApplyMatrix(camera,camera_position,&dest); // Locate camera in world  camera.t = -dest;
```

```
  // Set transformed camera location  MulMat4x3(matrix,camera,final); // 4x3 multiply into
```

```
  final matrix  Translate(final,0,115,1000); // Move camera up and back
```

```
  ScaleMatrix(final,scale); // Perform world scaling  SetTransMatrix(final);
```

```
  SetRotMatrix(final);
```

```
  RotAverageNClip30)...etc.
```

Anyone? Please? \*help\*

Carl Ferreira

---

8/15/95 9:16 AM

Fwd: Code demonstrating SPRT

Rusty Buchert

LIBGTE

spirt.c 2K

LIBGPU/GTE

Okay... I am trying to write code that will draw a 16-color sprite stored anywhere in VRAM to the display. Theoretically, this code should work, but it doesn't! I have a feeling it is because either I am confused about the TWINS, TPAGES, and UV's, or else things just don't work like they're documented.

So, if anyone knows anything about this stuff, could you take a look at this code snippet that I have attached and see what I'm doing wrong?

Right now, to get around this problem, I use MoveImage to move the data to a location in VRAM that is at 0,0 in a TPAGE and then draw it. This is wasting time, and isn't pretty, but it

works. I hope this isn't the final solution!  
Thanks! John Slagel Parallax Software

---

8/15/95 2:12 PM

Re: Fwd: Code demonstrating SPRT

Dave S. Akers

Rusty Buchert

LIBGTE

In sprt.c, you wrote (in the sprite setup):

```
>SprtPrim.u0 = sy % 64; // Offset from start of 64x256 TPAGE >SprtPrim.v0 = sy % 256;
```

For a 16 color texture, this is the way to do it:

```
SprtPrim.u0 = (sx % 64) << 2; // u0 coordinate is in 4 bit pixels (and use sx, not sy)
```

```
SprtPRim.v0 = sy % 256;
```

Hope this helps,

Dave

---

8/15/95 1:34 PM

CLUT positioning

Carl Ferreira

LIBGTE

I have some questions regarding the limitations of CLUT placement in VRAM.

The documentation for GetClut states that the CLUT address is limited to a multiple of 64 in the X direction, but empirical experimentation indicates the limit is a multiple of 16?!?

The LoadClut documentation indicates that 256 palette entries are transmitted, even in 4-bit mode. This would suggest that LoadClut would clobber some memory when 4-bit CLUTs are used yet again, empirically, we don't seem to be seeing this.

Could someone check this out and definitively state what limitations are imposed upon CLUTs in VRAM? Is the documentation for both GetClut and LoadClut wrong, or am I not understanding what they are trying to say?

Carl Ferreira

---

8/15/95 10:29 AM

SPRT code with no restrictions!!!

Rusty Buchert

LIBGPU

sprt1.c 4K

LIBGPU/GTE

Here is some code that allows you draw any size 16-color sprite stored anywhere in VRAM to the screen. Unlike the normal SPRT code that requires your SPRT data to be smaller than 256x256 and not crossing any texture page boundaries.

I am posting this because I think that it should be a function available in the base LIBGTE library, and it would be nice if Sony would optimize this much needed function and include it in the next rev of the libgte. Why? It allows you to concentrate on packing as many bitmaps into VRAM without worrying about restricting their placement. Also, the limit of 256 wide sprites for a 320x200 screen mode is just ridiculous. You have to do multiple sprite calls just to draw a simple background!

I hope this helps someone... John Slagel Parallax Software

---

8/16/95 1:51 PM

Re: CLUT positioning

John Brandwood

Carl Ferreira

LIBGTE

You only need to look at LIBGPU.H to find the definition for getClut ...

```
#define getClut(x,y) ((y<<6) | ((x>>4)&0x3F))
```

This shows that the X position can be on any of the 64 16-colour boundaries that fit on the 1024 wide VRAM.

LoadClut() doesn't seem to have an entry to specify the amount of palette entries to send, so a default of 256 values would seem sensible.

If you don't want to move 256 colours into VRAM at once, just do a LoadImage() instead. There is nothing magical about CLUT data, it's only bits in VRAM, it just has a 16-pixel/16-colour boundary limitation.

John.

---

8/17/95 4:55 PM

gte question

Sam Black

LIBGTE

1) Is there any way to force the GTE to do a perspective divide, even when : a)  $Z < h/2$  b) X, Y, and or Z exceeds the range  $2^{15} -- -2^{15}$  (of course I don't need it to do the divide if  $Z \leq 0$ ).

2) Is there any way to transform 3 vectors in one GTE operation that does NOT cause a perspective divide to be done? I.E. could there be a RotTrans3?

3) Is there any way to read the VECTOR results of a transformation (a la RotTrans) and have it do the perspective divide for the screen coordinates or Is there any way to JUST do the perspective divide? I.e. is there a way to do: RotTrans(input, output, &flags); /\* do the transformation \*/ /\* Check if the point is clipped \*/ gte\_PersDivide(&sxsy, &flags); /\* uses the X, Y, and Z left over from the last xform \*/

If I can have any one of these, my life would be easier. If I could have half of them, I'd be pretty darn happy. If all of them are possible (before we have to ship product) I'd be downright ecstatic.

---

8/21/95 3:37 PM

Mesh RotTrans

Mike Gomez

LIBGTE

I also (along with Sam Black, and I'm sure many other developers) would find it extremely handy if there were a library call to rotate a mesh of an arbitrary number of vertices. Currently I call RotTrans() in a loop for each vertex. Then, since RotTrans() returns the result in a long vector, I have to individually move each of the result X, Y, and Z components into a short vector.

Would be nice routine #1:

```
void RotTransMesh(SVECTOR *src, VECTOR *dest, long *flag, ulong num_verts)
```

Would be nice routine #2 (this routine would rule - yeah yeah, heh heh, that would be cool, heh heh heh):

```
void RotTransMeshS(SVECTOR *src, SVECTOR *dest, long *flag, ulong num_verts)
```

Also, the translation is often set to zero. Would library routines be faster if they didn't have to do a post-translate? If so, additional would-be-nice routines would be the same as above but without the translate.

Thanks, Mike

---

8/22/95 3:24 PM

TV's are horrible!

stephen chaplin

LIBGPU

In my experience (even with cool Sony monitors), quite a FEW scan lines seem to get chopped off on the top and bottom of the TV... This problem seems even worse with the dev system we have for the PS-X. The "other" 32 bit gaming system (we shall not speak of its blasphemous name here :) ) seems to have less of a problem with the TV. My question is thus: Is there a problem with the Dev system, or is the production PS-X like this? If there is, is there some way we can adjust it on the PLAYSTATION? Most new TVs I've seen no longer have a way to adjust the horizontal scan lines!

Thx!

---

8/22/95 7:16 AM

Re: Mesh RotTrans

Carl Ferreira

Mike Gomez

LIBGTE

>I also (along with Sam Black, and I'm sure many other developers) would find it extremely >handy if there were a library call to rotate a mesh of an arbitrary number of vertices. >Currently I call RotTrans() in a loop for each vertex. Then, since RotTrans() returns the >result in a long vector, I have to individually move each of the result X, Y, and Z components >into a short vector.

I don't know what you're doing, but I asked for a similar routine when I first started playing with the PSX. My idea was to translate all points in an object then display faces using the pool of commonly translated points. Figured that I would save processing time by only processing a point once instead of three or four (or more) times. WRONG. Strangely enough, it is MUCH faster to process each face than to process all points and then display the faces. Don't know why. Maybe this information will be of use to you.

Carl Ferreira

---

8/23/95 11:16 AM

Re: TV's are horrible!

Rusty Buchert

LIBGPU

Here's what I did... I only use 320x200 (which means all my PC title screens, etc don't have to change) and I black out the top 20 and bottom 20 lines. This also frees up another 320x40 pixels of VRAM for storing CLUTS, and small bitmaps. And it looks much cleaner on the TV set. Here is the code I use to display a 320x200 page in VRAM located at cv\_x, cv\_y, and will blacken the top/bottom 20 lines for you.

```
void gr_show_canvas( int cv_x, int cv_y ) { DISPENVdisp; // display environment
```

```
DrawSync(); SetDefDispEnv(&disp, cv_x, cv_y, 320, 240 ); disp.screen.y += 20; disp.screen.h =
200; if ( waitforretrace ){ int cnt; cnt = VSync(1); // check for count VSync(0); // wait for V-
BLNK } PutDispEnv(&disp); //update drawing environment }
John Slagel Parallax Software
```

---

8/23/95 11:27 AM  
32-BIT ROTATION  
Henrik Markarian  
LIBGTE

Is there any possibility of having 32-bit versions of RotAverageX() functions? (i.e. The input would be VECTOR as opposed to SVECTOR).  
Henrik Mindscape

---

8/23/95 8:58 AM  
RotMatrixX, RotMatrixY, RotMatrixZ don't work  
Carl Ferreira  
LIBGTE

Either the RotMatrix?() functions do not work, or I am grossly misunderstanding their usage. Could you (Sony) please verify and either fix them or tell me how they should be used?  
Thanks,  
Carl

---

8/24/95 10:44 AM  
Re: Anti-RotMatrix  
Angus  
Dave R. Scheele  
LIBGTE  
I'm not sure what you mean. Why would you need this function?  
Angus

---

8/24/95 7:29 AM  
Re: RotMatrixX, RotMatrixY, RotMatrixZ don't work  
Carl Ferreira  
LIBGTE

>Either the RotMatrix?() functions do not work, or I am grossly misunderstanding their usage.  
>Could you (Sony) please verify and either fix them or tell me how they should be used?  
>Thanks,  
>Carl  
Uh... Never mind. I thought that these functions CREATED a rotation matrix, but really they MULTIPLY the passed matrix by a rotation matrix.  
Carl

---

8/24/95 1:22 PM  
Re(2): 32-BIT ROTATION  
Mike Gomez

Thomas Boyd  
Henrik Markarian

Yes, but is there any chance at all of getting a rotation routine that does not convert the vector size, say for instance one that takes 16 bit input values and returns 16 bit output values?

---

8/24/95 8:58 AM  
Re: 32-BIT ROTATION  
Thomas Boyd  
Henrik Markarian  
LIBGTE

No, multiplication (rotation) is 16 bit in the GTE. Only translation is 32 bit. Tom -----  
- Is there any possibility of having 32-bit versions of RotAverageX() functions? (i.e. The input would be VECTOR as opposed to SVECTOR).  
Henrik Mindscape

---

8/24/95 10:34 AM  
Ramblings About GPU  
Angus  
LIBGPU

Participants: Lord Angus Scroll Lock Sounds  
Invite... Send Lord Angus has joined the chat. Lord Angus: sup Blake Senftner: please see my gpu post, I have an gpu thing to have deciphered Lord Angus: i saw it already Blake Senftner: a gpu timeout message Lord Angus: it looks like a problem with your drawotag call Lord Angus: memory address 3 is out of range Blake Senftner: I have not yet called DrawTOag Lord Angus: what gpu calls have you made Blake Senftner: is it being sent data from addr 3? Lord Angus: yes. madr means memory address. Blake Senftner: I've been doing FntPrints and ClearScreens Lord Angus: fntprint does a drawotag Blake Senftner: I have also done some loadimages Lord Angus: nope it is definitely a drawotag problem i think Blake Senftner: hmmm... I'll look over my calls to see... Blake Senftner: you say I have a bad addr being sent to DrawoTag Lord Angus: yes Blake Senftner: thank you! Blake Senftner has left the chat.

---

8/24/95 9:48 AM  
DrawSyncCallBack weirdness  
David Cartt  
LIBGPU

I'm not sure if this is a LIBGPU or a LIBGS question.  
It's my understanding that the function passed as a parameter to the DrawSyncCallBack routine is called each time the GPU finishes drawing a list of primitives.  
This works as expected in the PROFILE sample (which does not use any LIBGS calls). When I try to use DrawSyncCallBack in the DINO sample it appears to work the same as VSyncCallBack. The callback function is called at the first vblank after drawing is finished - not when drawing is finished.  
Any ideas whats going on here?

---

8/24/95 10:36 AM  
Anti-RotMatrix

Dave R. Scheele  
LIBGTE

RotMatrix converts an SVECTOR to a MATRIX very nicely ...  
Is there an easy way to convert the MATRIX back into the original SVECTOR hidden somewhere in the GTE? If not, any ideas about how to do so? I've tried multiplying out the 3 rotation matrices shown in the manual on the RotMatrix page and solving, but I'm not getting valid results. I don't think the manual matches what's being done by the hardware. Worst case, can I find out the EXACT matrices being used by the hardware?  
Dave

---

8/24/95 10:43 AM  
intro to libgte  
Angus  
LIBGTE

Participants: Mike McAulay                      B. Guschwan  
Scroll Lock    Sounds                              Invite...      Send B. Guschwan has  
joined the chat. Mike McAulay: Hi. Got a minute? B. Guschwan: yes Mike McAulay: I'm  
attempting to wade my way through the libgpu and libgte stuff... Mike McAulay: ...and I'm  
finding it really hard to suss the docs. B. Guschwan: what do you need to know. B. Guschwan:  
the gpu is simple B. Guschwan: it only understands primitives Mike McAulay: Is there any kind  
of descriptive documentation (ie an overview) anywhere? Mike McAulay: Right, my real  
problem is the gte... B. Guschwan: what do you need to know B. Guschwan: there should be an  
overview with your docs Mike McAulay: Especially figuring out which of the seemingly-  
synonymous funcs to use. B. Guschwan: what do you need? Mike McAulay: Well I got the full  
2.0 docs, including "overview," but its pretty meager.... B. Guschwan: the overview for 2.0 is  
pretty good Mike McAulay: OK, right now I'm trying to get an independently moving textured  
object... B. Guschwan: did you look at the code samples Mike McAulay: ...plus independently  
moving camera, plus independently moving light sources. Mike McAulay: If you mean the  
samples on the CD, yes. Most of them anyway. B. Guschwan: sample code is pretty good to do  
that. Mike McAulay: Right now when I rotate my object, the light rotates with it. B. Guschwan:  
what code sample are you using Mike McAulay: Can you recommend any sample progs in  
particular? Mike McAulay: I started with the cube demo called, I believe, tuto4, and I've been  
modifying it. Mike McAulay: I'm assuming I need to recalculate the normal vectors to my polys,  
and I'm wondering what the recommended chain of lib calls would be. Mike McAulay:  
Currently I'm using RotAverageNClip4 and, if the poly is visible, NormalColorCol to set light  
level. Mike McAulay: It would seem I need to add 1 more step in there to recalc the normals so  
that NormalColorCol works correctly. Right? B. Guschwan: without seeing your code it is hard  
to tell. Mike McAulay: NormalColorCol wants the normal vectors in world space, not object  
space, right? Mike McAulay: Also, what are the \_nom routines for? B. Guschwan: nom means  
no memory access to the stack. B. Guschwan: you supply only the input parameters to the gte  
routines, and the output is retrieved using assembly routines. Mike McAulay: Okay. I won't  
worry about them for now. And world space vs object?? B. Guschwan: that way, you use less  
than 4 parameters on a c routine. more than 4 parameters goes on the stack and takes a slow  
memory hit each time. Mike McAulay: Let me try rephrasing my question: There appear to be  
many higher-order routines for perspective projection plus clipping, depth-queueing, etc... B.  
Guschwan: you need to put the normal vector to the poly in local coordinates. B. Guschwan: the  
local light matrix should be calculated such that it contains the matrix that performs the local to  
world transformation Mike McAulay: ...but I can't figure out which (if any) is most appropriate  
to my situation, or if I need to break the process down into smaller steps (since I seem to need  
intermediate values, specifically the world coords of my vertices so I ca Mike McAulay:

...vectors via cross product). Mike McAulay: Ah! Cool. That was one step I was missing. So, I need to reset local light matrix for each object, yes? B. Guschwan: yes Mike McAulay: So then I leave the normal vectors in object space for purposes of light, correct? B. Guschwan: yes because the light matrix will contain the transform matrix. B. Guschwan: it is a cheat of sorts. Mike McAulay: Excellent. Thanks. A very general question: are other people having trouble wading through this stuff too, or am I just dumb? B. Guschwan: this is explained in the gte overview. don't you have it. B. Guschwan: it is hard to get started because of peoples different backgrounds. B. Guschwan: the gte is very simple. Mike McAulay: Not sure what you mean by "GTE overview." I have a few pages from the 2.0 docs. I found them to be confusing. B. Guschwan: you should have a separate folder with the overviews. Mike McAulay: Well I got my stuff as a hand-me-down from one of the other programmers. What is the doc called? And is it available online? Mike McAulay: By overview are you referring to section 5, "Library Overview?" B. Guschwan: There is a 20 page gte overview Mike McAulay: Okay, I don't appear to have that. What's the easiest way to get it (so I don't have to ask lots more dumb questions) B. Guschwan: send a message to devsupport B. Guschwan: ask for it B. Guschwan: it will explain everything. B. Guschwan: it is a bit concise but it explains how world relates to local. Mike McAulay: To confirm: are you sure you aren't referring to chapter 7 (Basic Geometry Library) of section 5 of the docs? B. Guschwan: that B. Guschwan: is it, how many pages does it have Mike McAulay: 20. B. Guschwan: doesn't it help?? Mike McAulay: Well, obviously not in this case. :( B. Guschwan: let me explain. B. Guschwan: you have a light source vector B. Guschwan: the light source is parallel and remains in the world coord system. B. Guschwan: as a cheat, you multiply the light source vector by the local to world transform matrix. B. Guschwan: this sum is the local light matrix. Mike McAulay: In your opinion, are most folks using libgs or libgpu + libgte? B. Guschwan: therefore the normals never have to be transformed. Mike McAulay: Right. I've got it now thanks to your explanation. B. Guschwan: libgs is now getting faster because it's low level routines are written in assembly. B. Guschwan: because they are in assembly, they fit easily into the 4k icache. B. Guschwan: libgte is written in c. B. Guschwan: so, it falls out of the icache a lot. Mike McAulay: Uh oh. Is libgte going to be rewritten in asm? B. Guschwan: good question. B. Guschwan: what they did is to take out the gs routines from the libgs. Mike McAulay: My first inclination was to go for libgte so I'd have more control over optimization etc. Maybe that's not such a good plan B. Guschwan: so if you look in libgpu, you will see routines like GsTMDfast etc. B. Guschwan: sorry look in libgte for GsTMDfast. Mike McAulay: Yes, I've seen those in the 3.0 acro docs. B. Guschwan: This GsTMD routine is really a libgte routine taken out of libgs for people like you. Mike McAulay: Okay, I will look into that. B. Guschwan: These are the routines that libgs calls that are written in assembly. B. Guschwan: They are the fastest routines. B. Guschwan: The best routines are new RotMesh functions. B. Guschwan: They do a vertex rotation instaed of a polygon roation. Mike McAulay: WHERE can I find good descriptions of TMD and Mesh funcs? B. Guschwan: This is faster because a square has 8 vertices but in a polygon world it has 6 x 4 or 24 vectices. Mike McAulay: I haven't yet read gs overview in much detail. Are they in there? Mike McAulay: Right. I was planning on implementing vertex stuff on my own. Those gs routines are sounding better and better. B. Guschwan: The RotMesh functions are different from the GsTMDfast calls. Mike McAulay: Where is definition of "mesh" to be found? Mike McAulay: So you know, I'm working on some Magic Carpet-like terrain. B. Guschwan: What's your title? B. Guschwan: We are also releasing a terrain library with source code soon. Mike McAulay: We're calling it "Extreme Dreams" for now... it's still in the very early stages of design B. Guschwan: hey mind if I post this talk, taking out the stuff about your title you just told me? Mike McAulay: Yes, I read about the terrain lib. I have to confess I'm a bit of a hacker with a nagging mistrust of layers between myself and the machine... Mike McAulay: ...hence the appeal of libgte. Mike McAulay: No, I don't mind at all. Maybe it will help someone. B. Guschwan: I have some info on RotMesh somewhere, I'll see if I can find it. Mike McAulay: Ok, that would be cool. Mike McAulay: Should I wait, or will you mail it to me later? B. Guschwan: ill send it now i found it it is prelim. Mike McAulay: Groovy. B. Guschwan: i sent it. B. Guschwan: do you know about meshes Mike McAulay: Okay. Thanks a bunch, this has been very helpful! B. Guschwan: see ya/ Mike McAulay: Meshes? Mike McAulay: Not really. B. Guschwan: strip meshes versus round meshes.



basically the vertices oriented calcs versus the poly oriented transform calculations/ Mike McAulay: Are they described in the doc you just sent? B. Guschwan: mesh is just a vertice based system. Mike McAulay: OK, yes, I'm hip to that. Mike McAulay: I've done some 3D stuff before. Mike McAulay: Bye.

---

8/28/95 3:19 PM  
Mode bits in GsBG  
Silas S. Warner  
LIBGPU

I am trying to generate a GsBG using a TIM image generated from a BMP. This TIM is 8 bits wide and has a CLUT. When I generate the GsBG, I create a GsCELL array by using GetTpage(tp,abr,x,y), where (x,y) is derived from the image location in the TIM. The problem is that no matter what values I put in tp and abr, the screen image always comes out wrong -- and unchanging, no matter what values are used. In fact, I can cycle through all 16 possible values for tp and abr, and observe absolutely no change in the onscreen image. The background seems to be assuming the cell tiles are all 16-bit, no matter what the source mode bits tell it. And I have already observed the tpage members of each cell structure, and the tpf and abr bits ARE changed when the GsBG is input to libgs! What am I doing wrong?  
Silas Warner

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8/28/95 3:23 PM  
Re: Mode bits in GsBG  
Angus  
Silas S. Warner  
LIBGPU  
Please try and use one of the bg samples, like bgsample and work backwards.  
Angus

---

8/28/95 3:25 PM  
Re(2): Mode bits in GsBG  
Silas S. Warner  
Angus  
LIBGPU  
>Please try and use one of the bg samples, like bgsample and work backwards.  
>Angus  
That's exactly what I did. It still doesn't work. Besides, bgsample uses a preloaded GsBG file.  
Silas Warner

---

8/29/95 6:58 AM  
Re(2): Object -> Camera transformations (Help)  
Carl Ferreira  
Mike Gomez

>Carl, You never got a response from this posting, and it looks interesting. Did you get your > problem solved?  
The best I've managed so far is the following camera transformations. No attempt has been made to make this code efficient -- only to get it to work properly. The routine SetCamera is called for every object with the object's rotation and center point in world co-ordinates.

```

VECTOR CamPosition; // Camera position in world co-ordinates SVECTOR CamRotation;
// Camera rotation
void SetCamera(SVECTOR *ObjRotation, VECTOR *ObjCenter) { MATRIX camera, local,
tmatrix, final; VECTOR v;
// Create camera matrix from camera position and rotation
init_matrix(&tmatrix); // Sets up a unity matrix RotMatrixY(CamRotation.vy,&tmatrix);
RotMatrixZ(CamRotation.vz,&tmatrix); RotMatrixX(CamRotation.vx,&tmatrix);
TransposeMatrix(&tmatrix,&camera);
// Determine Translation portion of final matrix from camera and object positions
v = CamPosition; subtractVector(&v,ObjCenter); // Macro to subtract argument 2 from
argument 1 ApplyMatrixLV(&camera,&v,(VECTOR *)&final->t[0]);
// Create object matrix from object rotation
init_matrix(&local); RotMatrixY(ObjRotation->vy,&local); RotMatrixZ(ObjRotation->vz,&local);
RotMatrixX(ObjRotation->vx,&local);
// Create final concatenated transformation matrix
MulMatrix0(&camera,&local,&final); // ScaleMatrixL(&final,&scale); // Scaling seems to
blow everything to heck.
// Set Rotation and Translation Parameters
SetRotMatrix(&final); SetTransMatrix(&final); }
I hope this help save someone the enormous amount of time that I wasted on this problem.
Thanks to Tom Boyd for his assistance.
Carl

```

---

8/29/95 3:59 PM

RotTransPersN

Mike Gomez

Thomas Boyd

LIBGTE

Can you tell me how to use RotTransPersN()? I changed my routines to work with short OT list instead of longs. Is the OT val still 1/4 zval?

```

// Old code that works SVECTOR *svect_src_ptr; // Source 3d vertices. long *dest_ptr; //
Destination 2d vertices. long *ot_ptr; // 1/4 z val
for(i = 0; i < num_verts; i++) *ot_ptr++ = RotTransPers(svect_src_ptr++, dest_ptr++, &p,
&flag);
// Attempted new code SVECTOR *svect_ptr; long *dest_ptr; short *ot_ptr;
RotTransPersN(svect_ptr, dest_ptr, ot_ptr, &flag, (long) num_verts);

```

---

8/29/95 10:16 AM

Multitasking and GTE

Thomas Boyd

OS

The following has been brought to my attention:

If you want to do multitasking and use the GTE, you need to be sure that the coprocessor usable bits of the R3000 coprocessor 0 (System-control processor) status register (bits SR\_CU0 - SR\_CU3 of C0\_SR in MIPS.H) are set correctly to enable the GTE.

For more info see page 335 of The MIPS Programmer's Handbook, by Erin Farquhar and Philip Bunce (or any other MIPS book)

Tom

---

8/30/95 12:47 PM  
PS-X Typeface support :(  
Shaival Varma  
LIBGPU

Would it be at all possible to create a generic font toolset? Some interesting functions could be useful, such as; PenColor, FontHeight/Width, X/Y Location, perhaps some other standard font libraries (other than the original & kanji set) such as Gothic, Times, Courier,...

Here are some generic functions i think other developers may see as useful.  
StartText(), SetFont(), EnableText(), DisableText() AllocTextCels(), ClearTextCels(),  
DeleteTextCel() MoveTo(), SetTextCelCoords(), DrawText() TextLength(), SetTextCelColor(),  
SetFGPen() DrawNumber(), DrawCenterJustifiedNumber(), DrawRightJustifiedNumber()  
GetFontCharInfo(), GetFontCharWidth()

Just a idea.  
-Bretto

---

8/31/95 9:19 AM  
New PRIMs  
Randy X. Thompson  
LIBGPU

Wouldn't it be cool if there were OT-list support for LoadImage(), StoreImage(), and MoveImage() operations? I can understand why LoadImage and StoreImage (which must access the CPU bus) might not be feasible, but how about a SPRT-type primitive that doesn't shade, clip, or care about texture bit-depths -- it just moves VRAM around?  
Randy Thompson

---

9/1/95 7:59 PM  
Re: New PRIMs  
chris m. coffin  
LIBGPU

Sounds good... youve got my vote for it. It would be very useful to me indeed :) So how about it Sony?

---

9/2/95 11:52 AM  
Re(2): New PRIMs  
david eader  
LIBGPU

Seems like it might not be so simple, due to co-processor synchronization.  
Currently you give the gpu it's own ot & packet space to work with (double-buffering). Those are the only two chunks of memory the gpu refers to, so it can chudder along merrily, independent of the cpu.  
If you start having the gpu reference arbitrary areas memory asynchronously, strange things could happen. Might cause the gpu to stall in the midst of packet processing, for instance.  
But I'm just speculating. What do the Sony dudes think?  
deader

---

9/6/95 10:32 AM

Re: How do you do skylines?

chris m. coffin

Carl Ferreira

LIBGTE

Use libGs. :) It's easier.

---

9/6/95 8:04 AM

How do you do skylines?

Carl Ferreira

LIBGTE

Can anyone out there explain to me how to do a skyline which properly rotates in relation to a driving model? I do not want to use the GS library if possible.

Thanks.

Carl

---

9/6/95 2:08 PM

Re(2): How do you do skylines?

Carl Ferreira

chris m. coffin

LIBGTE

I choose not to use a library which may take up an unknown amount of space, does God Knows What when initialized, may have unpredictable results when mixed with low-level calls, and operates on data structures which I do NOT want to use (i.e. TMD and PMD).

So -- without using the GS library, how do you do skylines?

(8->

Carl

---

9/7/95 7:20 PM

Colored fog without CLUT tricks???

Mike McAulay

LIBGPU

As near as I can tell, there is no way (using GPU/GTE) to set up a colored fog effect for distance shading other than using the multiple CLUTs trick ala the Clutfog sample program. Can anyone confirm this?

If there is a way, how is it done?

Is there a way using GS? (Zimen's tuto5, which uses GS, does its white fogging using the CLUT trick, which leads me to believe the answer is no)

Also, can anyone explain precisely how the lighting, fogging, texturing, etc, get blended together? I have a theory that fogging and lighting simply manipulate the underlying RGBs associated with poly vertices, and that it is only this one RGB triple that is blended with the texel RGB. Is this true? And where does the ambient rate (ABR, see libgpu.h) figure into all of this?

I tried an experiment where I used POLY\_GT3s and tried setting the RGBs by hand with no light sourcing at all. If I set the RGBs to <0,0,0> I get solid black polys. But if I set them to <FF,FF,FF> I get not white polys but highly saturated textured polys. If I set them to <FF,0,0> I get textured polys where the lighter texels map to a highly saturated red, but the darker texels map to darker reds (not the more highly saturated red). What this leads me to believe is that

the blending of the underlying color with the texel color is essentially subtractive. In other words, if the base color is lower than the texel color, the texel color will be reduced toward the base color. But if the base color is higher, the texel color won't be raised. Or something like that. If this is true, and if my above theory of "it all boils down to the one base RGB" is true, then that would indicate that there is \*no way\* to do colored fog without multiple CLUTs, which is what I kind of believe, I just wish I were more certain.

Basically, there are bits and pieces of relevant info scattered throughout the docs and samples. I'm looking for some kind of comprehensive summary.

Anyone?

TIA,

M.

---

9/7/95 7:37 PM

Moire effect with POLYFT4s

Silas S. Warner

LIBGPU

Can you give me any suggestions, without using valuable video real estate, for reducing the moire effect that comes about when you display a 64x64 8-bit texture on a large scale? I am using the semi-transparent mode to superimpose a waving water field over a vari-colored background, and it should work except that the quads come colored in distinct moire stripes that do not appear in the texture.

Silas Warner

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9/7/95 7:45 AM

Re(3): How do you do skylines?

chris m. coffin

Carl Ferreira

LIBGTE

Does this skyline need to just tilt and pan left to right (like most 3D games now) or does it have to be closer to true 3D because your camera can look straight up? :)

---

9/7/95 1:45 PM

Re(4): How do you do skylines?

Carl Ferreira

chris m. coffin

LIBGTE

>>Does this skyline need to just tilt and pan left to right (like most 3D games now) >>or does it have to be closer to true 3D because your camera can look straight up? :)

Ideally it would be unrestricted. Let's assume a flight simulator type model, but with a fixed skyline of mountains or buildings.

Carl

---

9/7/95 3:33 PM

Re(5): How do you do skylines?

chris m. coffin

Carl Ferreira

LIBGTE

Here's a method that has worked for me in the past. You can create a 3D polygon dome or cylinder with texture mapped facets to represent your skyline. Build it with shared vertices quads of course :) If you translated the dome's center point to your camera's location, transformed it and then drew it before and completely separate of your 3d terrain it will work fine. Make sure you don't light the dome and since you're always at its center it won't shimmy when you move through the world since you're always at its "center" and provided the dome has enough facets and its size is reasonably small. There are other ways but they are not true 3D which is what you wanted. Hope this helps, :)

---

9/7/95 7:20 PM

Colored fog without CLUT tricks???

Mike McAulay

LIBGPU

As near as I can tell, there is no way (using GPU/GTE) to set up a colored fog effect for distance shading other than using the multiple CLUTs trick ala the Clutfog sample program. Can anyone confirm this?

If there is a way, how is it done?

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Basically, there are bits and pieces of relevant info scattered throughout the docs and samples. I'm looking for some kind of comprehensive summary.

Anyone?

TIA,

M.

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9/8/95 12:13 PM

Re(3): Quads vs Triangles

chris m. coffin

LIBGPU

>not really. The GTE does three calcs at once, so  $3 + 1 = 6$  for a quad. Bummer, that's what I heard :( It's taking a faces approach for transform instead of a transforming a list of vertices????

---

9/8/95 12:03 PM  
Re(2): Quads vs Triangles  
Thomas Boyd  
LIBGPU

>>Are Quads better at doing some things than Triangles? >Storage is smaller than 2 triangles.  
>You transform 2 less vertices with a quad(4) versus 2 triangles(6) >which means its much  
faster. not really. The GTE does three calcs at once, so  $3 + 1 = 6$  for a quad.

---

9/8/95 12:01 PM  
Re: Quads vs Triangles  
chris m. coffin  
LIBGPU

>Are Quads better at doing some things than Triangles? Storage is smaller than 2 triangles. You  
transform 2 less vertices with a quad(4) versus 2 triangles(6) which means its much faster.  
>I ask because Konami's "Winning Eleven" 3D Soccer game uses Flat or Textured Triangles for  
everything except the Field. The Field is done in Textured Quads. The lines on the field don't  
seem to distort as much as other textures I have seen on triangles.  
They are probably placing the line portion of the texture at the poly's outer edges where it will  
distort the least compared to putting it in the center where it will bend badly :)

---

9/8/95 1:31 PM  
Re(2): Moire effect with POLYFT4s  
Silas S. Warner  
LIBGPU

>Try tiling the texture??  
It already is tiled, if I understand tiling correctly as the division of the quad into a large number  
of smaller quads. (There are now 64 quads of which about 27 of which are onscreen.) Is there a  
way to insert a modulus into the texture co-ordinates, so that one quad can be covered by more  
than one copy of a texture? As I understood it, there was no way to do this. I could subdivide  
the quad even further, but I worry about display time. If the quads cover the same area,  
textured, flat-shaded and semitransparent, will four times the quads take significantly more  
time to draw?  
Silas Warner

---

9/8/95 11:58 AM  
Re: Moire effect with POLYFT4s  
Angus  
LIBGPU

Try tiling the texture??

---

9/8/95 11:47 AM  
Re: Quads vs Triangles  
Jay Stelly  
LIBGPU

>Are Quads better at doing some things than Triangles?

Not that I have noticed. They seem to draw a bit faster (considering you get 2 tris in a quad). Also, I've found some cases where quads allow easier calculations involving texture coordinates.

>I ask because Konami's "Winning Eleven" 3D Soccer game uses Flat or >Textured Triangles for everything except the Field. The Field is done in >Textured Quads.

Probably because they're less computationally expensive to subdivide.

>Do Quads have less distortion of texture maps with lines in the map?

No, they seem to have the same distortions as if they were two triangles tied together (in fact they are, as I understand it).

Jay Stelly Tetragon, Inc.

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9/8/95 11:20 AM

Quads vs Triangles

David W. Marshall

LIBGPU

Are Quads better at doing some things than Triangles?

Do Quads have better gross clipping? Do Quads have less distortion of texture maps with lines in the map?

I ask because Konami's "Winning Eleven" 3D Soccer game uses Flat or Textured Triangles for everything except the Field. The Field is done in Textured Quads. The lines on the field don't seem to distort as much as other textures I have seen on triangles. As I scroll the stadium model thru my code, the polygon dropout, when the polys get to the edge of the screen, doesn't seem to be as bad as a triangle terrain.

I was surprised to see that only the field was done in quads.

I'd like to find out if quads have any advantage in the PSX hardware/libraries.

thanks,

dave

---

9/11/95 10:11 AM

Re(6): Quads vs Triangles

Carl Ferreira

LIBGPU

>>>Are Quads better at doing some things than Triangles?

>>Storage is smaller than 2 triangles. >>You transform 2 less vertices with a quad(4) versus 2 triangles(6) >>which means its much faster.

>not really. The GTE does three calcs at once, so  $3 + 1 = 6$  for a quad.

Yes, but it takes much longer to set up 6 vertices (mapping textures, establishing lighting, etc.) than it does to set up 4! The GTE calculation time is trivial. It's the amount of time needed to prepare each POLY that eats the time!

Carl

---

9/11/95 9:40 AM

Re(5): Quads vs Triangles

chris m. coffin

LIBGPU



>>i have textures WITH straight lines (brick walls). Yuck! (YOU'RE ASKING FOR TROUBLE!)  
>>when i walk up to the texture and then begin to turn sideways, the texture begins to wave (the straight lines look like 'WWW'). ITS CALLED NON PERSPECTIVE CORRECTED TEXTURE MAPPING :( LINES IN TEXTURES THAT EXTEND IN THE DIRECTION OF VIEW (INTO THE DISTANCE) BEND WHEN THEY CROSS FROM ONE TRIANGLE TO ANOTHER  
>>I have to use the textures. Is there any way to program around this? Is this a sony BUG? I'm not looking for (less wavy lines) I'm looking for straight lines.  
Its not a bug, Thats just the way Playstation texture maps. You can do a number of things: -  
Subdivide your polys based on Z-distance to reduce warpage(easy) - Place line texture on polys outer edges where they distort least(easy) - Use the line drawing primitives to draw your own lines on top of your textured polys!(thats a can of worms!) -Float small quads on top of your walls shaped like lines.(sorting nightmare) -Lose the brick walls :)  
Anyway, those are my suggestions. Hope this helps :)

---

9/11/95 8:54 AM  
Re(4): Quads vs Triangles  
Shaival Varma  
LIBGPU

i find myself if a slight bind.  
i have textures WITH straight lines (brick walls).  
when i walk up to the texture and then begin to turn sideways, the texture begins to wave (the straight lines look like 'WWW').  
I have to use the textures. Is there any way to program around this? Is this a sony BUG? I'm not looking for (less wavy lines) I'm looking for straight lines.  
-can anyb0dy help mE. -bretto

---

9/12/95 3:11 PM  
CVector Structure  
Chris E. Reese  
LIBGTE

What does the pad value in the CVECTOR mean? I was expecting it to be nothing more than what it is described as, a PAD. It turns out when modifying colors in a primitive that the pad value has significant effect on whether or not the primitive will be displayed or not. I don't recall reading anything in the docs about it, so I thought I would ask.  
Chris Reese..... Eidetic, Inc.

---

9/13/95 4:35 PM  
GTE flag bits  
Sam Black  
LIBGTE  
LIBGPU

Is it possible for Sony to add status bits to the flags returned by the GTE operations. I noticed that a couple of bits are reserved. Can meaning be assigned to these reserved bits through software?  
Specifically, what I'm interested in are some indicators which would help when using RotTransPers3 (I actually use gte\_rtpt) to draw a triangle. It would help a lot if could set a flag

to indicate that one or more edges defined by the points exceed 1023 (since the GPU doesn't seem to draw polygons with a width or height > 1023). Also, it would help if the GTE could set flags to indicate which edge(s) overflowed, and if it could set flags to indicate which point(s) violated the  $z > h/2$  rule. These are all things that can be tested other ways, but it's slowing me down considerably and it seems the GTE is in a better position to figure these things out (it's already got the necessary data in it's registers, which saves me from having to read it out of the GTE if nothing else).

---

9/13/95 4:35 PM

GTE flag bits

Sam Black

LIBGTE

LIBGPU

Is it possible for Sony to add status bits to the flags returned by the GTE operations. I noticed that a couple of bits are reserved. Can meaning be assigned to these reserved bits through software?

Specifically, what I'm interested in are some indicators which would help when using RotTransPers3 (I actually use gte\_rtpt) to draw a triangle. It would help a lot if could set a flag to indicate that one or more edges defined by the points exceed 1023 (since the GPU doesn't seem to draw polygons with a width or height > 1023). Also, it would help if the GTE could set flags to indicate which edge(s) overflowed, and if it could set flags to indicate which point(s) violated the  $z > h/2$  rule. These are all things that can be tested other ways, but it's slowing me down considerably and it seems the GTE is in a better position to figure these things out (it's already got the necessary data in it's registers, which saves me from having to read it out of the GTE if nothing else).

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9/13/95 2:20 PM

Line drawing speed? (And quad speed)

Dr. Cat

LIBGPU

Well, I've got some code working to put up a grid in proper perspective on the PSX screen. So far so good. But it seems that I'm running out of drawing time if I get more than a certain number of lines on the screen and still try to put out one frame per vertical blank. (The core loop I'm using is a modified version of the code in graphics/tuto/tuto1.c) The code is trying to draw 726 lines by putting 242 LINE\_F4 primitives up there. (I really wish there were a primitive that drew four lines instead of three to make a grid square, but I can work around that.) What I'm getting is about 720 or so actually making it onto the screen, and a flickering display. If I cut the number of lines drawn in half they all get drawn and the display is nice and flicker-free.

So, here are a few questions: Can I get any exact figures on line drawing speed to use in figuring out how much stuff I can get on the screen at once? And figures on speed of POLY\_F4 and POLY\_FT4 drawing, since I'm going to have some of those on the screen too? If exact figures aren't available estimates would do. I would like to be able to work out what my worst case will look like and whether I can still squeeze it all into one frame of drawing time or not. One more question - is it possible that making a POLY\_F3 or POLY\_F4 that actually WAS a line (some of the endpoint coordinates matching) might be faster than drawing an actual line? If not, would it be faster to draw two lines side by side to get a double-thick vertical line (to reduce color artifacting), or to draw a POLY\_F4 from (x1,y1) (x2,y2) to (x1+1,y1) and (x2+1,y2)? I can determine some of this experimentally, but if there's someone that already knows about some of these timing issues and could take a couple minutes to inform me, it'd save me a lot of much-needed time.

---

9/13/95 3:02 PM  
about FntPrint routines  
Blake E. Senftner  
LIBGPU

If not already requested, can the following modifications be made to the FntPrint routines: if the %ld format specification is found in a format string passed to FntPrint, the program hangs. This is an annoying bug, because every other c compiler I use complains if the format specification does not match the type passed...  
Can some means of specification where the CLUT goes be specified? Currently it seems to be hardcoded to some offset beneath the font load location. There's a lot of space between the font graphics and the font CLUT... if they could be together, that would work also...  
-Blake

---

9/14/95 10:59 PM  
that old h/2...  
Pat Quinn  
LIBGTE

Greetings:

I believe Sam Black asked basically this same question, but never got a public response (he's posted a \*lot\* of good questions that didn't get responses). It's important enough to me to ask it again.

SetGeomScreen is used to set the perspective parameter "h" for LIBGTE. I understand this to be the distance from the view plane (on this system, the screen) to the eye. What I don't understand is, why the heck is h/2 the closest you can get to a primitive?

If I'm translating in the positive z direction, my world and my sprites move closer. But when a sprite reaches the distance h/2, it stops moving while the world and the rest of the sprites continue to move. Eventually it disappears -- it gets near clipped, as it should, when its z distance reaches zero.

But between h/2 and zero is a lot of ground, and the thing just stands there waving at you like one of those geeks that hangs around just behind TV news reporters. I don't want that! I'd rather the sprite stride \*all the way\* up to the camera, larger than life, like a goon bodyguard intent on assaulting the cameraman!

I use FT4's, BTW, for sprites, because I want them scaled. So I use RotTransPers4 for transformations. I actually don't care about perspective division on these sprite FT4's, but I like the convenience & speed of the RotTransPers4 function (there is no RotTrans3 or RotTrans4).

As a workaround, I suppose I could check that flag parameter; and if the 17th bit is set (sz < h/2), perform RotTrans individually on the 4 vertices!

But you don't want me doing that, do you..?

David Crain NuFX, Inc.

---

9/14/95 10:24 PM  
Re(3): Line drawing speed? (And quad speed)  
Dr. Cat  
Bugs  
LIBGPU

> Nice idea but even with placing a line texture around the polys edge you'll still get texture mapping distortion.

I actually was using that approach on the Saturn (am I the only one here simultaneously coding

the same title for Saturn and Playstation both? And on a tight deadline, yet!) and got some nasty distortion. Which is why I went to actual line drawing there, which they have a nice primitive for. The only reason I was considering this approach on the Playstation is the possibility it might be faster.

It looks like the problem I was having wasn't necessarily a speed problem so much as perhaps some kind of low level timing conflict in the hardware or in the Sony libraries. My code currently has a 4 level ordering table. If I put the first batch of 121 LINE\_F4 primitives in table 2, and the second batch in table 3, I get flicker and a few missing lines. If I swap that, putting the first batch in table 3 and the second batch in table 2, everything works fine. I have no idea why.

I needed to make some changes to this whole driver anyway, and I'll be putting the whole batch of 242 into the same ordering table. I hope THAT works ok!

---

9/14/95 11:03 PM

Texture warping update?

Pat Quinn

LIBGPU

Greetings:

I'm having \*serious\* texture warping problems. I've perused the archives of the LIBGPU conference and found numerous pre-April posts referring to this as the infamous "texture map perspective divide" problem. Some of those posts -- the most recent from Angus on April 21 -- made references to a fix for this problem in an upcoming 3.01 release.

Well, I'm using the 3.1 beta library (released June 6), and I'm warping like crazy. What gives? I never saw a 3.01 release (3.0, yes)... Is the fix to this problem not in the 3.1 release? If not, what are the most current projections for the fix? Or, if the fix is indeed in 3.1, what do I need to do to make it work?

This is a critical problem for me, and I need an answer soon. I have to specify the modeling criteria to an artist subcontractor. Will I need a model of hundreds of complex polygonal elements in it to render on the PSX, or simply a rendering of that complex model that I can use as texture on a handful of polygons?

Regards,

David Crain NuFX, Inc.

---

9/14/95 11:31 AM

Re(2): Line drawing speed? (And quad speed)

chris m. coffin

LIBGPU

Dr. Cat

>>Since you are drawing a grid, perhaps drawing POLY\_FT4s using a texture that was transparent apart >>from >>a line around the edges might be faster than drawing lines? Nice idea but even with placing a line texture around the polys edge you'll still get texture mapping distortion. Also, the width of the grid line would be dictated by the texture size used (you'd have to use 64x64 4bit to get decent results). Using polys would be more storage too. Your grid lines would not be uniformly sized either because they are a texture on a poly with its line size dictated by distance from camera with grid lines falling out in the distance. I believe the line approach is better because it produces nice uniform results with no line fallouts and you could color the lines based on distance from the camera giving a nice feeling of depth (you could take it to the extreme and use LINE\_G4 and set the point colors using the same approach for best results) Polys might be faster but their weaknesses to this specific application outweigh any speed increase they might have over lines in my opinion. Chow,

Chris :)

---

9/14/95 7:28 AM  
Re: Line drawing speed? (And quad speed)  
Carl Ferreira  
LIBGPU

Since you are drawing a grid, perhaps drawing POLY\_FT4s using a texture that was transparent apart from a line around the edges might be faster than drawing lines?  
Carl

---

9/15/95 6:44 AM  
DrawSync & DrawSyncCallback  
Paul C. Isaac  
LIBGPU

Please help me solve this problem...  
I am have been trying to use DrawSyncCallback but it seems like I am sometimes missing these events... I do have SYSTEM and VLANK timer firing off interrupts so perhaps DrawSync's get smothered by these more precedent signals...  
That wouldn't be such a problem is DrawSync(1) actually did what the documentation says it should... by my reading of its description it should be returning 0 if there is no left to draw and otherwise some number of things in the queue waiting to be drawn... as near as I can tell DrawSync(1) always returns 1... is that supposed to be useful.  
my code looks something like this  
{ DrawOT(ot)  
while (DrawSync(1) > 0) wait(); }  
it never gets out of the loop  
Please tell me what I am doing wrong... or how I can find out for sure whether the Draw is complete... and note it would destroy what I'm doing if I have to use DrawSync(0)...  
Thank You (pci)

---

9/15/95 9:00 PM  
Re(4): Line drawing speed? (And quad speed)  
Dr. Cat  
LIBGPU

Well, I figured out my problem - it isn't weird inexplicable bugs in the Sony hardware or software, it was another part of my code that was overwriting some memory it shouldn't have been. Thus the difference in how things worked based on where in my data structures and ordering tables I happened to place various things. It's all working nicely now.  
I'd still like to see some timing figures on line drawing if they're available, though.

---

9/15/95 3:44 PM  
Re: that old h/2...  
Lobotomy Software  
Pat Quinn

LIBGTE

As far as I can tell, the reason the sony "stops moving" poly's at  $h/2$  is to keep the scaling in check. At  $h/2$  a vertex offset is scaled to twice its normal value. as you get closer and closer the final vertex value may not fit in the short required by screen coordinates on polys. At  $vz=1$  the vertex is scaled to 160 times its normal offset...

The  $vz$ =small value problem occurs quite often as you pass by polygons which are off to the side of you, but you don't want the poly to have illegal coordinates, so a compromise has to be made. So... at  $vz < h/2$ , the x and y scale as though they were at  $h/2$ . This way a polygon will remain visible (but distorted!) which is acceptable on your periphery... you do have to do work around when the poly is dead ahead and looks bad... clipping, ouch!

Jeff Blazier

---

9/15/95 12:47 PM

Re: DrawSync & DrawSyncCallback

Roy Eltham

LIBGPU

I'm currently using DrawSync(1) without any problems.

I use:

```
while (DrawSync(1) > 0);
```

and it waits until the queue is empty and then falls out.

(this of course isn't optimal for multitasking, but it works for what I'm doing right now)

Perhaps your 'wait()' call isn't doing what you're expecting.

Roy Eltham Regal Productions

---

9/15/95 1:47 PM

GsPrst() vs. RotPMD()

Jay Stelly

LIBGPU

Greetings,

Can someone tell me what the exact differences between RotPMD\_SV\_FT3() and GsPrstTF3NL() would be. I prefer the data organization that the GsPrst() calls allow, but I have some documentation that implies that the RotPMD() routines are faster. Looking at the Acrobat docs, it seems that the two functions do exactly the same thing (other than the fact that the vertex indices are stored with the packets in the PMD and in a separate place in the GsPrst() ). Is this the only difference? When the docs say that GsPrstTF3NL() completes the GPU packet, exactly what data is being written to the packet? Shouldn't it be only  $x_0, y_0, x_1, y_1, x_2,$  and  $y_2$ ?

Will there be support in the future for GsPrst() style calls that don't require the TMD data that is duplicated in the preset packets? (like  $u, v$  coords, id, tpage, clut, and color in the case of non-lighted polygons) This seems to be one of the advantages of PMD. But I'm sharing modelling data, so using PMDs would cost me memory, and the non\_SV calls make it more difficult to animate 3D models.

I guess I will probably rewrite the GsPrst() calls I'm using to allow this if it isn't ever done, but since Sony already has a head start, I'd love to see them do it. This would allow most of the benefits of PMD (speed), with the model sharing benefits of TMD-style models.

Jay Stelly Tetragon

---

9/17/95 11:06 AM

Re(6): Quads vs Triangles  
Shaival Varma  
LIBGPU

muchos gracias senior coffin.  
i'll try the straight line trick first i think. or talk my artists into redoing textures  
i feel a free artist lunch coming on. (hehe)

---

9/17/95 7:33 PM  
DivideGT4  
Gene Sewell  
LIBGTE

Hi,  
I'm working on a terrain engine. It is based on a heightfield approach, using GT4 polygons.  
Right now I'm trying to deal with those polygons which get clipped close to the camera (when the polygon gets too close.) I'm planning on using DivideGT4 to divide those polygons which are too close (and get clipped), hoping to generate smaller polygons which will survive the clipping process.  
I have a couple of questions.  
One question has to do with deciding what rdev (# subdivisions) value to use. Any suggestions on how to dynamically do this, or is it just expected that you would pick a fixed #?  
The other question has to do with the GPU packet address. It appears that you could allocate a big buffer of POLY\_GT4s, and as you loop through your polygons, use the returned value from DivideGT4 as the input pointer to the next call. Is this the right idea?

---

9/18/95 6:29 PM  
Re(3): CVector Structure  
Thomas Boyd  
Chris E. Reese  
LIBGTE

OK, I will find out... (pause) (longer pause) got it. cp is just passed through the GTE and used by the GPU. Here are its guts for polys. Lines and stuff are different:  
bit 0 : 0=shaded texture mapping on, 1=off (counterintuitive, I know - check for yourself) bit 1 :  
0=semitransparent off, 1=on bit 2 : 0=texture mapping off, 1=on bit 3 : 0=triangle, 1=quad bit 4 :  
0=flat shaded, 1=gouraud bits 5-7 : code=001 (010=line, 011=sprite, ...) =====  
CVECTOR Character vector. Structure typedef struct { unsigned char r, g, b, cd; }; Members r,  
g, b: Colors, cd: reserved GPU field  
===== I need to know what the cd field  
requires when updating the colors in a primitive. We need to be able to change the colors at  
runtime for certain objects and if we put anything in the cd field other than what was previously  
in there things will break. We are using the TMD structure and have found in the docs that  
there is what seems to be 8 bits for something that I assumed was just padding for the structure.  
Since that is probably the GPU reserved field that you described in the above structure should  
we just read that value and write it back out as the same value or do we need to modify it  
because the colors have changed?

---

9/18/95 1:21 PM  
Re(2): CVector Structure

Chris E. Reese  
Thomas Boyd  
LIBGTE

```
===== CVECTOR Character vector. Structure typedef struct { unsigned char  
r, g, b, cd; }; Members r, g, b: Colors, cd: reserved GPU field  
=====
```

I need to know what the cd field requires when updating the colors in a primitive. We need to be able to change the colors at runtime for certain objects and if we put anything in the cd field other than what was previously in there things will break. We are using the TMD structure and have found in the docs that there is what seems to be 8 bits for something that I assumed was just padding for the structure. Since that is probably the GPU reserved field that you described in the above structure should we just read that value and write it back out as the same value or do we need to modify it because the colors have changed?

```
Chris Reese Eidetic, Inc.===== CVECTOR Character vector. Structure  
typedef struct { unsigned char r, g, b, cd; }; Members r, g, b: Colors, cd: reserved GPU field  
=====
```

I need to know what the cd field requires when updating the colors in a primitive. We need to be able to change the colors at runtime for certain objects and if we put anything in the cd field other than what was previously in there things will break.

---

9/18/95 2:35 AM  
DivideGT4 - can't get it  
Gene Sewell  
LIBGTE

I'm (still) trying to get DivideGT4 to work, and I'm having problems. I've studied the sample code and the documentation, and one point I don't understand is the return value, and the "GPU Packet buffer address" entry in the interface. It would seem that this is a pointer to a work area. The example code didn't show iterative calls to the divide function, and didn't show how to adjust this buffer value for successive calls. In my experience, the returned value is a pointer to the buffer used by the call. Each time I inc the pointer, the return value is the value of the pointer I passed. I've allocated a large pool of memory, made a POLY\_GT4\* pointer to the pool, and I increment the pointer by 4 (I'm subdividing by 2) after each call. I am double buffering this pool:  
POLY\_GT4 pool[2][SIZE];  
It appears that some of the time things are working, but I'm experiencing sever problems most of the time. The screen gets trashed with clut errors, which could be memory overwrites and I'm getting GPU timeouts. Typically, I seem to be trying to subdivide 50++ polygons on each frame. I know I'm not overflowing my pool (I have it set to a huge number with no change.) Total number of polygons being drawn would be 100-150 (without the divide), so the total number should be less than say 500. I've tried increasing the size of the ordering table, my buffer space, everything I can think of....  
I've tried many variations on passing the parameters, and don't know why I'm trashing things. I occasionally get an error message like:  
GPU Timeout:que=0; stat=4002060d; chcr=01000401; madr=00242e7c.  
This memory address looks like its pointing to my buffer. Other timeout stats are 40020408. Sometimes the madr isn't close to my buffer.  
Can you offer any suggestions?  
Thanks  
Gene

---



9/18/95 11:54 AM

Re: that old h/2...

Thomas Boyd

Pat Quinn

LIBGTE

I do not know exactly why, (I suspect Jeff is correct, though), but the GTE hardware limit is h/2 and there is nothing that can be done about it. You must work around it with SubPol, etc...

Tom ===== SetGeomScreen is used to set the perspective parameter "h" for LIBGTE. I understand this to be the distance from the view plane (on this system, the screen) to the eye. What I don't understand is, why the heck is h/2 the closest you can get to a primitive?

If I'm translating in the positive z direction, my world and my sprites move closer. But when a sprite reaches the distance h/2, it stops moving while the world and the rest of the sprites continue to move. Eventually it disappears -- it gets near clipped, as it should, when it's z distance reaches zero.

But between h/2 and zero is a lot of ground, and the thing just stands there waving at you like one of those geeks that hangs around just behind TV news reporters. I don't want that! I'd rather the sprite stride \*all the way\* up to the camera, larger than life, like a goon bodyguard intent on assaulting the cameraman!

9/18/95 12:16 PM

Re: CVector Structure

Thomas Boyd

Chris E. Reese

LIBGTE

What pad value? Please show me what you mean. ===== CVECTOR

Character vector. Structure typedef struct { unsigned char r, g, b, cd; }; Members r, g, b: Colors, cd: reserved GPU field ===== What does the pad value in the CVECTOR mean? I was expecting it to be nothing more than what it is described as, a PAD. It turns out when modifying colors in a primitive that the pad value has significant effect on whether or not the primitive will be displayed or not. I don't recall reading anything in the docs about it, so I thought I would ask.

Chris Reese..... Eidetic, Inc.

9/19/95 6:00 PM

Ordering of points in a POLY\_FT4

Silas S. Warner

LIBGTE

I have found by trial and error that the ordering of the X and Y points in a POLY\_FT4 is as follows:

|                                                                    |       |         |         |       |         |
|--------------------------------------------------------------------|-------|---------|---------|-------|---------|
|                                                                    | X0,Y0 | X1,Y1   | +-----+ | !     | !       |
| !                                                                  | !     | +-----+ | X2,Y2   | X3,Y3 |         |
| My question is: is the same ordering true for the texture co-ords: |       |         |         | U0,V0 | U1,V1   |
| +-----+                                                            | !     | !       | !       | !     | +-----+ |
| U2,V2                                                              | U3,V3 |         |         |       |         |
| or is the order, as I first thought for X and Y, circular, as in   |       |         |         | U0,V0 | U1,V1   |
| +-----+                                                            | !     | !       | !       | !     | +-----+ |
| U3,V3                                                              | U2,V2 |         |         |       |         |

Silas Warner

---

9/19/95 5:55 PM  
RotAverage(Nclip)4  
Silas S. Warner  
LIBGTE

I seem to be having some problems substituting RotAverageNclip4 for RotAverage4 in my system. I want to use RotAverageNclip4 to generate an outer product to eliminate wrong-sided polygons

Using RotAverage4, I have the following code:

```
SVECTOR *v0,*v1,*v2,*v3; POLY_FT4 *w; long P,Flag,otz,op;; otz=RotAverage4(v0,v1,v2,v3,  
(long *)&(w->x0),(long *)&(w->x1), (long *)&(w->x2),(long *)&(w->x3), &p,&Flag);
```

This generates a properly formatted polygon, and returns a value in OTZ which I can use directly in AddPrim with a 256-element sorting table.

If I substitute the following statement: `op=RotAverageNclip4(v0,v1,v2,v3, (long *)&(w->x0),(long *)&(w->x1), (long *)&(w->x2),(long *)&(w->x3), &p,&otz,&Flag);` then the value of `otz` is never used or set, and the value of `op` seems to always return zero.

Is there a known library bug with RotAverageNclip4?

Silas Warner

---

9/19/95 2:36 PM  
Re(4): CVector Structure  
Silas S. Warner  
Thomas Boyd  
Chris E. Reese

Thank you for this kind of prompt response. This is the kind of thing that Sony should do when asked about mysterious bits.

Silas

Warner

---

9/20/95 5:45 PM  
Re: Ordering of points in a P  
Karen Paik  
Silas S. Warner  
LIBGTE

The uvs go in the same order as the xyzs.

---

9/20/95 10:38 AM  
Ginsu those polys  
chris m. coffin  
LIBGPU

Shaival Varma

One more thing you can do to reduce warpage for those brick wall texture using people(not a good idea in the first place). Since the longest straight lines in a brick wall run horizontally(usually) from one end of the poly to another they will distort the most because the brick wall lines will point into the distance (assuming a doom style game). When drawn in 3D they will bend into WWWWW.

The way to reduce warpage best for this type of situation is not to use a LIBGS style autodivide which uniformly divides a wall up (4x4 etc.) The way to go is to only slice the wall horizontally across (in the direction of those long brick lines). This method of dividing in one direction works best for specific style textures like brick walls/pipe textures. Hope this helps :)

---

9/20/95 5:43 PM

Re: RotAverage(Nclip)4

Karen Paik

Silas S. Warner

LIBGTE

RotAverageNClip4 returns 0 or a negative value if the polygon is back facing and doesn't set any values for x,y, or otz in this case. This is what you'd want the library to do. It would be a waste of time to calculate these values. It sounds like your polygons are all back facing.

---

9/20/95 1:18 PM

DrawSync(1)

Paul C. Isaac

LIBGPU

this is kind of a repeat of an earlier question that I got no satisfactory answer to...

```
LoadImage(...) LoadImage(...) LoadImage(...) LoadImage(...)
```

```
while (DrawSync(1) > 0) { printf("DrawSync = %d\n",DrawSync(1)); pollhost(); // this is an infinite loop when I run it! }
```

I would have expected this to print out a series of 4,3,2,1's but as far as I can tell DrawSync(1) always returns "1" am I doing something crazy... do I not understand what is happening... am I supposed to just call DrawSync(1) and ignore what it returns...

I'm expecting DrawSync(1) to kind of count how many DrawOT or LoadImage tasks are waiting in the internal queue... what is it really doing?

(pci)

---

9/20/95 1:18 PM

DrawSync(1)

Paul C. Isaac

LIBGPU

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LoadImage(...) LoadImage(...) LoadImage(...) LoadImage(...)
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I'm expecting DrawSync(1) to kind of count how many DrawOT or LoadImage tasks are waiting in the internal queue... what is it really doing?

(pci)

---

9/21/95 6:29 AM  
clipping and sub-division  
Sam Black  
LIBGTE

From many of the messages I've seen here, I'm guessing that many (most) developers are handling near clipping problems by subdividing near polygons. I have two questions about this:

1) is it really faster than just clipping the poly? Can subdividing into 16 or 32 pieces really be a win over just clipping? I can see that the subdivision code can be smaller, and so can more easily fit in cache, which makes a huge difference, but it seems you ought to be able to streamline a clipping algorithm to fit in cache too.

2) How do you deal with the seams that show up between the subdivided and non-subdivided polygons? Just ignore them?

And can anyone tell me why the GPU refuses to draw any polygons whose extent in x or y is > 1024? That one really annoys me. It means I have to clip (or subdivide) what otherwise would be a perfectly valid polygon (and on top of that I have to check every damn polygon to see if I need to clip it). I know it's asking too much, but could someone at Sony please tell me that it's correctable behavior and will be fixed in the next release?

---

9/21/95 11:00 AM  
Re: clipping and sub-division  
stephen chaplin  
Sam Black  
LIBGTE

From our tests here, it would seem as if clipping is really slow (we are doing it on the R3000 processor, the GTE/GPU don't seem to have polygon clipping functionality!). The reason that you can't get the GPU to draw the polygons (with an x or y extent > 1024) is that the GPU has a range of 10bits! I'm afraid that it has to do with the hardware, and not the software :( Can anyone explain to me why Sony chose the bizarre ordering of quads over a normal [counter]clockwise approach?

Romesh Prakashalan, Celeris Inc.

---

9/22/95 1:44 PM  
RotSMD, RotRMD  
Dave R. Scheele  
LIBGTE

RotRMDxxx and RotSMDxxx etc. are in libgte, but used by the libgs library. Are they ROM routines, or are they completely implemented in the library?

Also, you can pass in the bit length of the order table. Using RotNClip3, for example, the otz value is divided by 4. If I pass in a large enough bit length (16?) to RotxMDxxxx, will it do NO shifting, and use the actual z value for the index into the order table?

Dave

---

9/22/95 5:45 PM  
Re: clipping and sub-division  
Karen Paik  
Sam Black

LIBGTE

Clipping can be faster than subdividing. I've written my own 3D clipping routine and it works really well in cases where you can use one large polygon instead of a zillion little ones. You can create extra polygons to fill in the subdivision cracks. Take three vertices that are supposed to be on a line and make a triangle out of them.

---

9/25/95 2:33 PM

Re(7): Quads vs Triangles  
FLORIA L. ROSS  
LIBGPU

I have been wondering about this Quads v.s. Triangles problem as well. Won't using quads give you a lower poly count and also less storage? It seems to me that it's better to use quads if you are able to model effectively with them. I wish someone would clear this up once and for all. Does the Playstation just break up quads into triangles internally anyway?  
-TK

---

9/25/95 5:08 PM

Re(3): clipping and sub-divis  
Karen Paik  
Carl Ferreira  
Sam Black

To clarify about the 3D clipping, it doesn't help the texture distortion but it does fix polys which disappear or have their geometry distorted. I suppose you might have fewer polys to subdivide after clipping is done.

---

9/25/95 10:14 AM

Re(2): clipping and sub-division  
Carl Ferreira  
Karen Paik  
Sam Black

>Clipping can be faster than subdividing. I've written my own 3D clipping >routine and it works really well in cases where you can use one large >polygon instead of a zillion little ones. I'm afraid I don't quite follow this. If you have a ground or wall texture which you come close to in the 3D world, are you saying that your 3D clipping routine prevents the texture wedgies? If this is so, I would appreciate it if you would elaborate somewhat on the technique.  
>You can create extra polygons to fill in the subdivision cracks. Take >three vertices that are supposed to be on a line and make a triangle out >of them.  
This is also an interesting idea, but what texture do you assign it?

---

9/25/95 11:18 PM

Re(3): clipping and sub-division  
Gene Sewell  
Karen Paik  
LIBGTE

I'll chime in here and also ask for any clarification on what you are doing? It seems to me that these are the two biggest problems I'm having - near Z clipping, and cracks between polygons.

I would have hoped that near-z clipping would have been done automatically by the Sony firmware. I now hope that I'll learn how to divide polys in a way that can handle it - although I'm sure there will be small polys which will still disappear. What we need is a pixel level clipper.

Can you post any pseudo code, or better, C code?

Thanks

---

9/26/95 8:45 AM

Re(4): clipping and sub-division

Carl Ferreira

LIBGTE

I have wrestled with the sub-division / clipping / warping problem for the last six months and this is what I've come up with for myself:

\* Multiple levels of geometry pre-divided so that when an object becomes closer than  $H/2$  ( $H$ =camera distance set by SetGeomScreen) the hi-resolution geometry is used.

\* Objects translated into world space will have round-off error resulting in seams between objects, even if those objects should be contiguous. The only solution I've found is to turn off background clearing so that the seam is (usually) filled-in by the previous frame's texture. This also covers the occasional drop-out of a peripheral polygon.

\* Any two polygons which are adjacent (should be touching) which do not share common vertices \_may\_ display a seam.

I would be interested in anyone else's solution.

Carl

---

9/26/95 2:49 PM

Which support person specializes in libGPU?

Blake E. Senftner

LIBGPU

Sony;

Which support person specializes in support for LibGPU? I have a detailed question that I don't want posted to the public.

-Blake

---

9/26/95 12:45 PM

Re(8): Quads vs Triangles

Silas S. Warner

LIBGPU

As far as I can tell, the PSX simply breaks a quad into two triangles, one at  $P_0, P_1, P_2$  and one at  $P_1, P_2, P_3$ . This leaves a "seam" down the middle (between  $P_1$  and  $P_2$ ) that's usually visible in the texture map. Folks complain about this bitterly, but I haven't found it to be much of a problem when the points are coplanar.

I'm using quads whenever I can to save on storage space. There are problems when a textured quad doesn't look quite the same on the PSX as it did in 3D Studio. About all you can do about that is rant and scream, but I still use the quads for the reasons you (Gloria L. Ross) mentioned.

Silas Warner

---

9/27/95 6:58 PM

OT execution & DR\_ENV

Blake E. Senftner

LIBGPU

Angus

Angus & Tom:

I have an operation where I need to render a texture into an offscreen location of VRAM, and from our previous discussion you both suggested using the DR\_ENV primitive to change the clipping bounds of my drawing environment when I need to render into this offscreen location...

Well, my current logic goes something like this:

calculate my local to screen transformation (matrix) set this matrix into the GTE call

RotRMD\_FT4() for a set of rendering primitives organized as a PMD primitive group (we'll call primGroup0)

This gives me primitives located in the ordering table at the correct z depth

Now I take those screen xy coordinates generated by the RotRMD\_FT4() call and copy them into another primitive group (we'll call primGroup2)

Next I set the xy coordinates inside primGroup0 to be the off screen VRAM location where I'll be building my texture

Following that I have another primitive group (we'll call primGroup1) that I'm setting to render into that same offscreen VRAM location.

Finally, I do an addPrim( primGroup0, primGroup1 ) and addPrim( primGroup1, primGroup2 ) to each prim in the groups. This results in a drawing order of primGroup0 followed by primGroup1 followed by primGroup2. Which is what I want.

Problem: in order for this to work, I have to set my clipping bounds to the large rectangle that includes my offscreen VRAM work location. Because my clip bounds is so large, I get the occasional polygon rendered to the screen's far right, inside my VRAM texture storage area-between screen VRAM and my offscreen VRAM work space.

solution I'm thinking about: I can use the DR\_ENV primitive to change my clipping bounds, but how do I insert the DR\_ENV primitive in front of my primGroup0? The addPrim() macro inserts the adding primitive after the first parameter. So if I use RotRMD\_FT4() to locate my primGroup0 into the ordering table, how do I insert a DR\_ENV before it in the OT?

I guess I could do a read of the z fifo, and then figure out which Z entry the primitive was added to in the ordering table, and then follow that with a walk of that linked list looking for my first primitive from primGroup0... but I'd like to find something less iterative.

any suggestions are welcome. Additionally, I'd like to thank you guys for the rapid callback on my problem!

-Blake

---

9/27/95 2:19 PM

Re(9): Quads vs Triangles

chris m. coffin

LIBGPU

Quads take less storage. Quads are easier to texture map when you model with them in the first place instead of glueing 2 tri's together. Quads are drawn as triangles but only take one primitive instead of 2. Quads are not transformed faster than tris because quads are treated as 2 triangles during transformation ( boo hoo :( ) That's my 3 cents. :)

---

9/28/95 1:42 PM

Re: OT execution & DR\_ENV

Silas S. Warner

LIBGPU

The way I handle this problem is to create a separate DrawEnv for the intermediate screen, with its own OT. Before drawing into the intermediate area, I just SetDrawEnv to this special intermediate DrawEnv. I then put in the primitives with their OTs (mostly overlapping font and sprite images) and call DrawScreen. THEN I revert to the video DrawEnv and start stacking up the primitives, including the POLY\_FT4 that copies the intermediate screen. I do a DrawSync to make sure the GPU has got done with the intermediate screen, then call DrawScreen with the video DrawEnv set.

Silas Warner

---

9/28/95 11:03 AM

Need FntLoad() information

Carl Ferreira

LIBGPU

The information I get from the documentation is that the loaded built-in font information is 64x128, but if I perform the following:

```
FntLoad(1024-64,512-128);
```

the font is garbage. However if I use

```
FntLoad(1024-64,512-256);
```

the font works just fine. BTW, I'm using an arcade version and there are no TIMs located below the 512 boundary yet.

Questions:

1) Why does FntLoad seem to require 64x256? I have examined VRAM using the sample in PSX\SAMPLE\GRAPHICS\SCREEN and the used area is apparently quite small -- somewhere around 64x64, and then there is a CLUT loaded below it(?).

2) What exactly is FntLoad doing? Where is the CLUT loaded? How large is the built-in font table? How can I minimize the amount of precious VRAM used to display debug information?

Thanks,

Carl Ferreira

---

9/29/95 2:08 PM

Re: DrawSync(1)

Angus

Paul C. Isaac

LIBGPU

I know 3.0 had a problem with this. Try lib 3.2. It should clear up.

Angus

---

9/29/95 7:03 PM

Load Image is workin' perfectly and I canna tell why!

Silas S. Warner

LIBGPU

When I load a 64x64 8-bit texture to, say, 512,256, use GetTPage(1,0,512,256) to get the page and then set texture U,V values to 0 and 63, I get the texture perfectly displayed.

The problem is that this also happens if I change the texture numbers to, say, 960,0... in other words, NOT on a TPAGE boundary! The U and V values remain the same even though I order the texture loaded off the page boundary.

Is this a bug in LoadImage, that's always putting the image on a page boundary? Or is it some



mysterious function of GetTPage that magically stores the true co-ordinates of the loaded texture? I hope it is the latter, as I would like to use RAM between 640,0 and 960,0 for a subsidiary page buffer and load the texture actually at 960,0 instead of, say, 768,0.  
Silas Warner

---

9/29/95 2:08 PM

Re: DrawSync(1)

Angus

Paul C. Isaac

LIBGPU

I know 3.0 had a problem with this. Try lib 3.2. It should clear up.

Angus

---

10/2/95 10:35 AM

Re: Load Image is workin' perfectly and I canna tell why!

Mark D. Lyons

LIBGPU

>>The problem is that this also happens if I change the texture numbers to, say, 960,0... >>in other words, NOT on a TPAGE boundary! The U and V values remain the same even 960,0 is a TPAGE boundry.  $960/64 = 15$ . The TPAGE's start every 64 VRAM pixels.

---

10/3/95 11:04 AM

Re: Which support person specializes in libGPU?

Kristine Severson

LIBGPU

Angus or Tom can help you out with GPU issues.

To everyone: If you have a question for Suppor that you don't want to post publicly, you can send private email to "Developer Support." We'll get it to the appropriate engineer who specializes in your area of concern.

Kris

---

10/3/95 8:42 AM

Strange 'Fog' effects

Carl Ferreira

LIBGPU

I have been experimenting with the SetFogNear() function and I find that some polygons display fog effects and others do not. For example, I might have grass (256 color) which is affected by the fog parameters, but a tree (also 256 colors) is always displayed as black?!? Any ideas?

Also, can someone explain what the two parameters the SetFogNear() actually do; how they relate to what I would expect to see on the screen?

Thanks,

Carl Ferreira

---

10/5/95 2:33 PM

Re: Need FntLoad() information

Silas S. Warner

LIBGPU

Let me add my own question to this, as I need to make my own fonts. Is there any way other than the way I am doing, which is to FntLoad the system font, then LoadImage a TIM image on top of the top of the font?

It also appears that the font will not load unless it is on 64 bytes horizontally and 256 bytes vertically. Is this correct? (I suspect it is, because the FntPrint seems to send a series of SPRITE8s to the GPU, and the source co-ords of the SPRITE8s seem to be constant.)

Silas Warner

---

10/6/95 10:36 AM

Size of Trans Vect in MATRIX

David W. Marshall

LIBGTE

Can someone please clear up my confusion on the following:

The translation vector in the MATRIX data structure is made up of 3 longs. However, the GTE only does 16 bit math. Therefore, it seems impossible to have a translation larger than 16 bits.

Why is the translation vector a 32 bit vector? Is there a way to use a full 32 bit translation?

dave

---

10/6/95 1:15 PM

Re: Size of Trans Vect in MATRIX

Silas S. Warner

David W. Marshall

LIBGTE

As far as I can tell, the GTE seems only capable of the rotation matrix math. The rotation portion of the MATRIX is all 16 bits, and this is what is into the X,Y, and Z coordinates. The CPU does the translation, and since the CPU is native 32 bits, so is the translation portion of the matrix. The result seems to be a 16-bit value in any case.

It would make sense in certain applications, except that the MATRIX application seems to do the translation BEFORE the rotation! This means data is computed, then lost.

Silas Warner

---

10/6/95 11:08 AM

DrawSync() == constant???

Dean M. Grandquist

LIBGPU

OS

I am having trouble with DrawSync(1), after I run for a while the value returned is a constant.

My game is running with threads and lots of callbacks (all the root counters and drawsync).

One thread is the render and draw calls the other is the ai's and movement. The vsync is checking if the drawsync call back is done and the render is done before swapping the frame buffers.

What does the DrawSync(1) do really, or is this a classified? Please don't quote the manual 8-)

Thanks bunches. --DeanG

---

10/6/95 11:13 AM

Fwd: 192 dead pixels

Carl Ferreira  
LIBGPU

Can you send me an example that exhibits this? If so we will seek and destroy it.  
Also, I have your questions on fonts, but the Primal Rage II guys have my old arcade board, so I have to install another one today. I will try to get that set up today, since I will be gone next week on vacation.

Tom

=====

Both. It is uncertain whether the problem is in the memory or in the GPU. There is some evidence that SOMETHING is writing out a line at that address. More information as it is discovered. ===== New board or old board?  
===== There seems to be a bug in the arcade board which has a 192 pixel wide dead area at 0,896. Can anyone else confirm this? Carl Ferreira

---

10/11/95 6:18 PM

Fog  
Jeff Davies  
LIBGTE

Anyone know how to make white fog?  
For the last 6 months I've been doing black fog by doing a SetShadeTex on all my polys and then setting the r/g/b color value to something between 0 and 160. This worked pretty good, but now I need white fog.  
Setting the r/g/b to 255 just slightly overexposes the textured polys, but it doesn't make it white. Even if I do the legitimate thing by using the SetFogNear/Far et.al. and then calc the r/g/b's with DpqColor it does the same thing.  
Is there a flag that needs to be set in one of the primitive entries that makes this work? I know it can be done with the GS lib because the rcube demo does it, but I'm not using the GS lib.  
-Brian

---

10/11/95 3:00 PM

Sequence of events in SPRTs  
Silas S. Warner  
LIBGPU

I'm having trouble setting the default tpage to use with a group of sprites. The sequence of events is about like this, with some questions:

1. i=GGetActiveBuff(); pOT=OTBuff[i]; This uses the double-buffering page data. How does it relate to PutDispEnv?
2. PutDrawEnv(&dE[i]); Does this store a pointer to dE[i], or does it copy the data in dE[i] to the GPU?
3. de[i].tpage = xtpage; Does this affect the base tpage now being used for sprite drawing?
4. SetSprt(This); : : AddPrim(pOT,This); Is the default tpage from the current DRAWENV copied at this point?
5. GsSwapDispBuff(); I realize that this changes the value gotten from GsGetActiveBuff(). Would a PutDispEnv with appropriate screen co-ordinates have the same effect? Would it change the GsGetActiveBuff value, or is that value only changeable by GsSwapDispBuff? What is the effective difference between these two methods?
6. GsDrawOt(pOT); Is this where the default tpage set in the DRAWENV comes into effect? If so, will the default tpage be set from the value at PutDrawEnv or the value to which the DRAWENV was changed after the PutDrawEnv?

7. VSync(1): In a previous message, a reference was made to using VSync(1) to always set the number of VBLANKS to be transmitted. This does not seem to work this way in my library (3.1.) I seem to need to use GsGetVcount() to count vblanks and set the proper speed. Is this correct, or do I just have an old library?

Silas Warner

---

10/11/95 5:27 PM

ordering table questions

Blake E. Senftner

LIBGPU

Angus

A few questions answered and you can MAKE MY DAY!

1) when the ordering table is initialized, is it set such that each ordering table entry's "tag" field points to the next ordering table entry?

To word this another way: is an empty ordering table a linked list that links each ordering table entry to the next ordering table entry? `ot[0]->tag = ot[1]; ... ot[n-1]->tag = ot[n];`

2) Is a 'code' value of zero an ordering table entry?

-Blake

---

10/12/95 1:24 PM

Re: Size of Trans Vect in MATRIX

Angus

David W. Marshall

LIBGTE

There is a 32 bit translation unit which is a simple add in the GTE. It is done in hardware.

World coords are 32 bit. Local and Screen Coords are 16 bit.

Angus

---

10/12/95 11:07 AM

Re: ordering table questions

Angus

Blake E. Senftner

LIBGPU

Code for ClearOTagR is something like this `u_long *ClearOTag(u_long *ot,int n) { while (-n) { setlen(ot,0); setaddr(ot,(u_long)&ot[1]; ot++ } ot[0] = 0x00ffffff; return (ot); }`

Command code 0 is a NOP for the GPU.

Hope this helps.

Angus

---

10/13/95 5:58 PM

Re: Fog

David R. Sullivan

Jeff Davies

LIBGTE

I haven't tried white fog, however, you may try using Goroud shading to provide a fog lighting effect in any color (inc. white)

---

10/13/95 4:29 PM

Re: GPU primitive ordering

Blake E. Senftner

LIBGPU

Silas S. Warner

This is similar to issues I'm dealing with right now, and I've noticed that the use of the addPrim() macro is somewhat tricky:

```
addPrim( ot, prim )
```

This takes the "next" pointer inside the 'ot' passed and sets it equal to 'prim' while taking the previous value of 'ot->next' and placing that inside 'prim->next'

This causes logic like this:

```
addPrim( ot, prim0 ); addPrim( ot, prim1 ); addPrim( ot, prim2 )
```

to create an ordering table:

```
ot->next = prim2; prim2->next = prim1; prim1->next = prim0; prim0->next =
```

```
whatever_ot_started_with
```

Which is backwards from what one would expect. This info may help you resolve your prim ordering logic.

-Blake

---

10/13/95 11:08 AM

Re: Fog

Angus

Jeff Davies

LIBGTE

There is a clutfog examples in the graphics sample that will let you do the fog. White fog does not work on textures for the PSX. White fog works for everything but textures, thus the rcube demo works. Use cluts ala the sample..

Angus

---

10/13/95 1:00 PM

GPU primitive ordering

Silas S. Warner

LIBGPU

I am running into problems in which primitives are not being drawn in the order in which I place them in the OT. Specifically, in order to make the foreground of my scene, I am placing these primitives, in the following order, into entry 0 of an OT. (Other objects are placed in positions further back in the OT, including a GsBG in entry 255.) All drawing is done in 8-bit CLUT mode. 1. 64x32 POLY\_FT4 2. 64x32 POLY\_FT4 3. 192x160 POLY\_FT4 4. DR\_MODE (changes tpage only) 5. SPRT\_8 6. SPRT\_8 7. SPRT\_8 8. SPRT\_8 9. SPRT\_8

On the screen, these objects are being displayed in the order 4,5,6,7,8,9,1,3,2. In other words, the small SPRTs are done first, then one medium POLY\_FT4, then the humongous POLY\_FT4, then the other medium POLY\_FT4.

Now this would make sense if the GPU were somehow multiprocessing the entries: in other words, one GPU process might be handling the small SPRTs and another two processes sharing the large POLY\_FT4s. Is this actually the case? If it is so, is there any FLUSH primitive that I can deliver to the GPU to prevent groups from being displayed in the wrong order?

Note that distributing the primitive entries among the first 3 entries in the OT has no effect.

Silas Warner

---

10/16/95 6:21 PM

Re(3): GPU prinitive ordering  
Blake E. Senftner  
LIBGPU

Silas,  
void AddPrimAfter(DR\_MODE \*newprim,DR\_MODE \*oldprim) { newprim->tag =  
oldprim->tag; oldprim->tag = newprim; }  
Your code shown here is the same as what addPrim() does.  
Just keep in mind that the rendering order will be the inverse of the order that you called  
addPrim().  
-Blake

---

10/16/95 6:10 PM  
Re(2): GPU prinitive ordering  
Silas S. Warner  
LIBGPU

Okay, is there any reason I shouldn't write void AddPrimAfter(DR\_MODE  
\*newprim,DR\_MODE \*oldprim) { newprim->tag = oldprim->tag; oldprim->tag =  
newprim; } or is there some system phenomenation somewhere that is done by AddPrim that I  
cannot duplicate?

Silas Warner

---

10/16/95 7:16 PM  
about LoadImage()  
Blake E. Senftner  
LIBGPU

Angus

When calling LoadImage(), is the RECT passed copied?

The routine is async, yet I have seen and used code that looks like:

```
for (i = 0; i < slices; i++) { setRECT( &r, 16 * i, 0, 16, 256 ); LoadImage( &r, gMDECSlices[i] );  
}
```

Which should only work if the RECT is being copied, or the LoadImage() were executing very  
very fast.

What happens when LoadImage() is called?

-Blake

not just curious, but tracking down a voodoo bug...

---

10/17/95 11:15 AM  
Re(3): GPU prinitive ordering  
Angus  
LIBGPU

addPrim is a macro in libgpu.h. You can make what you want.

Angus

---

10/17/95 6:44 PM  
Re(4): GPU prinitive ordering

Silas S. Warner  
LIBGPU

Thanks for the help. I did indeed make "AddPrimAfter" along the lines you suggested.  
Now back to my original question: is there some type of multitasking taking place in the GPU?  
In particular, is it possible to have a large POLY\_FT4 overwrite a small SPRT that is placed after it in the ordering table?

Silas Warner

---

10/17/95 9:40 AM  
Re: about LoadImage()  
Dan Burnash  
LIBGPU  
Blake E. Senftner  
If the queue is empty, the command is executed immediately. If not, the args are copied into the queue. Therefore, 'r' may be safely redefined when LoadImage returns.  
Dan Burnash

---

10/18/95 4:06 PM  
DrawSync() & DMA  
Blake E. Senftner  
LIBGPU  
Angus  
The manual for DrawSync() states that this function returns when all drawing is completed... yet many descriptions of other lib functions seem to imply that DrawSync() returns when "transmission of the ordering table to the GPU" has completed. Or the implication sounds like DrawSync() returns when the que is empty- but not when the GPU has completed rendering... Well... I have a info that talks about the two types of DMA: "source chain" and "slice transfer." Source chain sounds like the ordering table execution, while slice transfers sound like a LoadImage() call...  
My info continues to state that when a slice transfer is in progress any requests by the GPU to access memory suspends the slice transfer until the GPU has completed.  
This sounds like if I have a LoadImage() going to my background, followed by an ordering table execution... the ordering table will interrupt the LoadImage()s. Once the OT is complete, the LoadImage()s resume.  
Additionally, DrawSync() only looks for the que being empty, not the completion of the slice transfer...  
So, how would one copy a background image to VRAM, and be assured that the slice transfer is completed before execution of any ordering tables?  
Is my info accurate? What is the official word on this? My info is hand notes from previous meetings with Sony people, so I'm unsure what the true facts are.  
-Blake

---

10/23/95 11:12 AM  
DivideFT  
David W. Marshall  
LIBGTE

One of the arguments for DivideFT3() is s. The library reference states that s is the "GPU packet buffer address".

I'm assuming that this is some type of work buffer for the DivideFT3() routine to use. How big does this buffer need to be? Is the buffer size dependent on the divp->ndiv setting? If so, what is the formula for calculating the buffer size?

I searched the archives and found this same type of question asked in September, but I couldn't find the answer.

thanks,  
dave

---

10/23/95 12:31 PM

Re: DivideFT

Silas S. Warner

David W. Marshall

LIBGTE

The buffer, S, must be big enough to contain the NxN FT3s that the DivideFT3 will create. In other words, you introduce the parameters for a great big FT3. Then when you divide it, you wind up with between 4 and 1024 little POLY\_FT3s. The buffer S is where to put them. When they are made, they will be linked in a chain. Then the pointer pointed to by OT will be pointed to the start of the chain.

The data stored in S by DivideFT has to be kept intact until the OT is drawn, because it contains the GPU instructions created by DivideFT. Note that "registering": the result in the OT does NOT make a copy of the data: it just links it, where it is, into the chain that will be passed to the GPU. Until the GPU actually draws the data in S, it can't be touched.

Silas Warner

---

10/24/95 1:28 PM

GPU Timeout interpretation, please!

Dave R. Scheele

LIBGPU

I've started getting this wonderful message today --

```
GPU timeout:que=1,stat=40040609,chr=01000401,madr=000d73e4,func=(8001b988)(803a720,00000000)
```

The format is different from ones I've gotten before ... can you interpret this?

Dave

---

10/24/95 8:15 PM

RE: AddPrimAfter?

Paul C. Isaac

LIBGPU

Did I misunderstand someone to say they wrote a NEW AddPrimAfter()...

what does it really look like...

as far as I can tell you can't do it efficiently any differently than the SONY libs

```
#define addPrim(ot,p) setaddr(p,getaddr(ot)) setaddr(ot,p)
```

Note: setaddr(p,addr) is basically ((DR\_MODE\*)p)->tag=addr

here is my logic... am I wrong?

```
ClearOTag
```

```
ot[0] = ot[1] ot[1] = ot[2] ot[2] = ot[3] ot[3] = 0
```

```
addPrim(ot+0,A)
```

```
ot[0] = A ot[1] = ot[2] ot[2] = ot[3] ot[3] = 0
```



```
A = ot[1]
addPrim(ot+0,B)
ot[0] = B ot[1] = ot[2] ot[2] = ot[3] ot[3] = 0
B = A A = ot[1]
addPrim(ot+0,C)
ot[0] = C ot[1] = ot[2] ot[2] = ot[3] ot[3] = 0
C = B B = A A = ot[1]
there is no way to get
ot[0] = A A = B B = C C = ot[1]
if you addPrim in the same order...
UNLESS you write a slow_addPrim() that looks for the end of the link list and tries to tack the
new prim there
the only GOOD way to achieve this would be to use ClearOTagR which is faster anyway!
(pci) pisaac.origin.ea.com
```

---

10/24/95 7:54 PM  
Re: DrawSync() == constant???  
Paul C. Isaac  
LIBGPU

I think we have been having been experiencing the exact problems you have described... below  
is the response I just got... we are using 3.0... so I'll try 3.2 and see if it helps.  
Paul Isaac Origin -----  
I know 3.0 had a problem with this. Try lib 3.2. It should clear up.  
Angus

---

10/25/95 11:54 AM  
Re: RE: AddPrimAfter?  
Silas S. Warner  
LIBGPU

I wrote AddPrijmAfter myself. It is a macro, similar to AddPrim. Here it is:  
/\*\* Macro for inserting a primitive in an OT list \*/ #include <libgpu.h> /\* Necessary to have  
getaddr and setaddr definitions \*/ #define AddPrimAfter(p0,p1)  
setaddr(p1,getaddr(p0)),setaddr(p0,p1)  
Note that p1 (the second argument) is the primitive to insert in the list after primitive P0 (the  
first argument.)

Silas Warner

---

10/25/95 5:13 PM  
Re(2): RE: AddPrimAfter?  
Paul C. Isaac  
Silas S. Warner  
LIBGPU

Look at these one more time and tell me if you see anything similar :)  
// Excerpt from LIBGPU.H #define addPrim(ot,p) setaddr(p,getaddr(ot)), setaddr(ot,p)  
/\*\* Macro for inserting a primitive in an OT list \*/ #include <libgpu.h> /\* Necessary to have  
getaddr and setaddr definitions \*/ #define AddPrimAfter(p0,p1)  
setaddr(p1,getaddr(p0)),setaddr(p0,p1)  
(pci)

---

10/25/95 7:17 PM

Re(3): RE: AddPrimAfter?

Silas S. Warner

Paul C. Isaac

LIBGPU

```
>Look at these one more time and tell me if you see anything similar :) >> // Excerpt from
LIBGPU.H >#define addPrim(ot,p) setaddr(p,getaddr(ot)), setaddr(ot,p) >>/** Macro for
inserting a primitive in an OT list ***/ >#include <libgpu.h> /* Necessary to have getaddr and
setaddr definitions */ >#define AddPrimAfter(p0,p1) setaddr(p1,getaddr(p0)),setaddr(p0,p1) >
>(pci)
```

The difference is the order of the arguments. AddPrim could be used for AddPrimAfter, but the arguments would have to be reversed. Besides, it's much more convenient to separate AddPrim, which takes a prim and an OT, from AddPrimAfter, which takes two prims as arguments.

Silas Warner

---

10/26/95 11:46 AM

Generic Vector Math

David B. Brickhill

LIBGTE

I need a fast way to do basic vector arithmetic such as inner products, outer products, scalar \* vector multiplies. The OuterProduct0 and OuterProduct12 library functions return imprecise results (which I don't understand because an outer product involves no division). I've looked at using ApplyMatrix, RotTrans, and MulMatrix to do inner products (3 at once, 3 at once with additions appended, and 9 at once, respectively) but the problem there is that the library matrix math functions correct the results back to (1,3,12) numbers, so I have to shift my original vectors 12 bits left before I load them into a matrix to use the GTE, which leaves me 3 bits of magnitude for my vectors, which is of course not enough.

Is the GTE capable of doing generic, uncorrected matrix and vector arithmetic? If it is capable, are there plans to extend the library to support the capability? If there are no plans, can I get the co-processor function codes to write the routines myself (I work for Sony, so it would be kept in-company)?

Any suggestions would be welcomed.

David Brickhill Sony Interactive Studios America (619)677-3858

---

10/27/95 12:05 PM

Generic Vector Math Part Deux

David B. Brickhill

LIBGTE

OuterProduct0 & 12 are fine. In previous message I said they returned imprecise results, but it was really my own arithmetic and memory that were imprecise.

Problem of inner products still remains. Please advise.

---

10/27/95 4:12 PM

what is the matrix cache?

Blake E. Senftner

Documentation

I've run across mention of a matrix cache.

What are the characteristics of this cache?

Additionally, how many caches does the PSX have? I know about a texture cache, a clut cache, a CD ROM cache, a data cache and an instruction cache.

I'd love a summary of these and their various behaviors, sizes and uses.

Thanks. -Blake

---

10/29/95 8:38 PM

Re(4): RE: AddPrimAfter?

Paul C. Isaac

LIBGPU

sorry for endlessly replying to a hopeless debate... but, the naming of the macro variable 'ot' is arbitrary and it might as well be 'p0' with 'p' being 'p1' in the exact order you are requiring???

```
long otable[256]; addPrim(&otable[65],prim);
```

Note: the only difference between an OT slot and an actual Primitive is that the LEN portion of the OT slot's tag is set to zero...

unless I'm mistaken about how the ordering table works, if you traverse the table you should get a mixture of actual primitive (len!=0) and slot nodes (len==0)

```
ot=p0 p=p1
```

```
addPrim() is your man!
```

```
#define AddPrimAfter addPrim
```

```
(pci)
```

```
-----
```

```
>Look at these one more time and tell me if you see anything similar :) >> // Excerpt from  
LIBGPU.H >#define addPrim(ot,p) setaddr(p,getaddr(ot)), setaddr(ot,p) >> /** Macro for  
inserting a primitive in an OT list **/ >#include <libgpu.h> /* Necessary to have getaddr and  
setaddr definitions */ >#define AddPrimAfter(p0,p1) setaddr(p1,getaddr(p0)),setaddr(p0,p1) >  
>(pci)
```

The difference is the order of the arguments. AddPrim could be used for AddPrimAfter, but the arguments would have to be reversed. Besides, it's much more convenient to separate AddPrim, which takes a prim and an OT, from AddPrimAfter, which takes two prims as arguments.

Silas Warner

---

10/30/95 4:08 PM

Re(2): what is the matrix cache?

Blake E. Senftner

Angus

Documentation

Inside libgs.h for lib3.2, there is a variable "PSDCNT" made available to us, that has the comment "frame counter for using matrix cache."

Maybe a better question would be asking what they mean there...

-Blake

---

10/30/95 8:40 PM

Re(5): RE: AddPrimAfter?

William Botti

LIBGPU

Hey Silas give it up. Paul is right. WB

P.S. Boy, do I have time on my hands...

---

10/30/95 10:05 AM

Re: what is the matrix cache?

Angus

Blake E. Senftner

Documentation

Where is a matrix cache referred to? There is no matrix cache. The closest thing is the registers on the gte coprocessor. But they're just registers. I guess that can be considered a cache.

ANgus

---

10/30/95 11:52 AM

Re: Generic Vector Math

Angus

David B. Brickhill

LIBGTE

What functions explicitly do you want for inner products? I'll can tell you if it is possible.

ANgus

---

10/31/95 12:33 PM

Re(3): what is the matrix cache?

Angus

Blake E. Senftner

Documentation

PSDCNT is incremented everytime in GsSwapDispBuffer. Thus, it is a frame counter. PSDCNT is then used in GsGetLw in comparison to the GsCOORDINATE2.flg field. The cache is a software cache not a hardware cache.

Angus

---

11/2/95 9:43 AM

Reset PSX/GPU ?? (help!)

david eader

LIBGPU

I have a bug thats killing me...

The first time I run my program, everything works fine.

The next time, and all subsequent times, my textures are darkened.

Its as if the gpu maintains some internal state, regardless of resetpsx, etc..

The only fix seems to be to recompile a certain module that deals with packet initialization.

Then, again, it runs properly only the first time...

Could this be the notorious code-cache-needs-to-be-flushed bug that I vaguely recall reading months ago?

Urrggghh, I cant help but say that it SUCKS to make hardware that cant be INITIAIALIZED to a WELL-DEFINED STATE !!!!!

(apologies, i'm really really frustrated...)

Anyone know any tricks for TOTALLY resetting the PSX ??? Or have a clue as to this kind of bug ???

Thanks in advance, deader

---

11/3/95 12:10 PM  
PushMatrix  
Karen Paik  
LIBGTE

I was wondering if it would be better to use PushMatrix and PopMatrix or pass them as parameters. When is the memory for PushMatrix and PopMatrix allocated? Is the memory going to waste if I don't use Push and Pop? Are push and pop faster than accessing variables on the stack? (Accessing variables on the stack has been faster than accessing global variables in my recursive function.)

---

11/3/95 4:17 PM  
  
Borden Covell II  
LIBGPU

We were trying to use OpenTMD and ReadTMD after we called GsMapModelingData but it appears that ReadTMD ignores the flag in the header of the TMD that indicates that the data is absolute rather than relative. Are we missing something or do we need to write our own ReadTMD type of routine that operates on absolute pointers in the TMD data?  
Thanks...

---

11/3/95 8:52 AM  
Clipping and Poly Subdivision  
David W. Marshall  
LIBGPU

What is the correct way to check if a polygon needs to be subdivided?  
We are using RotAverageNClip3() to render the model. We check the OTZ, ClipVal, and Flag values that are returned. We are finding that some polys that pass all these checks and get added to the OT table are then thrown out by the GPU and not rendered.  
What other information needs to be checked? Why is the GPU not rendering some of these polygons? Is anyone trying to use the library calls to do subdivision?  
thanks,  
dave

---

11/6/95 1:26 PM  
Re(2): Clipping and Poly Subdivision  
David W. Marshall  
Angus  
LIBGPU

In the formula it says, >>> (..... || abs(x) < 1023 || abs(y) < 1023 ....) >>> { >>> polygon is fully clipped >>> }  
Shouldn't it be abs(x) > 1023 for the poly to be fully clipped. Shouldn't it also be abs(y) > 511?????  
If the x value is less than 1023, then don't you want the polygon drawn?  
thanks,

dave

---

11/6/95 11:47 AM

Re: Clipping and Poly Subdivision

Angus  
LIBGPU

> Subject: [tech-support 66] GPU polygon clipping > > Dear Kaol, > > Perhaps you can help me with this GPU question. > > [GPU] > > - Can you tell me the exact conditions in which a polygon clipped by > the GPU will not be displayed at all? > > - How does the GPU decide when to not draw a polygon? > > Thank you for your help. > > Allan.

Condition in which a polygon will not be displayed at all: (x,y) ----- | | |  
Drawing | | Polygon | h | | | | ----- w  
if (w > 1023 || h >= 511 || abs(x) < 1023 || abs(y) < 1023 || abs(x)+w < 1023 || abs(y)+h < 1023) { polygon is fully clipped; }

---

11/6/95 2:29 PM

Re(2): Clipping and Poly Subdivision

David W. Marshall

Angus  
LIBGPU

The GPU must be doing something else. Adding this code does not seem to catch the triangle polys that the GPU is throwing out. It also seems that RotAverageNClip30 never returns a X value greater than 1023 anyway. Using the demo in ...\\divide\\clip\\tuto0.c (modified to do triangles and not quads) and printing out the X/Y values from each poly returning from RotAverageNClip30, the X and Y values never get bigger than 1023. This would explain why adding the code did nothing.

In the tuto0 demo we have a triangle that the GPU drops and does not render. The following is the info returned from RotAverageNClip30:

Flag = 0 NClip = 197980 Otz = 1809 X0,Y0 = -8, 67 X1,Y1 = 499,257 X2,Y2 = -543,257

All values seem to be in the proper range. What's going on with the GPU? Why is this poly being dropped? Does SCE have any more information on this and what the GPU rendering code is actually checking?

thanks,  
dave

---

11/6/95 5:16 PM

Re: Reset PSX/GPU ?? (help!)

FLORIA L. ROSS

LIBGPU

3DS Beta 1.0

Hmm maybe you are not using DrawSync() at the right places?

-TK

---

11/7/95 6:13 AM

Re(3): Clipping and Poly Subdivision

Sam Black

LIBGPU

> The following is the info returned from RotAverageNClip30: > > Flag = 0 > NClip = 197980 > Otx = 1809 > X0,Y0 = -8, 67 > X1,Y1 = 499,257 > X2,Y2 = -543,257

The problem is that the width of your polygon is > 1023:  $x1 - x2 = 499 + 543 = 1042$ . The GPU will not draw any polygon which is wider than 1023 or taller than 511.

The only real problem I have with this restriction is that failure of this condition is not reported by the GTE, so you're responsible for the check yourself. Sony, is there any chance of getting the GTE to do this check?

---

11/7/95 6:59 AM

Reversing libgte transformations.

Pat Quinn

LIBGTE

We are searching for a method to reverse the transformations used in a 'RotTransPers' call. So given the screen coords (Sx, Sy) and the depth at which that pixel is considered to be at, Wz, we would like to determine what the world coords are (Wx, Wy, Wz).

Are there any functions to do this as of yet? Will there ever be any functions to do this? If not, does anyone know how to carry out this process (of reversing libgte's transformations from world coords to screen coords)?

Appreciate the help,

Gordon Read NuFX, Inc.

---

11/9/95 5:21 AM

3D Clipping

Yoram Berkowicz

LIBGS

Hello,

I frequently run into 3D clipping problems when using LIBGS. The NEAR CLIP value is always set to half the PROJECTION distance. Any attempt to change this value by calling GsSetNearClip renders no result. It seems that LIBGS insists on using the same value and ignores calls to GsSetNearClip.

If anyone has an insight on how to change the NEAR CLIP value used by LIBGS this would be most helpful. Any advice about how to avoid the problem would also be welcomed.

Thanks, Yoram.

---

11/10/95 2:25 PM

Re: Reversing libgte transformations.

Paul C. Isaac

Pat Quinn

LIBGTE

you're asking for something that isn't completely possible

the projection math is roughly:

$Sx = Center.X + Scale * Wx/Wz$   $Sy = Center.Y - Scale * Wy/Wz$

Center.X, Center.Y, and Scale are constants you can determine

but you have to know the 'Wz' for to reverse project... otherwise there is a pyramid of possible solutions... ie. there is not a direct 1:1 mapping from screen to world space

photographer use this principle in trick photography: you can't visually tell the difference between a tiny man who is very close and a giant man who is very far...

(pci)

---

11/10/95 12:12 PM

formal enhancement request

Blake E. Senftner

LIBGTE

Kristine Severson

I'd like to formally request an enhancement to all the routines that place rendering primitives into ordering tables. Specifically the routines like RotRMD\_XXX, RotRMD\_SV\_XXX and RotPMD\_XXX are the ones I'd like to see modified.

Note that I'm requesting a TRANSPARENT modification that will not affect anyone's current usage of these routines, only add new capability.

All the specified routines use the following logic to place a rendering primitive into an ordering table:

```
orderingTableHashLocation = primitiveZLocation >> (14 - orderingTableBitLength) if
(orderingTableHashLocation < 0 || orderingTableHashLocation >= (1 <<
orderingTableBitLength)) { clip this primitive } else { place primitive into ordering table }
```

The enhancement that I would like is the ability to specify my own hashing function. If a callback function could be specified that performs this logic, then only those people that want to specify their own hash function would have their use of the GTE library affected.

Additionally, if that hash function were in charge of placing the primitive into the ordering table itself, then I'd be able to catch primitives comming "out the back door" of these routines and perform some special processing that I have in mind.

Is this enhancement possible? Probable? No way possible with current schedules? Any information about this I would be happy to receive.

Thanks. -Blake

---

11/12/95 8:18 PM

Re: formal enhancement request

Silas S. Warner

LIBGTE

I would like to second this request. And I would especially like it if it would also intercept the ROT\_ calls done during GS library functions as well as the raw calls.

Silas Warner

---

11/16/95 7:07 AM

Re(2): Reversing libgte transformations.

Pat Quinn

Paul C. Isaac

LIBGTE

Paul Isaac,

Thank you for responding to my mail on reversing the world to screen transformation.

Fortunately, we have a known Wz. It's Wz = 0. Unfortunately, we find that Wx = 0 and Wy = 0 for all values of (Sx, Sy) when trying to reverse the following math projection :

$$Sx = \text{Center.X} + \text{Scale} * Wx / Wz \quad Sy = \text{Center.Y} + \text{Scale} * Wy / Wz.$$

I would guess that some how the distance to the projection plane has to be factored in. Do you have any thoughts on how to get around this dilemma?

Thanks for your time,



Gordon Read NuFX, Inc.

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11/16/95 11:59 AM  
isbg flag in the DRAWENV  
stephen chaplin  
LIBGPU

Hello all, I have a problem with the isbg flag in my DRAWENV. Whenever I set isbg to 0, I keep on getting garbage displayed on my screen (a vertical test pattern). I need to shut off isbg as I need to keep the contents of the back buffer (it's for a menu system). I have been developing with isbg set to 1 until this point, and I can't seem to find any examples that use isbg = 0. Thanks for the help, Romesh Celeris Inc.

---

11/17/95 10:38 AM  
RotTrans Question  
Paul Masters  
LIBGTE

I've got a point SVECTOR point; which is defined to be point = {0,0,300};  
I've got a rotation vector SVECTOR rotation; which I am changing at a constant rate in a continuous loop rotation.vy += 100;  
I'm building a matrix based on this rotation matrix m; RotMatrix (&rotation, &m);  
I establish the rottrans matrix SetRotMatrix (&m); SetTransMatrix (&m);  
And apply this to point RotTrans (&point, &temp\_vector, &flag);  
After this, the value of temp\_vector is always {0,0,300} If I give values in x or y, a rotation occurs, but z is ignored.  
Why is this happening?  
Paul Masters American Laser Games

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11/17/95 9:06 PM  
Re(3): Reversing libgte transformations.  
Paul C. Isaac  
Pat Quinn  
LIBGTE

You may have noticed that it is impossible to calculate Sx,Sy when Wz == 0...  
Sx = Center.X + Scale \* Wx / Wz Sy = Center.Y + Scale \* Wy / Wz.  
Wx/0 is undefined... often when performing projection math like this you have to test for Wz getting too small or Sx,Sy will overflow your number range... you need to catch these cases before trying to calculate them and clip the points  
(pci)

---

11/17/95 12:06 AM  
Re: isbg flag in the DRAWENV  
Dan Burnash  
LIBGPU  
stephen chaplin

You can do one of the following:  
1. Start out with the isbg flag set to 1, so that the test pattern gets cleared, then reset it to 0.

2. Fill the whole screen with a background color using something like:

```
setRECT(&screen_rect, db_ptr->draw.clip.x, db_ptr->draw.clip.y, db_ptr->draw.clip.w,
db_ptr->draw.clip.h); ClearImage(&screen_rect, r0, b0, g0); DrawSync(0); /* wait for
drawing to complete */ draw_screen(); /* swap display and draw buffers */
setRECT(&screen_rect, db_ptr->draw.clip.x, db_ptr->draw.clip.y, db_ptr->draw.clip.w, db_ptr-
>draw.clip.h); ClearImage(&screen_rect, r0, b0, g0); DrawSync(0); /* wait for
drawing to complete */ draw_screen(); /* swap display and draw buffers */
this will clear both of the double buffers to the same color, then you can stop clearing the
background and overwrite only the part of the screen that you want.
```

Dan Burnash

---

11/21/95 2:40 PM

new functions in lib 3.2 and 3.3

Sam Black

LIBGTE

I'm interested in finding documentation on the new functions which have been introduced in library versions 3.2 and 3.3. I'm most interested in the promisingly named `pers_map` function, which in the update document is described as doing perspective correct texture mapping. It is obviously too good to be true, but I would like to learn more about this function, as well as the other new functions introduced in those libraries.

---

11/27/95 3:03 PM

Re: RotTrans Question

Thomas Boyd

LIBGTE

Have you checked out TUTO7.C in the graphics samples? I use it all the time and find it to work fine with Z. Dan says you answered this question yourself while I was out last week, so let me know if you want more. T

---

11/28/95 3:59 PM

GsSetRefView2...what matrix?

Silas S. Warner

LIBGS

Is `GsLSMATRIX` the matrix set by `GsSetRefView2`? If so, can I modify this matrix directly, changing the view as necessary?

I need to use `RotTransPers` to transform some 32-bit vectors. They will be within 32767 of my viewpoint (or I can check to make sure they are) but `RotTransPers` persists in adding the 32-bit values of the T part of the ViewMatrix. If I just chop off the upper 16 bits of the T, then replace the view matrix, what I want to do will work.

Can I do this by grabbing `GsLSMATRIX`, chopping the T values, then replacing it... and restoring `GsLSMATRIX` after I've done with it?

Silas Warner

---

11/28/95 8:54 AM

Re(3): Formal enhancement request

Thomas Boyd

LIBGTE

Blake E. Senftner

Blake et. al., Here's your response from SCEI on hashing request. Tom -----

Dear Tom and tech-supporters,

I will forward the answer from Mr.Oka for the question '[tech-support 235] request from a developer'.

Best regards,

Makoto TANAKA Sony Computer Entertainment Inc. R&D division

----- Forwarded message

> Hi, > > I have received the following request from Blake Senftner (game = "Eggs of > Steel").

He wants to know if it is possible to add the following functionality > to the libraries. > > Is it possible to add the hashing functionality he is requesting? > > Let me know if you need more

information from him. > > Thank you, > > Tom Boyd > ----- > Dear Sirs, > >

I'd like to formally request an enhancement to all the routines that place > rendering primitives > into ordering tables. Specifically the routines like RotRMD\_XXX, RotRMD\_SV\_XXX > > and

RotPMD\_XXX > are the ones I'd like to see modified. > > Note that I'm requesting a

TRANSPARENT modification that will not affect > anyone's current usage > of these routines,

only add new capability. > > All the specified routines use the following logic to place a

rendering > primitive into an ordering table: > > orderingTableHashLocation =

primitiveZLocation >> (14 - orderingTableBitLength) > if (orderingTableHashLocation < 0 ||

orderingTableHashLocation >= (1 << > orderingTableBitLength)) > { clip this primitive } > else

> { place primitive into ordering table } > > The enhancement that I would like is the ability to

specify my own hashing > function. If a callback > function could be specified that performs

this logic, then only those people

> that want to specify > their own hash function would have their use of the GTE library

affected. > > Additionally, if that hash function were in charge of placing the primitive > into

the ordering table itself, > then I'd be able to catch primitives coming "out the back door" of

these > routines and perform some > special processing that I have in mind. > > Is this

enhancement possible? Probable? No way possible with current schedules? > > Any

information > about this I would be happy to receive. > > Thanks. > -Blake >

Your request's modification of libGTE functions is possible. But, it will affect the function's

speed for current usage. Because we need for modification 1.some additional

arguments(flag&function address) 2.some conditional jump(for current usage) 3.some

save&load temporary registers 1. has little affection because it is out of LOOP, but 2.&3. have big

because they are in LOOP(about 5% down). And, it is not efficient to call function from inside

libGTE functions, because it may cause instruction cache miss.

We will rewrite the PMD functions by DMPSX and release their source codes as sample

programs. We recommend you to write your original functions including your original hash

function using the samples. It will be faster and easier.

The following is DMPSX version of PMD functions.

```
/* ** test program for inline RotPMD ** Copyright (C) 1993/1994/1995 by Sony Corporation * All rights Reserved */ #include <sys/types.h> #include <libetc.h> #include <libgte.h> #include <libgpu.h> #include <libgpc.h> #include <inline.h> #include <gtemac.h>
```

```
#define SCR_Z (1000) /* screen depth (h) */ #define OTLEN 8 #define OTSIZE (1<<OTLEN) /* ordering table size */
```

```
#define RECTH 25 #define RECTV 20 #define RECTD 16 #define PIH 640 #define PIV 240 #define OFX (PIH/2) /* screen offset X */ #define OFY (PIV/2) /* screen offset Y */
```

```
#define BGR 60 /* BG color R */ #define BGG 120 /* BG color G */ #define BGB 120 /* BG color B */
```

```
typedef struct { POLY_F3 surf[2]; SVECTOR v0,v1,v2; } PBUF; typedef struct { int n; PBUF pb[RECTD][RECTV][RECTH]; } PMD_OBJ; typedef struct { DRAWENV draw; /* drawing environment */ DISPENV disp; /* display
```

```

environment /* u_long ot[OTSIZE]; /* ordering table */ BLK_FILL bg; /* background */ }
DB;
typedef struct{ long flg; long opz; long otz; } WORK;
static int SELECT=0;
main() { PMD_OBJ obj; DB db[2]; /* packet double buffer */ DB *cdb; /* current db */
int i,j,k; long ret; long id; int c; obj.n= RECTD*RECTV*RECTH;
PadInit(0); /* reset graphic environment */ ResetGraph(0); /* reset graphic subsystem
(0:cold,1:warm) */ SetGraphDebug(0); /* set debug mode (0:off, 1:monitor, 2:dump) */
InitGeom(); /* initialize geometry subsystem */ SetGeomOffset(OFX, OFY); /* set geometry
origin as (160, 120) */ SetGeomScreen(SCR_Z); /* distance to viewing-screen */
/*interlace mode*/ SetDefDrawEnv(&db[0].draw, 0, 0, PIH, PIV);
SetDefDrawEnv(&db[1].draw, 0, PIV, PIH, PIV); SetDefDispEnv(&db[0].disp, 0, PIV, PIH,
PIV); SetDefDispEnv(&db[1].disp, 0, 0, PIH, PIV);
FntLoad(960,256); SetDumpFnt(FntOpen(64, 64, 256, 200, 0, 512));
init_bg(&db[0]); init_bg(&db[1]); init_prim(obj.pb); /* set primitive parameters */
SetDispMask(1); /* enable to display (0:inhibit, 1:enable) */
GsInitVcount();
ret=0; while (pad_read() == 0) { cdb = (cdb==db)? db+1: db; /* swap double buffer ID */
ClearOTagR(cdb->ot, OTSIZE); /* clear ordering table */
GsClearVcount();
if(SELECT==0) RotPMD_F3((long*)&obj,(u_long*)cdb->ot,OTLEN,(cdb==db),0);
if(SELECT==1) gte_RotPMD_F3((long*)&obj,(u_long*)cdb->ot,OTLEN,(cdb==db),0);
if(SELECT==2) gte_RotRMD_F3((long*)&obj,(u_long*)cdb->ot,OTLEN,(cdb==db));
if(SELECT==3) gte_RotSMD_F3((long*)&obj,(u_long*)cdb->ot,OTLEN,(cdb==db)); /*
RotSMD_F3((long*)&obj, (u_long*)cdb->ot,OTLEN,(cdb==db),0,0,0,1);
RotRMD_F3((long*)&obj, (u_long*)cdb->ot,OTLEN,(cdb==db),0,0,0,1); */
c=GsWithVcount();
/* swap buffer */ DrawSync(0); /* wait for end of drawing */
if(SELECT==0)FntPrint("RotPMD_F3\n"); if(SELECT==1)FntPrint("gte_RotPMD_F3\n");
if(SELECT==2)FntPrint("gte_RotRMD_F3\n"); if(SELECT==3)FntPrint("gte_RotSMD_F3\n");
FntPrint("c=%d\n",c);
VSync(0); /* wait for the next V-BLNK */ PutDrawEnv(&cdb->draw); /* update drawing
environment */ PutDispEnv(&cdb->disp); /* update display environment */
DrawOTag(cdb->ot+OTSIZE-1); /* draw */ FntFlush(-1); } PadStop(); return; }
static pad_read() { MATRIX rottrans; /* rot-trans matrix, light matrix */ static SVECTOR ang
= { 0, 0, 0 }; /* rotate angle */ static VECTOR vec = { 0, 0, 10*SCR_Z }; /* rottranslate vector */
static VECTOR sca={4096,2048,4096};
int ret = 0;
u_long padd = PadRead(0);
/* rotate light source and cube */ if (padd & PADRup) ang.vz += 32; if (padd & PADRdown)
ang.vz -= 32; if (padd & PADRleft) ang.vy += 32; if (padd & PADRright) ang.vy -= 32; if
(padd & PADm) ang.vx += 32; if (padd & PADO) ang.vx -= 32;
/* change distance */ if (padd & PADl) vec.vz += 32; if (padd & PADn) vec.vz -= 32;
if (padd & PADLup) SELECT=1; if (padd & PADLdown) SELECT=0; if (padd & PADLright)
SELECT=2; if (padd & PADLleft) SELECT=3;
if (padd & PADk) ret = -1;
RotMatrix(&ang, &rottrans); /* make rot-trans matrix */ ScaleMatrixL(&rottrans,&sca); /*
set matrix */ TransMatrix(&rottrans, &vec); SetRotMatrix(&rottrans);
SetTransMatrix(&rottrans);
return(ret); }
/* * initialize primitive parameters */ init_bg(db) DB *db; { db->draw.isbg = 1;
setRGB0(&db->draw, BGR, BGG, BGB);
}
static init_prim(pb) PBUF pb[RECTD][RECTV][RECTH]; { int i,j,k;
for(k=0;k<RECTD;k++){ for(j=0;j<RECTV;j++){ for(i=0;i<RECTH;i++){

```

```

SetPolyF3(&pb[k][j][i].surf[0]); SetPolyF3(&pb[k][j][i].surf[1]);
  setRGB0(&pb[k][j][i].surf[0],10*i,10*j,10*k); setRGB0(&pb[k][j][i].surf[1],10*i,10*j,10*k);
  pb[k][j][i].v0.vx= -150*12+ 150*i;          pb[k][j][i].v0.vy= -150*10+ 150*j;
pb[k][j][i].v0.vz= -150*4+ 150*k;
  pb[k][j][i].v1.vx= -150*12+ 150*i +100;          pb[k][j][i].v1.vy= -150*10+
150*j;          pb[k][j][i].v1.vz= -150*4+ 150*k;
  pb[k][j][i].v2.vx= -150*12+ 150*i;          pb[k][j][i].v2.vy= -150*10+ 150*j
+100;          pb[k][j][i].v2.vz= -150*4+ 150*k; } } }
gte_RotPMD_F3(pa,ot,otlen,id,backc) long *pa; /*header address of PRIMITIVE Gp*/ u_long
*ot; /*header address of OT*/ int otlen; /*OT bit length*/ int id; /*double buffer ID*/ int
backc; /*backface clip ON/OFF flag(0=ON)*/ { int pn; int backcc; long *pc; long *pd; long
*pe; int otsft; u_long padrs; u_long *ott;
WORK *SCw;
SCw= (WORK*)getScratchAddr(100);
backcc= backc; pn= *pa; pc= pa+1; pe= pc+5*2; otsft= 14-otlen;
gte_ldv3c(pe); while(pn>0){ gte_rtpt(); pn--; /*parallel process*/ if(id!=0) pd= pc+ 5;
/**/ else pd= pc; /**/ pc += 5*2+6; /**/ pe += 5*2+6; /**/ gte_stflg(&SCw->flg);
gte_ldv3c(pe); /*faster than before gte_rtpt*/
if((SCw->flg&0x00060000)!=0) continue;
gte_nclip(); if(backcc==0){ /*parallel process*/ gte_stopz(&SCw->opz); if(SCw-
>opz<=0) continue; }
gte_stsxy3_f3(pd); gte_avsz3(); padrs= (u_long)pd&0xfffff; /*parallel process*/
gte_stotz(&SCw->otz); ott= ot+(SCw->otz>>otsft);
*((u_long*)padrs)= *ott | 0x04000000; *ott= padrs; } }
gte_RotRMD_F3(pa,ot,otlen,id) long *pa; /*header address of PRIMITIVE Gp*/ u_long *ot;
/*header address of OT*/ int otlen; /*OT bit length*/ int id; /*double buffer ID*/ { int pn;
long *pc; long *pd; long *pe; int otsft; u_long padrs; u_long *ott;
WORK *SCw;
SCw= (WORK*)getScratchAddr(100);
pn= *pa; pc= pa+1; pe= pc+5*2; otsft= 14-otlen;
gte_ldv3c(pe); while(pn>0){ gte_rtpt(); pn--; if(id!=0) pd= pc+ 5; else pd= pc; pc += 5*2+6;
pe += 5*2+6; gte_stflg(&SCw->flg);
gte_ldv3c(pe);
if((SCw->flg&0x00060000)!=0) continue;
gte_stsxy3_f3(pd); gte_avsz3(); padrs= (u_long)pd&0xfffff; gte_stotz(&SCw->otz); ott=
ot+(SCw->otz>>otsft);
*((u_long*)padrs)= *ott | 0x04000000; *ott= padrs; } }
gte_RotSMD_F3(pa,ot,otlen,id) long *pa; /*header address of PRIMITIVE Gp*/ u_long *ot;
/*header address of OT*/ int otlen; /*OT bit length*/ int id; /*double buffer ID*/ { int pn;
long *pc; long *pd; long *pe; int otsft; u_long padrs; u_long *ott;
WORK *SCw;
SCw= (WORK*)getScratchAddr(100);
pn= *pa; pc= pa+1; pe= pc+5*2; otsft= 14-otlen;
gte_ldv3c(pe); while(pn>0){ gte_rtpt(); pn--; if(id!=0) pd= pc+ 5; else pd= pc; pc += 5*2+6;
pe += 5*2+6; gte_stflg(&SCw->flg);
gte_ldv3c(pe);
if((SCw->flg&0x00060000)!=0) continue;
gte_nclip(); gte_stopz(&SCw->opz); if(SCw->opz<=0) continue;
gte_stsxy3_f3(pd); gte_avsz3(); padrs= (u_long)pd&0xfffff; gte_stotz(&SCw->otz); ott=
ot+(SCw->otz>>otsft);
*((u_long*)padrs)= *ott | 0x04000000; *ott= padrs; } }
----- End of forwarded message

```

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12/7/95 3:34 PM

LoadImage/StoreImage limitations

Carl Ferreira

LIBGTE

Thomas Boyd

I noticed that when I tried to do a LoadImage and StoreImage on very large rectangles, the following happens:

1) I seem to get a HUGE delay (around 2 seconds). 2) I seem to get garbage.

This occurs when I use StoreImage / LoadImage to save and restore the following rects in VRAM (one or both may have problems):

```
setRECT(&rect,640,0,1024-640,480); setRECT(&rect,640,0,1023-640,480);
```

```
setRECT(&rect,0,480,1024,1024-480); setRECT(&rect,0,480,1023,1023-480);
```

When I break the screen down into 128 x 128 chunks there is no problem with saving and restoring.

Any ideas?

Carl

P.S. I am using a coin-op station which has 2 Meg of VRAM.

---

12/7/95 7:40 PM

Light Source Shading

Chris E. Reese

LIBGS

Is there a way I can selectively turn off light source shading for certain objects, specifically TMD data? I have objects that are texture mapped that lose a lot of their color and become muddy looking due to the light source shading. I want those objects to display at their full brightness level. Anyone have any suggestions?

Chris Reese Eidetic, Inc.

---

12/8/95 8:45 AM

Re: GsSetRefView2...what matrix?

Thomas Boyd

Silas S. Warner

LIBGS

Yes, let me know if this does not work. Tom -----

Is GsLSMATRIX the matrix set by GsSetRefView2? If so, can I modify this matrix directly, changing the view as necessary?

I need to use RotTransPers to transform some 32-bit vectors. They will be within 32767 of my viewpoint (or I can check to make sure they are) but RotTransPers persists in adding the 32-bit values of the T part of the ViewMatrix. If I just chop off the upper 16 bits of the T, then replace the view matrix, what I want to do will work.

Can I do this by grabbing GsLSMATRIX, chopping the T values, then replacing it... and restoring GsLSMATRIX after I've done with it?

Silas Warner

---

12/8/95 1:43 PM

ResetGraph() and PadInit() print stuff

Mike Benna

LIBGPU

I notice that ResetGraph() and PadInit() both print stuff to the debugger's message window (e.g. "ResetGraph:jtb=80029a2c,env=80029a74").

Is this permissible in a production master or can it be disabled somehow? I've been disabling it by calling close(1) before these calls but I'm also not sure how safe (or legal) that is.

---

12/8/95 12:50 PM

Re: Light Source Shading

Jay Stelly

LIBGPU

>Is there a way I can selectively turn off light source shading for certain >objects, specifically TMD data? I have objects that are texture mapped >that lose a lot of their color and become muddy looking due to the light >source shading. I want those objects to display at their full brightness >level. Anyone have any suggestions? >Chris Reese >Eidetic, Inc.

Hey Chris,

If you're using LIBGS I think there's a bit for that in each TMD packet. If you're using GsDOBJ5's I think you'll have to set it before you generate the packets, or go back and manually set the lighting in each packet to 0x80,0x80,0x80. I haven't used GS in a while, but I think that's how I dealt with it then.

You don't have to use LIBGS to render TMDs though. Building your own object structures gives you greater control in these areas and usually greater performance. You can still call the core LIBGS code if you need to via GsTMD...() and GsPrst...() calls and many of these calls will allow you to do the lighting separately or not at all.

Jay Stelly Tetragon

---

12/8/95 3:59 PM

Re: Light Source Shading

Blake E. Senftner

LIBGPU

If you want to use TMDs, but not with shading... why not just go with PMDs? They ARE TMDs with no shading- and faster to boot.

-Blake

---

12/11/95 9:32 AM

Re: LoadImage/StoreImage limitations

Thomas Boyd

LIBGTE

Carl Ferreira

hmmm, I am looking at it today. The huge delay and accompanying garbage do not sound like a planned feature. T

---

12/12/95 10:22 AM

Re: ResetGraph() and PadInit() print stuff

Thomas Boyd

LIBGPU

Mike Benna

Possible, but DON'T do it. Leave those printf's in  
Hypothetical situation here: Japan changes something in a possible future rev of the hardware  
which should not affect anything. It does It affects your game. You want to know where You  
will need the printf's for us to figure out where.  
This should never happen, but... it has.

Tom

----- I notice that ResetGraph() and PadInit() both print stuff to  
the debugger's message window (e.g. "ResetGraph:jtb=80029a2c,env=80029a74").  
Is this permissible in a production master or can it be disabled somehow? I've been disabling it  
by calling close(1) before these calls but I'm also not sure how safe (or legal) that is.

---

12/14/95 7:17 PM  
LoadImage() bug?  
Dan Chang  
LIBGPU

I just spent 2.5 hours tracking down this one, so I hope it saves someone else some time.  
LoadImage() seems to fail if you call it with x = 320, y = 0, w = 360, and h = 512. The last row is  
not DMA'ed properly.  
If you break it up into two separate LoadImage() calls like this:  
x = 320, y = 0, w = 360, h = 256 and x = 320, y = 256, w = 360, h = 256  
then it works.  
Dan

---

12/15/95 1:49 PM  
Re: LoadImage() bug?  
Carl Ferreira  
LIBGPU

HEY SONY!!!!  
Is anyone out there listening? This problem has been reported several times, so could you  
PLEASE let us know what LoadImage and StoreImage limitations are? Huh?  
Thanks,  
Carl Ferreira

=====  
I just spent 2.5 hours tracking down this one, so I hope it saves someone else some time.  
LoadImage() seems to fail if you call it with x = 320, y = 0, w = 360, and h = 512. The last row is  
not DMA'ed properly.  
If you break it up into two separate LoadImage() calls like this:  
x = 320, y = 0, w = 360, h = 256 and x = 320, y = 256, w = 360, h = 256  
then it works.  
Dan

---

12/15/95 7:43 AM  
Fwd: Re(2): Dual sided polygons  
Tim Crossman  
LIBGTE

This is not sounding too promising. Do we or do we not have this documented feature? I'm sure  
someone has run into this before, unless it is a recently introduced bug in the latest library



revision. I'm sorry to press, but I have to do something about my lampshades, and doubling the poly count on them is my least favorite solution. Tim

---

12/19/95 5:29 PM  
getTPage() vs. GetTPage()  
Dan Chang  
LIBGPU

Hello,  
Is it permissible to use the getTPage() (little 'g') macro found in <libgpu.h>? It runs a bit faster. If so, could you please add the prototype for GetGraphType() to one of the header files so that the compiler doesn't complain about a missing function prototype. Thanks, Dan Chang Boss Game Studios

---

12/19/95 3:58 PM  
gpu timeout  
Mark Slemko  
LIBGPU

I'm having trouble tracking down a bug that causes the gpu to timeout and I was hoping I could get some clues from the error message the GPU sends. I don't understand the message:  
GPU timeout: que=9, stat=40020005, chcr=01000401, madr=000df160,  
func=(00080ef0)(801dd520,00000000)  
there are many messages of the same type that follow the first one, and it seems that once it starts, it's broke until reset. !?!?  
-Mark

---

12/20/95 11:07 AM  
Re: getTPage() vs. GetTPage()  
Thomas Boyd  
LIBGPU

Go for it. As for adding the prototype, it may happen in the future.  
Tom ----- Hello,  
Is it permissible to use the getTPage() (little 'g') macro found in <libgpu.h>? It runs a bit faster. If so, could you please add the prototype for GetGraphType() to one of the header files so that the compiler doesn't complain about a missing function prototype. Thanks, Dan Chang Boss Game Studios

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12/20/95 1:36 PM  
DR\_MOVE  
Jay Stelly  
LIBGPU

I noticed the addition of the DR\_MOVE primitive in the latest library release. Recently, I came upon the need for some functionality like this, but what I really want is a LoadImage() type primitive. Is LoadImage handled the same way? or does it require some special GPU handling? If it could work that way, I'd really like to see a DR\_LOAD type primitive sometime in the future as it would allow several effects to be achieved that currently require too much VRAM.

---

12/20/95 2:18 PM

Re: Fwd: Re(2): Dual sided polygons

Mark Slemko

Tim Crossman

LIBGTE

I have tested this before in lib 2.6 and earlier... Two sided poly's were not possible.

---

12/28/95 3:47 PM

Re: gpu timeout

player 1

LIBGPU

I just got this bug while working on some code, and it was because I was overwriting memory that wasn't mine. Sounds like you've got a hosed pointer somewhere...

Tom Ketola PSX Programmer Player 1, Inc.

---

1/2/96 4:46 PM

Re: Reversing libgte transfor

Jay Ryness

Pat Quinn

LIBGTE

Howdy--

To reverse the transformation with the distance to the projection plane figured in, do this...

$V_x = S_x * V_z / ProjDis;$   $V_y = S_y * V_z / ProjDis;$

Where  $V_x$  and  $V_y$  are in VIEW space and  $V_z$  is the depth of the point. After you have the location in view space, create a matrix to convert view space to world space (i.e. negate camera angles and translations).

-- Jay R., Semi Logic Entertainments

---

1/2/96 10:35 AM

Re(2): LoadImage() bug?

Thomas Boyd

LIBGPU

The 512 bug has been fixed in lib 3.4. It is in beta at Sony right now and will be out soon.

T

---

1/3/96 4:55 PM

texture cache question

Blake E. Senftner

LIBGPU

Tom Boyd

I was looking through some Sony notes on the texture cache, and I noticed that for 8-bit textures, the cache size is given as 64 by 32 8-bit pixels...

In my geometry conversions I've been using an 8-bit texture cache size of 32 by 64...

I know that these two dimensions are the same total size, but does the GPU know that?

Would a 32 by 64 8-bit texture require two texture cache loads to render?

-Blake

---

1/4/96 6:24 PM

Fwd: Re: texture cache question

Thomas Boyd

LIBGPU

It is 64 X 32, and the GPU knows, ie: a 32 X 64 8-bit texture would generate a TCache miss halfway through. T ----- I was looking through some Sony notes on the texture cache, and I noticed that for 8-bit textures, the cache size is given as 64 by 32 8-bit pixels...

In my geometry conversions I've been using an 8-bit texture cach size of 32 by 64...

I know that these two dimensions are the same total size, but does the GPU know that?

Would a 32 by 64 8-bit texture require two texture cache loads to render?

-Blake

---

1/4/96 10:56 AM

Re: DR\_MOVE

Angus

LIBGPU

Hi Jay,

Sorry for the delay. Anyway, LoadImage does have special processing. Basically, to load from main ram to vram, the GPU uses the texture cache as buffer. We're being economical here so the texture cache has 2 functions then: 1) texture cache 2) buffer for LoadImage. MoveImage is moving from VRAM to VRAM so there is no need to use the texture cache as a buffer. Therefore LoadImage will not be able to be put in an order table.

Angus

---

1/5/96 3:05 PM

Quadrangles

Jay Ryness

LIBGPU

Are quadrilateral polys ultimately handled as two triangles during rasterization? Would it be efficient to build models out of quads, or would we essentially be using twice as many polys?

Jay Ryness, Semi Logic Entertainments

---

1/8/96 10:22 AM

Re: Quadrangles

Angus

LIBGPU

GPU does draw triangles only. Quads are mapped to triangles. With quads, you only use 4 points for a polygon and need to only transform 4 points instead of 6 points for 2 triangles. However, the gte is optimized to process 3 points at a time anyway so running 3 points and then 1 point through the gte is about the same as run 2 sets of 3 points through the gte. It is really up to you what you want to do. I would suggest whatever you are comfortable with.

angus

---

1/8/96 6:10 PM  
UnApplyMatrix: feature request  
Silas S. Warner  
LIBGTE

I would like to be able to reverse the transformation of a vector through a matrix, done by ApplyMatrix. I can do this by creating an inverse matrix from the matrix that exists, but this is slow. It seems to be relatively simple to create an UnApplyMatrix by first passing the vector through the rotation matrix backwards, then translating it by the negative of the translation portion of the matrix.

Note that simply inverting the rotation matrix and negating the translation matrix will NOT create an inverse matrix. ApplyMatrix first translates and then rotates the vector: UnApplyMatrix would have to first rotate and then translate. In order to create an inverse matrix, you need to rotate the translation portion of the matrix by the rotation portion, THEN negate it. This is an extra matrix multiplication that I'd like to avoid.  
Is there any way that this feature can be added?

Silas Warner

---

1/9/96 2:59 PM  
ResetGraph(?)  
Mark D. Lyons  
LIBGPU

We are rebuilding some old code with the new libraries and have run into a change in the way ResetGraph() seems to be working. In the old version of our code using the pre 3.0 version of the libraries our main program did a ResetGraph(0), ran, and did a ResetGraph(3) before doing a LoadExec to run our next program. The next program then did a ResetGraph(1). This sequence would run the second program, leaving the display from the first program up. We didn't have documentation on the levels of ResetGraph() at the time, we just glommed together some sample code and it worked. It no longer works.  
What is the correct sequence to have one program load another without clearing out VRAM?

---

1/9/96 12:08 PM  
Re(3): Quadrangles  
Angus  
LIBGPU

It is really a preference in my opinion. I know other developers who use only triangles. My general point is choose your poison.  
angus

---

1/9/96 8:37 AM  
Re(2): Quadrangles  
Carl Ferreira  
LIBGPU

Ah -- if it were only that simple! Certainly from a mere transformation standpoint, processing 6 vertices using something like RotTransPers3 may be roughly equivalent to a single call to

RotTransPers4, but there is so much more (like setting up twice as many polygons for processing, processor overhead, shading, etc.) that it is significantly more efficient to create your models out of quads than triangles!

Carl Ferreira ===== GPU does draw triangles only. Quads are mapped to triangles. With quads, you only use 4 points for a polygon and need to only transform 4 points instead of 6 points for 2 triangles. However, the gte is optimized to process 3 points at a time anyway so running 3 points and then 1 point through the gte is about the same as run 2 sets of 3 points through the gte. It is really up to you what you want to do. I would suggest whatever you are comfortable with.

angus

---

1/9/96 4:59 PM

Re: ResetGraph(?)

Angus

LIBGPU

Whoa! You are right.

Well, ResetGraph(3) seems to be no longer supported. Only ResetGraph(0) and ResetGraph(1) are now supported.

There were 4 ResetGraphs in the past due to inefficient code. Basically, ResetGraph only needs 2 commands which are 0 and 1.

0 does the full hardware reset. It includes a VRAM clearing.

1 does just a command reset and an interrupt reset. Those are hardware resets. There is also a software reset of the command queue. No VRAM flush goes on.

The GPU code was restructured a lot mostly in regards to the software command queue and draw sync callback mechanism. Some residual code in the ResetGraph call was then taken out.

A ResetGraph(3) should do nothing, which may explain the problem. Call ResetCallback(1).

Angus

---

1/10/96 4:08 PM

Re: UnApplyMatrix: feature request

Thomas Boyd

LIBGTE

Silas S. Warner

>I would like to be able to reverse the transformation of a vector through a matrix, >done by ApplyMatrix. I can do this by creating an inverse matrix from the matrix >that exists, but this is slow.

>It seems to be relatively simple to create an UnApplyMatrix >by first passing the vector through the rotation matrix backwards, then translating >it by the negative of the translation portion of the matrix.

"Passing the vector through the rotation matrix backwards" = applying the inverse matrix, so the matrix still has to be inverted somehow. Your library request would then still have to invert the matrix in a manner very similar to what I am describing below.

The way I have done this is like this:

```
RotMatrix(v, M); // rotates Z, then Y, then X ... invM={{1, 0, 0},{0, 1, 0},{0, 0, 1}} // psuedo-code
= build the ID matrix RotMatrixX(-v[0], invM); // un-rotate X RotMatrixY(-v[1], invM); // un-rotate Y
RotMatrixZ(-v[2], invM); // un-rotate Z ... // now you have the inverse matrix. If you
wanna unsnarl some translation too, just apply your matrix to the T vector if you need.
```

Tom

---

1/10/96 10:05 AM  
Vertex projection  
Jay Ryness  
LIBGTE

Instead of projecting every poly's three vertices for EVERY poly, which ignores the fact that most vertices are shared, I was planning on projecting a vertex list and working out shared vertices later. PMD seems to support this fine. I learned recently that the GTE is optimized for working with three vertices at a time, which would explain the why the Strip/Round mesh thing is kind of a big deal. Being the lazy person that I am, I would like to ignore the Strip/Round mesh vertex order and pass the GTE arbitrary vertices in packets of three, which would obviously ruin any kind of backface removal. My question is, would it be feasible do the outer product calculation "manually" for every poly when I decide where its three vertices are, or do functions like RotAverageNclip3 and its brethren get GTE to do it much faster than I ever could manually. If I'm being completely stupid, I apologize. Thanks! JR, Semi Logic Entertainments

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1/10/96 4:31 PM  
Re(2): ResetGraph(?)  
Alex J. Garden  
LIBGPU

Aaahh... Did I see mention of ResetCallback? I have run into a situation where DrawSync(0) and DrawSync(1) produce the same results... NOTHING. DrawSync(#) seems to be doing nothing. I have heard that one must call ResetCallback (which I am doing). However, I am not passing any parameters to it. Has anyone else incountered these problems?  
Alex Garden@Radical Entertainment.

---

1/10/96 10:58 AM  
Re(2): ResetGraph(?)  
Mark D. Lyons  
LIBGPU

This doesn't seem to work.  
ResetGraph(1) doesn't seem to do as much as it used to. I used to be able to run a stand alone program with a ResetGraph(1) in the initialization and everything would work the same as a ResetGraph(0), except that VRAM wouldn't get cleared out. Now if I write a program that only does a ResetGraph(1), most of the drawing commands cause things to lock up. What I want to do is a full reset without the VRAM clear, something is getting skipped.

---

1/11/96 1:35 PM  
Re(5): ResetGraph(?)  
Angus  
Mark D. Lyons  
LIBGPU

I meant calling ResetCallback after ResetGraph(1). That is 1 difference I noticed.  
angus

---

1/11/96 12:53 PM  
Re(3): ResetGraph(?)  
Angus  
LIBGPU

I don't know. Try a ResetCallback. Meantime, I'll ask.  
angus

---

1/11/96 4:45 PM  
Re: Vertex projection  
Thomas Boyd  
LIBGTE

Jay Ryness  
OuterProduct call is the same thing that the GTE does. You could just use it manually.

T -----

-----  
Instead of projecting every poly's three vertices for EVERY poly, which ignores the fact that most vertices are shared, I was planning on projecting a vertex list and working out shared vertices later. PMD seems to support this fine. I learned recently that the GTE is optimized for working with three vertices at a time, which would explain the why the Strip/Round mesh thing is kind of a big deal. Being the lazy person that I am, I would like to ignore the Strip/Round mesh vertex order and pass the GTE arbitrary vertices in packets of three, which would obviously ruin any kind of backface removal. My question is, would it be feasible do the outer product calculation "manually" for every poly when I decide where its three vertices are, or do functions like RotAverageNclip3 and its brethren get GTE to do it much faster than I ever could manually. If I'm being completely stupid, I apologize. Thanks! JR, Semi Logic Entertainments

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1/11/96 1:31 PM  
Re(4): ResetGraph(?)  
Mark D. Lyons  
LIBGPU

I have always used the ResetCallback(), the difference just seems to be in ResetGraph()

---

1/11/96 2:00 PM  
Re(6): ResetGraph(?)  
Mark D. Lyons  
LIBGPU

Nope, the ResetCallback() didn't help.  
I just went wading back through library versions, linking in different versions of libgpu.lib while keeping everything else 3.3. The change happens between library 3.1 and 3.2. Hopefully there aren't too many other changes to libgpu, for now I'll just use the 3.1 version.

---

1/12/96 11:47 AM

Re: Has anyone incountered problems with DrawSync?

Dan Burnash

LIBGPU

Alex J. Garden

Do you have a sample that you can upload to me? It would make it much easier to pinpoint the problem.

Check the sample programs to find out what, if any, differences you have in your program.

---

1/12/96 2:42 PM

Re(2): UnApplyMatrix: feature request

Silas S. Warner

Thomas Boyd

LIBGTE

>The way I have done this is like this: >>RotMatrix(v, M); // rotates Z, then Y, then X >...  
>invM={{1, 0, 0},{0, 1, 0},{0, 0, 1}} // psuedo-code = build the ID matrix >RotMatrixX(-v[0],  
invM); // un-rotate X >RotMatrixY(-v[1], invM); // un-rotate Y >RotMatrixZ(-v[2], invM); //  
un-rotate Z >... > // now you have the inverse matrix. If you wanna unsnarl some translation  
too, just apply >your matrix to the T vector if you need.

I have found an easier way: invM.t[0][0]=M.t[0][0]; invM.t[1][0]=M.t[0][1];

invM.t[2][0]=M.t[0][2];

invM.t[0][1]=M.t[1][0]; invM.t[1][1]=M.t[1][1]; invM.t[2][1]=M.t[1][2];

invM.t[0][2]=M.t[2][0]; invM.t[1][2]=M.t[2][1]; invM.t[2][2]=M.t[2][2];

Note that this only works if the SCALE factor is ONE or ScaleMatrix is not used. The only problem with this is that I have to create an invM from M, then call ApplyMatrix with invM to transfer the inverse matrix into the rotation engine. UnApplyMatrix would basically transfer the matrix M into the rotation engine with the rows and columns interchanged as I have done here.  
Silas Warner

---

1/12/96 11:16 AM

Has anyone incountered problems with DrawSync?

Alex J. Garden

LIBGPU

Hey there...

I am incountering a problem where as I am moving around in my world, I get this really nasty flicker where objects seem to be randomly disappearing. It appears that I am switching buffers before drawing is complete. If this were the case, I would be overwriting my ordering tables before their contents were completely drawn. I completely removed the call to DrawSync(0) and I got identical results. If I add an extra VSync(0) there, The world draws OK.

Unfortunately, it also cuts my framerate in half.

Has anyone incountered a situation where DrawSync(0) or DrawSync(1) just stopped working? I am calling ResetCallback and ResetGraph and all the other necessary initialization functions for the GPU (that are listed in the docs). I am using the most current versions of the libs (v3.4b) This is a most annoying problem.

Alex Garden@Radical Entertainment

---

1/12/96 10:48 AM

Re: Vertex projection

Carl Ferreira



Jay Ryness  
LIBGTE

I don't think that processing the vertices seperately is faster. When I first started working on the PSX, I tried creating a vertex list, processing that and then testing faces. The problem is, it takes virtually the same amount of time to test the face for backface as to transform all vertices AND test the face for backface. The net result was that it was slower using a vertex list with indirect pointers into it than to process all points every time! I have shunned the standard geometry structures (such as TMD or PMD) and am using one of my own design. If anyone has had a better experience comparing these two techniques, please let me know.

Carl Ferreira =====  
Instead of projecting every poly's three vertices for EVERY poly, which ignores the fact that most vertices are shared, I was planning on projecting a vertex list and working out shared vertices later. PMD seems to support this fine. I learned recently that the GTE is optimized for working with three vertices at a time, which would explain the why the Strip/Round mesh thing is kind of a big deal. Being the lazy person that I am, I would like to ignore the Strip/Round mesh vertex order and pass the GTE arbitrary vertices in packets of three, which would obviously ruin any kind of backface removal. My question is, would it be feasible do the outer product calculation "manually" for every poly when I decide where its three vertices are, or do functions like RotAverageNclip3 and its brethren get GTE to do it much faster than I ever could manually. If I'm being completely stupid, I apologize. Thanks! JR, Semi Logic Entertainments

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1/15/96 5:35 PM  
Question about Texture Cache again  
Teh Kao Yang  
LIBGPU

Hi I just want to ask a simple question about how texture cache works. For example for an 8 bit texture the cache size is 32X64 I think. So what does this mean when I am texture mapping my models? Do I have to make sure my texture on EACH polygon is not larger than 32X64? Or I just can't use any texture larger than 32X64, even if it is spread over multiple polygons?

---

1/16/96 12:10 PM  
Re(2): Question about Texture Cache again  
Blake E. Senftner  
LIBGPU

Oops!  
The texture cache is 64 by 32 for 8-bit textures!  
Texture cache: 4-bit 64 by 64 8-bit 64 by 32 15-bit 32 by 32  
My previous posting should still make sense, but just remember that the texture cache miss example would need a poly sized 70 by 32 for a miss each scanline.  
-Blake

---

1/16/96 11:32 AM  
Re: Question about Texture Cache again  
Blake E. Senftner  
LIBGPU

>Hi I just want to ask a simple question about how texture cache works. For >example for an 8 bit texture the cache size is 32X64 I think. So what does >this mean when I am texture mapping my models? Do I have to make sure my >texture on EACH polygon is not larger than 32X64? Or I just can't use any >texture larger than 32X64, even if it is spread over multiple polygons? Each primitive's texture should not exceed the texture cache size.

For example, an 8-bit primitive that references a source texture of 35 by 64 will have a texture cache "miss" each scanline, while the same primitive referencing a texture 32 by 64 will fit entirely into the texture cache and render with a single read of VRAM. The primitive that has a "miss" each scanline will have to read from VRAM twice per scanline to render the polygon.

Exactly what gets loaded when a texture cache "miss" occurs is unknown to me. It could be another 32 by 64 pixel block, or something else... but I think it is another 32 by 64 chunk of VRAM. If it were not, then the logic to explain the operation of a texture cache "hit" would be much more complicated.

-Blake

---

1/16/96 6:44 PM

Re(4): Question about Texture Cache again

Blake E. Senftner

LIBGPU

After my previous post I spoke with Tom Boyd, who explained it like this:

Yes, it is a 2K cache, but the line size appears to be 8 bytes.

The rendering, and therefore loading of this cache, occurs from frame buffer top to bottom... so if your primitive is rotated 180 degrees in the xy plane the texture data will load from texture source bottom to top.

Tom says that the key to efficient use of the textue cache is to use the texels that have been loaded... and don't cause multiple loads of the same texel data.

For example: an 8-bit texture sized 64 by 32 with no rotations will render very efficiently, while that same texture rotated 15 degrees in z will cause an area larger than 64 by 32 to be referenced by the renderer... causing some unused texels to be loaded and not used, but in general rather efficient usage of the texture cache. The unused texels will be those loaded along the top and bottom edges less than 8 texels wide. Also, after the 15 degree rotation, the left edge of the texture data may not sit on an 8 byte boundary, causing some extra texels to be loaded along the right edge.

I've had it explained to me that a texture rotated 90 degrees in the z plane is the worst case for the texture cache... but when I walk through the logic, it seems no worse than other cases... continuing with 64 by 32 8-bit, it triggers loads for the first 32 pixels rendered, but then the following 224 render pixels all have textue cache hits... I think...

Also keep in mind when a texture is scaled down. An 8 bit texture rendered at 1/8th its size will be loading 8 texels and only using 1 texel from each load. Remember that our renderer point samples the textures...

Any help for any of you? Does this not fit with your understandings? tell me! I'm hoping that others will chime in and we'll get this nailed down.

-Blake

---

1/16/96 10:05 AM

Re(3): UnApplyMatrix: feature

Karen Paik

Silas S. Warner

Thomas Boyd

You can use the inline macros to load a rotation matrix into the hardware. I've found that this is what the macros are good for. They allow you to leave out some steps that the regular functions perform that you don't need.

---

1/16/96 11:44 AM

Re(4): UnApplyMatrix: feature

Thomas Boyd

Karen Paik

Silas S. Warner

Exactly!

The idea is to get your main poly-spraying loop to fit in the 4K instruction cache. Knock out everything you do not need.

You can ALSO use macros to take apart a function and do small amounts of CPU processing after long GTE calls.

Q: What's a long GTE call? A: There are three types of GTE calls in the macros (pardon my one-armed-bandit analogy) Type 1: Load the GTE registers (put your coins in the top) Type 2: GTE commands (pull the lever) Type 3: Store results (get your payoff out of the bottom) Type 1 and 3 commands are fast, but type 2 commands take a few cycles. (Example: RotTransPers, gte\_rtp... takes about 15 GTE cycles, you could cram a CPU multiply in your code there instead of sitting on your hands waiting for the GTE to stop spinning).

Additionally, you can set your variables up on the scratchpad and then not pass so many parameters, because if you pass more than four parameters, you hit the stack (This is bad).

More additionally, you can put your local variables on the scratchpad and avoid the stack and excessive register calls.

Even more additionally, you can set your stack pointer temporarily to the scratch pad and proceed as normal. Don't blow off the 1K boundary!

Tom -----

...I've found that this is what the macros are good for. They allow you to leave out some steps that the regular functions perform that you don't need.

---

1/16/96 2:30 PM

Re(3): Question about Texture Cache again

Dean M. Grandquist

LIBGPU

I had thought the texture cache was a 2K direct mapped cache with a line size of 64 bytes.

--DeanG

---

1/16/96 10:40 AM

Translucency

Paul Masters

3D Development

How does one set multiple levels of translucency on a single poly using LIBGPU and avoiding LIBGS? Any advice would be greatly appreciated.

Paul and Company

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1/16/96 3:36 PM

Re(2): Vertex projection  
player 1  
Thomas Boyd  
LIBGTE

Well, you can also use just the screen x,y coordinates and the Playstation function NormalClip to figure out the backface clipping if you transform the vertices beforehand. I am in a similar situation as you, and this is the solution I used.  
Tom Ketola Games Programmer Player One

---

1/17/96 5:02 PM

Re(5): Question about Texture Cache again  
Thomas Boyd  
LIBGPU

WARNING: View this with a fixed-pitch (non-proportional) font - or it will look horrible!!  
>>I've had it explained to me that a texture rotated 90 degrees in the z plane is the worst >>case for the texture cache... but when I walk through the logic, it seems no worse than >>other cases... continuing with 64 by 32 8-bit, it triggers loads for the first 32 pixels >>rendered, but then the following 224 render pixels all have texture cache hits... I think...

OK, rotating 90 degrees: To oversimplify, I am pretending that the cache is 7 X 7 pixels  
TEXTURE = 7 X 9 pixels (as drawn below) - each letter is a different (but lovely) color.

abcdefghijklmnopqrstu vwxyzAB CDEFGHI JKLMNOP QRSTUVW XYZ1234 567890\$

At 90 deg. Here's how the poly will be drawn on the screen: (the aspect ratio looks kooky in ASCII)

5XQJCvoha 6YRKDwpib 7ZSLExqjc 81TMFyrkd 92UNGzsl 03VOHAtmf \$4WPiBung

The thing draws scanline by scanline. Now I wanna draw the thing Here is a pixel by pixel blowout on what happens:

\* = old data # = other VRAM data

VRAM TCACHE // 1ST PIXEL: 1 TCACHE LOAD TOTAL

5\*\*\*\*\* 567890\$ \*\*\*\*\*  
\*\*\*\*\*

VRAM TCACHE // 2ND PIXEL: 2 TCACHE LOADS TOTAL

5X\*\*\*\*\* 567890\$ \*\*\*\*\* XYZ1234 \*\*\*\*\*  
\*\*\*\*\*

VRAM TCACHE // 3RD PIXEL: 3 TCACHE LOADS TOTAL

5XQ\*\*\*\*\* 567890\$ \*\*\*\*\* XYZ1234 \*\*\*\*\* QRSTUVW \*\*\*\*\*  
\*\*\*\*\*

VRAM TCACHE // 4th PIXEL: 4 TCACHE LOADS TOTAL

5XQJ\*\*\*\*\* 567890\$ \*\*\*\*\* XYZ1234 \*\*\*\*\* QRSTUVW \*\*\*\*\* JKLMNOP \*\*\*\*\*  
\*\*\*\*\*

VRAM TCACHE // 5th PIXEL: 5 TCACHE LOADS TOTAL

5XQJC\*\*\*\* 567890\$ \*\*\*\*\* XYZ1234 \*\*\*\*\* QRSTUVW \*\*\*\*\* JKLMNOP \*\*\*\*\* CDEFGHI  
\*\*\*\*\*

VRAM TCACHE // 6th PIXEL: 6 TCACHE LOADS TOTAL

5XQJCv\*\*\* 567890\$ \*\*\*\*\* XYZ1234 \*\*\*\*\* QRSTUVW \*\*\*\*\* JKLMNOP \*\*\*\*\* CDEFGHI  
\*\*\*\*\* vwxyzAB \*\*\*\*\*

VRAM TCACHE // 7th PIXEL: 7 TCACHE LOADS TOTAL THE CACHE IS FULL!

5XQJCvo\*\* 567890\$ \*\*\*\*\* XYZ1234 \*\*\*\*\* QRSTUVW \*\*\*\*\* JKLMNOP \*\*\*\*\*  
CDEFGHI \*\*\*\*\* vwxyzAB \*\*\*\*\* opqrstu

VRAM TCACHE // 8th PIXEL: 8 TCACHE LOADS TOTAL. FIRST ROW REPLACED!

5XQJCvoh\* hijklmn \*\*\*\*\* XYZ1234 \*\*\*\*\* QRSTUVW \*\*\*\*\* JKLMNOP \*\*\*\*\*  
CDEFGHI \*\*\*\*\* vwxyzAB \*\*\*\*\* opqrstu

VRAM TCACHE // 9th PIXEL: 9 TCACHE LOADS TOTAL. SECOND ROW REPLACED!  
5XQJCvoha hijklmn \*\*\*\*\* abcdefg \*\*\*\*\* QRSTUVW \*\*\*\*\* JKLMNOP \*\*\*\*\* CDEFGHI  
\*\*\*\*\* vwxyzAB \*\*\*\*\* opqrstu

VRAM TCACHE // 10th PIXEL: 10 TCACHE LOADS TOTAL. THIRD ROW REPLACED!  
5XQJCvoha hijklmn 6\*\*\*\*\* abcdefg \*\*\*\*\* 67890\$# // I have no clue if it loads 567890\$ or  
67890\$#, but it does not matter for this \*\*\*\*\* JKLMNOP \*\*\*\*\* CDEFGHI \*\*\*\*\* vwxyzAB  
\*\*\*\*\* opqrstu

OK, does this make sense? This means that this texture will require 63 (sixty-three) cache loads.

=====  
=====  
=====  
=====

NOW here's what happens if the texture fits in the cache: TEXTURE = 7 X 7 pixels (as drawn below)

abcdefg hijklmn opqrstu vwxyzAB CDEFGHI JKLMNOP QRSTUVW

At 90 deg. Here's how the poly will be drawn on the screen: (the aspect ratio looks kooky in ASCII)

QJCvoha RKDwpib SLExqjc TMFyrkd UNGzsl VOHAtmf WPIBung

The thing draws scanline by scanline. Now I wanna draw the thing Here is a pixel by pixel blowout on what happens:

\* = old data

VRAM TCACHE // 1ST PIXEL: 1 TCACHE LOAD TOTAL

Q\*\*\*\*\* QRSTUVW \*\*\*\*\*  
\*\*\*\*\*

VRAM TCACHE // 2ND PIXEL: 2 TCACHE LOADS TOTAL

QJ\*\*\*\*\* QRSTUVW \*\*\*\*\* JKLMNOP \*\*\*\*\*  
\*\*\*\*\*

VRAM TCACHE // 3RD PIXEL: 3 TCACHE LOADS TOTAL

QJC\*\*\*\* QRSTUVW \*\*\*\*\* JKLMNOP \*\*\*\*\* CDEFGHI \*\*\*\*\*  
\*\*\*\*\*

VRAM TCACHE // 4th PIXEL: 4 TCACHE LOADS TOTAL

QJCv\*\*\* QRSTUVW \*\*\*\*\* JKLMNOP \*\*\*\*\* CDEFGHI \*\*\*\*\* vwxyzAB \*\*\*\*\*  
\*\*\*\*\*

VRAM TCACHE // 5th PIXEL: 5 TCACHE LOADS TOTAL

QJCvo\*\* QRSTUVW \*\*\*\*\* JKLMNOP \*\*\*\*\* CDEFGHI \*\*\*\*\* vwxyzAB \*\*\*\*\* opqrstu  
\*\*\*\*\*

VRAM TCACHE // 6th PIXEL: 6 TCACHE LOADS TOTAL

QJCvoh\* QRSTUVW \*\*\*\*\* JKLMNOP \*\*\*\*\* CDEFGHI \*\*\*\*\* vwxyzAB \*\*\*\*\* opqrstu  
\*\*\*\*\* hijklmn \*\*\*\*\*

VRAM TCACHE // 7th PIXEL: 7 TCACHE LOADS TOTAL. The CACHE IS FULL!

QJCvoha QRSTUVW \*\*\*\*\* JKLMNOP \*\*\*\*\* CDEFGHI \*\*\*\*\* vwxyzAB \*\*\*\*\* opqrstu  
\*\*\*\*\* hijklmn \*\*\*\*\* abcdefg

VRAM TCACHE // 8th PIXEL: 7 TCACHE LOADS TOTAL. WOW! IT WAS IN THE CACHE

QJCvoha QRSTUVW R\*\*\*\*\* JKLMNOP \*\*\*\*\* CDEFGHI \*\*\*\*\* vwxyzAB \*\*\*\*\* opqrstu  
\*\*\*\*\* hijklmn \*\*\*\*\* abcdefg

VRAM TCACHE // 9th PIXEL: 7 TCACHE LOADS TOTAL. WOW! IT WAS IN THE CACHE

QJCvoha QRSTUVW RK\*\*\*\*\* JKLMNOP \*\*\*\*\* CDEFGHI \*\*\*\*\* vwxyzAB \*\*\*\*\* opqrstu  
\*\*\*\*\* hijklmn \*\*\*\*\* abcdefg

Now note that everything is in the cache, so you get 7 (seven) loads total, not the 63 you got last time.

Does this make sense yet?

Tom

---

1/19/96 4:58 PM

LoadImage() don't like scratch pad?

Blake E. Senftner

LIBGPU

Tom Boyd

I'm decompressing some run length data into the scratch pad, and then attempting to load that into VRAM via a LoadImage() call...

If I use "normal" memory, everything works fine, but if my decompression buffer is a pointer to the scratch pad, LoadImage() chokes with:

DMA bus error: 80808000

The above is displayed by calling LoadImage() the first time, second time through the error displayed is:

GPU timeout:que=0,stat=5204000f,chcr=00000201,madr=00800020,

func=(80716e80)(80013db8,1f800000)

The decompression buffer is 480 bytes long, and I'm double buffering between (unsigned char \*)SCRATCH\_PAD and (unsigned char \*)SCRATCH\_PAD + 480.

Any ideas? Any reason why we haven't been informed how to read these error messages?

-Blake

---

1/19/96 8:42 AM

Light Source Vector

Dave R. Scheele

LIBGTE

In the Run-time Library 3.0 / Overview manual, page 121, the discussion entitled Light Source Calculation lists three attributes of the light source: the ambient color, the color of the light source, and a "light source vector (direction and intensity)". What is the format of this vector? How are both direction and intensity represented within it? I understand that there is no position corresponding to the lights, but that instead the direction of the parallel light rays is given. How do I specify the direction and intensity of a light?

So far I've been making lucky guesses, but that's not going to be good enough much longer. I have searched the manuals, sample files and includes but haven't found anything. Can someone point out a resource I've missed, or describe to me how the lights work?

Dave

---

1/22/96 8:40 AM

Re: LoadImage() don't like scratch pad?

Thomas Boyd

Blake E. Senftner

LIBGPU

Quote from Mr. Yamamoto:

"You can't DMA to or from the scratchpad."

>Any reason why we haven't been informed how to read these error messages? I will inform y'all soon as I find it. I have this info somewhere...

Tom

---

1/22/96 9:50 AM  
Re: Light Source Vector  
Thomas Boyd  
LIBGTE

>In the Run-time Library 3.0 / Overview manual, page 121, the discussion entitled Light Source Calculation lists three attributes of the >light source: the ambient color, the color of the light source, and a "light source vector (direction and intensity)".

>What is the format of this vector? SVECTOR (1,3,12)

>How are both direction and intensity represented within it? A vector is defined as having both direction and magnitude. Example (1,2,3) and (2,4,6) both have the same direction, but the second vector has greater magnitude.

>I understand that there is no position corresponding to the lights, but that instead the direction of the parallel light rays is given. >How do I specify the direction and intensity of a light?

Example:

(1) Bright white light source coming from above - noon sun: (0, 0x7FFF, 0) // note that this is a positive value. Y aims down from our perspective, so the light is aiming down from above (2) Dim red light from the right: (0x83FF, 0, 0) // note that this is a negative value, so it is going from right to left on the X-axis

>So far I've been making lucky guesses, but that's not going to be good enough much longer. I have searched the manuals, sample >files and includes but haven't found anything. Can someone point out a resource I've missed, or describe to me how the lights work?

\PSX\SAMPLE\GRAPHICS\TUTO\TUTO7.C

Tom

---

1/22/96 9:32 AM  
MatrixNormal documentation  
Thomas Boyd  
LIBGTE

Following is the document about MatrixNormal() This will formally be documented in a future release T----- Forwarded Message

MatrixNormal Normalize a matrix.

Syntax void void MatrixNormal(m,n) MATRIX \*m; MATRIX \*n;

Argument m Matrix(input) n Matrix(output)

Explanation

This function orthogonalizes and normalizes a rotation-matrix m and returns the result in n.

\* This function doesn't use m->m[2][0],m->m[2][1],m->m[2][2].

The argument format is as follows:

m->m[i][j]:(1.3.12) n->m[i][j]:(1.3.12) MatrixNormal\_1 Normalize a matrix.

Syntax void void MatrixNormal\_1(m,n) MATRIX \*m; MATRIX \*n;

Argument m Matrix(input) n Matrix(output)

Explanation

This function orthogonalizes and normalizes a rotation-matrix m and returns the result in n.

\* This function doesn't use m->m[0][0],m->m[0][1],m->m[0][2].

The argument format is as follows:

m->m[i][j]:(1.3.12) n->m[i][j]:(1.3.12)

MatrixNormal\_2 Normalize a matrix.  
Syntax void void MatrixNormal\_2(m,n) MATRIX \*m; MATRIX \*n;  
Argument m Matrix(input) n Matrix(output)  
Explanation  
This function orthogonalizes and normalizes a rotation-matrix m and returns the result in n.  
\* This function doesn't use m->m[1][0],m->m[1][1],m->m[1][2].  
The argument format is as follows:  
m->m[i][j]:(1.3.12) n->m[i][j]:(1.3.12)  
----- End of Forwarded Message

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1/22/96 6:11 PM

Re(2): Light Source Vector

Dave R. Scheele

Thomas Boyd

LIBGTE

Du-uh!!! Sometimes I wonder what's wrong with me brain ...

Thanks, Tom, for defining a vector for me ;) -- for some dumb reason I was thinking the lights are defined like some of the fields of a TMD, like the first 5 bits are intensity and the next 11 are direction, or something like that.

I'll wake up one day, I promise.

Dave

---

1/24/96 7:28 PM

View based on LookAt, LookUp ???

Tim L. Lowery

LIBGTE

We are porting a game whose camera view is defined by these three vectors:

VECTOR CameraPosition; VECTOR LookAtDirection; VECTOR LookUpDirection;

I want to implement this on PSX. My first attempt was to use a simple GsRVIEW2.

CameraPosition and LookAtDirection mapped quite nicely into view.vpx/y/z and view.vrx/y/z, but I couldn't implement LookUpDirection because view.rz is undefined whenever you look down the Y axis, and therefore is not useful in our game.

My next stab at this was to change view.super from WORLD to a GsCOORDINATE2. Is this the right way to go? The math for calculating the view rotation matrix for given pair of LookAt and LookUp vectors eludes me. Does anybody have an example of how to do this?

Or should I set up a GsCOORD2PARAM? Does anybody have an example of how to do this, from a LookAt and LookUp vector?

Dave Howell Pablo Media

---

1/24/96 5:59 PM

CLUT VRAM X Address Restriction

David Cartt

LIBGPU



The documentation ("Run-time Library 3.0 / Reference", function GetClut, page 179) says that the CLUT address is limited to multiples of 64 in the X direction.  
The macro dumpClut (libgpu.h, line 268) indicates that the CLUT address is limited to multiples of 16 in the X direction. My experience seems to bear this out also.  
Which is correct - multiples of 64 or multiples of 16?  
David Cartt BlueSky Software

---

1/25/96 9:29 AM  
Near Z Clip...  
stephen chaplin  
LIBGTE

Hello all, We have decided to finally port over the last of the transformation/projection/clipping PC code that works on the R3000 to the GTE, and are having a few problems. Namely:

1) Near Z clip, I have seen that there is a libgs call to set the near and far Z clip planes, but I am loathe to use such a library since god only knows what else is in there, and we don't want to convert our data structures :). So, the million dollar question is: Does the GTE have the capability to do Near Z clipping, or is libgs using the R3000 to do it?

2) Is there a function that can take an array of points (NOT associated in triangles or quads, but rather a group of points) and do the Rotation and Translation on them. I see functions that do the Rotation/Translation/Projection on a group of triangles or quads, but we are interested in a function that ONLY does the Rotation and Translation (no projection) on a group of points.

Thank you for your help, Romesh

---

1/25/96 7:50 PM  
Re: View based on LookAt, LookUp ???  
Silas S. Warner  
Tim L. Lowery  
LIBGTE

The easiest way I've found to do this is to rotate the camera view by a master matrix if the view is close to the Y axis. You need not use a GsCOORD2PARAM for this: simply make a parent GsCOORDNATE2 for your GsRVIEW2, then set your GsCOORDINATE2->coord to  $m[0] = [0 \ 1 \ 0]$   $m[1] = [-1 \ 0 \ 0]$   $m[2] = [0 \ 0 \ 1]$   $t =$  Camera This will rotate the entire camera framework such that +X becomes +Y and -Y becomes +X, in other words tilts the entire view 90 degrees straight down. Then rz, instead of being  $\text{atan}(\text{Up.vx}, \text{Up.vz})$  becomes  $\text{atan}(-\text{Up.vy}, \text{Up.vz})$  The new GsRVIEW2.View vector becomes  $[\text{View.vy} \ -\text{View.vx} \ \text{View.vz}]$  Zero the GsRVIEW2's Camera and continue from there. It's kludgy but it works.

Silas Warner

---

1/26/96 1:35 PM  
Re: Hey! Slower Libs?  
Dan Burnash  
LIBGPU  
Paul Masters

What version of the libraries were you using? Did you get the latest 3.4 libs? Are you using the multitap library? Any specifics will help. A test program you can send us would be best. No wonder it's slower, were spending all our time reading 4 copies of your post, so we can't fix the problem! :-)

Dan Burnash

---

1/26/96 9:35 AM

Re: View based on LookAt, LookUp ???

Thomas Boyd

LIBGTE

I do not understand what the LookUpDirection is. It seems to me that the camera view is entirely defined by cameraposition (x,y,z) // where it is lookatdirection(x,y,z) // where it's aimed Tell me what lookupdirection is about, and I can figure out the math. (I am sorry if I am asking for an explanation of the obvious, but I don't get it).

Tom ----- We are porting a game whose camera view is defined by these three vectors:

VECTOR CameraPosition; VECTOR LookAtDirection; VECTOR LookUpDirection;

I want to implement this on PSX. My first attempt was to use a simple GsRVIEW2.

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Or should I set up a GsCOORD2PARAM? Does anybody have an example of how to do this, from a LookAt and LookUp vector?

Dave Howell Pablo Media

---

1/26/96 1:22 PM

Hey! Slower Libs?

Paul Masters

LIBGTE

What gives? we downloaded the new libraries and lost framerate in our 3D engine. We're not doing anything that tricky and indications were that we should have gained some ground. Any advice would be helpful...

Tim Ray

(Speaker for The Pablo)

---

1/26/96 3:58 PM

Re(2): Hey! Slower Libs?

Dave Ross

LIBGPU

We found 3.2 3.3 and 3.4 beta to be significantly slower than 3.1. My guess is that the speed loss is in the libgte rotRMD and RotSmd routines.

---

1/26/96 10:10 AM

Re: Near Z Clip...

Thomas Boyd

LIBGTE

>1) Near Z clip, I have seen that there is a libgs call to set the near and far Z >clip planes, but I am loathe to use such a library since god only knows what >else is in there, and we don't want to convert our data structures :). So, the >million dollar question is: Does the GTE have the capability to do Near Z >clipping, or is libgs using the R3000 to do it?

The GTE only limits the Z-coordinate, which makes for some uncool-looking smooshing effects. The result is that you gotta o it yourself.

best best:

0) dont use Gs if you are only on the GTE. 1) subdivide near polys. This works great for roadways and stuff where you will not see the nearest of the subdivided polys. 2) do not get your viewpoint so close to polys that they can distort - clip 'em by R3000

>2) Is there a function that can take an array of points (NOT associated in >triangles or quads, but rather a group of points) and do the Rotation and >Translation on them. I see functions that do the Rotation/Translation/Projection >on a group of triangles or quads, but we are interested in a function that >ONLY does the Rotation and Translation (no projection) on a group of points.

There are the mesh functions (RotMesh). Lemme know if this is not what you wanted.

Tom

---

1/26/96 2:50 PM

Re(2): View based on LookAt, LookUp ???

Tim L. Lowery

LIBGTE

Thomas Boyd

>>> I do not understand what the LookUpDirection is. It seems to me that the camera view is entirely defined by cameraposition (x,y,z) // where it is lookatdirection(x,y,z) // where it's aimed Tell me what lookupdirection is about, and I can figure out the math. (I am sorry if I am asking for an explanation of the obvious, but I don't get it). <<<<

Imagine that you put your camera on a tripod. That's the camera position. Now you aim it at a sunset on the horizon. That's the lookAt vector. Now you turn your camera upside-down so that it's still in the same position and still looking at the sunset, but when you take the picture it will come out upside down. In that case, you have set a lookUp vector that is rotated 180 degrees from when you first set it up.

Dave Howell Pablo Media

---

1/26/96 1:22 PM

Hey! Slower Libs?

Paul Masters

LIBGTE

What gives? we downloaded the new libraries and lost framerate in our 3D engine. We're not doing anything that tricky and indications were that we should have gained some ground. Any advice would be helpful...

Tim Ray

(Speaker for The Pablo)

---

1/29/96 9:35 AM

EggOnFace()

Paul Masters

LIBGPU

Please disregard the message from us about slower libs. We were in error and have both solved our problem and beaten ourselves in shame for it. Thank you. Tim Ray (for Paul Masters and the EggFacedBoyz)

---

1/29/96 3:42 PM

Gouraud shading BUG REPORT!

Ayo A. Orimoloye

Administrator

LIBGPU

I have found a bug in the Gouraud shading. I suspect this is a hardware problem. This bug is demonstrated in the TUTO0 demo in the SAMPLE\GRAPHICS\PMD directory of the SONY examples, so I am convinced since it is not a fault of my program.

The bug occurs when Gouraud-shading a POLY\_G4 or a POLY\_GT4. If Gouraud-shading a quad with 3 corners of the same colour and a different colour on the 4th corner, it works fine when the "different" colour is on vertex 1 or 2. If the different colour is on vertex 0 or 3, the Gouraud shading appears as 2 distinct TRIANGLES: one shaded (with the "different" colour on it's apex and the "same" colour on the other 2 vertices) and one solid (with all three vertices the same colour). This can be seen in certain faces on the cubes in the tuto0 example (look carefully at the Gouraud-shaded faces on the cubes and you will easily be able to tell which faces are working properly and which are not - I hope!).

I realize that the PlayStation hardware deals with textures and polygons on a triangular level and I suspect this to be the cause of the bug. What I want to know is are there any fixes planned for this bug?

In future, who do I address this sort of bug reports to?

---

1/29/96 3:42 PM

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In future, who do I address this sort of bug reports to?

---

1/29/96 3:02 PM

Re(3): View based on LookAt, LookUp ???

Blake E. Senftner

Tim L. Lowery  
LIBGTE

I drives me nuts wathing you guys go back and forth on this...

Dave (Tim?): Your LookUp vector corresponds to the "rz" field of a GsRVIEW2 structure. The LookUp vector specifies the direction that is "up" in your camera view, while the "rz" field in GsRVIEW2 specifies the amount of "z" rotation that camera view should have...

If you don't see that these are the same thing, than you'll never be able to figure out how to map your vector into the vz rotation.

-Blake

---

1/29/96 6:06 PM

VRAM X,Y Coordinate Question

Teh Kao Yang

LIBGPU

Sorry if this is a boneheaded question, but I am sort of confused about the way we can assign X,Y coordinates in VRAM to our texture. For eaxmple let's say I am trying to fit in a bunch of textures in one texture page. I know that a 256X256 texture only takes up 128X256 in VRAM if it is 8bit, 64X256 if it is 4 bit, and so on. If I have a bunch of 8 bit texture, I know thir sizes, but how does this translate to VRAM size? Suppose I put the first texture at 640,0 in VRAM. The texture is 32X64 pixels. But in VRAM, what does this actually translate to? Where can I put in the next texture?

-TK

---

1/30/96 5:41 PM

Re: VRAM X,Y Coordinate Question

Silas S. Warner

LIBGPU

After long, painful research this is what I have found.

The TPAGE is calculated on the basis of 16-bit addressing. In other words, if you put your texture page at 640,0, and you want a texture 256 pixels right of the start, then you must find the page at 640+128,0, because 256 8-bit pixels are 128 16-bit pixels. BUT, the texture co-ordinates are based on the texture size in the bitmap given, NOT the video RAM size. So if your texture starts 280 pixels in, then you must add 128 to the X needed to get the TPAGE, then put 34 (280-256) in your U co-ordinates. Further note that TPAGE entries are spaced 64 16-bit pixels apart. This translates to 128 8-bit pixels, or 256 4-bit pixels. This means that you should take your texture coordinates mod 128 if you are using 8-bit textures.

It's bloody confusing, ain't it?

Silas Warner

---

1/30/96 5:05 PM

Texture Cache information

Thomas Boyd

Dan Burnash

Here is some good stuff on the texture cache

Tom ----- (There are 4 short words (8byte) boundry about texture cache).

\*\* cache block

A texture page is divided to rectangle areas of cache size unit. This each unit is called "cache block". "cache block" has a continuous number(block number). In case of 4bits mode, cache

block and block number are as follows. One cache block is 64x64 and block number is 16.  
 0 64 128 192 255                      ck is divided to small areas of 16x1  
 size(cache entry). In case of 4bits mode, a cache block is divided to 256 entries as follows.  
 0 16 32 48 63                      size of cache data is 4 short word. In case  
 of 4bits mode, 16 texture pixels are stored in a entry.

\*\* cache strategy

Each entry keep a block number, and cache hit or not is judged by using this number. You can judge if your texture pixels(u, v) are on cache as follows.

```

block number: (v>>6)>>2 + (u>>6)
entry number: (v&0x3f)<<2 + (u&0x3f)>>4
is_cache_hit_4bit(u_char u, u_char v) {      int block_id = (v>>6)>>2 + (u>>6);
int entry_id = (v&0x3f)<<2 + (u&0x3f)>>4;
    if (Entry[entry_id].block_id == block_id)      return(1); /* cache hit */
else      return(0); /* cache miss */ }
---
```

1/31/96 3:19 AM

Re: Texture Cache information

Dean M. Grandquist

LIBGPU

Ok here some of my questions about the texture cache docs we have now.

|                     |      |       |             |       |             |        |       |     |
|---------------------|------|-------|-------------|-------|-------------|--------|-------|-----|
| The cache doc says: | mode | block | total block | entry | total entry | 4      | 64x64 | 16  |
|                     | 16x1 | 256 8 | 32x64       | 32    | 8x1         | 256 16 | 32x32 | 64  |
|                     |      |       |             |       |             |        |       | 4x1 |
|                     |      |       |             |       |             |        |       | 256 |

Is this block size in 16bit pixels?

I think I understand the the entry numbers. The cache is direct mapped just like the I-cache on the R3000, so the line size is 64bits. My problems come in when I see the code in Tom's post and in the cache docs that shift the V of the texture coords to come up with which line to load. How does the Y coord figure into the block\_id? Is the entry the line size?

What would really help is a picture 8-) I made an image that divided vram into 64x64x16 chunks to show how I originally thought the cache layout worked. So if I wanted to fix my image, what would I need to do? Graph 16x64x16 to show the cache layout? I didn't think that the cache squares were different for the different modes, just interpreted differently. Am I getting warmer?

If all this is silly just send me to my room. --Dean Grandquist

1/31/96 11:08 AM

Gouraud Shading Bug Demonstration

Ayo A. Orimoloye

Bugs

LIBGPU

GOURAUD0.C            9K

LIBGPU/GTE

Attached is an example program that demonstrates the Gouraud shading bug. My theory is that due to the fact that the GPU internally represents all primitives as triangles, the algorithm for linear interpolation of the colours in the vertices of a gouraud-shaded QUAD only work properly when the quad cannot be subdivided into 2 triangles (i.e. when vertex 1 or 2 are used). This will only probably make sense when you try out the program. You will need to have the "PAT8.TIM" texture (from PSX\SAMPLE\GRAPHICS\TMDVIEW\DATA in the CURRENT

directory on the C drive to run the program.

The example polygons on the left side have the shading colour on vertex 1 and so are rendered correctly. You can see on the polygons on the right how the bug has resulted in the quad appearing as 2 distinct shaded triangles instead of a continuously shaded quad like it's counterpart on the left.

The vertices can be changed and the colours altered using the joypad for both the textured and untextured test polygons. Only the data for the textured polygon is displayed.

---

1/31/96 6:07 PM

Setting up a Hierarchical View

Tim L. Lowery

LIBGTE

Thanks to Silas for explaining the rotating 90-degrees workaround for LibGS's Z-rotation limitations. Now I've got another question. See, we programmers are like wildlife; you can't feed us or we'll just prowl around your campsite demanding more.

Our camera implementation requires offsets in local camera coordinates as well as positioning and aiming in world coordinates. It's a pretty general purpose model, where a camera is defined like this:

```
typedef struct { VECTOR pos; // viewpoint in world coordinates VECTOR lookAt;
// normalized vector, in world coords VECTOR lookUp; // normalized vector, in world
coords VECTOR vcPos; // viewpoint in camera coords int revolve; // angle (4096=1
degree) in camera coords int tilt; // angle (4096=1 degree) in camera coords int pan;
// angle (4096=1 degree) in camera coords } Camera;
```

We fill in our GsRVIEW2 struct based on a such a camera like this:

```
void RegisterCameraSettings (Camera *cam, GsRVIEW2 *view) { VECTOR lookRight;
GsCOORDINATE2 *viewCoord = view->super;
// Set up view hierarchical coordinate system. viewCoord->coord.t[0] = cam->pos.vx;
viewCoord->coord.t[1] = cam->pos.vy; viewCoord->coord.t[2] = cam->pos.vz;
// Determine lookRight (the cross-product of lookAt x lookUp). OuterProduct12(&cam-
>lookAt, &cam->lookUp, &lookRight);
// Derive world coordinate rotation matrix from camera's lookAt // and lookUp vectors,
by just cramming lookRight, lookUp, and // lookAt into the matrix. viewCoord-
>coord.m[0][0] = lookRight.vx; viewCoord->coord.m[0][1] = lookRight.vy; viewCoord-
>coord.m[0][2] = lookRight.vz;
viewCoord->coord.m[1][0] = cam->lookUp.vx; viewCoord->coord.m[1][1] = cam-
>lookUp.vy; viewCoord->coord.m[1][2] = cam->lookUp.vz;
viewCoord->coord.m[2][0] = cam->lookAt.vx; viewCoord->coord.m[2][1] = cam-
>lookAt.vy; viewCoord->coord.m[2][2] = cam->lookAt.vz; viewCoord->flg = 0;
// Set view position in camera coordinates. view.vpx = cam->vcPos.vx; view.vpy = cam-
>vcPos.vy; view.vpz = cam->vcPos.vz;
// Set view reference point ( ignoring pan and tilt for now) view.vrx = view.vpx;
view.vry = view.vpy + ONE; view.vrz = view.vpz;
// Set up camera revolve angle (around camera's Z axis). view.rz = cam->revolve;
// Smack a stamp on that puppy and send it in. GsSetRefView2(&view); }
```

Unfortunately, this doesn't work; we end up staring from the wrong position in the wrong direction.

SO FINALLY... Here's the question part of this epistle.

Am I correct in assuming that a GsRVIEW2's super GsCOORDINATE2 is a matrix that, when applied to a point in camera coordinates, yields a point in world coordinates? Or does it to the opposite, transforming from world coordinates to camera coordinates?

(Actually, this is just the sort of question that one might naively expect to find clarified in well-written documentation.)

Lost in Los Angeles, Dave Howell (dshowell@aol.com) Pablo Media

---

1/31/96 2:19 PM

Gouraud Shading Bug - FINAL!

Ayo A. Orimoloye

Bugs

Developer Support

GOURAUD2.C 9K

LIBGPU/GTE

On further analysis, It appears the "workaround" I found earlier for the Gouraud Shading bug will NOT work properly (in fact it is also "bugged" in exactly the same way as the Sony hardware except it goes down vertices 0 and 3 and not 1 and 2!).

To PROPERLY Gouraud-shade a QUAD, one would need to divide it into 4(!) triangles down BOTH diagonals. This would of course be a heavier polygon load for the GPU but we are talking of doing things properly here!

After dividing the quad into 4, to get the colour for the mid-point which is common to all the 4 triangles, you would need to find the average of the 4 colours on all four vertices by adding-up the Red, Green and Blue components and dividing by 4 in each case. This new value of R,G and B will then be used for the mid-point. Obviously it's X and Y screen position will also need to be calculated. Then you can achieve the result shown in the example file. The only difference between this and Sony's is that this will ALWAYS work irrespective of what colours you have on the 4 corners!

Any chance of getting this in silicon, Sony?

---

1/31/96 1:36 PM

Gouraud shading bug THE ANSWER!

Ayo A. Orimoloye

Bugs

LIBGPU

GOURAUD1.C 9K

LIBGPU/GTE

Well since I got fed up waiting for Developer Support to answer this one I found out what was going on myself. I also found a way to work around it:

The PlayStation ALWAYS divides up QUADS into 2 triangles for Gouraud shading. This division is done along the diagonal from vertex 1 to vertex 2 (top right to bottom left). It therefore ONLY ever does QUAD Gouraud shading PROPERLY when either of these 2 vertices contains the primary colour. This can be seen by using the controls on the RIGHT half of the joystick to move around the vertices on the quad in the demo program and experimenting with the wing buttons to change the colours on the selected vertex. The ENTIRE quad is seen to be affected ONLY when you alter vertices 1 or 2. If you alter the other vertices (0 and 3), only one TRIANGULAR half of the quad is affected.

To get around this, one would have to divide ALL the Gouraud-shaded quads in one's models into triangles! This appears to be the only solution since I believe the bug is inherent in the GPU silicon. I have demonstrated what the upper left quad SHOULD look like by using two triangles in the lower left corner.

Is Sony planning to do something about this?

P.S. Compile and run the file GOURAUD1.C. It uses no textures.

---

2/1/96 12:09 PM

Re: Gouraud Shading Bug - FINAL!



Dan Burnash  
LIBGPU

Ayo A. Orimoloye

I have passed your sample on to Japan to see what they reccomend as a solution. I will post their response when I get it.

Dan Burnash

---

2/1/96 10:01 AM

Re: Fwd(2): CLUT VRAM X Address Restriction

Thomas Boyd

Developer Support

David Cartt

Short answer: 16

Long answer:

Here is GetClut() `u_short GetClut(int x, int y) { return(getClut(x,y));}`

And here is getClut() `#define getClut(x, y) \ ((y<<6) | ((x>>4)&0x3f))`

which looks like  $(Y*64)$  or  $((X \text{ div } 16) \text{ modulo } 64)$  or  $(Y*64) + ((X \text{ div } 16) \text{ modulo } 64)$

So it looks like 16 to me.

Tom ----- The documentation ("Run-time Library 3.0 / Reference", function GetClut, page 179) says that the CLUT address is limited to multiples of 64 in the X direction.

The macro dumpClut (libgpu.h, line 268) indicates that the CLUT address is limited to multiples of 16 in the X direction. My experience seems to bear this out also.

Which is correct - multiples of 64 or multiples of 16?

David Cartt BlueSky Software

---

2/1/96 9:40 AM

Re(2): Texture Cache information

Thomas Boyd

LIBGPU

I will make a decent picture and post it.

Tom -----

Ok here some of my questions about the texture cache docs we have now.

|                     |      |       |             |       |             |     |       |       |    |     |
|---------------------|------|-------|-------------|-------|-------------|-----|-------|-------|----|-----|
| The cache doc says: | mode | block | total block | entry | total entry | 4   | 64x64 | 16    |    |     |
| 16x1                | 256  | 8     | 32x64       | 32    | 8x1         | 256 | 16    | 32x32 | 64 | 4x1 |
| 256                 |      |       |             |       |             |     |       |       |    |     |

Is this block size in 16bit pixels?

I think I understand the the entry numbers. The cache is direct mapped just like the I-cache on the R3000, so the line size is 64bits. My problems come in when I see the code in Tom's post and in the cache docs that shift the V of the texture coords to come up with which line to load. How does the Y coord figure into the block\_id? Is the entry the line size?

What would really help is a picture 8-) I made an image that divided vram into 64x64x16 chunks to show how I originally thought the cache layout worked. So if I wanted to fix my image, what would I need to do? Graph 16x64x16 to show the cache layout? I didn't think that the cache squares were different for the different modes, just interpreted differently. Am I getting warmer?

If all this is silly just send me to my room. --Dean Grandquist

---

2/2/96 2:26 PM

Fading 16-bit and 24-bit screens  
John Brandwood  
LIBGPU

Continued from a thread in the CD conference ...

>You know it possible to do a fade down by just drawing a screen (or even just an area) sized solid block with the >attributes (global in this case) set to the (third, I believe) subtractive semitrans mode (the one that takes 100% of the >background and subtracts some % of the foreground from it). You can set the color of the solid block to 1,1,1 (R,G,B) >for a slow fade out to black by repeatedly drawing the solid block to the screen.

Sure, thats what I'm doing. Its just that I'm doing the drawing to a backscreen so that the raster doesn't catch the fade part way down the screen. This means that I need to have both the backscreen and forescreen start out with exactly the same image. Before the new MoveImage() call was added to lib 3.4, the easiest way to do this was to do a StoreImage()/LoadImage() combination.

>p.s. haven't figured out any easy way to fade up the whole screen to an image (not solid color), but you can repeatedly >load the source image and fade it down less and less before displaying each frame. (load image fade it down to near >black in one step, then display, load image again and fade to near black (but brighter then last time) and display, repeat

And thats what I'm doing for a fade up.

The real challenge has been to do a 24-bit fade up and down.

I've written a software fade that can fade down a 24-bit screen at 20fps, but I've had to give up on trying to write a software fade up routine.

Does anyone know of a software/hardware trick to fade up/down 24-bit screens ?

John.

---

2/2/96 12:53 PM

Re: Setting up a Hierarchical View

Silas S. Warner

Tim L. Lowery

LIBGTE

The GsCOORDINATE2.coord transfers from LOCAL coordinates to GLOBAL coordinates. That is, it transfers coordinates from stuff attached to the GsCOORDINATE2, to stuff attached to the GsCOORDINATE2's super. If the super is WORLD, then it transfers from local to world coordinates.

If the super is NOT WORLD, then when the GsCOORDINATE2 is calculated during

GsSetRefView, and the flg is set to indicate calculation is done, then the

GsCOORDINATE2.workm seems to be set to a translation from local to world, through all the super pointers. If the super is WORLD, then calculating the GsCOORDINATE2 seems to set workm to coord.

By the way, and this may be a feature request: Is there any way other than GsSetRefView, to force calculation of a chain of GsCOORDINATE2s?

Silas Warner

---

2/3/96 1:32 AM

Re: Fading 16-bit and 24-bit screens

Tim L. Lowery

LIBGPU

John Brandwood

>> Does anyone know of a software/hardware trick to fade up/down 24-bit screens ?

I know a method that works on the Macintosh, I don't know about PSX. If you have control of

the video device gamma, it's easy enough to write attenuated values in the gamma table. If that is possible, you can use the top four bits of each of the R, G, and B bytes for your source image, and the bottom four bits of each R, G, and B byte for your destination image, and do a very smooth gamma fade directly from a source to a destination image. The downside is that you have to restrict yourself to 16 levels of R, G, and B.

This may not be possible on PSX because I don't think you have control of the gamma table though. But I thought it was an interesting enough software trick to share.

Dave Howell Pablo Media

---

2/5/96 12:41 PM

OuterProduct0 timing and DotProduct??

Travis Hilton

LIBGTE

Three questions.

1. How many cycles required for OuterProduct0?
  2. Is there a GTE instruction for a 32 bit DOT product and what is it? It seems that if the GTE can do six 32 bit multiplies and 3 adds for a cross product in a single GTE instruction than it should be able to do three 32 bit multiplies and 3 adds for a dot product :-)
  3. is there a GTE instruction for a 32 bit vector multiplied by a 16 bit normal?
- 

2/5/96 1:05 AM

Re(2): Fading 16-bit and 24-bit screens

John Brandwood

Tim L. Lowery

LIBGPU

>> Does anyone know of a software/hardware trick to fade up/down 24-bit screens ?

>I know a method that works on the Macintosh, I don't know about PSX. If you have control of the >video device gamma, it's easy enough to write attenuated values in the gamma table.

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>you >have to restrict yourself to 16 levels of R, G, and B. >>This may not be possible on PSX

because I don't think you have control of the gamma table >though. But I thought it was an

interesting enough software trick to share. >>Dave Howell >Pablo Media

Thanks, I'll keep that in mind. It sounds similar to the 3DO method where each of the 5-bit RGB values in the 15-bit RGB screen pixel is put through a lookup table, allowing you to do smooth screen fades.

On the PSX, I've not been able to do get better than having the processor subtract a value from each r,g,b value (with certain optimizations).

Thanks, John.

---

2/5/96 12:51 PM

fading in/out

R.Brett Butler

LIBGPU

here's 1 way to fade in or out.

make a loop, and use setRGB ( texture, r, g, b );

change r,g,b equally from (0 -> 255) depending on fade in or out.  
then use SetShadeTex ( texture, 0); to apple shading.

2/6/96 3:04 PM

Re(2): Gouraud Shading Bug - FINAL!

Dan Burnash

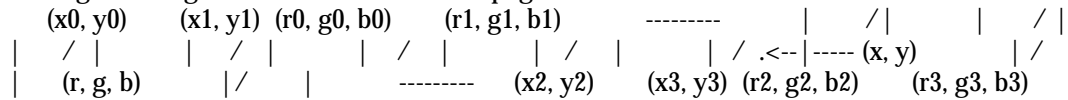
LIBGPU

Ayo A. Orimoloye

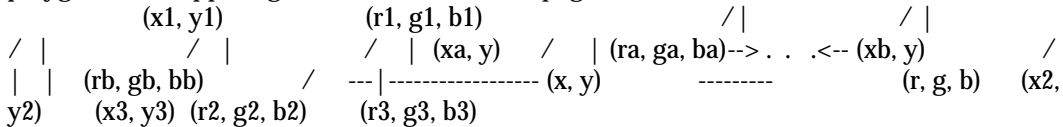
The short answer: Use your workaround, there is no hardware fix. It is a limitation on a triangle based drawing engine.

The long answer:

This problem is based on the algorithm for linear interpolation of colours in the vertices, as his message. The algorithm is described in the pages that follow.



The algebraic expression for calculating the red colour value of the pixel (x, y) on the quad polygon in the upper figure, is described in the pages that follow.



$$ra = (r2 - r1) * (y - y1) / (y2 - y1) + r1$$

$$rb = (r3 - r1) * (y - y1) / (y3 - y1) + r1$$

$$xa = (x2 - x1) * (y - y1) / (y2 - y1) + x1$$

$$xb = (x3 - x1) * (y - y1) / (y3 - y1) + x1$$

$$r = (rb - ra) * (x - xa) / (xb - xa) + ra$$

The all pixels on gouraud shaded polygon is calculated colors on this expressions. Therefore, this problem necessarily occurs.

2/8/96 2:51 PM

Re: Strange TMDs

Dan Burnash

LIBGS

LIBGPU

I haven't tried it. However, if you want to do something unusual with the tmd file format, why not just use your own, and not use libgs? That is probably best route in the long term, anyhow. If you want to try it, let us know if it works. The tmd file format is documented in the library 3.0 overview, if you need specifics on the format.

Dan Burnash

2/8/96 8:52 AM

Strange TMDs

Paul Masters

3D Development

Is it possible to build a TMD file with no polys only vertices? Will the libraries handle such abuse? Has anyone tried it? Thanks.  
Pablo Picasso

---

2/12/96 9:48 PM

Back Face for Primitives and TMDs

Jose R. Villeta

LIBGPU

Dan Burnash

1. Is there a way to back clip faces at the primitive level (i.e., GT4, etc...). Case in example is a mesh terrain with polys hanging on the backside of the mountain. They still get drawn!!  
2. For GsSortObject4 using GsDOBJ2s no back facing is allowed unlike with GsSortObject2 which allows back facing. Is this true for all new libraries releases? If so, can we get the feature back.  
Any information, greatly appreciated!! Jose Villeta Black Ops

---

2/12/96 8:49 AM

GTE Flag Bits 23 & 24

Sam Black

LIBGTE

Bits 23 & 24 of the GTE flag bits are described as "the value of x/y in the screen coordinate system before perspective transformation exceeds  $[-2^{15}, 2^{15})$ ."

My question is: are the results of the transformation prior to division really limited to 16 bits, or is the GTE just reporting that the coordinates were transformed outside of the range of an SVECTOR, but still doing the perspective division properly?

If the results are truly limited to 16 bits, what then is the point of a 32-bit translation vector?

---Doug Muir Papyrus 617-528-1101

---

2/13/96 1:46 AM

LoadTPage, LoadImage

Lobotomy Software

LIBGPU

Is LoadTPage a blocking function?

I had a problem where I was decompressing textures to a one-texture-at-a-time buffer and sending them to VRAM with LoadTPage.

The problem was that each texture after the first was garbled until I put a `drawsync()` after the `loadtpage(...)`.

should I need to do this? Is LoadTPage a non-block function? Is it really part of LoadImage which itself is non-blocking?

-Jeff Blazier, Lobotomy

---

2/14/96 9:15 AM

Re: GTE Flag Bits 23 & 24

Thomas Boyd

Sam Black

LIBGTE

>Bits 23 & 24 of the GTE flag bits are described as "the value of x/y in the screen coordinate system before >perspective transformation exceeds  $[-2^{15}, 2^{15})$ ."

>My question is: are the results of the transformation prior to division really limited to 16 bits,

or is the GTE just >reporting that the coordinates were transformed outside of the range of an SVECTOR, but still doing the >perspective division properly?

16-bit

>If the results are truly limited to 16 bits, what then is the point of a 32-bit translation vector?

You can build your world with 32-bit translations, and then put your camera anywhere in it.

---

2/20/96 2:58 PM

Dumb OT Question

Teh Kao Yang

LIBGPU

Ok this may seem like a dumb question, but I am rather confused by how the OTs work. In the manual the OT is defined as an array. Now if I understand correctly, each entry in an OT points to a primitive. And each of these primitives can in turn point to another primitive through their \*tag field. Now this makes sense for function like AddPrim(). However I don't understand how CatPrim and AddPrims() work in this context. How can an OT be concatenated or inserted into another OT? How do you insert an array into another array? I mean is the OT really an array or a linked list? From the manual and how they talk about being able to regard OT as a null primitive, and being able to create a linked list of primitives and use it as an OT, seem to imply that OT is simply a linked list.

-TK

---

2/20/96 10:49 AM

Re: Gouraud shading BUG REPOR

Jay Ryness

Ayo A. Orimoloye

Administrator

Hi there. This bug results from the fact that quadrangles are actually treated as two triangles by the GTE, with an edge dividing the quad between vertices 0 and 3. I don't think there is or ever will be any way around this, so you're kind of stuck if this is a major problem for you. Jay R.

---

2/20/96 10:49 AM

Re: Gouraud shading BUG REPOR

Jay Ryness

Ayo A. Orimoloye

Administrator

Hi there. This bug results from the fact that quadrangles are actually treated as two triangles by the GTE, with an edge dividing the quad between vertices 0 and 3. I don't think there is or ever will be any way around this, so you're kind of stuck if this is a major problem for you. Jay R.

---

2/22/96 6:39 AM

Re: Dumb OT Question

Carl Ferreira

LIBGPU

The order table is an array of linked list elements each of which (once you call ClearOTag or ClearOTagR) points to the next element in the list. The last element is flagged specially as an end of list element. Each primitive has a pointer to the next element in a linked list, ready for insertion into such a list.

When you call AddPrim, it inserts the primitive into the linked list at the specified point in the array. CatPrim adds the second linked list given to the end of the first linked list. AddPrims inserts the specified linked list chain into the chain starting at the passed order table array element.

An example (5 element list)

After calling ClearOTag(ot,5) (eX means element number X in the array): e0 -> e1 e1 -> e2 e2 -> e3 e3 -> e4 e4 EOL (End of list pointer)

After calling AddPrim(&ot[2],p1) (p1 is primitive number 1): e0 -> e1 e1 -> e2 e2 -> p1 -> e3 e3 -> e4 e4 EOL

After calling AddPrim(&ot[2],p2), AddPrim(&ot[3],p3), AddPrim(&ot[2],p4): e0 -> e1 e1 -> e2 e2 -> p4 -> p2-> p1 -> e3 e3 -> p3 -> e4 e4 EOL

Now consider the following list with P1, P2, and P3 in it... E0 -> E1 E1 -> P3-> E2 E2 -> P2-> P1-> EOL

Added to the previous list by CatPrim(ot,OT):

e0 -> e1 e1 -> e2 e2 -> p4 -> p2-> p1 -> e3 e3 -> p3 -> e4 e4 -> E0 -> E1 -> P3 -> E2 -> P2 -> P1 -> EOL

If, INSTEAD, we performed AddPrims(&ot[2],&P3,&P2):

e0 -> e1 e1 -> e2 e2 -> P3 -> E2 -> P2 -> p4 -> p2-> p1 -> e3 e3 -> p3 -> e4 e4 EOL

I hope this clears up the mysterious inner workings of the Order Table!

Carl Ferreira

p.s. -- Sony, if my explanation is in any way inaccurate, please feel free to point out my errors.

Or review this and validate it! ===== Ok this may seem like a dumb question, but I am rather confused by how the OTs work. In the manual the OT is defined as an array. Now if I understand correctly, each entry in an OT points to a primitive. And each of these primitives can in turn point to another primitive through their \*tag field. Now this makes sense for function like AddPrim(). However I don't understand how CatPrim and AddPrims() work in this context. How can an OT be concatenated or inserted into another OT? How do you insert an array into another array? I mean is tht OT really an array or a linked list? From the manual and how they talk about being able to regard OT as a null primitive, and being able to create a linked list of primitives and use it as an OT, seem to imply that OT is simply a linked list.

---

2/22/96 5:53 PM

Re(2): Dumb OT Question

Teh Kao Yang

LIBGPU

Thanks for the extremely comprehensive answer!!! Now everything is much clearer to me.

-TK

---

2/22/96 2:20 PM

Re: Back Face for Primitives and TMDs

player 1

LIBGPU

If you are using LibGTE and not GS, then you can use either the RotTransPersNorm calls, or you can use NormalClip which takes 3 screen coordinates as input and returns the normal. You can then decide whether to add these to the ordering table.

---

2/23/96 10:35 AM  
LIBGTE.H on LIB3.4  
Jose R. Villeta  
LIBGTE

Thomas Boyd

Recently, we upgrade to 3.4 latest release, and found that libgte.h has eliminated the read GTE macros if ASSEMBLER not defined. Please make a note of it for future releases so we don't have to paste from older libraries.

---

2/23/96 11:15 AM  
Urgent: GTE 16-bit limit  
Carl Ferreira  
LIBGTE

Help!

I am trying to perform an ApplyMatrixLV and the results go crazy when the input vector values exceed +/- 32k.

My understanding of ApplyMatrixLV was to multiply a 32-bit number by a 16-bit rotation to obtain another 32-bit number. What seems to be happening is that you can pass in a 32-bit number, but the components can only be 16-bit.

What is going on. Am I hosed?

Urgent reply is needed. This is a show-stopper.

Carl Ferreira

---

2/27/96 5:01 PM  
Re: LIBGTE.H on LIB3.4  
Thomas Boyd  
LIBGTE

noted and sent to library engineers for repair.

T

---

2/27/96 4:58 PM  
Re(2): Dumb OT Question  
Thomas Boyd  
Carl Ferreira  
LIBGPU  
Carl has it right.  
Tom

---

2/28/96 11:35 AM  
Weird texturing bug?  
Teh Kao Yang



Art Tools

We have noticed that when we try to apply a texture that has an odd-numbered width, an extra white(blank) pixel line is added to the texture. Why does this occur?

-TK

---

2/28/96 10:34 AM

Fwd: Excessive draw time

Rob Vawter

LIBGPU

My problem has to do with the time to draw an ot. In the psx directory there is a directory called profile. If you have tried to use this source in any shape or form, you'll know that you can measure how long portions of your code take to run. Knowing that approximately 263 ticks on the counter represent 1 / 60 second (amount of time to display screen), you will have a fair idea of what fraction of processing time you will be taking up.

The problem I have has to do with an abnormal amount of processing time being taken up for an unknown reason. I measure the time before a DrawSync(0) and the time after that DrawSync(0). This is the DrawSync we are using in our central display function and is probably waiting for the central ordering table to get done being drawn. I have been getting different results for various screens : t1 = 244, t2 = 244; t1 = 62, t2 = 63; and so on. On one of my screens however I am getting t1 = 82, t2 = 256. Any ideas on what might cause the drawing of an ordering table to take so much more time.

To give you more background, this screen uses approximately 137 primitives and 114 textures (similar numbers to another screen we are using, but no problem for that screen). Another thing worth noting is that if we get rid of a few primitives and textures and we start to get numbers like t1 = 80, t2 = 81.

Thanks again for any help,

Gordon Read NuFX, Inc.

---

2/29/96 2:03 AM

LoadTPage

Lobotomy Software

LIBGPU

Does anyone know if LoadTPage is a blocking or non-blocking function?

The docs say it is blocking, but it acts like a non-blocking function...

thanks, Jeff Blazier

---

2/29/96 10:58 AM

Re: LoadTPage

Dan Burnash

LIBGPU

Lobotomy Software

LoadTPage uses LoadImage, which is non-blocking, so the result is that LoadTPage is non-blocking.

Dan Burnash

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2/29/96 6:20 PM  
Re(2): Dumb OT Question  
Silas S. Warner  
LIBGPU

Carl has made an excellent explanation of how OTs are handled, with one minor bug. If an OT consists of entries E0,E1, and E2, the list is linked  
E2->p5->E1 E1->p4->p3->E0 E0->p0->p1->p2->EOL  
In other words, the highest numbered entries in the linked list will be accessed first, pointing down to lower numbered entries, and finally to entry 0. If you'll think about it, this makes sense, since as the GPU follows the OT list it will draw the farthest primitives first, then overwrite them with nearer primitives.  
Other than this minor point, Carl's explanation is right on.  
Silas Warner

---

3/1/96 2:11 AM  
Re(2): LoadTPage  
Lobotomy Software  
Dan Burnash  
LIBGPU  
thanks for the info!  
I suspected LoadTpage was acting like a non-blocker.  
Thank again, Jeff Blazier

---

3/7/96 6:43 PM  
Re(3): Re:How to set color mode  
Dean M. Grandquist  
LIBGPU

You can get much faster tpage setting if you hack the getTPage macro to not call the function GetGraphType(). GetGraphType is a nontrivial function and for us always returned 0, thus a hacked getTPage to look like the following helped us. #define getTPage0(tp, abr, x, y) \  
(((tp)&0x3)<<7) | (((abr)&0x3)<<5) | (((y)&0x100)>>4) | (((x)&0x3ff)>>6) | \ ((y)&0x200)<<2)  
#define getTPage12(tp, abr, x, y) \  
(((tp)&0x3)<<9) | (((abr)&0x3)<<7) | (((y)&0x300)>>3) | (((x)&0x3ff)>>6))  
The other mode for GetGraphType looks like something to support more vram, 2meg instead of 1meg?  
Ta --DeanG

No, you can use the calls GetTPage and GetClut respectively, and it returns the TpageID and the CLUTID needed by the GPU prims. Get Tpage takes the clut mode, the semi-transparency rate, and the x and y locations to return the tpage, and getclut just takes x and y. Also, there are actually 2 GetTPage calls, one with a capital G, one without, and the one without is a macro and is slightly faster then the capital G version.

---

3/7/96 5:54 PM  
Re(2): Re:How to set color mode  
player 1  
LIBGPU

No, you can use the calls GetTPage and GetClut respectively, and it returns the TpageID and the CLUTID needed by the GPU prims. Get Tpage takes the clut mode, the semi-transparency rate, and the x and y locations to return the tpage, and getclut just takes x and y. Also, there are actually 2 GetTPage calls, one with a capital G, one without, and the one without is a macro and is slightly faster than the capital G version.

Tom Ketola PSX Lead Engineer Player 1, Inc. See y'all at the conference!

---

3/7/96 2:13 PM

How to set color mode in GPU primis?

Teh Kao Yang

LIBGPU

Oops the thats prims not primis. Anyway, I just can't figure out how the color mode (4 or 8 or 16 bit) is determined in GPU primitives. There is a way to set the texture page and clut location, but how does it know what color mode it is in? Or is this a really dumb question?

-TK

---

3/7/96 4:16 PM

Re:How to set color mode in GPU primis?

Silas S. Warner

LIBGPU

>Oops the thats prims not primis. Anyway, I just can't figure out how the >color mode (4 or 8 or 16 bit) is determined in GPU primitives. There is a >way to set the texture page and clut location, but how does it know what color >mode it is in? Or is this a really dumb question? > >-TK Well, semi-dumb. The color mode is set by Bits 8 and 7 of the Tpage number: 0x000 = 16-bit 0x080 = 8-bit 0x100 = 4-bit

Silas Warner

---

3/7/96 5:19 PM

Re: Re:How to set color mode

Teh Kao Yang

LIBGPU

Thank for the quick response, but I went back to look through the docs and couldn't find any mention of these bits in the tpage number. How are these bits set? Are there any funtions that set them? Do u have to poke them in yourself?

-TK

---

3/11/96 7:22 PM

Addressing VRAM

Teh Kao Yang

LIBGPU

I am wondering if there is a way to addressing VRAM directly? I mean instead of using LoadImage or those other functions?

-TK

---

3/13/96 3:05 PM  
Examples from conference  
Thomas Boyd  
LIBGTE

GTE\_CONF.ZIP        239K  
LIBGPU/GTE  
Hi,  
Unzip with the -d option  
Tom

---

3/14/96 11:12 AM  
Re: Addressing VRAM  
player 1  
LIBGPU

No, you have to use LoadImage to DMA stuff to VRAM  
Tom Ketola PSX Programmer Player 1, Inc.

---

3/14/96 12:39 PM  
KanjiFntOpen & FntOpen  
Geoffry R. Meek  
LIBGPU

Does anyone know how to close a font stream once it has been opened with KanjiFntOpen or FntOpen? Also, can the location (rectangle) on the screen be changed, once the font is opened?  
Thanx, Ron Maxwell Virtual Music Entertainment, Inc.

---

3/15/96 11:41 AM  
Re: KanjiFntOpen & FntOpen  
player 1  
LIBGPU

I don't know about actually closing one, but I know if you initialize twice it should reload the font into a new VRAM address.

---

3/15/96 5:47 PM  
Re: Problems with Scratch Pad  
David W. Marshall  
Paul Masters  
LIBGTE

Make sure your READRAM and WRITERAM areas in the .C00 debugger config file are setup to access the dcache area.  
You have to put in the dcache addresses or else the debugger will only show 0's in these areas.  
dave

---

3/15/96 1:44 PM  
Problems with Scratch Pad  
Paul Masters  
LIBGTE

For some reason, I cannot write to a scratchpad that I have accessed with `my_struct = (MY_STRUCT *)getScratchAddr (0);`  
MY\_STRUCT is well below the 1K limit, and I can see the data members in the debugger, but if I try to write anything into the struct, I just get 0's.  
I'm not sure if I'm missing a mystery header or whatever. Any suggestions would be GREATLY appreciated.  
Paul Masters ALG

---

3/18/96 10:27 AM  
ReadSZfifo4, szx?  
david eader  
LIBGTE

`ReadSZfifo4 (szx, sz0, sz1, sz2);`  
What is the meaning of the szx param? Watching the values in the debugger, its in the same range of values as sz0,1,2.  
Is it a z-depth, with some additional perspective compensation ? (ie: for two equal zs, the one farthest from center of screen is actually slightly deeper w.r.t viewpoint trig).  
Here's a brilliant idea to ponder: Why not use all that extra white space in the manuals to actually document stuff!  
All the manual sez is that ReadSZfifo4 stores the values of SZX, SZ0, SZ1, SZ2. Gee, i coulda guessed as much...

---

3/18/96 12:12 PM  
Re: Weird texturing bug?  
Michael Koziniak  
Teh Kao Yang  
Art Tools  
>We have noticed that when we try to apply a texture that has an odd-numbered >width, an extra white(blank) pixel line is added to the texture. Why does >this occur?  
>Was this problem occurring in the Materials Editor? Are you still having this problem?  
Michael

---

3/18/96 11:05 AM  
better gte fifo docs?  
david eader  
LIBGTE

Is there a good source of documentation for the gte fifo stuff?  
The overview doesn't address the fifos, and the manual lib refs basically say function foo(a,b,c) takes arguments a,b, and c.  
I'd like to have a decent 'model' of how the gte operates. I'm doing alot of my game development on psx software emulator. (ie. I've written RotTransBlah(), etc...)

This has been really useful, but now I'm starting to "tighten-up" the renderer, using lower-level stuff like the fifo routines.

Instead of littering my renderer with compiler conditionals for psx vs. emulator, I'd like to just emulate everything. Makes the emulator more accurate, less bug-prone, less maintenance, etc.

----- So basically I need to take a step forward from mathematical emulation to hardware emulation. It'd really help to have some documents on the gte registers, protocols etc. Did I miss some faq on gte hardware voodoo? Will there be an addendum to the manuals? Does Pat Buchanan wear rubber undergarments? Is anybody really reading this?  
deader

---

3/18/96 12:08 PM

Re: better gte fifo docs?

player 1

david eader

LIBGTE

Good luck getting any information out of Sony on the hardware. You're better off interrogating developers outside of the BBS, since I'm sure anyone who knows anything they shouldn't is not gonna talk about it here. But anyway, like I said before, good luck getting any information out of Sony, I used to work for them and they still wouldn't tell us anything about the hardware. Tom Ketola PSX Lead Engineer Player 1, Inc.

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3/18/96 3:28 PM

Hacking Sony Libraries

Ayo A. Orimoloye

LIBGPU

What is the current position regarding hacking the Sony libraries? I understand (from the conference last week) GTEMAC.H will NOT be available for assembly programmers. This is a shame as I have been hacking the libraries for months now and for instance I have a similar "home-made" assembly function to "AddPrim" which is faster and which is written in 100% R3000 assembly using registers. Try it - look at the disassembly of AddPrim under the debugger (with optimisation -O4 turned off) within a typical program - one cannot help but noticing how crappy the code is and how the compiler reads a value into v0 from memory on the 5th line and then reads the same exact value again from the same exact location 5 lines later! This routine does not use any COP2 instructions (unlike RotTransPers and the others I have "optimised"! so I believe we SHOULD at least be allowed to use our own routines for this and not have to go through snail C to use GTEMAC.H. I understand the principles behind having everyone go through the libraries and not hit the hardware due to future compatibility issues but we all know that the life-expectancy of consoles cannot be compared to PCs - when was the last time you played a Genesis game on a Saturn? By the time Ultra 64 and M2 hit the streets (which could be anytime now) Sony will be FORCED to scrap the lousy texture-mapping and Gouraud shading and probably the entire GPU and PlayStation 2 will probably have nothing in terms of hardware remotely similar to PlayStation 1. So what would have been the point of all the pathetically slowwww Sony library legal code ?

So let's hit the hardware and enough of these strong arm tactics - the probability of routines like RotTransPers remaining in the libraries when PlayStation 2 arrives is too low to warrant forcing everybody to conform to C. As a matter of fact, I foresee Sony engineers coming up with a totally new GPU capable of mip-mapping and PROPER perspective correct texture-mapping in a few months, making the old system a "Genesis" instantaneously! So let's hack it to bits okay?

---

3/19/96 12:11 PM  
Re: New LoadImage Function  
Dave R. Scheele  
LIBGPU

Add my vote for that function!!!  
Dave

---

3/19/96 8:31 AM  
Near Z / Far Z  
Dave R. Scheele  
LIBGTE

Thomas Boyd

At the recent Dev Con, I asked about obtaining the Near or Far Z (after a RotTransXXX) from the GTE directly, instead of having to read all 3 actual Z's and testing to find the near/far one. Is such a capability available somewhere, and I just missed it in the docs? ;)

Dave

---

3/19/96 12:06 PM  
New LoadImage Function  
Robert w. Calfee  
LIBGPU

I'd like a load image style function that takes an arbitrary rectangle from within a given rectangle of graphics data and loads it into VRAM. something like:

```
LoadImageRect( void * src, RECT *srcRect, RECT *destRect)
```

This will save me a whole lot of time in execution. rwc

---

3/19/96 12:09 PM  
Crashing on ResetGraph call  
John Harris  
LIBGPU

I am trying to update a product using very old libraries to the 3.4 release. After compiling with the new libs, the system locks up at the following location:

In the call ResetGraph(0), just after the label GPU\_cw, execution gets to address \$5C4 and then does this:

```
addiu t0,zero,$200 sll t1,t1,$2 ;t1 had $49, set at GPU_cw, and now = $124 add t0,t0,t1  
;=$324 lw t0,0(t0) ;=$BFA1204C nop jr t0 ;locks up here
```

There appears to be a jump table from \$2fc through \$4bc, and all of these locations contain addresses in the range \$BFAxxxxx, which would appear to be outside the normal address range. (Should they have been \$BFCxxxxx)?

Any idea what's going on?

---

3/20/96 2:00 PM  
Re(2): New LoadImage Function

Dave S. Akers  
LIBGPU

>I'd like a load image style function that takes an arbitrary rectangle from within a given  
>rectangle of graphics data and loads it into VRAM. something like: > >LoadImageRect( void \*  
src, RECT \*srcRect, RECT \*destRect) > I think you would at least have to specify the size of the  
total graphics area rectangle:  
LoadImageRect( void \*src, RECT \*totalsrcRect, RECT \*ArbitrarysrcRect, RECT \*destRect)  
This magical new routine would need this information to know how to find the arbitrary  
rectangle in memory, and to know how far to step in memory between horizontal lines.  
- Dave

---

3/20/96 6:34 PM  
Re: Crashing on ResetGraph call  
player 1  
LIBGPU

Can you post or e-mail the code that comes before the resetgraph(0)? If so, we might be able  
to tell you better what is wrong, I have a feeling that either you're still linking in old libraries or  
something, or there is another call you made that freaked out the GPU? Tom Ketola PSX Lead  
Engineer Player 1, Inc.

---

3/20/96 8:57 PM  
Re: Has anyone incountered problems with DrawSync?  
John Bryant  
Alex J. Garden  
LIBGPU

I am Having exactly the same problem (that is the reason I am here). It appears as if Drawsync  
completely stopped working. If I add an extra VSync(0) everything works fine. Any help  
would be appreciated greatly!!! (The problem seems to occur only when I am adding clipping  
primitives)  
Thanks.  
John J Bryant

---

3/20/96 8:37 AM  
ReadSZfifo4 (szx, sz0, sz1, sz2);  
david eader  
LIBGTE

ReadSZfifo4 (szx, sz0, sz1, sz2);  
What is the meaning of the szx param?

hello?  
Why hasn't anyone answered or even acknowledged my simple question?

deader



---

3/20/96 2:06 PM  
Re(3): New LoadImage Function  
Robert w. Calfee  
LIBGPU

You are correct, sir.  
rwc

---

3/20/96 1:07 PM  
Re: New LoadImage Function  
Michael Koziniak  
Robert w. Calfee  
LIBGPU

>I'd like a load image style function that takes an arbitrary rectangle from within a given  
>rectangle of graphics data and loads it into VRAM. something like: >>LoadImageRect( void \*  
src, RECT \*srcRect, RECT \*destRect) >  
I will pass this request along to our Engineers in Japan.  
Michael

---

3/21/96 3:32 PM  
Re: better gte fifo docs?  
Thomas Boyd  
david eader  
LIBGTE

I think that Tom Ketola has summed it up below, but we are not allowed to divulge much  
hardware info at all. I am trying to get a picture of how the GTE works approved to be posted,  
but there is not much I am allowed to put on it. It may end up looking like a square labeled  
"GTE."

Tom =====>Is there a good source of documentation for the  
gte fifo stuff?

[...]

>The overview doesn't address the fifos, and the manual lib refs basically say function  
foo(a,b,>c) takes arguments a,b, and c.

I'd like to have a decent 'model' of how the [...]

> written RotTransBlah(), etc...)

This has

I suspect he wears underwear made out of the "cro" part of velcro aimed inside.

>een really useful, but now I'm

Click on "History" from the "Message" menu to find out. sTom (who would post more on the  
GTE hardware if he could)

>t>arting >to "tighten-up" the rendere>r, using lower-level stuff like the fifo routines.

Instead of littering my renderer with compiler conditio>nals for psx vs. emulator, I'd like to just  
emulate everything. Makes the emulator more accurate, less bug-pro>ne, less maintainance, etc.

----- So basically I need to take a step forward from mathematical emu>lation to  
hardware emulation. It'd really help to ha>v>e some docu>ments on the gte r>egisters,  
protocols etc.

Did I miss some faq on gte hardware voodoo? Will there be an addendum to the manuals? Does  
Pat Buchanan wear rubber undergarmets? Is anybody really reading this?

deader ===== Good luck getting any information out of Sony on  
the hardware. You're better off interrogating developers outside of the BBS, since I'm sure

anyone who knows anything they shouldn't is not gonna talk about it here. But anyway, like I said before, good luck getting any information out of Sony, I used to work for them and they still wouldn't tell us anything about the hardware.  
Tom Ketola PSX Lead Engineer Player 1, Inc.

---

3/21/96 10:45 AM

Re: OuterProduct0 timing and DotProduct??

stephen chaplin

Travis Hilton

LIBGTE

Yes, a Dot product would be much appreciated! The CPU is so darn slow at doing multiplies (what are they, 12 clock cycles or so, from what I can figure out from the examples in the R3000 manual). It seems rather silly not to have one, how do people do backface elimination (using the GTE)? Another great design decision, at least it's not as bad as the one made by the R3000 engineers with their divide instruction (multiply produces a 64-bit result, but divide will only divide 32 bit quantities, unlike the x86, which has a 64/32 divide, so you can use the result of a large multiply!).

---

3/22/96 1:57 PM

Re(4): Crashing on ResetGraph call

John Harris

LIBGPU

One more piece of new info. I traced one of the other crashes in the program, (and I can only get this far when compiling with 2/8/95 libraries). It dies on a 'new' operator, which I traced through to the malloc call. I believe the malloc call failed and returned 0, and before returning to my main program I traced it into the same location where the ResetGraph call failed. It went to \$5c4 and then wound up at a \$BFAxxxxx address.

John Harris Tachyon Studios, Inc.

---

3/22/96 10:14 AM

Re(2): Crashing on ResetGraph call

John Harris

LIBGPU

> Can you post or e-mail the code that comes before the resetgraph(0)?

There doesn't appear to be any function calls before the ResetGraph(0). Just data setup. I do have additional info that should narrow down what I need to find out.

I thought the reason why the program was locking up was because of jumping into the address range of \$BFAxxxxx, but I traced the ResetGraph() call from the program compiled with the old libraries, and it appears to jump to the same place. (In fact, the jump table addresses from \$2fc-\$4bc are the same even if I go right to the debugger before running any of my code at all). The debugger can't follow the code into that memory address, and shows it as all 0's, but if I just click the Go button, program execution continues and runs just fine when I used the old libraries. With the new libraries, the system will lock up if I press the Go button at the same point. (Target does not respond).

Basically, if I try to StepOver the ResetGraph() call, the system locks up. And I can't step by instruction because I wind up at the \$bfa1204c address. So I have no idea what is going on.

Additionally, even the version compiled with the old libraries does crash at some points, and the debugger says it breaks at

PC = \$BFA1B31C nop 09 Break instruction

The ra, a1 and t3 registers, plus several entries in the stack point to \$BFAxxxxx addresses which I thought was an unmapped address region. (The stack crawler functions report that they cannot determine the scope, and so I can't backtrace anywhere).

-----

Basic questions: Is that address range really unmapped memory? If so, why are the jump table addresses pointing there? Why can the old code seem to run through that region and seem to work correctly, even though the debugger shows it as all 0s. (Is it possible that that whole region is run through as NOPs, and when the CPU finally gets to the ROM at \$BFC00000 it recovers?

I am completely confused about this behavior, and any and all help will be greatly appreciated. This project is supposed to be completed in less than 2 months, and I won't have a chance to succeed unless I can fix these problems in the very near future.

Thanks,

John Harris Tachyon Studios, Inc.

---

3/22/96 7:59 AM

Re: Problems with Scratch Pad

Randy X. Thompson

LIBGTE

> my\_struct = (MY\_STRUCT \*)getScratchAddr (0);

Hmm. I've always referenced the Scratch area with the hardcoded address of 0x1F800000.

Should I be calling getScratchAddr() instead?

-Randy

---

3/22/96 10:17 AM

Re(3): Crashing on ResetGraph call

John Harris

LIBGPU

>There doesn't appear to be any function calls before the ResetGraph(0). Just data setup. >I do have additional info that should narrow down what I need to find out.

One small correction. There was a setRECT() and ClearImage() call before ResetGraph(0), but I tried moving those calls after the ResetGraph and it made no difference.

---

3/25/96 3:07 PM

Re: ReadSZfifo4 (szx, sz0, sz1, sz2);

Thomas Boyd

LIBGTE

david eader

>>ReadSZfifo4 (szx, sz0, sz1, sz2); >>What is the meaning of the szx param?

>>hello?

Hi!

>>Why hasn't anyone answered or even acknowledged my simple question?

It is not that simple. None of the library functions other than ReadSZFifo... use it, and we do not have hardware details on what it does. The info I do have on the hardware says that it is the following:

It is a reg of the GTE that is seldom (actually never) read by the libraries. For RotTransPers, it

contains the same value (z-value of the point) as the other three. For RotTransPers3, it contains a duplicate of sz2

but it does not seem to work this way, so I have sent a message to Japan tech support to find out what it does. Now you and I are both waiting.

>>Here's a brilliant idea to ponder: >>Why not use all that extra white space in the manuals to actually document stuff!

Tom

---

3/27/96 2:30 PM

Re: Shameful SONY libraries!

Sam Black

Ayo A. Orimoloye

Bugs

Sorry, but once again you are mistaken. The ANSI C standard (again, unless this has changed between my printing of K&R covering the draft standard and the adoption of the actual standard) specifies that numbers with leading zeros (1 or more) are to be interpreted as OCTAL. Further, my copy of K&R makes no mention of 0o, o, or x being legal prefixes for integer constants. Specifically: 0NNN -- octal 0xNNN -- hexadecimal 0XNNN -- hexadecimal NNN -- decimal anything else -- error. I don't know which compiler you're used to, but Sony's compiler is pretty much just GNU CC -- a very well tested and standards conforming compiler (when used with the -ansi switch). Whatever else may be wrong with the Sony libraries (and it seems there is a legitimate bug with atoi -- it should always work in base 10), there is nothing wrong with the compilers interpretation of character constants.

---

3/27/96 9:49 AM

Shameful SONY libraries!

Ayo A. Orimoloye

Sam Black

Bugs

Well, in response to the message sent to me by Sam Black replying to my atoi message about octal numbers - I stand corrected. The octal sequence 202 in decimal IS 130! I thought it was converting my DECIMAL number 00202 (which I WANTED to have leading zeros, because I just like doing things like that and it's a free country!) to octal (and getting the result "312" wrong). But I would now clarify the reason for my confusion:

**THE SONY LIBRARIES ARE SO BUGGED IT'S UNBELIEVABLE!**

STANDARD C represents an octal sequence as 0oNNN where NNN is the octal number. You can also represent it as oNNN. Hex numbers are represented as 0xNNN or xNNN.

IMPORTANT: note that 0oNNN is "zero - oh", ie the NUMBER zero and the LETTER oh.

**NOW FOR THE DEPRESSING NEWS:**

SONY C represents octal numbers as 00NNN ie zero-zero! THIS MEANS THAT IF YOU EVER HAPPEN TO HAVE 2 OR MORE LEADING ZEROS FOR YOUR DECIMAL NUMBERS, THEY WILL BE TREATED AS OCTAL!! As a matter of fact, if you have more than one leading zero before your DECIMAL number, it would immediately be "OCTALIZED"!

**I WAS STUNNED!!!!!!**

I tried adding two numbers: 0010 and 002 and I received the result 10 (decimal!). Don't take my word for it - TRY IT YOURSELF!

```
printf("The Sony answer is %d\n", 0010 + 002 );
```

**YOU WILL BE SHOCKED!**

This makes sense if you think of 0010 as 0o10 (octal) which is 8 decimal and 002 as 0o2 which is 2 decimal. Unfortunately, those numbers ain't OCTAL dammit!

Note also Sony that standard C allows oNNN and xNNN for representing octal and hex

numbers respectively but Sony C does not - something to bear in mind for whenever you plan to fix this bug.

---

3/27/96 3:06 PM

Re(2): Shameful SONY libraries! - A retraction

Ayo A. Orimoloye

Sam Black

Bugs

Yep! The "OCTAL USING GUY" has been taken out and shot!

Actually, I found out this was the case when I tried the same test on Borland C++ and got the same result. It actually all started when someone else (always blame someone else when you eat crow) was trying to get filenames with weird names like "001" to "009" on the PSX and was having problems with the atoi function on filenames "008" and "009". I immediately assumed this was Sony's fault but it is actually a "quirk" of C. When PRINTING octal numbers, you use %o (percent-oh) but when specifying them you use a leading 0 (zero). Of course with HEX numbers you use %x when printing and 0x when specifying. Obviously this strange language C was designed to be logical to aliens from Mars.

Due to the fact that I am such an assembly freak (and we have a really old K & R C book in the office) I rarely use C or octal numbers so a thousand apologies to Sony.....

---

3/27/96 3:37 PM

Re(2): Shameful SONY libraries!

Ayo A. Orimoloye

Sam Black

Bugs

Actually, one last thing I must point out:

the Sony atoi function also prints the atoi("0x202") as 514. This is correct right? Wrong! ANSI C does not support hex strings. The correct thing to print out in this case is 0.

In trying to explain the atoi("008") phenomenon, I got a bit carried away. ANSI C (well, okay Borland C++) says it should be 8. If the Sony takes it to octal, (in which case it is meaningless because 8 is not a valid octal digit), it should print 0. This is what happens. My point is the Sony should not be taking this value to octal because ANSI says parameters passed to atoi are DECIMAL. That is why the hex number 0x202 should return a 0 and not a 514.

---

3/28/96 6:29 PM

Re(2): Problems with Scratch Pad

Dan Burnash

LIBGTE

Randy X. Thompson

Check out the macro defining getScratchAddr in libetc.h and I think you can decide which one to use.

Dan Burnash

---

3/29/96 3:30 PM

maybe a bug?

Blake E. Senftner

LIBGPU

Tom Boyd

Debugging some code performing LoadImages, I had a version that tried to LoadImage with a rect set to x=512,y=511,w=32,h=18...

This should have clipped, but it rendered at x=512,y=0,w=32,h=18

Yes, I have clipping set... VRAM WRAPS?!?! And wrapping vertically too?!?!

This will be a very serious problem for us if it is not corrected. I remember the clipping working previously... something broke it?

I use GPU only, no GS routines... I thought VRAM bounds were clipped by the hardware...?

-Blake

---

4/2/96 5:08 PM

Tiling with DR\_MODE

Tony G. Grant

LIBGPU

Hi, I am trying to tile a texture onto a polygon and I do have some problems. Everything is working fine when I use DrawPrim(&dr\_mode) then DrawPrim(&ft4) but as soon as I try to include the dr\_mode in my OT everything is corrupt on screen. Any suggestion?

---

4/3/96 6:42 PM

Re: maybe a bug?

player 1

LIBGPU

As far as I know, VRAM has always wrapped, that's not only why the screen program (the VRAM viewer) works the way it does, but why we're having problems with the same thing now :)...

Tom Ketola PSX Programmer Player 1, Inc.

---

4/5/96 10:00 AM

Re(2): Has anyone incountered

Paul Masters

LIBGPU

I've encountered a very similar problem with DrawSync. My problem appears to be stemming from bad data in my OT. I don't know (even a little) how bad data could be getting into my OT, but I can't Dump the OT data to look at it. If I try, the system simply freaks.

In my system, if I add fairly large objects to the OT at different otz depths, the OT seems to get confused. For no apparent reason. If anyone has any ideas on this problem, I would be extremely appreciative. The only solution I have found so far is to cram objects into their own OTs and draw them. I cannot sort OTs together. I cannot dump primitives into a single OT. All I can do is fill a small OT and draw it. Sorting has to happen on an OBJECT basis.

Paul Masters Lonely Sony programmer

---

4/8/96 1:43 PM

How to close a Fnt stream

Mark DeSimone

LIBGPU

Did anyone ever find out how to close a stream whose id is returned by FntOpen or KanjiFntOpen? I cannot find this anywhere in the docs.  
Thanks for any help.

---

4/8/96 1:37 PM

Quads and coord systems  
david eader  
LIBGTE

I recently tried to convert my psx renderer to use quads instead of tris, for all the obvious optimization wins. But I found it suprisingly difficult.

It seemed that I could not come up with a consistent approach that satisfied both the NormalClip constraints of the gte and the rasterizing of polys in the gpu.

I wrote a .3ds converter, so I'm not using any Sony file formats. Instead, my geometry is in a 3dStudio coordinate space, which is right-handed, while the PSX is left-handed. (Or visa-versa; they are opposites, thats for sure).

When I was using only tris, I just swapped arguments to RotNClip3(), thus effectively flipping my faces, and thus implicitly flipping my normals from .3ds outward norms to PSX inward norms and implicilty converting from right to left. This was incredibly simple and kinda clever, I thought.

But know that I'm trying to use quads, I haven't been able to come up with any system that satisfies both the gte normClip and the gpu rasterizing (the 0-1-2-3 ZigZag Z vertex order). Either NormalCLipping is unstable on boundary cases (polys viewed almost edgewise), or my packets don't satisfy the gpu rasterizing vertex order constraint.

I suspect now that my world geometry MUST be left-handed to satisfy the playstation hardware, but I can't quite formulate in precise mathematical terms why this might be true.

For tris, you can invert your coordinate system by re-ordering the face indices, but for quads, no variant of this little trick doesn't seem to suffice.

The other way to invert a coordinate system (besides re-ordering face indices) is to change the sign of one of the components of your geometry data (x or y or z). This would be a minor pain, so I don't want to do it unless its "mathematically necessary".

Obviously whoever wrote the RSD plugins for 3dstudio dealt with the right-to-left coord system conversion (assuming your conversion tools can produce quads from .3ds). What is the best\correct way to do this?

Is it true, as I suspect, that I have to flip the sign of one of my components? Or doesn't that make any difference (ie: my bug lies elsewhere?).

In other words, is it possible to have a right-handed .3ds world geometry in my game?

Hope this brief explanation isn't too obtuse. I'd love to hear from Sony .3ds software engineers, or anyone that's using quads from a right-handed world coord sys....

deader

P.S. Fundamental question - do your .3ds converters produce quads at all?

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4/9/96 10:06 AM

Re: Quads and coord systems  
Thomas Boyd  
david eader  
LIBGTE

>I wrote a .3ds converter, so I'm not using any Sony file formats. >Instead, my geometry is in a 3dStudio coordinate space, which is right-handed, >while the PSX is left-handed. (Or visa-versa; they are opposites, thats for sure).

PSX is RH

>But know that I'm trying to use quads, I haven't been able to come up with any system >that

satisfies both the gte normClip and the gpu rasterizing (the 0-1-2-3 ZigZag Z vertex order).  
>Either NormalClipping is unstable on boundary cases (polys viewed almost edgewise), >or my packets don't satisfy the gpu rasterizing vertex order constraint.  
The former. This was covered at the conference, so you may have it in the GTE notes. Basically, the NClip checks the first triangle in the quad. If it fails, it chucks the whole quad. If the triangle is almost linear, the GTE knows when the GPU will not draw it and it throws it out without concern for the other tri. You gotta do this:  
if (tri 1 fails NClip) if (tri 2 fails NClip) then throw-quad-away  
>Obviously whoever wrote the RSD plugins for 3dstudio dealt with the right-to-left coord system >conversion (assuming your conversion tools can produce quads from .3ds). > What is the best\correct way to do this?  
I think you already hit it, it is the other problem headaching you.  
>P.S. Fundamental question - do your .3ds converters produce quads at all?  
dunno, I have cc-ed Mike Koziniak for enlightenment from him.

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4/9/96 6:32 PM  
Hi-Res Double Buffering  
John Bryant  
LIBGPU/GTE

Can anyone point me in the right direction towards handling Hi-Res double buffering. There seems to be only a 2 paragraph blurb in the PsyQ Library overview concerning High-Res. Everything works fine at 60 hz but when I jump down to 30 I get flickering (every other frame is black. Everything works fine in 320 x 240 though.) Thanks John J Bryant Realtime Associates, Inc. Seattle Division

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4/10/96 2:55 PM  
Re(2): Quads and coord systems  
david eader  
LIBGPU/GTE

Thanks for the reply. A few notes:  
>PSX is RH Well, yes and no. It is RH wrt x-y-z axis, but since the PSX defines normals as pointing INWARDS, in some sense it's more like a LH coord system.  
Both 3ds and psx are RH, but if you feed 3ds geom to the gte it wont be visible, since all 3ds norms are pointing OUTWARDS (ya know, "normal" normals!). So my hack for tris was to swap the args to RotNclip3(). In a sense this 'trick' converts my RH geometry to LH geometry, just so that my normals point INWARDS, psx-style ("abnormal" normals!).  
This worked fine for tris, but seems to fall apart for quads.  
I can think of three ways to juggle the geometry to acheive inverted normals: 1) Swap args to RotNclip3() (my first attempt, works for tris) 2) Swap any two components (ie: exchanging x and y would convert RH to LH) 3) Negate any one compenent (ie: z = -z)  
I've only tried the first approach so far. This worked fine for tris, but seems to fall apart for quads. Haven't tried the other approaches; I've deferred the quad optimization until I (hopefully) get some free wisdom from somebody.  
It's not that I really want to convert from RH to LH, I just need to twiddle my geometry to invert the NormalClip.  
I tried inverting my logic w.r.t NormalClip return value, but It seems to create that boundary-case instabliity.  
Anyway, I have lots of theories and not enough time to try them all. Hopefully Mike K. will have some insights. I'll post more details once I hear from him.



>The former. This was covered at the conference, so you may have it in the GTE notes. Basically, the NClip >checks the first triangle in the quad. If it fails, it chucks the whole quad. If the triangle is almost linear, the >GTE knows when the GPU will not draw it and it throws it out without concern for the other tri. You gotta do >this: > >if (tri 1 fails NClip) > if (tri 2 fails NClip) then throw-quad-away

I didn't attend the conference (assuming conference info will make its way to printed form soon enough), but I had heard about the NormClip instability. Now, I've seen boundary cases where the edge-wise quads 'flicker', as if NormalClip succeeds/fails on even-odd ticks. Is this the same bug, or something different?

Do you know of actual games that fully utilize quads? I don't mean just for terrain, where you can make gross assumptions about normal clipping, but using quads just like tris for any arbitrary orientable geom (face-by-face clipping).

>dunno, I have cc-ed Mike Koziniak for enlightenment from him.  
Can I e-mail him directly w/ more details?

Thanks again, deader

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4/10/96 11:19 AM  
Re(2): Hi-Res Double Buffering  
Chris E. Reese  
LIBGPU/GTE

If I need to do a LoadImage to the draw buffer in Hi-Res how can I do that? From what I have noticed it seems that LoadImage will transfer to VRAM without taking into consideration the automatic double buffering done in interlace mode. Is this true or is there something I am missing?

Chris Reese Eidetic, Inc.

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4/10/96 8:27 AM  
Re: Hi-Res Double Buffering  
Carl Ferreira  
LIBGPU/GTE

My understanding (Sony, correct me if I'm wrong) is that the 'Hi-Res' mode is interlaced. This means that the entire screen is updated 30 times a second -- the even numbered lines on one scan, the odd numbered lines on the other.

Example:

| Video Frame | Calculate | Render | Screen Redraw | Screen Untouched | 1    |
|-------------|-----------|--------|---------------|------------------|------|
| ODD         | EVEN      | ODD    | EVEN          | 2                | EVEN |
| ODD         | EVEN      | ODD    | 3             | ODD              | EVEN |
| ODD         | EVEN      | 4      | EVEN          | ODD              | EVEN |
| ODD         |           |        |               |                  |      |

For video frame 1, while the GPU is rendering to the screen buffer (EVEN lines only), the ODD lines are being redrawn on the video monitor. The lines which you are rendering (the EVEN ones) are NOT being updated in this video frame. For the next video frame (frame 2), while the GPU renders the ODD lines (which are not refreshed this cycle), the EVEN lines (which were rendered during the last frame) are now being updated, but the ODD lines are not.

The upshot of this is, that unless you can maintain a rock-solid 60 fps frame rate, the screen looks like shit. I suppose that if you could guarantee an unvarying frame-rate of 20 fps, the screen would update in a fair manner assuming 1) that the GPU can update the screen in 1/60th

of a second, and 2) that the change between screens is not excessive, otherwise you will get some sort of interlaced blurring on fast moving objects.

Hope this helps.

Carl Ferreira

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4/12/96 2:32 PM

Re(3): Hi-Res Double Buffering

Blake E. Senftner

LIBGPU/GTE

>If I need to do a LoadImage to the draw buffer in Hi-Res how can I do that? From what I have >noticed it seems that LoadImage will transfer to VRAM without taking into consideration the >automatic double buffering done in interlace mode. Is this true or is there something I am >missing?

Your double buffer still sits in vram as two individual 240 scanline tall buffers. It's the display processor that interleaves the two frame buffers.

Your program logic just has to keep track of which buffer to copy into, the same as with non-interlaced displays.

From my experiece, getting a 60 fps to be rock solid is pretty difficult and still be pushing the machine... If I HAD to have an interlaced display, I'd triple buffer my display and ping pong between two buffers at 60 fps while working on a third. Note that is gives one an interlaced display without having to run at 60 fps... it is up to your logic to figure out keeping the display meaningful with such a set up... the easiest would be 4 buffers, but texture space is all but gone...

-Blake

---

4/14/96 1:05 PM

Fuzz about szx register.

Dave Footitt

LIBGPU/GTE

Hi!

People wonder about the szx, sz0, sz1, sz2 registers in the GTE. It's actually quite simple. If you have a quad, you'd want to use gte\_rtpt(), then gte\_rtps() for the last vertex. After doing this, you have all \*four\* Z-values in these registers, so that gte\_avsz4() can actually work.

That's it.

Paal-Kr. Engstad FUNCOM Oslo A/S engstad@funcom.com

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4/15/96 1:52 PM

Re(4): Hi-Res Double Buffering

Chris E. Reese

LIBGPU/GTE

>>If I need to do a LoadImage to the draw buffer in Hi-Res how can I do that? From what I have >>noticed it seems that LoadImage will transfer to VRAM without taking into consideration the >>automatic double buffering done in interlace mode. Is this true or is there something I am >>missing?

>Your double buffer still sits in vram as two individual 240 scanline tall buffers. It's the >display processor that interleaves the two frame buffers.

>Your program logic just has to keep track of which buffer to copy into, the same as with >non-interlaced displays.

I guess that is where I get a little lost. How do I determine which buffer to copy into with LoadImage since it is in interlace mode? As far as I can tell LoadImage just takes an XY VRAM coordinate and because I don't have two buffers that I am swapping as I do in lo-res mode I can't change the address where LoadImage is dumping stuff.

>From my experiece, getting a 60 fps to be rock solid is pretty difficult and still be pushing >the machine... If I HAD to have an interlaced display, I'd triple buffer my display and ping pong >between two buffers at 60 fps while working on a third. Note that is gives one an interlaced >display without having to run at 60 fps... it is up to your logic to figure out keeping the >display meaningful with such a set up... the easiest would be 4 buffers, but texture space is >all but gone...

Thanks for the triple buffer idea, that was the missing element in our display code. We actually implemented our display code so that we wouldn't have to run at a constant 60 fps to be able to do hi-res. Once I added the triple buffer scheme we have been able to achieve flicker-free display. The only time we get flicker is when it takes longer than a tick to draw a frame.  
Chris Reese. Eidetic, Inc.

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4/15/96 1:14 PM  
DMPSX  
Mark Slemko  
LIBGPU/GTE

Hey the DMPSX.exe always says "fault processing with: 00a06021" for any obj file I give it. I'm using all the new stuff from the sony conference CD from San Jose. What could be going wrong? stephen.

---

4/15/96 10:09 AM  
Dithering?  
Carl Ferreira  
LIBGPU/GTE

Does anyone know if/how to turn dithering on? The DRAWENV structure has a dtd flag, but it doesn't seem to do anything.  
Carl Ferreira

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4/16/96 12:02 PM  
LoadImage in ordering table  
Blake E. Senftner  
LIBGPU/GTE

At the Sony conference, I heard about pending support for a LoadImage() like capability being added to the libs that works through the ordering table...  
any time frame attached to this facility? Next release? I misheard, and it is not going to happen?  
-Blake

---

4/16/96 4:20 AM  
Re: How to close a Fnt stream  
Dan Burnash  
LIBGPU/GTE

I do not believe that you can currently close a fnt stream that has been opened. It may be added in a future version of the libs.  
Dan Burnash

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4/16/96 4:14 AM

Re: DMPSX  
Dan Burnash  
LIBGPU/GTE  
Mark Slemko

This is usually caused by a version conflict between dmplx and the macros files. Check again to make sure all of the files in the bin and include directories are the latest.  
Dan Burnash

---

4/17/96 1:33 PM

VSync Callback  
Chris E. Reese  
LIBGPU/GTE

We are using the Vsync callback for drawing and we have noticed in Interlace mode that we have to put in a delay of about 2-4 milliseconds before the draw otherwise we get screen flash. The delay can happen anywhere just as long as it happens before the actual call to draw the OT. We are doing a DrawSync() and ResetGraph() before the draw takes place, but that delay is still needed.

Does the Vsync callback trigger at the time of the vertical retrace or is it triggering too soon and GPU is not in the right state before I initiate the draw?  
Has anyone else run into this problem?  
Chris Reese Eidetic, Inc.

---

4/18/96 11:28 AM

Re(2): tim utility  
Brett Butler  
Carl Ferreira  
Graphic Art Tools

i filled out my resume. check it out.

ps. I'm about to complete a DOS version tool of "VAGS2VAB.exe"

This would allow you to take your vags and pack them together into a vab FROM DOS. Then from there, just run VABSPLIT.exe to get your .VH and .VB files.

So, if anyone out there is tired of leasing a Mac just to do sound,...here's your tool.

Is anyone interested in this VAB tool?

Send me mail.

:) Bretto

---

4/18/96 8:47 AM

Re: tim utility  
Carl Ferreira  
Brett Butler  
Graphic Art Tools

This is a cruel joke in the worst possible taste. As every PSX programmer knows, VRAM is worth its weight in gold and to taunt us with the possibility of having a noticeably greater

amount of it is a torture beyond words.

Don't toy with me. I know that Black Magic exacts a heavy toll.

Now-- on the off-chance that you are serious, why not post the methodology used and we'll let you know if it would actually help us in a real situation.

BTW-- Who the Hell \*are\* you, anyway? This seems to be your first posting and there is no resume on file for you.

Carl Ferreira (resume on file, albeit brief) =====>Just a little feeler here.

>>Would anyone be interested in a Sony Utility that would allow you >to go through your texture art files and replace those Vram & Dram >memory eating textures with just a few bytes of data? [snip] >This package would include all structure formats, examples how to >load in, AND the tool is Visual in nature. You could take all your >textures that your artist or your publisher dumped on ya, and toss >out the unneeded ones. >>This puts a major smile on your face when it comes time to make >room in Dram & Vram for all those model textures you're using. >>-Lemme know if this is something you would be interested in.

---

4/18/96 8:19 AM

tim utility

Brett Butler

Graphic Art Tools

Just a little feeler here.

Would anyone be interested in a Sony Utility that would allow you to go through your texture art files and replace those Vram & Dram memory eating textures with just a few bytes of data? ex: converts .tims to a new file format that only a few of the new files actually contain a texture, which saves memory BigTime.

1. Texture remains the same (keep this texture).
2. Texture and Texture (keep this texture, and reference another one that would be on top of it at a varied translucency level. Which is all stored in the new file.) (This is Great for Gun shots/burns/holes on textures & saves memory!)
3. Texture combined with flat shade data to create darkness level in file.
4. Texture combined with gouraud shading data stored in file.
5. Texture tossed, store flat shade data in file instead.
6. Texture tossed, store gouraud shading data instead.

Instead of your models reading .tim files, they would read this new .JAT format.

This package would include all structure formats, examples how to load in, AND the tool is Visual in nature. You could take all your textures that your artist or your publisher dumped on ya, and toss out the unneeded ones.

This puts a major smile on your face when it comes time to make room in Dram & Vram for all those model textures you're using.

-Lemme know if this is something you would be interested in.

:) Bretto

---

4/20/96 8:12 PM

Re: Dithering?

Dylan Cuthbert

LIBGPU/GTE

Check again.. it does make a difference, especially if you take a close look at some gouraud polygons.

I personally prefer dithering to be switched off - it gives a much cleaner look.

Dyl

---

4/22/96 12:58 PM

Re: LoadImage in ordering table

Dan Burnash

LIBGPU/GTE

Blake E. Senftner

>At the Sony conference, I heard about pending support for a LoadImage() like capability

>being added to the libs that works through the ordering table...

>any time frame attached to this facility? Next release? I misheard, and it is not going to happen?

I have not tried it, but the latest lib 3.4, which is on the release 1.6 programmers cd, does contain the DR\_LOAD primitive. Try it, and let us all know if it works. If not, it will be in lib 3.5 due out ??????

Dan Burnash

---

4/25/96 9:54 AM

Re(2): Dithering?

Jose R. Villeta

LIBGPU/GTE

You can change dither on the fly with the DR\_MODE changes. This is helpful if you want to mix dither and non-dither for smooth rendering specially if you are clut fogging.

Jose Black Ops

---

4/25/96 4:45 PM

GTE overflows

Blake E. Senftner

LIBGPU/GTE

Is there any documentation about what values will generate overflow from various GTE routines?

We've found many problems with these routines, even though they state valid inputs with values like 1.31.0.

Specifically, we just wrote our own VectorNormal routine because it overflows with any component value above 20K. We're trying to locate all places where math is having problems, and our product is very math intense... many formulas using GTE routines...

Even an informal list would be better than tracking every formula that uses GTE calls.

-Blake

---

4/29/96 1:26 PM

Near Z / Far Z

Dave Scheele

LIBGPU/GTE

Well, now that Tom Boyd is gone, I'll have to re-ask this question. Can someone from Sony please look into this ??

Dave

----- cut here -----

At the recent Dev Con, I asked about obtaining the Near or Far Z (after a RotTransXXX) from

the GTE directly, instead of having to read all 3 actual Z's and testing to find the near/far one. Is such a capability available somewhere, and I just missed it in the docs? ;)  
Dave

---

4/30/96 11:58 PM  
Adding DR\_LOAD primitive to OT  
John Bryant  
LIBGPU/GTE

The DR\_LOAD primitive is in the header file, and the SetDrawLoad function is there, but I see no pointer to the memory address you wish to load from in memory. How do I achieve this. (All SetDrawLoad wants is a pointer to the primitive and a pointer to RECT. Neither of these 2 structures contain a pointer to a memory area.) This is important since I need to have this working soon. Thank you  
John J Bryant Realtime Associates

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5/3/96 5:50 PM  
RotTrans() questions  
Blake E. Senftner  
LIBGPU/GTE

We use RotTrans() for non-perspective vector\*matrix operations...  
I was wondering why no RotTrans3() routine exists.  
In getmac.h I see the define for RotTrans as being:  
gte\_RotTrans(r1,r2,r3) \ { gte\_ldv0(r1); \ gte\_rt0; \ gte\_stlwnl(r2); \ gte\_stflg(r3); \ }  
while the define for gte\_RotTransPers3 is:  
gte\_RotTransPers3(r1,r2,r3,r4,r5,r6,r7,r8,r9) \ { gte\_ldv3(r1,r2,r3); \ gte\_rtpt0; \  
gte\_stsxy3(r4,r5,r6); \ gte\_stdp(r7); \ gte\_stflg(r8); \ gte\_stszotz(r9); \ }  
So, from this I guess gte\_ldv0 loads a single vector, while gte\_ldv3 loads three vectors into the GTE's registers.  
the gte\_rt0 does a RotTrans operation with the GTE while gte\_rtpt0 does a RotTransWithPerspective...  
What does gte\_stlwnl(r2) stand for? I wonder if it would be possible to create a RotTrans3 routine, somewhat like RotTransPer3. I understand what the gte\_stsxy3(r4,r5,r6), gte\_stdp(r7), gte\_stflg(r8) and gte\_stszotz(r9) macros do for RotTransPer3(), but I do not entirely understand gte\_stlwnl(r2)...  
Is that "store long vector N-something L-something"?? What is the "nl" refer to?  
I looked for a gte\_stlv3, or something like it, but could not find anything. I would LOVE some more info in the area, I would mean a 3 fold increase in our non-perspective vector\*matrix operations if we could do three vectors at a time.  
-Blake

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5/3/96 7:10 PM  
Re: RotTrans() questions  
John Phua  
LIBGPU/GTE

Hi Blake,

At this time we are unable to find out what exactly the NL of gte\_stlvnl(r2) means. We will contact SCE next week since they are on holiday this week. All we have is what is documented in the update 3.2 book which is "Store Vector from 32-bit universal register.

On your second question: The gte does not allow the support of a RotTrans3 routine.

John

---

5/7/96 6:53 PM

TPageID

Christopher Deel

LIBGPU/GTE

What are the meanings of the bits in a Tpage ID?

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5/9/96 12:46 PM

Re: Adding DR\_LOAD primitive to OT

Mike Fulton

LIBGPU/GTE

The DR\_LOAD primitive is in the header file, and the SetDrawLoad function is there, but I see no pointer to the memory address you wish to load from in memory. How do I achieve this. (All SetDrawLoad wants is a pointer to the primitive and a pointer to RECT. Neither of these 2 structures contain a pointer to a memory area.) This is important since I need to have this working soon. Thank you

John J Bryant Realtime Associates

SetDrawLoad Initialize LoadImage primitive

SYNOPSIS void SetDrawLoad(DR\_LOAD \*p, RECT \*rect)

ARGUMENT p primitive pointer rect rectangle to be translated

DESCRIPTION SetDrawLoad initializes DR\_LOAD primitive which is linked to the OT to execute as same as LoadImage(). NOTE Maximum pixels to be translated must be less than 48byte. RETURN VALUE none

I think sample code is the best documentation. This sample uses DR\_LOAD primitive to change CLUT of the ball. -----

```
#include <sys/types.h> #include <libetc.h> #include <libgte.h> #include "libgpu.h"
```

```
#define OTSIZE 1 #define MAXOBJ 4000
```

```
typedef struct { DRAWENV draw; DISPENV disp; u_long ot[OTSIZE]; DR_LOAD  
load[MAXOBJ]; SPRT_16 sprt[MAXOBJ]; } DB;
```

```
typedef struct { u_short x, y; u_short dx, dy; } POS;
```

```
#define FRAME_X 320 #define FRAME_Y 240 #define WALL_X (FRAME_X-16) #define  
WALL_Y (FRAME_Y-16)
```

```
static void init_prim(DB *db); static int pad_read(int n); static int init_point(POS *pos); static  
int cbvsync(void);
```

```
main() { POS pos[MAXOBJ]; DB db[2]; DB *cdb; int nobj = 1; u_long *ot; SPRT_16 *sp;
```

```
DR_LOAD *lp; POS *pp; int i, cnt, x, y;
```

```
PadInit(0); ResetGraph(0); SetGraphDebug(0);
```

```
SetDefDrawEnv(&db[0].draw, 0, 0, 320, 240); SetDefDrawEnv(&db[1].draw, 0, 240, 320, 240);
```

```
SetDefDispEnv(&db[0].disp, 0, 240, 320, 240); SetDefDispEnv(&db[1].disp, 0, 0, 320, 240);
```

```
FntLoad(960, 256); SetDumpFnt(FntOpen(16, 16, 256, 200, 0, 512));
```

```
init_prim(&db[0]); init_prim(&db[1]); init_point(pos);
```



```

VSyncCallback(cbvsync); SetDispMask(1);
while ((nobj = pad_read(nobj)) > 0) {
    cdb = (cdb==db)? db+1: db;
    ClearOTag(cdb->ot, OTSIZE);
    ot = cdb->ot; sp = cdb->sprt; lp = cdb->load; pp = pos; for (i = 0; i < nobj; i++, sp++, lp++,
pp++) { if ((x = (pp->x += pp->dx) % WALL_X*2) >= WALL_X) x = WALL_X*2 - x; if ((y =
(pp->y += pp->dy) % WALL_Y*2) >= WALL_Y) y = WALL_Y*2 - y;
    setXY0(sp, x, y); AddPrim(ot, sp); AddPrim(ot, lp); } DrawSync(0); cnt = VSync(0);
/* wait for V-BLNK (1/60) */ PutDispEnv(&cdb->disp); PutDrawEnv(&cdb->draw);
DrawSync(0); DrawOTag(cdb->ot);
    FntPrint("sprite = %d\n", nobj); FntPrint("total time = %d\n", cnt); FntFlush(-1); }
PadStop(); return(0); }
#include "balltex.h"
static void init_prim(DB *db) { u_short clut[32]; RECT rect; SPRT_16 *sp; DR_LOAD *lp;
int i, j;
    db->draw.isbg = 1; setRGB0(&db->draw, 60, 120, 120); db->draw.tpage =
LoadTPage(ball16x16, 0, 0, 640, 0, 16, 16);
    for (i = 0; i < 32; i++) clut[i] = LoadClut(ballcolor[i], 0, 480+i);
    setRECT(&rect, 0, 480, 16, 1); for (lp = db->load, sp = db->sprt, i = 0; i < MAXOBJ; i++, sp++,
lp++){ SetSprt16(sp); SetSemiTrans(sp, 0); SetShadeTex(sp, 1); setUV0(sp, 0, 0); /*sp-
>clut = clut[i%32]; */ sp->clut = clut[0]; /* init DR_LOAD primitive */ SetDrawLoad(lp,
&rect);
    for (j = 0; j < 8; j++) lp->p[j] = ballcolor[i%32][j]; } }
static init_point(POS *pos) { int i; for (i = 0; i < MAXOBJ; i++) { pos->x = rand(); pos->y =
rand(); pos->dx = (rand() % 4) + 1; pos->dy = (rand() % 4) + 1; pos++; } }
static int pad_read(int n) { u_long padd = PadRead(1);
if(padd & PADLup) n += 4; if(padd & PADLdown) n -= 4; if(padd & PADselect) return(-1);
limitRange(n, 1, MAXOBJ-1); return(n); }
static int cbvsync(void) { /* print absolute VSync count */ FntPrint("V-BLNK(%d)\n", VSync(-
1)); }

```

---

5/9/96 12:28 PM

DMPSX info..  
Andy Hsiung  
LIBGPU/GTE

Where can I find information on how to use DMPSX? From the docs I have(from the conference, etc.), I'm able to run DMPSX on my object files before I link them. However, whenever I run my program, I get a reserved instruction error in the debugger. Thanks for any help.

---

5/9/96 9:47 PM

Perspective calculation  
Ken Bretschneider  
LIBGPU/GTE

I've got a couple questions that hopefully someone can help me with:

1) What formula is used to compute the perspective distortion in screen space? Or is there a function that only computes the perspective distortion (without being forced to compute

rotation or transformation)

2) What do the flag bits represent in RotTransPers? (or where do I find this info).

3) In the libgs (sorry to post this in this forum) is there a way to force the polygons to be sorted by closest or farthest Z rather than the average Z values for the Polygon?

Thanks for any help you can give me,

Greg Bennett Morpheus Interactive (801)224-8228

---

5/9/96 12:58 PM

Re: TPageID

Mike Fulton

LIBGPU/GTE

What are the meanings of the bits in a Tpage ID?

I'm not sure I understand what you want to know. The 'tpage' parameter used by several structures and returned by GetTPage() is simply an identifier used to reference the specific part of VRAM used to identify a particular texture. I don't think the individual bits have any specific purpose other than contributing to the overall value.

Can you provide more information for what you're doing and what context this question goes into?

Mike @ SCEA

---

5/10/96 2:19 PM

DR\_ENV primitive

Phil Weeks

LIBGPU/GTE

Curious if anyone has encountered any problems with DR\_ENV primitive in libraries since lib3.1 We used the DR\_ENV primitive in the first release of our game to do two player split screen, adding the DR\_ENV primitive to the OT after drawing the top half of the screen. All the libraries since do not seem to support the DR\_ENV primitive. Anyone got any help?

---

5/12/96 4:07 PM

Re(2): TPageID

Jay Stelly

LIBGPU/GTE

>>What are the meanings of the bits in a Tpage ID?

>I'm not sure I understand what you want to know. The 'tpage' >parameter used by several structures and returned by GetTPage() >is simply an identifier used to reference the specific part of VRAM >used to identify a particular texture. I don't think the individual >bits have any specific purpose other than contributing to the >overall value.

Take a look at the getTPage() macro in LIBGPU.H. The tpage ID contains the texture mode (4-bit,8-bit,etc) alpha blending rate, and partial x & y coords in vram.

Jay Stelly Tetragon

---

5/13/96 12:56 PM

Preprocessor flag to turn optimization on/off???

Dave Howell

LIBGPU/GTE

I'm having a problem with optimization.

From C, I'm calling RotTransPers4\_nom, which for some insane reason of its own returns two values (flag and sxsy0) in registers v0 and v1, respectively. I've tried to write an inline assembly macro to read v0 and v1, and they work just fine with optimization OFF, but when we crank it up to level 3, my v0 and v1 don't get read correctly because they're being used for something else.

So is there a preprocessor flag I can just use to turn optimization OFF before calling RotTransPers4\_nom, and then restore it to its original setting afterward?

Dave Howell Pablo Media

---

5/13/96 12:59 PM

Documentation on GTE macros???

Dave Howell

LIBGPU/GTE

Will there ever be any real documentation on the GTE macros?

Dave Howell Pablo Media

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5/15/96 4:33 PM

Transparency rate on non-textured polygons

Randy X. Thompson

LIBGPU/GTE

Can I set the transparency rate of a non-textured polygon (i.e., a POLY\_F3 or POLY\_F4)? Seeing that transparency rates are set by a primitive's tpage member and a POLY\_Fx has no tpage, I see no obvious solution. I tried changing the draw environment's default tpage via DR\_MODE to reflect the transparency level I want, but this doesn't appear to help.

Any ideas?

-Randy

---

5/16/96 4:56 PM

Re: Transparency rate on non-textured polygons

Lobotomy Software

LIBGPU/GTE

Make sure the dr\_mode primitive executes before the primitive you want to be translucent. Insert it at the same node in the OT, but after you insert the target primitive (if using addPrim). This will insert it just before the target primitive in the OT linked list.

Jeff Blazier, Lobotomy.

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5/17/96 7:43 AM

Re(2): Transparency rate on non-textured polygons

Randy X. Thompson

LIBGPU/GTE

Lobotomy Software writes: Make sure the dr\_mode primitive executes before the primitive you want to be translucent. Insert it at the same node in the OT, but after you insert the target

primitive (if using addPrim). This will insert it just before the target primitive in the OT linked list.

Jeff Blazier, Lobotomy.

I'm almost positive I inserted the DR\_MODE primitive correctly, but it doesn't seem to affect the translucency rate of a POLY\_F4. Have you successfully used this method to alter the translucency rate of a non-textured polygon?

-Randy

---

5/22/96 5:51 PM

Re(5): Hi-Res Double Buffering

John Bryant

LIBGPU/GTE

I assume that in order to triple buffer you must be using a resolution lower than 540 x 480 (ie 320x240).

Any info on this would be appreciated (i am currently trying to implement a 640 x 480 hi res display and not have to keep up with 60hz). It's ok, but i run out of texture space and have to load from ram. That is when I get the performance hit.

Thanks

John J Bryant

---

5/23/96 3:05 PM

Re(6): Hi-Res Double Buffering

Mike Fulton

LIBGPU/GTE

John J. Bryant,

In order to triple-buffer, you have to use any resolution that allows you to fit 3 screens into the 1024x512 VRAM area. So 320x240 would work fine, as you could place the 3 screens side by side to take up a 960x240 area.

Triple buffering is normally used when you are spending a significant amount of time waiting around after drawing a frame before you can switch it into the display. With a 3rd buffer you can start drawing into it while the 1st buffer is being shown and while waiting to switch to buffer #2.

I don't quite understand how the question of triple buffering goes along with your statement that you are trying to implement a 640x480 display and that you are running out of space for textures.

Mike

---

5/23/96 6:29 PM

tiling sizes on poly\_ft4

Dennis Harper

LIBGPU/GTE

I am trying to tile some POLY\_FT4 polygons on the PSX. I am setting a RECT for the width and height and calling SetDrawMode to create a DR\_MODE structure. I then add this to my ordering table after I add my polygon.

What I have noticed is that it seems that only widths and heights that are equal to  $2^X$  (i.e. 2, 4, 8, 16, 32, 64, 128) seem to work. All the other values seem to give weird results. I saw nothing in

the documentatation that seemed to suggest that only certain values can work. What is going on?  
Garrett Jost

---

5/23/96 7:55 AM  
Transparency Rates  
Randy X. Thompson  
LIBGPU/GTE

Is there any way to change the level of transparancy for a POLY\_F3 or POLY\_F4? If yes, how?  
Any help here would be appreciated.  
-Randy

---

5/23/96 3:49 PM  
Re: Transparency Rates  
Mike Fulton  
LIBGPU/GTE

Is there any way to change the level of transparancy for a POLY\_F3 or POLY\_F4? If yes, how?  
Any help here would be appreciated.  
-Randy X. Thompson  
Are we talking about flat-shaded polygons here? Not texture-mapped? I don't think there's any way to do that, because transparency is set at the texture level, not at the primitive level. Perhaps what you could do is have a very small texture filled with the desired color and use textured polys with it. You can do it as a small 4-bit texture with a 16-color CLUT. This will use the minimal amount of VRAM.  
Transparency is controlled by a texture's CLUT. So if you have multiple polygons with the same texture, and you want them to have different levels of transparency, then you'll have to make copies of the CLUT.  
Make as many copies of the CLUT as you need, and set up each one for the desired transparency. Be sure to make one that is an exact copy of the original, because we'll be overwriting the original. When building your primitive list, include a DR\_MOVE primitive to move the correct clut for the desired transparency into the position of the original clut, followed by the POLY\_FT3 or POLY\_FT4 primitive. (Or POLY\_GT3 / POLY\_GT4).

Mike

---

5/24/96 2:31 PM  
Re(3): Transparency Rates  
Kirk Bender  
LIBGPU/GTE

We made semitransparent POLY\_F4s. make a separate DR\_MODE prim for each F4. When initializing, do a SetSemiTrans on the F4, then get a tpage pram from a GetTPage, and use it in a SetDrawMode on the F4's DR\_MODE prim. When drawing, add the F4 prim first, then its DR\_MODE prim in the same OT slot.  
Note the man page for the GetTPage says that the rate is also effective on non textured primitives.  
hope this helps.

kirk

---

5/24/96 11:54 AM  
Re(3): Transparency Rates  
Jay Stelly  
LIBGPU/GTE

>Is there any way to change the level of transparency for a POLY\_F3 or >POLY\_F4? If yes, how?  
Any help here would be appreciated.

>-Randy X. Thompson

>>Mike Fulton writes: >>Are we talking about flat-shaded polygons here? Not texture-mapped? I >>don't think there's any way to do that, because transparency is set at the >>texture level, not at the primitive level.

>Yes, non-textured polygons (thus the reference to POLY\_F3 and >POLY\_F4). Perhaps I was more clear in my previous message dated >5/15/96.

In that case, the only way I've found to get it working is to create a new primitive by merging a DR\_MODE primitive with margePrim() Then link these in to your OT as if they were a single POLY\_F4. Set the DR\_MODE's tpage to whatever blending rate you want. Unfortunately, there's no way to create these with the artist tools, so you'll have to do it in code. If you're using specialized rendering routines that rely on sequential arrays of the same type of primitive you'll take a performance hit as well, unless your entire object is made up of merged-prims.

Usually I just have the artist apply some texture to it and handle it that way, but in some situations that's not ideal so I'll create the new primitives.

The other downside is that if you're looking for a library routine that will render/rasterize those things (GsPrst, GsTMD, etc.) you're out of luck.

Jay Stelly Tetragon

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5/24/96 9:23 AM  
Re(3): Transparency rate on non-textured polygons  
Lobotomy Software  
LIBGPU/GTE

I have successfully made a non-textured poly translucent. I use this effect to do full screen color flashes. I'll try to find a reasonable code segment to send you...

Jeff Blazier

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5/24/96 8:37 AM  
Re(2): Transparency Rates  
Randy X. Thompson  
LIBGPU/GTE

Mike Fulton writes: Is there any way to change the level of transparency for a POLY\_F3 or POLY\_F4? If yes, how? Any help here would be appreciated.

-Randy X. Thompson

Are we talking about flat-shaded polygons here? Not texture-mapped? I don't think there's any way to do that, because transparency is set at the texture level, not at the primitive level.

Yes, non-textured polygons (thus the reference to POLY\_F3 and POLY\_F4). Perhaps I was more clear in my previous message dated 5/15/96.

Transparency is controlled by a texture's CLUT. So if you have multiple polygons with the same texture, and you want them to have different levels of transparency, then you'll have to

make copies of the CLUT.

Certainly a texture's CLUT affects the color intensity of a transparent texture, but I'm looking to change the transparency rate (50%, 25%, whatever)--there is a difference. As stated in my previous message, this value is set by bits in a primitive's tpage element, not its CLUT. And, as you know, a non-textured polygon doesn't have a tpage member.

Page 102 of the Run-Time Library 3.0 / Overview manual states "The same rate is applied to primitives that do not perform texture mapping," so I guess that means the transparency rate is hard-wired to something like 50%. Obviously I can draw a single-color polygon by using a textured primitive and setting its ux and vx elements to point to a single pixel; and then change the transparency rate to my heart's desire. I was hoping to avoid that hack.

-Randy

---

5/28/96 12:35 PM

Re(5): Transparency Rates

Ayo A. Orimoloye

LIBGPU/GTE

Randy X. Thompson

I would like to contribute this to the transparency (or translucency to use the correct English term) discussion.....

Whilst working in England I discovered a "trick" with transparency rates on flat-shaded polys such as POLY\_F3s and POLY\_F4s. (Mike Fulton please note that non-textured polys CAN be made transparent just like textured ones - transparency is NOT set at texture level). Sony says the RGB values range from 0 - 128 (0 - 0x80). I discovered that trying numbers HIGHER than 0x80 ranging from 0x80 to 0xFF (since storage space for RGB values in the primitives are BYTE locations) resulted in BRIGHTER colours when you go above 0x80. Strange - Sony seems to think you can only use numbers from 0 to 0x80. Anyway, getting back to the main point - when you use SetSemiTrans to make the POLY\_F3 or POLY\_F4 transparent, as you observed this seems to do a 50/50 transparency only- 50% foreground and 50% background. What you need to do is vary the R, G, and B values PROPORTIONATELY to make the polygon lighter or darker whilst remaining (roughly) it's original colour. This would then appear to vary the transparency level.

For instance if you have a poly with RGB 0x0, 0x20, 0x60 which is a torquoise colour, you could use SetSemiTrans( &Poly, 1) and then set it's RGBs to 0x0, 0x10, 0x50 or 0x0, 0x60, 0xa0 which would make it darker in the first case (or transparency level of about 60% FG, 40% BG) and washed-out or lighter in the second case (transparency level about 20% FG, 80% BG).

WARNING: The resultant polygon might not look as "proper" as the one from the other solution but it saves you the trouble of having to use a DR\_MODE primitive.

---

5/28/96 8:12 AM

Re(4): Transparency Rates

Randy X. Thompson

LIBGPU/GTE

Jay Stelly writes: In that case, the only way I've found to get it working is to create a new primitive by merging a DR\_MODE primitive with margePrim() Then link these in to your OT as if they were a single POLY\_F4. Set the DR\_MODE's tpage to whatever blending rate you want. Unfortunately, there's no way to create these with the artist tools, so you'll have to do it in code. If you're using specialized rendering routines that rely on sequential arrays of the same type of primitive you'll take a performance hit as well, unless your entire object is made up of merged-prims.

Thanks, Jay. This sounds like just the ticket.

-Randy

---

5/28/96 5:40 PM  
Rewriting ClearOT....  
player 1  
LIBGPU/GTE

I rewrote the clear OT call (which for some reason is taking 1/50 of a second to execute if I use the library calls on a 16k OT, and only 1/200-1/300 of a second if I do it myself), unfortunately, every once in a while and when objects get too close, stuff starts popping in and out and eventually I get a GPU timeout and crash, which makes me think I'm missing something...Anyway, the code looks like this:

```
u_long *otptr,n;  
otptr=db[cdb].ot+OTSIZE-1; for(n=0;n<OTSIZE;n++) { *otptr=(u_long)(otptr)-4;  
*otptr&=0xFFFFFF;  otptr--; } db[cdb].ot[0]=0x00FFFFFF;
```

Is there anything here that I'm missing or does this look right? This should clear it, should it not?

Tom Ketola PSX Lead Engineer Player 1, Inc.

---

5/29/96 2:38 PM  
Re(4): Transparency rate on non-textured polygons  
Dave Howell  
LIBGPU/GTE  
Administrator

Jeff Blazier, from Lobotomy Software, posted some source code for doing semi-transparent non-textured poly drawing. Could somebody please approve that upload so that the rest of us can read it?

Dave Howell Pablo Media

---

5/29/96 4:08 PM  
Near Z / Far Z  
Dave Scheele  
LIBGPU/GTE

Well, it's time once again for my monthly posting of this unanswered question. To the author(s) of the similar question in the LIBGS conference, no fair, I was here first!!

Can someone from Sony please look into this ??

Dave

----- cut here -----

At the recent Dev Con, I asked about obtaining the Near or Far Z (after a RotTransXXX) from the GTE directly, instead of having to read all 3 actual Z's and testing to find the near/far one. Is such a capability available somewhere, and I just missed it in the docs? ;)

Dave

---

5/29/96 3:51 PM  
Re: Rewriting ClearOT....  
Mark D. Lyons  
LIBGPU/GTE



Use ClearOTagR() and a reverse order table instead. Somewhere some manual talks about this routine being supported by the DMA hardware and that ClearOTag() is much slower. My profiler is somewhat crude, I can see down to 1/ but the time for ClearOTagR() on a 4K OT table doesn't even show up.

---

5/30/96 1:47 PM  
Re(2): Rewriting ClearOT....  
player 1  
LIBGPU/GTE

Well, maybe on your profiler, but ClearOtR is taking 1/50 of a second on my profiler with a 16k OT....  
Tom Ketola PSX Lead Programmer Player 1, Inc.

---

5/31/96 6:23 PM  
Re(4): Rewriting ClearOT....  
player 1  
LIBGPU/GTE

I'm not clearing the OT I'm drawing, I place my clear OT code in the same place clearing the same OT I pass ClearOtR....Hmm, I think it might have to do with the fact that some other DMAs are occurring in my page swap routine, which causes the DMA controller to switch DMA types (source chain and slice mode, etc.), which may cause some slowdown. Monday I'm gonna try and rearrange the order things are happening in and see if I can speed it up.

---

5/31/96 9:39 AM  
Re(3): Rewriting ClearOT....  
Mark D. Lyons  
LIBGPU/GTE

There's just no way I can see that taking so long. My profiler works, it's just that it displays bars, not numbers so I can't see down to the 1/200th of a second resolution. I cranked my OT up to 16k entries and the ClearOTagR() now does take up a visible fraction of a VBLANK, roughly 1/10. You are saying that for you however it is taking over 1 full VBLANK, I would suspect something else is going wrong someplace. From the problems you are having with your own clear routine, it sounds like you might be trying to clear the OT that is currently being drawn. Who knows what effect that could have on the ClearOTagR which is supposedly doing something DMA wise which we have no documentation on.

---

6/3/96 12:20 PM  
Some GPU Questions  
Michael K. McCarty  
LIBGPU/GTE

msg.txt 3K  
LIBGPU/GTE

(obviously :)

Hi folks...

Sorry if these questions were asked before...I checked the archives and didn't see anything useful there.

I have a few questions regarding some problems I'm encountering with the GPU 'features':

1) I'm aware of the feature of the GPU that doesn't draw the right or bottom pixels of a texture, and when you flip the texture, you must subtract 1 to get it to draw properly. Now, my problem is when the texture is on the edge of the tpage.

For example, if a texture is at 0,0 of a tpage and I need to flip it horizontally, the UV co-ordinates will go negative. The attached text file illustrates the problem better than I can describe it.

\_Without\_ offsetting my texture by 1 pixel to get the sodding thing to draw properly, how can I fix it with code? I'm quite surprised that this hasn't been discovered before.

2) I'm using the code out of the Overview doc to submit a texture page change command, but it doesn't work. I am merging (er, marging :) a SPRT and a DR\_MODE together, I am using a reverse OT, so the DR\_MODE must be merged to the SPRT. I don't see where my code is incorrect. I'm not getting an error from the MargePrim(), by the way. Can anyone shed some light? I can submit a code fragment if necessary.

If anyone can offer suggestions or comments or whatever, I would be most grateful.

-- Bob Vortex Media Arts

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6/4/96 3:28 PM

Re(2): Rewriting ClearOT....

player 1

Mike Fulton

LIBGPU/GTE

Well, it doesn't seem to matter too much which one I use, both take roughly 1/50 of a second, clearOT taking slightly longer, and clearOTR being slightly faster. I'll try using your code, it makes sense now that I think about it because there is some stuff (sprites, etc.) that get placed in OT[0]. Anyway, thanks for the help, I'm gonna keep messing with it, making the OT smaller, etc. and see what kind of results I get.

Tom Ketola Player 1, Inc.

---

6/4/96 2:19 PM

Re: Rewriting ClearOT....

Mike Fulton

LIBGPU/GTE

The first question I've got is do you mean ClearOTagR() ? Your message is not that specific, but the code in your message is initializing a reverse table so I'm guessing that you meant ClearOTagR().

The library version of the ClearOTagR() function uses the GPU, while ClearOTag() uses a basic loop. I cannot see why ClearOTagR() would take 1/50th of a second, unless there was another DMA operation going on that had to finish first.

Looking at the code you provide, I note that you are placing the 0xFFFFFFFF terminator directly in the table, whereas the library functions set the table to point at the terminator. You mentioned having problems when objects get too close, and that could indicate problems with objects at level 0 of the ordering table, where you've placed the terminator. Maybe your terminator is getting stepped on somehow. That could certainly lead to a GPU timeout and/or crash because the end of the primitive list wouldn't be found by DrawOTag(). Aside from that, your clear routine looks OK.

Just to be safe, I would recommend that you insert a pointer to the terminator into the OT

array, rather than the terminator value itself. Here are my own software-only versions of functions to initialize an ordering table to the same state as what the main library functions do.

Mike

```
-----  
u_long ot_terminator = 0x00FFFFFF;  
void AltClearOTag( u_long *ot, long size ) { register u_long *entry;  
  entry = ot; ot[--size] = (u_long)&ot_terminator; while( size-- ) *entry++ = (u_long)(entry+1) &  
  0x00FFFFFF; }  
void AltClearOTagR( u_long *ot, long size ) { register u_long *entry;  
  entry = ot + (size-1); while( size-- ) *entry-- = (u_long)(entry-1) & 0x00FFFFFF; ot[0] =  
  (u_long)&ot_terminator; }
```

---

6/4/96 12:18 PM

Re: tiling sizes on poly\_ft4

Mike Fulton

LIBGPU/GTE

Garrett Jost: I am trying to tile some POLY\_FT4 polygons on the PSX. I am setting a RECT for the width and height and calling SetDrawMode to create a DR\_MODE structure. I then add this to my ordering table after I add my polygon.

Mike Fulton: I'm not sure I know what you mean by "trying to tile some POLY\_FT4 polygons". Are you trying to repeat a portion of a texture across a polygon? Is that what you meant when you said "trying to tile..."? I'm going to presume that is the case, so please clarify if that's not true.

You are setting a RECT for the width and height of what? You're referring to a POLY\_FT4, but the vertices for a POLY\_FT4 are not stored as a RECT. Do you mean to say that you are passing a RECT for the texture window to the DR\_MODE primitive via the SetDrawMode() call?

Garrett Jost: What I have noticed is that it seems that only widths and heights that are equal to  $2^X$  (i.e. 2, 4, 8, 16, 32, 64, 128) seem to work. All the other values seem to give weird results. I saw nothing in the documentation that seemed to suggest that only certain values can work. What is going on?

Mike Fulton: Once again, assuming you're talking about setting the texture window, then I'll have to look into the question. I cannot find anything that specifies that the texture window set with SetDrawMode() is limited to specific sizes. I've prepared a message to our engineers at SCEI in Japan and I'll let you know what they tell me.

Mike

---

6/5/96 4:58 PM

Re: tiling sizes on poly\_ft4

Mike Fulton

LIBGPU/GTE

Garrett Jost: What I have noticed is that it seems that only widths and heights that are equal to  $2^X$  (i.e. 2, 4, 8, 16, 32, 64, 128) seem to work. All the other values seem to give weird results. I saw nothing in the documentation that seemed to suggest that only certain values can work. What is going on?

Mike Fulton: Here's what Colin at SCE-Europe tells me about this:

As far as I have found, the width and height variables act as masks, ( and are stored as inverted

bit patterns ) and ALL of the values are only stored with 5 bits of accuracy, so only multiples of 8 will have any effect. Because the width & height are masks, they are anded with the co-ords. ( This explains why there are strange results when W&H are not powers of 2 ).

I hope that helps you figure things out.  
Mike

---

6/5/96 4:32 PM  
RotAverage4 Macro  
Christopher Deel  
LIBGPU/GTE

Do you have an example of a gte macro for RotAverage40)?

---

6/5/96 4:13 PM  
Re(6): Transparency Rates  
Mike Fulton  
LIBGPU/GTE

You're right about setting transparency with a DR\_MODE primitive or the SetSemiTrans() call. I'm still figuring some of this stuff out myself, and the fact that it's done differently for non-textured polys threw me.

Sony says the RGB values range from 0 - 128 (0 - 0x80). I discovered that trying numbers HIGHER than 0x80 ranging from 0x80 to 0xFF (since storage space for RGB values in the primitives are BYTE locations) resulted in BRIGHTER colours when you go above 0x80. Strange - Sony seems to think you can only use numbers from 0 to 0x80.

I think there's a misunderstanding here. Where did you see anything that specifies RGB values can range only from 0 to 0x80? There are some sample bits of code that use 0x80 as an example, but I don't think it actually said this was the upper limit.

Mike

---

6/5/96 4:56 PM  
Re: Some GPU Questions  
Mike Fulton  
LIBGPU/GTE

1) I'm aware of the feature of the GPU that doesn't draw the right or bottom pixels of a texture, and when you flip the texture, you must subtract 1 to get it to draw properly. Now, my problem is when the texture is on the edge of the tpage.

For example, if a texture is at 0,0 of a tpage and I need to flip it horizontally, the UV co-ordinates will go negative. The attached text file illustrates the problem better than I can describe it.

\_Without\_ offsetting my texture by 1 pixel to get the sodding thing to draw properly, how can I fix it with code? I'm quite surprised that this hasn't been discovered before.

I think the problem is that you're including the extra blank line when you flip the graphic. Don't do scanline 16, just do the following scanline swapping:

0=15 1=14 2=13 3=12 (original position = new position) 4=11 5=10 6=9 7=8 8=7 9=6 10=5

11=4 12=3 13=2 14=1 15=0

This way scanline 16 is still blank, and you don't change your UV coordinates at all.

2) I'm using the code out of the Overview doc to submit a texture page change command, but it

doesn't work. I am merging (er, marging :) a SPRT and a DR\_MODE together, I am using a reverse OT, so the DR\_MODE must be merged to the SPRT. I don't see where my code is incorrect. I'm not getting an error from the MargePrim(), by the way. Can anyone shed some light? I can submit a code fragment if necessary.

If you are doing anything different because you have a reverse OT, that's the problem. The sample code at the bottom of page 92 in the library overview applies equally to both reversed and non-reversed OTs.

Having a reverse OT only affects which end of the OT array you work from when you draw it or add primitives to it. Within each individual level of an OT, the primitives are inserted and executed in the same order as within a non-reversed OT.

Here is the code fragment from the overview (including a typo correction in the MargePrim() call):

```
typedef struct { DR_MODE mode; SPRT sprt; } TSPRT;  
setTSPRT( TSPRT *p ) { SetDrawMode( &p->mode ); SetSprt( &p->sprt ); return( MargePrim(  
&p->mode, &p->sprt ) ); }
```

Hope this helps...

Mike

---

6/10/96 9:05 AM  
FT4 timing in vblank  
Kerry J. Ganofsky  
LIBGPU/GTE

On my menus, I am running at 640x480, so I re-draw the screen by issuing a DrawOTag in the vertical blank callback. My ordering table and all primitives are double buffered, and they are not getting trashed.

An interesting problem cropped up. When a POLY\_FT4 is the first primitive in the drawing list, the poly renders in a really whacked way on every other frame. The result is, one triangle of the FT4 is rendered fine, the other gets rendered late or not at all. By late, I mean that everything else on the screen is rendered and then this triangle appears on top of the other data. Very strange.

Once again, the primitives are not getting added to two ordering tables by mistake, nor are they getting trashed. The most interesting result is that I can make the first FT4 render correctly by adding in another FT4 in front of it, but this only works if the leading FT4 is a critical number of pixels on-screen, about 4800. This helps prove that the primitive itself is not getting trashed. It seems to be an odd GPU timing thing. This problem crops up even if there isn't alot of rendering going on (i.e. one poly\_ft4 of 320x240 pixels exhibits this problem).

I kinda doubt anyone else has run in to this problem, but if you have, I'd be interested in hearing about it.

Scott

---

6/11/96 11:09 AM  
New Font?  
Geoffry R. Meek  
LIBGPU/GTE

We are currently using the builtin Kanji font to display Japanese subtitles. Does any one know how to change this font or to replace it with a different one? We would like to make it bigger (20 X 20) and thicker lines.

Thanx, Ron Maxwell Virtual Music Entertainment, Inc.

---

6/13/96 3:18 PM

Re: New Font?

Rob Vawter

Geoffry R. Meek

LIBGPU/GTE

Q: We are currently using the builtin Kanji font to display Japanese subtitles. Does any one know how to change this font or to replace it with a different one? We would like to make it bigger (20 X 20) and thicker lines.

A: There is no way to effectively change this font. The libraries don't currently support this possibility. Even if it were possible Changing a 16 x 16 to a 20 x 20 would make an already sub-par font (only "cheap-looking" games in Japan use the built-in font from the information I have heard) look worse. The only way to replace it would be to build your own pre-rasterized kanji at a 20 X 20 size, throw it up on some sprites that you manage....Sorry.

---

6/15/96 1:39 PM

Re(6): Transparency Rates

Randy X. Thompson

LIBGPU/GTE

Ayo A. Orimoloye writes: I would like to contribute this to the transparency (or translucency to use the correct English term) discussion....

Oh yes, I meant to say translucency in my previous posts. (Sorry if that confused anyone).

-Randy

---

6/16/96 3:57 PM

Camera motion in LIBGTE

Ayo A. Orimoloye

LIBGPU/GTE

Mike Fulton

Hi there!

I have been trying to get a camera moving properly in my current game for over a week now.

By 'properly' I mean:

1. Rotating the camera rotates the entire world about the CAMERA's axis.

2. Translating the camera (by changing it's z coordinate for example) moves it forward and backward relative to it's current rotation.

#2 is quite tricky because the Angles and Positions of all objects (as you know) are expressed in WORLD coordinates - including the camera. This means that any motion of the camera (rotation or translation) must affect the Rotations and Translations of every other object for this to work.

I would like to achieve this seemingly impossible task using the GPU or more accurately the GTE libraries only.

Herein lies the problem:

The Sony MATRICES treat the Rotations and Translations differently. This means that all the MulMatrix calls operate only on the 3x3 Rotation matrix and not the 3x4 rotation and translation as one would expect. I tried using an ApplyMatrixLV call to multiply the translation by the rotation but this didn't work properly. I ended up with a "camera on rails" effect - rotation of the world about the camera's axis but translation about the world's axis (the camera didn't move

in the direction it was looking but in the direction the world was looking).

I then tried using my own matrix multiplication routines but they didn't work either - possibly due to the fact that Sony seems to be multiplying their matrices in a different way from everyone else on the planet (ie going from the last column and multiplying backwards, etc). Since all RotTrans instructions depend on the way the RotMatrix is set up, if I used my own "home-made" MulMatrix I would end up with an invalid RotMatrix. The problem is: even after taking apart the MulMatrix0 instruction, I can't tell how the 'COP2 486012' instructions multiply the rows of the matrix in a0 with the columns of the matrix in a1. How is this done?

I have looked in the LIBGTE archives at Carl Ferreira's Object->Camera transformations post of August 29, 1995 and Karen Paik's World Movement post of June 9, 1995 and their methods only seem to solve half the problem - you get the rotation about the Camera's axis but the translation still goes about the World's x,y,z axis (much like a camera on rails). All the examples in the Sony examples have the other type - the camera rotates about the world's axis (much like an orbiting planet) but translates about it's own axis. This includes the spinning earth demo, dinosaur demo, cubes, etc. From the dates of the previous posts I mentioned, it's obvious a lot of people have been trying to crack this problem for a long time. Anyone got it working? The Sony examples are no help whatsoever unless you're writing a demo.

So how is this done? How is it implemented in the GS Library? I strongly believe that the GS Library functions are simply a bunch of strung together GTE library calls so I'm sure this can be done with GTE - you just have to understand what's going on in terms of the matrix math. By the way CompMatrix does not work properly and is not really doing a 4x4 matrix multiplication. I also noticed you can get a "better" 32 bit CompMatrix by using a MulMatrix0 and then an ApplyMatrixLV which seems to be what CompMatrix is doing except instead of ApplyMatrixLV it apparently does an ApplyMatrix (which cuts down it's accuracy to 16-bit translations only). CompMatrixLV anyone?

P.S - my previous games in England (Olympic Summer Games and Olympic Soccer) used a "self-made" 3D system based on 4x4 matrices using 16-15 fixed point math (as opposed to Sony's 1-3-12) and all the matrix calculations were done by the R-3000 and so no RotTransPers nor SetRotMatrix calls were made. This is probably slower than using the GTE but the Camera worked and it allowed simultaneous development on "the other guys" (3DO, Saturn, PC) using the same data from Softimage, similar code, etc. I would like NOT to have to resort to this method with the current game which does not require portability and is drawing an unbelievably large number of Gouraud-shaded textured polys per second at the moment!

---

6/16/96 5:29 PM

Thrashing MulMatrix

Ayo A. Orimoloye

LIBGPU/GTE

Mike Fulton

Hi there!

I would like very much to thrash the MulMatrix instructions and use my own matrix multiplies. This is because using my own multiplies, I can use the R3000 processor to multiply 2 32-bit fixed point (Sony format 1-3-12) numbers and get a 64-bit result in the LO and HI registers and then shift this down by 12 bits. I would thus be able to multiply my Translations by their Rotations and not lose accuracy. I noticed in a Sony Matrix, the Rotation part is a 3x3 16-bit array whilst the translation is a 1x3 32-bit array. I also noticed that between element 3,3 of the Rotation and element 1,1 of the Translation is a pad of 16-bits. The Sony matrix is stored as follows in memory (correct me if I'm wrong):

Half-word offsets (16 bits) 0 2 4 6 8 10 - Rotation (Note: stored as columns then rows - is this correct?) 12 14 16

18 - pad (not used - err am I right to assume?)

Word offsets (32 bits) 20 24 28 - Translation.

Looking at a disassembly of MulMatrix0, it appears the first matrix is loaded into the first 5 registers of the GTE and then the second matrix is loaded in 16-bits column by column (i.e. 0, 6, 12, then 2, 8, 14) and multiplied using a COP2 instruction. What is strange is that (for example) 0 and 6 are combined into one 32-bit word and then 12 is expanded into a word. What I want to know is what does that COP2 instruction do to these words (i.e. what parts of the word in 16-bits are multiplied with what parts of the 1st matrix and in what order)?

I have generated the matrices

```
R00 R01 R02 0 r00 r01 r02 0 R10 R11 R12 0 r10 r11 r12 0 R20 R21 R22 0 r20 r21 r22 0 T0 T1 T2
1 t0 t1 t2 1
```

from PSX matrices and multiplied them using a 4x4 matrix multiplication so that I ended up with

$R00 \times r00 + R01 \times r10 + R02 \times r20$  in the Rotations of the product; and

$T0 \times r00 + T1 \times r10 + T2 \times r20 + t0$  in the Translations of the product; effectively applying the rotation to the translation of the object.

The weird thing is this product matrix does not work with any RotTrans calls so obviously I must be a victim of the Z,X,Y Sony Algorithm For Matrix Multiplication or something. Help!

---

6/17/96 3:51 PM

Re: Thrashing MulMatrix, etc.

Ayo A. Orimoloye

LIBGPU/GTE

Mike Fulton

I have managed to get my own R3000-based MulMatrix function going and have discovered what I suspected to be true - Sony doesn't really do the matrix math the way everyone else does it. This is probably because of the way the RotTrans functions work backwards from Z to X?

Anyway, I have a camera (A) with angle SVECTOR {0, 0, 0} and position VECTOR {0, 0, 0x1000}. I also have an object (B) with angle SVECTOR {0, 0x400, 0} (90 degree Y) and position VECTOR {0x1000, 0, 0x7000}. Here are results obtained using my "home-made" Mulmatrix, Sony's CompMatrix and Sony's MulMatrix0 followed by an ApplyMatrixLV (which is a better way of doing CompMatrix because it allows 32 bit translation vectors):

(Note: The angles are rotated into a matrix using RotMatrix and the positions are added to the matrix using TransMatrix)

Matrix A

```
1000 0000 0000 0000 1000 0000 Rotation (16 bits) 0000 0000 1000
0000 Pad value
```

```
0 0 000010000 Translation (32 bits)
```

Matrix B

```
0000 0000 1000 0000 1000 0000 Rotation F000 0000 0000
```

```
E7FB Pad value (probably meaningless / uninitialized )
```

```
00001000 0 00007000 Translation
```

Product (AXB) using "home-made" MulMatrix which does a 4x4 matrix multiplication taking the ROWS of A X COLUMNS of B:

```
0000 0000 1000 0000 1000 0000 Rotation F000 0000 0000
```

```
0000 Pad value
```

```
0 0 00007000 Translation ****NOTE !!!! *****
```

Product (AXB) using Sony's CompMatrix:

```
0000 0000 1000 0000 1000 0000 Rotation F000 0000 0000
```

```
0000 Pad value
```

```
00001000 0 00008000 Translation *** NOTE!!!! *****
```

The result above was also obtained using MulMatrix0 on the 2 matrices, followed by ApplyMatrixLV on the Matrix A, the VECTOR Translation of Matrix B, and storing the result in the VECTOR Translation of the product matrix. This Translation was then added to the



Translation of A to get an identical result to CompMatrix (except it acts like a CompMatrixLV function).

What becomes obvious is that Sony seems to agree with my math teacher when it comes to calculating the Rotation part of the matrix but the Translations just don't make any sense. Am I missing something?

If I am NOT missing something, it could mean all the ApplyMatrix calls (as well as CompMatrix) do not work "properly". Is this true?

PS You could work it out manually using these 2 matrices:

```
1 0 0 0 0 0 1 0 0 1 0 0 0 1 0 0 X -1 0 0 0 0 0 1 1 1 0 7 1
```

---

6/17/96 4:35 PM

Re(2): Thrashing MulMatrix, etc.

Ayo A. Orimoloye

LIBGPU/GTE

Well, it appears Sony is doing a B x A matrix multiply (i.e. Object X Camera ). From matrix algebra B x A is not A x B. This was the problem.

Any ideas on the Camera motion?

---

6/18/96 3:24 PM

Re(4): Thrashing MulMatrix, etc.

Ayo A. Orimoloye

LIBGPU/GTE

Dylan Cuthbert

Dylan Cuthbert writes:

What exactly is the problem with the camera? I haven't had any problems so far and I'm using the GTE.

Just do a RotMatrix into, say, 'm0', then a RotTrans into 'screen' to set up the rotation and translation matrix. (pass the objectxyz-cameraxyz to the RotTrans)

Do a PushMatrix and then Multiply the object's individual rotation/translation matrix ('m0') with the view/camera's matrix that you set up once per frame (put the result in 'screen') and then do a SetRotMatrix and a SetTransMatrix on 'screen' - remember to pop the matrix when you've finished - if you recursively call the same routine before you pop you get a rotation/translation heirarchy of objects..

Dyl

Well I tried your method (which incidentally - due to the fact that the 1st parameter of RotTrans is an SVECTOR - limits your translations to 16-bits) and it gave the second result I have been having.

I will clarify the camera problem:

I have a Camera C with rotation angle C->a, translation C->t and matrix C->m. I use a RotMatrix to rotate the angle C->a into the matrix C->m. I also use a TransMatrix to add the translation.

I have objects O1 and O2 with angles O1->a and O2->a respectively and translations O1->t and O2->t. They also have matrices O1->m and O2->m.

I set up the object matrices as described above for the camera, and then I use a CompMatrix to multiply the Camera's matrix with BOTH object matrices. At each stage I SetRotMatrix to the products (ie. O1->m \* C->m, O2->m \* C->m) which is what the CompMatrix, MulMatrix functions actually do and not C->m \* O1->m as Sony would have us believe on page 283 of the docs.

Anyway, anytime I move the camera by changing the angle C->a, I get a proper rotation about the CAMERA's axis. Translations HOWEVER remain in the WORLD's axis (which is what yours

did).

Sony's examples do it the other way - rotations go around the WORLD's axis but translations travel along the Camera's axis (such as adding 32 to the C->t[2] for instance.

My question is how do I get the silly thing working properly?

---

6/18/96 10:59 AM

Re(3): Thrashing MulMatrix, etc.

Dylan Cuthbert

LIBGPU/GTE

Ayo A. Orimoloye writes:

Any ideas on the Camera motion?

What exactly is the problem with the camera? I haven't had any problems so far and I'm using the GTE.

Just do a RotMatrix into, say, 'm0', then a RotTrans into 'screen' to set up the rotation and translation matrix. (pass the objectxyz-cameraxyz to the RotTrans)

Do a PushMatrix and then Multiply the object's individual rotation/translation matrix ('m0') with the view/camera's matrix that you set up once per frame (put the result in 'screen') and then do a SetRotMatrix and a SetTransMatrix on 'screen' - remember to pop the matrix when you've finished - if you recursively call the same routine before you pop you get a rotation/translation heirarchy of objects..

Dyl

---

6/18/96 5:24 PM

Re(5): Thrashing MulMatrix, etc.

Dylan Cuthbert

Ayo A. Orimoloye

LIBGPU/GTE

Ayo A. Orimoloye writes: Well I tried your method (which incidentally - due to the fact that the 1st parameter of RotTrans is an SVECTOR - limits your translations to 16-bits) and it gave the second result I have been having.

no, because you subtract the camera's xyz (32 bit) from the object's xyz (32 bit) giving you a 16 bit xyz relative to the camera which is all you need... you reject the object if it is still larger than 16 bit.

I will clarify the camera problem:

I have a Camera C with rotation angle C->a, translation C->t and matrix C->m. I use a RotMatrix to rotate the angle C->a into the matrix C->m. I also use a TransMatrix to add the translation.

I have objects O1 and O2 with angles O1->a and O2->a respectively and translations O1->t and O2->t. They also have matrices O1->m and O2->m.

I set up the object matrices as described above for the camera, and then I use a CompMatrix to multiply the Camera's matrix with BOTH object matrices. At each stage I SetRotMatrix to the products (ie. O1->m \* C->m, O2->m \* C->m) which is what the CompMatrix, MulMatrix functions actually do and not C->m \* O1->m as Sony would have us believe on page 283 of the docs.

Anyway, anytime I move the camera by changing the angle C->a, I get a proper rotation about the CAMERA's axis. Translations HOWEVER remain in the WORLD's axis (which is what yours did).

try doing the following exactly as I've written it - I don't really like supplying source code.

Sony's examples do it the other way - rotations go around the WORLD's axis but translations

travel along the Camera's axis (such as adding 32 to the C->t[2] for instance.

The example I gave didn't do it this way.

My question is how do I get the silly thing working properly?

I'll try again:-

Calculate the camera's matrix via it's angle but \*don't\* put the translation vector in, leave it at zero... instead store it globally. Then inverse the camera's matrix (physically flip the matrix around x=y) to generate a matrix we will call 'world'. Set the 'world' matrix with SetRotMatrix and SetTransMatrix (zero translation).

Then per object, subtract the view's 32 bit globally stored coordinates from the object's 32 bit coordinates giving you a sixteen bit relative value to the actual view. Do a RotTrans on this into screen.t (where screen is a matrix). Now PushMatrix to preserve the GTE constant rotation/translation matrix, then generate your object's rotation matrix with a RotMatrix() and MulMatrix0 the result of this with the 'world' matrix. (world is the first parameter) ... put the result into screen (it won't overwrite the translation values). This leaves you to SetRotMatrix and SetTransMatrix on 'screen' and then you can RotTransPers or whatever as you see fit - just remember to PopMatrix afterwards.

Dyl

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6/19/96 2:54 PM

Re(7): Thrashing MulMatrix, etc.

Dylan Cuthbert

Ayo A. Orimoloye

LIBGPU/GTE

Ayo A. Orimoloye writes: Dylan Cuthbert writes:

Having a 16-bit translation relative to the camera DOES limit your world to a 16-bit radius around the Camera (-32768 to +32767) which might not be a problem for you if your 3D world in your game has a SMALL playfield but if you've been granted a 32-bit translation by the Almighty Sony, I don't see why you shouldn't use it. :-) BOOMING SONY P.R. VOICE:"You can generate vast worlds, 32-bit playfields, huge vistas in space n' all that" and not have to "reject objects larger than 16 bits". This I like and I think the gameplayers would like as well!

We must have some wires crossed here... the GTE can't actually project values larger than 16 bits. That's the only point where the object's coordinates become 16 bit - just before it is drawn. The object's are in a 32 bit world. The 16 bit world only exists temporarily around the camera when you draw the view.

Your method sounds intriguing but I think you should try dropping the RotTrans and doing it the way everyone else seems to be doing it (set up a matrix for the Camera and one for each object, do your RotMatrix and TransMatrix and then use MulMatrix0 or CompMatrix to combine the camera's matrix with the objects'. Then use SetRotMatrix and SetTransMatrix on each product matrix when transforming vertices with RotTransPers or whatever). I think you will discover you could drop the inverse matrix stuff, drop setting the 'world' matrix, drop all those Push and Pop Matrices and drop the RotTrans which could make your code whizz. And of course your world radius would grow to  $(-2^{31} \text{ to } 2^{31})!$

The Push and Pop matrices allow for a heirarchy of objects. My world is 32 bit (see above). The RotTrans and MulMatrix0 is basically what the CompMatrix function does if you look at the description in the manual. The inverse matrix is needed so I can have any object in the world \*become\* the camera and besides, it does it just once per view generation so it's pretty cost effective for the convenience it provides.

You seem to be dealing with your camera in a fairly hardwired manner, the objects in the world shouldn't even know there is a camera.

Dyl

---

6/19/96 5:51 PM  
2 sided polys in PMD  
Borden Covell II  
LIBGPU/GTE

Is there a way (using the existing tools) to get a TMD's 2-sided polygon data passed through to a PMD???

We want to use PMDs due to size constraints but need to have some polys that are 2-sided (i.e. no backface testing).

HELP???!!!

---

6/19/96 10:30 AM  
Re(6): Thrashing MulMatrix, etc.  
Ayo A. Orimoloye  
Dylan Cuthbert  
LIBGPU/GTE

Dylan Cuthbert writes: Ayo A. Orimoloye writes: Well I tried your method (which incidentally - due to the fact that the 1st parameter of RotTrans is an SVECTOR - limits your translations to 16-bits) and it gave the second result I have been having.

no, because you subtract the camera's xyz (32 bit) from the object's xyz (32 bit) giving you a 16 bit xyz relative to the camera which is all you need... you reject the object if it is still larger than 16 bit.

Having a 16-bit translation relative to the camera DOES limit your world to a 16-bit radius around the Camera (-32768 to +32767) which might not be a problem for you if your 3D world in your game has a SMALL playfield but if you've been granted a 32-bit translation by the Almighty Sony, I don't see why you shouldn't use it. :-) BOOMING SONY P.R. VOICE: "You can generate vast worlds, 32-bit playfields, huge vistas in space n' all that" and not have to "reject objects larger than 16 bits". This I like and I think the gameplayers would like as well! try doing the following exactly as I've written it - I don't really like supplying source code.

Thanks for the suggestion. Jay Stelly at Tetragon suggested I try pulling my Camera's FORWARD vector from the rotation matrix and scaling it by the amount of FORWARD translation. I did this - it worked! This is what I REALLY wanted to ask. I was simply changing the Camera's Z coordinate in it's Translation (which is in the WORLD's coordinate system and NOT the Camera's local coordinate system) and of course this translates the Camera without regard to where the Camera is facing but to where the world is facing. I should have phrased the question better (or kept awake at my Matrix Algebra class in college!).

My question is how do I get the silly thing working properly?

I'll try again:-

Calculate the camera's matrix via it's angle but \*don't\* put the translation vector in, leave it at zero... instead store it globally. Then inverse the camera's matrix (physically flip the matrix around  $x=y$ ) to generate a matrix we will call 'world'. Set the 'world' matrix with SetRotMatrix and SetTransMatrix (zero translation).

Then per object, subtract the view's 32 bit globally stored coordinates from the object's 32 bit coordinates giving you a sixteen bit relative value to the actual view. Do a RotTrans on this into screen.t (where screen is a matrix). Now PushMatrix to preserve the GTE constant rotation/translation matrix, then generate your object's rotation matrix with a RotMatrix() and MulMatrix0 the result of this with the 'world' matrix. (world is the first parameter) ... put the

result into screen (it won't overwrite the translation values). This leaves you to SetRotMatrix and SetTransMatrix on 'screen' and then you can RotTransPers or whatever as you see fit - just remember to PopMatrix afterwards.

Dyl

Your method sounds intriguing but I think you should try dropping the RotTrans and doing it the way everyone else seems to be doing it (set up a matrix for the Camera and one for each object, do your RotMatrix and TransMatrix and then use MulMatrix0 or CompMatrix to combine the camera's matrix with the objects'. Then use SetRotMatrix and SetTransMatrix on each product matrix when transforming vertices with RotTransPers or whatever). I think you will discover you could drop the inverse matrix stuff, drop setting the 'world' matrix, drop all those Push and Pop Matrices and drop the RotTrans which could make your code whizz. And of course your world radius would grow to  $(-2^{31}$  to  $2^{31})!$

---

6/20/96 3:24 PM  
tmd light sourcing  
Floria Ross  
LIBGPU/GTE

This is Bob Polaro from THQ. I would like to know what code would need to be added to the tmd example file tuto0.c under sample\graphics\tmd to turn the light source on.

---

7/3/96 2:28 PM  
DivideFT3  
Dan Chang  
LIBGPU/GTE

I've been using the DivideFT3 function with some success, but I have one problem: even when I have piv/pih set to very high numbers (8192,8192), occasionally DivideFT3 throws away an entire polygon before any subdivision, or at least doesn't submit it to the OT, even though the polygon has most of its area in full view. Some of these polygons are large (maybe 1000 on an edge).

My divide work area is the scratch pad.

Is there a reason I am losing some polygons? What is the exact relationship between the piv/pih values and the polygons that get thrown away?

thanks,

David Brickhill Boss Game Studios

---

7/5/96 8:30 AM  
Re: DivideFT3  
Dan Chang  
LIBGPU/GTE

My loop where I call the Divide function resembles (barring type-o's)

```
work_area = (DIVPOLYGON3*)SCRATCH_PAD; work_area->pih = 8192; work_area->piv = 8192; work_area->ndiv = 2;
```

```
/* ... */
```

```
while(n_triangle) { color.r = triangle->r0; color.g = triangle->g0; color.b = triangle->b0;
color.cd = next_ft3->code;
  RotTransPers3(&triangle->v0,&triangle->v1,&triangle->v2, (long*)&next_ft3-
>x0),(long*)&next_ft3->x1),(long*)&next_ft3->x2), &p,&flag);
  next_ft3=DivideFT3(&triangle->v0,&triangle->v1,&triangle->v2, (u_long*)&triangle-
>u0),(u_long*)&triangle->u1),(u_long*)&triangle->u2), &color, next_ft3, work_area);
  triangle++; n_triangle--; }
```

There is plenty of space in the buffer pointed to by next\_ft3.

I've tried the above with the piv/pih ranging from 320/240 to 640/480. 320/240 causes lots of lost polygons, and 640/480 on up all seem to have the same amount of lost polygons.

Also, is the RotTransPers3 necessary? The samples call it before the Divide call, before they decide whether to AddPrim or Divide. If I know in advance I will need to divide, do I still need the RotTransPers3 for any reason. I've tried it without it, and it seems to work fine, but maybe with more lost polygons. It's hard to tell, because losing the polygons seems to occur at random.

Any help from anyone is appreciated.

Thanks,

David Brickhill bossgame studios

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7/5/96 11:16 AM

Transparency

Albert Neuburger

LIBGPU/GTE

Just Recently I started programming the playstation. I picked up where another programmer had left off, so I get to wade through someone elses code. Anyway, I have a quickly approaching deadline and I need some tips. I am trying to make a texture semitransparent. Do I need to use SETSEMITRANS on every primitive that this texture is applied to, or can I somehow make the texture semitransparent? I dont really have convient access to the primitives as they are stashed way below the tmd pointer that I found.

Any help will be greatly appreciated, Jason Overgard Regal Productions

I can also be mailed at Overgard@earthlink.net

Thanks

---

7/6/96 4:08 PM

Re: Transparency

player 1

LIBGPU/GTE

Both, for a texture to appear semitransperent, the semitransparent bits must be set in the texture's CLUT and the poly must be set semi-transparent before anything shows up. Colors with RGB values of 0,0,0 will never show up (are always transparent) no matter what you do.

---

7/8/96 6:46 PM

Re(4): DivideFT3

Mike Fulton

Dan Chang

LIBGPU/GTE

I was counting backwards from the end, so I figured 'next\_ft3' was the OT parameter, and didn't notice you had just accidentally omitted one of the parameters.

In that case... 'next\_ft3' should be a pointer to a buffer large enough to contain 'n' POLY\_FT3 structures, where 'n' is  $2*(ndiv^2)$ .

The return value of DivideFT3 is, as far as I can tell from looking at the library source, a pointer to the first unused position in the output buffer. So if you get 6 out of 8 primitives clipped, the other 2 are placed in 'POLY\_FT3 my\_ft3\_buffer[]' then the return value should be a pointer to my\_ft3\_buffer[2].

The question about is RotTransPers3() necessary depends on your program. It doesn't look to me like you're using the values returned by it and my guess is that you could take it out. What demo program(s) were you getting this from?

The 'pih' and 'piv' parameters are supposed to be the size of the display area and a superficial look at the assembly source for the part of the library code that cares indicates that these parameters are used for clipping the individual new polygons as they are created. I don't know what setting them to 8192 would do... but it's not likely to be a GOOD thing.

I have an idea about what's wrong... if no subdivision occurs because everything in the original triangle is being clipped, the RotateFT3 function does not place the original triangle into the OT. You still have to do that yourself. If the return value from DivideFT3 is equal to the 's' input value, then it did not register anything in the OT and you still have to do it yourself.

Mike

---

7/8/96 1:02 PM

Re(2): Transparency

Ayo A. Orimoloye

LIBGPU/GTE

Albert Neuburger

player 1 writes: Both, for a texture to appear semitransperent, the semitransparent bits must be set in the texture's CLUT and the poly must be set semi-transparent before anything shows up. Colors with RGB values of 0,0,0 will never show up (are always transparent) no matter what you do.

This is partly correct - you should set the translucent mode to ON (by using the -t option with BMP2TIM for instance) and also SetSemiTrans( &poly, 1 ) on the polygon. One thing I noticed is if you have a texture with a lot of dark colours (where the SUM of the RGB values was  $\leq 0x20$ ) and not just the case of (0,0,0) like player 1 says, you WOULD get see-through "background" pixels. This is also true for RGB values like (5,5,5), (20,0,0), etc. If you set the translucent mode for texture files like these to ON but not the STP on the POLYGON (ie SetSemiTrans( &poly, 0)), you CAN get a solid black or dark colour on the pixel and not the usual see-through effect.

---

7/8/96 4:33 PM

Re(3): DivideFT3

Dan Chang

Mike Fulton

LIBGPU/GTE

Okay,

- 1) Yes, in this case I do want to be setting ndiv to 2. Under other circumstances, I set it to other values. Different settings for ndiv don't seem to have any effect on my problem.
- 2) The "next\_ft3" pointer points at my primitive buffer. Are you sure that it should point to an ot? If it should then why does the function take another argument called "ot", and why does the library reference say that the "s" argument should be a GPU packet address, and what then does the function use for primitives, and why does my use this way work most of the time? I am not

sorting according to z-depth, but am using a BSP tree, so adding at a single OT entry is actually what I want.

(Oh, I just looked at the sample I sent you, and now I see the cause of confusion: I omitted the passing of the ot argument in my sample. After "next\_ft3" should be "ot" which is an ClearOTag'd u\_long pointer.)

Regarding this, though, am I right that the function returns an updated pointer to my primitive buffer?

3) What I mean by occasionally throws away an entire polygon is that the original is not drawn, and no polygons are drawn in its place. It is not near the near clipping plane. and it is not near the edges of the screen necessarily.

Trapping this bug is somewhat difficult, because often DivideFT3 rightly throws out polygons if they are near clipped, so checking for an unupdated primitive pointer doesn't help trap. Any suggestions?

4) My screen z is 512. The lost triangles do not necessarily extend past the view point. Usually I spot them when they are in full view, out in front, clear of any near clip.

5) By "polygon" I mean triangle. I am using DivideFT3 on polygons with three sides.

Is the RotTransPers3 necessary? What role do piv/pih play? Any idea what's going on?

David Brickhill bossgame studios

---

7/8/96 12:07 PM

Fwd: Near Z / Far Z

Dave Scheele

LIBGPU/GTE

Oops!! I almost forgot!! It's time once again for my monthly posting of this unanswered question. It was originally posted shortly after the now not-so-recent Dev Con back in March. Can someone from Sony please look into this ??

Dave

----- cut here -----

At the recent Dev Con, I asked about obtaining the Near or Far Z (after a RotTransXXX) from the GTE directly, instead of having to read all 3 actual Z's and testing to find the near/far one. Is such a capability available somewhere, and I just missed it in the docs? ;)

Dave

---

7/8/96 1:21 PM

Re(2): DivideFT3

Mike Fulton

LIBGPU/GTE

David Brickhill @ Boss Game Studios,

I have some questions about what you're doing with DivideFT3(). As far as I know, it wouldn't just throw away anything, unless perhaps they intersected the near-clip plane.

1) You're setting the 'ndiv' parameter to 2, indicating a 4x4 division that will result in a total of 8 triangles... is this what you are trying to do?

If your lost triangles are around the outside edge of the original larger triangle, perhaps they are intersecting the near-clip plane or the clipping rectangle. Going to a greater level of subdivision (i.e. from 4x4 to 8x8 or 16x16) would help in this case.



2) What exactly is 'next\_ft3' pointing at?

This should be a pointer to an array of 'u\_long' pointers that has been initialized into an empty ordering table using the ClearOTag() function. This could be a single entry that points to a terminator or it could be several with the last one pointing to a terminator. Failing to properly initialize this as an ordering table could result in problems.

You should avoid using DivideFT3 to place anything directly into your main ordering table. It would add all the new primitives at the same depth level, which in most cases won't be what you want. Create a separate empty ordering table, do your DivideFT3(), and then you can add the resulting POLY\_FT3 primitives to your main OT either individually according to their respective Z-depths, or you can simply merge the whole thing in using the MargePrim() call.

3) You say "occasionally DivideFT3 throws away an entire polygon before subdivision".

Do you mean to say that the entire original triangle is thrown out and no new triangles at all are created? Or do you mean that some of the smaller triangles resulting from the subdivision are lost?

Precisely, what triangles are being lost? If they weren't lost, would they be completely on-screen or would they go off the edges?

The illustration below shows a triangle with 4x4 subdivision. I've labeled each of the smaller subtriangles. Please indicate which ones are subject to loss. (I really wish FirstClass had some graphics functions... ;^)

```

*****
***** E *** H * * * * * * * * * * *
* D * F * G * * * * * * * * * * * C * * *
***** B * * * * * * * * A * * * * *
*

```

Also, you theorize that the lost polygons have not been submitted to the OT. Have you checked to see? It should be fairly simple to walk the OT pointers to find out what's there.

4) What sort of perspective is being used? Does the triangle extend from close to the viewpoint into the picture? Or is it perpendicular (or close to it) to the viewpoint?

5) You are constantly referring to "polygons" but DivideFT3 works on and creates only triangles. Are you simply not being specific, or have you been trying something other than triangles?

Mike

7/8/96 5:30 PM

Cheaper gte\_LoadAverageCol()

Jay Stelly

LIBGPU/GTE

It seems like there is a way to get a cheaper gte\_LoadAverageCol() if the interpolation weights are reciprocal. I'm trying to effect the same result by using gte\_SetFarColor() and gte\_DpqColor(). This is faster, but has some side effects. Is there a way I can make the two identical assuming p0 = n and p1 = ONE-n ?

Also is there a way to load the far color into GTE as a CVECTOR instead of 3 ints ? What exactly is the difference between gte\_stcv() and gte\_strgb()?

Thanks,

Jay Stelly Tetragon

7/9/96 7:01 PM

Re(6): DivideFT3

Mike Fulton

LIBGPU/GTE

The polygons I am losing include polygons that are in no danger of being clipped.

I wish I were as sure of that as you are... I've got a feeling that is what happening, as unlikely as it may seem to you.

Are there any other circumstances under which DivideFT3 does not update the primitive packet pointer?

There are two levels of clipping. First the main routine checks the original polygon. If it wants to clip it, then it just returns the original packet pointer. Then it goes into a routine that loops to do the subdivision. If a polygon it creates isn't going to be clipped, then it calls an internal equivalent to AddPrim, which always updates the pointer. So only if everything gets clipped will the packet pointer be unchanged.

Are there any circumstances under which DivideFT3 updates the primitive packet pointer and yet does not add primitives to the OT?

It is the internal equivalent of AddPrim that updates the packet pointer, after it has added the primitive. That's the only place the pointer gets updated.

Are there any circumstances under which DivideFT3 wipes out values in piv/pih or ndiv and under which I need to reset these values before calling DivideFT3?

As far as I could tell, the 'piv' and 'pih' fields are read-only.

Does DivideFT3 count on the fact that anything in the work area is unmodified before the OT is drawn?

It doesn't clear the area first, so to be safe, zero it out in advance. It only writes to the work area, so it doesn't care, but something else might if there were other fields with garbage in them.

Does DivideFT3 do any back-face clipping? (I ask because I know that there are circumstances under which the RotNclip functions wrongly clip front-facing polygons.)

Not as far as I can tell.

It's sort of hard to go anywhere from here without having some source code to look at. If you can put together any sort of sample that demonstrates this, it would really help me to figure out what is happening.

The DivideFT3() function is implemented using just the R3000. It doesn't actually access the GTE. If you can't figure out what the problem is, then you may wish to consider writing your own routine. This would give you more direct control over what's going on.

Mike

---

7/9/96 2:01 PM

Re(5): DivideFT3

Dan Chang

LIBGPU/GTE

Yes, there are times when the primitive packet address is returned unchanged, but if the whole original triangle is being clipped, I don't want to add it to the OT anyway. The polygons I am losing include polygons that are in no danger of being clipped.

Are there any other circumstances under which DivideFT3 does not update the primitive packet pointer?

Are there any circumstances under which DivideFT3 updates the primitive packet pointer and yet does not add primitives to the OT?

Are there any circumstances under which DivideFT3 wipes out values in piv/pih or ndiv and under which I need to reset these values before calling DivideFT3?

Does DivideFT3 count on the fact that anything in the work area is unmodified before the OT is drawn?

Does DivideFT3 do any back-face clipping? (I ask because I know that there are circumstances under which the RotNclip functions wrongly clip front-facing polygons.)

Thanks,  
David Brickhill Boss Game Studios

---

7/10/96 8:39 AM  
Re(7): DivideFT3  
Dan Chang  
LIBGPU/GTE

Can you tell me exactly what circumstance cause DivideFT3 to decide to clip a triangle? For instance, what value does it use for near-z? Does it clip when all vertices are behind near-z, or just when one of them is? Would it ever clip a triangle you could still see? If it doesn't use GTE, does it do R3000 divides to calculate perspective, or does it do some kind of approximation? How does it know what my screen-z is if it doesn't get it from the GTE register? What about piv/pih: does it clip when all vertices are left/right/above/below piv/pih, or just one? Is there a far clip? If so, what is the far-z?

Is it possible to send me the C-source for DivideFT3? :)

I will look into providing a running sample of my program that has the problem. It happens rarely, so putting together a demo might require that I send along with it the actual world model data I'm using. I also need to check with my boss to make sure it's okay.

Thanks for trying to help so far.

David Brickhill Boss Game Studios

---

7/10/96 4:27 PM  
Re: Cheaper gte\_LoadAverageCol()  
Michael Koziniak  
Jay Stelly  
LIBGPU/GTE

Also is there a way to load the far color into GTE as a CVECTOR instead of 3 ints ?

Use the soon to be disclosed GTE info.

What exactly is the difference between gte\_stcv() and gte\_strgb()?

They work off of different registers.

-Michael

---

7/10/96 8:47 AM  
Re(8): DivideFT3  
Dan Chang  
LIBGPU/GTE

I just looked at the disassembly of DivideFT3: not only does it the GTE, but it uses back-face clipping, because it calls RotAverageNclip3 (theres a "jal ROTAVERAGENCLIP3" 60 instructions after the start of DivideFT3, and there are no branches in between.)

Do I have a different version of DivideFT3 than you? (I'm using lib 3.5, newset dmpsx).

---

7/10/96 3:16 PM  
Re(8): DivideFT3  
Mike Fulton  
LIBGPU/GTE

No, I am afraid I cannot send the source for DivideFT3... and most of the work is done by another routine anyway.

The RotAverageNclip3() function is only used once at the to determine if the entire original polygon should be clipped or not. If it passes back a value greater than zero, the routine returns with no subdivision performed and the original not added to the OT.

If the original triangle is not clipped, it passes control to a subroutine that does the actual polygon subdivision. At first, I thought that routine was 100% R3000 assembly, but taking another look I see a single GTE instruction I missed the first time, but that comes after the clipping has been done.

I still don't have a clear picture of what's getting clipped and what isn't. Sometimes it sounds like the entire original triangle is getting clipped and at other times it sounds like some of the smaller triangles being created are being clipped.

It would be nice if you could send a sample program, but even if you could just draw something in a graphics program and send it as a BMP picture it would be better than nothing.

Mike

---

7/17/96 2:52 PM

Re: S.O.pSx: one more thing...

Ayo A. Orimoloye

LIBGPU/GTE

Dane Emerson

Dane Emerson writes: BUT, how can a CLUT stored in 16bit VRAM on a one to one ratio be 524 bytes. I calculate it to be (256 colors) x 16 bytes = 4096?

The CLUT contains 256 VRAM ENTRIES where 1 entry = 16 BITS not BYTES. This makes 512 bytes of colour info. Adding the 12 byte (BNUM, DX/DY, H/W) header makes it 524 bytes.

This may be part of my original problem, because the pixel data in the TIM is located after the CLUT, and I need to know how far to inc my ptr.

You might wanna try OpenTIM and ReadTIM which could help. Alternatively, if you open the TIM file, move the fp to the start, read a long (the 32-bit ID), then another long (the 32-bit FLAG). ORing this second long with the value 0x8 will tell you if there's a clut (which there IS in your case). Then read the next long (32-bit BNUM). Adding this bnum to your fp (if your fp is a LONG ptr then you need to add BNUM/4) should skip over the CLUT block and point to the start of the pixel block.

Also, should I use POLY\_FT4 f.tpage = LoadTPage & f.clut = LoadClut or LoadImage? There is also a sample prog which uses the GS structures.

Actually, if you use TIMPOS -v TEXTURENAME.TIM the tpage is shown and you can just do a POLY\_FT4.tpage = whatever timpos reports. To save a lotta grief you can just use somefink like...

```
TIM_IMAGE Tim; // you can find the definition of this structure in the docs long *ptr;
ptr = (long *)malloc ( sizeof tim file in bytes ); if (OpenTIM (ptr)) { printf("Weird error opening
the TIM\n"); exit(0); } if(!ReadTIM (&Tim)) { printf("Weird error reading the TIM\n"); exit(0); }
LoadImage( Tim.prect, Tim.paddr ); if(Tim.mode & 0x8) { LoadImage( Tim.crect, Tim.caddr );
POLY_FT4.clut = Getclut( Tim.crect->x, Tim.crect->y ); } else ( POLY_FT4.clut = 0; }
Hope that helps.
```

---

7/17/96 11:16 AM

S.O.pSx: tpage, clut, TIM?

Dane Emerson

LIBGPU/GTE

(quick intro)First, I'm not Dane Emerson... I know him. I'm kID. I know nothing...  
Someone knows how to load a TIM into the frm bfr then display it directly, I don't. Any suggestions?  
My latest attempt was to create a POLY\_FT4 the size of the screen, and slap the TIM info (LoadImage'd into the frm bfr) on as a texture with POLY\_FT4.tpage & .clut.  
-kID

---

7/17/96 11:55 AM  
S.O.pSx: one more thing...  
Dane Emerson  
LIBGPU/GTE

After sending that last msg, I realized how broad my ? was. More specifically:  
I am loading my own "256x256.TIM" which was converted from bmp using bmp2tim. 8 bitsperpixel, 256x256 image has 8bit CLUT. I used the -v option while converting from .bmp to .tim which told me the CLUT was 524 bytes long (probably including header). BUT, how can a CLUT stored in 16bit VRAM on a one to one ratio be 524 bytes. I calculate it to be (256 colors) x 16 bytes = 4096?  
This may be part of my original problem, because the pixel data in the TIM is located after the CLUT, and I need to know how far to inc my ptr.  
Also, should I use POLY\_FT4 f.tpage = LoadTPage & f.clut = LoadClut or LoadImage? There is also a sample prog which uses the GS structures.  
Any response accepted. Any donation respected.  
-kID

---

7/18/96 10:34 AM  
Do I have to? use of OT, packets.  
Dane Emerson  
LIBGPU/GTE

What's the deal with the OT? I create a u\_long array ot[4096], and all my progs work. I take it out and the screen is blank. I did replace all AddPrim instances with DrawPrim (320,256 non-inter), with a few other mods.  
Is SetPoly() necessary? What does it do? MY guess: sets up poly for use with OT or further POLY ftns like setXY4, etc. Is there a way I can handle the POLY structure myself?  
I am running into several speed problems when using higher-archys: class, lists, other hierarchial structure concepts. Are they just not for the PSX to handle? Without exp, I see it impossible to prog anything complicated w/o these objects (but should I just get over that?)  
Are we there, yet?!  
-kID

---

7/18/96 10:55 AM  
Re: DRAWENV, DISPENV, (my own?)  
Ayo A. Orimoloye  
Dane Emerson  
LIBGPU/GTE  
Hello. I DID manage to download your attachment. Here is what I think.....  
#include <sys/types.h> #include <libetc.h> #include <libgte.h> #include <libgpu.h> #include

<libgs.h>

```
#define TIM_ADDR 0x80010000
```

You might wanna try loading your textures directly from the PC using PCOpen, PCread, etc. That way you'll never have to worry about remembering to BLOAD the texture before you run the program (you ARE remembering to do that I hope?). Otherwise there will be garbage at the above address.

```
typedef struct { DRAWENV draw; DISPENV disp; } DB;
POLY_FT4 f; // A flat-shaded textured polygon POLY_F4 g; // A flat-shaded polygon
void LodTIM();
void main() { DB db[2]; DB *cdb=db; int padd;
  PadInit(0); ResetGraph(0);
  SetGraphDebug(0); // This was missing from your code but I don't think it's the problem
  SetDefDispEnv(&db[0].disp, 0, 0, 256, 240); SetDefDrawEnv(&db[0].draw, 0, 240, 256,
240); SetDefDispEnv(&db[1].disp, 0, 240, 256, 240); SetDefDrawEnv(&db[1].draw, 0, 0,
256, 240); SetDispMask(1);
  // Your screen sizes of 256x240 are a bit unusual. Usually most people use sizes of 320x240 or
640x480 // I suspect you have been misled by the error in the documentation here (Reference
3.0 page 198). // Try changing to 320x240. 256x240 IS an acceptable size though. For more
information, check pages 85 - // 88 of the Run-time library release 3.0 OVERVIEW.
  // setRGB0( &db[0].draw, 0, 40, 60 ); - these set a bluish colour for the background. it's not vital
but its a // setRGB0( &db[1].draw, 0, 40, 60 ); - good idea to SEE if somethings going wrong...
//db[0].draw.isbg = 1; - These make sure the drawing area is CLEARED to the colour set above
BEFORE //db[1].draw.sibg = 1; - any drawings are registered. VERY important if you don't
want everything smeared // all over each other.....
  SetPolyFT4(&f); setXY4(&f, 0, 0, 255, 0, 0, 239, 255, 239);
  // f is a TEXTURED polygon so you need something like: //setUV4( &f, 0, 0, 255, 0, 0, 255, 255,
255 ); to set the TEXTURE coordinates (VERY IMPORTANT) // if it is a 256x256 texture (which
I believe you have said it is ) and it's top left pixel VRAM coords start on a //TPAGE
boundary.....see page 102 - 111 of the Overview manual.... // you also need: // setRGBO( &f,
0x80, 0x80, 0x80 ); // or something like that to set the BRIGHTNESS of the texture to it's default
value SetPolyF4(&g); setXY4(&g, 0, 0, 255, 0, 0, 239, 255, 239); setRGB0(&g, 80, 0, 0);
LodTIM();
  DrawPrim(&f); // DrawPrim(&g); don't you wanna draw this too? // cdb = (cdb == db)? db
+ 1; db; Typically used to swap buffers by Sony examples PutDrawEnv(&cdb->draw);
PutDispEnv(&cdb->disp); // What I believe is happening is that you are not displaying the
buffer that was drawn. Try sticking a //DrawSync(0) which will wait for completion of all GPU
drawing and then swap the buffers as shown //before you PutDrawEnv and PutDispEnv. See
the Sony examples. }
void LodTIM() { TIM_IMAGE tim; long *ptr;
  ptr = (long *)TIM_ADDR; OpenTIM(ptr); // It's always a good idea to trap these for errors
like I did in the last message ReadTIM(&tim); // that way you won't get any nasty surprises!
LoadImage(tim.prect, tim.paddr); if(tim.mode & 0x8) { LoadImage(tim.crect, tim.caddr
); f.clut = GetClut(tim.crect->x, tim.crect->y); } else { f.clut = 0; }}
```

---

7/18/96 4:51 PM

Re(2): Do I have to? use of OT, packets.

Dane Emerson

LIBGPU/GTE

player 1

My new friend, Ayo did a pretty good job updating me on the OT issue, and you helped finalize the concepts. Thanks.

So, now understanding the OT I can also replace all ftns like AddPrim(), etc. with those of my

own. Is this efficient or just non-necessary?  
"You have more than I do... I want some of yours!"  
-kID

---

7/18/96 4:27 PM

Re: Do I have to? use of OT, packets.  
player 1  
LIBGPU/GTE

The ordering table is a linked list. It is an array of pointers, each pointing to the next one in the list. When you call addprim, it takes the otz value you pass it to pick an index into the array, change the pointer to the primitive you called addprim with, and changes the pointer in your primitive to point to the next element in the array. The setpoly calls are required because it basically inputs a 'code' into the primitive that all the primitives have, that tells the playstation what kind of structure you are using. Without it or the OT, nothing will get drawn.  
Tom Ketola PSX Lead Engineer Player 1, Inc.

---

7/18/96 4:24 PM

Re: S.O.pSx: one more thing...  
player 1  
LIBGPU/GTE

256\*16 bytes is 4096, but it's 16 BIT vram, meaning 2 bytes (8 bits to a byte), i.e. 512 bytes for 256 colors not including the header... Tom Ketola PSX Lead Engineer Player 1, Inc.

---

7/18/96 9:46 AM

DRAW/DISPENV

Dane Emerson

LIBGPU/GTE

Ayo A. Orimoloye

Thanks for your help...

My prog remains unrunnable (or at least unfunctional). I am using your (Ayo's) TIM info as LodTIM(). What's wrong?

(I tried to attach this, but found out it had to be "approved" before anyone could get to it... is there any way around this?)

```
#include <sys/types.h> #include <libetc.h> #include <libgte.h> #include <libgpu.h> #include <libgs.h>
```

```
#define BOXSIZ 10
```

```
SVECTOR P0 = { -BOXSIZ, BOXSIZ,0,0 }; SVECTOR P1 = { BOXSIZ, BOXSIZ,0,0 };
```

```
SVECTOR P2 = { BOXSIZ,-BOXSIZ,0,0 }; SVECTOR P3 = { -BOXSIZ,-BOXSIZ,0,0 };
```

```
SVECTOR *v[4] = { &P0,&P1,&P2,&P3 };
```

```
#define OTSIZ 4096 #define TIM_ADDR 0x80010000
```

```
typedef struct { DRAWENV draw; DISPENV disp; } DB;
```

```
u_long ot[OTSIZ]; POLY_FT4 f;
```

```
void LodTIM();
```

```
void main() { DB db[2]; DB *cdb=db; MATRIX rottrans; SVECTOR **vp; SVECTOR
```

```
ang; VECTOR trn; long p,otz=0,flag; long isomote; int padd;
```

```
PadInit(0); ResetGraph(0); InitGeom(0); SetGeomOffset(160,120);
```

```
SetGeomScreen(512);
```

```
SetDefDispEnv(&db[0].disp, 0, 0, 320, 240); SetDefDrawEnv(&db[0].draw, 320, 240, 320,
```

```

240); SetDefDispEnv(&db[1].disp, 320, 240, 320, 240); SetDefDrawEnv(&db[1].draw, 0, 0,
320, 240); SetDispMask(1);
SetPolyFT4(&f); setXY4(&f, 0, 0, 255, 0, 0, 239, 255, 239); setRGB0(&f, 128, 128, 128);
LodTIM();
ang.vx = 0; ang.vy = 0; ang.vz = 0; trn.vx = 0; trn.vy = 0; trn.vz = 0;
for(;;) { cdb = (cdb==db)? db+1: db; ClearOTagR(ot, OTSIZE);
PutDrawEnv(&cdb->draw); ClearImage(&cdb->draw.clip, 0, 0, 0);
ang.vx+=0; ang.vy+=5; ang.vz+=5;
RotMatrix(&ang, &rottrans); TransMatrix(&rottrans, &trn);
SetRotMatrix(&rottrans); SetTransMatrix(&rottrans); vp = v; isomote =
RotAverageNclip4(vp[0], vp[1], vp[2], vp[3], (long *)&f.x0, (long *)&f.x1, (long
*)&f.x3, (long *)&f.x2, &p, &otz, &flag); if(otz>0 && otz<4096) AddPrim(ot+otz, &f);
DrawOTag(ot+OTSIZE-1); /* DrawSync(0);*/ VSync(0); PutDispEnv(&cdb-
>disp); }}
void LodTIM() { TIM_IMAGE tim; long *ptr;
ptr = (long *)TIM_ADDR; OpenTIM(ptr); ReadTIM(&tim); LoadImage(tim.prect,
tim.paddr); if(tim.mode & 0x8) { LoadImage(tim.crect, tim.caddr); f.clut =
GetClut(tim.crect->x, tim.crect->y); } else { f.clut = 0; }}

```

---

7/18/96 4:54 PM

Re(2): S.O.pSx: one more thing...

Dane Emerson

LIBGPU/GTE

player 1

Again, I thanks you...

I have realized my childish error amidst confusion of bits/bytes.

"Supply me!"

-kID

---

7/18/96 11:16 AM

Re: Do I have to? use of OT, packets.

Ayo A. Orimoloye

LIBGPU/GTE

Dane Emerson writes: What's the deal with the OT? I create a u\_long array ot[4096], and all my progs work. I take it out and the screen is blank. I did replace all AddPrim instances with DrawPrim (320,256 non-inter), with a few other mods. The OT is used for rudimentary Z-sorting of polys. You usually do not need one that big (4096) - it's size should not have to be bigger than a quarter of your screen Z distance. BTW 320x256 is PAL mode! Using DrawPrims instead of AddPrims shouldn't crash your program - you should only get badly sorted polys! Might be the fact that you're trying to use a PAL (English) screen on an NTSC (American/Japanese) development station without proper hardware! Might I suggest reading the LIBGPU FAQs and Archives as well as the Sony docs? True, the docs might be terrible and contain lots of errors & omissions but they're not worthless :-)

Is SetPoly() necessary? What does it do? MY guess: sets up poly for use with OT or further POLY ftns like setXY4, etc. Is there a way I can handle the POLY structure myself?

SetPoly is used to let the GPU know what type of poly the structure is (Flat tri, flat quad, Gour tex tri, etc). All it does is sets an ID (32-bit long) value in the first word of the poly structure depending on what type of poly it is. You CAN set up all the POLY stuff yourself. Take apart (look in) LIBGPU.H to see how Sony does it :- ) heh heh heh!



I am running into several speed problems when using higher-archys: class, lists, other hierarchial structure concepts. Are they just not for the PSX to handle? Without exp, I see it impossible to prog anything complicated w/o these objects (but should I just get over that?) The PSX does not like C++. There! I've said it! Frankly, I don't particularly like it as well - nasty language! C++ is NOT (BTW: this is MY personal opinion before I get FLAMED by 5000 C++ Borg!) a good language to use for GAMEs programming (especially on a console with LIMITED memory) simply because of the way it handles memory for classes and all that. It is better suited for writing word-processors and spreadsheets. REAL MEN use assembly.....  
Are we there, yet?!  
I didn't even know we had left where we were!

---

7/19/96 2:10 PM

If you saw that last msg..

Dane Emerson

LIBGPU/GTE

Ayo A. Orimoloye

Please disregard that last msg! I solved my inquiries. Thank you, you've been a big help.

"Buy Kix!" -kID

---

7/19/96 5:39 PM

Re(3): Do I have to? use of OT, packets.

player 1

Dane Emerson

LIBGPU/GTE

It would probably gain you a few cycles to change them to your own routines, depending on what you are doing. I know we did, but your going to get most of your performance gains from optimizing the code that takes the longest, and usually filling the OT isn't gonna take too long.  
Tom Ketola PSX Lead Engineer Player 1, Inc.

---

7/19/96 8:23 AM

Quarternions

Ayo A. Orimoloye

LIBGPU/GTE

Hi there!

Anyone know where I can find a good book on quarternions? I was having a couple of problems with camera rotation and motion and a good friend at Funcom in Norway suggested I try using "quarternions".

What are these magical things? Is it true that they solve most of the problems inherent in the "matrix-and-rotation-angle" method? Where did they come from? What do they want? How did they get to earth? Do they have their own web page? And more importantly, what is the title and where can I find a good book about 'em that a mere mortal without a Phd. could understand?

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7/20/96 10:43 AM

Re: Quarternions

Dave Scheele

LIBGPU/GTE

Ok, you asked for it :) I snagged this off the 'net a couple of months ago, but haven't had time to explore it further :(

If you find the answer to life in all this, let me know!!

Dave

----- cut here -----

Beeler, M., Gosper, R.W., and Schroepel, R. HAKMEM. MIT AI Memo 239, Feb. 29, 1972.

Retyped and converted to html (Web browser format) by Henry Baker, April, 1995.

## QUATERNIONS

### ITEM 107 (Salamin): QUATERNIONS

A quaternion is a 4-tuple which can be regarded as a scalar plus a vector. Quaternions add linearly and multiply (non-commutatively) by

$$(S_1+V_1)(S_2+V_2) = S_1 S_2 - V_1 \cdot V_2 + S_1 V_2 + V_1 S_2 + V_1 \times V_2$$

where S=scalar part, V=vector part,  $\cdot$ =dot product,  $\times$ =cross product.

If  $Q = S+V = (Q_0, Q_1, Q_2, Q_3)$ , then  $S = Q_0$ ,  $V = (Q_1, Q_2, Q_3)$ . Define conjugation by  $(S+V)^* = S-V$ .

The (absolute value)<sup>2</sup> of a quaternion is

$$|Q|^2 = Q_0^2 + Q_1^2 + Q_2^2 + Q_3^2 = Q Q^* = Q^* Q.$$

The non-zero quaternions form a group under multiplication with (1,0,0,0) = 1 as identity and

$$1 Q^* = Q^* 1 = Q^* Q Q.$$

The unit quaternions, which lie on a 3-sphere embedded in 4-space, form a subgroup. The mapping  $F(Q) = P Q$  (P a unit quaternion) is a rigid rotation in 4-space. This can be verified by expressing  $P Q$  as a 4x4 matrix times the 4-vector Q, and then noting that the matrix is orthogonal.  $F(Q)$  restricted to the unit quaternions is a rigid rotation of the 3-sphere, and because this mapping is a group translation, it has no fixed point.

We can define a dot product of quaternions as the dot product of 4-vectors. Then  $Q_1 \cdot Q_2 = 0$  iff  $Q_1$  is perpendicular to  $Q_2$ . Let N be a unit vector. To each unit quaternion  $Q = S+V$ , attach the quaternion

$$N Q = -N \cdot V + N S + N \times V.$$

Then it is seen that

$$(N Q) \cdot (N Q) = N \cdot N = 1 \text{ and } (N Q) \cdot Q = 0.$$

Geometrically this means that  $N Q$  is a continuous unit 4-vector field tangent to the 3-sphere. No such tangent vector field exists for the ordinary 2-sphere. Clearly the 1-sphere has such a vector field.

PROBLEM: For which N-spheres does a continuous unit tangent vector field exist?

Let W be a vector (quaternion with zero scalar part) and  $Q = S+V$ . Then

$$Q W Q^* = (S^2 + V \cdot V) W + 2 S V \times W + 2 V (V \cdot W).$$

Let N be a unit vector and Q the unit quaternion

$$Q = \pm(\cos(\theta/2) + N \sin(\theta/2)).$$

Then

$$Q W Q^* = (\cos \theta) W + (\sin \theta) (N \times W) + (1 - \cos \theta) N (N \cdot W),$$

which is W rotated thru angle theta about N. If Q thus induces rotation R, then  $Q_1 Q_2$  induces rotation  $R_1 R_2$ . So the projective 3-sphere (+Q and -Q identified) is isomorphic to the rotation group (3x3 orthogonal matrices). Projectiveness is unavoidable since a  $2\pi$  rotation about any axis changes  $Q = 1$  continuously into  $Q = -1$ .

Let U be a neighborhood of the identity in the rotation group (ordinary 3 dimensional rotations) and  $U_1$  the corresponding set of unit quaternions in the neighborhood of 1. If a rotation R carries U into U', then a quaternion corresponding to R carries  $U_1$  into  $U_1'$ . But quaternion multiplication is a rigid rotation of the 3-sphere, so  $U_1$  and  $U_1'$  have equal volume. This shows that in the quaternion representation of the rotation group, the Haar measure is the Lebesgue measure on the 3-sphere.

Every rotation is a rotation by some angle theta about some axis. If rotations are chosen "uniformly", what is the probability distribution of theta? By the above, we choose points uniformly on the 3-sphere (or hemisphere since it is really projective). Going into polar coordinates, one finds

$$P(\theta) = \frac{1}{2} \sin \theta, \quad 0 < \theta < \pi.$$

In particular, the expected value of theta is

$\pi/2$

Quaternions form a convenient 4-parameter representation of rotations, since composition of rotations is done by quaternion multiplication. In contrast, 3-parameter representations like Euler angles or (roll, pitch, yaw) require trigonometry for composition, and orthogonal matrices are 9-parameter. In space guidance systems under development at D-lab, the attitude of the spacecraft is stored in the guidance computer as a quaternion.

Path: newsfeed.pitt.edu!uunet!in1.uu.net!spool.mu.edu!uwm.edu!msunews!netnews.

penn.edu!bambi!shoemake From: shoemake@bambi.cis.upenn.edu (Ken Shoemake)

Newsgroups: comp.graphics.algorithms Subject: Re: What is a quaternion? Date: 4 Sep 1995

09:48:58 GMT Organization: Center for Human Modeling and Simulation Lines: 22 Message-ID:

<42ei2a\$hc7@netnews.upenn.edu> References: <42a2ko\$jgf@raffles.technet.sg> NNTP-Posting-

Host: bambi.cis.upenn.edu X-Newsreader: Tin 1.1 PL5

Quaternions are used in computer graphics as coordinates for 3D rotations, just as vectors are used for translations. One online tutorial in this context is at

<ftp://ftp.cis.upenn.edu/pub/graphics/shoemake/> There are a number of published papers, especially the often cited "Animating Rotation with Quaternion Curves" found in the Siggraph '85 conference proceedings. Unfortunately, the proceedings are almost impossible to find now and there is no online copy. If you have trouble finding graphics books, you could also try books on aircraft or satellite control, books on physics (look for "spin matrices"), or mathematics books on abstract algebra. If that doesn't work, you could also try the robotics literature.

The three most fundamental algebraic/geometric coordinate forms used in computer graphics are probably vectors and linear transformations homogeneous coordinates and perspective transformations quaternions and quaternion multiplication

-- Ken

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7/22/96 6:43 PM

Re(2): Do I have to? use of OT, packets.

Mike Fulton

LIBGPU/GTE

Ayo A. Orimoloye writes:

The PSX does not like C++. There! I've said it! Frankly, I don't particularly like it as well - nasty language! C++ is NOT (BTW: this is MY personal opinion before I get FLAMED by 5000 C++ Borg!) a good language to use for GAMES programming (especially on a console with LIMITED memory) simply because of the way it handles memory for classes and all that. It is better suited for writing word-processors and spreadsheets. REAL MEN use assembly.....

The real problem isn't the C++ language, it's the way most C++ class libraries are designed. C++ itself is actually reasonably efficient at handling classes and inheritance, et al. The problem is that with most class libraries, just including the definitions causes code to be generated which ends up requiring the entire class to be linked in even if none or just a few of the functions are actually used.

If you use C++ strictly with your own custom classes, and avoid packaged libraries, it can work very well for game development.

Mike

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7/22/96 6:34 PM

Re(3): Do I have to? use of OT, packets.

Mike Fulton  
LIBGPU/GTE

The AddPrim function is VERY simple. You might manage to optimize a few cycles out of it, but even when you call it hundreds or even thousands of times per frame, those few cycles won't make a big difference. You'd be much better off focusing your optimization on other areas first.

Mike

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7/23/96 11:27 AM

Re(5): Do I have to? use of OT, packets.

Montgomery Singman  
LIBGPU/GTE

overhead is minimal. it doesn't use much of a stack frame ( i think ) and is about 15 instructions long. ( I use my own anyway! . ditto SetSprt etc. so i can set shading and transparency to my own defaults)

Tod Frye.

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7/23/96 1:51 PM

Re(5): Do I have to? use of OT, packets.

Mike Fulton  
LIBGPU/GTE

If you call it hundreds or thousands of times per frame you might want to make it an inline function to save the overhead.

There is already an inline version. The "addPrim" macro defined in LIBGPU.H is used as the body of the "AddPrim" library function. There's nothing else there. (It's not guaranteed to stay that way in future versions, mind you.)

So if you want, you can just use the "addPrim" macro directly instead of "AddPrim".

But my point was that there are probably other optimizations that can be done first that will make a bigger difference.

Mike

---

7/23/96 10:36 AM

Re(4): Do I have to? use of OT, packets.

Borden Covell II

LIBGPU/GTE

If you call it hundreds or thousands of times per frame you might want to make it an inline functions to save the overhead.

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7/24/96 4:55 PM

VSync: timeout

Jay Stelly

PAL

I'm having problems with the PAL version of our game. We've got it running on the PAL system with color and 256 scanlines, but every frame we get a VSyn: timeout error. It is built from the same codebase as our NTSC product, but the NTSC build does not produce the error. We are calling SetVideoMode( MODE\_PAL ); and setting up correct draw/display environments. We changed the jumpers on the Dev system to PAL. What does this error indicate?

Jay Stelly Tetragon

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7/24/96 4:47 PM

PC ftns vs. PQBLOAD

Dane Emerson

LIBGPU/GTE

PQBLOAD "<filename.tim>" 80100000?

what is the address range for download storage? Where do I have to start (any specifics on the memory map?), and how much can I use?

I have been informed through means of an electronically simulated dream, by a greater being than myself, that it proves worthy to (unsinfully) use PCopen(), PCread()... with only the ref & overview 3.0 & 3.0 respectively, I see no such ftns or how to implement them into my daily life. Hast not thou knowledge from a previous life to inform me of such? (I'm not looking for a one word answer here, I want the whole Bible!)

"Go ye now into the wilderness, and serve ye fellow game developers" non-religiously signed, -  
KID

---

7/25/96 12:30 PM

How soon is "soon"?

Ayo A. Orimoloye

LIBGPU/GTE

Administrator



From message in the "News" folder (dated June 24 which incidentally is over a month ago).....  
The PlayStation Developer Support Team is pleased to announce that we will soon be releasing the following information and software:

1) Command/Register Specification (for the GTE) 2) Updated version of DMPSX for C language incorporating the above information. 3) DMPSX for Assembler Language 4) I-Cache (CPU) Simulation Software

Any ideas when this would happen? (Especially #3).....

Yours eagerly  
Mr. Impatient.

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7/25/96 11:26 AM  
Re: PC ftns vs. PQBLOAD  
Mike Fulton  
LIBGPU/GTE

PQBLOAD "<filename.tim>" 80100000?

What is the address range for download storage? Where do I have to start (any specifics on the memory map?), and how much can I use?

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"Go ye now into the wilderness, and serve ye fellow game developers" non-religiously signed, -  
kID

The address range available for your code and data starts at \$80010000 and extends to either \$801FFFFFF (standard retail PlayStation or blue test station) or \$807FFFFFF (DTL-H2000 cards). You can use this range however you want. It does not include either VRAM or SPU-RAM. Do not use locations below \$80010000 as this is used by the PlayStation hardware and OS. Keep in mind that the high byte of the address is used to indicate the cache control. Locations with \$80 in the high byte are cacheable. See the "PlayStation Operating System" and "PlayStation Hardware" documents for a memory map/cache table that explains this stuff. The calls PcOpen() and so forth are documented in the "Psy-Q Development Environment" document.

Mike

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7/25/96 12:43 AM  
Re: PC ftns vs. PQBLOAD  
Montgomery Singman  
LIBGPU/GTE

pcopen etc are psyq fileserv fuctions and are covered in the development system manual

---

7/25/96 10:24 AM  
Re(2): PC ftns vs. PQBLOAD  
Dane Emerson  
LIBGPU/GTE

Any help w/ memory map of PSX (in ref. for storing image data)?  
"What is life?" -kID

---

7/25/96 1:57 PM

Re: How soon is "soon"?  
Administrator  
LIBGPU/GTE

Ayo A. Orimoloye writes: From message in the "News" folder (dated June 24 which incidentally is over a month ago).....

The PlayStation Developer Support Team is pleased to announce that we will soon be releasing the following information and software:

1) Command/Register Specification (for the GTE) 2) Updated version of DMPSX for C language incorporating the above information. 3) DMPSX for Assembler Language 4) I-Cache (CPU) Simulation Software

Any ideas when this would happen? (Especially #3).....

Yours eagerly

Mr. Impatient.

Currently, the GTE and all related releases are going through translation. I cannot give you a precise date, but it would be safe to say within the month of August.

-Peter

---

7/26/96 3:19 PM

Re(2): Fwd: Near Z / Far Z  
Dave Scheele  
LIBGPU/GTE

> At the recent Dev Con, I asked about obtaining the Near > or Far Z (after a RotTransXXX) from the GTE directly

You can't get this value directly. I'm sure though that when we release the GTE specs you will be able to add on to RotTransXXX and get what you want at a small cost.

Great, I'm looking forward to the specs ... access to them little internal intermediate states etc. that seem insignificant can help out in so many little ways ... ;)

Dave

---

7/26/96 3:06 AM

Re(2): How soon is "soon"?  
Dave Scheele  
LIBGPU/GTE

Currently, the GTE and all related releases are going through translation. I cannot give you a precise date, but it would be safe to say within the month of August.

Bummer ... looks like Iron & Blood won't be using them then. With my luck, they probably triple performance or something like that ;)

Dave

---

7/26/96 12:13 PM  
Re: Fwd: Near Z / Far Z  
Michael Koziniak  
LIBGPU/GTE

Dave Scheele writes:

Question: At the recent Dev Con, I asked about obtaining the Near or Far Z (after a RotTransXXX) from the GTE directly, instead of having to read all 3 actual Z's and testing to find the near/far one. Is such a capability available somewhere, and I just missed it in the docs?  
;)

Dave

Dave,

You can't get this value directly. I'm sure though that when we release the GTE specs you will be able to add on to RotTransXXX and get what you want at a small cost.

-Michael

---

7/29/96 5:39 PM  
Seem to be missing VSyncs -- URGENT  
Sam Black  
LIBGPU/GTE

We've recently found a bug in our product (due to go to Sony for approval very soon) which manifests itself as a SEVERE slowdown in the game. My initial investigations lead me to believe that something happens to cause us to miss the VSync interrupt. I have been unable to look at this in the debugger, since as soon as the bug manifests when running in the debugger, the entire system locks up and needs to be rebooted (running in a DOS box under Win95). The bug is also very difficult to reproduce, so I'm not sure what is happening immediately beforehand to trigger the behavior. However, I feel certain that what ends up happening is that we begin missing several VSync interrupts (we get approx. every tenth VSync -- If our framerate counter is reporting 10fps, we're seeing about 1fps).

What might cause our VSync handler to not be called at 60hz? Except during program startup, there are no calls to EnterCriticalSection anywhere. Any ideas that might help me track down what is going on would be greatly appreciated.

---

7/29/96 12:28 PM  
GTE usage in threads  
Robert w. Calfee  
LIBGPU/GTE

I'm getting a fatal error when I try to access the co-proc in a secondary thread. Any suggestions?  
rwc

---

7/30/96 10:23 AM  
Re(2): Seem to be missing VSyncs -- URGENT  
Sam Black  
Rob Vawter  
LIBGPU/GTE

We have not ourselves installed any other handlers. I don't know if any get installed by the libraries. The bug appears both on our CD builds (using the CD filesystem, etc.) and our

development builds (using the host PC filesystem in place of the CD).  
Our intention was that the only processing done in an interrupt context is what is called from the vsyncHandler -- this includes swapping buffers (PutDrawEnv and PutDispEnv) checking for drawing completion (DrawSync(1) -- non-blocking), and reading the controllers. 99% of the time we have no problem, but then something happens and we just don't get the VSyncs. Is there any way to tell what the PSX is doing during this time given that the debugger seems useless (since it cannot talk to the target once the bug manifests)?

---

7/30/96 1:39 PM  
Re: NormalClip, gte\_NormalClip problems  
player 1  
LIBGPU/GTE

I am using NormalClip and gte\_NormalClip just fine without any problems....Are you sure you're passing it the parameters in the way it wants (2 shorts, one with x and one with the y coordinate passed as a single long pointer)? I know the functions work okay, so keep trying.

---

7/30/96 8:53 AM  
Re: GTE usage in threads  
Borden Covell II  
LIBGPU/GTE

You need to get the co-processor enabled bit set in the TCB. Check with Dev Support, they know how to do this.

---

7/30/96 1:21 PM  
NormalClip, gte\_NormalClip problems  
Paul Masters  
LIBGPU/GTE

I've just recently run into a problem in using NormalClip and gte\_NormalClip. Most notably, neither one of them works. More notably, they both do different, FUNNY things. NormalClip() seems to be doing correcting backface removal, but, unfortunately, it also clips my polys to the left edge of my screen. They draw if they overlap the left edge, but nowhere else. gte\_NormalClip() picks certain polys in my world and always draws them, whether they are CR, CCR, whatever. It always picks the same polys which is a VERY small subset of the polys that I actually wish to draw. The others get "clipped" so that my world becomes completely surreal. I've come to the point where I REALLY need one of these functions to perform as advertised. Help me, Obi Wan Kenobi...  
\*Paul Masters Shining Sword Lead Engineer

---

7/30/96 10:14 AM  
Re: Seem to be missing VSyncs -- URGENT  
Rob Vawter  
Sam Black  
LIBGPU/GTE

What might cause our VSync handler to not be called at 60hz?  
Do you have some other callback or interrupt which may be taking too long to process?

---

8/1/96 12:44 PM  
Re: GTE usage in threads  
Mike Fulton  
LIBGPU/GTE

I'm getting a fatal error when I try to access the co-proc in a secondary thread. Any suggestions?  
rwc

Well, first of all, please define "fatal error" more precisely... is this a runtime problem you're seeing, or what? Please provide lots of details.

Secondly... do you mean that you are accessing the GTE from both threads at the same time?

That's a big whomping no-no in most cases. The big question would be when and how are you switching from one thread to the next? Unless you can absolutely guarantee that a thread switch won't happen in the middle of a GTE operation, you're hosed.

Mike

---

8/2/96 5:07 PM  
Re: GTE usage in threads  
Robert w. Calfee  
Mike Fulton  
LIBGPU/GTE

I sent: I'm getting a fatal error when I try to access the co-proc in a secondary thread. Any suggestions?

Borden Covell II wrote You need to get the co-processor enabled bit set in the TCB. Check with Dev Support, they know how to do this.

You sent: Well, first of all, please define "fatal error" more precisely... is this a runtime problem you're seeing, or what? Please provide lots of details.

Secondly... do you mean that you are accessing the GTE from both threads at the same time?

That's a big whomping no-no in most cases. The big question would be when and how are you switching from one thread to the next? Unless you can absolutely guarantee that a thread switch won't happen in the middle of a GTE operation, you're hosed.

First of all fatal error means processing stops--in the debugger it says the co-pro is unusable.

Secondly I'm not accessing the co-proc at the same time because I'm getting a fatal error.

Thirdly I don't appreciate the amount of effort I have to go through to get a simple piece of information. I'm not a child playing with matches. I want to access the gte inside a sub thread. If there is trouble with collisions I expect CUSTOMER SUPPORT to provide me the means to detect and correct this.

If you don't know the answer to my question then SAY SO and quit wasting my time.

robert w calfee

---

8/2/96 5:56 PM  
Re(2): GTE usage in threads  
Borden Covell II  
LIBGPU/GTE

I'm not quite sure how to take your last message. I gave you the magic clue, but I'm not a Sony Dev Support guy. I hope you did not think I was someone from Sony who was teasing you and then passing the buck.

The solution is to set the coprocessor enabled bit in all TCB's processor status word after the GTE has been enabled. I would hope that someone at Sony can give you their "official" code that does this. If not, I'll be glad to help but I just didn't want to muddle the waters with unofficial

solutions.  
Hope this helps. Good luck.

---

8/5/96 11:00 AM  
Re(4): GTE usage in threads  
Borden Covell II  
LIBGPU/GTE

Here is the snippet of code that does the job. Make sure it is executed in a critical section.

```
int i; struct TCB *tcb, *tcb_list;
// this code sets the GTE coprocessor's enable bit // in the status register for all tasks.
tcb_list = tot[2].u.tcb_list;
for( i=1 ; i < MAX_NUM_TASKS; i++ ) {    tcb = &tcb_list[i];    tcb->reg[R_SR] |=
0x40000000; }
```

---

8/5/96 10:35 AM  
Re(3): GTE usage in threads  
Robert w. Calfee  
LIBGPU/GTE

Borden:

>>I'm not quite sure how to take your last message. I gave you the magic clue, but I'm not a Sony Dev Support >>guy. I hope you did not think I was someone from Sony who was teasing you and then passing the buck.

No, no. I'm disturbed by the answer I got from Mike Fulton who IS in customer support. I know that you're another developer like me, and I understand that you don't want to give "unofficial solutions." It's frustrating to me to ask Sony a simple question and get this kind of answer. I haven't been needing much help, but I do keep tabs on the questions that have been posted. To tell the truth I haven't seen a straight answer yet from this Fulton guy.

>>The solution is to set the coprocessor enabled bit in all TCB's processor status word after the GTE has been >>enabled. I would hope that someone at Sony can give you their "official" code that does this.

I would have hoped that too, but it doesn't look like it will happen. If you can post code to me that will give the solution I would be very thankful.

Gratitude in advance, rwc

PS If sony won't let it be posted here send it to : rwCalfee@aol.com

---

8/12/96 11:39 AM  
using RCPolyGT4  
Borden Covell II  
LIBGPU/GTE

I am trying to use RCPolyGT4 but the resulting polyGT4s all have the wrong color values. Can someone help me to understand the processing that is taking place in RCPolyGT4 so that I can ensure that I have set up all of the right data. How is the rgbc member of the DIVPOLYGON4 supposed to be set up for subdividing Gouraud shaded polys? It appears that the rgbc value is not used at all. What is being used to determine the correct color values?  
Any help is appreciated. Thanks.

---

8/13/96 1:07 PM  
Re: using RCPolyGT4  
Mike Fulton  
LIBGPU/GTE

I am trying to use RCPolyGT4 but the resulting polyGT4s all have the wrong color values. Can someone help me to understand the processing that is taking place in RCPolyGT4 so that I can ensure that I have set up all of the right data. How is the rgbc member of the DIVPOLYGON4 supposed to be set up for subdividing Gouraud shaded polys? It appears that the rgbc value is not used at all. What is being used to determine the correct color values?

Any help is appreciated. Thanks.

Most likely the problem is that you aren't setting up everything properly in the work area. Particularly for the RVECTOR fields. Below is an expanded depiction of the DIVPOLYGON4 function which shows everything you should set. Note that there are additional fields in this structure past the end of what is shown below, but I didn't show them since YOU don't have to change them.

To my knowledge, it is the CVECTOR fields within the four RVECTOR fields that will control the shading of the subdivided polygons. If you're only setting the CVECTOR at the top level, I don't think that's enough data.

Mike

```
-----
typedef struct { unsigned long ndiv; unsigned long pih, piv; unsigned short clut,tpage;
/* CVECTOR rgbc; */ { unsigned char r, g, b, cd; }
unsigned long *ot;
/* RVECTOR r0 */ { /* SVECTOR v; */ { unsigned short vx, vy, vz, pad; }
unsigned char uv [2]; unsigned short pad;
/* CVECTOR c; */ { unsigned char r, g, b, cd; }
/* DVECTOR sxy; */ { unsigned short vx, vy; }
unsigned long sz; }
/* RVECTOR r1 */ { /* SVECTOR v; */ { unsigned short vx, vy, vz, pad; }
unsigned char uv [2]; unsigned short pad;
/* CVECTOR c; */ { unsigned char r, g, b, cd; }
/* DVECTOR sxy; */ { unsigned short vx, vy; }
unsigned long sz; }
/* RVECTOR r2 */ { /* SVECTOR v; */ { unsigned short vx, vy, vz, pad; }
unsigned char uv [2]; unsigned short pad;
/* CVECTOR c; */ { unsigned char r, g, b, cd; }
/* DVECTOR sxy; */ { unsigned short vx, vy; }
unsigned long sz; }
/* RVECTOR r2 */ { /* SVECTOR v; */ { unsigned short vx, vy, vz, pad; }
unsigned char uv [2]; unsigned short pad;
/* CVECTOR c; */ { unsigned char r, g, b, cd; }
/* DVECTOR sxy; */ { unsigned short vx, vy; }
unsigned long sz; }
/* you don't have to set anything past here... */
} DIVPOLYGON4;
```

---

8/14/96 9:26 PM  
Re(2): How soon is "soon"?  
Paul Masters  
LIBGPU/GTE

From message in the "News" folder (dated June 24 which incidentally is over a month ago).....  
The PlayStation Developer Support Team is pleased to announce that we will soon be releasing the following information and software:

1) Command/Register Specification (for the GTE) 2) Updated version of DMPSX for C language incorporating the above information. 3) DMPSX for Assembler Language 4) I-Cache (CPU) Simulation Software

Any updated time estimates on these? Last post said some time in August... Just looking for some more specifics if you've got them. \*Pablo

---

8/19/96 4:54 PM  
normalcolorcol etc..  
Greg G. Gibson  
LIBGPU/GTE

This is Bob Polaro at T.H.Q. I'm trying to optimize the speed for calculating and rotating an object trying each of the following 4 methods:

NormalColorCol3

gte\_ldrgb and gte\_strgb3

RotAverageNclipColorCol3

gte\_RotAverageNclipColorCol3

they all seem to go about the same speedwise but none of them work without saving and loading the primitive code. how did the sample routines work without saving the code and if you need to save it what's a fast way to do it?

---

8/20/96 5:29 PM  
Re: normalcolorcol etc..  
Mike Fulton  
LIBGPU/GTE

This is Bob Polaro at T.H.Q. I'm trying to optimize the speed for calculating and rotating an object trying each of the following 4 methods:

NormalColorCol3, gte\_ldrgb and gte\_strgb3, RotAverageNclipColorCol3,

gte\_RotAverageNclipColorCol3

They all seem to go about the same speedwise but none of them work without saving and loading the primitive code. how did the sample routines work without saving the code and if you need to save it what's a fast way to do it?

What do you mean by "saving and loading the primitive code" ? Are you referring to a GPU primitive? And what sample routines do you mean?

Mike

---

8/20/96 5:43 PM  
Re(2): normalcolorcol etc..  
Greg G. Gibson  
LIBGPU/GTE

yes it is the gpu code. it gets trashed when you do a normalcolorcol or any of the other similar calls (found in tuto/tuto4.c) and i found the only way to make it work is to save the code in a



variable before the call and reload it afterwards. i tried storing it in the CVECTOR structure but that still didn't do it.

---

8/21/96 11:04 AM

Re(2): normalcolorcol etc..  
player 1  
LIBGPU/GTE

I think he means the 'code' field inside the primitive, that pads out the RGB values to a long word.

---

8/21/96 4:12 PM

Re(3): normalcolorcol etc..  
Mike Fulton  
LIBGPU/GTE

yes it is the gpu code. it gets trashed when you do a normalcolorcol or any of the other similar calls (found in tuto/tuto4.c) and i found the only way to make it work is to save the code in a variable before the call and reload it afterwards. i tried storing it in the CVECTOR structure but that still didn't do it.

I'm unsure what you mean exactly by "it gets trashed". Do you mean that the GPU code in the SOURCE CVECTOR arguments to these calls is getting changed, or that the GPU code of the source is not carried into the destination?

I know what the example program says in the comments, and frankly it looks like the code is simply not carried over to the destination, which is quite a bit different from it getting trashed somewhere. Regardless, I want to know what YOUR experience is with this situation might be. Also, are you using the same CVECTOR as both source and destination with any of these calls?

Mike

---

8/22/96 1:44 PM

GTE Specifications  
Paul Masters  
LIBGPU/GTE

Developer Support

I'm bothered by the lack of `nRT macro nop nop dw $000000ff endm` in `inline_a.h`. Is there a reason for this? The `$000000ff` comes from `INLINE_C.H`, so I can only assume this is valid. Why are only the commands in `inline_a.h` included in the GTE Specifications?

The following is a list of commands that seem to be being referenced directly as GTE commands. These come from the `inline_` files from run-time library 3.5. Where are the specifications for these commands?

I've excluded the commands that are actually in the GTE Command Reference. As you can see, there are 61 commands that have no (direct) specifications for them. Some of them are partially referenced (OP, GPF, GPL), but not in the form that they are used (OP0, OP12, GPF0, GPF12, GPL0, GPL12). When are these specifications going to be published, and why haven't they already been published?

`rt rtv0 rtv1 rtv2 rtir rtir_sf0 rtv0tr rtv1tr rtv2tr rtirtr rtv0bk rtv1bk rtv2bk rtirbk rtv0fc rtv1fc`

rtv2fc rtirfc ll llv0 llv1 llv2 llir llv0tr llv1tr llv2tr llirtr llv0bk llv1bk llv2bk llirbk llv0fc llv1fc  
llv2fc llirfc lc lcv0 lcv1 lcv2 lcir lcv0tr lcv1tr lcv2tr lcirtr lcv0bk lcv1bk lcv2bk lcirbk lcv0fc lcv1fc  
lcv2fc lcirfc dpcl - DCPL? sqr12 sqr0 op12 op0 gpf12 gpf0 gpl12 gpl0  
\*Pablo

---

8/22/96 2:18 PM  
Re: GTE Specifications  
Paul Masters  
LIBGPU/GTE

Correction on my last rant... OP, GPF, GPL, and SQR do support the 0 and 12 formats... Just missed that on my first read through. Still concerned about the rest of those functions, though.  
\*Pablo

---

8/23/96 5:24 PM  
lib 3.5 slow down  
Dave Ross  
LIBGPU/GTE

I just installed lib 3.5 and the whole game slowed down. The only change was the new libraries? Please Help....., it slowed way downnnnnnnnnnnnn.

---

8/23/96 3:59 PM  
Re: GTE Specifications  
Mike Fulton  
Paul Masters

Pablo @ American Laser Games asks...  
I'm bothered by the lack of (the equivalent of)  
nRT macro nop nop dw \$000000ff endm  
in inline\_a.h. Is there a reason for this? The \$000000ff comes from INLINE\_C.H, so I can only assume this is valid. Why are only the commands in inline\_a.h included in the GTE Specifications? The following is a list of commands that seem to be being referenced directly as GTE commands. These come from the inline\_ files from run-time library 3.5. Where are the specifications for these commands? I've excluded the commands that are actually in the GTE Command Reference. As you can see, there are 61 commands that have no (direct) specifications for them. Some of them are partially referenced (OP, GPF, GPL), but not in the form that they are used (OP0, OP12, GPF0, GPF12, GPL0, GPL12). When are these specifications going to be published, and why haven't they already been published?

rt rtv0 rtv1 rtv2 rtir rtir\_sf0 rtv0tr rtv1tr rtv2tr rtirtr rtv0bk rtv1bk rtv2bk rtirbk rtv0fc  
rtv1fc rtv2fc rtirfc ll llv0 llv1 llv2 llir llv0tr llv1tr llv2tr llirtr llv0bk llv1bk llv2bk llirbk  
llv0fc llv1fc llv2fc llirfc lc lcv0 lcv1 lcv2 lcir lcv0tr lcv1tr lcv2tr lcirtr lcv0bk lcv1bk lcv2bk  
lcirbk lcv0fc lcv1fc lcv2fc lcirfc dpcl - DCPL? sqr12 sqr0 op12 op0 gpf12 gpf0 gpl12 gpl0  
\*Pablo

-----  
Correction on my last rant... OP, GPF, GPL, and SQR do support the 0 and 12 formats... Just missed that on my first read through. Still concerned about the rest of those functions, though.  
\*Pablo

-----  
We will forward your questions to the engineers at SCEI and let you know when we've got a response.

Mike

---

8/23/96 11:30 AM

\_96\_init

Dave Ross

LIBGPU/GTE

What would cause \_96\_init to hang up and not return? We're using Load() and Exec(). All recommend support code has be installed and sometimes the call hangs up in the parent process. I get the feeling from all that I have read, that Sony recommends Load and Exec should not be used. If this is the case why even have it included as part of the Library?

---

8/26/96 2:40 PM

Re: GTE Specifications

Mike Fulton

LIBGPU/GTE

I got a response back from the Japanese engineers regarding the GTE questions. Essentially, those functions in question were removed when the GTE spec was opened up because they weren't essential any longer. The reason they are still in INLINE\_C.H is that this file is essentially used for backwards-compatibility. The INLINE\_O.H file is the new stuff... and please don't ask me to explain filename conventions because I don't get it either.

Mike

---

8/27/96 1:23 PM

Re(3): GTE Specifications

Mike Fulton

Paul Masters

LIBGPU/GTE

There may be something in the older DMPSX documentation, but since they have been dropped, they are not included in the new documentation. Remember, they are included for backwards-compatibility purposes. You shouldn't be using them for new code.

Mike

---

8/27/96 5:53 PM

Re(3): normalcolorcol etc..

Dylan Cuthbert

LIBGPU/GTE

Greg G. Gibson writes: yes it is the gpu code. it gets trashed when you do a normalcolorcol or any of the other similar calls (found in tuto/tuto4.c) and i found the only way to make it work is to save the code in a variable before the call and reload it afterwards. i tried storing it in the CVECTOR structure but that still didn't do it.

Well, the GTE keeps the .cd part of the CVECTOR intact so it probably isn't being trashed by the GTE itself. I, myself, use this feature and store the GPU primitive code in the .cd field... remember it has to be stored in the CVECTOR you are passing it as \*INPUT\*, it then gets copied to the output CVECTORS.

---

8/27/96 10:49 AM

Re(2): GTE Specifications

Paul Masters

Mike Fulton

LIBGPU/GTE

Uhhh... Ok... So, are these function calls just macros that simply access the 16 main GTE functions? The macros obviously still do something. Do they have any kind of specs for them?

\*Pablo

---

8/27/96 5:58 PM

Re(2): GTE Specifications

Dylan Cuthbert

LIBGPU/GTE

Mike Fulton writes: I got a response back from the Japanese engineers regarding the GTE questions.

Essentially, those functions in question were removed when the GTE spec was opened up because they weren't essential any longer. The reason they are still in `INLINE_C.H` is that this file is essentially used for backwards-compatibility. The `INLINE_O.H` file is the new stuff... and please don't ask me to explain filename conventions because I don't get it either.

I think you mean `'inline_o.h'` is the old stuff as it has the temporary register load still in it (originally to hide the GTE register specification) whereas `'inline_c.h'` doesn't and is hence faster.  
Dyl

---

9/3/96 11:34 AM

Re(3): GTE Specifications

Mike Fulton

LIBGPU/GTE

Mike Fulton writes: I got a response back from the Japanese engineers regarding the GTE questions. Essentially, those functions in question were removed when the GTE spec was opened up because they weren't essential any longer. The reason they are still in `INLINE_C.H` is that this file is essentially used for backwards-compatibility. The `INLINE_O.H` file is the new stuff... and please don't ask me to explain filename conventions because I don't get it either.

I think you mean `'inline_o.h'` is the old stuff as it has the temporary register load still in it (originally to hide the GTE register specification) whereas `'inline_c.h'` doesn't and is hence faster.  
Dyl

Yeah... that's correct (`INLINE_C.H` = new stuff).

Let me take another shot at interpreting the response I got. The message I got says that those functions are not documented because they are non-essential, but they are still in the include file for backwards compatibility... I took that to mean that the include file in question was the not-new stuff version (awesome grammar, eh?), but that is not the case.

Mike

---

9/3/96 12:03 PM

Re: lib 3.5 slow down

Michael Koziniak

LIBGPU/GTE

Dave Ross writes:

I just installed lib 3.5 and the whole game slowed down. The only change was the new libraries? Please Help....., it slowed way downnnnnnnnnnn.

Dave,

You are going to have to be more specific. What code is slowing down? CD access, GPU processing, and/or GTE processing. To see the GPU time use the profiler sample code on your game.

-Michael

---

9/9/96 11:55 AM

Re(5): GTE Specifications

Rob Vawter

Greg D. Christensen

LIBGPU/GTE

Where and what are these files "inline\_o.h" and "inline\_c.h"? All I have are inline.h and inlinetm.h.

You must be using an older version of dmplx, I'm guessing 2.06 from July 3rd, '96.

Please check out the 1.7 CD ROM in the following directories: 1) psx\include for the new dmplx

inline\_?.h headers 2) psx\bin\dmplx.exe for the newest version of dmplx (3.01) 3)

psx\doc\dmplx for the docs on how to use it

---

9/9/96 5:37 PM

Collision Detection

Dane Emerson

LIBGPU/GTE

I am attempting to detect collisions between my hero and a maze of walls. There are no restrictions to the width, length, position, or direction the wall faces (there are no horizontal & vertical restrictions... that would be easy!) For ease of presentation, let my hero be a single point in space represented on a single Y plane as (x, z) or (Px,Pz). Points A=(Ax, Az) & B=(Bx, Bz) are the endpoints of each wall in the loop. 'distance' is the final value calculated to determine the hero's distance from each wall in the loop. When distance is 0, a collision has occurred. All formulas were derived from the well-known Graphics Gems book by Andrew S. Glassner (pp. 9,10).

I pose the following questions: -Without regard to the overhead of such a process, is this completely over the top of what I should be doing? Perhaps using bounding rectangles and keeping it simple? (How is that possible?) -WITH regard to the overhead, how can I simplify this formula and optimize each operation? I am fairly new to most any optimization technique, meaning I am open to any suggestions.

```
int HeroCollision() { int Ax, Az, Bx, Bz; int Px, Pz; int Vx, Vz; int Nx, Nz; int Qx, Qz;
int t; int distance, dist; int i;
for(i=0;i<scn.nWalls;i++) { Px = salinas.cord[0].coord.t[0]; Pz =
salinas.cord[0].coord.t[2];
Ax = scn.wall[i].x1; Az = scn.wall[i].z1; Bx = scn.wall[i+1].x1; Bz =
scn.wall[i+1].z1;
dist = SquareRoot0((Bx-Ax)*(Bx-Ax) + (Bz-Az)*(Bz-Az)); Vx = (Bx-Ax)/dist; Vz =
(Bz-Az)/dist; Nx = -Vz; Nz = Vx;
t = ( (Nx*Px+Nz*Pz)-(Nx*Ax+Nz*Az) ) / (Nx*Nx+Nz*Nz);
Qx = Px-Nx*t; Qz = Pz-Nz*t;
distance = SquareRoot0( (Qx-Px)*(Qx-Px) + (Qz-Pz)*(Qz-Pz) ); if(distance == 0)
return 1; }
```

```
return 0; }
```

---

9/9/96 11:32 AM  
Re(4): GTE Specifications  
Greg D. Christensen  
LIBGPU/GTE

Where and what are these files "inline\_o.h" and "inline\_c.h"? All I have are inline.h and inlinetm.h.  
Greg Christensen

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9/10/96 12:17 PM  
Re: RAM - 2 megs vs. 8 megs  
Mike Fulton  
LIBGPU/GTE

I've forwarded your message regarding memory sizes and RAM to the "Development Env." conference, and posted the response there.  
Mike

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9/10/96 10:24 AM  
RAM - 2 megs vs. 8 megs  
Dane Emerson  
LIBGPU/GTE

I am having problems with memory assignment. I assume that the CPE is stored at 0x80000000. Currently, my CPE is approx. 122K or 0x1DC90. I am placing 6 large textures into RAM at 0x8001DC90. They take up 0xE1000 (approx. 921K) amount of RAM. I then place some modelling data at 800FEC90.

How much do I have left? Do I have to reserve more room for the CPE or is it placed somewhere else?

My understanding is the developer's board for the PSX system has a total of 8 megs RAM for use by the developer, yet the PSX system itself has only 2 megs available to the developer. Can I place any piece of data into any section of this 8 megs? Is it one large chunk of RAM or is it split into several smaller segments?

Jesse B. Perrin

---

9/12/96 3:22 PM  
Poly subdivision and PMDs  
Scott Osborn  
LIBGPU/GTE

We're running into some texture "warping" with our PMD-generated polys, and are wanting to divide them using the Sony Divide...() functions. At this stage, we're using the RotPMD..() functions for our rendering, which obviously will have to change to get around the warping. A few questions:

1) Are there any references available for the RotPMD..() functions? Anything (including psuedo code) would be fine.

2) Are there any inherent problems with using the Divide...() functions with PMD data?

We've been unable to get the Divide...() functions to work properly using our PMD data.

In advance, thanks for the input.

Scott Osborn

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9/12/96 7:14 PM

Banding in Gouraud Shading

Crystal Dynamics

LIBGPU/GTE

I've noticed that whilst playing Crash Bandicoot on our PC dev boards there is clear banding across the gouraud shaded polygons. On a US production machine the shading is smooth. Is there a bug with the GPU on the dev. cards? I've tried different machines/tvs.

This is important since we decided against gouraud shading in our game based on the banding.

Adrian Longland Crystal Dynamics

---

9/13/96 2:51 PM

Re(2): Banding in Gouraud Shading

Crystal Dynamics

LIBGPU/GTE

In reply to Ayo A.Orimoloye:

I'm quite sure it's not the dtd flag since our own code sets it and exhibits the same banding. Also the Naughty Dog team must have got really lucky if they don't set the flag - since the production machine would then have the dither on/off randomly each boot depending on what was in memory beforehand. I think they are a little better than that.

In reply to Dylan Cuthbert:

The production machine was connected via composite(yellow/white/red) lead as was one of the Pc dev. card sets. No RF involved.

I encourage other developers to test this out. The effect is VERY noticable.

My next stage of testing would be to cut a disk that just displays a large gouraud triangle then run around testing all our dev. cards / blue stations / production machines.

Sony tech. support - any comment?

Adrian Longland Crystal Dynamics

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9/13/96 7:00 PM

Re(3): Banding in Gouraud Shading

Crystal Dynamics

LIBGPU/GTE

MAIN.C 2K

LIBGPU/GTE

After burning a bootable disk and trying in on various machines, here are my conclusions. The US production machine works fine. The Blue test stations, PC dev cards and some early grey machines have a bug with the dithering of gouraud shading on textured faces. Plain gouraud polys work fine. The problem is with POLYGT\*.

My test program draws two triangles - a POLYG3 and a POLYGT3. With dither off the banding is clear on both triangles. With dither on the banding disappears on the POLYG3 but on a faulty GPU the banding does not disappear on the POLYGT3. There is a difference in the dithering but it is not smooth across the poly.

Does this relate to GPU A / GPU B?

I've attached my test code.

Adrian Longland Crystal Dynamics

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9/13/96 8:36 AM

Re: Banding in Gouraud Shading

Ayo A. Orimoloye

LIBGPU/GTE

Crystal Dynamics writes:

I've noticed that whilst playing Crash Bandicoot on our PC dev boards there is clear banding across the gouraud shaded polygons. On a US production machine the shading is smooth. Is there a bug with the GPU on the dev. cards? I've tried different machines/tvs.

This is important since we decided against gouraud shading in our game based on the banding.  
Adrian Longland Crystal Dynamics

I don't think the banding is a good reason to decide against Gouraud shading - I know that you can turn on dithering of Gouraud shading by simply setting the dtd flag in the DRAWENV structure but I don't think it's possible for the same polygon in the same point on the same game to exhibit different behaviour on the dev sys and US machine. If this is the case, perhaps Crash Bandicoot NEVER bothers to set the dtd flag in the DRAWENV and maybe the dev system defaults the flag to 0 whereas the console defaults the flag to 1. This would explain it. It's quite unlikely though - if I had a copy of Crash Bandicoot I would look at both games playing on both systems side by side and compare the polygons very carefully.....

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9/13/96 1:59 PM

Re: Banding in Gouraud Shading

Dylan Cuthbert

LIBGPU/GTE

Crystal Dynamics writes:

I've noticed that whilst playing Crash Bandicoot on our PC dev boards there is clear banding across the gouraud shaded polygons. On a US production machine the shading is smooth. Is there a bug with the GPU on the dev. cards? I've tried different machines/tvs.

This is important since we decided against gouraud shading in our game based on the banding.

Maybe it's because you have your dev. system connected via S-video and your psx is connected to a bog-standard TV via RF or plain video and so your \*TV\* is removing the banding because it's fuzzy anyway?

Dylan Cuthbert Senior Programmer Sony Interactive Studios America

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9/16/96 12:52 PM

Re(5): Banding in Gouraud Shading

Crystal Dynamics

LIBGPU/GTE

How many GPU A machines are out there?

Adrian Longland Crystal Dynamics

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9/16/96 12:48 PM

Re(4): Banding in Gouraud Shading

Crystal Dynamics

LIBGPU/GTE



After further testing I'm fairly sure that GPU A has a bug with the dither on gouraud shaded textured polys. I amended the previous test code to display a blue border on GPU B and red on GPU A. Sure enough the dev. stations, blue test stations and two early grey consumer units with GPU A all have the bug. New grey consumer units with GPU B don't.  
Adrian Longland Crystal Dynamics

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9/17/96 3:40 PM  
Re(6): Banding in Gouraud Shading  
Brian Dawson  
LIBGPU/GTE

Your problem has been noted. We will investigate this further, and notify you of our findings. How many GPU A machines are out there?  
I do not have an exact number but it is relatively few compared to the number of GPU B's currently in consumers hands. Due that and the fact that the negative results manifest on the Debug and early production units only, I would not suggest letting it impact your development decisions. Keep in mind that now that we know, a solution may be found. Thanks for the info.  
Brian Dawson@SCEA

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10/9/96 2:21 PM  
Re: DMPSX working on assembled object files  
Dylan Cuthbert  
LIBGPU/GTE

Dave Ross writes: I am having trouble using the "inline\_a.h" macros in my assemble files. It seems that DMPSX is unable to alter my object files and, hence the program crashes due to a 'Reserved Instruction' error.  
< stuff deleted > Here is my program. I am trying to generate a sum of squares using MVMVA: Then I link with the /c /g /m flags.  
The code for MVMVA (\$000013bf) is not changed by dmpsx and my program chashes when it tries to execute that instruction.  
Could you tell me what I need to do to make dmpsx work with my assembled object file?

From talking with the GTE guys in Japan I came to understand that the assembler macros actually insert the GTE opcode directly into your code and DMPSX is only used to check for preceding NOPs so you don't write dangerous code - therefore DMPSX shouldn't be changing your code it should just generate warnings. (it still changes C generated object files though as far as I could translate).

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10/9/96 9:28 AM  
DMPSX working on assembled object files  
Dave Ross  
LIBGPU/GTE

I am having trouble using the "inline\_a.h" macros in my assemble files. It seems that DMPSX is unable to alter my object files and, hence the program crashes due to a 'Reserved Instruction' error.  
Here is my program. I am trying to generate a sum of squares using MVMVA:  
include gtereg.h include inline\_a.h xdef sum\_of\_squares MODULE sum\_of\_squares:

```
mtc2 C2_IR0, a0 mtc2 C2_IR1, a1 mtc2 C2_IR2, a2
sll a1, a1, 16 or a0, a0, a1 ctc2 C2_L11L12, a0 ctc2 C2_L13L21, a2
nMVMVA 0, 1, 3, 3, 0 (which translates to: nop nop dw $000013bf + shifted arguments)
nop nop nop nop nop mfc2 v0, C2_MAC1 jr ra nop MODEND
```

I assemble this program using asmpsx with these flags: /l /k /g /zd /z /oc+ I then run dmplx on the produced object file with the -b flag.  
Then I link with the /c /g /m flags.  
The code for MVMVA (\$000013bf) is not changed by dmplx and my program chashes when it tries to execute that instruction.  
Could you tell me what I need to do to make dmplx work with my assembled object file?  
Thanks!

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10/10/96 8:23 AM

Re(2): DMPSX working on assembled object files

Ayo A. Orimoloye

LIBGPU/GTE

Dave Ross

Dylan Cuthbert writes: Dave Ross writes:

The code for MVMVA (\$000013bf) is not changed by dmplx and my program chashes when it tries to execute that instruction.

Could you tell me what I need to do to make dmplx work with my assembled object file?

From talking with the GTE guys in Japan I came to understand that the assembler macros actually insert the GTE opcode directly into your code and DMPSX is only used to check for preceding NOPs so you don't write dangerous code - therefore DMPSX shouldn't be changing your code it should just generate warnings. (it still changes C generated object files though as far as I could translate). This should be more helpful than the last message:

Helpful hints for writing assembler

1. Don't go through the DMPSX - you're just giving yourself unnecessary grief! As you can see, the op-code DMPSX is generating for that MVMVA instruction is \$000013bf. This is WRONG! ALL COP2 instructions have an op-code of \$4Axxxxxx or \$4Bxxxxxx. Look in Appendix A of the MIPS RISC Architecture manual for more info. One thing you will notice is your instruction (\$00013bf) looks like a DIV instruction and not a COP instruction.

2. To fix your program: A. Rename it to squares.asm or whatever.asm B. Get rid of the INCLUDEs (GTEREG.H and INLINE.H). They are used for C code. C. Get rid of the line nMVMVA. Replace with the proper COP2 \$xxxxxx instruction. You can find out what this is by simply disassembling the compiled C code you had previously in the debugger and searching for the appropriate section. The legal red-tape with Sony means I can't say what it is..... D.

Assemble your code using ASMPSX. You might have to rename the GTE registers with the r0 - r31 standard R3000 names. If you use a makefile, you can simply create a make rule for .ASM type files and use ASMPSX as the builder command.

3. Voila! Your first assembly program!

---

10/10/96 4:56 PM

near clipping on tuto1

Bob Polaro

LIBGPU/GTE

is there a way to make the globe in the sample program in psx\sample\graphics\tmd to not clip the polygons prematurely when zooming in?

---

10/11/96 7:06 AM

GTE macros

pyro technix

LIBGPU/GTE

pyro technix

I was disappointed to find that gtemac.h (Release 3.5) does not contain any new macros compared to gtemac.h (Release 3.4).

I am primarily interested in macros for: 1. ApplyMatrixLV() 2. SquareRoot0() 3. SquareRoot12() 4. VectorNormal() 5. VectorNormalS()

When will these be made available?

Dave Miller PyroTechnix, Inc.

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10/11/96 7:19 AM

GTE dot product

pyro technix

LIBGPU/GTE

pyro technix

The GTE has an explicit outer product, namely OuterProduct0() and OuterProduct12(). Yet it has no explicit inner product (i.e. dot product).

What is the best way to perform a dot product using the GTE between: 1. two 16 bit vectors 2. one 16 bit vector and one 32 bit vector 3. two 32 bit vectors assuming 1.3.12 and 1.31.0 numeric formats?

Dave Miller PyroTechnix, Inc.

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10/11/96 7:04 AM

getScratchAddr()

pyro technix

LIBGPU/GTE

pyro technix

The getScratchAddr() macro found in libetc.h (Release 3.5) is poorly defined. The current formulation produces the incorrect address of 0x1f800009 for getScratchAddr(1+2) due to operator precedence. The correct address should be 0x1f80000c.

Would it be possible to place parentheses around 'offset' in the next library release? This would fix the problem.

Eg. #define getScratchAddr(offset) ((u\_long\*)(0x1f800000+((offset)\*4)))

Dave Miller PyroTechnix, Inc.

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10/14/96 12:44 PM

Lib 3.5's DR\_TPAGE Primitive

Michael K. McCarty

LIBGPU/GTE

I'm using setDrawTPage() with the tpage address I use for the tpage element in other primitives (POLY\_FT4, etc.) then using AddPrim(). Is there anything else I need to do? When using the new primitive, it seems like it isn't changing the tpage at all on some frames. It isn't consistent, either. It's something like every 3rd frame is completely wrong and the other 2 are mostly correct.

One last question: Is using DR\_TPAGE faster (GPU-wise) than using an off-screen POLY\_FT3?

Thanks for the assistance.

-- Bob Koon Vortex Media Arts

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10/15/96 12:37 PM

Re: Lib 3.5's DR\_TPAGE Primitive

Mike Fulton

LIBGPU/GTE

I'm using setDrawTPage() with the tpage address I use for the tpage element in other primitives (POLY\_FT4, etc.) then using AddPrim(). Is there anything else I need to do? When using the new primitive, it seems like it isn't changing the tpage at all on some frames. It isn't consistent, either. It's something like every 3rd frame is completely wrong and the other 2 are mostly correct. One last question: Is using DR\_TPAGE faster (GPU-wise) than using an off-screen POLY\_FT3?

Thanks for the assistance.

Bob Koon @ Vortex Media Arts

First the setDrawTPage() function is used to set the opcode of a DR\_TPAGE primitive. Then this primitive must be inserted into your primitive list so that it would be executed prior to the primitives that require the changed texture page.

If you're adding the DR\_TPAGE primitive to your ordering table at the same Z-depth as the other primitives that require it, then you must add it AFTER all those primitives.

This has to do with the way the ordering table mechanism works. If higher Z-depth values are farther away from the viewpoint, then all of the primitives at Z-depth of 11 would be executed before the primitives at a Z-depth of 10. However, within each Z-depth, the primitives are executed in the reverse order from which they were added to the ordering table.

If you want more information about why it works that way, see the "Ordering Table Overview" document here in the "Tech Notes" section of the BBS.

I'm afraid we don't have precise timing information about using DR\_TPAGE versus an off-screen POLY\_FT3, but DR\_TPAGE has to send less data to the GPU, and the GPU doesn't have to do anything but store the information, so I would expect it to be significantly faster percentage wise. As a percentage of your overall drawing time, I doubt it makes any significant difference either way, however.

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10/17/96 6:17 AM

Re(3): DMPSX working on assembled object files

Dylan Cuthbert

LIBGPU/GTE

Ayo A. Orimoloye writes:

This should be more helpful than the last message:

Helpful hints for writing assembler

1. Don't go through the DMPSX - you're just giving yourself unnecessary grief! As you can see, the op-code DMPSX is generating for that MVMVA instruction is \$000013bf. This is WRONG! ALL COP2 instructions have an op-code of \$4Axxxxxx or \$4Bxxxxxx. Look in Appendix A of the MIPS RISC Architecture manual for more info. One thing you will notice is your instruction

(\$00013bf) looks like a DIV instruction and not a COP instruction.  
Bypassing DMPSX is exactly what the Japanese engineers don't want you to do unless you \*really\* know what you are doing, so be careful. Missing one NOP where it is needed (and they are needed in pretty strange places due to the nature of MIPS pipelining) can cause an almost certainly fatal bug that will only crop up one time every hundred or even less often. Very difficult to find and fix if you're only 2 weeks away from a deadline when it crops up.  
Dylan Cuthbert Senior Engineer Sony Interactive Studios America

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10/17/96 9:53 AM

Re(4): DMPSX working on assembled object files

Ayo A. Orimoloye

LIBGPU/GTE

Dylan Cuthbert writes:

Bypassing DMPSX is exactly what the Japanese engineers don't want you to do unless you \*really\* know what you are doing, so be careful. Missing one NOP where it is needed (and they are needed in pretty strange places due to the nature of MIPS pipelining) can cause an almost certainly fatal bug that will only crop up one time every hundred or even less often. Very difficult to find and fix if you're only 2 weeks away from a deadline when it crops up.

Actually, NOPs are not NEEDED with MIPS assembler. There are no "strange" places where you magically insert NOPs, or where missing a NOP causes catastrophic damage. MIPS pipelining is actually very simple in nature - it is misunderstood by many and unfairly blamed for "fatal bugs" that are usually caused by MISINFORMATION and some various other reasons (perhaps DMPSX giving the wrong code for a COP2 instruction?):

The MIPS pipeline is such that there are actually only 3 types of instructions you should be concerned about in terms of latency: branches (or jumps) and reads from memory (loads), and coprocessor-related instructions.

When a branch or jump is being processed (JAL, J, BNE, BEQ, etc), the CPU is also fetching the next instruction immediately after it (because of the RISC pipelining). This instruction starts to process while the next one is fetched. ANY instruction (except another jump or branch instruction for obvious reasons) can be placed after a branch or jump instruction AS LONG AS IT DOES NOT affect the LOGIC of the instruction. This is why NOPs are usually placed there by compilers because by definition they do nothing (i.e. they do not affect the logic). Sony also recommends that GTE instructions (COP2 instructions) should not be placed in these "branch delay slots".

When a load instruction is processed, the DATA read is usually NOT available for one or more ticks because it is read from memory which is slow. As long as the following 1 - 4 instructions do not DEPEND on the data read in from the load, they can also be ANYTHING (including NOPs). Load delay slots CAN contain GTE COP2 calls or branches, by the way, with the same caveat.

Finally, with regard to COP2 (e.g. MVMVA, RTP, etc) calls. COP2 calls simply initiate the GTE function. Each function uses up a different amount of time, depending on what it does. Care should be taken to allow these functions to complete before attempting to read results (LWC2, CFC2, MFC2) or alter coprocessor registers that are being used by the function (CTC2, MTC2). As long as you have enough instructions between the COP2 (MVMVA, RTP) call and these types of instructions, no "fatal bugs" would happen. In fact, EVEN IF you don't have enough instructions between them, the worst thing that usually happens is the CPU is halted (an interlock occurs) until the current GTE function completes. It IS very possible (and very desirable) to write 5000 lines of code without a single NOP instruction with full use of the GTE. With practice, a human is usually more intelligent than a compiler when it comes to performing these 3 basic optimisations, and remember the compiler is only as good as the person writing it. The easiest way to avoid these problems is for a compiler to insert spurious NOP instructions,

which is why when you look at the GNU compiler's output, this is what you notice. Most people I know ARE CAPABLE of finding better instructions to go in these slots. In fact, one definition of RISC is Relegate the Impossible Stuff to Compiler!  
For more clarification on this issue, check out chapter 1 of the MIPS RISC Architecture by Gerry Kane and Joe Heinrich (ISBN 0-13-590472-2).

---

10/18/96 10:21 AM

Re(5): DMPSX working on assembled object files  
Mike Fulton  
LIBGPU/GTE

Ayo,

The information you present regarding the MIPS is essentially correct, as far as I know. The problem is, the MIPS R3000 isn't the issue, the GTE is. The reason for the NOP codes is to allow the GTE instructions to reach a certain stage of execution before you do other operations. If you miss a NOP, you could potentially foul up the GTE operation and that's what Dylan was referring to.

Strictly speaking, the instructions do NOT have to be a NOP, but there has to be something there that takes the required number of cycles and which doesn't touch the GTE. DMPSX assumes the instructions will be NOPs because it doesn't have a complete disassembler built in that could analyze all the various instructions one might place there instead.

Mike

---

10/18/96 9:50 AM

Re: DMPSX working on assembled object files  
Ayo A. Orimoloye  
LIBGPU/GTE  
Dave Ross

I tried to compile the Sony active divide example (PSX\SAMPLE\GRAPHICS\DIVIDE\ACTIVE) on the Programmer's CD ver. 1.7. When PSYMAKE gets to the third line (DMPSX datg4\_cm.o), it prints the error "undefined macro 000024bf". I looked in inline.h and noticed this is contained in the macro for gte\_stflg(r1), which is invoked in the datg4\_cm.c program. I looked at inline\_a.h and I couldn't find it. I am using DMPSX version 3.01 and inline\_a.h version 3. Inline.h has no version info. I suspect something similar is happening in your program. Perhaps the dw \$000013bf lines for MVMVA and nMVMVA are simply too long for the compiler when they are expanded so they are simply ignored or deleted resulting in the macro becoming undefined. Could someone at Sony please clarify this issue?

---

10/18/96 12:02 PM

Re(2): Lib 3.5's DR\_TPAGE Primitive  
Michael K. McCarty  
LIBGPU/GTE

Yes, I know about all of the reverse drawing/zdepth gubbins regarding where to place the tpage change instruction in the ordering table...It was just me being a plonker. (Crisis averted.)

:-)

-- Bob Vortex Media Arts

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10/22/96 4:56 PM

Re(5): DMPSX working on assembled object files

Dylan Cuthbert

LIBGPU/GTE

Ayo A. Orimoloye: With practice, a human is usually more intelligent than a compiler when it comes to performing these 3 basic optimisations, and remember the compiler is only as good as the person writing it. The easiest way to avoid these problems is for a compiler to insert spurious NOP instructions, which is why when you look at the GNU compiler's output, this is what you notice. Most people I know ARE CAPABLE of finding better instructions to go in these slots. In fact, one definition of RISC is Relegate the Impossible Stuff to Compiler!

Of course they are, however...it's no good to brush over things just because you think you know or understand what's going on. The warnings DMPSX generates are important in order to eliminate bugs you might \*not\* have intentionally written!! Imagine a C compiler with NO type or class assignment checking!!

Sure, if DMPSX has a bug currently which prevents it from generating the right code when used with assembler files then temporarily the solution you suggested is the only solution until the bug is fixed, however, it shouldn't be a final solution.

Dylan Cuthbert Senior Programmer Sony Interactive Studios America

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10/22/96 12:08 PM

Re: GTE macros

Mike Fulton

LIBGPU/GTE

I was disappointed to find that gtemac.h (Release 3.5) does not contain any new macros compared to gtemac.h (Release 3.4). I am primarily interested in macros for:

1. ApplyMatrixLV() 2. SquareRoot0() 3. SquareRoot12() 4. VectorNormal() 5. VectorNormalS()

When will these be made available?

Dave Miller @ PyroTechnix, Inc.

I've asked SCEI if there are any additional LIBGTE functions which will be made into macro versions in future releases, and I'll let you know what they tell us. However, I'm thinking there are two important facts to consider.

1) Not every single LIBGTE function is necessarily a good candidate for creating a DMPSX macro equivalent. Some functions simply would not show any improvement. I don't know if any of these fall into this category, but it's quite possible that there are no plans at SCEI to create macro versions of these particular functions for this reason, and also because...

2) Since we have now released the entire GTE specification, it's now possible for you to create your own functions made up of any combination of GTE low-level commands that you require.

Mike @ SCEA

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10/22/96 11:50 AM

Re: getScratchAddr()

Mike Fulton

LIBGPU/GTE

The getScratchAddr() macro found in libetc.h (Release 3.5) is poorly defined. The current formulation produces the incorrect address of 0x1f800009 for getScratchAddr(1+2) due to

operator precedence. The correct address should be 0x1f80000c.  
Would it be possible to place parentheses around 'offset' in the next library release? This would fix the problem.

```
#define getScratchAddr(offset) ((u_long*)(0x1f800000+((offset)*4)))
```

Dave Miller @ PyroTechnix, Inc.

I've forwarded this fix along to SCEI, and I expect it should show up in the next release.

Mike @ SCEA

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10/24/96 8:30 AM

Re: GTE dot product

Administrator

LIBGPU/GTE

pyro technix writes: The GTE has an explicit outer product, namely OuterProduct0() and OuterProduct12(). Yet it has no explicit inner product (i.e. dot product).

What is the best way to perform a dot product using the GTE between: 1. two 16 bit vectors 2. one 16 bit vector and one 32 bit vector 3. two 32 bit vectors assuming 1.3.12 and 1.31.0 numeric formats?

Dave Miller PyroTechnix, Inc.

From our GTE specialists:

>>>The GTE has an explicit outer product, namely OuterProduct0() >>>and OuterProduct12(). Yet it has no explicit inner product >>>(i.e. dot product).

GTE does not have an explicit command for inner product since inner product is just your basic scalar multiplication. However presently you should be able to do the following:

>>>1.multiplication of two 16 bit vectors let's say two svector A & B such that A (ax, ay, az).B(bx, by,bz) = axbx+ayby+azbz = 16bit result in IR1 & 32 bit result in MAC-1, obtained using MVMVA(sf=0,mx=1,v=0,cv=0) 5cycle later.

>>>2.multiplication of one vector(32bit) and one svector(16 bit) load up 16 bit vector as row of coefficient matrix R or L or LR(light color) GTE control registers, and correspondingly split 32 bit vector into two shorts and load up vector VX0,VY0,VZ0 data registers and invoke MVMVA twice to obtain results.

>>>3. multiplication of two 32 bit vectors preliminary impression is that this would be faster to just accomplish on the CPU(R3000) directly. There might be a solution involving setting up the coefficient matrix twice(maybe ??) but implementation on GTe would be complicated and very time consuming.

Hope this helps,

-Peter

---



## Graphic Artist

6/9/95 8:45 AM

JPEG/MPEG movie compression

Thomas Boyd,Sony Computer Entertain

CD,Sony Computer Entertain

> I have been asked the following: > ----- > I am considering playing animation in  
JPEG/MPEG on the playstation. I am > wondering whether the decoding functions in  
libpress.lib support third party > JPEG/MPEG format, for example: if I compress my data into  
JPEG/MPEG using tools > like Alchemy on IBM PC. (It will be hard to compress my data  
using the encoding > functions supplied by libpress.lib, which needs to be run on playstion). I  
> appreciate any guidance on this. > -----

We have no plan to support third party JPEG/MPEG format with libpress.lib now. But they can  
make their own tools like Alchemy, as long as they use it personally and they use our libraries.  
If they want to sell it or distribute it to anyone else they need to let us know.

I think libpress.lib doesn't have encoding functions now while we have the documentation of  
them. So, I think it is impossible to implement Alchemy.

Koji

---

6/9/95 9:11 AM

Fwd(2): Re: JPEG/MPEG Compres

Dave Elton,Sony Computer Entertain

Art Tools

I thought we need the specific Artist Tool Board to run MOVCONV while we don't have the  
board and I cannot download MOVCONV without ordering the board. That's why I am  
concerning about whether the decoding of libpress.lib support 3rd party encoding JPEG.  
According to the feedback from Japan, it looks like libpress.lib only support JPEG encoded by  
MOVCONV. Since MOVCONV can run separately without the Artist Tool Board, I wonder  
why I cannot download it before we order the board. Maybe we should put only those tools  
which need to run with the board under Artist Board Files in Art Tools conference, and put the  
others can run separately in another directory. Another related question is: Can aiff2vag run  
separately or does it need the Sound Tools Board with Macintosh ?

Simon Lai

----- You have not mentioned the development tool MOVCONV  
which compresses movies in JPEG format. I have passed your question on to Japan, but was  
curious why you wanted to use a differeCt JPEGC comprCsion toCol thanCMOVCONVA. I  
have heard of people using Alchemy to make their movies, but do not know if there are any  
limitations. I am finding out if any JPEG will do, and if so, how to do it. Tom Boyd -----  
-

---

6/23/95 4:44 PM

Re(3): New pricing for TrueSpace

david eader,Sony Computer Entertain

Art Tools

What is the return policy on the PSX version of TrueSpace?

Presumably this software is only available thru Sony. Is there a trial period?

Also, is there any tool that exports .tmd binary files directly, instead of .rsd text files? Sounds

like TrueSpace only does .rsd.  
deader@headgames

---

6/26/95 12:58 PM  
TIM Snapshot on Meditor  
Jose R. Villeta,Sony Computer Entertain  
Art Tools

We are trying to get snapshot working from the Meditor Utility on version 1.6 and higher. Every time we get a snapshot we get a blue color bleed all over the TIM image. Does anybody knows why we are getting this blue color bleed? If so how can we fix it? The Snapshot utility from Meditor otherwise gives you the right image. Thanks in advance, Jose Black Ops

---

6/26/95 9:36 AM  
Re(4): New pricing for TrueSpace  
Dan Burnash,Sony Computer Entertain  
Art Tools

david eader,Sony Computer Entertain  
This software is only available thru Sony. There is no return policy, so find out as much as you can before buying. Ask Caligari for general info, and check with your Account Executive if you want all of your options.  
Currently there is a plugin for Wavefront that exports tmd binary files. The next version of the Alias plugin will do the same. Those are the only two that I know of which will generate tmd files directly.

---

6/26/95 11:14 AM  
Re: 3ds2rsd and rsdlink  
Dan Burnash,Sony Computer Entertain  
Art Tools

Greg D. Christensen,Sony Computer Entertain  
>When I use 3ds2rsd on a file with multiple textures in it, the rsds' mat file includes a texture number to use for each polygon. But >then when I run rsdlink the texture page info in the generated tmdfile is always 0 (according to tmdinfo) for every polygon. >Shouldn't rsdlink set the texture page info for a polygon to the texture number from the rsd file instead of 0?  
Do you have your TIM files in right place? You have to place it in the TIM directory which is in the same level as your RSD directory.

For instance,

```
c:\foo\bar\rsd\boo.rsd <- your rsd file c:\foo\bar\tim\tex1.tim <- TIM files refered  
from boo.rsd c:\foo\bar\tim\tex2.tim <-TIM files refered from boo.rsd
```

---

7/5/95 4:41 PM  
Re: TIM Snapshot on Meditor  
Dan Burnash,Sony Computer Entertain  
Jose R. Villeta,Sony Computer Entertain

Art Tools

I see the color bleed when viewing the resultant tim file within Timutil. I believe it to be caused by the Windows configuration, as it only happened when Windows was in 256 color mode. As soon as I switched to a 65k color mode, the bleeding went away. The problem also only showed up while "preview"ing the tim file, not when using the "tim view" option. This is just a limitation of Windows, so the solution is to switch to a higher color mode or to only use the tim view option. If you are experiencing something else, send me your example and I will test it here.  
Dan Burnash SCEA

---

7/6/95 12:23 AM

Yoram Berkowicz,Sony Computer Entertain  
Art Tools

Hi there,  
Could we get an update on the status of the 3D converters (Alias, Wavefront, etc.)?  
Yoram.

---

7/6/95 9:40 AM

Re:

Dan Burnash,Sony Computer Entertain  
Art Tools

Yoram Berkowicz,Sony Computer Entertain

This is the status, as far as I know.

3D Studio - I expect a new version of the plug-in to be available within two weeks.

Alias - This is waiting on some signatures before it will be released. I will post a message when it can be sent out.

Wavefront - I believe that an alpha/beta version of this is available thru Wavefront.

Caligari Truespace - The Playstation version has been released, and a limited number of copies should be arriving at scea any day. Place your order today so we know how many copies we will need.

---

7/11/95 7:07 AM

Using 3DS keyframer

Mark Beardsley,Sony Computer Entertain  
Art Tools

Is there any way to get 3d animation data out of 3DStudio's keyframer for use on tmd models?  
Is support for this on the way?

---

7/13/95 1:30 PM

MovConv slows down vertical retrace

Dave Elton,Sony Computer Entertain

CD,Sony Computer Entertain

Art Tools

I am trying to use vertical blank as a time counting base and I found when the movie is played, some interrupt are cancelled. Is anybody there know how I can choose a time base counter not affected by movie decoding?

Also I am considering embedded the joystick move information in the movie in future, so I can

basically get information at the right frame in movie, does anybody know how to do it?

Thanks!

Simon Lai ReadySoft Inc.

---

7/13/95 8:05 AM

Re(3): Still Using Sound in MovConv

Dave Elton,Sony Computer Entertain

Mark Beardsley,Sony Computer Entertain

CD,Sony Computer Entertain

Thanks for the info, it IS because of the depth in compression setup was set as millions+. Now we can convert the movie we want now.

As I learned from your message, the movie with sound cannot be played from memory and need to be played from CD or emulator board. I don't know where I can find the playstr demo you said. Is it in somewhere on BBS I can download? Is there any other way we can play the movie with sound form memory, I mean either there's some other way to play or other way to generate the movie so we can actually play not using CD emulator? Thanks!

Simon Lai

---

7/13/95 9:03 AM

Re(4): Still Using Sound in MovConv

Mark Beardsley,Sony Computer Entertain

Dave Elton,Sony Computer Entertain

CD,Sony Computer Entertain

There used to be a playstr example posted on the board (but this was months ago). Try looking in the archives of the CD conference. There are two problems with playing from memory instead of the CD emulator. First, the whole movie must fit into the 8 megs of ram on the development system (so it has to be short). Second, you cannot play the XA sound with it (the sound data gets taken directly from the CD read process and is routed to the sound processor), so if you are reading the movie from memory, the sound chip never receives the sound data (I also think that if you run from memory, the sound data will be considered part of the video data and will probably screw it up, but I don't know this for sure). Overall, if you're going to be working with a lot of movies, you should probably get a CD emulator and do it the right way. Hope this helps.

---

7/13/95 10:07 AM

Re(3): Bugs in 3DS plugin

Dan Burnash,Sony Computer Entertain

David W. Marshall,Sony Computer Entertain

Art Tools

>The RSD Plug-in does not generate this info either. Has anyone been able to generate an RSD .MAT file that >gives you 3 vertices, 3 normals, and 3 RGB colors? If so, what buttons and switches do you have to turn >on in 3D-Studio to get that info.

3D studio cannot make "Gradation Color polygon". It surely has "Gouraud polygon", but it is not "Gradation polygon", because each vertex of the gradation polygon does not have different color.

Material Editor of PlayStation graphics tool (not 3DS's material editor) can produce "Gradation polygon", as follows.

First, choose a polygon you want to color, then choose a vertex you want to color via "Edit Vertex Dialog", finally select a color from "Material Dialog".

This will generate Gradation polygon with each vertex different color.

---

7/14/95 3:12 PM

Re(5): Still Using Sound in MovConv

Dave Elton, Sony Computer Entertain

Mark Beardsley, Sony Computer Entertain

CD, Sony Computer Entertain

I know XA sound track can be routed directly to SPU and played. But if I use pqbload to load a small movie into memory, is there anyway to figure out which sector has audio data and then transfer them to SPU by DMA and play the audio? I want to figure this out because I want to get sound played before our ordered CD emulation board shipped to us. I figure maybe I need the specs of sector structure for interleaved movie.

BTW, I went thru the archives in CD conference and couldn't find the playstr demo. Could you send me the playstr sample source code if you have it, Mark? Thanks in advance!

Simon Lai ReadySoft Inc

---

7/28/95 10:31 AM

Caligari Truespace

Dan Burnash

Art Tools

We have just received our shipment of Caligari Truespace for Playstation. If you have ordered it, you should get it any day. If not, there are limited copies available for purchase.

A Caligari Truespace for Playstation, version 2.0, is planned, but not scheduled. When/If plans become more concrete, or plans for it are scrapped, I will let you know.

---

8/2/95 5:59 AM

MovConv question

Dave R. Scheele

Art Tools

When we converted uncompressed AVI's to the STR format, we tried several different combinations of resolution, size and number of colors (e.g. 320x240, 640x480, 16 bit, 24 bit, 15 frames, 30 frames, etc.). We used several versions of the same AVI. In all cases, the MovConv program created .STR files that were exactly the same file size, regardless of the input. Other, different AVIs created different file sizes, but again each AVI ended up converting to it's own .STR file size, regardless of size, frame rate, color depth etc.

We were able to successfully view all of the .STRs, btw. None of them had sound.

Can anybody explain why the STR file sizes are the same?

Phil Spagnolli (using Dave's account)

---

8/7/95 2:29 PM

New Releases

Administrator

News

NEW RELEASES--

Releasing the 2D and 3D utilities along with the NEW Movie Converter.

RELEASES conference :PROGRAMMER TOOLS: \*\*2D Utilies " " \*\*3D Utilities " "

Movie Converter

Kathleen

---

8/7/95 9:10 PM

RSD Plug In for 3D studio

Montgomery Singman

Art Tools

Is there a limitation on number of textures per object ? Or any restriction on the mapping methods ? Can we use face mapping ?

The RSD plug in tool seems to fail without any warning, it would create a RSD file with :

NTEX=0

Thanks for any help, Monte

---

8/8/95 7:59 AM

Re: MovConv question

Thomas Boyd

Dave R. Scheele

Art Tools

Phil, The AVI that you are converting at multiple frame rates, bit depths, and resolutions is probably the same duration throughout all of your tests. The STR file format is for streaming off of the CD at a fixed rate (150 sectors per second). Therefore, at 15 frames per second, your movie has ten sectors per frame for audio and video data compression, while at thirty frames per second, you have five. Likewise, the compression algorithm has to cram movies of different resolutions and bit depth into the same bandwidth. The STR file is merely a concatenation of sector data. So in the end, it is the duration of your movie that determines the size.

You will notice the obvious effects of this. 15fps @ 320X240 will look pretty decent, while 30fps @ 640X480 starts to look real shoddy, depending on the compressibility of your data.

PS: the duration changes when you add sound (or leave room for sound in your compression) because it saves the sectors in a different format. It will still be the same number of sectors.

Tom -----

When we converted uncompressed AVI's to the STR format, we tried several different combinations of resolution, size and number of colors (e.g. 320x240, 640x480, 16 bit, 24 bit, 15 frames, 30 frames, etc.). We used several versions of the same AVI. In all cases, the MovConv program created .STR files that were exactly the same file size, regardless of the input. Other, different AVIs created different file sizes, but again each AVI ended up converting to it's own .STR file size, regardless of size, frame rate, color depth etc.

We were able to successfully view all of the .STRs, btw. None of them had sound.

Can anybody explain why the STR file sizes are the same?

Phil Spagnolli (using Dave's account)

---

8/8/95 6:55 AM

Re: MovConv question

Mark Beardsley

Dave R. Scheele

Art Tools

As I understand it, STR file sizes will only vary when the length of the movie varies. The file size is determined by the data transfer rate of the CD interface. Using less frames per second or less bit depth will simply pack more data into each frame (reducing the amount of MPEG compression loss). So, basically if your movie is 30 seconds long, it's always going to take up about 9megs (30 seconds \* 300 KB/second = 9000KB). I believe that there is a way (using the "advanced settings") to force the size of a frame to be smaller, but I haven't messed with that lately. Hope this helps.

---

8/8/95 5:58 AM

Re: RSD Plug In for 3D studio

Dave R. Scheele

Montgomery Singman

Art Tools

>> Is there a limitation on number of textures per object ?

As far as I know, your only limit is the PlayStation VRAM spec ...

>> Or any restriction on the mapping methods? Can we use face mapping ?

Yes, a big restriction -- the converter(s) don't support 3D Studio's tiling of materials .. you have to "custom map" (as our artists call it) or "face map" everything. (I'm not sure of the terminology; I'm a programmer, Jim, not an artist!) So far as using face mapping, well, there ya go!

>> The RSD plug in tool seems to fail without any warning, it would create a RSD file with : >>

NTEX=0

Not sure on this one, but maybe if all your materials were "tiled" the converter(s) aren't recognizing any of them ...

Also, the texture files you use MUST be .BMP's, btw.

Dave

---

8/10/95 4:02 PM

Re: 3DS plug-in's not new

Dan Burnash

David W. Marshall

Art Tools

Yes, it is. Don't you like the easy access, though:-) I haven't heard anything about the new 3DS plug-in lately, so my latest estimate is late July. Maybe they meant 1996!

---

8/10/95 12:53 PM

3DS plug-in's not new

David W. Marshall

Art Tools

If you have the 3D-Studio Plug-in's from May, don't bother downloading the new file. All the files are the same.

I hope this is not the "new plug-in" that was supposed to be coming from SCEJ weeks ago.

Per request from one of the readme files for bugs,

The TOD plug-in processing material information and the RSD plug-in processing a multi-object model into a multi-object RSD would be nice.

dave

---

8/10/95 11:11 AM

New Releases  
Administrator  
News  
Releases

NEW RELEASES---

Please look in the RELEASES conference: ARTIST TOOLS for the latest releases of:

2D utilities 3D utilities Movie Converter Aboard utility Adobe plu-in files Animation tool  
dxf2rsdw tool Material editor Mime utilities Sprite Editor TIM utility 3D Studio plug-in Graphic  
Artist tutorials

Enjoy!

Kathleen

---

8/14/95 10:04 AM

Re: MovConv Compression Alg

Thomas Boyd

Jose R. Villeta

Art Tools

Don't use version 3, it has slightly (imperceptibly) better image quality, but drops frames on  
playback Tom -----

The new MovConv has a version 3 option besides version 2 for MDEC image conversion. What  
are the main improvements? Can we forget about version 2? Thanks in advance, jose Black Ops

---

8/14/95 4:49 PM

Re(3): MovConv Compression Alg

Thomas Boyd

Jose R. Villeta

Art Tools

I have suggested 32 bit to the author. Tom

---

8/15/95 2:57 PM

Material Editor / RSD Link Request

Erick S. Dyke

Art Tools

My art staff after noticing about 500Meg in duplicate TIM files due to the way that the Material  
Editor works has requested another 2 gig drive. I think it would be much easier to request that  
an environment variable be set to let the Material Editor and the RSD link software know where  
a master .TIM directory is.

For those of you that dont know the problem, currently all of the .TIM files for a model must be  
in a directory ../TIM from the model. If we could have one MASTER Tim directory, it would  
save much disk space, since each .TIM would only be out there once.

Any chance of this small option being added?

Erick

---



8/16/95 1:39 PM  
Re(2): Material Editor / RSD Link Request  
Ian McGee  
Art Tools

>> A similar option was considered by SCE, but they have decided that it would have the potential for >> causing confusion, and possibly use of the wrong TIM file.  
A policy of flexibility and utility would seem to be more productive than one of trying to protect developers from themselves. Given that we are all using tools that allow us to "get confused" about files already, perhaps it could be inferred that developers can keep such things straight in their minds.  
Most every tool developed these days lets the developer customize paths for their particular needs. We should certainly have the same functionality in the tools Sony provides.  
This could also be seen as yet another call for the source to the tools to be made available so we could fix these things ourselves without taking away from Japans busy schedules.

---

8/16/95 1:18 PM  
Re: Material Editor / RSD Link Request  
Dan Burnash  
Art Tools  
Erick S. Dyke

A similar option was considered by SCE, but they have decided that it would have the potential for causing confusion, and possibly use of the wrong TIM file. Luckily, hard drives are cheap. I like your option, but it won't happen soon.  
Dan B.

---

8/16/95 5:56 PM  
3DS Plug-in kinda sucks  
chris m. coffin  
Art Tools

How come the model preview mode for the 3ds plugin doesnt show the objects texture mapped? Is this something that will be added soon? The tool seems marginally useful since it doesn't include this feature and only a Programmer with 3dstudio can even use this tool at all.

---

8/17/95 1:29 PM  
Re: 3DS Plug-in kinda sucks  
Dan Burnash  
Art Tools  
chris m. coffin

A new version is on the way. Keep your fingers crossed. I expect it to "kinda suck" much less than the last one. :-)

---

8/17/95 6:14 AM  
Re(2): Material Editor / RSD Link Request  
Erick S. Dyke  
Art Tools

> A similar option was considered by SCE, but they have decided that it would have > the potential for causing confusion, and possibly use of the wrong TIM file.  
Thats too bad, I (and I must assume that Im not alone), find that when I change ONE texture map that is used on a bunch of models, it is MUCH more confusing to change it in multiple locations. Currently its kind of a configuration nightmare.  
> Luckily, hard drives are cheap. I like your option, but it won't happen soon.  
Too true. Well, thanks for listening, and if you can perhaps poke the people with the code as Ian suggested <GRIN>  
Thanks Again!

---

8/18/95 7:04 AM  
Hack to RSDLINK  
Erick S. Dyke  
Art Tools

Well, for those of you following the rsd thread I decided to fix the problem myself.  
Fixing rsdlink to use a global directory was easy, for the 3.6 version (81533 bytes) the change was at \$12388. I changed the '..' that was there to a 'P:' with a hex editor so now I can have a single TIM directory for linking, which stops me from having to change a ton of maps.  
The change to the material editor is going to take a bit of time with the codeview debugger to find since it is not a simple '..' to change, but it should be easy enough.  
I sure am glad I dont have any options that might confuse me.....

---

8/21/95 2:05 PM  
Re: About aiff2vag  
Buzz Burrowes  
Dave Elton  
Art Tools

>> Say you have a 30 Meg aiff source file (which usually is normal in game)...  
I assume that you are trying to convert this LARGE file for use with the new streaming library.  
If not, your going to have to rethink this! A 30 meg file through a 4:1 compressor will still yeild a 7MEG FILE! (I know it's pretty simple math, so you've probably thought of this.)  
Assuming you are going to stream it through the SPU with the new library, you may have found a bug in the AIFF2VAG tool which will have to be fixed. In this case you would be absolutly correct... AIFF2VAG must be able to deal with LARGE files (ones bigger than available RAM)  
>> Also I have read before you can drag the source file on the icon >> and convert, which is good to do batch converting, but >> it does not work for me. Even after I change the converting >> mode to Auto Mode, any idea there? Thanks in advance!  
Well, you could try rebuilding your desktop. Perhaps your finder doesn't know that AIFF2VAG accepts dragged files. I have found this to happen with other (non Sony) programs and rebuilding the desktop USUALLY works.

---

8/21/95 11:57 AM  
Caligari\Truespace Questions  
chris m. coffin  
Art Tools  
Angus

We are deciding on what 3D PC modeler to use and it looks like we're going to go with truespace since the artists will have to do less jumping around between DOS \ Windows. But I

was wondering what exported formats preserves quads and painted vertices? It looks like DXF does this but we are going to get the sony version which saves out to RSD. Can somebody tell me if the sony version saves painted vertices\quad format polys when it goes to RSD format since I have no information on the sony version of truespace?

---

8/22/95 2:13 PM  
SoftImage Plug-Ins ??  
Christopher C. Rywelski  
Art Tools

Just wondering! Are there any plug-ins for SoftImage (similar to the ones for 3DS) in existance or on the planning board?  
Thanks.

---

8/22/95 10:54 AM  
pict2tim source?  
Russell A. Pflughaupt  
Psyq Tools

All of our other image manipulation tools run under Unix (Sun Solaris 2.5). Is source available for pict2tim? I'm assuming that there isn't a Sun Solaris compatible binary available... We have 100s of individual textures and it would be muchly productive if we didn't have to transfer our images over to the Windows box to convert to tim. Source for timpos would be great too.  
Thanks for any help,  
Stacey Campbell stacey@anyware-fast.com 408 244 2095

---

8/22/95 11:25 AM  
Re: About aiff2vag  
Mark D. Hirsch  
Dave Elton  
Art Tools

I don't know how the software is written. But most Mac software does not need special code to take advantage of Virtual Memmory. You probably can just turn it on and use your wonderfull hard drive. Also, until the wonderful mutlitasking OS (Gershwin (SP?)) comes out, you can always buy the program Ram Doubler, and that should expand your useable memmory quite a bit. I have 40 Meg of Ram on my Mac and the program makes software think I have literally almost double.

---

8/22/95 7:39 AM  
Tim Utility  
Christopher C. Rywelski  
Art Tools

Hi.  
I hope someone can help me out.  
This might be a really dumb mistake but for the life of me I cannot find the TIM Layout button (described in the 3d/2d tutorial for the graphics tools) to access the layout feature in TIM utility. I am using version 1.20e and have also tried a previous version.

The documents I am reading have Japanese pictures of the tool and maybe this Layout button is only in the Japanese version of the tool??  
Any help would be appreciated.  
Thanks.

---

8/22/95 11:22 AM  
Re(2): About aiff2vag  
Mark D. Hirsch  
Art Tools

I don't really know if this pertains to you, since I haven't seemed to follow the post since the beginning, but let's see if this info helps you at all.  
On the Mac, there is an addition to the system software. (It should be included in the latest versions). Its called the Drag & Drop Manager (Or Something like that). It needs to be installed for software written for Drag & Drop to be used properly.

---

8/23/95 11:31 AM  
VDF Files  
David Foley  
Development Env.

Can someone tell us how to create .VDF files for animation. The running dino demo uses this format and it appears to be different than the .TOD format.  
Thanks, David

---

8/23/95 1:38 PM  
Re: VDF Files  
Dan Burnash  
Development Env.  
David Foley  
The mimefilt.exe program generates the .vdf file. The file format and usage of each of the mime... programs is documented in the Artist Tools docs.  
Dan B.

---

8/23/95 10:27 AM  
Re(3): About aiff2vag  
Dave Elton  
Art Tools  
Mark D. Hirsch  
>On the Mac, there is an addition to the system software. (It should be included in the latest versions). Its called the Drag & Drop Manager (Or Something like that). It needs to be installed for software written for Drag & Drop to be used properly.  
I know the drag and drop utility works on my mac since I have my another drag and drop application works, though I don't know how to check out whether my system has the Drag & Drop Manager you said. Is that a seperate package we need to install?  
Simon ReadySoft Inc.

---

8/23/95 1:00 PM

Re: pict2tim source?

Dan Burnash

Psyq Tools

Russell A. Pflughaupt

If I can get approval to release the source to our developers, I will post it in the Art Tools folder.

For now, it is not available.

---

8/23/95 7:46 AM

De-babelizer plug in?

Carl Ferreira

Art Tools

Is there / Are there plans for a plug-in converter for De-Babelizer?

Carl

---

8/24/95 11:46 AM

Selecting video modes in TimUtil

David Cartt

Art Tools

Is it possible to change the video mode in TimUtil from the default 640x480 interlaced to another mode such as 320x240 non-interlaced?

---

8/24/95 2:22 PM

PSX Truespace Questions

chris m. coffin

Art Tools

Will there be a 2.0 version of sony's truespace available? Does paint vertices in truespace carry over into the sony format? Is there a way to quadrangulate the triangle geometry created in 3d studio into caligari format while preserving texture mapping?

Any help is greatly appreciated. Chow- Chris

---

8/25/95 4:52 PM

3ds2rsd.exe problems

David Cartt

Art Tools

3DS2RSD.ERR 1K

Graphic Art/Movie Tools

I get the same error every time I use 3ds2rsd.exe.

The command line and output from 3ds2rsd.exe are in the attached file 3ds2rsd.err. An example input file is attached as donut1.3ds. The program used to create donut1.3ds is Lightwave for the PC.

Please let me know if you can fix it.

---

8/28/95 4:00 PM

Re: PSX Truespace Questions

Dan Burnash

Art Tools

chris m. coffin

>Will there be a 2.0 version of sony's truespace available? No version 2.0 Truespace for Playstation has been planned.

The converter is for model data. We don't have a Truespace<->3D Studio converter, you are on your own for anything that goes between the two.

---

8/28/95 4:38 PM

Re(2): Selecting video modes in TimUtil

David Cartt

Dan Burnash

Art Tools

We are using version 1.20e.

How do you get to the timview window? We have found nothing like that. There is a tim view selector in the dialog that appears after opening a tim file but that only sends the image to the art card.

We want to view our art in something other than the default 640x480 interlace video mode.

---

8/28/95 5:20 PM

Re(3): Selecting video modes in TimUtil

Dan Burnash

David Cartt

Art Tools

Where do you want to view it in something other than 640x480 interlace mode? If you are using timutil, I assume it is on the graphics artist board. In which case you have answered your own question. If you mean the "preview" button, that works fine for me, and shows you a small version of your image. What do you expect timutil to do?

---

8/28/95 2:09 PM

Re: Selecting video modes in TimUtil

Dan Burnash

Art Tools

David Cartt

????? You mean other than clicking on the mode you want in the "tim view" window?

---

8/29/95 9:30 AM

Re(4): Selecting video modes in TimUtil

David Cartt

Dan Burnash

Art Tools

We want to view the art through the graphic artist board on a television in a video mode of our choosing - not necessarily the 640x480 interlace mode that it uses now. If the art is something other than 640x480 then it will be distorted when viewed through the graphic artist board at 640x480. We need to be able to display the art in the video mode that it will be displayed in

the game. There should be a way to select the video mode to display the art through the graphic artist board. We need to be able to specify the horizontal resolution and vertical resolution instead of being forced to display the art in 640x480.

---

8/30/95 9:32 AM

Comments/Bugs in new TOD plugin

David W. Marshall

Art Tools

Dan Burnash

I've had one problem so far with the new plugin.

I am processing a textured model. It gets to an object and says "unable to open c:\3ds4\maps\graph.bmp". The plugin basically aborts after that. It doesn't abort cleanly because I can no longer exit to DOS from 3D-Studio. Everything is fine with the BMP as far as I can tell. It is in the directory, in 256 color mode, converts with BMP2TIM, and is a valid BMP.

Comments:

The old TOD tool would produce a TMD and a TOD file. It would be nice if it gave you the option of generating a TMD or RSD files. Right now it only generates RSD files. It generates 4 files for each object. If you have a model made of 15 objects, that's 60 files.

The tool should also have an option to only generate a TOD file and not the RSD's to go with it. If I have a model with 10 animations, I only need one TMD file and 10 TODs. The tool will currently generate 10 TODs and 10 RSD sets. Having to deal with 600 files when you only need 1 set sucks.

Granted this tool is much better than the previous rev, at least I get colored models now. I hope a new rev will be coming soon. I have heard the SCE does not put high priority on these 3D-Studio tools, which I can't understand since 3D-Studio is widely used as a 3D package.

dave

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8/30/95 9:53 AM

More Info on TOD plugin bug

David W. Marshall

Art Tools

Dan Burnash

The bug in the Plugin for "unable to open file" seems to be a memory issue.

If you try to process a textured model with more than 10 objects in the model, the plugin will puke when it gets to object 11 and say "unable to open file".

We have verified this by randomly removing objects from the model. With 10 or less textured objects, the RSD files are processed correctly; 11 or more, puke.

The size of the bitmaps has no impact on the tool getting past 10 objects.

Since this makes the tool useless for doing large, textured models, I hope that SCE can at least fix this bug (or tell me what I am doing wrong).

dave

---

8/30/95 2:17 PM

Re: More Info on TOD plugin bug

Dan Burnash

David W. Marshall

Art Tools

What is your "files=?" line say in your config.sys? Maybe upping that to a higher number maximum 255, will help. Please let me know.

---

8/30/95 4:02 PM

Re(5): Selecting video modes in TimUtil

Dan Burnash

Art Tools

David Cartt

Here is what I do:

1. Load timutil. 2. Open my TIM file. 3. click on TIM view. 4. click on desired resolution 5. click off the interlace button, if desired.

Now, this does what I think you are asking for, and it works fine for me. Are you asking for something else? Does this not work for you? Please let me know what you expect this tool to do that it isn't doing already.

Dan B.

---

8/31/95 12:20 AM

Re: 3ds2rsd.exe problems

Dan Burnash

Art Tools

David Cartt

Please try this with the latest 3d studio plug-in. The plug-in is replacing the converter, so let me know if it still won't work.

---

8/31/95 3:39 PM

Basic Material Editor Question

David W. Marshall

Art Tools

My artist has just started to play with the Materials Editor. I don't really have time to help him, so I was wondering if anyone could answer this basic question.

When you open an RSD file that has textures, a box appears asking where the TIM file goes in VRAM. Is there any way to tell it to do an auto-load and just use the info in the TIM headers? Or do you just have to click the OK button for all the textures every time?

thanks,

dave My artist has just started to play with the Materials Editor. I don't really have time to help him, so I was wondering if anyone could answer this basic question.

When you open an RSD file that has textures, a box appears asking where the TIM file goes in VRAM. Is there any way to save this information? Every time the artist opens the same model, the Materials Editor keeps asking for the TIM VRAM location.

---

8/31/95 9:27 AM

Re(2): More Info on TOD plugin bug

Dave R. Scheele

Art Tools

Dan Burnash

>> What is your "files=?" line say in your config.sys? Maybe upping that to a higher number maximum 255, will help.

Good idea! Shame it didn't work...

I am having the same problem, and upping my files= from 60 to 90, and then again to 245, made absolutely no difference in where the plug-in bombs.

I have a 21-object character, with each object being all textured, all colored, or a mixture of each.



There are only 4 256 x 256 pixel, 16-color (4-bit clut) textures in use for all 21 objects. Some objects use 1 texture, some use more than 1, some (colored) use none at all.

Upon investigation of the RSD files the plug-in DID make, and the onscreen messages I got when it died, I may have figured out why it's dying. I'll try to describe it with an example:

Objects 1 thru 5 are all texture mapped the following manner:

Obj 1 Texture 1    Obj 2 Texture 1    Obj 3 Texture 2    Obj 4 Texture 2  
Obj 5 Texture 1

The plug-in dies when it tries to access Texture 1 on object 5. It seems it can access an individual texture across multiple objects only if there are no intervening textures. It's almost as if it processes obj 1, and keeps the file handle for texture 1. When processing obj 2, it says "cool I already have a handle on that texture" and uses it. When it processes obj 3, it finds a different texture so it drops the handle on texture 1 (perhaps in a "unclean" manner) and gets a handle on texture 2. All is fine for obj 4 since texture 2 is the current texture again. When it hits obj 5, it tries to get texture 1 again but since it didn't properly "let go" of it back at obj 2-3, it can't access it again, so it bombs.

You watch, I'll be shown to be completely wrong about this, but it does fit the results I'm getting. I don't think the problem is related to how big the models or textures are, or how many objects there are, because I have cases where 13 of 21 objects process, and others where only 4 of 21 process.

And yes, I have to agree with Dave Marshall ... this sucker is useless as it stands. Can this be fixed ASAP?

Dave

---

8/31/95 10:19 PM

Sprite Editor Bug? Help!

Matt S. Arrington

Art Tools

To All,

I've encountered a problem with the Sprite Editor and was wondering if anyone else has found it. Normally, I use the editor on a PC with a Diamond Stealth 64 VRAM video card. But lately, I've been using a PC with a ATI Mach 32 video card. The problem I've found out after I'd set up all the animations is that the Animation Display Window's grid width and height are different on the two machines even though they are running the same cut of software. I've looked for a setting to change the grid size but to no avail. There really is no reason that the grid should be any different should it? This is a major bug and I was hoping that someone would have a work around or know of a fix for it. It couldn't be the difference in video card could it? Thanks in advance for any help.

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8/31/95 9:26 AM

Re(2): More Info on TOD plugin bug

David W. Marshall

Dan Burnash

Art Tools

I changed my "files =" from 60 to 200. I also added SHARE just in case.

This did not fix the problem.

Also, if you have a textured model that processes correctly, you reload that model into the KeyFramer, and try the TOD plugin again, you will get the "Unable to open file" message and puke.

It looks like they are not allocating and cleaning things up correctly.

Since SCE is no longer going to support 3DS2RSD.EXE or the RSD-Plugin, can they release the

source for those tools.  
dave

---

9/1/95 4:22 PM

Re(6): Selecting video modes in TimUtil

David Cartt

Dan Burnash

Art Tools

Your description of what your TIMUtil does is exactly what I want our TIMUtil to do!

Unfortunately our TIMUtil does not do steps 4 and 5. Immediately after clicking on TIM view it displays the TIM file through the graphic artist board on the TV. There aren't any additional messages or windows or selections displayed after clicking on TIM view. We've checked for this window being hidden by another window or something but it is nowhere to be found.

Our version of TIMUtil is 1.20e, the latest version in the TIMUtil folder on your BBS.

Is your version the same? What the heck is going on here????

---

9/1/95 4:36 PM

Re(7): Selecting video modes in TimUtil

Dan Burnash

David Cartt

Art Tools

My version is 1.20e as well. I have no idea why your version doesn't pop up the box with the image size buttons.

Has anyone else had this behavior?

Maybe it is specific to your TIM file. Have you tried it with multiple TIM's? If you want, send me your TIM file directly, and I will try it on my machine.

---

9/5/95 1:24 PM

TMD2PMD

cary hammer

Art Tools

The graphics documentation lists a tmd2pmd utility. How can we get this routine and/or how can we do this conversion? Thanks.

---

9/5/95 5:09 PM

other missing routines

cary hammer

Art Tools

Trying to make headway through the art tools, we noticed a few other routines missing in addition to TMD2PMD that we asked about in a previous e-mail. Specifically, we seem to be missing dx2rsd, rsdlink and an entire subdirectory full of help files for anim.

We are also wondering if there is some updated version of psxgraph documentation. For example, it seems that MaterialEditor only produces .RSD files but ANIMator only wants .DXF files which it appears to want to convert to .RSD, except that it complains that dsx2rsd is missing. Our documentation is dated December 1994.

Another, possibly related question. ANIM seems to look for .DXF files when we try to IMPORT files. When we try to open files, it tries looking in some directory, the full name of which spills off of the tiny window, and this directory, if it exists, seems to not contain any file it

can "open". We also don't seem to be able to tell it to look at directories which contain our .rsd and .dxf files.

By the way, the ANIM and MEDITOR code that we are using was freshly downloaded from the BBS last week.

Thanks for your help.

---

9/5/95 12:51 PM

3DS TOD plug-in

Dave R. Scheele

Art Tools

Any idea on when the fix for that bug in the plug-in will come in? Can you get it expedited through the "Sony process" and have it posted this week if possible? We've got an important demo to do and it would be nice to show more than the minimal stuff we've been able to kludge through the old converters.

Better yet, can source for the plug-in be provided? (I know, I know, but it's STILL worth asking)

Best of all, has anyone else written a 3DS->Sony converter, and is willing to post it?

(might even be worth some \$\$\$ ...)

Dave

p.s. ya right!

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9/6/95 12:03 PM

Re: 3DS TOD plug-in

Dan Burnash

Art Tools

Dave R. Scheele

>Any idea on when the fix for that bug in the plug-in will come in? Can you get it expedited through the "Sony process" and have it posted this >week if possible? We've got an important demo to do and it would be nice to show more than the minimal stuff we've been able to kludge >through the old converters. I don't expect it this week. When I get an estimate from SCE, I will pass it along.

>Better yet, can source for the plug-in be provided? (I know, I know, but it's STILL worth asking) Yes, it is worth asking, but unfortunately the source is not available now.

---

9/6/95 12:25 PM

Re: Basic Material Editor Question

Dan Burnash

Art Tools

David W. Marshall

>When you open an RSD file that has textures, a box appears asking >where the TIM file goes in VRAM. Is there any way to tell it to do an >auto-load and just use the info in the TIM headers?

Or do you just >have to click the OK button for all the textures every time?

If you have set the TIM files location in VRAM, you can just click on okay. If not, you have at least two options. 1. Use the TIMPOS.EXE program to set the location of each tim file. This will then become the default position when the object is loaded into the meditor. 2. Input the correct coordinates whenever you load the file into the meditor.

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9/6/95 10:02 AM  
Re: 3DS TOD plug-in  
Shaival Varma  
Art Tools

are you looking for 3DO -> Sony conversion tools?  
-bretto

---

9/6/95 12:06 PM  
Re: other missing routines  
Dan Burnash  
Art Tools  
cary hammer  
The 3d utilities zip file has been posted that contains all of the missing files.

---

9/6/95 10:35 AM  
Re: other missing routines  
Dan Burnash  
Art Tools  
cary hammer  
>Trying to make headway through the art tools, we noticed a few other routines missing in addition to TMD2PMD that we asked about in a >previous e-mail. Specifically, we seem to be missing dxf2rsd, rsdlink and an entire subdirectory full of help files for anim. A new version of the 3d Utilities will be posted shortly which should contain all of the missing files.  
>We are also wondering if there is some updated version of psxgraph documentation. For example, it seems that MaterialEditor only produces >.RSD files but ANIMator only wants .DXF files which it appears to want to convert to .RSD, except that it complains that dsx2rsd is missing. Our >documentation is dated December 1994.  
Download the latest documentation from the bbs.  
>Another, possibly related question. ANIM seems to look for .DXF files when we try to IMPORT files. When we try to open files, it trys looking in >some directory, the full name of which spills off of the tiny window, and this directory, if it exists, seems to not contain any file it can "open". >We also don't seem to be able to tell it to look at directories which contain our .rsd and .dxf files.  
The Animation tool creates a whole set of directories off of the one you choose for your project. Look in your project directory structure for the appropriate place to put your files. The version of the tool that I am using, 1.1.5, imports RSD files directly.  
>By the way, the ANIM and MEDITOR code that we are using was freshly downloaded from the BBS last week. You should be using version 1.1.5 of the Animation tool then, which supports importing RSD files.

---

9/6/95 10:20 AM  
Re: TMD2PMD  
Dan Burnash  
Art Tools  
cary hammer  
TMD2PMD.EXE 71K  
Graphic Art/Movie Tools

I can't find it up here either. Maybe it was a casualty of our recent Art Tools conference loss. Until it can be reposted officially, here it is.

---

9/6/95 1:45 PM  
VRAM packing editor?  
david eader  
Art Tools

I heard rumors that a tool was forthcoming to aid the task of packing textures into vram. Is this true?

---

9/6/95 1:40 PM  
Re: De-babelizer plug in?  
david eader  
Art Tools

The Tim Export plugin for Photoshop works with DeBab (as do all photoshop filters) You just have to put it in the right directory for DeBab to find it.

---

9/7/95 9:04 AM  
Re(2): 3DS TOD plug-in  
Dan Burnash  
Art Tools

The new plug-in that fixes the problems mentioned in this thread should be ready sometime next week. To be safe, don't expect it until the 18th. If there is a delay, I will let you know.  
Dan B.

---

9/8/95 7:03 PM  
MDEC Play back glitch  
Matt S. Arrington  
Dan Burnash  
Art Tools

We are experiencing glitches on the top 16-32 scan lines of play playback and I need to know if Sony is aware of any problems with play back. The glitch looks like a mis-placed macro-block that is random on X and fixed on the Y-axis.

At first I suspected our play back code but we get the same glitches with Sony's sample play back code. We also have tried just about every version of the movie converted including the latest, with no improvement.

I would appreciate a response as to whether or not you or anyone there at tech-support has seen this problem before.

Thanks.

Matt

---

9/8/95 4:00 PM  
MEDITOR in 320x240?  
Dan Chang  
Art Tools

Q1: I'm running Meditor 1.66e. It defaults to 640x240. Is there some way to set it to 320x240?  
Q2: I tried to run Meditor 1.71ae and the new Aboard.EXE, but both programs complain about not being able to find my art card. What up? I installed the art card without changing any of the dip switches (besides, the old utilities work just fine).  
Thanks, Dan Boss Game Studios

---

9/8/95 4:13 PM  
Re: MEDITOR in 320x240?  
Dan Chang  
Art Tools

Oops. Ignore previous message. A1: Use v1.71ae. It has a resolution setting menu option.  
A2: The Art Card is conflicting with the SCSI card plugged into the machine...  
Dan

---

9/11/95 8:59 AM  
Re: MDEC Play back glitch  
Thomas Boyd  
Art Tools

I have seen it. It is exactly what you think it is. I have been trying to find a solution to it for a long time. I will ask the SCE streaming expert (again) and see if he has a solution yet. Tom  
===== We are experiencing glitches on the top 16-32 scan lines of play playback and I need to know if Sony is aware of any problems with play back. The glitch looks like a mis-placed macro-block that is random on X and fixed on the Y-axis.  
At first I suspected our play back code but we get the same glitches with Sony's sample play back code. We also have tried just about every version of the movie converted including the latest, with no improvement.  
I would appreciate a response as to whether or not you or anyone there at tech-support has seen this problem before.  
Thanks.  
Matt

---

9/11/95 11:59 AM  
Re(2): MDEC Play back glitch  
Thomas Boyd  
Art Tools

ANIM150.ZIP 9K  
Graphic Art/Movie Tools  
OK, the answer is (drumroll) ....  
use the most current version of the movie player. I have attached it for convenience, although it is located in its correct, happy home somewhere on the BBS

Tom

---

9/11/95 8:19 PM

Re(3): MDEC Play back glitch

Matt S. Arrington

Thomas Boyd

Art Tools

Thanks. Using the latest convertor with play back in RGB mode 24 seemed to fix the problem.

---

9/14/95 4:23 PM

Fwd: Movie Converter Problems and Requests

John Phua

Artist Tools

TGA\_SPEC.ZIP 75K

Graphic Art/Movie Tools

I've been having two problems with the movie convertor (v:1.96e) which I'm hoping there is an easy solution to:

1) I find that I am unable to set the output frame size to any custom values. When will this option be available?

2) Converting .WAV files to .XA files results in a file which cannot be interleaved with a movie file properly. The resulting .XA file does not seem to have headers at the beginning of each sector. How do I create the sound track suitable for interleaving with the video data?

Finally, I'd like to request two new features for the movie convertor:

1) It would be nice if the width and height settings for .RGB files would be remembered from the last time I typed them in, and also when the dialog box for those settings does come up, the cursor should default to the width field.

2) If support for reading compressed (or even uncompressed) .TGA or .TIF files were added it would be very helpful. Uncompressed Targa (.TGA) files are very simple - they typically only have an 18-byte header and the data is very similar in format to the .RGB format. Adding decompression is only slightly more complex. I've attached documentation for the .TGA file format in Microsoft Word format. Tiff files are slightly more complicated but compress better than .TGA files and are supported by more applications. Unfortunately I don't have documentation handy for them. Support for either file type would be greatly appreciated.

---

9/14/95 11:06 AM

MEDITOR Keys

Ian McGee

Art Tools

Does anyone have a text file showing the short-cut keys for MEDITOR (and the other art tools, for that matter).

I've poked around, but didn't find anything.

---

9/20/95 1:24 PM

3DS Plug-in fix

Dave R. Scheele  
Art Tools

Dan, does the product release 1.5 contain a fixed version of the 3DS plug-in, or is it still the version 1.1 that had the texture file bug? If it's not the fix, any new word on when it'll come?  
Dave

---

9/20/95 3:10 PM  
Re: .MAT file contents  
Dan Burnash  
Art Tools

Yes, check out the latest graphics artist docs(on line), under the file formats appendix.

---

9/20/95 1:58 PM  
.MAT file contents  
Chris E. Reese  
Art Tools

We are looking at building our own data tables from the files generated from converting a .3DS file to the .RSD format. We are not exactly sure what the values are that are stored in the .MAT file. There are three columns of numbers or characters which are then followed by what we have assumed to be the RGB values for a color. Are there any docs that describe the format of the .MAT file?

Chris Reese. Eidetic, Inc.

---

9/20/95 2:40 PM  
Re: 3DS Plug-in fix  
Dan Burnash  
Art Tools

The new plug-in will be posted soon.

---

9/20/95 3:31 PM  
Is there a tool to combine triangles into quads?  
FLORIA L. ROSS  
Art Tools

Hi there , I was wondering if there is such a tool that can combine triangular polyons into quads. We are trying to use 3D studio to create our models. Thanks  
-TK

---

9/20/95 1:52 PM  
RSDLINK error  
Chris E. Reese  
Art Tools



I wanted to turn a very large ( in excess of 10,000 poly's) .3DS file into a tmd for data retrieval purposes. When trying to convert the RSD files into a TMD the RSDLINK tool barfed with the message "Alloc Error: UCHAR 3x1(sum = 453973)". Does this mean that the DOS tool RSDLINK is bound to the old 640k boundary? Is there a way to get the source code to the tool so we can convert it to a WINDOWS tool and bypass that boundary?

Chris Reese. Eidetic, Inc.

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9/20/95 2:48 PM  
Re: RSDLINK error  
Dan Burnash  
Art Tools

>I wanted to turn a very large ( in excess of 10,000 poly's) .3DS file into a tmd for data retrieval purposes. When trying to convert the RSD files >into a TMD the RSDLINK tool barfed with the message "Alloc Error: UCHAR 3x1(sum = 453973)". Does this mean that the DOS tool RSDLINK is >bound to the old 640k boundary? Probably.

> Is there a way to get the source code to the tool so we can convert it to a WINDOWS tool and bypass that boundary? No, this isn't possible. Sorry.

Dan B.

---

9/21/95 1:57 PM  
Re(2): 8bit bmp -> 4bit tim  
Dan Burnash  
Mark Beardsley  
Art Tools

Looks like a bug in timutil to me. the problem appears to be that timutil thinks the file is an RGB file, not a BMP.

---

9/21/95 4:30 PM  
Re(2): Is there a tool to com  
FLORIA L. ROSS  
Art Tools

Well what I was thinking was that by using quads we can cut down on the polygon count of the models. I know some other 3D modellers like Truespace lets you model in quads. Or is there some good reason not to use quads for models on the Playstation that I am not aware of? I'm not sure what you mean by the Playstation liking triangles more. I thought both triangles and quads are equally supported. Thanks for any advice.

-TK

---

9/21/95 8:49 PM  
Re: 3ds u,v -> .mat  
Roy Eltham  
Art Tools

I had a similar problem with the 3ds2rsd.exe utility. What might bw your problem is box mapping. It just plain doesn't work. You have to map each face of the cube (not each poly) separately using the mapping icon thingy. (or whatever they call it)

I found that even with that the 3ds2rsd util failed to orient the textures properly on the faces and it would often messup on a face (seemingly ramdomly). Check out the plug in and see if they corrected it.

I ended up rolling my own.

Roy Eltham Regal Productions

p.s. Four months to do a project and I have to stop in the middle and write my own tools...

---

9/21/95 2:21 PM

Re(2): 3ds u,v -> .mat

Dan Burnash

Art Tools

Whatever I can find out about what the plug-in supports, I will pass on.

Dan B.

---

9/21/95 10:17 AM

Re: 3ds u,v -> .mat

David W. Marshall

Art Tools

We have experienced the same problem in 3D-Studio.

The plugin only seems to support certain methods of texture mapping. Even when those methods are used, there can sometimes be problems. I once had a model that was all face-mapped and got no U/V offsets.

It would be nice to know exactly what the tool does with the different texture mapping methods in 3D-Studio. Right now I just tell my artist to map it again, since the tool didn't like the first model. Needless to say, the artists don't like that too much.

dave

---

9/21/95 9:57 AM

8bit bmp -> 4bit tim

cary hammer

Art Tools

To turn our 8bit color .bmp texture pages into 4bit color .tim files, we have been using windows based timutils, which is rather labor intensive. We'd love to be able to use bmp2tim in a batch file to do this but there seems to be no option for specifying color depth of the output. Any suggestions? Thanks.

Mark Nicely Unexpected Development

---

9/21/95 9:54 AM

3ds u,v -> .mat

cary hammer

Art Tools

We are having problems getting texture mapped object out of 3ds but our difficulties don't seem to match those discussed in previous threads. Maybe it's a cockpit problem on our end, but any help would be appreciated.

We have a rectangular solid with simple textures face mapped onto it. When we use the 3ds

plug in that creates tod/rsd files, we don't seem to be getting the u,v values out of 3ds' materials handler into the .MAT file. All of the u,v values in the .MAT files are 0. If we hand edit these values accordingly then we can get the texture mapping happening down stream so it appears that either the plug-in isn't working or that we aren't doing something correctly in 3ds. Any help would be appreciated.  
Mark Nicely Unexpected Development

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9/21/95 2:13 PM

Re: Is there a tool to combine triangles into quads?  
Dan Burnash  
Art Tools

Since the Playstation likes triangles, why bother?  
No, I don't know of a tool that does this.

---

9/21/95 12:32 PM

Re: 8bit bmp -> 4bit tim  
Mark Beardsley  
Art Tools

PINBALL.BMP 1K  
Graphic Art/Movie Tools

We would also like to be able to change bit depths with bmp2tim. Also, attached is a small bmp file (24x13, 8bit) that the windows timutil seems to misread (it thinks it's 256x256, 24bit). The DOS bmp2tim reads it fine though.

---

9/25/95 11:14 AM

Re(3): 3ds u,v -> .mat  
Dan Burnash  
Art Tools

Here is a quick list of features sent to me by SCE.  
Current 3D Studio TOD plug-in supports following texture maps.  
1) General texture mapping (planar, cylindrical, spherical) 2) Face mapping  
On the other hand, you cannot do following mapping.  
1) Tiling 2) 2 textures overlap 3) Texture size more than 256x256

---

9/26/95 11:35 AM

Re: Request for info on Truespace.  
Blake E. Senftner  
Christopher C. Rywelski  
Art Tools

I was only briefly exposed to Truespace for PSX, and during that time I only used it for trivial modeling. It had a few bad habits like when I'd be dragging a vertex around, if I dropped the vertex in the wrong place it would start subdividing the polygons to "allow" for the vertex to be located at that spot. This meant that I had to save my model before every vertex adjustment, just in case I dropped the vertex in a bad location I could restore to just before that. (Undo failed after the model had been subdivided.) It also had a habit of creating front and back polygons, when I only wanted front facing polygons- but that was supposed to be fixed... but I stopped

using it.

Truespace is very difficult to model objects that do not have interior polygons, or interpenetrating polygons- and the PSX rendering scheme does not like such polygons, it causes polygon flickering.

My 2 cents.

-Blake

---

9/26/95 5:38 AM

Request for info on Truespace.

Christopher C. Rywelski

Art Tools

I have been trying to define a method to use 3D Studios here for our model creation for PSX data. Due to limitations in the 3ds2rsd util and the 3D Studio plug in (hey they are just betas) the following do not seem possible at this moment: - Tiling of textures. - Mapping of textures to an object. - Conversion of large models. (3ds2rsd will crash).

I have heard a little about the Truespace version for Sony and would like some more info on it. I have heard it has a way to output straight to RSD file format(s). If it can solve any of the above problems it would be very useful.

Therefore I would appreciate hearing from any Developer that has experience using Truespace or from anyone at Sony on this BBS that might be able to answer these and other questions about Truespace.

Questions: - What is the cost? - Does it properly handle tiling of textures and the conversion of this tiling to PSX RSD file format? - Does it properly handle mapping for textures and the conversion to PSX RSD file format? - Will it allow more than one mapping to be applied to an object? - Will Truespace import 3D Studio 3ds file format? - Will Truespace import DXF file format?

Thanks in advance.

---

9/26/95 3:17 PM

LightWave plugin/converter

Christian F. Aubert

Art Tools

Has Sony considered supporting Newtek's LightWave for modeling. It's my polygonal modeler of choice, once I'm done with Alias.

---

9/27/95 1:32 PM

Re(6): 3ds u,v -> .mat

David W. Marshall

Art Tools

Beware of the TOD plugin generating invalid U/V's in the mat file.

I had a 64x64 texture and V offsets of 66 and 253. I am assuming that 3D-Studio does some type of internal stretching of the textures and generates negative mapping coords that the plugin does not handle.

Changing the 66 to a 63 and the 253 to a 0 caused the model to map correctly.

dave

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9/27/95 11:59 AM  
Re(5): 3ds u,v -> .mat  
Roy Eltham  
Art Tools

The largest UV numbers you can have in a .MAT file is 255! The numbers are put into the TMD as unsigned chars, so 256 (which is 0100 hex) gets chopped to 0. It's like taking the numbers in the .MAT file and anding them with 00FFh.

This is probably part of the reason tiling doesn't work. The PSX can only deal with UV numbers from 0-255 (u\_char). In order for a texture to tile the UV numbers have to get bigger. For a 256x256 texture that you want to tile twice across the face of a poly would require PSX UVs in the 0 to 512 range. However if you use a small texture the PSX still doesn't work, because it doesn't wrap the UVs at the texture width. The poly just has a texture page number and a set of UVs. If the UVs go off the edge of the texture in the given page (say if the textures was 32 x 32 and the UVs were 0 -> 128) you just see whatever's in the "unused" area of the page.

Roy Eltham Regal Production

p.s. Sorry for the extra ramblings... This is from my experience. I could be wron, but I hope it helps someone.

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9/27/95 2:11 PM  
Re(2): Request for info on Truespace.  
chris m. coffin  
3D Development  
Christopher C. Rywelski

You should use Truespace(both sony's 1.0(rsd output) and the commercial 2.0 version). That's my 3 cents worth (no i don't work for Caligari ;) ) Here's the lowdown on it.

>>What is the cost? Cheaper than 3D studio ;) >>Does it properly handle tiling of textures and the conversion of this tiling to PSX RSD file format? NO! NOTHING DOES THIS

AUTOMATICALLY :( There is no way to infer tiling in your modeling data since UV mapping coordinates on the sony get turned into 0-255 :( Tiling has to be programmed into the transformation/link to OT process which means using LIBGTE ;) You have to store your tiling information separately since you can't directly 'tag' it onto your objects.

To tile you have to insert texture window primitives in your OT to tell the GPU to tile all subsequent drawing commands. Setting up texture the window primitive is slow and you pretty much have to make one for each primitive since every primitive's tiling is unique and when another primitive gets placed in the list it probably just jumped in between 2 primitives that could have used the same texture window primitive! Errors in placing the texture window primitive are visually unpleasant! To say this is a pain in the butt is an understatement. If anybody knows a better way i'd like to know. Now back to your questions..

>>Will it allow more than one mapping to be applied to an object? Well...on a face by face basis no you can't even though caligari will let you slap 7 textures on top of each other. Basically you'll need to detach each face that needs to be specially textured, map it, then glue it back onto the parent object.

>>Will Truespace import 3D Studio 3ds file format? YES...but everything will be in triangles(yuck) so your models will take more data whereas you could have built them from quads in the first place using Truespace.

>>Will Truespace import DXF? YES. Also takes 3D studio ascii files as well  
Hope this helps :)

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9/27/95 9:18 AM  
Re(4): 3ds u,v -> .mat  
cary hammer  
Art Tools

It looks like we've found a way around our 3ds plug-in problem. We were face mapping 256x256 texture maps onto simple cubes, but the u,v values put into the .MAT file were all 0. We tried using a 240x240 texture map and noticed reasonable u,v values with one caveat -- the values were either 0 or 240 (not 239). Therefore, an nxn texture map will create u,v values of 0,n+1 from the plug-in. Is this the way it *should* work? If so, it implies that the largest texture map that one can use in 3ds with the plug-in is 255x255, unless there is something we are doing wrong. Any ideas? Thanks. - Mark Nicely - Unexpected Development

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9/27/95 1:54 PM  
Re(7): 3ds u,v -> .mat  
Dave R. Scheele  
Art Tools

I'm kinda surprised at the number of people having problems with u&v numbers from 3D Studio. Our first attempts at converting models didn't work, but that was because the textures were tiled and the converter(s) never supported that. Since then, the artists have changed how they map textures on and we're not having any problems. We typically use 256x256 and 256x192 textures, 4-bit color, and can have several different textures on different parts of a model.  
So, hey, using 3DS for Sony development isn't all bad -- I just wish I had the time (and the 3DS API) to write my own converters cuz waiting for Sony has been a pain.  
If anyone wants to know more about how our artists are getting this to work, I can find out from them and post it.  
Dave

---

9/28/95 10:56 AM  
Tim Layout in Tim Util  
cary hammer  
Art Tools

Last month, Christopher Rywelski posted a question about how to access the tim layout feature of TimUtil which is listed in the documentation. Since we can't find the magic button either, we'd like to know the answer. Sorry if we missed a previously posted message.

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9/28/95 9:11 AM  
Re(8): 3ds u,v -> .mat  
cary hammer  
Art Tools

If you could post your artists' procedure for getting texture mapped objects correctly out of 3ds, that would be fantastic! Having worked with my artist on this, I don't see what else he could do to possibly face map a 256x256 texture map on a single face of a cube (non tiled, of course). No matter what we seem to do, the plug-in seems to express non-0 values as +1 larger than the

width of the texture map. Any tips that you can share would be greatly appreciated. - Mark Nicely - Unexpected Development

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9/28/95 6:54 PM  
Re: Tim Layout in Tim Util  
Dan Burnash  
Art Tools

It isn't yet available in the U.S. version of that utility. the docs were written for the Japanese versions of all of the tools, and the version numbers and features don't always match exactly. I have no idea when the U.S. version will be updated, so we will just have to wait and see.  
Dan B.

---

9/30/95 6:50 PM  
TOD plug-in for 3d Studio  
Scott Hartin  
Art Tools

I seem to be having a slight problem with this plug-in for 3dstudio. Whenever I try to save my model, after I choose the name, when I click OK, I get a message "Cannot create that file", then "RSD save failed". Can anyone clue me in on what the problem may be?  
Thanks in advance, Scott

---

10/2/95 11:33 AM  
8b lbm -> 4b bmp -> 4b tim  
cary hammer  
Art Tools

This might be obvious to the rest of y'all, but then again... 1st we were unhappy that we had to use timutil to convert from 8bit bmp files into 4bit TIMs since we wanted to use bmp2tim in a batch mode but the latter routine did not allow for target color depth specification. Then, it appeared that the 8bit bmp -> 4bit tim conversion was messing up the target palette assignments.  
Our solution was to work with 4bit bmp files in the first place. Our original art is created using deluxe paint and by choosing the appropriate -c16 parameter with the alchemy file converter, we get 4bit bmp files which work fine w/ 3ds and convert w/ no problem to .TIM format.

---

10/2/95 11:56 AM  
3ds->rsd material rotation  
cary hammer  
Art Tools

Yet another problem with the 3ds plug-in. If a material is rotated in order to be properly aligned with the face of a cube, the rotation information seems to be getting lost on it's way out through the plug-in. Instead of using 3ds generated cubes, we seperately created each face so we'd control the vertex order and then assembled the faces into a rectangular solid. The face mapping could then proceed without requiring any of the materials to have a non-0 rotation. Even this more arduous approach didn't seem to work as some of the faces were still displayed at

some wrong texture mapping material rotation.

Again, either something in our very simple procedure is wrong or this plug-in is pluggin' us but good.

And, oh by the way, we are still awaiting some word on our previously posted problem (try saying that 3 time fast) where our 256x256 .bmp files u,v coordinates were getting turned into all 0's (real 0 and 256+1 truncations into 0).

And, oh by the way, we have a demo due in 2 weeks and are finding it very frustrating that the support tools seem to be either not really supported and/or not really tools.

Thanks, in advance, for any help.

Mark Nicely

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10/2/95 6:38 AM

Icons for Memory Card

Mark Beardsley

Art Tools

I thought that I had seen (a while ago) someone post a program for generating the icons for a memory card file. I think it converted either bmp or maybe tim files. I can't seem to find it posted anywhere now. Did I just dream it? If it exists, could someone either re-post it or point me to where it is? Maybe there should be a LIBETC conference?

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10/2/95 4:24 PM

Re(4): Tim Layout in Tim Util

chris m. coffin

Dan Burnash

Art Tools

Dead serious of course! I've got a japanese version of windows NT but need to find out where I can get regular dos/windows in japanese also for some other people. Any ideas??? I'd like the tool very much. Are there any other japanese tools out there that have features not available in the US version? ;) Jaa mata ashita, Chris

---

10/2/95 4:57 PM

Re: multiple pmd

chris m. coffin

Art Tools

>>#1 - Is there some way of getting the 3ds plug-in to combine the 3ds >>objects of a single model into a single rsd file?

If you want them all saved as one RSD then attach them all together as one 3D studio object and then save it. Save a file that has all your geometry as separate objects as a backup though.

>>#2 - What is the best way to load and deal with multiple pmd files? All >>of the pmd sample routines seem to deal with a single pmd.

Don't use pqbload to download them into the playstation. Include each one as binary data in your executable. Use LibGs and GsDOBJ3 to handle them in your program(easy) Or you could use ROTPMD fuctions in LIBGTE.

:)

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10/2/95 1:52 PM

Re(3): Tim Layout in Tim Util

Dan Burnash



chris m. coffin

Art Tools

I don't have it. If you are serious, know Japanese, and use Japanese DOS/Windows, let me know. Then I will check and see if I can get them.

---

10/2/95 10:49 AM

Re: TOD plug-in for 3d Studio

Dan Burnash

Art Tools

I am not sure why you would get that error. I will ask what conditions would cause this, and let you know. If you want, send me the model, and I will try it here.

Dan B.

---

10/2/95 4:48 PM

Re: 3ds->rsd material rotation

chris m. coffin

Art Tools

As far as your texture problems go, I've found that if you do a snapped region fit texture mapping to a poly it doesn't come out right after the tools process it (not all your texture shows up or none of it!).

For some reason after you snap it to the polys extents and then scale the mapping to 101-105% the mapping comes out fine after going through the tools.(I know 3D studio isn't CAD accurate but this is ridiculous) Don't ask me why this works, It just does ;)

I use Truespace now since its results are better. Chris :)

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10/2/95 11:35 AM

Re(2): Tim Layout in Tim Util

chris m. coffin

Art Tools

How about giving us the japanese version then? :)

---

10/2/95 12:06 PM

multiple pmd

cary hammer

3D Development

I'm not sure if this is a 3ds plug-in problem or a general programming problem, but here goes... We have multiple rectangular solids in 3ds (call them buildings) which we'd like to work with as a collection (call it city block). Unfortunately, the 3ds plug in spits out a separate rsd file for each building in our 3ds model instead of just one for the entire collection.

#1 - Is there some way of getting the 3ds plug-in to combine the 3ds objects of a single model into a single rsd file?

#2 - What is the best way to load and deal with multiple pmd files? All of the pmd sample routines seem to deal with a single pmd.

Thanks, Mark Nicely

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10/3/95 1:46 PM  
Re: multiple pmd  
Dave R. Scheele  
Art Tools

>> #1 - Is there some way of getting the 3ds plug-in to combine the 3ds >> objects of a single model into a single rsd file?

We've been having the artists join everything together in 3DS (I think it's using weld?) when we needed that. They'd make a separate .3DS file called Single.3DS or something like that when we wanted to see one object. Another thing you can do is go back to the old RSD plug-in (RSD\_I.PXP) which automatically combined everything into one object. Of course, it has other, severe, limitations ... but it works for me!

Dave

---

10/3/95 8:41 AM  
Re(5): Tim Layout in Tim Util  
cary hammer  
Art Tools

We would also be interested in Japanese tools. Regarding Japanese dos / windows 3.1, i'll see if i can find anything in JapanTown (San Francisco) or through contacts in my Japanese class (so desu ne) but would appreciate more direct information. - Mark Nicely

---

10/3/95 9:32 AM  
Re: TOD plug-in for 3d Studio  
Dan Burnash  
Art Tools

The response from the plug-in developer:

\_\_\_\_\_ Make sure you are using the latest TOD plug-in version 3.1. It could happen if the RSD file already existed, and was write-protected.

Any way, I would like to know more detail about the problem.

- 1) What is the plug-in name and the version.
- 2) Can I get the 3DS file which causes the problem?
- 3) Did you save the RSD file with filenames automatically generated?

\_\_\_\_\_ If you can, send me the 3ds and associated files directly, and I will pass them along.

Dan B.

---

10/3/95 9:48 AM  
Re: Tim Layout in Tim Util  
Christopher C. Rywelski  
cary hammer  
Art Tools

I don't think there was a missing message. No one responded to my post.

.)

I still have not found the magic button and do all the layouts by hand now.

Later.

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10/3/95 9:48 AM  
Re: multiple pmd  
Dan Burnash  
Art Tools

For now, attaching the objects, as mentioned already, is your only option. The developer is looking into adding an option to the plug-in that would save all objects to one rsd file.  
Dan B.

---

10/3/95 1:58 PM  
Re: 3ds->rsd material rotation  
Dave R. Scheele  
Art Tools

>> And, oh by the way, we are still awaiting some word on our previously posted >> problem (try saying that 3 time fast) where our 256x256 .bmp files u,v >> coordinates were getting turned into all 0's (real 0 and 256+1 truncations >> into 0).  
Sorry, I had promised you and several others to post something but haven't called / been able to connect for over a week. Our artists, you may recall, have no problem mapping 256x256 4-bit textures onto objects. The trick may lie in the 3DS menu selection "Surface" - "Mapping-Adjust-Region Fit" which they use constantly. It does something like scaling the texture mapping to the map image size, I believe (sorry, but getting a technical description out of our artists proved to be impossible!). Also, make sure your .TIM file versions of the texture maps exist, with proper VRAM coordinates, in a directory that is at the same level as the one you're saving your RSD files in. For example, I have C:\SONY\RSD and C:\SONY\TIM. If the converter can't find the TIM files, I think it screws up and acts similarly to what you're describing.  
If these don't help, call me at (412) 925-6162 and maybe we can exchange sample data or talk more about it or something. I know the frustration you're having, we've just been lucky that we can live with the limitations of the Sony tools for now.  
Dave

---

10/3/95 9:37 PM  
Re(2): multiple pmd  
Roy Eltham  
Art Tools

To combine all the separate "pieces" in a 3ds file into one object to be saved in one rsd file by the plug-in tool you do the following.  
In 3DStudio-ese: select all, create face detach selected  
In english: Go to the Select menu and click 'all'. Then, go to the Create menu, select 'face' then on the "create face" menu select detach. Now, click on the 'selected' button (near the bottom right corner) or press spacebar so that it turns red (for on). Then click in the viewport and it will ask you for a name for the new object. Give it one and blammo you will now have one object.  
Roy Eltham Lead Programmer Regal Productions  
p.s. I'm beginning to get scared by how much I know about 3DStudio... Dammit Jim, I'm a programmer, not an Artist! ;)

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10/4/95 10:26 AM

Re: TOD plug-in for 3d Studio

Dan Burnash

Art Tools

Chris E. Reese

Send me the model that has the problem, preferably both of them, and I will look into the problem.

---

10/4/95 9:22 PM

3ds plug in fixes

cary hammer

Art Tools

Thank's to Dave Scheele's suggestion that we attach texture maps to surfaces using "Surface" - "Mapping Adjust Region (somethingorother)" we seem to have overcome our 2 major problems: 1) u,v mapping seems to work correctly 2) we don't seem to get any wild texture map rotations My artist was somewhat stuck on using "face mapping" because he was in the habit of generating a rectangular solid and then assigning texture maps. By building up the sides of the solid one plane at a time (sorry if i'm boring anyone with the obvious) we were able to use the "surface" - "mapping" option which seems to only work once for any given object. Since each face is now it's own object, each can be texture mapped using the "surface" - "mapping..." feature.

While I'm doling out "thank you's", much appreciation for the suggestions involving how to get multiple objects to spit out a single pmd. - Mark Nicely - Unexpected Development

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10/4/95 2:33 PM

Re(8): Selecting video modes in TimUtil

David Cartt

Dan Burnash

Art Tools

It does not matter what TIM file is used. We have tried TIMUTIL with images we have created and images that came with the PSX software, including the art tutorial examples.

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10/4/95 10:12 AM

TOD plug-in for 3d Studio

Chris E. Reese

Art Tools

I have run into an interesting problem with the plug-in for 3D Studio. I have a large model, approx. 11,000 faces that is gouraud shaded. I run the plug-in on the model saving it as an RSD. I took a look at the .MAT file and found that there were numerous places where FLAT colors were being defined and after face #6536 it seemed to have some serious problems because it saved out garbage numbers and then continued the face count starting at 9000. I have checked with the artists on the model and they have checked the colors and they are positive there are no flat colors. The .PLY file confirms there were flat polys written out because there are more normals than vertices.

I would assume this is a bug. I have even tried it on a model that was 1/3 of the above size and that one just blew up 3D Studio. We just need to the data that is being converted to RSD. We are not trying to make a TMD out of them. We are using ver. 3.1 of the plugin. If there is a fix for this problem we could really use it, since we are now relying on the 3DS2RSD command line

tool, that also seems to have many problems of its own.  
Chris Reese Eidetic, Inc.

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10/5/95 8:16 PM  
Re(5): Tim Layout in Tim Util  
chris m. coffin  
Art Tools

No problemo, Just keep us posted! :)

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10/5/95 1:59 PM  
Suggestions for making a PMD or TMD file?  
Silas S. Warner  
3D Development  
Art Tools

Does anyone have suggestions for a tool that is not part of the Graphic Artist Tools, that will convert a 3DS or DXF file directly to a TMD or PMD file without going through the RSD stage? The RSD files are apparently only useful if working with the Graphic Artist tool, which we do not have. It would be far better to convert our DXF models directly to TMD or PMD data. If there isn't such a tool, I'll probably write one.

Silas Warner

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10/5/95 11:46 AM  
buildings in 3ds  
cary hammer  
Art Tools

Two questions regarding building type objects in 3ds:

- 1) ..\sample\graphics\gsgpu\mado.tmd building seems to be comprised of many polygons, each texture mapped with some small section of mado.tim using non-trivial values for u,v. How was this created? Could this be done using 3d studio? If so, how?
- 2) If one wanted to place planar opaque windows on a planar side of a building (flat shaded, texture mapped, what-ever), how does one do this using 3d studio (which doesn't seem to deal with co-planar objects). It seems that we could have the closer planes be one pixel away from the base plane but my artist is crying that this would be a ton of work -- i guess due to mesh snapping. Any suggestions?

Thanks, Mark Nicely

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10/5/95 4:14 PM  
Re(4): Tim Layout in Tim Util  
Dan Burnash  
Art Tools

I will see if I can get the Japanese versions. Don't expect them quickly, or count on them showing up at all, but I will try to get them.

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10/6/95 12:47 PM  
Applying textures to faces in 3DS

Scott Hartin  
Art Tools

OK, real basic question here, hope someone can help:

We just started making models for output using the TOD plugin, and we would like to know what is the easiest way to apply the textures to the faces.

I read somewhere about selecting all the faces we want a texture stretched across, then choosing region fit, then apply, but I couldn't make this work, is there another step involved, or are we hopelessly lost?

Thanks in advance!

Scott at JVC

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10/6/95 11:10 AM

Re: buildings in 3ds

Dave R. Scheele

Art Tools

I can take a stab at your questions, although I'll probably just be demonstrating that I'm no artist

...

1) ..\sample\graphics\gsgpu\mado.tmd building seems to be comprised of many polygons, each texture mapped with some small section of mado.tim using non-trivial values for u,v. How was this created? Could this be done using 3d studio? If so, how?

Our artists select all the faces that they want to put a texture on, then choose the Region Fit thing and it scales the texture to fit all the selected polys. Then they apply it. The SELECTED button in the lower right comes in handy here, I think.

2) If one wanted to place planar opaque windows on a planar side of a building (flat shaded, texture mapped, what-ever), how does one do this using 3d studio (which doesn't seem to deal with co-planar objects). It seems that we could have the closer planes be one pixel away from the base plane but my artist is crying that this would be a ton of work -- i guess due to mesh snapping. Any suggestions?

Would it be ok to just make a flat building, and then use texture maps to be the windows? Just make a flat box in 3DS and then make a nice bitmap picture of a building, complete with windows, etc., and map it on. What you're trying seems complicated, but then again I don't know your application or goals.

Dave

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10/9/95 2:28 PM

Re: Suggestions for making a PMD or TMD file?

Blake E. Senftner

Silas S. Warner

3D Development

Write your own conversion program. The knowledge you'll gain from getting that familiar with PMD models is well worth it.

-Blake

---

10/11/95 1:20 PM

Photoshop for Mac?

Carl Ferreira

Art Tools

Are there / will there be any plug-ins for Macintosh Photoshop TIM converters?  
Carl Ferreira

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10/12/95 1:11 PM

Re: multiple pmd

Angus

cary hammer

3D Development

Multiple PMDs is not a big deal. Just sort each object separately. Remember a file is just a depository for objects. You can have as many PMD files as you want and as many objects as you want. They all come together when you call GsSortObject. You will only have 1 sort list. The sort list does not understand objects, it only understands polygons. You can send separate objects to the sort routine and it will be sorted appropriately.

Something like for (i=0; i < 10; i++) GsSortObject50;

If you have 10 objects they will be handled appropriately.

As far as getting 1 rsd file, you can still have multiple pmd files for each.

Angus

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10/16/95 2:13 PM

Re: 3DS Plugin

Dan Burnash

Art Tools

Chris E. Reese

>We are trying to use the 3DS plugin tool and we have run into a problem where it is spitting  
>out vertex data that is very different from what is in 3D Studio. We have a simple grid that  
>has the lower left corner set to the origin in 3D Studio (0, 0, 0). The grid increases on the  
>positive X and Z axis. When we run the plugin on it the values we are getting in the .PLY file  
>are huge negative numbers and conversely does not display correctly. We then ran the  
>3DS2RSD command line utility and it came up with what looked to be correct vertex values in  
>the .PLY file, but the origin is not at the lower left corner as it was in 3D Studio. Instead the  
>origin was in the center of the grid. >Are there newer versions of these tools that might work?  
Depends on what version you have. Download the latest plug-in and try again. The converter  
is being phased out, so has not been updated lately.

>This isn't the first time we have run into inconsistencies and serious problems with these 3D  
>Studio conversion tools. Is there a fix to the above problem? I would gladly accept a solution  
>that meant changing a setting in 3D Studio just as long as the data we retrieve is correct. >We  
need a consistent way of building models in 3D Studio and exporting them to the formats  
>required by Sony.

The more examples of problems we can forward to the developer, the better the product will  
become. If you have a specific case that is failing, send it to me, and I will make sure it gets  
fixed. Without the example, not much can be done.

>Please respond to this problem Sony. It seems like most of our development issues and  
>problems come about from a lack of support given to the tools we need in order to get data to  
>the machine.

The plug-in is getting better, though it is not yet perfect. The developer is spending time on it,  
and considers it a priority. Whatever problems are reported, should get fixed.

Dan Burnash

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10/16/95 1:29 PM

3DS Plugin  
Chris E. Reese  
Art Tools

We are trying to use the 3DS plugin tool and we have run into a problem where it is spitting out vertex data that is very different from what is in 3D Studio. We have a simple grid that has the lower left corner set to the origin in 3D Studio (0, 0, 0). The grid increases on the positive X and Z axis. When we run the plugin on it the values we are getting in the .PLY file are huge negative number and conversly does not display correctly. We then ran the 3DS2RSD command line utility and it came up with what looked to be correct vertex values in the .PLY file, but the origin is not at the lower left corner as it was in 3D Studio. Instead the origin was in the center of the grid.

Are there newer versions of these tools that might work? This isn't the first time we have run into inconsistencies and serious problems with these 3D Studio conversion tools. Is there a fix to the above problem? I would gladly accept a solution that meant changing a setting in 3D Studio just as long as the data we retrieve is correct. We need a consistent way of building models in 3D Studio and exporting them to the formats required by Sony.

Please respond to this problem Sony. It seems like most of our development issues and problems come about from a lack of support given to the tools we need in order to get data to the machine.

Chris Reese..... Eidetic, Inc.

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10/17/95 6:56 AM

Re: 3DS Plugin

Dave R. Scheele

Art Tools

Dan Burnash

>> We have a simple grid that has the lower left corner >> set to the origin in 3D Studio (0, 0, 0). The grid >> increases on the positive X and Z axis. When we >> run the plugin on it the values we are getting in the >> .PLY file are huge negative number ...

We had a similar problem. When the model is loaded into 3D Studio, does it appear in the viewports as being extremely large (i.e. is the "camera" or "user view" VERY close to the model (zoomed in)?? This causes numerical distortions in ALL the converters. It was supposed to have been fixed in the latest plug-in (and was for the camera view, I believe) but we had the problem again just yesterday with a model that was "zoomed-into". Just right-click the button in 3DS in the lower right hand that resets all views to show the full model in their window, and run the plug-in again. That'll help a lot. Also, be very careful where you put the origin (Display menu -Const?? - Show Axis?? something like that), although it sounds like you've got that part nailed down.

Note to Dan Burnash: it DOES still screw up if you've zoomed in real close, btw... seems to happen consistently with meshes that come up zoomed in when you load them. Sorry, I don't know about 3DS to tell you more, but if you have any questions or need an example, lemme know!

Dave

---

10/17/95 10:08 AM

Material editor dialog fix

Jay Stelly

Art Tools



For those of you working with meditor, here's a suggestion:  
The dialog boxes are poorly laid out and are too large to fit on a screen smaller than 1280x1024. Using Borland's resource workshop (or any other Windows dialog editor) you can move the controls around to suit your taste/display. I'll upload our changes in a separate message. You'll need a resource linker (RLINK.EXE) to use them. We made the changes to material editor v 1.68ce. If anyone else has done the same thing, I'd like to see it. Also, if the person responsible at sony can make the dialogs smaller in future meditor releases, I'd appreciate it.  
Jay Stelly Tetragon, Inc.

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10/17/95 9:08 AM

Re(2): 3DS Plugin

Dan Burnash

Dave R. Scheele

Art Tools

>it DOES still screw up if you've zoomed in real close, btw... seems to happen consistently  
>with meshes that come up zoomed in when you load them. Sorry, I don't know about 3DS so  
>tell you more, but if you have any questions or need an example, lemme know!

An example always helps, though may not be necessary in this case. If you have one that I can just load up and will fail during conversion, please forward it to me.

---

10/17/95 10:10 AM

New material editor dialogs

Jay Stelly

Art Tools

NEWMAT.RES        20K

Graphic Art/Movie Tools

Here are the changes we made to the material editor. To use them, make a copy of the material editor EXE and link them to it:

COPY MEDITOR.EXE NEWMAT.EXE RLINK NEWMAT.RES NEWMAT.EXE

Now run NEWMAT.EXE and you'll have more manageable dialogs.

Jay Stelly Tetragon, Inc.

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10/18/95 2:35 PM

COREL plugins

Dave Ross

Art Tools

According to COREL PHOTOPAINT 5.0 help, it can use plugins that follow the ADOBE plugin specification. However I'm unable to get it to use/recognize the ones available here for ADOBE PHOTOSHOP to import/export TIMs. Does anyone have the technology to read/write TIMs in COREL - I personally don't like PHOTOSHOP: it's REAL expensive, not intuitive (at least for me) and its a Windows RESOURCE HOG( read: can't do anything else if PHOTOSHOP is open).

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10/19/95 10:03 AM

Re: Photoshop for Mac?

Dan Burnash

Art Tools

>Are there any plug-ins for Macintosh Photoshop TIM converters? No.  
>Will there be any plug-ins for Macintosh Photoshop TIM converters? None are planned.

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10/19/95 7:10 AM

Re(2): De-babelizer plug in?  
Geoffrey Sanders  
david eader  
Art Tools

What did you do to the tim export plugin to get it to work with Debabelizer? The file on the bbs is a plugin for the windows version of photoshop. I have tried changing the file type and creator in resedit but I can't get photoshop or debab to recognize the plug in.  
Geoffrey Top Dog Software

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10/19/95 9:06 AM

Re: COREL plugins  
R.Brett Butler  
Art Tools

wow, i always felt corel was limitting, and i haven't had trouble opening other apps while photoshop 3.0 was running. I use a p90 w/ 16 mgRam.  
(:

---

10/20/95 1:23 PM

Re: PMD formats  
Dan Burnash  
FLORIA L. ROSS  
Art Tools

Check out the on-line docs, and the new manuals when they show up(e.g. hopefully within a week or two). Then post any specific questions to the Art Tools conference.  
Dan Burnash

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10/20/95 10:49 AM

Re(2): Photoshop for Mac?  
Jay Stelly  
Art Tools  
Dan Burnash

>>Are there any plug-ins for Macintosh Photoshop TIM converters? >No.  
>>Will there be any plug-ins for Macintosh Photoshop TIM converters?> >None are planned.  
Wow, I guess the .TIM plug-ins we are using don't really exist. Shhh.. don't tell our artists!  
Seriously, we have them, and I'm pretty sure they came from this BBS. They were developed by Sony Imagesoft (Chris Mayberry) according to the about information.  
Jay Stelly Tetragon, Inc.

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10/20/95 5:39 PM

3D Studio  
Dan Burnash  
Art Tools

Some answers to questions I have been asked.

> I'd like to report the following "bug" with the 3D-Studio TOD plug-in. > > The plug-in should save the Scale Value that is set in the TOD menu. Every time > you open the menu it defaults to 10. It should default to whatever it was the > last > time the TOD plug-in was exited. This value could be saved in a simple text

> file. > > The TOD menu should also allow you to load models from within the plug-in. > Getting 30 new > animations is a pain. > 1) load model > 2)start plugin > 3)change scale > 4)save tod > 5)exit plugin > 6)say YES you really want to exit > 7)goto step 1 > > It should be > 1)Start plugin > 1.5)change scale once if necessary > 2)load model > 3)save tod > 4)goto step 2

As for the first complaint (Scale Value), it will be fixed in the next release.

As for "load models" function, I wonder if this function is really useful or not. Because, after loading a model, user often edit animation. So, he has exit the plug-in anyway.

Anyway I will also try this "load models" function too. But it won't be in the next release.

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10/23/95 11:44 AM

Re(2): 3D Studio

Dan Burnash

Art Tools

Hopefully, all will be fixed in the next release. Realistically, keep you fingers crossed.

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10/23/95 2:57 PM

3DS to TOD

Sky Lounge

Art Tools

HELP!

What is the latest release of the 3DS to TOD plug-in? Do I have it!?!?

I have version 2.1 and it's making me NUTS.

Trouble with hierarchies n stuff...

Thanks folks,

Bondi, reporting from the Sky Lounge.

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10/23/95 2:56 PM

Re(4): Photoshop for Mac?

Jay Stelly

Art Tools

Dan Burnash

Sony TIM Open 13K

Graphic Art/Movie Tools

Here are the plug ins I was referring to. I don't know if they are what everyone is looking for, but they allow Mac Photoshop to open and save .TIM files and set the semi-trans bit in palettes.

I got them from this BBS a few months ago.

Jay Stelly Tetragon

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10/23/95 8:14 AM  
Re(3): Photoshop for Mac?  
Dan Burnash  
Art Tools

oh. I will track it down.

---

10/23/95 10:29 AM  
Re: 3D Studio  
David W. Marshall  
Art Tools

>>As for "load models" function, I wonder if this function is really useful or >>not.  
I'd like to say that the load function is useful. Tthe artists don't use the tool to make the .rsd and .tod files. The artists give me the .3ds files for the animations and I convert the anims into Sony format.

Are the other bugs being fixed also? 1)Doesn't complain when it can't find the textures. Just generates a RSD file 0 texture references. 2)Generates invalid mapping coords. Generates a V coord of 254 for a texture map of 64x64. 3)Just make a TMD file and not generate 4 files for every object in the model.

dave

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10/24/95 9:11 AM  
8-bit TIM conversion to BS  
Kirk Woller  
Art Tools

I am trying to use 8-bit TIM files (which have been converted from PIC files) in the Movie Converter to produce BS files and am having difficulty. I have viewed the sample code available and have adapted it to my use. The current process I am using is .pic -> .tim (using a tim utility) -> .bs (using the Movie Converter) and then converting the resulting binary files to hex using my code, then viewing with altered sample code. This is not working. The files preview fine in the Movie Converter.

How do I get 8 bit TIM files to work with the Playstation?

-Kirk

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10/24/95 5:10 PM  
Re: 3DS to TOD  
Dan Burnash  
Art Tools

It sounds like you have the latest version. If you have specific problems, send me examples and I will try to get them fixed. Hopefully a new version will be released in a couple of weeks.

Dan Burnash

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10/24/95 6:48 PM  
3DS2RSD.EXE  
Dan Chang  
Art Tools

Does the 3DS2RSD.EXE utility still exist? Or is it now considered obsolete? I searched the BBS, but I didn't find it. I prefer it to the 3DS plug-in as the artist doesn't have to do any extra work, and I can add it to my makefile.  
Dan Chang Boss Game Studios

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10/24/95 10:12 AM

Re: Windows 95 Statement

chris m. coffin

Documentation

Art Tools

FYI, I would like to point out that the TIM plugins DO work with WIN95 if you bother to get the latest photoshop upgrade 3.04 from Adobe or use the older version 2.5 (3.0 does not work)

Hope this helps you out, Chris

---

10/25/95 10:05 AM

Re: 3DS2RSD.EXE

Dan Burnash

Art Tools

The 3ds2rsd converter is considered obsolete. If you want the old copy, I will post it. However, I recommend switching over to the plug-in when you get the chance as it will continue to get better while the converter just gets older.

Dan Burnash

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10/25/95 11:13 AM

Re(3): De-babelizer plug in?

david eader

Geoffrey Sanders

Art Tools

Just saw your message (haven't been on the bbs in a while)

Here's what I know:

I'm using Debabelizer 1.61 on the macintosh (Quadra 605, 12 Megs). In the 'Plugins' subdirectory of my debab folder, I have two plugins: 'Sony TIM Open', and 'Sony TIM Save'.

I downloaded these many months ago, so I'm sure they're not the latest. Finder Info (aka command-I) says they were created Fri, Jan 13, 1995, 12:38 PM modified Sun, Jan 15, 1995 1:55 PM (version n/a)

I run debab with min size 700, preferred size 2600.

I only use this stuff once every couple of weeks; just to create test textures for the gte-emulator I'm working on.

I have noticed some limitations. It seems like you can't create 4bit tims. To do that, I use debab to create 4bit .bmps (uncompressed), then I use the dos util bmp2tim.exe

----- Hope this is of some help. I actually would like to learn alot more about the plugins - I've been meaning to surf the ArtTools conferences, etc... but so many other things on my plate.

Please reply and let me know what you've learned. You can forward this message to various art conferences if you like.

deader@headgames.com

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10/26/95 4:19 PM

Re: Caligari and Quads

chris m. coffin

David W. Marshall

Art Tools

>>Someone posted a while back the Caligari TrueSpace allows you to make models out of true quads. Is this true? YES it does!

>>Is there a button to turn on in TrueSpace to say "make models from true quads and not 2 triangles"? Do we need 1.0 to >>make quad models? Both version 1 and 2 model in quads by default, you just need to make sure you save to the appropriate format that does not break the quads into tris (.cob <-caligari object file).Make/uv map your models in 2.0 and texture them in 1.0.

>>We have TrueSpace 2.0 (and are waiting for the 1.0 version from Sony). We made a test model, saved it as a DXF, >>brought it into the Material Editor, textured it, and saved it into RSD format. The RSD file contained triangle data. That conversion process is what destroys the quads. If you save the model as a .cob(caligari object file) import it into Truespace 1.0(sony) paint it with your TIM texture maps and save to RSD you get your quads.

I found the best way to go was to model only in version 2.0 and write a tool that took a .cob file that was textured with TGA texture maps, convert it to RSD format and convert all associated TGA files to TIMs and be done with it.

Chris :) Tip: (if you use the 3DR mode in Truespace 2.0 it renders all polys non-perspective texture mapped and as triangles so you can basically see what it looks like on the Playstation since the textures distort the same) >>>> I call it the sony mode :)

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10/26/95 3:30 PM

Caligari and Quads

David W. Marshall

Art Tools

Someone posted a while back the Caligari TrueSpace allows you to make models out of true quads. Is this true?

We have TrueSpace 2.0 (and are waiting for the 1.0 version from Sony). We made a test model, saved it as a DXF, brought it into the Material Editor, textured it, and saved it into RSD format. The RSD file contained triangle data.

Is there a button to turn on in TrueSpace to say "make models from true quads and not 2 triangles"? Do we need 1.0 to make quad models?

Any help would be appreciated,

thanks, dave

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10/26/95 7:52 PM

Texturing RSD files

Silas S. Warner

3D Development

I cannot use MEDITOR to texture RSD files on my PC, because this company does not have an Artist Board. (I would like to see a version of MEDITOR that will accept a DTL-2000 as an Artist Board, but realize that this will happen a few months after H\*ll freezes over.) Because of this, I am planning to write a converter which will read the appropriate RSD files together with a definition file linking RSD texture names to locations in the video RAM, and change the MAT files appropriately.

1) Has anyone already written a DOS or Windows tool like this?

2) When looking at the MAT file, my texture lines are seriously goofy. They do not quite match the format shown in the Appendix to the Graphic Tools manual, and in several places on a 128-by-128 texture they place a corner co-ordinate at 0,128. There also seems to be only one number where the manual says there should be R,G, and B values.  
Can anyone enlighten me on these points?

Silas Warner

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10/27/95 2:08 PM  
Re(2): Texturing RSD files  
Silas S. Warner  
Art Tools

Thanks for your prompt response. I now have some questions which I would like answered in order to build the C tool. The RSD format with its PRJ and associated files is simple, thank (somebody). But all the files, including RSD and MAT, contain these components:

- 1) A title and comments set off by # signs. Are these read by the RSD tools, or simply ignored and passed through? In other words, can I add my own comments?
- 2) An ID number, on the order of MAT070924. Does this identify the specific file or the creator and its version? Is it a key ID for further processing? I take it I MUST pass on this ID unchanged. But if editing all files in the set, can I change the ID for all files at once?
- 3) The specific data used by the program. How up-to-date is the Appendix of the current Graphic Artist Tool manual? The version I have is DTL-D220A for 3D Graphics Tool Version 2.0. Is there a later release?

Silas Warner

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10/27/95 12:17 PM  
Re: Texturing RSD files  
Dan Burnash  
Art Tools

>I cannot use MEDITOR to texture RSD files on my PC, because this company does not have >an Artist Board. (I would like to see a version of MEDITOR that will accept a DTL-2000 >as an Artist Board, but realize that this will happen a few months after H\*ll freezes over.) Eventually, meaning sometime next year, I expect a version of the materials editor that supports the development boards.

>2) When looking at the MAT file, my texture lines are seriously goofy. They do not quite >match the format shown in the Appendix to the Graphic Tools manual, and in several places >on a 128-by-128 texture they place a corner co-ordinate at 0,128. There also seems to be >only one number where the manual says there should be R,G, and B values.  
How were these files generated. If you have a specific converter problem, send me the before and after files so that I can get the problem fixed.

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10/30/95 3:39 PM  
How does RSDLINK use TIMs?  
Silas S. Warner  
Art Tools  
Dan Burnash

I notice that the RSDLINK program must have access to the TIM files used for textures. Is this so that RSDLINK can set the origin addresses of textures correctly?  
I am currently manually modifying MATs to point to the correct location in the video RAM,

and pointing the TIM references to the TIM which is actually loaded in the RAM. This causes the TMD data to be out of bounds. Should I manually modify the MATs to point to the location in the TIM?

Silas Warner

---

10/31/95 6:03 PM  
3DS Plugins: Scaled Texture Maps  
Silas S. Warner  
Art Tools

Apparently, the 3DS plugin ignores expansion factors when setting texture maps. I had an original piece of 3DS artwork which relied on a pair of 128x128 texture maps. In order to convert these to PSX, I created a single texture map with the two original maps squeezed into 64x64 areas.

The artist then rescaled the texture maps on the 3DS model so that the polygons matched the original textures. This was done essentially by setting a scale factor on the textures, adding offsets to the two maps and pointing them to the same texture.

When converted, the MAT files still showed the original texture coords. The scaling factors were ignored. Is this a known bug in the 3DS plugin, and if so, how soon can it be fixed? I will transmit the 3DS file and the RSD files created from it, on request, to whatever tech-support person picks up this message.

Silas Warner

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11/7/95 7:14 PM  
3DS Plugin Tool  
Chris E. Reese  
Art Tools  
Dan Burnash

We have run into yet another major problem with the 3DS plugin tool. We have found that if we save out an object that consists of multiple elements, such as having a figure with the head being one element and the body being another, the origin for that object is different than the origin that was specified in 3D Studio. The origin that the plugin uses ends up being the last element it encounters, or so it seems. The only way we have found to get around this is to weld our models and not have it made up of elements, or to prevent the artists from going ballistic on me I have written a tool that takes the .PLY file and calculates the correct origin and modifies the vertex information based on a bounding box. In 3D Studio, as far as I can tell, it is possible to set the construction axis or origin for a model. Shouldn't the plugin use this information? Is this something that can be fixed or do I tell my artists to weld their models into one element?  
Chris Reese Eidetic, Inc.

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11/8/95 10:07 AM  
Re: 3DS Plugin Tool  
Dan Burnash  
Chris E. Reese  
Art Tools

>Is this something that can be fixed or do I tell my artists to weld their models into one element?  
For now, have them weld their models. I have asked the developer to fix the problem, and will let you know his response/when it will be fixed.  
Dan Burnash

---



11/12/95 8:11 PM

Timutil vs. Photoshop plugins

Silas S. Warner

John Phua

Art Tools

Is there any reason to have Timutil in my Windows directory if I already have the Photoshop plugins? As far as I can tell, Photoshop with the plugins will do everything Timutil will do, and then some.

Silas Warner

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11/13/95 10:24 AM

Re: Timutil vs. Photoshop plugins

John Phua

Silas S. Warner

Art Tools

Hi Silas,

It is your preference, if you wish to use the Photoshop plugins instead of timutil. We'll let you know if we find a difference in features between the two methods.

John

~~~~~  
~~~~~

~~~~~ ~~~~~ Is there any reason to have Timutil in my Windows directory if I already have the Photoshop plugins? As far as I can tell, Photoshop with the plugins will do everything Timutil will do, and then some.

Silas Warner

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11/13/95 4:11 PM

Re: How does RSDLINK use TIMs?

Silas S. Warner

Art Tools

Experimentation has produced the answer to this question:

The RSDLINK program uses the TIM files ONLY to set the TPAGE and CLUT of texture data. The TPAGE and CLUT are computed, once only, from the upper left corner of the TPAGE and CLUT RECTs on the TIM.

NOTE THAT THIS CAN LEAD TO PROBLEMS:

If your texturing TIM is more than 256 pixels wide, which can happen if you combine a large number of textures into one TIM, then RSDLINK will NOT adjust the TPAGE values. The offset values will be placed modulo 256, and may well point to the wrong texture.

Silas Warner

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11/16/95 2:09 PM

Editing color vertices?

Jay Stelly

Art Tools

It has recently become necessary for us to develop some pre-shaded gouraud-triangle (POLY\_G3) based models. We are not shading these with a lighting algorithm. Ideally, I'd like our artists to be able to specify each vertex color and preview the gouraud interpolation

somehow. I'm considering throwing together something for them, but I thought I'd check and see if anyone else had found a way to do this using an existing tool or application.  
Jay Stelly Tetragon

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11/16/95 2:07 PM  
Material editor VRAM usage  
Jay Stelly  
Art Tools

We're using the material editor to texture models, and having a few problems. It seems as though the material editor is using part of the VRAM. I know it has its double buffer set up for (0,0 - 511,479) in 512x240 mode. We are also having problems with the bottom of VRAM. We have a texture with its CLUT loaded into 768, 511 (it's 8-bit) and some of the colors end up wrong. Our artists have reported some other problems with textures in that area, but I had originally ignored them since I thought they were colliding with the debug font I was loading with FntLoad( 960, 256 )...

Does the Material editor load any data into VRAM? If so is there a map somewhere that details this info? How big is the FntLoad() font in pixels?

Thanks,  
Jay Stelly Tetragon

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11/20/95 3:58 PM  
Black color and transparency  
Montgomery Singman  
Art Tools

Does anyone know how I can have both black color and transparency in a same sprite(TIM) ?  
Thanks, Monte

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11/21/95 2:45 PM  
3D Studio  
Dan Burnash  
Art Tools

BTW, I have done several tests concerning following problem which you have sent me before. In (4), he says that the 3D Studio screen is messed up by the message "Generating TOD file ...". I have tried with your 3DS under English MS-DOS. However I could not reproduce the problem on my machine. I would like to know following data of the user's environment who has the problem.

- 1) machine name
  - 2) OS (MS-DOS or PC-DOS) and version
  - 3) plug-in version
- Thank you.

> > \_\_\_\_\_ > > I've written my own animation data converter that runs out of 3D Studio's > > KeyScripter, so I'm mainly interested in the model > > conversion. This worked almost perfectly on the model that it barfed on > > before. The only glitch (a tiny one) is that, in the .PRJ > > file created, the number of objects is 1 too high. RSDLINK didn't seem to

> > care, though, as it created a perfect TMD file that I am > > displaying right now. Still, my animation data converter does use that number, > > so it'd be nice if that was fixed. No biggie, though, > > since I can fix the number by hand for now. > > > Well, uh, there is another problem, a BIG one. I could not get the animation > > previewer to work for me at all. I tried it on some .3ds > > files that the previous version did work fine on. Here's what happens: > > > > 1. I select the tod plug-in, and choose Preview. > > > > 2. the plug-in processes all the objects in the model, everything looks good. > > > > 3. it says "Generating TMD file" in a little centered box and up at the top > > line I see the "Copyright (c) Sony" message from > > RSDLINK, just like the old version(s) did. > > > > 4. Here's where the bad things start. When the TMD file is created, the > > message "Generating TOD file" is displayed in a little box > > in the UPPER RIGHT corner of the screen .. it looks like it's displaying at > > current cursor position?? > > > > 5. starting at the top of the screen (or just under the "Generating TOD" > > message? am not sure right now, goes by too quick), the > > screen is erased to black, one line at a time. It's as if some text is being > > printed to the screen, and since it's in graphics mode it > > just screws up and clears the line off. > > > > 6. When the entire screen was black for a while, I checked my hard drive light, > > and there was no activity. After waiting and > > watching a while longer, I hit Ctrl-Break. > > > > 7. I got the infamous ^C in the lower right corner of the screen (again, > > current cursor position maybe? also suggests something's > > being printed, eh?? > > > > 8. I then got my mouse cursor back, but the screen was not refreshed. I could > > click on the buttons etc. on the tod plug-in, it just > > wasn't fully displayed. I clicked on Exit to get out before I hurt myself! > > > > 9. after confirming my choice to exit, the KXP terminated and I was back to 3D > > studio. Everything worked fine from there. > > > >  
\_\_\_\_\_ > > > Dan Burnash >

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11/21/95 7:37 PM  
Re: Black color and transparency  
Chris E. Reese  
Art Tools

The easiest method is to not use RGB(0,0,0) as black. Try using RGB(0,0,1). The color will still look black, but technically it no longer is. That is how we are getting around it in the texture maps we are using that need to have both transparency and black.  
Chris Reese Eidetic, Inc.

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11/22/95 3:04 PM  
Re(3): Black color and transparency  
Montgomery Singman  
Art Tools

>If the Photoshop plugins indeed recognized RGB(0,0,1) as nonblack, and did not put the transparency bit on for this color, the single bit would be chopped off in the truncation and we would get true black. But apparently the test for true black comes after the value is truncated, necessitating RGB(0,0,8).

It's because Photoshop is using 24 bits for RGB, it's 888 RGB, and PSX is using 1-555 for STP bit plus RGB. The three bits difference results the photoshop (0,0,8) equals PSX (0,0,1). In photoshop the RGB values range from 0-255, and in PSX they range from 0-31.

The plugin doesn't do anything to the palettes, it just saves and loads TIM files as if you're using TIMUtil.

I am using PSX(0,0,1) for black, I was just wondering if there's a way I can have real black(0,0,0) and transparency. If you watch closely, you'll see dithered pixels in (1,0,0), (0,1,0) and (0,0,1) colors, because they only have 32 levels.

Can Sony tech support confirm if it's impossible to have real black color and transparency in a same TIM ?

Thanks, Monte

---

11/22/95 3:27 PM

Re(4): Black color and transparency

Jay Stelly

Art Tools

>I am using PSX(0,0,1) for black, I was just wondering if there's a way I can >have real black(0,0,0) and transparency. If you watch closely, you'll see >dithered pixels in (1,0,0), (0,1,0) and (0,0,1) colors, because they only >have 32 levels.

Don't the manuals say to set the STP bit in a 0,0,0 black for it to be solid? I don't remember offhand if we've used this or not, but I'm pretty sure this is how it's done.

Jay Stelly Tetragon

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11/22/95 1:11 PM

Re(2): Black color and transparency

Silas S. Warner

Art Tools

>The easiest method is to not use RGB(0,0,0) as black. Try using RGB(0,0,1). The color will >still look black, but technically it no longer is. That is how we are getting around it in the >texture maps we are using that need to have both transparency and black.

I would like confirmation of this, specifically with the Photoshop plugins. When I have used the Photoshop plugins, I have found it necessary to go to RGB(0,0,8) in order to get non-transparent black. This appears to be the result of R,G, and B values truncated to 5 bits each in 16-bit palettes.

If the Photoshop plugins indeed recognized RGB(0,0,1) as nonblack, and did not put the transparency bit on for this color, the single bit would be chopped off in the truncation and we would get true black. But apparently the test for true black comes after the value is truncated, necessitating RGB(0,0,8).

Silas

Warner

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11/27/95 4:34 PM

Re(6): Black color and transparency

Silas S. Warner

Michael Koziniak

Art Tools

>To get a description of Transparency with pixels take a look at page 101(Texture Mapping) >in the Runtime Library Overview of the >Developer reference series. Basically, to get black transparency you would set (STP: 1, >B:0, G:0, R:0.)

Right, but the Photoshop plugins work differently. There, you check a box saying "Black=Transparent" when you create the TIM, and the plugin code sets the STP bit whenever it encounters an RGB value of 0. You do not have the option to set some pixels to zero and some transparent: only all black or all transparent.

If the Photoshop plugin recognized (0,0,1) as nonblack, it would convert it such that it would appear black on the PlayStation but not have the transparent bit switched on. Instead, the plugin seems not to recognize a nonblack color unless it is really nonblack on the PlayStation, like

(0,0,8).

Silas Warner

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11/27/95 5:15 PM

Re(7): Black color and transparency

Dan Burnash

Art Tools

Silas S. Warner

The photoshop plugin was written by a developer, and distributed by the author for your use. However, it is not an SCEA product, and therefore cannot be fixed/enhanced by us. It would be nice if it was an SCE tool, but it isn't, and isn't likely to be one in the near future.

It is fine to ask questions about the plugin, so that other developers can aid in your use of the tool. When it doesn't do what you want, however, you are on your own.

Dan Burnash

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11/27/95 4:28 PM

Re(5): Black color and transparency

Michael Koziniak

Art Tools

Jay Stelly

>I am using PSX(0,0,1) for black, I was just wondering if there's a way I can have real black(0,0,0) and transparency. If you watch closely, you'll see >dithered pixels in (1,0,0), (0,1,0) and (0,0,1) colors, because they only have 32 levels.

>The easiest method is to not use RGB(0,0,0) as black. Try using RGB(0,0,1). The color will >still look black, but technically it no longer is. That is how we are getting around it in the >texture maps we are using that need to have both transparency and black.

>If the Photoshop plugins indeed recognized RGB(0,0,1) as nonblack, and did not put the >transparency bit on for this color, the single bit would be chopped off in the truncation >and we would get true black. But apparently the test for true black comes after the >value is truncated, necessitating RGB(0,0,8).

To get a description of Transparency with pixels take a look at page 101(Texture Mapping) in the Runtime Library Overview of the Developer reference series. Basically, to get black transparency you would set (STP: 1, B:0, G:0, R:0,)

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11/27/95 1:00 PM

Re: 3D Studio

Dave R. Scheele

Art Tools

>>> The only glitch (a tiny one) is that, in the .PRJ file created, >>> the number of objects is 1 too high. RSDLINK didn't seem to >>> care, though, as it created a perfect TMD file that I am >>> displaying right now. Still, my animation data converter >>> does use that number, so it'd be nice if that was fixed.

This wasn't addressed in the response you posted, Dan. Any word?

In regards to the preview problem I had:

>> However I could not reproduce the problem on my machine. >> I would like to know following data of the user's environment >> who has the problem.

Is anyone using the TOD plug-in to preview animation data? We aren't, I just mentioned the

bug since I found it while experimenting with the newest version. Our artists don't have development boards, so the preview function is useless as far as we're concerned. We just use the plug-in for model conversion.

If anyone else is using the plug-in for previews, and having problems, let Dan know. I don't want to waste time chasing it down since we don't use it.

If no one is using the preview functionality (as I suspect is so), maybe it can be removed and more time spent on the model conversion process?

In other words, if you want the preview functionality in the TOD plug-in, speak up!! I vote that Sony gets rid of it....

Dave

---

11/27/95 3:48 PM

Re(2): 3D Studio

David W. Marshall

Dave R. Scheele

Art Tools

I vote to keep the preview option in until Sony:

1)Makes it work with the artist boards.

OR

2)Makes a TSR, Cable, and PSX CPE that will allow models to be directly downloaded from a PC thru a port on the PSX and displayed on screen thru the dev boards.

We don't currently use the preview option either, but might have to get a dev system for the artists to shorten the feedback loop on the models and textures they are producing.

dave

---

11/27/95 2:23 PM

Re(2): 3D Studio

Dan Burnash

Art Tools

>>> > The only glitch (a tiny one) is that, in the .PRJ file created, >>> > the number of objects is 1 too high. RSDLINK didn't seem to >>> > care, though, as it created a perfect TMD file that I am >>> > displaying right now. Still, my animation data converter >>> > does use that number, so it'd be nice if that was fixed.

>This wasn't addressed in the response you posted, Dan. Any word?

No word on a fix to this yet. The developer does know the problem exists, however. I am hoping for a new release soon, so hopefully it will be fixed in that rev.

Note: No definition of the word "soon" is available at this time.

---

11/28/95 9:55 AM

Re: RSDLINK problems?

David W. Marshall

Sky Lounge

Art Tools

>>>But when we translate the RSD files with RSDLINK, we just get a crushed together mess. This is the way that the plugin seems to have been setup to operate. The model appears this way because the 3D position info for all the objects in the model is in the TOD file. If you just render the TMD file without the TOD info, you will get the glob of objects. If you use the matrix info from the TOD file, your model should appear correctly.

I hope this is what your question was addressing.  
daev

---

11/28/95 8:01 AM  
RSDLINK problems?  
Sky Lounge  
Art Tools

We are having trouble getting a viable TMD file out of RSDLINK. We're using the 3DS plug in, and the model looks fine when we PREVIEW it, but when we pass the RSD files on to RSDLINK, it dies. The plug in generates all the appropriate models and displays them correctly for a heirarchical model and animation when previewing. However, the TMD file that RSDLINK spits out is unusable. All of the components of the model originate at the same point. In other words, they don't maintain their 3DS orientation. Also, the animation doesn't translate. We just get this clump of objects in the center of the screen. What's going on? When we use preview, we can see that a TMD and TOD file are created, and the preview program uses these files with no problem. But when we translate the RSD files with RSDLINK, we just get a crushed together mess. Is there any way to grab the TMD file that is passed to the preview function? Or are there special parameters that need to be passed to RSDLINK to make it generate a good TMD?

---

11/28/95 12:15 PM  
Re(2): RSDLINK problems -> TODVIEW5 source code?  
Sky Lounge  
Art Tools

>>>But when we translate the RSD files with RSDLINK, we just get a crushed together mess.  
>If you use the matrix info from the TOD file, your model should appear correctly.  
A-ha! If you display a TMD file generated by RSDLINK with the sample program TODVIEW, it's messed up as I described, but if you display it with TODVIEW5, it looks fine. Only trouble is, we weren't given the source code for TODVIEW5 - just the .exe. Is there any way we could get this source code? It would be very helpful.

---

11/29/95 9:50 PM  
Re(8): Black color and transparency  
Montgomery Singman  
Art Tools

My question was for finding a way to do blackcolor and transparency, I guess you answered my question, too bad there's no tool for us to look at the cluts, edit the cluts, turn on and off the STP for each clut entry.  
I guess I can write a offline parser to look for (0,0,1) clut entries, and turn them into STP 1, RGB(0,0,0).  
Thanks for replying, Monte

---

12/1/95 1:31 PM  
U/V offsets for TIM files  
David W. Marshall  
Art Tools

If I run TIMPOS -v on a TIM file and it says the file is 100x100 in size, what should the max U and V offset be in my MAT file?  
Should my U/V offsets go from 0 to 99 or from 0 to 100?  
If they should go from 0 to 99, what would it mean if I looked in the MAT file and had an offset of 0 100 for the texture?  
thanks,  
dave

---

12/1/95 5:22 PM  
Re: U/V offsets for TIM files  
Silas S. Warner  
Art Tools

Going from 0-99 to 0-100 would be WRONG (are you listening, plugin writers?) but probably wouldn't be catastrophic.  
What IS catastrophic is if the X goes from 255 to 256. Remember that only BYTES are put in the file, so a computed offset of 256 results in a file byte of 0!  
This can happen if, for instance, you have a 256x256 texture map divided into 4 128x128s or 16 64x64s. The damfool thing computes a byte offset of 128. The TIM itself is loaded at something,128, so RSDLINK adds 128 to 128 and gets 256. It then thoughtfully puts 0 in the file, causing the programmer to curse as he manually goes back and adjusts the MAT file.  
This has been reported to Japan, many times, and has been incorporated in the list of things to fix when they feel like it.

Silas Warner

---

12/4/95 11:42 AM  
Re(3): RSDLINK problems -> TODVIEW5 source code?  
Dan Burnash  
Art Tools

>A-ha! If you display a TMD file generated by RSDLINK with the sample program TODVIEW, >it's messed up as I described, but if you display it with TODVIEW5, it looks fine. Only >trouble is, we weren't given the source code for TODVIEW5 - just the .exe. Is there any >way we could get this source code? It would be very helpful.  
Maybe. I am asking for the source to distribute it, and will let you know.

---

12/5/95 9:35 AM  
Re(2): U/V offsets for TIM files  
David W. Marshall  
Art Tools  
Dan Burnash

>>>This can happen if, for instance, you have a 256x256 texture map divided into 4 >>>128x128s or 16 64x64s. The damfool thing computes a byte offset of 128.  
So if I have a 128x128 texture, should the UV offsets go from 0 - 127 or 0 - 128? My problem is that I have 4 128x128 textures. If I place the 4th texture at 128,128 in VRAM, then I get the UV wrap and my 255 offsets change to 0. This, of course, screws up the texture mapping.  
So where is the bug? Is the TOD plugin generating incorrect UV offsets? Does TIMPOS and BMP2TIM generate invalid TIM sizes? Is RSDLINK not doing the math correctly and causes the



wrap?

As Silas mentioned, is this a known Sony bug? Will Sony fix this or what is the suggested work around.

thanks,  
dave

---

12/5/95 2:54 PM

Re(3): U/V offsets for TIM files

Silas S. Warner

Art Tools

>So where is the bug? Is the TOD plugin generating incorrect UV offsets? Does TIMPOS >and BMP2TIM generate invalid TIM sizes? Is RSDLINK not doing the math correctly and >causes the wrap?

The bug appears to be in the plugin, when fractional texture coords used by 3DS are converted to integer texture coords in the MAT file. The coord of the right side of a texture in any size in 3DS is 1.0: 3DS multiplies this by (texture pixels-1). The plugin, however, multiplies it by (texture pixels), thus messing up.

Sony is aware of this, but the 3DS plugins do not seem to be an SOJ-supported product.

Silas Warer

---

12/5/95 4:19 PM

Re(4): U/V offsets for TIM files

David W. Marshall

Art Tools

>>>Sony is aware of this, but the 3DS plugins do not seem to be an SOJ-supported product.

This bug is starting to show up for us and is causing problems with the way textures look on the model.

Does Sony Tech Support have any comment on this issue? Is this bug being addressed by the TOD Plugin people in SCE?

dave

---

12/7/95 3:45 PM

Re: MIMe

Dan Burnash

Paul Masters

Art Tools

>This is really just a quick question about the documentation concerning MIMEFILT.EXE. The documentation has a >file format listing for a .VDF file. There are 4 blocks of vertex information listed in the file. The first block says that >it is the differences between the corresponding coordinate values of M0.TMD and M1.TMD. I am assuming that the >points that are "differenced" are linear in the file (if you modify one, you modify everything after it also.) Then >there is a second object which I assume is object 2 (1) in the files M0.TMD and M1.TMD.

>Next, they jump to the next file grouping. They state that the next file comparison for differencing is between >M0.TMD and M1.TMD again. This is obviously incorrect, but it is not clear which comparison will be made here. Is >it supposed to be the difference between M0.TMD and M2.TMD or between M1.TMD and M2.TMD?

It is supposed to be the difference between M0.TMD and M2.TMD.  
Dan Burnash

---

12/7/95 7:26 PM

Re: Material editor VRAM usage  
Dan Burnash  
Jay Stelly  
Art Tools

>We're using the material editor to texture models, and having a few problems. It seems as though the material editor is using >part of the VRAM. I know it has its double buffer set up for (0,0 - 511,479) in 512x240 mode. We are also having problems >with the bottom of VRAM. We have a texture with its CLUT loaded into 768, 511 (it's 8-bit) and some of the colors end up >wrong. Our artists have reported some other problems with textures in that area, but I had originally ignored them since I >thought they were colliding with the debug font I was loading with FntLoad( 960, 256 )...

>Does the Material editor load any data into VRAM? YES. >If so is there a map somewhere that details this info? YES. Meditor uses a part of display/draw area of VRAM as its working area. The rectangle area is, (0,460) - (40, 479). Aside from this area, Meditor does not load any data into VRAM.

>How big is the FntLoad() font in pixels?

FntLoad() font 256x128 pixels 4 bit

Dan Burnash

---

12/7/95 6:00 PM

Re(5): U/V offsets for TIM files  
Michael Koziniak  
David W. Marshall  
Art Tools

>Does Sony Tech Support have any comment on this issue? Is this bug being addressed >by the TOD Plugin people in SCE?

When you have a 256x256 texture map the 3D Studio plug-in calculates the U/V values as a one byte hex number so FF(255 decimal) becomes 0 when one is added to it, thus the texture wraps. This problem is still occurring in 4.0d of the plug-in. Japan knows about this problem. The new version of the plug-in 4.0d does have other new feauteres worth looking at.

---

12/8/95 9:48 AM

tim utility  
Karen Paik  
Art Tools

The "3D Graphics Tools" manual describes a "TIM layout" command in the timutil. (Page 54). The manual also says it is for version 1.35 of the timutil while the version on the CD was 1.20e. When are we going to get the tim layout feature?

---

12/8/95 1:51 PM

Re(5): U/V offsets for TIM files

Michael Koziniak  
David W. Marshall  
Art Tools

>Just wanted to make sure that they will look at the global problem mentioned by Silas and >not just the specific case of the 256x256 texture. All textures have this problem. It is just >easiest to see with 128x128 or 256x256 textures.

Japan is aware of the general problem and we are expecting a fix within the next 2 weeks.

---

12/8/95 10:12 AM

Re: tim utility

Dan Burnash

Art Tools

Karen Paik

>The "3D Graphics Tools" manual describes a "TIM layout" command in the >timutil. (Page 54). The manual also says it is for version 1.35 of the >timutil while the version on the CD was 1.20e. When are we going to get >the tim layout feature? The new version with the tim layout feature was released in version 1.5.3 of the graphic artist cd, which was posted to the bbs on November 10th. It is in "graphic artist CD->release 1.5.3 message". Download all of the new revisions while you are at it, to get current with the releases.

Dan Burnash

---

12/8/95 11:08 AM

Re(2): tim utility

Karen Paik

Dan Burnash

Art Tools

Sorry about that. I was was going to send a message saying I'd found it, but you'd already replied in your very efficient manner. The layout feature is really nice to have.

---

12/12/95 3:36 PM

RST angles in TOD plugin

David W. Marshall

Art Tools

Can anyone verify that the RST matrix option works in the new plugin?

I generated a TOD file using both the standard matrix method and the RST method. I had an object that was rotated 90 degrees and the standard matrix method generated a valid matrix:

```
1000 0 0 0 0 1000 0 f000 0
```

The RST method produced the vector: fffa6000 0 0

Unless I misunderstand the RST vector, the first value should be something like 0x400 for a rotation angle of 90.

thanks,

dave

---

12/18/95 2:14 PM

Movie Converter Preview

David Minogue

Art Tools

Dan,

I suspect that the "Preview" dialog in the Movie Converter has a problem. The image quality doesn't seem to be affected by the disk speed, frame rate, or number of channels. My guess is that it has a hard-coded target image size. Note that the quality is affected if the image size is set manually (using the Custom data rate option).

Has anyone taken advantage of the option to set quantization matrix values yet? Any advice?  
-- David Minogue, Acclaim Entertainment.

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12/18/95 1:51 PM

Bug in new TOD plugin

David W. Marshall

Art Tools

Dan Burnash

The new TOD plugin (both versions 4.0 and 4.0e) do not generate valid UV offsets. I can process a model with the older version (the one without the MATRIX/RST option) and get valid UV offsets.

This sample mat file is from the latest plugin:

```
# # created by 3DS RSD plug-in on Mon Dec 18 13:07:48 1995 # 3DS2RSD (c) Copyright SCE
1995 # @MAT940801 12 # # # Number of lines # 0 0 FT 0 0 195 0 195 0 195 0 195 1 0 F
T 0 0 195 0 195 0 195 0 195 2 0 FT 0 0 195 0 195 0 195 0 195 3 0 FT 0 0 195
0 195 0 195 0 195 4 0 FT 0 0 195 0 195 0 195 0 195 5 0 FT 0 0 195 0 195 0 195
0 195 6 0 FT 0 0 195 0 195 0 195 0 195 7 0 FT 0 0 195 0 195 0 195 0 195 8 0 FT
0 0 195 0 195 0 195 0 195 9 0 FT 0 0 195 0 195 0 195 0 195 10 0 FT 0 0 195 0
195 0 195 0 195 11 0 FT 0 0 195 0 195 0 195 0 195
```

This sample mat file is from the old plugin that works:

```
# # created by 3DS RSD plug-in on Mon Dec 18 13:38:31 1995 # 3DS2RSD (c) Copyright SCE
1995 # @MAT940801 12 # # # Number of lines # 0 0 FT 0 0 195 195 0 195 195 0 195 1 0
FT 0 0 195 0 0 195 0 0 195 2 0 FT 0 0 195 195 195 0 195 0 195 3 0 FT 0 0 195
195 195 195 195 0 195 4 0 FT 0 195 195 195 0 195 195 0 195 5 0 FT 0 195 195 195 0
195 0 0 195 6 0 FT 0 195 0 0 0 195 0 0 195 7 0 FT 0 195 0 0 0 0 0 0 195 8
0 FT 0 0 0 0 195 0 0 0 195 9 0 FT 0 0 0 0 195 0 195 0 195 10 0 FT 0 0 195
195 0 0 0 0 195 11 0 FT 0 0 195 195 195 195 0 0 195
```

This makes the new plugin useless. I hope SCE can give a quick turnaround on this problem.

thanks,

dave

---

12/19/95 1:17 AM

Re(2): RSDLINK problems?

Tim L. Lowery

Art Tools

>> The model appears this way because the 3D position info for all the objects in the model is in the TOD file. If you just render the TMD file without the TOD info, you will get the glob of objects. If you use the matrix info from the TOD file, your model should appear correctly. << So is there some tool that can take the TOD information and apply its RST matrices to the model data? Do we have to roll our own tools to do that? We are creating .TMD files with the RSDLINK tool, which does not read the TOD data.

Correct me if I'm mistaken, but this would seem to be a fairly common problem.

Dave Howell Pablo Media

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12/19/95 4:44 PM

Re: Bug in new TOD plugin

Michael Koziniak

David W. Marshall

Art Tools

>The new TOD plugin (both versions 4.0 and 4.0e) do not generate valid UV offsets. I can  
>process a model with the older version (the one without the MATRIX/RST option) and get  
>valid UV offsets.

I am notifying japan again today about the U/V coordinates not showing up right.

Unfortunately I don't know why it is happening so I'm at a loss to explain to them whats going on. I would appreciate if the two of you would upload some samples that illustrate the problem you are seeing.

Thanks, Michael

---

12/20/95 6:52 PM

Re: RST angles in TOD plugin

Tim L. Lowery

Art Tools

>> The RST method produced the vector: >> ffa6000 0 0 >> >> Unless I misunderstand the RST vector, the first value should be something like 0x400 for a rotation angle of 90. Note that the value 0xfffa6000 is equal to (-90 x 4096). So the vector you're getting is (-90.0, 0.0, 0.0). I think this follows, since the matrix you had was:

```
1.0 0.0 0.0 0.0 0.0 1.0 0.0 -1.0 0.0
```

Dave Howell Pablo Media

---

12/22/95 2:05 PM

Re(3): RST angles in TOD plugin

Michael Koziniak

David W. Marshall

Art Tools

>>>I am researching this issue. How do come up with your value of 0x400 and how do you >>>think the RST vector is made. I must admit the concept of these vectors is new to me, but I >>>am figuring it out.

>According to the docs, the Playstation angles go from 0 to 4096. So 90 degrees would be >4096 / 4 or 1024 or 0x400. I am assuming that the angles in the RST format are normal >playstation angles. I don't know anything else about them because no tool has ever been >able to generate this data format.

I am finally starting to break some ground in figuring out the vectors that are being generated from the plug-in. One clarification here is that you are mistaken about playstation angles, but by no fault of your own. The documentation is wrong. ONE degree = 4096 so 90 degrees would be 5A000 in hex. It doesn't seem that:

```
ffa6000 0 0
```

is right either though. Unless the number is broken up into significant parts which I'm working on. In any case looking at your model in preview definately doesn't look right. There is a box around your guy. I think this is the same problem. Anyway I'm still waiting on a response back from Japan.

---

12/29/95 11:02 AM

Re(2): RST angles in TOD plugin

David W. Marshall

Tim L. Lowery

Michael Koziniak

>>>Note that the value 0xffffa6000 is equal to (-90 x 4096). So the vector you're getting is >>>(-90.0, 0.0, 0.0).

Thanks for the info. We were able to get the RST angles to work for us. In our post-processing tool we just take the angle given by the TOD plugin and divide by 360 to get a useful angle to stick into a RotMatrix call.

dave

---

12/29/95 11:05 AM

Re(4): RST angles in TOD plugin

David W. Marshall

Michael Koziniak

Chris E. Reese

>>>by no fault of your own. The documentation is wrong. ONE degree = 4096 so 90 degrees

>>>would be 5A000 in hex.

Could you please clarify which docs you are referring to when you say they are wrong. Is this the RST format doc? It seems that in Sony internal angle format, 4096 is 360 degrees.

dave

---

12/29/95 8:00 AM

3DS Plug-in

Pat Quinn

Art Tools

Subj: 3DS Plug-in Problems -- Part 1: .PLY file

We have been using the old RSD plug-in, but with only limited success in writing out usable texture-mapping data. Since we need reliable improvement, and since the old RSD plug-in is no longer supported, we have turned to the new TOD plug-in (currently using version 4.0e).

However, we are having difficulty with that plug-in as well...

First of all, we do not need TOD data. So we are using the RSD output feature only, although the preview (of a single frame) feature would be nice if we could get it to work.

The problem described here only concerns the contents of the output .PLY file. It only remotely resembles the model in 3D Studio ver 4.0. I'll give a couple of examples that can be easily duplicated.

The first is a simple, single rectangle. It is created in 3DS with keyboard entered vertices. With the Display/Geometry/All Lines feature on, the triangle diagonals (my impression is 3DS does everything, ultimately, in triangles) are shown as below. With the assignment of a simple color, it renders fine in 3DS.

y z (0., 10., 0.) \_\_\_\_\_ (10., 10., 0.) | / | \ | | /\_x |  
| \ | | | \ | | | \ | |  
(0., 0., 0.) (10., 0., 0.) | \ | | \ | |

But after examining the .PLY file output (below) from the TOD plug-in, and flipping to a right-handed coordinate system (3DS is LHS) I see the geometry is not quite the same...

z (-5., -5., -1.) \_\_\_\_\_ (5., -5., -1.) / | \ | /\_x | \ | |  
| \ | | | \ | | | \ | |  
1.) (-5., 5., -1.) (5., 5., -1.)

```

## created by 3DS RSD plug-in on Wed Dec 27 15:05:25 1995 # rsd_i.pxp (c) Copyright SCE
1995 @PLY940102 ## number of Vertices Normals Polygons # 4 2 2 ## # Vertex (x y z) # -
5.000000e+000 -5.000000e+000 -1.000000e+000 5.000000e+000 -5.000000e+000 -1.000000e+000 -
5.000000e+000 5.000000e+000 -1.000000e+000 5.000000e+000 5.000000e+000 -1.000000e+000 ##
# Normal (x y z) # 0.000000e+000 0.000000e+000 -1.000000e+000 0.000000e+000 0.000000e+000
-1.000000e+000 ## # Polygon (Flag v0 v1 v2 v3 n0 n1 n2 n3) # 0 0 3 2 0 0 0 0 0 0
0 1 3 0 1 1 1 0

```

There is mention in the file 3dstod\_e.txt something about objects saved in RSD format being in "local coordinates." I can guess that a local coordinate system was generated about the center of my 3DS object in X & Y (5., 5.) and back by some magic number 1.0 for Z... The text file implies the offset can be found in the TOD file... which we don't have.

So what about real model data, like an object from our game? I chose a wall object for its simplicity. In 3DS it looks like this:

```

y z (-28.14, 3.60, -71.01) _____ (25.16, 13.60, -71.03) | / | \
| | /_x | \ | | \ | |
| \ | ----- (-28.14, 0.04, -71.01) (25.16,
0.04, -71.03)

```

After examining the .PLY file output (below) from the TOD plug-in, and again flipping the coordinate system direction, the geometry looks something like this:

```

z (-28.12, -0.84, -11.74) _____ (24.32, -0.84, -2.27) / | / |
/_x | / | | ----- (-28.12, 2.72, -11.74) (24.32,
| / | y ----- (-28.12, 2.72, -11.74) (24.32,
2.72, -2.27)

```

```

## created by 3DS RSD plug-in on Wed Dec 27 15:59:30 1995 # rsd_i.pxp (c) Copyright SCE
1995 @PLY940102 ## number of Vertices Normals Polygons # 4 2 2 ## # Vertex (x y z) # -
2.812674e+001 2.719010e+000 -1.174178e+001 2.432522e+001 2.718673e+000 -2.277457e+000
2.432522e+001 -8.398172e-001 -2.277457e+000 -2.812674e+001 -8.398248e-001 -1.174178e+001 ##
# Normal (x y z) # 1.775705e-001 0.000000e+000 -9.841080e-001 1.775705e-001 0.000000e+000 -
9.841080e-001 ## # Polygon (Flag v0 v1 v2 v3 n0 n1 n2 n3) # 0 0 2 1 0 0 0 0 0 0
0 3 2 0 1 1 1 0

```

This does not appear to be a translation to some local coordinate system, it's just plain wrong. The vertex data is way off. The normal data is skewed which becomes obvious by examining the vertex delta Z. Even the vertex ordering -- the triangle diagonal corners -- is different than in 3DS. The output is useless to us. The more complicated models for our game are even more trashed by the plug-in's RSD feature. Objects have their basic shape, but seem randomly rotated, scaled, and placed in the 3D world when displayed on the PSX.

Am I pushing the wrong buttons in 3DS? Am I lacking some basic understanding of the plug-in's operation? There's not much to its interface and the 3dstod\_e.txt file doesn't offer much guidance. Are we misusing the new TOD plug-in design by attempting to make use of only the RSD output function? If so, what are our alternatives? The no longer supported version of the RSD plug-in is also very unstable.

We have other problems with the TOD plug-in, but this is the show-stopper. Any help you can offer would be greatly appreciated.

David Crain NuFX, Inc. (708)884-2000

12/29/95 8:01 AM  
More 3DS Plug-in  
Pat Quinn  
Art Tools

Subj: 3DS Plug-in Problems -- Part 2: .RSD file(s) location

After much experimentation, I have isolated one of the problems I was having with the TOD plug-in (currently using version 4.0e). I'd now call it a bug...

Basically, in the Save RSD dialog (I'll bet this problem occurs with Save TOD as well), if the Dir: field contains a subdirectory with a name with a period in it, e.g.

C:\OBJECTS\GAME1.DIR\RSD, then the RSD files generated will have the basename of the offending directory, and will be placed in that offending directory's parent directory. In the above example, you'd get C:\OBJECTS\GAME1000.RSD, C:\OBJECTS\GAME1001.RSD, etc.. The .PLY, .GRP, .MAT and .PRJ files are similarly named and placed. The Filename: field is ignored. The remaining portion of the directory path in the Dir: field is ignored (strangely, the full path is saved in the TOD.INI file).

Some DOS-purists might consider a directory with a period in it bad form, but it is perfectly allowable. 3D Studio itself has no such problem.

By the way, I'm operating in the non-windowed, DOS-style Single Application Mode that comes with Windows '95, but I doubt that has anything to do with it...

David Crain NuFX, Inc. (708)884-2000

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1/2/96 3:26 PM

Re(5): RST angles in TOD plugin

Michael Koziniak

David W. Marshall

Art Tools

>>>by no fault of your own. The documentation is wrong. ONE degree = 4096 so 90 degrees

>>>would be 5A000 in hex.

>Could you please clarify which docs you are referring to when you say they are wrong. Is

>this the RST format doc? It seems that in Sony internal angle format, 4096 is 360 degrees.

If you look at the definition for RotMatrix you will see a definition of a playstation angle.

---

1/2/96 10:34 AM

Re: More 3DS Plug-in

Michael Koziniak

Pat Quinn

Art Tools

>Basically, in the Save RSD dialog (I'll bet this problem occurs with Save TOD as >well), if the Dir: field contains a subdirectory with a name with a period in it, >e.g.

C:\OBJECTS\GAME1.DIR\RSD, then the RSD files generated will have the basename >of the offending directory, and will be placed in that offending directory's parent >directory.

I will try that out for myself and will pass this message onto Japan. For now don't use directories that have a period in them.

Michael

---

1/2/96 4:00 PM

Re: 3DS Plug-in

Michael Koziniak

Pat Quinn

Art Tools

>There is mention in the file 3dstod\_e.txt something about objects >saved in RSD format being in "local coordinates." I can guess that >a local coordinate system was generated about the center of my 3DS object >in X & Y (5., 5.) and back by some magic number 1.0 for Z... The text



file >implies the offset can be found in the TOD file... which we don't have.  
I see that the coordinate system is generated about the center of the object. I would like to see your wall model so I can see the conversion for myself and test it out with our new plugin (4.0f). It looks like you are having a scaling problem and a normal vector generation problem. How did you know the normals were skewed? Did you figure out normals by hand and compare with what you got. I wonder if others know about this and have just been living with it? In any case this should get fixed. Send me an example I will try it and then send this on to Japan.  
\8^)

---

1/3/96 11:12 AM  
Re(6): RST angles in TOD plugin  
David W. Marshall  
Michael Koziniak  
Art Tools

>>>by no fault of your own. The documentation is wrong. ONE degree = 4096 so 90 degrees >>>would be 5A000 in hex. >Could you please clarify which docs you are referring to when you say they are wrong. Is >this the RST format doc? It seems that in Sony internal angle format, 4096 is 360 degrees.  
>>>If you look at the definition for RotMatrix you will see a definition of a playstation angle. According to the definition of RotMatrix, 4096 is 360 degrees. So which is incorrect?  
dave

---

1/10/96 11:56 AM  
Tiling Textures...  
Paul Masters  
Art Tools

This message is forwarded from our artists...  
Has anyone used any sort of tiling techniques on the Sony Playstation? We can't seem yo find the support for this really useful function. Any advice would be appreciated.

---

1/11/96 12:21 PM  
MoviePack 1.3e Bugs??  
David R. Black  
Art Tools

I seem to be having problems with the 1.3e version of MoviePack GPFing on me when trying to interleave a file. I have a total of 4 streams, two XA audio streams, and two MDEC streams. The MDEC streams are compressed to 4 sectors per frame, and the XA streams are mono with a sampling rate of 38.7Khz.  
When I try and interleave these files (I have tried this with th subheader checkboxes on/off in different combinations), I immediately getb a GPF in Kernel386 (sounds like a bad memory allocation call), and the program dies.  
So far, the only reasons I can come up with is that the filea are rather large (60 megs for each MDEC files and another 20 for each XA file), and/or there is a problem with the version of MoviePack that I currently have (1.3e from the last set of CDs).  
Any Ideas?

Thanks for your time and consideration.  
David R. Black Senior Programmer, Presto Studios, Inc.

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1/12/96 2:03 PM  
Re(2): Tiling Textures...  
Blake E. Senftner  
Art Tools

>>Has anyone used any sort of tiling techniques on the Sony Playstation? We can't seem yo  
>>find the support for this really useful function. Any advice would be appreciated.  
>This would be a nice feature but the Playstation doesn't support a technique like this.  
What about the discussion at the bottom of page 103, in the bound documentation "Run Time  
Library 3.0 / Overview"?  
I haven't tried it, but the facility seems to have been implemented.  
Unless by "tiling techniques" you mean like creating a bank of tiles that when assembled in  
different organizations creates your background screens... this is implemented in the GsLib as  
GsBGs or "background surfaces." See page 503 of the "Run Time Library 3.0 / Reference" for the  
description of a GsBG.  
-Blake

---

1/12/96 8:20 AM  
texture sub-pages  
cary hammer  
Art Tools

We are looking for a smart(er) method for applying nxn textures to surfaces where  $n \ll 256$ . Each  
VRAM texture page therefore contains multiple independent texture "sub-pages" The process  
that our artists use with 3DS seems rather obnoxious. From what I gather, they first choose a  
material (a 256x256 image file that contains all of the sub-pages) and scale it until the given sub-  
page is "about" as large as the given object to be covered. The object needs to be away from all  
other objects and then the entire image is applied to the object meaning that whatever section of  
image overlaps the object, that's what's mapped onto the object. Again, there seems to be no  
exact control to get, for example, a 64x64 sub-page located at 128x64 within the image --  
UNLESS there's just something we've overlooked and some kind person will point out the path  
to happiness for us.  
Along the same lines, we're wondering if Calagari TrueSpace would allow us to handle these  
sub-pages more gracefully instead? Any hints, suggestions or help would be much appreciated.  
Thanks.

---

1/12/96 10:41 AM  
Re: Tiling Textures...  
Michael Koziniak  
Paul Masters  
Art Tools

>Has anyone used any sort of tiling techniques on the Sony Playstation? We can't seem yo >find  
the support for this really useful function. Any advice would be appreciated.  
This would be a nice feature but the Playstation doesn't support a technique like this.  
Michael

---

1/15/96 3:12 PM  
Tiling Texture maps  
Paul Masters  
Art Tools

I wrote a couple of days ago about tiling. Thanks for the responses. I realized after I asked the question that I wasn't specific enough. I am looking for a way to tile texture maps onto polys on the Sony. The background tiling is cool, but not exactly what we need. Thanks again for the responses and patience.

---

1/16/96 5:13 PM  
Re: texture sub-pages  
Michael Koziniak  
cary hammer  
Art Tools

We are looking for a smart(er) method for applying  $n \times n$  textures to surfaces where  $n \ll 256$ . Each VRAM texture page therefore contains multiple independent texture "sub-pages" The process that our artists use with 3DS seems rather obnoxious. From what I gather, they first choose a material (a 256x256 image file that contains all of the sub-pages) and scale it until the given sub-page is "about" as large as the given object to be covered. The object needs to be away from all other objects and then the entire image is applied to the object meaning that whatever section of image overlaps the object, that's what's mapped onto the object. Again, there seems to be no exact control to get, for example, a 64x64 sub-page located at 128x64 within the image -- UNLESS there's just something we've overlooked and some kind person will point out the path to happiness for us.

Along the same lines, we're wondering if Calagari TrueSpace would allow us to handle these sub-pages more gracefully instead? Any hints, suggestions or help would be much appreciated. Thanks.

I am a little confused by a few things. A 256x256 material(TIM) wouldn't contain all of the pages within VRAM so what is a 256x256 image that contains all of them? Also it sounds like you are using the Materials Editor to map your Materials. As far as I know in 3DStudio you map materials to objects. For more info on mapping material you should get help from the AutoDesk techsupport. Now too put your textures in VRAM you can use our TIMUTIL.EXE. The latest version has a TIM Layout facility off of the window menu which allows one to place their textures into VRAM at certain places. Again for more control on placing textures I would use the Materials editor. You can choose faces(polys) to accept the overlapping texture(TIM) so it would cover what you want on the model. Calagari doesn't allow you to control where the textures are going to in VRAM.

---

1/17/96 11:20 AM  
multichannel movies  
Thomas Boyd  
Art Tools  
Jeff Davies

Here's the sample T -----

Hi Tom,

I will send source code for multi channel movie. It is an old sample. So, there may be some part which are not updated by later changes. They should just refer this sample to understand how to achieve multi channel movie playback.

Koji

P.S. I've not finished analyzing their data yet.

```

===== /* * SPSLibId: Runtime Library Versin 3.0$
*/ /* *   Movie Sample Program(Multi Channel) * * Copyright (C) 1994,5 by Sony
Corporation * All rights Reserved * * Version Date * ----- * 1.00
Jul,14,1994 yutaka * 1.10 Sep,01,1994 suzu * 1.20   Oct,24,1994 yutaka(anim
subroutine 1.30   Jun,02,1995 yutaka(AME_SIZEer3.1*/
#ifdef EMULATE #define StGetNext StGetNextS #define StFreeRing StFreeRingS #endif
#define IS_RGB24 0 /* 0:RGB16, 1:RGB24 */
#if IS_RGB24==1 #define PPW 3/2 /* 1efine PPW 1 /* 1E 2 /* 16bit C dec; /* tch; /* CD/
ResetGraph(0); /* GPU V disp; DRAWENV draw; void strCallback(); /* * CD-ROM status */
CdILOC ppos, lpos; /* CD-ROM position */ CdIFile file; int fn; u_char param[8]; static
strInit(),strNextVlc(),strSync(); void strCallback(); /* { printf("file not found\n");
StopCallback(); PadStop(); exit(); } loc.minute = file.pos.minute; loc.second =
file.pos.second; loc.sector = file.pos.sector; printf("%x %x
%x\n",loc.minute,loc.second,loc.sector); /* 40); channel = 1; CdSetFilter(1,channel);
StSetChannel(channel); strInit(&loc,strCallback);
/* /* ing(); CdSetFilter(1,0); StSetChannel(0); channel = 0; } if (PadRead(1) &
PADRright) { StClearRing(); CdSetFilter(1,1); StSetChannel(1); channel =
1; } if (PadRead(1) & PADRdown) { StClearRing(); CdSetFilter(1,2);
StSetChannel(2); channel = 2; } if (PadRead(1) & PADRleft) { StClearRing();
CdSetFilter(1,3); StSetChannel(3); channel = 3; } /* dec.rect[id].w,
dec.rect[id].h); SetDefDrawEnv(&draw, dec.rect[id].x, dec.rect[id].y, dec.rect[id].w,
dec.rect[id].h);
#if IS_RGB24==1 disp.isrgb24 = IS_RGB24; disp.disp.w = disp.disp.w*2/3; #endif
PutDispEnv(&disp); PutDrawEnv(&draw); SetDispMask(1); /* );
CdControlB(CdlPause,0,0);
/* * t imgbuf[16*PPW*240]; /* T(&dec->rect[1], x1, y1, 640*PPW, 240); setRECT(&dec->slice,
x0, y0, 16*PPW, 240); }
/* * static strKickCD(); DecDCTReset(0); /* MDEC { StCdInterrupt(); /* RGB24.x <
dec.rect[dec.rectid].x + dec.rect[dec.rectid].w { /* dec.slice.y = dec.rect[dec.rectid].y;
/*DecDCTout(dec.imgbuf, dec.slice.w*dec.slice.h/2);*/ } }
/* nt cnt = WAIT_TIME; u_long *next; static u_long *strNext(); while ((next = strNext(dec)
== 0) { /* get next frame */ if (--cnt == 0) return(-1); } dec->vlcid = dec->vlcid? 0: 1; /*
swap ID */ DecDCTvlc(next, dec->vlcbuf[dec->vlcid]); /* VLC decode */ StFreeRing(next);
/* free used frame */ return(0); }
/* * dec; { u_long *addr; StHEADER *sector; int cnt = WAIT_TIME; static int width = 0;
/* { Rewind_Switch = 1; } /* ctor->width; height = sector->height; }
/* _long cnt = WAIT_TIME; while (dec->isdone == 0) { if (--cnt == 0) { /* timeout: id].x;
dec->slice.y = dec->rect[dec->rectid].y; } } dec->isdone = 0; }
/* * CDROM | CdlModeSpeed | CdlModeRT | CdlModeSF) == 0); }
CdSetFilter(file,chan) u_char file,chan; { CdlFILTER filt;
filt.file = file; filt.chan = chan; while(CdControl(CdlSetfilter,(u_char *)&filt,0)==0); }

```

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1/17/96 12:46 PM

Re: Using TOD Info from 3DS plug-in?

David W. Marshall

Teh Kao Yang

Art Tools

>Has anyone got the TOD info obtained from the 3D Studio plug in to work? >I tried running the tod data through the TODVIEW sample program and it did >not work. All the objects were bunched together in one big mess. Do we have >to write our own TOD viewing program? Or is there some other sample program >out there than can use the data?

I use the TOD plugin and it does work. I don't know what the TODVIEW program is, but it

sounds like the model was being rendered without using any of the TOD matrices. The TMD info produced by the plugin is based on local coords. Therefore, all your objects will be bunched together. It is the TOD matrix for each object that holds the data for where to rotate and translate the object in 3space.  
I don't use any of the GS TOD routines. I take the TOD file, rip out the matrix data into my own structures, and animate using PMDs.  
dave

---

1/17/96 6:42 PM

Re: 3DS Plug-in  
Michael Koziniak  
Pat Quinn  
Art Tools

>I mentioned that the normals in the .PLY file were skewed based on the original vertices in >3DS. They do correspond correctly, however, to the messed-up vertex coordinates in the >.PLY file. Normal calculation isn't the problem -- the vertices are.  
David Crane, I have notified Japan of the problem with the generation of vertices with the RSD feature of the 4.0f plugin for 3D Studio. I will let you know what the outcome of this issue is.  
Thanks Michael

---

1/17/96 12:25 PM

Using TOD Info from 3DS plug-in?  
Teh Kao Yang  
Art Tools

Has anyone got the TOD info obtained from the 3D Studio plug in to work? I tried running the tod data through the TODVIEW sample program and it did not work. All the objects were bunched together in one big mess. Do we have to write our own TOD viewing program? Or is there some other sample program out there than can use the data?

-TK

---

1/17/96 5:53 PM

Re(2): Using TOD Info from 3D  
Teh Kao Yang  
Art Tools

I am using the sample program provided under sample/graphics/tod/todview. Since this program seems to be reading in TOD data, I expected it to work, but it didn't. I don't see why it shouldn't work, since it worked with the sample .tod files provided. As for ripping out the data from the TOD file itself, doesn't that defeat the purpose of the TOD file format in the first place? I could have just as well extracted the data from the the 3D Studio .ascii files or whatever file it uses for animation data.

Also, I couldn't seem to get the previewer to work. I pick preview and nothing happens. Do I have to save the .TMD and .TOD data to some specific path first? Or can I just click Preview and it will do everything?

-TK

---

1/18/96 9:04 AM  
Re(3): Using TOD Info from 3D  
David W. Marshall  
Art Tools

>>>Also, I couldn't seem to get the previewer to work. I pick preview and >>>nothing happens. Do I have to save the .TMD and .TOD data to some specific >>>path first? Or can I just click Preview and it will do everything?

The previewer will generate all data for you. It does, however, require certain things to be installed and uninstalled (like dexbios can't be running). The readme that comes with the plugin details what you need for that option. Make sure you have a c:\tmp directory.

>>As for ripping out the data from the TOD file itself, doesn't that defeat the purpose of the >>TOD file format in the first place?

Personal choice. The TOD file has other data in it that I don't need, so I save some memory. I also pre-load some of my data structures, so I save on load time. I didn't want to spend the time to figure out the .3ds data format to get the animation info, since the TOD plugin already provided it for me. The whole TOD file is only used by GS, which I am not using.

dave

---

1/18/96 8:31 AM  
Re(2): texture sub-pages  
Dave R. Scheele  
Art Tools

We are using 3D Studio to map our objects with texture "sub-pages" as you call them, and I understand your question. In order to do what you want to do, you need to take your one TIM file (256x256) containing several textures, and break it into individual TIM files, one per texture. Then, it is straightforward to map the individual materials using 3D Studio. The trick is placement of the multiple TIM files in memory. You must load them into VRAM so that they, together, fill one 256x256 texture page.

For example, assume you have 4 128x128 4-bit texture maps, and you map them on an object. Convert the 3DS file to RSD using the plug-in. Now take your 4 128x128 4-bit texture maps and make TIMs out of them ... place the first at (640,0), the second at (640,128), the third at (672, 0) and the fourth at (672, 128).

Note that this lets you have an individual clut for each individual TIM. If you just used one big 256x256 texture, you could only have one clut.

Hope this helps ;

(hey, Angus ain't around so I can use it :P)

Dave

---

1/19/96 11:37 AM  
TOD PLug-In Discoveries  
Teh Kao Yang  
Art Tools

Ok I found out a few things about the TOD plug in. The TOD file it generates only contains MATRIX packet types and not the COORD packet type. That's why the TODVIEW sample program doesn't work with it, since it expects COORD packet type for animation data. Just add some routines to read in the MATRIX data type and the program should work. Also, the .TOD file created when you save your model seem to produce garbage data. What I did was I used the TMP.TOD file that is created when you do a Quick Preview. That file seemd to work. I am

experimenting more on this. Someone correct me if I'm wrong on any of this...  
-TK

---

1/22/96 8:22 AM  
Re: TOD PLug-In Discoveries  
David W. Marshall  
Art Tools

>>The TOD file it generates only contains MATRIX packet types and not the COORD packet  
>>type.  
The latest TOD plugin allows you to choose between generating MATRIX data or RST (coord  
data.

---

1/23/96 11:42 AM  
3ds plug-in question  
Robert w. Calfee  
Art Tools

I'm ver unfamiliar with the 3ds plug-in. Does it allow users with the artist board to view 3ds  
files on a monitor as they would be rendered by the playstation? How does it work?  
rwc

---

1/23/96 7:44 PM  
Re: 3ds plug-in question  
Michael Koziniak  
Robert w. Calfee  
Art Tools  
Robert,

>I'm ver unfamiliar with the 3ds plug-in. Does it allow users with the artist board to >view 3ds  
files on a monitor as they would be rendered by the playstation? How does >it work? > >rwc  
The plugin works with the developer boards. When you install and run the plugin it converts  
your \*.3ds files into playstation format files(rsd,tmd,tod) and allows you to look at your model  
data and your animation data.  
Thanks, Michael

---

1/24/96 11:41 AM  
Re(3): TOD PLug-In Discoverie  
David W. Marshall  
Art Tools

The plugin generates rotation/translation (and scale if using the RST option) for every object on  
every frame. There is nothing in the TOD format that allows it to say, "just use the matrix frame  
the last frame since nothing changed".  
That's why, per a previous email, I use a tool to rip out the data I need from the TOD file and  
throw away the rest.  
dave

---

1/24/96 11:00 AM

Re(2): TOD PPlug-In Discoverie  
Teh Kao Yang  
Art Tools

Ok I found another unusual thing with the plug-in. I was wondering why the tod files being generated were unusually large in size, even with simple animations. I looked in the data and it appeared that it generates rotation, scaling, and translation info for each object even when that object is not being either rotated, scaled, or translated. I mean I have an object that is not scaling and still each frame contains data for its scaling factor which is like 4096 or 4095, totally meaningless. Does anyone know why the plug-in is doing this?  
-TK

---

1/24/96 6:54 PM  
Re: TOD PPlug-In Discoveries  
Michael Koziniak  
Teh Kao Yang  
Art Tools

>data type and the program should work. Also, the .TOD file created when you >save your model seem to produce garbage data. What I did was I used the "Garbage data." Are you referring to the RST object info from an object that doesn't move from one frame to the next. Please be more specific.  
Michael

---

1/25/96 2:05 PM  
Re(2): TOD PPlug-In Discoverie  
Teh Kao Yang  
Michael Koziniak  
Art Tools

Hi, yes that is what I was talking about... its there anyway to get rid of RST data of unmoving objects?  
-TK

---

1/25/96 2:08 PM  
Re(4): TOD PPlug-In Discoverie  
Teh Kao Yang  
Art Tools

OK thanks, I guess I will have to write a similar tool of my own to rip out the data...  
-TK

---

1/31/96 3:07 PM  
Re: Where can I find the TOD format?  
Rob Vawter  
Silas S. Warner  
Developer Support

I believe the information you are looking for is in Chapter 17 (file Formats) of the 3.0 Overview Document - pages 251-261.



- Rob \_\_\_\_\_ I need to find the format in which TOD files are output. I supposed it would be in the Graphic Artist Tool documentation but can't find it there. Where is it?  
- Silas Warner

---

1/31/96 11:40 AM

Re: MoviePack 1.3e Bugs??

Michael Koziniak

David R. Black

Art Tools

>I seem to be having problems with the 1.3e version of MoviePack GPFing on me when trying to interleave a file. I have a total of 4 streams, two XA audio streams, and two MDEC streams. The MDEC >streams are compressed to 4 sectors per frame, and the XA streams are mono with a sampling rate of 38.7Khz.

>When I try and interleave these files (I have tried this with th subheader checkboxes on/off in different combinations), I immediately getb a GPF in Kernel386 (sounds like a bad memory allocation call), and >the program dies.

>So far, the only reasons I can come up with is that the filea are rather large (60 megs for each MDEC files and another 20 for each XA file), and/or there is a problem with the version of MoviePack that I >currently have (1.3e from the last set of CDs).

At this point we have tested the following case:

MovPack version1.3e

total channels: 4

ch0: 60MB STR MDEC(4sectors/frame) subheader checkbox off ch1: 60MB STR

MDEC(4sectors/frame) subheader checkbox off ch2: 20MB XA-ADPCM(37.8KHz, mono)

subheader checkbox on ch3: 20MB XA-ADPCM(37.8KHz, mono) subheader checkbox on

output file: subheader checkbox on

This case worked. We are not sure why you can't interleave your data. If you are still having a problem then send us the files in question and we will do further testing.

Michael

---

1/31/96 2:48 PM

Where can I find the TOD format?

Silas S. Warner

Developer Support

Documentation

I need to find the format in which TOD files are output. I supposed it would be in the Graphic Artist Tool documentation but can't find it there.

Where is it?

Silas Warner

---

1/31/96 8:10 PM

Borden Covell II

Art Tools

Is there a way to specify the mode of the TIM files that BMP2TIM creates? I tried specifying - mode 8 on the command line and still get 24 bit time. I have LOTS of BMPs to xlate and would

really like to automate this process.  
HELP!!!!

---

1/31/96 2:43 PM  
U,V from TOD PlugIn in psxg1512  
Silas S. Warner  
Developer Support  
Art Tools

Is the latest TOD plugin for 3DS located in the download "psxg1512.zip"? If so, it still seems to be munging texture co-ordinates in some cases. In particular, a complexly textured object converts to an RSD file in which ALL of the texture coords are 0,127.  
Please confirm that I have the most current 3DS plugin. If I do, I will be happy to send you the relevant 3DS and texture files.

Silas Warner

---

2/1/96 2:26 PM  
Alternate texturing tools  
Paul Masters  
Art Tools

Is there an easier way to apply large numbers of textures (like for a street) that is less time consuming? The present set of tools is somewhat tedious. Thanks. --Tim Ray  
(for the art staff)

---

2/1/96 1:37 PM  
Re:

Michael Koziniak  
Borden Covell II  
Art Tools

Borden, Use TIMUTIL to change the bit depth of the bmp. bmp2tim won't let you do that right now.

Michael

----- Is there a way to specify the mode of the TIM files that BMP2TIM creates? I tried specifying -mode 8 on the command line and still get 24 bit time. I have LOTS of BMPs to xlate and would really like to automate this process.

---

2/1/96 1:46 PM  
Re: U,V from TOD PlugIn in psxg1512

Michael Koziniak  
Silas S. Warner  
Developer Support  
Silas,

>Is the latest TOD plugin for 3DS located in the download "psxg1512.zip"?  
The latest release is release 1.5.6 (bin156.zip) for the TOD plugin. This version has 4.0f of the plugin. Make sure you are using this. If there is still a problem then send me the files.  
Michael

---

2/1/96 2:09 PM

Re(2):

Borden Covell II

Michael Koziniak

Art Tools

Ya, but the whole problem is that TIMUTIL does not have a batch mode!

---

2/2/96 3:17 PM

Re(3):

Michael Koziniak

Borden Covell II

Art Tools

>Ya, but the whole problem is that TIMUTIL does not have a batch mode!

I knew that was what you were getting at. I'm sorry we don't have a pathway available. I will send the suggestion onto Japan.

Michael

---

2/2/96 12:44 PM

Correction(2): U,V from TOD PlugIn in psxg1512

Silas S. Warner

Michael Koziniak

Developer Support

Correction: version 4.0f seems to be in release 1.5.14. I will load this release and try it.

Silas Warner

---

2/4/96 7:05 PM

TOD2TEXT.EXE

Silas S. Warner

Art Tools

TOD2TEXT.EXE 15K

Graphic Art/Movie Tools

I have attached to this file a simple reader for TOD files. The program takes a TOD file and transfers its information to a text file with the default extension of TLS. It is a DOS utility program written in Microsoft Visual C.

This software is NOT guaranteed by Velocity, Inc., the undersigned, or any other party with respect to utility, fitness of purpose, integrity of code or data, program maintenance, or in any other way whatsoever.

However, if you are stuck figuring out the data in a TOD file, this program can convert it into at least a somewhat more readable form.

If you notice bugs in the program's interpretation of the data, please tell me on this forum. I would not exactly welcome suggestions for improvement or other comments, but I wouldn't totally ignore them either.

Silas Warner

---

2/5/96 6:48 PM

Re(8): texture sub-pages

Roy Eltham

## Art Tools

Once you have a TIM file with multiple CLUTs in it, how do you use it? Do the libraries know how to deal with them? Can a single poly be mapped with one of these things? It doesn't seem likely as that would require mid render CLUT changes. How do you specify which CLUT goes with which part of the pixel data?

Perhaps I've missed something in your conversation?

Roy

p.s. I have learned to pretty much avoid the SONY provided graphics tools. Aside from timutil/bmp2tim, everything is inhouse tools, and after next week, we'll have our own tools to replace those as well. I can't believe that the command line tools don't support the same functionality as the windows app tools??? it makes no sense, they had to write code to make it happen in windows (a much harder task then in dos), and they can't just pop it into the command line tool? Oh well...

---

2/5/96 1:23 PM

Re(8): texture sub-pages

Michael Koziniak

Sam Black

Dave R. Scheele

>What tool are you using to create these TIM's? An in-house one, or are there options in

>Sony's tools that I haven't found yet?

The latest bmp2tim.exe allows you to create a special "no CLUT" tim file. In order to do this you pass in -1's for the plt option. Example: bmp2tim -plt -1 -1sample.bmp

Hope this helps, -Michael

---

2/5/96 11:13 AM

Re(7): texture sub-pages

Sam Black

Dave R. Scheele

Art Tools

>The models, programs etc. are generated using those files, and loaded once onth the dev

>system, but the actual clut data is then written out in one block to a clut-less TIM file. In the

>end, my program should only have to load one or two big texture files instead of many small

>ones ... that's the goal, at least ;)

That's what we're doing also. We're going to end up with about 4 VRAM "heaps" that are loaded

(in some combination depending on the game state) and then one or two heaps per track. It

works very well for us, and is quite a bit faster than opening a bazillion little files.

---Jim Sokoloff

---

2/5/96 11:07 AM

Re(6): texture sub-pages

Dave R. Scheele

Art Tools

>> We've created some in house tools, as the Sony Sprite Editor >> is hated by our artists.

Frankly, the first time I took a look at it >> and its interface I was so underwhelmed that I scheduled some >> time for our engineers to write some in-house tools to save time.

hehe I know how you feel .. we've been successful in avoiding having to use every Sony art tool

except the .3DS model converter (not even using TOD's, thank goodness), and if I had the time the model converter'd be next ...

>> If you have a lot of it to do, think hard about writing your own tool to do it.

Actually, I've been letting the artists use the Photoshop plugins when they convert their .BMP texture maps for me, and all cluts are grouped in a common area. The models, programs etc. are generated using those files, and loaded once onth the dev system, but the actual clut data is then written out in one block to a clut-less TIM file. In the end, my program should only have to load one or two big texture files instead of many small ones ... that's the goal, at least ;)

Dave

---

2/5/96 2:06 PM

Re: Correction(2): U,V from TOD PlugIn in psxg1512

Michael Koziniak

Silas S. Warner

Art Tools

>Correction: version 4.0f seems to be in release 1.5.14. I will load this release and try it.

Your right also. You are refering to the release number of the Programmer Tools CD and I was refering to version numbers of the Graphic Artist Tools. Sorry for the miscommunication.

-Michael

---

2/5/96 10:58 AM

Re(4): texture sub-pages

Dave R. Scheele

Art Tools

>> I don't use 3D Studio to do what you guys are doing, >> but I thought I should point out that the TIM file format >> supports multiple CLUTs for a single pixmap. We have >> written our own graphics subsystem, using GTE & GPU, >> not GS, and make fairly extensive use of the multiple >> color maps for a single pixel pattern.

What tool are you using to create these TIM's? An in-house one, or are there options in Sony's tools that I haven't found yet?

Dave

---

2/5/96 11:02 AM

Re(5): texture sub-pages

Sam Black

Dave R. Scheele

Art Tools

>What tool are you using to create these TIM's? An in-house one, or are there options in >Sony's tools that I haven't found yet?

Both. We've created some in house tools, as the Sony Sprite Editor is hated by our artists.

Frankly, the first time I took a look at it and its interface I was so underwhelmed that I scheduled some time for our engineers to write some in-house tools to save time.

The Sony Sprite Editor can add multiple CLUTs to a single pixmap. If you have a lot of it to do, think hard about writing your own tool to do it. The TIM format is very easy. No compression, very straightforward. Your artists will probably hate the Sprite Editor; ours do.

---Jim Sokoloff

---

2/5/96 7:48 AM  
Re(3): texture sub-pages  
Sam Black  
Art Tools

>Note that this lets you have an individual clut for each individual TIM. If you just used one >big 256x256 texture, you could only have one clut.  
I don't use 3D Studio to do what you guys are doing, but I thought I should point out that the TIM file format supports multiple CLUTs for a single pixmap. We have written our own graphics subsystem, using GTE & GPU, not GS, and make fairly extensive use of the multiple color maps for a single pixel pattern.  
Perhaps for your application the above statement is true, but it is not true in the general case.  
---Jim Sokoloff

---

2/6/96 10:37 AM  
TIMUTIL  
Michael Koziniak  
Art Tools  
Borden Covell II  
FYI. TIMUTIL simply grabs the upper bits of each RGB entry when your converting the bit depth of an image(i.e. 24bit -> 8bit). You may want to use something like Phototshop to do your conversions.  
-Michael

---

2/6/96 2:45 PM  
Re(9): texture sub-pages  
Michael Koziniak  
Roy Eltham  
Art Tools  
>Once you have a TIM file with multiple CLUTs in it, how do you use it? Do the libraries >know how to deal with them? Can a single poly be mapped with one of these things? It >doesn't seem likely as that would require mid render CLUT changes. How do you specify >which CLUT goes with which part of the pixel data?  
From what I know at this point the lower level libraries could allow you to deal with multiple CLUT TIM files. I don't think LIBGS will help, but the GPU and GTE should allow you enough low level acces so that you could control the TIM better. I don't have an example of this, but I will see if I can come up with one.  
Thanks, Michael

---

2/6/96 4:02 PM  
  
Greg G. Gibson  
Art Tools

I am learning how to use mimewave and I am having trouble previewing with textures. The objects just never show up !! Running the objects with out the textures work fine. I am running the previewer from a batch file and have added the extra lines as per the documentation. I put the textures on via the meditor and have run them through another program that works fine.  
Any ideas ?  
Thanks in advance

FLR

---

2/9/96 12:25 AM

Re: Textures not displaying in the MIMe Wave Editor!

Michael Koziniak

Greg G. Gibson

Art Tools

> I am learning how to use mimewave and I am having trouble previewing with textures. >The objects just never show up !! Running the objects with out the textures work fine. >I am running the previewer from a batch file and have added the extra lines as per the >documentation. >I put the textures on via the meditor and have run them through another program that >works fine.

Hmmm. I am able to preview a model with textures. A few bumps which may be holding you up, could be: 1) Environment Vars. in batch not getting set because of Windows dos box. 2) The model may be small and you need to bring it to the foreground w/ controller. 3) Maybe the textures weren't placed in a free spot in VRAM

If none of the above help then please send me the offending models and textures.

Michael.

---

2/27/96 9:42 PM

Re: movconv script capabilities

Michael Koziniak

Geoffry R. Meek

Art Tools

>movconv apparently has some sort of scripting capability. >However, as far as I can tell, it's completely undocumented. > >Since we have 1000+ videos to convert to STR format, knowing >how this works would be EXTREMELY useful!

So, you've seen the samples. Just wanted you to see a script I wrote which works. Here is a typical AVI/WAV -> STR. So far this is the only way I've found to iterate.

```
Michael ### Script Begin Avi2strMdecV(c:\_test\movies\movie1.avi,  
c:\_test\movies\test1.str,          x2,          15fps,          1,  
2);  
Avi2strMdecV(c:\_test\movies\movie2.avi,          c:\_test\movies\test2.str,  
x2,          15fps,          1,          2); ### Script End
```

---

2/28/96 11:35 AM

Weird texturing bug?

Teh Kao Yang

Art Tools

We have noticed that when we try to apply a texture that has an odd-numbered width, an extra white(blank) pixel line is added to the texture. Why does this occur?

-TK

---

3/2/96 5:11 PM

Re: Weird texturing bug?

bits corporation

Art Tools

This bug appears to be generated by BMP2TIM - or the image convertors as a whole I suspect - and isn't to do with the hware/libs. Its quite annoying really. The easiest way around it is to make sure they're even pixel dimensions. I believe there's also a 4bit bug in both bmp2tim and timutil (both the latest versions). in BMP2TIM v2.2 where it was claimed that the loading in of BMP images which contained less colours than the bit depth had been fixed, it still doesn't fix the fact that any conversion from an 8bit depth image to that of a 4bit one destroys the clut data and replaces the palette with an incomplete system palette - this does not occur with the photoshop plugin, and unfortunately you cannot specify the bit depth with bmp2tim, so it has to be done in timutil - any ideas SCEA?  
Cheers, Laurence.

---

3/3/96 5:17 PM

Re: TOD2TEXT.EXE

Tim L. Lowery

Art Tools

Silas S. Warner

Silas,

Thanks a lot for posting the TOD2TEXT utility. It sure beats looking at values in the debugger as they're being loaded in!

I found a bug that probably doesn't affect most people. If a translation vector in a TOD file contains very large numbers (bigger than 16-bit), they are displayed incorrectly. Normally you wouldn't want very large numbers in there anyway because the GTE barfs on them when doing matrix multiplication, but that's just why you might on the TOD2TEXT utility, to find out if your translation vectors are within range.

Anyway, thanks. I'll try to reciprocate if I ever have a useful utility to post.

Dave Howell Pablo Media

---

3/15/96 8:53 AM

Gouraud Shading from vertex?

Paul Masters

Art Tools

Is there a facility in the Sony art tool package to let an artist shade a set of primitives by selecting RGB values for vertices and Gouraud shading across the poly? Tim Ray  
(Speaker for Pablo)

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3/18/96 3:24 PM

Re(2): Weird texturing bug?

Michael Koziniak

bits corporation

Art Tools

>It still doesn't fix the fact that any conversion from an 8bit depth image to that of a 4bit one  
>destroys the clut data and replaces the palette with an incomplete system palette - this does  
>not occur with the photoshop plugin, and unfortunately you cannot specify the bit depth with  
>bmp2tim, so it has to be done in timutil - any ideas SCEA?

I will pass along that the conversion of the palette could be done more gracefully. I would suggest doing bit depth conversion with a 3rd party authoring tool

Michael

---



3/18/96 1:17 PM

Re(2): Weird texturing bug?

Michael Koziniak

bits corporation

Art Tools

>This bug appears to be generated by BMP2TIM - or the image convertors as a whole I suspect  
>- and isn't to do with the hware/libs. Its quite annoying really. The easiest way around it is to  
>make sure they're even pixel dimensions. >I believe there's also a 4bit bug in both bmp2tim  
and timutil (both the latest versions). in >BMP2TIM v2.2 where it was claimed that the loading  
in of BMP images which contained less >colours than the bit depth had been fixed, it still  
doesn't fix the fact that any conversion from >an 8bit depth image to that of a 4bit one destroys  
the clut data and replaces the palette with >an incomplete system palette.

I have passed on the information to Japan about the width of images changing.

Michael

---

3/20/96 4:54 PM

Re: RSD Files, and Line Segments

Michael Koziniak

Jason G. Andersen

3D Development

>Does anyone out there know a way to get a LINE\_F? Primitive to be exported into an RSD?

>3D Studio can't do it, I was wondering if Caligari can?

Doesn't look like Caligari can do it either?

Michael

---

3/20/96 3:33 PM

Re: 3d sources

Michael Koziniak

Robert w. Calfee

3D Development

>We're at a crossroads in development, and I wanted to know what 3d modelling programs

>are supported for the sony libraries. If I go with the low level libgte instead of libgs what

>format does the data need to be in/come from?

Model data for our libraries comes from PMD and TMD. Both binary. The authoring/ascii  
format is RSD. Here is the support we have for RSD. Caligari trueSpace reads and writes this  
directly. 3DStudio can write out RSD and animation(TOD) format.

P.S. In the coming weeks we will have two more 3rd party tools. One for Alias | Wavefront and  
another for 3DStudio.

Michael

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3/20/96 3:21 PM

Re: MIIME CONVERSION

Michael Koziniak

William Botti

3D Development

>This question is from Maggie, one of our artists: >What is the best way to convert an animation  
loop I have created using >Wavefront Kinemation, to Mime? >We are using the mime tool on  
the PC, and are having problems retaining the same fluid >motion. >Is there a secret to choosing

the keyframes? >Is there a way to set the waveforms in mime? >Right now I can't seem to avoid jumps and glitches in the loop. >-Maggie

There is now way to take kinemation data and apply that to MIMe data. You would have to write a tool to do that. As I understand kinemation there are some very complex formulas which are applied to make motion for example, very natural. Say if you had a hand make a fist with all the finger closing at seperate speeds you would need multiple waveforms to accomplish that. The best you could do is save out your model data as seperate RSD files and then bring them into the wave editor and make make seperate waves for that data.

If you are interested in making a tool you might want to see if Nichimen Graphics could give you some advice on this subject. There animator can write out MIMe format files.

Michael

---

3/21/96 11:35 AM

Re: Gouraud Shading from vertex?

Michael Koziniak

Paul Masters

Art Tools

>Is there a facility in the Sony art tool package to let an artist shade a set of primitives by >selecting RGB values for vertices and Gouraud shading across the poly? > Tim Ray

This isn't possible now. I think the Materials Editor would be the appropriate place to add this functionality. I will request this feature.

Thanks, Michael

---

4/1/96 5:09 PM

3DS Plug-in question

Greg G. Gibson

Art Tools

I have just started looking at the 3ds plug-in and have some questions.

We are using morph targets to animate our objects. However, when we preview the animation with the plug-in nothing happens. All we see are all the objects that make up the morphed animation, including all the hidden objects..

Question:

Are we doing something wrong or are we requesting a feature to the 3DS plug-in ?

Thanks in advance

Rodger Ferris

---

4/3/96 11:24 AM

Re(2): RSD Files, and Line Segments

Jason G. Andersen

Michael Koziniak

3D Development

Thanks. Its all documented in 3d Graphics Tools Manuals, however, the Gs 3-d object library chokes on line segments in a tmd, when you use pre-set packets. (not using preset packets is not an option for me, so I didn't try it ...

---

4/12/96 11:27 AM

Palette Save/Load in TimUtil

Borden Covell II  
Graphic Art Tools

We would like to understand how to control the palettes that are saved/used by TIM Util. It appears that there may be a way to do this with the palette # selection list but we could not figure out how to use it. The documentation talks about "Write-out palette" and a Set... command in the File menu, but there ain't one of them, by Golly!. Any help appreciated, Thanks!!!

---

4/18/96 11:28 AM

Re(2): tim utility

Brett Butler

Carl Ferreira

Graphic Art Tools

i filled out my resume. check it out.

ps. I'm about to complete a DOS version tool of "VAGS2VAB.exe"

This would allow you to take your vags and pack them together into a vab FROM DOS. Then from there, just run VABSPLIT.exe to get your .VH and .VB files.

So, if anyone out there is tired of leasing a Mac just to do sound,...here's your tool.

Is anyone interested in this VAB tool?

Send me mail.

:) Bretto

---

4/18/96 8:47 AM

Re: tim utility

Carl Ferreira

Brett Butler

Graphic Art Tools

This is a cruel joke in the worst possible taste. As every PSX programmer knows, VRAM is worth its weight in gold and to taunt us with the possibility of having a noticeably greater amount of it is a torture beyond words.

Don't toy with me. I know that Black Magic exacts a heavy toll.

Now-- on the off-chance that you are serious, why not post the methodology used and we'll let you know if it would actually help us in a real situation.

BTW-- Who the Hell \*are\* you, anyway? This seems to be your first posting and there is no resume on file for you.

Carl Ferreira (resume on file, albeit brief) =====>Just a little feeler here.

>>Would anyone be interested in a Sony Utility that would allow you >to go through your texture art files and replace those Vram & Dram >memory eating textures with just a few bytes of data? [snip] >This package would include all structure formats, examples how to >load in, AND the tool is Visual in nature. You could take all your >textures that your artist or your publisher dumped on ya, and toss >out the unneeded ones. >>This puts a major smile on your face when it comes time to make >room in Dram & Vram for all those model textures you're using. >>-Lemme know if this is something you would be interested in.

---

4/18/96 8:19 AM

tim utility

Brett Butler

Graphic Art Tools

Just a little feeler here.

Would anyone be interested in a Sony Utility that would allow you to go through your texture art files and replace those Vram & Dram memory eating textures with just a few bytes of data? ex: converts .tims to a new file format that only a few of the new files actually contain a texture, which saves memory BigTime.

1. Texture remains the same (keep this texture). 2. Texture and Texture (keep this texture, and reference another one that would be on top of it at a varied translucency level. Which is all stored in the new file.) (This is Great for Gun shots/burns/holes on textures & saves memory!) 3. Texture combined with flat shade data to create darkness level in file. 4. Texture combined with gouraud shading data stored in file. 5. Texture tossed, store flat shade data in file instead. 6. Texture tossed, store gouraud shading data instead.

Instead of your models reading .tim files, they would read this new .JAT format.

This package would include all structure formats, examples how to load in, AND the tool is Visual in nature. You could take all your textures that your artist or your publisher dumped on ya, and toss out the unneeded ones.

This puts a major smile on your face when it comes time to make room in Dram & Vram for all those model textures you're using.

-Lemme know if this is something you would be interested in.

:) Bretto

---

4/19/96 7:29 PM

\*\*\*\*\* ATTENTION \*\*\*\*\* Beta version of MovieConverter that  
crash Win95 From:

Michael Koziniak

CD/Decompression LIB

Byrt Martinez

MOVCONV.ZIP 276K

Graphic Art/Movie Tools

Many people have been getting errors during conversion,  
floating point error etc....

Please use this beta copy of the converter until we release an official version

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4/23/96 6:31 PM

Re: 3DS Plug-in question

Michael Koziniak

Greg G. Gibson

Art Tools

>I have just started looking at the 3ds plug-in and have some questions.

>We are using morph targets to animate our objects. However, when we preview the animation with the plug-in nothing >happens. All we see are all the objects that make up the morphed animation, including all the hidden objects..

Could you please tell me what "morph targets" are. If you have some sample data that I could look at that would be great also.

Thanks, Michael

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4/23/96 6:29 PM

Re: Palette Save/Load in TimUtil

Michael Koziniak

Borden Covell II

#### Graphic Art Tools

>We would like to understand how to control the palettes that are saved/used by TIM Util. >It appears that there may be a way to do this with the palette # selection list but we could >not figure out how to use it. The documentation talks about "Write-out palette" and a Set...>command in the File menu, but there ain't one of them, by Golly!. Any help appreciated, Thanks!!!

The Sprite Editor has the ability to make and manipulate multiple palettes.

Michael

---

4/24/96 9:36 AM

Re(2): Palette Save/Load in TimUtil

Borden Covell II

Michael Koziniak

Graphic Art Tools

thanks, i'll take a look at that.

---

4/30/96 10:38 AM

Interleaving Problems with MovConv

David R. Black

Graphic Art/Movie Tools

Has anyone else been experiencing interleaving problems with MovConv and single speed movies?

Here's a more exact description of the situation.

Source Materials: - Uncompressed AVI movies @ 15fps and 256x128x24bpp resolution (around 900meg each) - Uncompressed 44.1, 16-bit, Mono WAV files (matched/synched to the aforementioned movies) (around 75meg each)

The Source materials are compressed using MovConv to the following: - MDEC only (Form1, non-interleaved) STR files, with 4 sectors per frame - 37.8 XA audio files

When I take the above files output and attempt to interleave them using MovConv, I lose sync between the audio and video. With one movie, I lose sync approximately 3-4 minutes into the clip. It appears that MovConv drops about 300-400 milliseconds of audio at some point in this movie. In another movie, it happens 20-30 seconds into the clip.

The problem could also be with the XA audio conversion code, but I did try converting the audio using 2 different version of MovConv, as well as the Mac Tools, and at 44.1 and 37.8 sample rates. all with the same result. This leads me to believe that it is the interleaving code that has the bug.

Has anyone else had any similar problems? I sent a message to Dev\_TechSupport a few days ago, but no one has gotten back to me yet, so I thought I'd post here and see if anyone else had run into anything similar.

Thanks for your time.

David R. Black Senior Programmer Presto Studios, Inc.

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5/8/96 5:21 PM

Higher quality movies with movconv

Dennis Harper

Graphic Art/Movie Tools

Presently, we are running MovConv v1.98e to make compressed movies. But we do not plan on streaming the movies off of a CD-ROM drive. After making a few movies, I noticed that when I increase the number of frames per second, the quality goes way down. And I noticed that the memory size of a frame is inversely proportional to the number of frames per second. Is there a way that we can make movies such that they have a high framerate (30+ fps), but with a higher quality? Could this be done by increasing the size of the frame, since we don't have to worry about how much data a double speed CD-ROM can read in 1/30th of a second?  
Garrett Jost

---

5/10/96 2:08 PM  
Re: Interleaving Problems with MovConv  
Michael Koziniak  
Graphic Art/Movie Tools

This was fixed by taking out leap sector.  
Michael

---

5/10/96 2:06 PM  
Some info on the new beta Movie Converter 2.0  
Michael Koziniak  
Graphic Art/Movie Tools

Many people have been asking what the leap sector check box in the new movie converter is for. What it does is add a sector of dummy data to your str. file for every 1,000 sectors. This is necessary if your original data is from tape. In other words if it came out through NTSC. NTSC drifts around 60kHz and we sync on VSync so its not true 60fps. Movies will end up playing slower.  
Since computer rendered movies are true 60fps or true 15fps a leap sector is not needed. It could cause problems actually.  
Thanks, Michael

---

5/10/96 12:48 PM  
Re: Higher quality movies with movconv  
Mike Fulton  
Graphic Art/Movie Tools

Garrett Jost @ Atari Games/Time Warner Interactive writes: (His questions are shown in italics, my response in plain text.)

"Presently, we are running MovConv v1.98e to make compressed movies. But we do not plan on streaming the movies off of a CD-ROM drive. After making a few movies, I noticed that when I increase the number of frames per second, the quality goes way down. And I noticed that the memory size of a frame is inversely proportional to the number of frames per second." With MovConv, you specify the desired data rate for the end result, and it adjusts the lossiness of the movie compression to achieve that rate. So if you have fewer frames per second, that means more data can be used for each frame, so you get less compression and higher quality. Or you can get higher frame rates with a greater compression and lower video quality. Is there a way that we can make movies such that they have a high framerate (30+ fps), but with a higher quality? Could this be done by increasing the size of the frame, since we don't have to worry about how much data a double speed CD-ROM can read in 1/30th of a second?  
I'm not sure I understand that last question. If by "increasing the size of the frame" you mean

increasing the data rate, then the answer is "yes". The only way to increase both your frame rate and quality is to use a higher data rate. But when you mention not worrying about how much data you can read in 1/30th of a second, that is what confuses me. Perhaps you're thinking that you can (or should) read the movie data one frame at a time, but that isn't really how you do it. Typically you have two buffers long enough for about 1 second of the movie, and play back from one while reading from the CD into the other. You can go with smaller buffers, but you have to be careful because the data rate will be less consistent, and the timing to get the next buffer filled becomes more and more critical.

What data rate are you using now? What resolution are your movies? Have you been looking at our sample movie player programs?

Mike @ SCEA

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5/15/96 4:04 PM

Re(2): Higher quality movies with movconv

Dennis Harper

Graphic Art/Movie Tools

> Garrett Jost @ Atari Games/Time Warner Interactive writes: (His > questions are shown in italics, my response in plain text.) >> Is there a way that we can make movies such that they have a high > framerate (30+ fps), but with a higher quality? Could this be done > by increasing the size of the frame, since we don't have to worry > about how much data a double speed CD-ROM can read in 1/30th of > a second? >> I'm not sure I understand that last question. If by "increasing the > size of the frame" you mean increasing the data rate, then the > answer is "yes". The only way to increase both your frame rate and > quality is to use a higher data rate. But when you mention not > worrying about how much data you can read in 1/30th of a second, > that is what confuses me. Perhaps you're thinking that you can (or > should) read the movie data one frame at a time, but that isn't really > how you do it. Typically you have two buffers long enough for > about 1 second of the movie, and play back from one while reading > from the CD into the other. You can go with smaller buffers, but you > have to be careful because the data rate will be less consistent, and > the timing to get the next buffer filled becomes more and more > critical. >> Mike @ SCEA

The reason I said not to worry about how much data I can read in a 1/30 of a second is because I'm not using a CD-ROM drive for my movie. This also means not to worry about reading 30 frames in a second. Let's just assume I have my whole movie already loaded into main memory.

I want to increase the data rate of the movie without decreasing the quality. When I was experimenting with movconv, I found that with a 320 x 176 movie I had, that a 15 fps movie (setting the CD-ROM speed to double) looked good. But when I made that same movie 30 fps, it looked unacceptable. I want to make a movie that can decompress and play at 30 fps that looks good. I'm assuming I could do this increasing the data rate, but movconv only allows a double speed CD-ROM data rate.

Garrett Jost

---

5/15/96 9:38 PM

movconv on SGI.

Dave Footitt

Graphic Art/Movie Tools

At the development conference, I was told that there exists an un-supported movie converter compiled for the SGI.

Is there any chance I can download it from this BBS?  
Paal-Kr. Engstad engstad@funcom.com FUNCOM Oslo A/S.

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5/17/96 10:38 AM  
3D Studio Plug-In  
Ayo A. Orimoloye  
Graphic Art/Movie Tools

Is there any particularly brilliant reason why the 3D Studio plug-in in the current release (Release 1.6) of the Graphic Artist CD has been replaced by version 4.0d, which generates insane UV coordinates (0 120 for ALL vertices of ALL polys!) when version 4.0f has been available on the previous releases (1.5)?

Why oh why have you guys replaced version 4.0f (which generates proper UV coordinates) with the horribly bugged 4.0d? Is this some cruel joke? I had to wade through releases and download for hours in the "1.5 archive release" of "Prog. Tools CD" in the "Product Releases" folder to get the "Release 1.5.14", which contained the "PSXG1514.ZIP" file, which is the one that actually had version 4.0f. It took several downloads of so many releases before I finally found it. Could you please ensure that the CURRENT releases of the tools have the CURRENT versions of everything in future?

One more thing, why does the plug-in generate random FLAT shaded textured polys when you specifically request for GOURAUD shaded textured polys? I have a file containing 600 polys of which 5 were flat-shaded for no apparent reason at the whim of the plug-in. This is not on. Especially since it appears that the 5 flat-shaded ones have THE NOTORIOUS UV bug still! AAARRGGH! When will this UV nightmare end? Why can't ALL my polys be GOURAUD shaded when I ask for gouraud shading? Is it a way optimizing simple polygons or am I missing something?

Initially, I felt it was "optimizing" simple polygons (like a really small poly) by saving them as flat-shaded instead of gouraud-shaded but apparently this is not the case. If you look at polygon #430 and #431, from their UVs and vertices, we can assume they are similar in size. So why is #430 Gouraud-shaded whilst #431 isn't? (These values were obtained from RSDLINK):

```
= [430] GOURAUD TEX 3-POLY(0x34000609) LIGHT: ON = Vert-0: ( -46, -401, -1209) (#273)
Vert-1: ( -42, -400, -1209) (#280) Vert-2: ( -45, -403, -1209) (#294) Norm-0: ( 661, 775,
3967) (#340) Norm-1: ( 0, 0, 4096) (#343) Norm-2: ( 804, 1115, 3858) (#339) UV 0-2: (
33 22) (33 24) (33 18) Pixel mode : 8bit CLUT : (x y)=( 0 481) Texture Page: 9 Texture No. :
5 = [431] FLAT TEX 3-POLY(0x24000507) LIGHT: ON = Vert-0: ( -46, -401, -1209) (#273)
Vert-1: ( -44, -399, -1209) (#275) Vert-2: ( -42, -400, -1209) (#280) Norm-0: ( 0, 0,
4096) (#344) UV 0-2: (33 22) (33 27) (33 24) Pixel mode : 8bit CLUT : (x y)=( 0 481) Texture
Page: 9 Texture No. : 5
```

You can see the UV bug in action from these 2 polygons. Poly #123 is the bugged one with a wild value of 255 for u2 when Texture No. 0 is only 36 x 180 in size! Poly #124 is "normal".....

```
= [123] FLAT TEX 3-POLY(0x24000507) LIGHT: ON = Vert-0: ( 34, -398, -1235) (#38) Vert-1:
( 35, -400, -1235) (#78) Vert-2: ( 36, -399, -1235) (#36) Norm-0: ( 0, 0, -4096) (#97)
UV 0-2: ( 1 1) ( 0 1) (255 1) Pixel mode : 8bit CLUT : (x y)=(512 481) Texture Page: 21
Texture No. : 0 = [124] GOURAUD TEX 3-POLY(0x34000609) LIGHT: ON = Vert-0: ( 33, -
399, -1235) (#80) Vert-1: ( 35, -400, -1235) (#78) Vert-2: ( 34, -398, -1235) (#38) Norm-0: (
-382, 113, -4077) (#98) Norm-1: ( 0, 0, -4096) (#99) Norm-2: ( -280, 170, -4083) (#100)
UV 0-2: ( 2 1) ( 0 1) ( 1 1) Pixel mode : 8bit CLUT : (x y)=(512 481) Texture Page: 21
Texture No. : 0
```

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5/20/96 2:55 PM



Re(3): Higher quality movies with movconv  
Mike Fulton  
Graphic Art/Movie Tools

I see the problem now... No offense, but I don't think you really asked the right question. Allow me to rephrase it, and please correct me if I am still not getting the right idea.

How can I specify a data rate in MovConv other than single-speed or double-speed? I want to be able to play back a movie at 30fps with nice quality, but from memory, not from disc. The quality I'm getting for double-speed/30fps isn't good enough, so I want to specify a higher data rate. How do I do that?

The "MDEC Parameters" dialog box includes a section labeled "Custom". If "Custom" is checked, then you can enter the desired number of CD sectors per frame of your movie in the "Maximum Sector Size" editbox. This can be used as either a constant data rate or as the maximum data rate. (I suggest you use the latter.) Remember that a sector is 2048 bytes long, so if you have 30fps and a desired data rate of about 450kps, then you would specify 7 or 8 sectors per frame. You can also specify this as the desired number of bytes. If you're reading everything into memory, you may wish to use this option instead of sectors. Simply change the popup menu from "sectors" to "bytes" and then enter the desired data rate in the edit box. If you wanted a data rate of 450kps for your 3 second (90 frame) movie, then you would enter 15360 bytes. (15360 bytes per frame \* 30 frames per second = 450kps data rate)

Always keep in mind that just because you aren't reading the data from the CD as you are playing it doesn't mean that there isn't a potential bottleneck. If your data rate is TOO high, the MDEC won't be able to keep up with the amount of data you're throwing at it. You'll have to experiment to see what the threshold is.

Mike

P.S. May I assume you've already tackled the problem of playing movies from RAM rather than from CDROM?

---

5/20/96 2:59 PM  
Re: 3D Studio Plug-In  
John Phua  
Graphic Art/Movie Tools

Ayo A. Orimoloye writes: Is there any particularly brilliant reason why the 3D Studio plug-in in the current release (Release 1.6) of the Graphic Artist CD has been replaced by version 4.0d, which generates insane UV coordinates (0 120 for ALL vertices of ALL polys!) when version 4.0f has been available on the previous releases (1.5)?

Why oh why have you guys replaced version 4.0f (which generates proper UV coordinates) with the horribly bugged 4.0d? Is this some cruel joke? I had to wade through releases and download for hours in the "1.5 archive release" of "Prog. Tools CD" in the "Product Releases" folder to get the "Release 1.5.14", which contained the "PSXG1514.ZIP" file, which is the one that actually had version 4.0f. It took several downloads of so many releases before I finally found it. Could you please ensure that the CURRENT releases of the tools have the CURRENT versions of everything in future?

Hi Ayo,

We checked the Graphic Artist CD 1.6 and it contains version 4.0f of the 3D Studio Plug-in and not version 4.0d. Could you please check again and let us know.

Thanks, John

---

5/22/96 2:32 PM

Material Editor & Shading  
Jay Stelly  
Graphic Art/Movie Tools

I'm having some trouble with the material editor.  
When you convert a .DXF object to .RSD, you must choose whether or not you want smooth shading. This causes the converter to generate either face or vertex normals. However, with many models it is desirable to mix the two types of normals (and shading). The material editor seems to generate the appropriate vertex normals if you create some spot gouraud shading on a flat shaded object. The problem is that when you save the file, the new normals are not written out. Instead, the normals are left as-is, and the gouraud shaded polygons end up with all three normals pointing to the face normal. Obviously this is not desirable. I can fix this by generating my own vertex normals after the fact, but that adds an unnecessary step, and it appears that the editor is doing the right thing internally. Is there something I'm missing? I think we're using the latest Material Editor. Is this a bug that's been fixed?  
Jay Stelly Tetragon

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5/24/96 1:36 PM  
Quicktime to AVI conversion  
John Harris  
Graphic Art/Movie Tools

Does anyone have any suggestions for a good tool to convert movies from Apple Quicktime format into 16-bit .AVI that MOVCONV can import?  
We tried using Autodesk Animator Studio, which did convert Quicktime into 24-bit .AVI, but I haven't found a way to do the 24->16 conversion. Microsoft Video for Windows seems like it should have done this, but it fails with an out of memory error even on a 9 frame partial-screen movie. And of course, it would be nice to have only one step.  
John Harris Tachyon Studios, Inc.

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5/25/96 3:59 PM  
15 bit textures  
Christian F. Aubert  
Graphic Art/Movie Tools

What software do you use to paint your textures?  
Most people use photoshop, but the problem we've found with it is that beautiful 24 bit gradients don't translate all that well to 15 bit format. Is there something on the market that actually lets you paint in 15 bit color?  
Chris [chris@megatoon.com](mailto:chris@megatoon.com)

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5/28/96 4:02 PM  
Re: 15 bit textures  
Dave Howell  
Graphic Art/Movie Tools

Christian F. Aubert writes: What software do you use to paint your textures?  
Most people use photoshop, but the problem we've found with it is that beautiful 24 bit

gradients don't translate all that well to 15 bit format. Is there something on the market that actually lets you paint in 15 bit color?

Chris,

Try just adding some very slight noise to your beautiful 24-bit gradient before converting to 15-bit. This will result in a dithered image and will look very nice. You'll have to experiment with amounts of noise.

Dave Howell Pablo Media

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6/5/96 5:39 PM

Re: Quicktime to AVI conversion

Mike Fulton

Graphic Art/Movie Tools

Does anyone have any suggestions for a good tool to convert movies from Apple Quicktime format into 16-bit .AVI that MOVCONV can import?

Well, I know that Adobe Premiere can do it, because I just went and created a stupid little 8-second movie and then ran it through MOVCONV. When you choose "Make Movie" you will see a dialog that has a "Compression" button. Then you should be able to Selecting it will take you to another dialog. First make sure you select "none" for compression. Then use the popup that lets you specify 256 colors, thousands (16-bit), or Millions (32-bit).

For something a bit less expensive, have you tried ULEAD's MediaStudio suite? It offers a Premiere-like non-linear editor and several utilities, including a format conversion tool that can understand both AVI and Quicktime.

We tried using Autodesk Animator Studio, which did convert Quicktime into 24-bit .AVI, but I haven't found a way to do the 24->16 conversion. Microsoft Video for Windows seems like it should have done this, but it fails with an out of memory error even on a 9 frame partial-screen movie. And of course, it would be nice to have only one step.

What do you mean when you say "Microsoft Video For Windows"? Are you referring to some little program that came with it?

I'm surprised that Animator doesn't do thousands, but perhaps that is because it doesn't use that format internally.

You may also want to browse "<http://www.shareware.com>" and search for "Video" in the MS Windows section.

Mike

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6/5/96 5:49 PM

Re: 15 bit textures

Mike Fulton

Graphic Art/Movie Tools

I don't know of any Windows apps that will really let you do anything directly in 15/16-bit mode, because that's not really a mode that the Windows GDI supports. Video drivers handle it by internally going from 24-bit down to 15/16-bit mode, but programs talk to Windows using either 24-bit mode or 8-bit & lower.

At any rate, if the problem is really just that the gradients don't translate, then doing stuff in 15-bit mode in the first place wouldn't help. I think what you really need to do is dither the gradient so the edges between colors aren't so sharply defined. With sharp edges, the differences between 24-bit and 15-bit are more pronounced.

Whenever I create a gradient that will end up on a device with lower color resolution (like going from 24-bit to 15-bit, or going to halftones for printing), I always use the "Noise" filter. This dithers the edge between one color and the next in a random way. I typically use a level of 3 or

4 for high-contrast gradients (like going from white to black, or red to blue), and a level of 1 or 2 for low contrast ones (like yellow to orange or yellow to green).  
Don't forget that you can save out to 15-bit, then close the file, then reload it. This will allow you to preview the gradient without leaving Photoshop.

Mike

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6/10/96 2:34 PM

3D Studio Plug-In

Ayo A. Orimoloye

Graphic Art/Movie Tools

John Phua

A question was asked wayyyy back in December '95 about the 3D Studio plug-in's apparent corruption of the vertices and normals of models. The message "3DS Plug-in" was signed by a David Crane at NuFX or something like that but was sent under the name of Pat Quinn, and can be found in the Archives. Anyway, I do not seem to see any satisfactory responses to this message anywhere other than the standard "we will pass this to Japan" line.

I am currently experiencing similar problems with version 4.0f of the plug-in. I have 3 models that were created on 3D studio. They are all centered perfectly at the origin on 3DS. I do not convert them all at once but I treat each one as a separate RSD file. One of them converts perfectly with all the texture UV's looking OK and is positioned bang in the center of the Sony origin. The other 2 have messed up UVs on 3 or 4 polygons (out of about 600) and are mysteriously randomly translated away from the origin. The translation is not a big deal because using RSDFORM I can translate the RSDs back to the origin but this is a bit worrying and annoying. Their scaling is also randomly affected although I can use RSDFORM to fix this problem as well.

Recently, I decided to incorporate depth queuing. Previously, I was reading the vertices X0, X1, and X2 from the TMD\_PRIM, doing a RotAverageNclip3 and drawing the polygons. This means I was using the INDEPENDENT VERTEX model. Anyway, to do the depth queuing, obviously I would need to use the normals N0, N1 and N2 from the TMD\_PRIM and do a NormalColorDpq3 after my RotAverageNclip3 using the interpolated value (p) returned from the Rot (see Sony example in PSX\SAMPLE\GRAPHICS\TUTO\TUTO6.C). Well this didn't work! In fact it thrashed my polys, drew up random multi coloured squares on the screen, etc. This is quite strange since all NormalColorDpq3 was doing different to each poly was writing a word to its R,G,B colour. I don't see why crazy values in the POLYS r0, g0, and b0 should result in such chaos.

So I thought I would try using the values in the SHARED VERTEX model (v\_offs, n\_offs, vert0 - vert2 and norm0 - norm2). This didn't work either. I took out the NormalColorDpq3 stuff and discovered that when using x0, x1 and x2 for your RotTransPers or whatever Rot from a 3D Studio generated TMD, there is no problem. When using the v-offss and vert0 - vert2s, everything is horribly deformed. Any explanation for this?

Also, why can't I read in the TMD file from the spinning earth demo

(PSX\SAMPLE\GRAPHICS\FASTER\TAKE\EARTH.TMD)? Is it an older format TMD file or something? I read it in but it appears to have a different coordinate system/format from the TMDs generated by RSDLINK (i.e it doesn't get displayed). I rendered a sphere on 3D studio with 180 polys, wrapped the EARTH4.TIM texture around it, saved out the RSD and tried that and it worked fine (with a few corrupt UVs on about 6 polys and translation and scaling off center of course!). What's the deal with that earth? The Sony tuto.cpe works but it is quite dated. Has anyone been able to successfully use the normals from a 3D Studio Plug-in generated TMD file with SetFogNear/NormalColorDpq3 etc to get proper lighting effects going? Do you have to save out 3D Studio models in the Sony coordinate system with the X, -Y and Z to get proper vertex and normal information or what? And why shouldn't I be able to use the shared vertex model data in a TMD\_PRIM if I wanted to (even if the model contained only one object)?

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6/11/96 12:04 PM  
Re: 3D Studio Plug-In  
Ayo A. Orimoloye  
Graphic Art/Movie Tools

Well, I found out what was causing the corruption of the polys - the cd value in the CVECTOR of the primary colour was not properly set by some dummy (me!). I have set the cd using SetRGBcd but the "apparent TMD normal problem" persists. I now believe that the normals stored in the TMD files might be worthless. Is there anything special to be done to the normals before leaving 3D Studio (like inverting them for instance)?

---

6/14/96 2:06 PM  
Re(2): 3D Studio Plug-In  
Michael Koziniak  
Ayo A. Orimoloye  
Graphic Art/Movie Tools

> Is there anything special to be done to the normals before leaving >3D Studio (like inverting them for instance)?  
No there is nothing special. If they aren't turning out right then consider the Animetix plugin. I can give you more info.  
-Michael

---

6/14/96 3:24 PM  
Re(3): 3D Studio Plug-In  
Ayo A. Orimoloye  
Michael Koziniak  
Graphic Art/Movie Tools

Thanks for the reply. I am intrigued by the thought that another plug in exists.....  
So what IS the Animetix plug-in, where can I get it, and the most important question of all.....  
DOES IT DO QUADS?????!!!!!!

---

6/17/96 10:07 AM  
Version 2 vs. Version 3  
Henrik Markarian  
Graphic Art/Movie Tools

When converting an AVI to an STR, in the details dialog box of MovConv, the user can select between version 2 or version 3 for the compression. In previous releases of MovConv, we were told not to use version 3 because it was buggy. Has this problem been addressed in release 2.0 of MovConv? If so, what are the differences between version 2 and version 3?  
Henrik Mindscape

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6/18/96 3:43 PM  
Re: Version 2 vs. Version 3  
Michael Koziniak  
Graphic Art/Movie Tools

>When converting an AVI to an STR, in the details dialog box of MovConv, the user can select  
>between version 2 or version 3 for the compression. In previous releases of MovConv, we  
>were told not to use version 3 because it was buggy. Has this problem been addressed in  
>release 2.0 of MovConv? If so, what are the differences between version 2 and version 3?  
There is more than one step to this process. One is getting the data and another is  
decompressing the stream data on the playstation. We can write version 2 and 3 data no  
problem. There is a problem decompressing version 3 data. The streaming libraries do not fully  
support it.  
-Michael

---

6/27/96 2:53 PM  
Re: Some info on the new beta Movie Converter 2.0  
Jeff Davies  
Graphic Art/Movie Tools

What is the status on the script files? They must of been updated to incorporate the leap sector  
option, no? Also is there a way to have movconv remember your prefered settings? -Jeff

---

6/27/96 5:29 PM  
Re(3): movconv script capabilities  
Buzz Burrowes  
Graphic Art/Movie Tools

Oooppoooooooooooooooooooo!  
Sorry, I found the example script finally! It looks pretty straight forward.

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6/27/96 5:04 PM  
Re(2): Some info on the new beta Movie Converter 2.0  
Erick S. Dyke  
Graphic Art/Movie Tools

Also any hope of adding .BMPS or .TGAS as input types? It should be easy enough to do and  
would save the step of BMP2TIM for many of us.

---

6/27/96 5:20 PM  
Re(2): movconv script capabilities  
Buzz Burrowes  
Graphic Art/Movie Tools

I appreciate your posting of a script which works, but how about some real documentation! I  
have a number of movies to create myself, and this functionality would save me TONS of time.  
I need to convert a bunch of rgb file series into str. Any ideas?

---

7/2/96 10:33 AM  
Leap Sectors  
Buzz Burrowes  
Graphic Art/Movie Tools

I understand the functionality of the "Leap Sector" option in MovConv. My question is in regard to how MovConv handles this in regard to multiple passes on the same STR data. Here is the situation...

Step 1) I've got rgb files which I feed through MovConv to get a 15fps STR file WITH room for audio (by checking the appropriate fields... in my case 37.8k stereo). I also check the "Leap Sector" option.

Step 2) NOW I need to go back and "Interleave Audio". This dialog box also has a "Leap Sector" option. Does this mean that MovConv will look for the Leap Sector it put in back in step 1, or will this add ANOTHER Leap sector?

If it adds another Leap sector I would assume that I only need to do this once... either when I convert the rgb files OR when I interleave audio. Can someone confirm which way I should go on this?

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7/2/96 12:45 PM

Re(3): Some info on the new beta Movie Converter 2.0

Michael Koziniak

Erick S. Dyke

Graphic Art/Movie Tools

>Also any hope of adding .BMPS or .TGAS as input types? It should be easy enough to do >and would save the step of BMP2TIM for many of us.

I have added this request to the engineers list. I will mention it to him again.

Michael

---

7/3/96 2:24 AM

Leap sector values in scripts...

Jeff Davies

Graphic Art/Movie Tools

Ok, after looking at the movconv.exe file I came to the conclusion that the only values for the leap sector param are TRUE or FALSE. I just want to check that TRUE means the same as checking the leap sector option in the details box. Is this correct? -Jeff

---

7/8/96 10:52 AM

Re: Leap sector values in scripts...

Michael Koziniak

Jeff Davies

Graphic Art/Movie Tools

>Ok, after looking at the movconv.exe file I came to the conclusion that the only values for >the leap sector param are TRUE or FALSE. I just want to check that TRUE means the same >as checking the leap sector option in the details box. Is this correct?

Correct. In movie scripts the "TRUE" or "FALSE" goes right after the MDEC version parameter and "TRUE" means you will get a leap sector.

Interesting note. You can't run multiple incarnations on multiple machines of MOVCONV into the same directory(i.e. network) because MOVCONV creates a temp file at the destination and there's problems when different MOVCONV's access the temp file(the name is the same).

-Michael

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7/10/96 10:12 PM  
Movie converter 2.0 Sample Script  
Michael Koziniak  
Graphic Art/Movie Tools

SAMPLE.SCR 5K  
Graphic Art/Movie Tools  
Here's a sample script for the new movie converter. It shows you how to deal with the new leap sector parameter.  
-Michael

---

7/16/96 9:16 PM  
Force unused sector in MovConv  
Heather Barclay  
Graphic Art/Movie Tools

Is there a way to force one unused sector per frame when building an MDEC STR w/ XA audio in MovConv? I know I can set a "Custom" fixed number of sectors per frame, but depending on how poorly the image compresses, all of the sectors might get used, leaving me none!  
If I need to, I can run MovConv and force it to create the STR with n-1 sectors, then write a utility that adds in the extra sectors that I need. But if MovConv can do it for me...  
HB

---

7/17/96 12:39 PM  
Re: Leap Sectors  
Buzz Burrowes  
Graphic Art/Movie Tools

Buzz Burrowes writes: I'm still looking for an answer to the following question... I understand the functionality of the "Leap Sector" option in MovConv. My question is in regard to how MovConv handles this in regard to multiple passes on the same STR data. Here is the situation...  
Step 1) I've got rgb files which I feed through MovConv to get a 15fps STR file WITH room for audio (by checking the appropriate fields... in my case 37.8k stereo). I also check the "Leap Sector" option.  
Step 2) NOW I need to go back and "Interleave Audio". This dialog box also has a "Leap Sector" option. Does this mean that MovConv will look for the Leap Sector it put in back in step 1, or will this add ANOTHER Leap sector?  
If it adds another Leap sector I would assume that I only need to do this once... either when I convert the rgb files OR when I interleave audio. Can someone confirm which way I should go on this?

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7/21/96 8:03 PM  
Source for tools...  
Tom Sloper  
Graphic Art/Movie Tools

Is there source for any of the offline tools(movconv and the like)?

---



7/22/96 6:21 PM  
Re: Source for tools...  
Mike Fulton  
Graphic Art/Movie Tools

No, I'm afraid we haven't released the source code to any of these tools.  
Mike

---

7/23/96 11:55 AM  
Movconv "feature"  
Ted Morris  
Graphic Art/Movie Tools

I have a series of 15 frame movies that I was trying to compress. They were named E\_01 to E\_14. For some reason, the movies from E\_04 through E\_14 would cause MOVCONV to crash with a floating point error. After several frustrating hours I finally figured out the problem with MOVCONV - It doesn't like frame numbers above (I assume) 32768 even if the movie has nowhere near that number of frames. In my case, when the frame number was added onto the movie title I got E\_040000 - E\_040014, for example. The simplest solution was to rename the frames.

I just thought I'd pass on this knowledge to prevent others from the extreme pain and suffering I endured. =)

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7/24/96 9:55 PM  
Re(2): Leap Sectors  
Michael Koziniak  
Graphic Art/Movie Tools

Buzz Burrowes writes: Buzz Burrowes writes: I'm still looking for an answer to the following question... I understand the functionality of the "Leap Sector" option in MovConv. My question is in regard to how MovConv handles this in regard to multiple passes on the same STR data. Here is the situation...

Step 1) I've got rgb files which I feed through MovConv to get a 15fps STR file WITH room for audio (by checking the appropriate fields... in my case 37.8k stereo). I also check the "Leap Sector" option.

Step 2) NOW I need to go back and "Interleave Audio". This dialog box also has a "Leap Sector" option. Does this mean that MovConv will look for the Leap Sector it put in back in step 1, or will this add ANOTHER Leap sector?

If it adds another Leap sector I would assume that I only need to do this once... either when I convert the rgb files OR when I interleave audio. Can someone confirm which way I should go on this?

I think I can safely say you will get two "leap sector" sections added to your stream data if you check leap sector both times. So, in conclusion only add leap sector once(I would do it on the first pass).

-Michael

---

7/27/96 5:44 PM  
MovConv 2.0 BUG

Buzz Burrowes  
Graphic Art/Movie Tools

HELP!!!!!!!!!!!!!!!

MovConv 2.0 has a bug in its script parser...

If you include a '~' in a filename field (which you quite often have to do when working in a Win95 environment) you get a syntax error message. This shouldn't cause an error! The file name should... must... be accepted!

PLEASE have this fixed ASAP.

Thanks.

---

7/31/96 10:41 AM

interleaving audio with funky stream

tim m. edwards

Graphic Art/Movie Tools

Hey, Guys.

I am having some difficulty interleaving audio into a movie which changes size dynamically. I built this movie by first building each section of the movie as a separate stream file, concatenating them, and then walking through and fixing the frameCount bits. After hacking my movie player, I can play back this movie fine.

The problem comes when I try to play back this movie after interleaving audio. The first section of the movie plays back fine, but when the first frame at a new size shows up, I get garbage on the screen, and MDEC errors galore.

What is going on here? Is MOVCONV getting size info from the first frame, and assuming it to be constant across the movie?

I would really like to avoid having to build a consistently 320x240 movie, as most of the the time my source video is between 320x160 and 64x96.

Thanks for any help -tim.

P.S. What is the size range for a an MDEC compressed 16x240 strip of solid black? (how many bytes?)

Tim Edwards @ Lifelike Productions (415) 332-9442

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7/31/96 12:46 AM

Re: MovConv 2.0 BUG

Michael Koziniak

Graphic Art/Movie Tools

Buzz Burrowes

If you include a '~' in a filename field (which you quite often have to do when working in a Win95 environment) you get a syntax error message. This shouldn't cause an error! The file name should... must... be accepted!

We will get one of the Japanese errors to fix this and another crash bug ASAP.

-Michael

---

8/2/96 3:01 PM

3D Studio Plug-In: Any a's to your q's, yet?

Dane Emerson

Graphic Art/Movie Tools

Ayo A. Orimoloye

>I am currently experiencing similar problems with version 4.0f of the plug-in. I have 3 models that were created on 3D studio. They are all centered perfectly at the origin on 3DS. I do not convert them all at once but I treat each one as a separate RSD file. One of them converts perfectly with all the texture UV's looking OK and is positioned bang in the center of the Sony origin. The other 2 have messed up UVs on 3 or 4 polygons (out of about 600) and are mysteriously randomly translated away from the origin. The translation is not a big deal because using RSDFORM I can translate the RSDs back to the origin but this is a bit worrying and annoying. Their scaling is also randomly affected although I can use RSDFORM to fix this problem as well.

Same problems here... translations all appear at origin of SONY, but in 3D studio all objects are formed under normal circumstances (not as yours were, i.e. They are all centered perfectly at the origin on 3DS.) Second is another major problem dealing w/ normal miscalculation while transferring from 3DS to SONY, which was also mentioned in your earlier msgs.

My wonder/concern lies in any answers you may have received. I noticed a msg was posted back to you from a Michael (?) selling his interest in the Animetix Plug-In. Is this a worthwhile utility to attain, or have you discovered an alternate route?

-kID

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8/6/96 7:55 PM

Re: interleaving audio with funky stream

Michael Koziniak

Graphic Art/Movie Tools

tim m. edwards writes: Hey, Guys.

I am having some difficulty interleaving audio into a movie which changes size dynamically.

I built this movie by first building each section of the movie as a separate stream file, concatenating them, and then walking through and fixing the frameCount bits. After hacking my movie player, I can play back this movie fine.

The problem comes when I try to play back this movie after interleaving audio. The first section of the movie plays back fine, but when the first frame at a new size shows up, I get garbage on the screen, and MDEC errors galore.

What is going on here? Is MOVCONV getting size info from the first frame, and assuming it to be constant across the movie?

I would really like to avoid having to build a consistently 320x240 movie, as most of the the time my source video is between 320x160 and 64x96.

As it turns out the problem here is that Movie Converter only checks the first frame to get size information.

-Michael

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8/7/96 5:55 PM

Re: 3D Studio Plug-In: Any a's to your q's, yet?

Michael Koziniak

Graphic Art/Movie Tools

Dane Emerson writes: >I am currently experiencing similar problems with version 4.0f of the plug-in. I have 3 models that were created on 3D studio. They are all centered perfectly at the origin on 3DS. I do not convert them all at once but I treat each one as a separate RSD file. One of them converts perfectly with all the texture UV's looking OK and is positioned bang in the center of the Sony origin. The other 2 have messed up UVs on 3 or 4 polygons (out of about 600)

and are mysteriously randomly translated away from the origin. The translation is not a big deal because using RSDFORM I can translate the RSDs back to the origin but this is a bit worrying and annoying. Their scaling is also randomly affected although I can use RSDFORM to fix this problem as well.

We're taking another look at our plugin and we will try to fix it.

-Michael

---

8/7/96 4:25 PM

Re(3): Leap Sectors

John Ross

Graphic Art/Movie Tools

I experience something similar, I click on the leap sector option when I create a .STR file but when I go to interleave sound with the .STR I get continuous errors. If I engage the leap sector function again the file interleaves with no errors.

I create a .STR from an uncompressed .AVI with Movconv 2.0e with the leap sector option on. I interleave audio to the .STR using the leap sector option on (errors occur when it is turned off. I get video that plays but the sound is speeded up. Can I create a .STR with leap sector on and interleave sound in 1.98e?

Does Movconv. downsample my sound file from 22050 khz to 18900 khz when interleaving? Do the sound files have to be 16 bit before conversion to .XA files?

I am having a very difficult time getting these files to convert and be playable. This has been done once before at SSI when we did Panzer General without as much trouble as I am having now. If anyone can help me, I need it. If I don't get these files converted, this product will not meet Sony's quarter and will not ship till January. HELP!!!!

Lee Crawford (408) 737-6800 Ext. 107 lcrawford@mindscape.com

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8/8/96 11:53 AM

Re(4): Leap Sectors

Buzz Burrowes

Graphic Art/Movie Tools

John Ross writes: I experience something similar, I click on the leap sector option when I create a .STR file but when I go to interleave sound with the .STR I get continuous errors. If I engage the leap sector function again the file interleaves with no errors.

I have been having this problem, and have sent some example data to tech support so they can at least tell us what the warning message is supposed to be telling us!

Does Movconv. downsample my sound file from 22050 khz to 18900 khz when interleaving? Do the sound files have to be 16 bit before conversion to .XA files?

Last question first... yes... 16bit files required.

As for the first question, someone in tech support would have to give you a definitive answer (I don't have time to test it now myself), but I will tell you this... I know that MovConv, unlike Raw2XA on the MAC, will take a 16bit 44.1k sound file and do the sample rate conversion while XA compressing.

So, if your "speeded up" sound is nearly twice as fast as it should be it may be that MovConv is treating your 22k sample as if it were a 44.1k sample and then doing the conversion (a 22k sample played at 44.1k would be twice as fast and an octave up in pitch.) While your waiting for an answer from Sony try taking your audio track and converting it to 44.1k, 16bit with a 3rd party tool... then convert it with MovConv.

---

8/8/96 6:22 PM

Re(5): Leap Sectors  
Michael Koziniak  
Graphic Art/Movie Tools  
\*PC Sound utilities

Buzz Burrowes writes: John Ross writes: I experinnece something similar, I click on the leap sector option when I create a .STR file but when I go to interleave sound with the .STR I get continuous errors. If I engage the leap sector funtion again the file interleaves with no errors. Correction from a previous message:

You do need to check leap sector also when you interleave sound with a .STR file. When you check leap sector the first time MOVCONV will adjust the compression ratio of your frames accordingly. When you go to interleave sound with the .STR you need to check the box again to let movie converter know if you used the leap sector compression ratio or not.  
-Michael

---

8/9/96 8:29 AM  
Animetix 3DS Max Plugin  
Erick S. Dyke  
Graphic Art/Movie Tools

Any idea on when this thing is going to be approved?  
I saw it demoed and the developers conference way back when, and it is fantastic. They say that it is being held up for SONY approval.  
Any idea when that approval is going to happen? Kind of frustrating to see it at the conference (along with the cheaper development options.) and have to wait.

---

8/15/96 4:53 PM  
Feature request for Movie Converter  
Henrik Markarian  
Graphic Art/Movie Tools

A nice feature for MOVCONV would be to warn the user if the selected AVI file is not full frames uncompressed. We don't store the AVI's in that format (they take up too much room), and every once in a while, we'll use the compressed version by mistake. It would be great if MOVCONV warns the user instead of happily converting the AVI into a stream that is useless.  
Henrik Mindscape, Northridge  
P.S. I tried to post this message in the feature request folder, but FirstClass would not accept "Feature Request" as a recipient.

---

8/23/96 6:27 PM  
3D Studio Developers  
Dane Emerson  
Graphic Art/Movie Tools

Does Anyone use 3D Studio or MAX for Development? If so what tools to you use to export (or convert) to a TMD (or other PSX file)? How well does it work and what kind of problems do you encounter? Where can I look for these tools? Do I have to write my own? --MAC.

---

8/25/96 7:46 PM

Re: 3D Studio Developers  
Dave Scheele  
Graphic Art/Movie Tools

We used 3DS v4 to develop the models and animations for Iron & Blood. We were able to use the Sony TOD plug-in to convert the models to RSD format, and then RSDLINK to get them in to TMDs. I've heard many other people saying they've run into serious problems with it, but I never seemed to run into anything major. We did not use the TOD plug-in for anything else. I wrote a 3DS Keyscript to pull the animation data, since Sony's TOD format was quite different from how I wanted the data layed out, and it's quite easy to pull frame data via Keyscripts. Just remember that you cannot tile textures in 3DS, everything must be face-mapped (or custom-mapped, however your artists call it ;). Also, it may help if you "Reset Xform" all your objects in your model before you start animating ...

Dave

---

9/25/96 11:55 AM  
movconv to .bs  
Bob Polaro  
Graphic Art/Movie Tools

when using movconv to convert an avi to a .bs file it saves it as one big .bs file. how do you break it down into the smaller .bs files for each frame?

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9/25/96 7:56 PM  
Re: movconv to .bs  
Mike Fulton  
Graphic Art/Movie Tools

Bob Palaro wrote:

When using movconv to convert an avi to a .bs file it saves it as one big .bs file. how do you break it down into the smaller .bs files for each frame?

When you are converting from an AVI file, you cannot create a sequence of still images with Movie Converter. You can convert from a sequence, but not TO a sequence.

Do you actually want a sequence of BS files, or an STR file? Do you realize that the individual frames of an STR file are the same thing as the individual BS files would be?

One way to create a BS sequence would be to write out an STR file, and then write a simple PC-based tool that would parse the STR file and write out each frame's worth of data, minus the frame header, to a BS file.

Mike

---

10/2/96 10:05 AM  
Re(2): 3D Studio Plug-In  
Mark Harmon  
Graphic Art/Movie Tools

We checked the Graphic Artist CD 1.6 and it contains version 4.0f of the 3D Studio Plug-in and not version 4.0d. Could you please check again and let us know.

Thanks, John

OH! I guess I wasn't looking hard enough. Is this the only place it's available?

---

10/2/96 10:02 AM

Re(2): 3D Studio Developers

Mark Harmon

Graphic Art/Movie Tools

You said that there is a plug-in, where is it available? More importantly, is it a free?

---

10/9/96 2:02 PM

DLL for accessing artist board?

Jay Stelly

Graphic Art/Movie Tools

Is the DLL for accessing the artist board available on the BBS? It was mentioned at the developer's conference, but I haven't been able to locate it on the BBS or the CD.

Jay Stelly Tetragon

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10/18/96 5:11 PM

Re: DLL for accessing artist board?

Mike Fulton

Graphic Art/Movie Tools

Is the DLL for accessing the artist board available on the BBS? It was mentioned at the developer's conference, but I haven't been able to locate it on the BBS or the CD.

Jay Stelly @ Tetragon

Check back the middle of next week. I just sent off an archive with everything to our release manager and BBS guy, so it should be posted within a few days.

Mike

---

10/18/96 2:52 PM

3ds2rsd

Bob Polaro

Graphic Art/Movie Tools

how can i get a copy of 3sd2rsd.exe?

---

10/22/96 4:03 PM

Suggestions for movconv

John Hamilton

Graphic Art/Movie Tools

I recently encountered a number of problems using movconv while creating a movie with sound. My suggestions for improving movconv 2.0 are:

- since movconv cannot use 8 bit waves, then an error message should appear when trying use

one. If this is a bug in movconv, then please fix the bug. If you use 8 bit waves, the sound doesn't play correctly. Only 16 bit sounds work.  
- In the US version, all error messages should be printed in English. Kanji comes out as garbage when running under the US version of windows. I encountered various jumbled error messages. In fact, too many to list them all. Besides, I suspect that there are many more that I didn't encounter that probably need to be translated.  
John Hamilton Namco Hometek Inc. 408-321-0551

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10/25/96 2:18 PM  
Re: 3ds2rsd  
Michael Koziniak  
Graphic Art/Movie Tools

This is no longer a supported tool.  
-Michael

---



## LIBGS

3/21/95 6:52 PM

Re(4): Macro GTE calls in LIBGS and fastest objects

Administrator

LIBGS

Don't have an example of NOM yet. Will work on it.

Angus

---

3/21/95 6:02 PM

Re(3): Macro GTE calls in LIBGS and fastest objects

Administrator

LIBGS

The only slowdown you will get with GS library is the generalized nature of it. It has to check for things that may not be applicable. You'll get hit there anytime.

Angus

---

3/21/95 2:10 PM

Re(2): Macro GTE calls in LIBGS and fastest objects

Robin H. Seaver

Bill "Angus" Guschwan

Dave Ross

Written in assembly is one thing - but do they implement the NOM functionality wherever possible, e.g. do they use the co-processor operand passing mechanism for GTE functions?

---

3/21/95 8:18 PM

please explain usage of GsSetView2

Blake E. Senftner

LIBGS

Angus:

We are having problems trying to use the GsSetView2() routine.

We are not using the GsSetRView2() because the roll component (rz) appears undefined in some cases we would be using. (If the roll is relative to the Y axis.)

How is the camera matrix from GsSetView2() applied? Is it treated as an inverse?

We begin our data with the matrices in a typical right handed coordinate system: (positive y is up, positive x is right, negative z is into the screen)

It seems the PSX camera system is a right handed coordinate system rotated 180 around X...

Our thinking was that we would take our camera matrix: 1) rotate 180 degrees in X We tried that, and it did not work.

We tried 1) rotate 180 about X 2) inverting the matrix did not work

We tried 1) a simple y scale did not work.

Also tried 1) invert of camera did not work.

So, how is the camera matrix being used by GsSetView2()?

-Blake

---

3/21/95 4:04 PM

Re(3): more on fog

William Botti

Scott Berfield

LIBGS

The PlayStation is an awesome game system with tons of features and library support. If you've ever actually programmed on the SNES, Genesis, etc. you would count your blessings to work on PSX. Make a game. Will Botti @black\_ops.com

---

3/21/95 6:21 PM

Re(3): Macro GTE calls in LIBGS and fastest objects

Dave Ross

Bill "Angus" Guschwan

LIBGS

We're starting the process of implementing a PMD file through GPU/GTE library calls. Initial indications are not favorable. We haven't tried the NOM macros yet, do you have a working code sample of one of these calls?

---

3/21/95 6:25 PM

Re(4): Macro GTE calls in LIBGS and fastest objects

Dave Ross

Administrator

LIBGS

But the GSLIB routines can call the absolute lowest level functions directly in a tight loop, where we must call GPU/GTE user level functions FOR EVERY SINGLE POLYGON. I'd say that's quite a hit also.

---

3/22/95 2:05 PM

Re(3): GsSortFlipSprite

Administrator

LIBGS

Try lib3.0.

Angus

---

3/22/95 1:33 PM

Re(2): GsSortFlipSprite

Todd Blackburn

Bill "Angus" Guschwan

LIBGS

Thanks. I tried bit 23 and it works for horizontal flipping, at least most of the time. I am still having a problem with the following sprite: Sprite.x = 244 Sprite.y = 196 Sprite.tpage = 5 Sprite.u = 0 Sprite.v = 232 Sprite.w = 168 Sprite.h = 7

The color mode is 4-bit/pixel.

If I display the above sprite without Sprite.attribute bit 23 set, and call GsSortFastSprite, the sprite displays o.k.; when I set bit 23 and call GsSortFlipSprite, I get garbage on the screen at the correct coordinates. What am I doing wrong?

Also, what do you need to do to use GsSortFlipSprite to flip vertically?

Thanks,  
Todd

---

3/22/95 11:01 AM

Re: please explain usage of GsSetView2

Bill "Angus" Guschwan

Blake E. Senftner

LIBGS

I don't know. However I know the GS guys don't encourage use of GsSetView2. But I'll set it their way.

ANgus

---

3/22/95 1:46 PM

Re(2): please explain usage of GsSetView2

Blake E. Senftner

Bill "Angus" Guschwan

LIBGS

Angus:

Well, we have a version that appears to work, using the following algo:

beginning with a camera matrix from our software that is defined for a: right handed system using row vectors for verticies (post concat) with aspect ration=1.33, aperture=1.0

We do: pre-scale our camera matrix by (1.0, -1.0, -1.0) // 180 degree

rotation about X pre-scale our camera matrix by (1.0, ( x\_res/yres)/(640/480), 1.0) // aspect ratio correction invert the camera matrix // psx

stores an inverted camera for use transpose the rotation components // we post-concat, while psx pre-concats

So, if we have an untransformed camera in our system, this correction gives us a PSX with positive x right, positive y up and positive z into the screen.

But from your reply, I am curious as why they do not advocate using GsSetView2(). Can you tell me why they don't encourage its use?

-Blake

---

3/22/95 2:06 PM

Re(3): please explain usage of GsSetView2

Administrator

LIBGS

It seems use SetView2 is a little more abstract than a RefView. Try lib3.0 and let me know how it goes.

ANgus

---

3/23/95 11:44 AM

Re(3): please explain usage of GsSetView2

Bill "Angus" Guschwan

Blake E. Senftner

LIBGS

Hey Blake,

Glad you got it to work. Here is the response from the GS Japanese engineer.

Angus

> How is the camera matrix from GsSetView2() applied? Is it treated as an inverse?  
GsSetView2 simply set GsWSMATRIX when the "super" which is the member of GsVIEW2 structure is set "WORLD", that means the camera coordinate is set to the world coordinate. So it isn't treated as an inverse. GsWSMATRIX is used for getting Local-Screen Matrix by muling GsWSMATRIX and Local-World Matrix.  
> We begin our data with the matracies in a typical right handed coordinate > system: > (positive y is up, positive x is right, negative z is into the screen) > > It seems the PSX camera system is a right handed coordinate system rotated 180 > around X...  
It is not corrent.positive y is up,pssitive x is right,positive z is into the screen,and the PSX camera system is a left handed coordinate system rotated 180 around X....  
So positive y is down,positive z is far from screen,positive x is right.  
I advise you for understainding GsSetView2() following way.  
1 GsSetView2() set directly GsWSMATRIX,so watch the GsWSMATRIX by "extern MATRIX GsWSMATRIX" definition on your sample program.  
2 GsSetRefView2() is easier for understanding,so watch GsWSMATRIX after calling GsSetRefView2() in various parameters.

---

3/23/95 10:37 AM  
Re(5): GsSortFlipSprite  
BillË"Angus" Guschwan  
Todd Blackburn  
Administrator  
Send me your example. I'll take a look.  
Angus

---

3/23/95 8:28 AM  
Re(4): GsSortFlipSprite  
Todd Blackburn  
Administrator  
LIBGS  
I just tried lib3.0 and it still trashes my sprite. Also, please tell me what attribute bit(s) I need to set for vertical flipping with GsSortFlipSprite.  
Thanks,  
Todd

---

3/27/95 4:49 PM  
Re(6): GsSortFlipSprite  
Todd Blackburn  
BillË"Angus" Guschwan  
Administrator  
I think that I have found the problem. It seems that if Sprite.u == 0, then GsSortFlipSprite does not work. I moved the same sprite to u = 2, and it worked fine. Could you verify this, and if this is the bug, let me know if and when it will be fixed. This is still a problem with lib 3.0.  
Thanks,  
Todd

---

3/27/95 10:09 PM  
GsDOBJ vs. GsDOBJ2  
Administrator

## LIBGS

Subject: About Use of LibGS

Questions: When I asked a question on April 21, I did not know I can use a question form like this. Very sorry for your trouble. Now, I will ask you a question using the specified form. LibGS contains two types of similar functions and structures like GsDOBJ and GsDOBJ2. How should I use them? (Apart from the question, I found the following misprinting in a text explaining GsDOB: MATRIX lsmatrix --> MATRIX lwmatrix MATRIX lighthm --> MATRIX lightm

Answers Thank you for correcting misprinting. There are two major differences between GsDOBJ and GsDOBJ2: difference in parameter interface, and whether or not a matrix can be seen by the programmer. In GsDOBJ, the parameters "rotation", "scale", and "translation", which are called RST type parameters are given to an object. These parameters are converted into matrix by LIBGS for calculation. The advantage of this method is that "it can be known by intuition, and is more easier than to give matrices". There is drawback that the method is inflexible because the process of conversion into matrices is not unique. In LIBGS, the order of rotation is only YXZ, but there exist some other combinations such as xyz and zxy. GSDOBJ2 is intended for a programmer who wants to manipulate matrices directly. GSDOBJ2 runs high speed because matrices are directly entered, and it has no ambiguity mentioned above. However, matrices are used for interface. So, it has the drawback that it is difficult to know it by intuition. The sample SPACESHUTTLE uses GsDOBJ2. You can use if for reference.

Keywords: LibGS, GsDOBJ, GsDOBJ

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3/27/95 7:11 PM

Re(7): GsSortFlipSprite  
Bill "Angus" Guschwan  
Todd Blackburn  
Administrator  
Yep, I think you just can't do this on 0. I'll check with Japan.  
Angus

---

3/28/95 2:42 PM

Re(7): GsSortFlipSprite  
Administrator  
Todd Blackburn  
Bill "Angus" Guschwan

Short answer: The reason of this is that the POLY\_FT4 is designed to draw a polygon mesh. The polygon mesh uses a common vertex for the neighbor polygons. And GPU escapes the double drawing to the common edge of the polygons.

Long answer:

>I think that I have found the problem. It seems that if Sprite.u == 0, then >GsSortFlipSprite does not work. I moved the same sprite to u = 2, and it >worked fine. Could you verify this, and if this is the bug, let me know if and >when it will be fixed. This is still a problem with lib 3.0.

It is a problem with POLY\_FT4. GPU has several limitation about POLY\_FT4.

GsSortFlipSprites() uses a POLY\_FT4 when drawing flipped sprite.

Sprite.u = 0 will cause error with horizontal flip. And Sprite.v = 0 will cause error with vertical flip.

It must be same in the case of GsSortSprite().

"The problem with the POLY\_FT4"-----

When the drawing of POLY\_FT4, you must specify the position of the right side and lower vertex into the next pixel you want to draw.

For example, to draw a rectangle from (10,10) to (20,20) by POLY\_FT4, you must specify the position for each vertex as (10,10), (10,21), (21,10), (21,21).

If sprite pattern includes the right edge of texture page (u = 0xff), you must set the u value into 0x100. But u field is 8bit, so you can't use right edge of the texture page.

But, when you draw a flipped polygon, the same problem appears at the left edge of the texture page. So, if u = 0 it will not work well.

The reason of this is that the POLY\_FT4 is designed to draw a polygon mesh. The polygon mesh uses a common vertex for the neighbor polygons. And GPU escapes the double drawing to the common edge of the polygons.

For More Detail----- See half pixel problem in libgpu

---

3/29/95 2:12 PM

GsObj Scaling

Christopher Deel

LIBGS

We are using a GsOBJ5 as a playfield. When we move the object around, the lines in the distance appear broken in different places as the camera moves. Also, the lines in the distance appear thicker than they should in relation to the rest of the field.

It looks as though the the PSX is picking a center pixel instead of averaging pixels.

Is there any way to make this look better Preferably make the pixels that are used less often disappear in the distance.

---

4/6/95 3:00 PM

Math limitations on LIBGS?

Mark Beardsley

Bill "Angus" Guschwan

What are the restrictions on the smallest physical dimensions of a polygon? We are having trouble taking a helicopter model from 3ds. It seems that the heli blades (long,narrow,thin) are beyond some basic limits for the library. They appear to cause major problems with anything drawn after them. Is there a list of restrictions on how 3d models need to be created for them to be drawn correctly (min/max of poly size, shape, orientation etc.)? I suspect that we're violating some rule that we don't know about. Thanks.

---

4/6/95 3:50 PM

Re: Math limitations on LIBGS?

Blake E. Senftner

Mark Beardsley

Bill "Angus" Guschwan

Large polygons cause problems with the Painter's Algorithm used for placing primitives into the ordering table. The basic "problem" is the fact that when a long (large) polygon is placed into the ordering table, it is only placed with an average of the primitive's final Z location, or worse taking only one of the verts final Z location. If the polygon has a large Z range, then placing it into the ordering table with only one Z location causes problems.

Break up your helicopter blades into multiple polygons, and your problems with go away. (But now you'll start to have a problem with the number of polygons you'll be generating.) By

breaking your helicopter blades into multiple polygons, you'll be placing multiple Z references for that object in the ordering table.

-Blake

---

4/21/95 7:05 PM

Re: GsPresetPacket Question

Administrator

Mark Beardsley

LIBGS

Look in the TMDView folder in the samples that came with the ISA boards. It has examples of GsDOBJ3 and 5.

In short, here are the differences: GsDOBJ is obsolete (it used a matrix viewpoint which is hard to understand unless you are strange). GsDOBJ2 is a reference view system that is easier to understand. GsDOBJ4 is GsDOBJ2 but has support for polygon subdivision. GsDOBJ3 supports PMD. GsDOBJ5 is GsDOBJ4 but it supports a preset area that GsDOBJ4 does not. As far as performance, GsDOBJ3>GsDOBJ5>GsDOBJ4>GsDOBJ2. As far as features, GsDOBJ4>GsDOBJ5>GsDOBJ3.

Basically, GsDOBJ3 uses PMD files instead of TMD files. PMD files are preshaded files whose lighting can not be adjusted but the files are the faster type.

When you call GsLinkObject, you pass a pointer to a PMD file, not a TMD file. The only other difference is they are named GsLinkObject3 and GsSortObject3 and the data structure is GsDOBJ3.

GsDOBJ5 is the same code as GsDOBJ2 but uses GsSortObject5, GsLinkObject5, and GsPresetObject.

GsSortObject5 has 1 extra parameter that can be set to null, but is used to store division calculations if you want to perform polygon subdivision. Polygon subdivision solves texture mapping distortions. Use GsDOBJ5.attribute | GsDIV3 for example to turn subdivision on for 2<<3 or 8 polygons (GsDIV1-5 are valid). GsSortObject5(&(marble.handler[objectCount]), (GsOT \*) &(marble.orderTable[curBuf]), ZRES, /\* 14 - OT\_NUM\_BITS \*/ NULL); /\* For polygon subdivision \*/

GsLinkObject5 is the same as GsLinkObject2 (different name though).

GsPresetObject replaces the see to call GsSetWorkBase(). GsPresetObject replaces the work area with it's own preset area. I explain preset area below.

The size of the preset packet area is defined as follows: For each GsDOBJ5: ((# different packets) \* 8) + Header bytes for each packet type (# packets \* 8) + 4 byte header per packet buffer

For each packet: (2 \* sizeof(GPU\_PACKET@)) Room for double buffer GPU Packet size is not constant for each packet. The differing sizes are defined in the libgpu.h.

You can use tmdsort.exe, rename it tmdinfo.exe and it will give you packet information about a model.

```
gPpp = (u_long *) GsPresetObject( &(theMarble->handler[objectCount]),gPpp );
```

Finally, here is some general information about the file formats: TMD, Sorted TMD & PMD

TMD defines the 3D models. Create TMD with rsdlink.exe. Create RSD file with

dxl2rsd.exe. Sorted TMD is a faster format than unsorted TMD, because it organizes

data in a more efficient manner. Use tmdsort.exe. PMD is a preset TMD file. Preset

"double buffers" your GPU primitive

information for best performance.

3D: FILE FORMATS - PRESORTING Presorting sorts the packets in the TMD file placing the same packet types next to each other If the same packets are loaded consecutively, the overhead of swapping in the parsing routine is not incurred

3D: FILE FORMATS - PRESETTING Presetting allows double buffering of the packet. With

the information double buffered, libgs can read from 1 buffer while it is writing from the

other buffer, which allows for better performance.

---

4/21/95 11:56 AM  
GsPresetPacket Question  
Mark Beardsley  
LIBGS

How big a packet area is needed based on a particular TMD file? Is there some way to tell without trial and error?

---

5/15/95 10:19 AM  
better linking?  
Crystal Dynamics  
Development Env.

hi folks. I'm not sure how valid a question this is, but is it possible for psylink to be a bit more selective about what it loads in? my program right now is very large (including the data), but I notice in the map file psylink spits out that a lot of stuff I don't use at all (eg. most stuff that gets linked in from libgte) is still linked in. since I'm only using the 2d stuff in libgs I really wish it wouldn't link in code to do matrix transformations and what not. I also noticed that a lot of 2d and 3d stuff is mixed in together in the modules in libgs.lib, and so I can't figure out what I might be able to delete out of the libraries. if there's nothing that can be done about linking unused code into the program, would it be possible to provide a smaller "2d version" of libgs.lib? one that doesn't reference the gte library?  
right now we're struggling to squeeze 1.4 megs of animation into the game at once, and every bit of memory we get back counts!  
- Chuck Woo - Illusions Gaming Co. for Crystal Dynamics

---

5/16/95 11:12 AM  
Fwd: GsDrawOT  
Administrator  
LIBGS

GsDrawOT calls DrawOTag. If you set a debugging level with SetGraphDebug(), then DrawOTag will be done by IO. It will block. In this case, it will sit in a loop and call DrawPrim. Else, it will use DMA.  
Angus  
To: Bill Guschwan cc:  
Is GsDrawOT a blocked function??? My profiler tells me that it is...

---

5/16/95 2:23 PM  
GsSortFixBg32/16  
Matt S. Arrington  
LIBGS

I've been unable to find any documentation on the GsSortFixBg16/32 functions. Can you please explain the purpose behind these two functions or tell me where these functions are



documented? I mainly need to know the size requirements of the work buffer, and what advantages/disadvantages it has compared to GsSortBg.

Thanks...

---

5/17/95 1:41 PM

Re: Packet area for GsSetWorkBase

Bill "Angus" Guschwan

Mark Beardsley

LIBGS

GsPresetObject replaces the see to call GsSetWorkBase(). GsPresetObject replaces the work area with it's own preset area. I explain preset area below.

The size of the preset packet area is defined as follows: For each GsDOBJ5: ((# different packets) \* 8) + Header bytes for each packet type (# packets \* 8) + 4 byte header per packet buffer

For each packet: (2 \* sizeof(GPU\_PACKET@)) Room for double buffer GPU Packet size is not constant for each packet. The differing sizes are defined in the libgpu.h.

You can use tmdsort.exe, rename it tmdinfo.exe and it will give you packet information about a model.

gPpp = (u\_long \*) GsPresetObject( &(theMarble->handler[objectCount]),gPpp );

---

5/17/95 10:11 AM

GsSortObject5 Transparency

Bill "Angus" Guschwan

LIBGS

I'm sorry for late to answer the questions. At first GsSortObject5() doesn't support attribute of transparent in this current version(ver 3.0) . If you want change transparency dynamically, you should change the code of preset packets. Don't touch the GPU packet type of the header field, change the type of each preset packets.

the preset packet format is following.

```

_____ |----| header 0 | header0: 32bit upper 8bit | | header 1 | type of
following packet | |-----| | | preset | lower 24bit | | packets | pointer to next
packets | | | header1: the number of following | | | packets | | |
|_____ | |---->| header 0 | preset packets: | | header 1 | same type of packets
make | |-----| the group | | preset | each preset packet has | | packets | two
set because of the | | | double buffer | | | | | | | | _____ | : : : : :
_____ :---->| terminator | terminator: lower 24 bit is 0x000000
|_____ |
```

packet is the structure of GPU packet described in libgpu.h ie. POLY\_FT4 POLY\_G3 ...

The next question of GsGetLs bug is missing for me. Please send me the detail value of wrong case.

I want GsCoordinate2 of the object and the parent of object until WORLD. I want GsWSMATRIX which is found by extern declaration.

---

5/17/95 12:45 PM

Packet area for GsSetWorkBase

Mark Beardsley

Bill "Angus" Guschwan

How does one determine the amount of packet space needed for various 2d objects for Libgs? I had thought that something like this would be okay: `PACKET [2][MAX_SPRITES*sizeof(GsSPRITE)];` but it seems that a few more bytes per sprite (or other object type) are used. For example, 1 GsBOXF seems to need 19 bytes, though a GsBOXF is only 16 bytes long. However it does not seem to be 190 bytes for 10 GsBOXF's. I'm guessing that there must be some general overhead and some additional overhead per object. The sample programs all seem to define just a huge area, regardless of how much they actually need. Is this packet stuff even addressed in the docs anywhere? It's taken me quite a while just to understand the concept behind this all (yes, I'm pretty dumb, but so are a lot of us).

---

5/19/95 9:52 AM

What ever happened to fog?

Ian McGee

LIBGS

Back in March, Scott Berfield reported that the library fog routines did not work correctly on textured polygons. A moderately short thread ensued, but no resolution was mentioned that I can recall.

A search of the March archives shows only a short, irrelevant response from William Botti, but the original messages are missing.

I remember at some point an explanation that it was not a bug, but a design "feature".

A design "feature" that would be desirable is a fog routine that worked on textured polygons equally well as on flat or shaded polygons. May we have such a feature in a future version of the libraries?

---

5/19/95 1:40 PM

Re: GsBG performance

Crystal Dynamics

Mark Beardsley

Bill "Angus" Guschwan

my experience with GsBG (I'm using it a lot for our 2d game) is that (1) cells that match with the texture cache (in my case, 32-wide 8-bit clut) provide the best possible performance, and (2) using GsSortBg() and not GsSortFastBg() is a grave mistake. unfortunately, I currently need to do scaling on a bg for an intro and GsSortBg(), the only way to do it with GsBG, is bogging like crazy... when my 8x8 "text screen" is up I have to drop to 30fps.

- Chuck Woo - Illusions Gaming Co.

---

5/19/95 2:50 PM

Re(2): GsBG performance

Mark Beardsley

Crystal Dynamics

Bill "Angus" Guschwan

Thanks for the insight. At least I know that you've seen the same level of performance and that it's not something stupid that I'm doing. I tried using GsSortFastBg() and it did help (I was able to get about twice as much displayed), but I was still only able to cover about half the screen before dropping to 30fps. I had thought that the purpose of the GsBG stuff was to provide a multi-plane "SNES" type scrolling background, but it seems that this would not be possible (unless you wanted to run at 10fps!). I'm glad I'm not trying to write a Sonic the Hedgehog Game!

Angus : Is this really the level of performance to be expected from LIBGS stuff? Are most developers using stuff at a lower level to get more speed?

---

5/19/95 3:13 PM

Re(3): GsBG performance

Bill "Angus" Guschwan

Mark Beardsley

Crystal Dynamics

At Christmas, I talked to the GS 2D lib guy, and he was working on a faster full screen BG mode. I don't know what became of it but I will follow up on it. Perhaps there is hope yet.

Angus

---

5/19/95 7:33 AM

GsBG performance

Mark Beardsley

Bill "Angus" Guschwan

I've been messing with doing a GsBG for a text screen. I'm using cells of 8x8's for the characters. This would enable me to have a sort of windowed text system. It's working well, however, the performance I'm seeing is lousy. It seems unable to put up a full-screen window of text (even in 320x240 mode) at 1/60th of a second (even if the data is set-up ahead of time and it is the only thing being drawn!). I've noticed that the demos seem to use a much larger cell size (and are therefore putting up less cells). Is it unreasonable to have a BG using 8x8's, or is there some special trick to get better performance from it?

Thanks.

---

5/19/95 12:39 PM

Re: What ever happened to fog?

Dave R. Scheele

Ian McGee

LIBGS

Ian, here's a message I grabbed from the discussion you mentioned (I think), with a resolution:

----- cut here -----

Wednesday, March 15, 1995 10:02:09 AM LIBGS Item From: David A. Gregory Subject: Re(3): more on fog To: Scott Berfield Cc: Blake E. Senftner LIBGPU LIBGS LIBGTE I'm fogging texture mapped polygons manually. It's really very simple and fast. I just use the OTZ value as a distance value to calculate the light change:

```
fogColor = gGlobalAmbientLight-((gGlobalAmbientList*otz)/FOG_MAX_DIST); if (fogColor < 0) break; if (fogColor > 127) fogColor = 127;
```

```
primPtr->r0 = primPtr->g0 = primPtr->b0 = fogColor;
```

```
AddPrim(.....);
```

My application suffered no noticable speed hit when I implemented this on about 800 polygons.

-Brian

----- cut here -----

I hope this helps, and all credit for this goes to the original author, not me!

Dave

---

5/19/95 12:47 PM

Re(2): What ever happened to fog?

Ian McGee  
Dave R. Scheele  
LIBGS

Thanks for the snippet. I remember it now.  
Angus, any idea what happened to the original message thread in the BBS database?

---

5/22/95 2:12 PM  
Re(4): GsBG performance  
Dave Ross  
Bill "Angus" Guschwan  
Mark Beardsley

On this subject, we're trying to find ANY documentation on a set of BG tile routines and have come up empty. They are listed in LIBGS in both the 2.6 and 3.0 versions. They are GsInitFixBG16, GsInitFixBG32, GsSortFixBG16, GsSortFixBG16. We are also looking for anything faster GSBG and GSFastBG. Could these be the other attempts at faster versions you mentioned in Re(3)?

---

5/25/95 12:23 PM  
Proper LibGS initialization  
Mark Beardsley  
Bill "Angus" Guschwan

Could you please inform as to the proper steps to initialize the display for LIBGS calls? It seems that if I call GsDrawOt(), it is taking an entire frame to return (even if the ot has been cleared and is still empty). I suspect that I somehow have the screen in debug mode or something. I probably have the wrong sequence of GsInit3D, SetGraphDebug, etc. I have a program that is just switching between the initial color bars and a blank screen, and if I try to draw any OT, the frame rate drops to 30fps. Thanks.

---

5/26/95 10:46 AM  
Re: GsSortFixBg32/16  
John Phua  
LIBGS

Hi Matt,

We are trying to find out the answers to your specific questions of - size requirements of the work buffer - advantages/disadvantages it has compared to GsSortBG  
There is a sample program in /sample/graphics/bgfix32 which uses the function GsSortFixBg32 to display the contents of BG data.  
John

---

5/30/95 10:54 AM  
Clipping stuff: Part I, 2D  
Thomas Boyd  
Alex J. Garden  
Bill "Angus" Guschwan  
Clipping stuff:

Part I: 2D----- 2D clipping simply takes vertices that are out of bounds (-1024 to 1023 for x and y) and clips the out of bounds values to the edge, making a "sqashed" poly. example: BEFORE:

poly vertices x y 1 345 1342 2 1000 1000 3 670 800 AFTER: poly vertices x y 1 345 1023 2 1000 1000 3 670 800 This is not a problem if the poly is not on the screen (small), but big polys will show up distorted. To avoid this, you must clip in 3D. Additionally, the GPU goes from left to right when it is clipping 2D polys to the screen. If you have a poly that shows partially on the left hand side of the screen, the GPU will waste time working from the left till it gets to the part in the window. However, if you have a poly that is partially showing on the right, the GPU stops when it gets to the edge of the window. The GPU also goes from top to bottom, making partially visible polys on top take more time than polys on the bottom in a similar manner. It is therefore faster to subdivide large polys to avoid computation waste on top and left partially visible polys. Close polys get huge in 2D. if a poly gets too big, it is clipped, even if part of it is visible. A loose interpretation of the clipping algorithm is as follows: if  $(W \geq 1024 \mid \mid H \geq 1024 \mid \mid y \geq 1024 \mid \mid x \leq -1024 \mid \mid y \leq -1024 \mid \mid (x+w) \geq 1024 \mid \mid (y+h) \geq 1024)$  then the poly is clipped. It is therefore important to clip these large polys if you want to see them.

---

5/30/95 3:33 PM  
General Library Questions  
Montgomery Singman  
LIBGS

1) ClearOTag() is much slower than ClearOTagR(). Even though they should do the same thing, the two routines are written differently. Why is this and why is there no mention about this speed fact in the manual?

2) Since GS is supposed to be the "high-level" library, I would assume that the routines in the GS library would make calls to the routines in the GTE/GPU libraries. This does not seem to be the case. For example, GsSortObject4() calls a routine GsTMDFastG3L(). This routine is not documented anywhere. Why do we not have access to these routines? Are they better than the routines in the GTE/GPU libraries?

thanks

---

5/31/95 10:32 AM  
Re: Clipping stuff: Part I, 2D  
Thomas Boyd  
Alex J. Garden

Sorry, my last clipping post had an error. The logic for fully clipping a poly is actually:

```
if (w > 1023 || h >= 511 || abs(x) > 1023 || abs(y) > 1023 || abs(x)+w > 1023 || abs(y)+h > 1023) {  
    polygon is fully clipped;  
}
```

---

6/2/95 8:24 AM  
Drawing Simple Polygons  
Mark Beardsley  
LIBGS

This may be an ignorant question, but...

Can LIBGPU stuff (such as POLYFT4) be drawn simultaneously with LIBGS stuff (such as GsSPRITE)? It would appear not. If so, how does one initialize the graphic libraries? And if not...

Is there some way to draw the equivalent of a POLYFT4 within LIBGS (in a 2D sense)? I want to be able to draw a non-rectangular area and specify all four x,y points and all four u,v points. I don't want to use LIBGPU since I'm doing everything else with LIBGS. I guess that what I want is some sort of GsPOLY structure/function.  
Is this not possible, or am I missing something (again)?

---

6/5/95 11:46 AM  
Re: GsBG performance  
Bill "Angus" Guschwan  
Mark Beardsley  
LIBGS

> 1) What are the size requirements of the work buffer?

The size of the work buffer is

size(unit is long) = (((ScreenW/CellW+1)\*(ScreenH/CellH+1+1)\*6+4)\*2+2)

ScreenH : The number of the vertical pixels on the screen (240/480) ScreenW : The number of the horizontal pixels on the screen (256/320/384/512/640) CellH : Height of the cell(the number of pixels) CellW : Width of the cell(the number of pixels)

> 2) What are the advantages and disadvantages compared to GsSortBG?

As compared with the GsSortFastBG(), this function reduces the load on the CPU. However, it has the following limitation.

-BG rotation/scale-up/scale-down are not permitted. -Cell size is fixed. (GsSortFastBG16 is 16\*16, GsSortFastBG32 is 32\*32) -Color mode of a texture pattern is only 4-bit/8-bit mode. -Any map size is available. -Scrolling is permitted. (by 1 pixel unit) -Only full screen is permitted.

---

6/5/95 12:30 PM  
Re: Drawing Simple Polygons  
Christopher Deel  
Mark Beardsley  
LIBGS

I believe you can use GsSortPoly to draw POLY\_FT4s in the Gs Lib. It has been my experience that this only works if you are drawing 2D onto the screen. The example program GSGPU that I got from Sony shows how to combine GS and GPU calls in the same program for drawing POLY\_FT4s in 3D.

---

6/5/95 2:16 PM  
More GsBG performance  
Bill "Angus" Guschwan  
Bill "Angus" Guschwan  
Mark Beardsley

> >Hi Tanaka-san, > >I remember you mentioned at Christmas that you were working on a full Screen >GsBG. Is it available? Is there any way to get 60 frames per second full screen >for GsBG? US developers here are wondering. Thanks for any insight. > >Angus  
I think it must be GsSortFixBg16() and GsSortFixBg32(). These functions have already been implemented in Version 3.0. And a program named "bgfix32" is sample source of GsSortFixBg32(). But, these functions have some bugs, and we will fix in Version 3.1.  
The following are the functions to draw BG plane.

===== Function  
Speed\* Rotation/Zoom Size - ----- GsSortBg slow  
OK variable GsSortFastBg fast N/A variable GsSortFixBg16 very fast N/A only full screen

GsSortFixBg32 very fast N/A only full screen

===== \*Speed

means the load of CPU. (not GPU drawing)

But the drawing period is same for any function, it depends on the size of the cell, the pixel depth of the texture, and the missing rate of the texture cache.

----- End of Forwarded Message

---

6/6/95 7:16 AM

Re(2): GsBG performance

Mark Beardsley

Bill "Angus" Guschwan

LIBGS

Thanks for the GsBG responses, but...

It appears that the formula for the size of the work buffer is not correct. I'm putting up a 320x240 screen of 8x8 cells (basically a text screen), and it seems that the buffer must be much larger (about 5 times as large). The formula would indicate 15754 longs are required, but unless I allocate 5 times as much (for each of the 2 frame buffers), adjacent memory will get overwritten. Has anyone else had this problem? I really don't want to use more memory than is necessary.

---

6/8/95 10:53 AM

Re(3): GsBG performance

Bill "Angus" Guschwan

Mark Beardsley

LIBGS

The formula is correct. However, this formula can be applied for only the GsSortFixBG16/32 functions. As 8\*8 cell is used, the GsSortBG/GsSortFastBG functions seem to be used. In this case, unfortunately this formula could not be applied.

In the GsSortBG/GsSortFastBG functions, the primitive generation area uses the area designated in the GsSetWorkBase() as in the GsSortObject2/4. The area size changes in some cases. Yet, it is approximately from 1.2 times to twice compared with the GsSortFixBG function.

---

6/8/95 9:27 AM

Hardware vs Software functions

Carl Ferreira

LIBGPU

Some operations and structures are directly supported by the hardware, and others are partially or entirely software oriented. Could you provide information regarding which functions are hardware based (and therefore, I assume, faster), and which use software in whole or in part. For example, Is the TMD structure something which is processed through a hardware call or calls, or is it something which was designed for use by software only functions?

It would help tremendously to know which functions should be used for fastest response and which we might be able to achieve faster results by bypassing.

Thanks,

Carl Ferreira

---

6/16/95 5:00 PM

GsSortPoly / GsSortFastSpriteArray

Matt S. Arrington  
LIBGS

Is there any way to package a group of polygons together, in order to reduce the number of calls to GsSortPoly? GsSortPoly seems to have a high overhead. Is there any samples or docs in existence for GsSortFastSpriteArray??

Thanks, Matt

---

6/19/95 6:42 PM  
VBI synchronization  
Jim T. Tomasko  
LIBGS

note.txt 2K  
LIBGS

Does the DrawSync(0) function work with GsDrawOt ??? If so, I've got some other sync problem. I'm just trying to insure all drawing is done, then swap the display buffer to draw again using the high-level libs. Inclosed is an example of the problem.

---

6/19/95 4:58 PM  
GSFlipSortSprite  
Dave Ross  
LIBGS  
Bill "Angus" Guschwan

Regarding the (new?) GsFlipSortSprite function I stumbled upon in the new lib30 docs, it mentions that it will flip GsSprites (without the overhead of scaling and rotation). However it fails to mention HOW you cause the GsSPRITEs to flip. Anyone know the secret?

---

6/26/95 6:04 PM  
Clipping in 3D using libgs.  
Alex J. Garden  
LIBGS

Hello there...  
I have been experimenting with the "3D clipping" support in libgs, and I have a few questions. First, in the libgs documentation v2.0, the highest GsDOBJ structure mentioned is GsDOBJ2. If I use this object structure, I take a considerable speed hit, and this object can only contain tris. Thus, I have chosen to use the GsDOBJ5 structure. I understand that the PS-X uses a point average system for each polygon (otz) that is used as an index into the ordering table. Assuming there is a fairly large polygon, what happens when this polygon's projection becomes fairly large? It completely clips out. I can understand the rationale behind this system, however, it seems unacceptable. If I break my worlds into small polygons that do not suffer from this problem, there is hardly enough RAM to load them. If I do not break them down, large portions of the world completely disappear. I am willing to accept the fact that I may have to use libgte and libgpu separately of libgs to implement my own clipping, however this hardly seems to fit SONY's ideal model of providing easy to use libraries to assist the developer. Does anyone have any ideas as to how clipping can be implemented using libgs? Please let me know

...Alex (Frustrated, bitter, and confused)Garden@Radical Entertainment.



---

6/26/95 9:54 AM  
3.1 Samples?  
Scott Berfield  
LIBGTE

When will samples be available which demonstrate new features of 3.1 libraries such as "Perfect Perspective Texture Mapping"?  
-sb

---

7/5/95 4:54 PM  
simple answer, complex question  
Blake E. Senftner  
CD  
LIBGS

I have the following situation:

Because CD emulation does something that makes printf() stop working, I've been trying to get the FntPrint() routines to work while I'm loading my emulated data. Without printf()'s and inside timing critical code, I don't want to use the debugger- rather I want to FntPrint() my logical situation to the PSX display screen.

(You may remember that this is the method that the CD tuto programs use for their status display.)

But here's the problem: I'm using the GsLib to handle my draw/display buffer rotations and all examples showing the usage of FntPrint() for screen display do not use the GsLib to handle buffer display rotation.

I have FntPrint() working in my other code, but for some reason I can not get FntPrint() to work on a just initialized display environment. The logic goes like this:

```
/* program has just begun */ ResetCallback(); CdInit(0); PadInit(0); ResetGraph(0);  
SetGraphDebug(0); GsInitGraph(512, 240, 0, 0, 0); GsDefDispBuffer(0, 0, 0, 240); GsInit3D();  
/* ordering table initialization omitted */ FntLoad(960, 256); gFontId[0] = FntOpen(0, 16,  
512, 24, 0, 512); gFontId[1] = FntOpen(0, 240 + 16, 512, 24, 0, 512); setDumpFnt(gFontId[0]);  
VSync(0); GsSwapDispBuff(); FntPrint("this should, but does not display!\n"); FntFlush(-1);  
As can be seen, this logic simply initializes the PSX, like any program running from emulation.  
Can you see any reason why the FntPrinting should not work?
```

What does GsSwapDispBuff() do anyway?

I've gone underneath GsLib everywhere except where it swaps my buffers for me... And at this point in the logic, I have not gone underneath GsLib at all, so no conflicts could be triggered yet...

So, can I get a simple answer to this? I'd love something complete where I won't have to look up functionality that I don't have documentation to... I guess what I'm saying here is that I'm trying to understand why this is not working, and I'd prefer a non-cryptic reply.

Thanks very much. -Blake

---

7/6/95 1:51 PM  
3rd arg to GsInitGraph()  
Blake E. Senftner  
LIBGS

The documentation has conflicts with the description of GsInitGraph(), specifically with the usage of the 3rd argument:

The documentation for the 3rd arg says that it has two possible values, zero for non-interlace, and 1 for interlace display. (libref3.0.pdf)  
BUT, other locations in the documentation refer to this arguement as the control for frame buffer offsetting, with valid values GSOFSGPU (==4) and GSOFSGTE (==0). (OVRVW09A.pdf)  
What is the correct usage of the parameter?  
I'm using lib 3.1, so I care about its 3.1 behavior.  
Thanks! -Blake

---

7/6/95 5:52 PM  
Interlaced mode VBI sync  
Jim T. Tomasko  
LIBGS

Is there a way to run double buffering at 30 frames a second in 640x480? The interlacing is confusing the display, and my draws only take place in one frame buffer (it appears). I'm having no problem syncing to 30 fps in low rez (320x200). Thanks, Jim

---

7/6/95 2:19 PM  
Re(2): simple answer, complex question  
Blake E. Senftner  
CD  
LIBGS  
Tom:

Well, I figured it out, and here's what I did so others can too:  
just after the call to GsSwapDispBuff() I added the following code:  
if (GetDrawEnv( &drawEnv )) { setRECT( &drawEnv.clip, 0, 0, 512, 240 ); drawEnv.dfe = 1;  
PutDrawEnv( &drawEnv ); }  
And, of course, I had to add this declaration to the beginning of the function:  
DRAWENV drawEnv;  
What this does: When the GsLib initalizes, it sets up for a double buffer rotation. For FntPrint output without a rotating double buffered display (such is the situation for program initalization) one needs to retrieve the draw environment that the GsLib set up, and change it to allow for rendering in the currently visible display buffer.  
Because this change only takes place on a copy of the data that GsLib maintains, once you start rotating buffers the changes you made are lost. Just the behavior one wants.  
Chow, -Blake

---

7/6/95 2:17 PM  
Re: simple answer, complex question  
david eader  
Blake E. Senftner  
CD

I noticed there's no DrawSync() call in your code outline. Could that be the problem?  
I know I've had to do some juggling of my initialization code to get FntPrint to work. Just hacked variations until it worked, not being very systematic (too may combos!) But I've definitinely seen the first call to LoadClut() fail due to missing DrawSync(), as well as FntPrint().

---

7/6/95 2:19 PM

Re: 3rd arg to GsInitGraph()

Bill "Angus" Guschwan

Blake E. Senftner

LIBGS

Bit 0 is reserved to determine interlace mode. 0x0001 means interlaced and 0x0000 means non-interlaced. Bit 2 is reserved to determine offset mode. 0x0004 means use GPU offset whereas 0x0000 means use GTE. So the documentation is not wrong; it is just not clear. 0x0000 Non-interlaced, GTE offset 0x0001 Interlaced, GTE offset 0x0004 Non-interlaced, GPU offset 0x0005 Interlaced, GPU offset

Angus

---

7/7/95 1:54 PM

Re: Interlaced mode VBI sync

Scott Berfield

Jim T. Tomasko

LIBGS

As far as I know, there is no way to double buffer 640x480. If you think about it, where would you be putting the second buffer when VRAM is only 1024x512? -sb

---

7/10/95 12:22 PM

3.1 double buffering?

Crystal Dynamics

LIBGS

hi folks. I installed library 3.1 a while ago to check it out, and when I compiled my program (which uses libgs to do double buffering) it would only draw to one buffer and not the other. it would switch fine with GsSwapDispBuf() but when I look at vram I find one buffer drawn and the other one completely blank. my draw routine works like this: (1) have a global "current buffer" variable; (2) build an ordering table; (3) swap display buffers and change "current buffer"; (4) call GsDrawOt(); (5) repeat as necessary. this code works fine under 3.0, which I'm using currently.

any ideas? thanks!

- Chuck Woo - Illusions Gaming Co.

---

7/11/95 7:55 PM

Re(4): Terrain Library ?

Erick S. Dyke

Scott Berfield

LIBGS

Preach On Brother Berfield!

Hallelujah!

---

7/11/95 5:30 PM

InitClip and Clip4F routines...

stephen chaplin

LIBGTE

Hello, I was wondering if anyone has gotten the InitClip and Clip4x routines to work? If so, is it possible if I can get an example? The syntax of the two commands seem rather confounding. Thanks

---

7/11/95 3:08 PM

Re(3): Terrain Library ?

Scott Berfield

Jay Stelly

Mark Beardsley

It probably is designed for exactly what you say. Have you tried it out? When I was down on the purported delivery of the terrain library, the list of items not to be supported came straight from Japan's announcement of what they would release. Basically, if the routines to do it are in the lib and you can figure out the functionality well enough to use them, you will probably be better off building your own system for doing terrain rather than waiting for SCE to provide anything useful. I speak from considerable experience regarding both their ability to deliver and the quality of the code when it finally shows up.

-sb

---

7/11/95 9:37 AM

Re: Terrain Library ?

Scott Berfield

Mark Beardsley

LIBGS

Given the description posted a while back, are you sure you want it? First release won't have: (1) Fog (no surprise since the hardware fog routines suck eggs) (2) Definition and decode of map data (3) 3D terrain which the height value is added (This allows very accurate modelling of Kansas - no height data) (4) Mesh-type data structure

One might ask what it WILL have, and as far as I can tell, it will probably have subdividing polys to make clipping work better. Other than that, it seems pretty useless near term. The RenderWare libraries from Criterion already support all of the above, but they seem to be stuck in negotiation mode with SCE (Japan) over permission to license them to developers. Anyway, I'm betting you won't see anything useful for quite a while from the SONY library, so if you need terrain, you had better get cranking on your own routines. -sb

---

7/11/95 2:35 PM

Re(2): Terrain Library ?

Jay Stelly

Scott Berfield

Mark Beardsley

Check out the routine RotMeshH(), it seems to be designed for a height-field based terrain renderer.

Jay

---

7/11/95 7:11 AM

Terrain Library ?

Mark Beardsley

LIBGS

What is the status of the promised 3D Terrain Library? I think that the initial release was to be ready by now. Since I haven't heard anything, it's probably safe to assume that it has been delayed. Is there a new ETA for it? Thanks.

---

7/14/95 4:28 PM

Re(8): Terrain Library !  
Dan Burnash  
Thomas Boyd  
Ian McGee

As Angus pointed out above, this is a dpmi issue. here are a few more specifics.  
To increase the amount of stack space you can set the dpmistack parameter in the GO32 environment variable. e.g. set GO32=dpmistack 500000 The default size for the stack is 256k

---

7/14/95 1:28 PM

Re(8): Terrain Library !  
Ian McGee  
Thomas Boyd  
Erick S. Dyke  
>> leave windows

That worked. Any idea why it crashes, and what I might change in my windows configuration to avoid it?

---

7/14/95 10:22 AM

Re(6): Terrain Library !  
Ian McGee  
Thomas Boyd  
Erick S. Dyke

I couldn't get RMESH and SMESH to compile, although I haven't dug into it too much. I'm running the most current stuff posted here on the BBS. Here's the errors I get:  
C:\PSX\SAMPLE\GRAPHICS\MESH\RMESH>psymake PsyMake version 1.11 copyright SN Systems Software Ltd 1993 C:\PSX\BIN\ccpsx.EXE -O3 -Xo\$80080000 tuto0.c - otuto0.cpe,tuto0.sym Stack Fault at eip=ce267 eax=0000013c ebx=000056e8 ecx=003eb884 edx=00002704 esi=0017700c edi=00000000 ebp=0016c6d0 esp=000e3cf0 cs=b7 ds=af es=af fs=af gs=c7 ss=bf cr2=0000cff4 Call frame traceback EIPs: 0x000ce267 0x000267b8 0x00015dd7 0x000073c1 0x000256d8 0x00027ca5 Bad return code - make aborted  
C:\PSX\SAMPLE\GRAPHICS\MESH\SMESH>psymake PsyMake version 1.11 copyright SN Systems Software Ltd 1993 C:\PSX\BIN\ccpsx.EXE -O3 -Xo\$80010000 tuto0.c - otuto0.cpe,tuto0.sym Stack Fault at eip=ce267 eax=000000f0 ebx=00005584 ecx=003dd200 edx=00001dc4 esi=0017700c edi=00000000 ebp=0016c6d0 esp=000e7608 cs=b7 ds=af es=af fs=af gs=c7 ss=bf cr2=0000cff4 Call frame traceback EIPs: 0x000ce267 0x000267b8 0x00015dd7 0x000073c1 0x000256d8 0x00027ca5 Bad return code - make aborted

---

7/14/95 6:05 PM

Compiling under windows  
Ian McGee  
Dan Burnash  
Thomas Boyd

Thanks for the help. I finally got it to compile after putting SET GO32=dpmistack 1024000 in my AUTOEXEC.BAT. It didn't work at 500000, and I didn't try anything else less than 1024000....  
Nifty springs, eh? (SMESH) Nice to see an english readme.txt that I could read!

---

7/14/95 2:40 PM

Re(9): Terrain Library !  
Bill "Angus" Guschwan  
Ian McGee  
Thomas Boyd

Change DPMISStack variable for windows. dos uses vcpi and win use dpmi. v means variable stack size, so dos will make the stack size bigger. windows uses a fixed stack whose size is dependent on a config.sys variable calls dpmistack.  
angus, who is a mac programmer embarassed to know this much about dos.

---

7/14/95 12:20 PM

Re(7): Terrain Library !  
Thomas Boyd  
Ian McGee  
Erick S. Dyke  
leave windows

---

7/14/95 9:37 AM

Re(5): Terrain Library !  
Thomas Boyd  
Erick S. Dyke  
Scott Berfield

The new graphics samples in the releases section contains the "terrain library." Download the new graphics samples (which includes subpol and mesh examples that are cool). To counteract your intuition, the terrain library may be in a directory called "zimen," which is Japanese for terrain. Tom

---

7/24/95 2:37 PM

vdf & ndf file formats  
Yoram Berkowicz  
LIBGS

The documentation does not specify in any place the actual format of the \*.VDF and \*.NDF files. This files are generated by the mimefilt function. We would be most greatfull to receive the format of the data in those files.

P.S. : Another question regarding TMD files. Is it safe to assume that different objects with in one TMD file DO NOT share vertices and that the vertex areas in the TMD file are disjointe?

---

7/25/95 10:51 AM

Frame Rate Synchronization for PlayStation Application  
Administrator

News  
LIBGS

To all the licensees, July 5, 1995 S.C.E

#### Frame Rate Synchronization for PlayStation Applications

With PlayStation, display area updating on the frame buffer like double buffer swapping and the video frame rate (1/60 sec) can be performed asynchronously. However, the display switching at inconstant rate, not integral multiple of 1/60 sec, would not be carried out during the vertical blanking synchronous period, and would cause flicker of a display screen. This may be misunderstood by users as application malfunction.

In order to avoid this, buffer swapping must be performed in accordance with the vertical blank (V-BLNK) in usual processing. In example (A), buffer swapping takes place depending on slower processing in either drawing or displaying, and will be asynchronous with V-BLNK. Thus, unless expecting special effects intentionally, synchronization with VSync(0) is needed when swapping the buffers.

```
(A) (B) while (1) { while (1) { .... .... DrawSync(0); DrawSync(0); VSync(0);  
swap_buffer(); swap_buffer(); DrawOTag(ot); DrawOTag(ot); } }
```

However, if swapping is forced to synchronize V-BLNK, in a case where the processing is finalized around at 1/60 sec, the frame rate will be often switched between 1/60 sec and 1/30 sec, and movements of objects will look unnatural. This may be also the cause of user complaints.

In such cases, the frame rate should be fixed at 1/30 sec with VSync(2).

```
while (1) { ..... DrawSync(0); VSync(2); /* Fixed at 1/30 sec */ swap_buffer();  
DrawOTag(ot); }
```

As far as the circumstances permit, the frame rate should be kept constant by executing VSync(n).

Use VSync(3) if the frame rate is 20, and VSync(4) if the rate is 15.

This function will solve the frame number variation caused by the difference of the processing time between the frames.

However, in some applications the lowest frame rate should not be adapted to by others. In this case, instead of counting buffer swapping, the absolute counters like VSync(-1) or RCnt3 must be used as a clock within a program.

```
(A) (B) while (1) { while (1) { .... .... DrawSync(0); DrawSync(0); VSync(0); VSync(0);  
swap_buffer(); swap_buffer(); frame++; frame = VSync(-1); DrawOTag(ot);  
DrawOTag(ot); } }
```

If counting up the frame counter as in example (B), the internal counter will not be delayed even if calculation or drawing overflows, and it causes a moment's frame rate reduction. If this counter is used for updating the object location, the movements will be kept looking natural even in the case of the frame rate reduction.

In particular, as for the MoveImage() execution for a rectangle of which width is 16 dots or less, or drawing a polygon with short width, their processing time tends to vary because a page break often occurs. When such processing is often used, strict time management not to depend on the drawing speed will be required.

Moreover, in interlaced mode both calculation and drawing must be terminated at 1/60 sec. Thus, V-BLNK must take precedence of the termination of drawing (DrawSync(0)) when swapping the buffers. In order to achieve this drawing must be reset during the processing in accordance with V-BLNK. If the drawing time should overflow, the occurrence of screen confusion specific to the interlaced mode will be reduced.

In order to keep the quality of applications for PlayStation, you are requested to take the measures described above. We would appreciate your corporation.

---

7/31/95 4:19 PM

".OFFSET" field of GS\_OT structure

Dave Ross  
LIBGS

The 3.0 PDFs indicate that the OFFSET field of the GsOT structure is NOT YET IMPLEMENTED. Any idea when this might happen? We're really trying to optimize things and a large OT (many null entries) really takes up a lot of time (not sure why). We'd like to tune them and the OFFSET is an ideal way to do it...but it doesn't help yet. I hereby nominate this one feature to be included in 3.2!

---

7/31/95 11:34 PM  
3ds2rsd.exe  
Roy Eltham  
LIBGS

Where do we post problems or bugs in 3ds2rsd? Is the source available? Do I have to write my own to get it working properly? Most of my problems involve UV info being left out or ignored or whatever...

Anyone with pointers, or recommendations please respond.

Roy

---

8/1/95 12:00 PM  
Re: 3ds2rsd.exe  
Dave R. Scheele  
Roy Eltham  
LIBGS

Check out the discussions in the Art Tools folder ... there are several messages there. Don't forget to check out the archives too. As for your texture problem, the converter(s) don't support 3D Studio's tiling of materials. That may be what you're running into. Your artists will have to "custom map" everything. They'll love it!

Dave

---

8/8/95 9:40 AM  
Lib 3.1 Problems?  
Scott Berfield  
LIBGS

Has anyone moved to 3.1 libs? If so, how severe was the size increase in your executable? Also, did you see performance hits due to the printf's embedded in each function?

-sb

---

8/8/95 10:06 AM  
Re: Lib 3.1 Problems?  
Angus  
Scott Berfield  
LIBGS

3.1 is 14k bigger overall. Of course, the impact on your project depends on what you link in.

Angus

---



8/10/95 1:59 PM  
GsFOGPARAM  
Tim Crossman  
LIBGS

Can anyone provide a clearer explanation of the 'dqa' and 'dqb' fields in the GsFOGPARAM structure? The documentation is unclear at best on this subject.

---

8/11/95 2:05 PM  
3ds2rsd  
chris m. coffin  
LIBGS

I'm having a problem getting 3ds2rsd to work properly. It will create the RSD,MAT,PLY, AND GRP files but chokes when it tries to convert my BMP to a TIM file by saying the conversion failed.

What puzzles me more is when I use the -v option and run 3ds2rsd it prints all the info about my BMP file (which is correct) as it tries to convert it so why can't it do it? All the required paths are correct and the BMP is uncompressed.

I could get around the problem by using bmp2tim but that doesn't really fix the problem. So whats the deal with this program? :(

---

8/11/95 4:30 PM  
Re: 3ds2rsd  
David W. Marshall  
chris m. coffin  
LIBGS

The deal with the program is that the program is buggy. If it did convert your BMP's, it would probably give them kanji extensions.

I use BMP2TIM to convert all the bitmaps and then run RSDLINK on the RSD file created by the 3DStudio plug-in.

---

8/14/95 11:18 AM  
Re: GsFOGPARAM  
Thomas Boyd  
Tim Crossman  
LIBGS

>Can anyone provide a clearer explanation of the 'dqa' and 'dqb' >fields in the GsFOGPARAM structure? The documentation is >unclear at best on this subject.

p is a hardware calculated value loaded into a GTE register during the hardware call RotTransPers##. The formula is:

$$p = DQB + DQA * (h / SZn)$$

where the limits on p are

$$0 \leq p \leq 2^{12} - 1$$

DQA and DQB are themselves registers in the GTE. You can set these (amaze your friends!) h is the distance between the viewpoint and screen. h is also a GTE register you can set. SZn is the distance to the vertex in the screen coord system (distance from eye). -----

----- to set DQA and DQB: you have this structure in libgs.h: typedef struct {  
short dqa; // depth queuing parameter a      long dqb; // depth queuing parameter b

unsigned char rfc,gfc,bfc; // RGB for far background (fog) color } GsFOGPARAM; To send this structure to the GTE registers, use the following call. This call simply sets the registers in the GTE. GsSetFogParam(fogparm); ----- To set h: GsSetProjection(h); ----- more notes on depth queing: for texture mapping, only black can be the background GsSetLightMode can be used to set the depth cueing light source ===== ... here is one more snippet about depth queing I found in our alpha release of the lib 3.0 library overveiw Also included below is an explanation of what SetFogNear does. ----- Depth cueing "Depth cueing" is the dimming or blurring effect that is seen in objects that are far away. Depth cueing is realized by mixing the screen vertex color found by the light source calculation and distance color corresponding with the Z component in the screen coordinate system. Using non-linear mixing, GTE performs depth cueing effectively. In order to use this feature you must designate certain constants with the SetFarColor() and SetFogNear() functions. SetFarColor() is a function which determines distant color. For example, if you designate white, it will become misty, if you designate black it will be like the darkness at night. SetFogNear() is a function that designates where depth cueing begins. [Also there is a SetFogNearFar() or SetFogFarNear() - I can't remember exact title - that does bothe DQA and DQB simultaneously.] If you call the RotTransPers() function with the appropriate constants set, the depth-cueing coefficient p will be returned. If you call NormalColorDpq() with this value, a value mixed with the distant color will be returned. ----- here is a loose (pseudo-pseudo-code) interpretation of what SetFogNear does:  
void SetFogNear(a,h) int a, //depth far h; //screen h { Set the DQA register to -5\*a\*64/h;  
Set the DQB register to 0x1400000; }

---

8/16/95 7:17 PM  
Generating a GsBG  
Silas S. Warner  
LIBGS

Where should I look for a complete description of the contents of a GsBG? In particular, where should I look to find the values of the FLAGS component of a GsCELL? The documentation in the library says that a FLAGS member exists in the structure, but gives no indication of what the flags are. By looking in the sample BGD and CEL files in BGSAMPLE, I can see that some flags are set but have no idea of what they mean. I presume the "Graphics Overview" document is intended to settle this. But the way the First Class server is set up, there is literally not enough time in the day to download this 8-meg document at 14400 baud! (I have asked Sony to FedEx the document, but haven't gotten it yet.)  
Silas Warner

---

8/18/95 1:45 PM  
GsSortFlipSprite  
Mark Beardsley  
LIBGS

How does one specify a sprite to be flipped horizontally and/or vertically when using GsSortFlipSprite? The docs neglect to mention it. Are there attribute bits for these functions?  
Thanks.

---

8/18/95 1:59 PM

Re: GsSortFlipSprite  
Angus  
Mark Beardsley  
LIBGS  
Use attribute bits. See libgs.h.  
Angus

---

8/21/95 5:47 PM  
VRAM page addresses for really big TIMs  
Silas S. Warner  
LIBGS

What call or computation is used to get the VRAM page address from an X and Y co-ordinate in the drawing page? I am loading a 960x128 background, and want to display a moving slice of this background. If I want to display a sprite from coordinate (512,64) of this TIM, I can't load the U and V into the cell, because they are both 8-bit quantities. I would like to put the texture page address directly into the TPA of the GsCELL data structure, but don't know how to compute it. Any suggestions?  
Silas Warner

---

8/21/95 11:34 AM  
Mixing GsDrawOT and DrawOTag  
David Cartt  
LIBGS

I am having trouble putting the profile bar graph into the dino graphics sample. I've copied the relevant code from protest.c. The graph either doesn't show up or shows up every other frame. Occasionally it will show up every frame. It seems to be dependent on the amount of time taken to draw the graphics. What's going on?  
Thanks.

---

8/22/95 7:08 PM  
Re: Generating a GsBG  
David R. Sullivan  
Silas S. Warner  
LIBGS

Note: I downloaded the document in question over several calls, if you do not delete the file it will RESUME when you tell it to download again...nice feature...works for me.

---

8/22/95 3:12 PM  
Re: Mixing GsDrawOT and DrawOTag  
Angus  
David Cartt  
LIBGS  
David,  
Please look at the gsgpu example in the samples folder. It shows how to mix gs and gpu calls. Also, you might try the following suggestion from the libgs archives, thanks to Blake Senftner.  
Angus  
Tom:

Well, I figured it out, and here's what I did so others can too:

just after the call to GsSwapDispBuff() I added the following code:

```
if (GetDrawEnv( &drawEnv )) { setRECT( &drawEnv.clip, 0, 0, 512, 240 ); drawEnv.dfe = 1;
PutDrawEnv( &drawEnv ); }
```

And, of course, I had to add this declaration to the beginning of the function:

```
DRAWENV drawEnv;
```

What this does: When the GsLib initializes, it sets up for a double buffer rotation. For FntPrint output without a rotating double buffered display (such is the situation for program initialization) one needs to retrieve the draw environment that the GsLib set up, and change it to allow for rendering in the currently visible display buffer.

Because this change only takes place on a copy of the data that GsLib maintains, once you start rotating buffers the changes you made are lost. Just the behavior one wants.

Chow, -BlakeI have the following situation:

Because CD emulation does something that makes printf() stop working, I've been trying to get the FntPrint() routines to work while I'm loading my emulated data. Without printf()'s and inside timing critical code, I don't want to use the debugger- rather I want to FntPrint() my logical situation to the PSX display screen.

(You may remember that this is the method that the CD tuto programs use for their status display.)

But here's the problem: I'm using the GsLib to handle my draw/display buffer rotations and all examples showing the usage of FntPrint() for screen display do not use the GsLib to handle buffer display rotation.

I have FntPrint() working in my other code, but for some reason I can not get FntPrint() to work on a just initialized display environment. The logic goes like this:

```
/* program has just begun */ ResetCallback(); CdInit( 0 ); PadInit( 0 ); ResetGraph( 0 );
SetGraphDebug( 0 ); GsInitGraph( 512, 240, 0, 0, 0 ); GsDefDispBuffer( 0, 0, 0, 240 ); GsInit3D();
/* ordering table initialization omitted */ FntLoad( 960, 256 ); gFontId[0] = FntOpen( 0, 16,
512, 24, 0, 512 ); gFontId[1] = FntOpen( 0, 240 + 16, 512, 24, 0, 512 ); setDumpFnt( gFontId[0] );
VSync( 0 ); GsSwapDispBuff(); FntPrint( "this should, but does not display!\n" ); FntFlush( -1 );
```

As can be seen, this logic simply initializes the PSX, like any program running from emulation.

Can you see any reason why the FntPrinting should not work?

What does GsSwapDispBuff() do anyway?

I've gone underneath GsLib everywhere except where it swaps my buffers for me... And at this point in the logic, I have not gone underneath GsLib at all, so no conflicts could be triggered yet...

So, can I get a simple answer to this? I'd love something complete where I won't have to look up functionality that I don't have documentation to... I guess what I'm saying here is that I'm trying to understand why this is not working, and I'd prefer a non-cryptic reply.

Thanks very much. -Blake

---

8/22/95 12:23 PM

Re: Generating a GsBG

Angus

Silas S. Warner

LIBGS

Basically, flag in GsCELL does nothing. It's a placeholder for future values.

Angus

---

8/22/95 12:40 PM

Re: Generating a GsBG

Angus

Silas S. Warner

LIBGS

I found some more info: if you use GsSortBg, 0x1 will do a horizontal inversion of data, and 0x2 will do a vertical inversion of data. Other GsSorts will not do anything.

ANgus

FLAG has the following bits:

\*\*\*

HLP Horizontal inversion data

VLP Vertical inversion data

---

8/23/95 4:06 PM

Re(3): Generating a GsBG

David R. Sullivan

Dave R. Scheele

LIBGS

Note: For all using MAC FirstClassClient, it will resume...apparently the PC cannot do this.

---

8/23/95 7:26 AM

Re(2): Generating a GsBG

Dave R. Scheele

David R. Sullivan

LIBGS

>> Note: I downloaded the document in question over several calls, >> if you do not delete the file it will RESUME when you tell it to >> download again...nice feature...works for me.

Are you using the FirstClass client? I am, and this thing has NEVER resumed for me.

Perhaps you're blessed ;-)

Dave

---

8/25/95 2:30 PM

GsFlipSprite Problem

Mark Beardsley

Angus

Is there some restriction on the range of values permitted for u and v when using a flipped sprite ?

I have sprite frames loaded in vram at 768,0 (which should be at the start of a tpage) for an 8-bit sprite. If I show that sprite without any flipping (using either GsSortSprite or GsSortFlipSprite) it shows up fine using both u=0 and v=0.

However, if I try to flip the sprite horizontally, by setting the u-flip bit (0x00800000), that same sprite will be displayed incorrectly (it actually seems as though it is trying to squeeze twice as much horizontal texture onto the sprite).

If I set u=1, the sprite will be shown okay (except of course, the texture is off by a pixel). I tried a few things and it seems that displaying horizontally flipped sprites will not work if u=0 and displaying vertically flipped sprites will not work if v=0, at least for 8-bit sprites (I don't know about other bit depths).

Is this a bug, a feature, or my own fantasy ?

Is there something else that needs to be set-up to display flipped sprites?

Thanks.

---

8/25/95 12:45 PM  
Flip Sprite  
Mark Beardsley  
Angus

I'm sorry Angus, but I just can't seem to find which attribute bits to set/clear to get a flipped sprite. You keep saying to look in libgs.h, but I don't see anything there that would explain it. I'm using lib 3.1. Thanks.

---

8/25/95 3:12 PM  
Re: GsFlipSprite Problem  
Angus  
Mark Beardsley  
LIBGS  
Try 3.2 and if it persists, send me something to reproduce and I'll send it to Japan.  
angus

---

8/25/95 12:50 PM  
Re: Flip Sprite  
Angus  
Mark Beardsley  
LIBGS  
try  
0x00800000 for u 0x00400000 for v  
angus

---

8/28/95 3:23 PM  
Re: Mode bits in GsBG  
Angus  
Silas S. Warner  
LIBGPU  
Please try and use one of the bg samples, like bgsample and work backwards.  
Angus

---

8/28/95 3:19 PM  
Mode bits in GsBG  
Silas S. Warner  
LIBGPU

I am trying to generate a GsBG using a TIM image generated from a BMP. This TIM is 8 bits wide and has a CLUT. When I generate the GsBG, I create a GsCELL array by using GetTpage(tp,abr,x,y), where (x,y) is derived from the image location in the TIM. The problem is that no matter what values I put in tp and abr, the screen image always comes out wrong -- and unchanging, no matter what values are used. In fact, I can cycle through all 16 possible values for tp and abr, and observe absolutely no change in the onscreen image. The background seems to be assuming the cell tiles are all 16-bit, no matter what the source mode bits tell it. And I have already observed the tpage members of each cell structure, and the tpf and abr bits ARE

changed when the GsBG is input to libgs! What am I doing wrong?  
Silas Warner

---

8/28/95 12:01 PM

Re: TMD / PMD are bitches.

Angus

Carl Ferreira

LIBGS

>>1) Is there some way to use a polygon list (without having to cram it into a PMD or TMD format) and >>still use the GS library? Use the routines with Gs as a prefix in the libgte library. They are the core routines from GS.

>>2) Is there some way to use TMD or PMDs while keeping them 'relocatable' in terms of the TIM >>locations? It is a limit of the architecture.

>>but Sony keeps shoving us toward the GS library. I am sorry you have this impression. If you can tell me who is pushing you, I will talk to them and admonish them. Our policy is to use our libraries, and if you have the 3d engineering talent, then you do not need the libgs. We offer libgs as a simple way to go, but sometimes the programmers opt to make their own anyway. We can not be everything to everybody. Again, I apologize if you got the wrong impression from Sony.

Angus

---

8/28/95 6:44 PM

Re: TMD / PMD are bitches.

Blake E. Senftner

Carl Ferreira

LIBGS

Just write code that accesses the PMD data directly. I use the PMD model type with changing texture data. The libgs routines that register a PMD into an ordering table are the fastest possible way to install a model into an ordering table; Because the same places keep getting changed in the PMD models, I have routines that calculate pointers to the change locations, and then I just write into those pointers during game simulation.

-Blake

---

8/28/95 3:25 PM

Re(2): Mode bits in GsBG

Silas S. Warner

Angus

LIBGPU

>Please try and use one of the bg samples, like bgsample and work backwards.

>Angus

That's exactly what I did. It still doesn't work. Besides, bgsample uses a preloaded GsBG file.

Silas Warner

---

8/28/95 9:53 AM

TMD / PMD are bitches.

Carl Ferreira

LIBGS

It would be nice to use some sort of polygon list for objects which is not as facist as TMD or PMD formats. The problem with them is that when (not if!) you change the texture location,

you need to recompile your TMD and PMD objects again.

1) Is there some way to use a polygon list (without having to cram it into a PMD or TMD format) and still use the GS library?

2) Is there some way to use TMD or PMDs while keeping them 'relocatable' in terms of the TIM locations?

Anyone else having this problem or discover a solution?

Currently I am using GTE to manipulate our own list of polygons and maintain TIM relocatability. Works well, but Sony keeps shoving us toward the GS library.

Carl

---

8/29/95 5:55 PM

Near Z Clip attribute bit

Joe J. Alemanni

LIBGS

Has anyone been able to get the Near Z Clip bit of the GsDOBJ2 attribute word to work? I expected that setting this bit would help to solve the problem of near polygons being clipped prematurely. It says in the libgs manual that a polygon very near  $Z < h/2$  will be forcibly displayed to the point of distortion if this bit is 1. Unfortunately, it has absolutely no effect. If anyone knows anything about this, or has any suggestions on how to stop near polygons from being clipped in libgs, I would greatly appreciate it.

Rich

---

8/30/95 11:50 AM

Shoving GS (was: TMD / PMD are bitches)

Dave R. Scheele

Angus

LIBGS

>> >>but Sony keeps shoving us toward the GS library.

>> I am sorry you have this impression. If you can tell me who is pushing you,

>> I will talk to them and admonish them.

(mental images of .... never mind)

I have been successful in staying completely away from the GS libraries, for a few reasons. I have noticed that the bulk of Japanese effort to improving the graphics libraries seems to be spent on the GS library. Perhaps this is what was meant by "Sony shoving us toward the GS library". I often wonder how much better/faster the GPU and GTE libraries could be if more time was spent on them instead of GS.

And yes, I realize the GTE macros were a big boon to many people, but the D-cache trick makes them ineffectual (unless I really screwed something up) and they're about the only new improvement I can recall in the last little while. Lib 3.2 actually dropped my frame rate slightly! (again, this could be my screw-up. Testing, testing ...)

>> Our policy is to use our libraries, and if you have the 3d engineering talent, >> then you do not need the libgs.

There are (actually were) some things in GS that I could have used, but since I've sworn off of it, I ended up spending lots of time creating my own equivalents. Perhaps if the GS library source was made available, developers could pick and choose the routines they'd like, and optimize them for their specific implementations. That way, Sony would have better games for the PlayStation, quicker, from everyone, not just those with 3d engineering talent ;-)

Please don't think I'm an angry Sony-hater or anything, just putting in my 2 cents worth! That comment about Sony shoving us is a thought that occurred to me a while back, and I just couldn't leave it alone ...



Dave

---

8/30/95 9:48 AM

Re: Near Z Clip attribute bit

Shaival Varma

Joe J. Alemanni

LIBGS

Actually From : R. Brett Butler

I'm writing a doom like game, and one problem i'm having is when i'm travelling down a hallway and i look at a side wall from an angle (other than straight on), the texture begins to wave, (degree of wave depending on angle of view).

If i look at a wall straight on, the texture is fine.

One thing that helped was to divide the polygon into 2 trigons then map the texture to the trigons. The degree of the texture waves has decreased on Near Poly's, yet it is still a wavy problem child. A major drawback to this cludge is there are more polys to process (twice as many)

I noticed that a poly can be dived into 3 trigons with the RotMeshS\_T3 function and processed quicker, but I haven't tried it yet.

Does anyone know if that could be the solution to the near poly distortion problemo?

-arigato gozaimasu     \_\_\_     |     ba     to     ra     |     \_\_\_|

---

8/30/95 3:07 PM

Re: Shoving GS (was: TMD / PMD are bitches)

Carl Ferreira

Dave R. Scheele

Angus

> There are (actually were) some things in GS that I could have used, but since I've sworn off of  
> it, I ended up spending lots of time creating my own equivalents. Perhaps if the GS library  
>source was made available, developers could pick and choose the routines they'd like, and  
>optimize them for their specific implementations. That way, Sony would have better games for  
> the PlayStation, quicker, from everyone, not just those with 3d engineering talent ;-)  
> Please don't think I'm an angry Sony-hater or anything, just putting in my 2 cents worth! >  
That comment about Sony shoving us is a thought that occurred to me a while back, and I just >  
couldn't leave it alone ...

Say, I bet that between all of the developers on this board, we could re-create the Gs library  
with source. Is this something that might be feasible?

Carl

---

8/30/95 11:07 AM

Re(2): Near Z Clip attribute bit

chris m. coffin

Shaival Varma

Joe J. Alemanni

-Your wall textures are distorting because there is no perspective texture mapping. Oh joy :( -  
Try using PMD with GsDOBJ3 and set the automatic subdivision attribute for each object based  
on its z-distance to the camera since tiny, far away textured polys dont distort too much. -  
Textures with lots of straight lines in them are not a good idea since they show the most  
distortion. -If you need straight lines in your texture maps or anything like that the texture  
distortion is the worst near the middle of a quad or two triangles put together so place the  
important texture map data at the edges. The near z-clip bit doesn't work for me either! Is this

function not supported or something? Are we clueless? Chow, Chris

---

8/31/95 4:29 PM

Re(4): Shoving GS

Angus

Mike Gomez

LIBGS

2 comments:

We have sample code. Libgs routines are in libgte.lib and begin with Gs.

Angus

---

8/31/95 8:42 AM

Re(2): Shoving GS

Dave R. Scheele

Carl Ferreira

LIBGS

>> Say, I bet that between all of the developers on this board, >> we could re-create the Gs library with source. Is this >> something that might be feasible?

Probably not. Each of us probably doesn't use all available functions, so you'd probably only be able to get the "most popular" functions converted. Also, if people needed functions available in GS, they'd use the ones in GS rather than roll their own. If the GS functions don't work for them, as is the case with me, they'd roll their own \*specific to their application\*, and hence incompatible with GS. For example, I have GS-less processing of my camera and objects, and it couldn't be converted to do what GS is doing with DOBJx, RefViewx etc. because I didn't need some of that functionality. Hopefully my routines are leaner and faster because of it!

Dave

---

8/31/95 4:08 PM

Re(3): Shoving GS

Mike Gomez

LIBGS

Samples

I am yet another developer who has no use for the GB lib. However the general subject of developers collaborating has come up a few times, and is appealing. I don't think it is feasible to do anything as ambitious as spec-ing out an entire library. For one thing that would be Sony's domain. For another thing there are so many developers that it would be a nightmare to try to make everyone happy.

I believe that there are two areas in which developers (Sony also) can contribute: Sample code, and Q&A style docs. These should be categorized by subject, not hodge-podge. Either have individual subject folders under the samples and doc conferences, or have a samples folder and a Q&A doc folder under each conference.

For starters there is much information in the existing conferences, but it is hard to find and sometimes strung out across months of discussions.

- Disclaimer -

I will incur no liability for the lack of knowledge of items contained in FAQ's. I eagerly await PC readable TEXT docs.

Later

- PSX rules

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9/1/95 10:15 AM

Re(5): Shoving GS

Dave R. Scheele

Angus

LIBGS

>> 2 comments:

2 responses:

>> We have sample code.

Often sample code is provided using LibGS, with no equivalent GPU/GTE example. The most irksome example of this is the object->camera transformation process. This has been asked for & discussed with no \*public\* resolution for quite some time now (see Carl Ferreira's LIBGTE message "Object -> Camera transformations"). I'd like to see how Sony suggests doing this.

>> Libgs routines are in libgte.lib and begin with Gs.

Excuse me for being dense, but your point is??? ;-)

Dave

---

9/5/95 11:43 AM

Once more into the GsBG, dear friends....

Silas S. Warner

Developer Support

LIBGS

090395.ZIP 152K

LIBGS

All right. In response to a request from Developer Support, I am reposting this question with further details. The attached ZIP file contains my source code and CPE and SYM files. I am creating a GsBG based on an 8-bit TIM image loaded with LoadImage. When I select the cells for this GsBG, the TPF bits of the tpage member of each cell structure should be used to set 8-bit source mode. I am using GetTPage to generate the tpage member of each cell, and the first argument to GetTPage should be 1. However, no matter how I set that first argument, the drawing system assumes that my background source is in 16-bit mode. To see this, use PADLright or PADLleft to scroll the display right and left. The GsBG is regenerated every 32 pixels. Pressing the M button scrolls the TPF bits of the tpage member of every cell structure through all possibilities by altering the argument to the GetTPage call on line 175 of INITBACK.C. However, as you can see when the program is tested, the tpage members of the cell structures are changed, but this has ABSOLUTELY NO EFFECT on the drawing of the GsBG! I have been banging my head against this problem for 3 weeks with no progress whatsoever. Can somebody help me?

Silas Warner

---

9/5/95 5:56 PM

Re: Once more into the GsBG, dear friends....

Silas S. Warner

Developer Support

Documentation

Okay, after 3 weeks of fumbling around with absolutely NO help from the documentation, this is what I found: 1) Setting 8-bit source mode is done with the attribute member of the GsBG. There is ABSOLUTELY NO documentation on this structure member, aside from a notation to see the description of GsMAP. And there is NO attribute member, or any description of an attribute member, in GsMAP. I found the description of the attribute member under GsGLINE. 2) The function GetTPage does NOT give correct results when setting the tpage member in the

cell structure, with an 8-bit cell source. This is true no matter how the TPF bits are fed into the structure. I was required to come up with my own expression for setting the TPage, to wit: `cell->tpage=(0x20)+((x>>8)<<1)+((y>>8)<<4)`; because the result of GetTPage was approximately `GetTPage(1,0,x,y)==(0x20)+(x>>8)+((y>>8)<<4)`; which resulted in incorrect page pointers. If I had recieved ANY help from Developer Support, other than "Look in the documentation", I would not have been stuck for 3 weeks.  
Silas Warner

---

9/6/95 10:23 AM

Re(2): Once more into the GsBG, dear friends...

Angus

Silas S. Warner

Developer Support

Silas,

I am sorry you are unsatisfied with our service. We are trying to do our best to help, but we can not possibly meet the demand of technical help for the PlayStation. We are in the midst of a launch of a product, and we have critical bugs we need to figure out. I hope you understand. I am sure you do. This message is not an excuse, but it is an explanation.

I might suggest an alternative to your general problems: 1) Refer to the sample code. Take it apart. 2) If you get stuck, go around the problem. Use 4 bit textures instead of 8 for example. Using 8 bit textures is bad to begin with, which may explain why it does not work.

I believe you followed rule #1 but blaming us for a 3 week delay is violating rule #2. However, these are just suggestions.

I would like to also correct your statement: >>If I had recieved ANY help from Developer Support, other than "Look in the >>documentation", I would not have been stuck for 3 weeks.

We did point you to the bgsample, and Kris Severson did have an extensive phone conversation with you. I might also suggest a common misconception in the conferences here. We are here for support. We can not design games for people and be blamed for your delays. Writing games is hard.

Second, we need clear and concise questions. Generalized questions without support of sample code is inefficient. Many developers try to pass their work onto us, which is unfair to us. If you have a pointed example, like you posted YESTERDAY, then we can look at it and identify the problem. You need to work with us so that we may work with you with extreme efficacy.

Again, I apologize if our service disappoints you.

Sincerely,

Angus

---

9/6/95 12:20 PM

Vertex ordering

chris m. coffin

LIBGS

Angus

In the 3.0 docs for GsDOBJ5 its says a polygon's front and back is based on order of the vertices. Dumb question->Is this clockwise or counter-clockwise? Our polys are all textured/gouraud/no lighting so why does linkrsd still include normals when the geometry is converted to TMD even when there is no lighting? Bit 7 (near-zclip) doesn't seem to work still. What's going on here? :)

---

9/8/95 7:45 PM

Problems with Seams between objects

Roy Eltham

LIBGS

I have a problem that I believe is rounding errors, but I wanted to put it up here in case someone ran into the same problem and solved it or perhaps it's not a rounding error and someone can tell me what I'm doing wrong.

I have a "playfield" made up of many "objects" (separate TMD files). These objects fit together and theoretically should create a solid "surface" over which the player moves. The vertex points for the triangles that make up the objects are "quantized" so that the edges of the objects meet up exactly. The X, Y, Z values are equal for the different vertices that meet along the edges of the objects. (also there are no places where one object's edge has more vertices then the other object it meets up with). All of the "playfield" objects are at fixed positions in the world and I move the camera view around (using the LIBGS calls for view stuff).

My problem is that I get sliver seams appearing and disappearing as I move around and change camera angles.

I am currently assuming that the problem is in the fixpoint math rounding errors during display transformation calculations. I am currently planning on abandoning LIBGS and moving to a rendering method that uses LIBGTE/GPU so I can do a vertex based transformation instead of face based. This along with a change in the data (abandoning TMD and going proprietary) would hopefully get rid of the seams. I'm assume that if I consolidate the vertices with the same xyz values and only do one transformation that it will eliminate the problem.

I know that I could combine all the objects together into one mondo object and probably get rid of the problem but I can't do that for other reasons. Also, I hoped that the vertices with EXACTLY the SAME values would transform the same and end up in the same place on the screen.

Thanks,

Roy Eltham Lead Programmer Regal Productions

---

9/11/95 8:46 PM

Re: Smoking Crack

Roy Eltham

Angus

LIBGS

The sample code you gave me (AGILE.ZIP) seems to be doing something with the subdivision functions. It doesn't appear to be drawing more then one "object" it's just subdividing a quad with the earth texture on it.

slightly confused...

Roy Eltham Regal Productions

---

9/11/95 5:55 PM

Smoking Crack

Angus

Roy Eltham

LIBGS

AGILE.ZIP 61K

LIBGS

Roy,

Take a look at this sample. Let me know your thoughts on it. I have not had the time to play with it but this is what Japan SCE gave me in reply to the crack problem.

Also, TransRot instead of RotTrans "seems" to fix the seams. The 32 bit precision seems to override the 16 problem.

The sample here apparently fills the seams.  
Angus

---

9/11/95 2:16 PM  
Quadrangles from LIBGS  
Tim Crossman  
LIBGS

Are quadrangles supported from LIBGS? Setting bit 3 in the polygon primitive mode only disappears my quads. I see quad specifig, Gs type routine in LIBGTE, but can find no reference to their functionality from any higher up.

---

9/11/95 8:27 PM  
Re: Smoking Crack  
Roy Eltham  
Angus  
LIBGS

Thanks for your responce! I'll checkout the sample you gave me.

Regarding your comment about TransRot vs. RotTrans:

I'm not using those functions currently.... heres a snippit of code from our game:

```
for(i = 0; i < NUMOFFSETS; i++) { Trans[i].vz = Offsets[i] - Trans[playerObjectIndex].vz;
if(Trans[i].vz > -32000 && Trans[i].vz < 32000) { op=&object[i]; RotMatrix(Rot+i, &(op-
>coord2->coord)); TransMatrix(&(op->coord2->coord), &Trans[i]); op->coord2->flg
= 0; GsGetLws(op->coord2,&tmplw,&tmpls); GsSetLightMatrix(&tmplw);
GsSetLsMatrix(&tmpls); GsSortObject5(op,&Wot2[outbuf_idx],14-OT_LENGTH,SCRATCH); }
}
```

This is a modification of one of the samples programs. I have tried doing the TransMatrix before the RotMatrix, and I have also left our the RotMatrix (because the objects being draw here are not Rotated in of themselves). The seems remained...

Roy Eltham Lead Programmer Regal productions

---

9/14/95 2:54 PM  
GsSprite size  
Mark Beardsley  
Angus

what is the max width/height of a GsSprite? I thought that it was 256.

It seems to work okay on my dev system, but on my partner's system it shows messed up (as if the u was set wrong).

We're using Lib 3.1

Also, what calls should be made to reset all screen functions to start from scratch for a new sequence? I think that we may not be resetting some screen stuff in some cases.

Thanks.

---

9/15/95 9:44 AM  
Packet size  
Chris E. Reese  
LIBGS

We are using the TMD structures and need a little more explanation on the GsDOBJ5 requirements for packet data. We realize that every object found in a TMD needs to have a packet data area preset, but in order to do that efficiently we need to understand what we can expect the size of the packet to be in order to allocate enough space for it. We have looked at the ALPHA overview for lib 3.0 and found that there are fields called ilen and olen that indicate lengths for the packet data block. Is this the correct way to calculate the packet data size for the object we are pulling out of the TMD? We just need to get an idea of what kind of memory impact the GsDOBJ5 will have on us, so that we know where best to use it and take advantage of its features.

Chris Reese Eidetic, Inc.

---

9/20/95 1:18 PM

DrawSync(1)

Paul C. Isaac

LIBGPU

this is kind of a repeat of an earlier question that I got no satisfactory answer to...

```
LoadImage(...) LoadImage(...) LoadImage(...) LoadImage(...)
```

```
while (DrawSync(1) > 0) { printf("DrawSync = %d\n",DrawSync(1)); pollhost(); // this is an infinite loop when I run it! }
```

I would have expected this to print out a series of 4,3,2,1's but as far as I can tell DrawSync(1) always returns "1" am I doing something crazy... do I not understand what is happening... am I supposed to just call DrawSync(1) and ignore what it returns...

I'm expecting DrawSync(1) to kind of count how many DrawOT or LoadImage tasks are waiting in the internal queue... what is it really doing?

(pci)

---

9/21/95 9:23 AM

Screen Size

Mark Beardsley

LIBGS

this problem has been mentioned by various developers here (and myself as well), but I have yet to see any official response from sony on the matter.....

When displaying a background screen, it appears that the top 7 or 8 pixels of an image are not displayed (i.e. of a 240 tall image, only the bottom 232 pixels are ever shown). This is not due to the settings of a particular monitor (we have been unable to view the top of an image on any monitor, regardless of its settings).

Is this being addressed by Sony? Are we to not use these top pixels (ie. pretend the resolution is 320x232) ?

---

9/21/95 7:03 PM

Re: Screen Size

Blake E. Senftner

Mark Beardsley

LIBGS

Welcome to the issue of Title Safe: all NTSC monitors/TVs have an overscan that may vary. In general the center 80% (width & height) are the only places guaranteed to be displayed. Blame the National Television Standards Committee for this one.

For a game using 320 by 240 resolution, title safe is 256 by 191... For a game using 384 by 240 resolution, title safe is 316 by 191... For a game using 512 by 240 resolution, title safe is 422 by 191...

you get the idea. It seems quite shocking when first presented with this information, but keep in mind that we're talking Every Color TV Ever Made... Most modern models only have overscan around 10%... But also keep in mind that many "kids" will be hooking up their game machines to an older TV that has aged a bit... which can cause the overscan to get worse...

Just make sure that your text lies inside this area, and ignore the rest. That's about all you can do.

-blake

---

9/22/95 6:03 AM

Re(2): Screen Size

Mark Beardsley

Blake E. Senftner

LIBGS

Yeah, I knew that would be someone's response, but that's not what I'm talking about. Having done 8-bit Nintendo games I know all about the problem with some TV's (especially old ones).

If I use a monitor that shows all the NTSC area for other game systems (I have a good sized black border around all sides), the playstation image is still missing the top 7 pixels (always the top 7 pixels, on any monitor, no matter how it is adjusted).

This is not the "some monitors can't show everything problem", this is the "no monitor can show the top 7 pixels problem".

I don't know if this is the problem, but I know that the development systems (and maybe the playstation itself?) does not put out a very good sync signal (to video tape stuff from a dev system we need to use a time-based corrector). Could this be related?

---

9/22/95 11:29 AM

Re(3): Screen Size

Blake E. Senftner

Mark Beardsley

LIBGS

This brings up an interesting bit of history...if I remember correctly, the Philip's CD-I player had a Sony video display chip that had a horizontal shift of 12 pixels on all NTSC displays. The left-most 12 pixels would be displayed, only it was "12 pixels" shifted on your monitor's display surface. Many consumer grade TV's had that edge cut off... The final word on it was a timing problem in the display chip, for what that's worth...

Well, it looks like a bit of a repeat, because I've also noticed this "non-centered nature" of the display signal. With my monitor, a Sony professional rack mounted trinitron, I can set the overscan on or off and get the whole thing or whatever... But that image is not centered. When I first was looking at the display back when I started working on the machine, it looked alot like my memory of the old 12 pixel CD-I shift.

Angus, have you heard any mention of this as an issue at Sony? I remember being a bit surprised by the complete lack concern about "title safe" when presented with the company line about psx development. Is there an official perspective on the overscan is the display processor?

-Blake

---

9/22/95 1:44 PM

RotSMD, RotRMD

Dave R. Scheele



LIBGTE

RotRMDxxx and RotSMDxxx etc. are in libgte, but used by the libgs library. Are they ROM routines, or are they completely implemented in the library?

Also, you can pass in the bit length of the order table. Using RotNClip3, for example, the otz value is divided by 4. If I pass in a large enough bit length (16?) to RotxMDxxxx, will it do NO shifting, and use the actual z value for the index into the order table?

Dave

---

9/27/95 11:52 AM

Semi-Xparent samples?

Sky Lounge

LIBGS

Anyone have any Semi-Xparent sample code/images lying around that they've used with GsSPRITE and the like?

Thanx

---

9/27/95 3:43 PM

Re(2): Semi-Xparent samples?

Silas S. Warner

Blake E. Senftner

Sky Lounge

I can give you a little more specifics on what these parts mean.

1) your primitive's 'TSB' (tpage) field is set with the semi-trans mode you desire  
In "GetTPage" the semi-trans mode is the 2nd argument to the function. This is usually 1, which means "Add 50% of the page texture to 50% of the background." You use "GetTPage" to set the texture page of your primitive. If you do not use GetTPage, you should set the 'TSB' bits manually.

2) your primitive's 'code' bit is set (on,1)

There is a primitive called "SetSemiTrans()" to do this. It changes the code of a POLY by ORing it with, I believe, 0x10. This changes the "code" bit that's used to identify the primitive.

3) the color being rendered has its STP bit set; for CLUT textures the STP bit must be set in the color table entry, for 16-bit texture the pixel itself needs have that STP bit set.

The STP bit is the highest bit in the color entry of your texture map. If you are using a 16-bit texture map, then every pixel has an STP bit that must be set if the pixel is to be transparent. If you are using an 8-bit or 4-bit texture map, the color entry in the palette must be so set. The "BMP2TIM" converter does not have a feature to do this automatically. The PhotoShop plugins have this feature, which can be set for all non-black colors or for black separately. I do not use any program that allows you to set individual colors or pixels, but it's certainly possible.

Hope this helps.

Silas Warner

---

9/27/95 4:17 PM

Re(3): Semi-Xparent samples?

Blake E. Senftner

Silas S. Warner

Sky Lounge

After looking over my posting, I noticed that this line was totally unclear:

2) your primitive's 'code' bit is set (on,1)

This line should read:

2) inside your primitives 'code' field the ABE bit should be set, which is bit 1, the bit whose value is 2.

So, once again just to make sure things are clear:

1) inside the 'tpage' field of your primitives, make sure that that the ABR bits are set correctly, these are 2 bits, numbered 5 & 6 (starting with a 0 bit), which have four possible settings 0 (no bits set) = 50% back + 50% foreground 1 = 100% back + 100% foreground 2 = 100% back + 50% foreground 3 (both bits set) = 100% back + 100% foreground. (see page 110, 3D Graphics Tool Manual)

2) inside your primitives 'code' field the ABE bit should be set, which is bit 1, the bit whose value is 2.

3) The color being rendered has its highest bit set, bit 15.

Between Silas and myself, this looks covered. -Blake

---

9/27/95 2:44 PM

Re: Semi-Xparent samples?

Blake E. Senftner

Sky Lounge

LIBGS

No samples lying about, but I do use them often. the key seems to be making sure that these three conditions are met:

1) your primitive's 'TSB' (tpage) field is set with the semi-trans mode you desire 2) your primitive's 'code' bit is set (on,1) 3) the color being rendered has its STP bit set; for CLUT textures the STP bit must be set in the color table entry, for 16-bit texture the pixel itself needs have that STP bit set.

Note that when rendering a 16-bit texture that has pixels with the STP bit set, the final rendered pixel will also have its STP bit set. (If you ask: "so what?" then never mind, this aspect only comes into play when multiple renderings are required for a single texture.)

-Blake

---

9/29/95 6:15 AM

Re(4): Semi-Xparent samples?

Sam Black

Blake E. Senftner

Silas S. Warner

From my own experience, the Sony docs are incorrect regarding the semi-transparent rate which is set in the tpage field. My own experience indicates that the actual values are: 0 -- 50% foreground + 50% background 2 -- 100% background - 100% foreground 3 -- 100% background + 50% foreground Note that 2 & 3 are switched from the information given in the documentation. I have never tried a value of 1, but I assume it is the documented 100% back + 100% fore.

---

9/29/95 2:08 PM

Re: DrawSync(1)

Angus

Paul C. Isaac

LIBGPU

I know 3.0 had a problem with this. Try lib 3.2. It should clear up.

Angus

---

10/2/95 12:06 PM

multiple pmd  
cary hammer  
3D Development

I'm not sure if this is a 3ds plug-in problem or a general programming problem, but here goes... We have multiple rectangular solids in 3ds (call them buildings) which we'd like to work with as a collection (call it city block). Unfortunately, the 3ds plug in spits out a separate rsd file for each building in our 3ds model instead of just one for the entire collection.

#1 - Is there some way of getting the 3ds plug-in to combine the 3ds objects of a single model into a single rsd file?

#2 - What is the best way to load and deal with multiple pmd files? All of the pmd sample routines seem to deal with a single pmd.

Thanks, Mark Nicely

---

10/4/95 1:53 PM  
Lighting ON/OFF  
Chris E. Reese  
LIBGS

We are using TMD's for our models and were wondering how to get rid of the normals that are being brought into the TMD. Is there a way to tell the data going into the TMD that it doesn't need to be lit. I know there must be a way as I have looked at models from other games that have primitives with lighting off when doing a TMDINFO on the TMD file. Is there a way to do it in 3D Studio that will translate through the plug-in tool?

Chris Reese Eidetic, Inc.

---

10/4/95 3:40 PM  
Re: Lighting ON/OFF  
Blake E. Senftner  
Chris E. Reese  
LIBGS

If you look on page 115 of the "3D Graphics Tool Manual" you'll see defs for a normal-less (no normals) TMD primitives... After no luck trying to get the various Sony supplied tools to create normal-less TMDs, I just wrote my own conversion program to create them. And, yes, even though the Sony provided tools will not create such models, the TMD software in the libs know about and correctly handle such models.

-Blake

---

10/5/95 5:44 AM  
Collision Detection  
Christopher C. Rywelski  
LIBGS

Hi.

Does anyone have any suggestions or help on the following:

I am trying to perform collision detection with my world mesh. For my uses I have to find out if a destination position xyz is touching or already inside the mesh. I am only really interested if the y co-ordinate at a given xz location has collided with my mesh. I believe I should proceed in the following manner: 1) Search all polygons until I find the first one that bounds the xz location. Ideally this would entail a binary search of the sorted polygon data. 2) Find the equation for the plane for the found polygon. 3) Find y value for the calculated plane equation

at the given xz location. 4) Compare this y value with the destination position y value to determine if a collision has occurred.

Searching the polygon data has and will prove to be a problem. I am using TMD data and could possibly parse the TMD data for my mesh where it is loaded in memory although it is not sorted here and is not the most efficient. I thought at one time that I might be able to use the sorted poly data the library uses after the GsSortObject4 call is made by looking through the appropriate zsort table (struct GsOT object\_table->org). The info on how this is laid out is rather sketchy though.

Maybe I am missing something obvious, don't have enough info or should just try a different method. I would appreciate any comments and questions that may help.

Thanks.

---

10/6/95 11:55 AM

Re: Collision Detection

William Botti

Christopher C. Rywelski

LIBGS

Your steps are correct. The only thing I recommend is using primitives instead of tmd for your polygon data. That way you can keep the mesh organized in X and Z. We went down the TMD path and had to back track. Cheers, Will Botti Black Ops Entertainment

---

10/9/95 3:55 PM

Re(4): Screen Size

Dave Ross

Blake E. Senftner

Mark Beardsley

As another data point on the screen size controversy:

On a completely underscanned NTSC monitor I also miss the top 7 lines BUT I also have an RGB monitor hooked up to the same cable connector and the top 7 lines ARE VISIBLE on it.

---

10/11/95 7:33 PM

new ordering table questions

Blake E. Senftner

LIBGS

My previous posting of ordering table questions is still valid and needs to have answers, but here are some GsLib specific ordering table questions:

When executing an ordering table with GsDrawOT(); what is the execution order?

I've written some code that dumps the ordering table, and most entries are pointers to the previous index of the ordering table. So, I'm left thinking that under GsLib, the reverse style ordering table is used. Upon execution, the ordering table is walked from the end (further-most z location) towards the beginning (front-most z location). Is this correct?

Upon finding a ot entry that points to a primitive list, it is executed in list order? \*\*\* This is the most critical part of my questions \*\*\* When an primitive list is located off the ordering table, that primitive list is rendered in the order specified by the list, correct?

I'm asking because I have some primitives that appear to be rendering in backwards order, so I'm walking the OT to see where they are located...

-Blake

---

10/12/95 2:10 PM

Re(2): GsOffsetting

Mark Beardsley

Angus

LIBGS

Thanks for the info. I got it working. But...

You may want to know that GsSetOrign(x,y); GsSetDrawBuffOffset(); work wonderfully.

Unfortunately GsSetOffset(x,y); seems to do nothing.

Neither does GsDRAWENV ofs[0] = x; GsDRAWENV ofs[1] = y;

At least they don't work in 640x240 with GsGPUOFS. Maybe they work in other modes?

---

10/12/95 11:11 AM

Re: new ordering table questions

Angus

Blake E. Senftner

LIBGS

GsLib uses ClearOTagR, which is the Reverse order table.

Within any Z level, the order of drawing is dependent on when you added the polygons.

Drawing of the polygons for a Z level is performed as you defined them. If you are having drawing problems, trying increasing the resolution of the Z ordering table. The moore levels you have the more resolution. Also, for empty Z levels, some DMA setup is still done. So, be sure to make a concise order table.

Angus

---

10/12/95 12:44 PM

GsOffsetting

Mark Beardsley

LIBGS

Could someone how to use GsSetOffset and/or GsSetBuffOffset (what's the difference?) ?

I have a 2D screen that I need to be able to shake, and I would like to be able to use a general offset to shift all the sprites (rather than adjust each one's position individually). Can a simple x and y drawing offset be done this way?

I tried to enter a value using GsSetOffset, but they didn't seem to have any effect. The manual states that I need to decide whether to use a GTE offset or a GPU offset. How and why do I do this?

Any help would be appreciated. Thanks.

---

10/12/95 4:48 PM

Re(2): GsLib's OT hashing logic

Blake E. Senftner

Angus

LIBGS

Angus:

I've been walking through my logic, and the bunching that I'm getting is correct for the items in my scene... Oh well...

I'd like to formally request a hook for custom hashing to be placed into the GsLib.

-Blake

---

10/12/95 2:06 PM  
GsLib's OT hashing logic  
Blake E. Senftner  
LIBGS

The logic for GsLib's placing of a primitive into the ordering table appears to be:

- 1) read SZ fifo to get screen transformed Z values
- 2) using one of the SZ values, it is modified:  $sz \gg= (14 - OT\_LENGTH)$
- 3) The result of that modification is the ordering table index the prim will be placed into.

Is this correct?

I'm walking my ordering table to see how my primitives are being placed, are they all bunched together, or evenly spread out...? Well, they are all bunched together near the front of the OT.

(My ordering table has a "length" of 6, meaning 64 entries.)

If I want to use this library for my objects, I need to use this same hashing method to register my own custom objects into the ordering table. Or is there another way to use GsLib that allows me to use my own logic for the ordering table hashing?

-Blake

---

10/12/95 1:02 PM

Re: GsOffsetting

Angus

Mark Beardsley

LIBGS

Mark,

In lib 3.2, the GS library engineer made a lot of the Gs internal data structures extern. So, you can fuck with something like GsDRAWEnv and try that. GTE offset is used to set the origin to the center of the screen. GPU offset keeps it at the upper left. Just depends on how you want to offset your graphics.

GsSetOffset does the following If GPU offset, update the GsDRAWENV ofs to it and call

PutDrawEnv If GTE offset, call SetGeomOffset with the new values

GsSetDrawBuffOffset is GsSetOffset but instead of passing in x and y, it uses the stored off X and Y. You can set these x and y with GsSetOrigin(x,y).

SO

GsSetOffset(x,y) and GsSetOrigin(x,y) GsSetDrawBuffOffset

ARE THE SAME.

Hope this helps.

Angus

---

10/12/95 2:43 PM

Re: GsLib's OT hashing logic

Angus

Blake E. Senftner

LIBGS

There is no hook for your own sorting. However, the bunching should not happen. Maybe there is a data error on your part?

Angus

---

10/12/95 1:11 PM

Re: multiple pmd

Angus

cary hammer

3D Development

Multiple PMDs is not a big deal. Just sort each object separately. Remember a file is just a depository for objects. You can have as many PMD files as you want and as many objects as you want. They all come together when you call GsSortObject. You will only have 1 sort list. The sort list does not understand objects, it only understands polygons. You can send separate objects to the sort routine and it will be sorted appropriately.

Something like for (i=0; i < 10; i++) GsSortObject50;

If you have 10 objects they will be handled appropriately.

As far as getting 1 rsd file, you can still have multiple pmd files for each.

Angus

---

10/23/95 11:07 AM

GsSortFlipSprite???

jeffrey Hall

LIBGS

I'm noticing some odd behavior in GsSortFlipSprite. It happens when I try to draw a sprite whose texture is on the right edge or bottom edge of a t-page boundary. The sprite's texture is an 8-bit image and the texture appears corrupt. For example, if the u value in my GsSPRITE structure is 0xf0, and the width is 0x10, then the sprite doesn't render properly.

Also I looked in vain for information about flipping. My assumption is that there is an undocumented bit in the GsSPRITE member attribute that handles this? I read the faq and there was some mention but I couldn't glean what I needed to know from it. Any help on these issues is greatly appreciated. Thanks, Jeff Hall

---

10/27/95 11:29 AM

Polygon drawing limit?

FLORIA L. ROSS

LIBGS

BETA 1.0 6/8/95

I am having problems when displaying large numbers of polygons. I am using LIBGS, and I seem to be only able to put about 1200 texture mapped + gouraud shaded polys on screen at 60fps. I thought the limit was supposed to be something like 3000 texture mapped polys at 60fps, at least theoretically. I am using TMDs and when I tried using PMDs the problem lessened somewhat but not by much. I am not doing any other external processing. Is this a real limit that I'm hitting or is there some other more efficient way to display polygons?

---

10/27/95 12:34 PM

Re: Polygon drawing limit?

Blake E. Senftner

FLORIA L. ROSS

LIBGS

Try fitting your textures to texture cache sizes. If a texture does not fit into the texture cache you get a performance hit from having to reload texture data repeatedly for the rendering of a single polygon.

16 bit cache 32 by 32 8 bit cache 64 by 32 4 bit cache 64 by 64.  
I think these are the right sizes...  
-Blake

---

10/27/95 4:08 PM

Re(3): Polygon drawing limit?  
Blake E. Senftner  
FLORIA L. ROSS  
LIBGS

You can't set the texture cache size, it is a hardware location inside the GPU that gets loaded with the most recently referenced texture data. The only thing you can do is make sure that your textured polygons do not reference an area that exceeds the texture cache's size.

The UV's in a textured polygon are what reference the texture data. So, break up your polygons such that they do not exceed the sizes:

4 bit 64 by 64 8 bit 64 by 32 16 bit 32 by 32

It may be a bit more complicated than this. It makes some sense that the texture cache "pages" would be aligned on a grid. Much like the texture pages are. But I've gotten conflicting reports on that fact. Just to be safe, I've been aligning my textures to a grid within the above bounds. I'd also recommend using PMD objects. They are the fastest.

-Blake

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10/27/95 2:26 PM

Re(2): Polygon drawing limit?  
FLORIA L. ROSS  
Blake E. Senftner  
LIBGS

Sorry if this is a dumb question, but what is the texture cache? And how do I set its size? By the way I did try using TMDSORT on my objects and it did improve performance somewhat but still not that much.

---

10/27/95 1:56 PM

PMD lighting problems and slow ReadTMD  
David Cartt  
LIBGS

I converted my TMD objects (drawn using GsSortObject5) into PMD objects (drawn using GsSortObject3). I used TMD2PMD with the options -b -l +s. When the PMD objects were drawn they had no lighting effects and some of the objects crashed the library. Is lighting not yet implemented for PMD's? If it is implemented why isn't it showing up? Any ideas on why it would crash on certain objects but not on others. All objects are lighted correctly and none crash when drawn as TMD's.

It seems that opening an object and getting all the polygons using OpenTMD and ReadTMD is much slower (about 8 times) than drawing the object using GsSortObject5. I am not doing any processing on the polygons when I get them with ReadTMD. Why is it so slow? Is it because GsSortObject5 has been highly optimized, doesn't use OpenTMD and ReadTMD, or is written in assembler?

---



10/30/95 11:51 AM

Re: PMD lighting problems and slow ReadTMD

Angus

David Cartt

LIBGS

PMD is preshaded only. PMD gets its performance because it reads the u,v values once and ignores them for the rest of the time. It would explain the crashes. As for OpenTMD, yes Gs library is written in hand tuned assembly that fits in the ICache. I think ReadTMD is C and probably falls out of the ICache.

Angus

---

11/1/95 9:07 AM

Re(2): PMD lighting problems and slow ReadTMD

Dave Ross

Angus

LIBGS

Speaking of the ICACHE, is there a better description of its operation than is found in the hardware manual (that description is as clear as mud). My simplest question about the ICACHE is "on a cache miss, how many bytes are then read into the icache?"

---

11/1/95 10:13 AM

Re(3): PMD lighting problems and slow ReadTMD

Angus

Dave Ross

LIBGS

The I Cache refill size is 4 words, or 16 bytes. THAT is the size of a cache line.

Angus

---

11/2/95 5:30 PM

LIBGS polygon sort disable

David Cartt

LIBGS

Is there any way to inhibit the Z sorting of GsSortObject5? I have an object that I would like to draw in the order that the polygons are defined in the TMD file.

Is that what the ZIGN bit in the object attribute is for? I tried it and it seemed to have no effect.

Can it be done using an ordering table of length 1 for the GsSortObject5 call (so all polygons are put in the same OT entry)?

---

11/3/95 6:01 PM

GsCOORD2PARAM

Silas S. Warner

LIBGS

Documentation

I have noticed that there is no documentation on the structures GsRVIEW, GsCOORDINATE, and GsCOORD2PARAM. From this I deduce that the GsRVIEW and GsCOORDINATE structure pairs are obsolete, and I should use GsRVIEW2 and GsCOORDINATE2 with GsCOORD2PARAM.

However, the RWVIEW and RWVIEW2 structures are identical, as are the GsCOORDINATE and GsCOORDINATE2 structures (except for the SUPER pointer.) I take it, therefore, that the

choice of functions, GsSetRefView2 or GsSetRefView, defines what type of parent GsCOORDINATE is used.

I also take it that GsSetRefView actually creates a temporary GsCOORDINATE2 matrix, which is then defined by the GsCOORDINATE in the same way that a GsCOORDINATE2 is defined by a GsCOORD2PARAM.

Please tell me if I can expect to continue to use GsRVIEW. I plan to mix GsRVIEWs for fast-moving objects with GsRVIEW2s for mostly stationary objects. Is this permissible?

Also, please make sure that GsCOORD2PARAM is explained in the docs. I had to look in <libgs.h> to find a definition, and then it became easier to create it as multiple components in my objects.

Also, what is the equivalent of 1 to 1 scale in the SCALE vector of the GsCOORD2PARAM? I am assuming it is ONE: that is, 4096.

Silas Warner

---

11/7/95 7:01 PM

GsLinkObject4

Chris E. Reese

LIBGS

I have a question regarding the effect that the function GsLinkObject4 seems to have on the TMD data. I've noticed that immediately after calling GsLinkObject4, the long value representing the 'priminfo' for the first packet in the first object in the TMD is being modified. Prior to the call to GsLinkObject4 the value for the first 'priminfo' is 0x04030020. After the call to GsLinkObject4 the value is changed to 0x80000020. All the other 'priminfo' values in the object remain unmodified.

This presents a problem for my code, since I am utilizing the TMD data to attain color information for each of the primitives. I am unable to use the 'ilen' bit values in the priminfo to loop through the primitive packets, since the first 'priminfo' is corrupted.

Is this a bug or is there an explanation for this that I have not been able to find in the docs? I can always work a hack around this by saving off the value before the GsLinkObject4, but I would rather not have to do that.

Chris Reese Edietic, Inc.

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11/8/95 11:44 AM

More on Offsetting

Dave Ross

LIBGS

Angus

TO follow on to discussion of GS offsetting of a few messages ago, the ref. manual discussion of offsetting (eg, in explanation for GsDefDispBuf) say to use GsInitGraph to indicate whether to use GPU or GTE offsetting, but in GsInitGraph there is absolutely no reference to this. Anybody know what the deal is?

---

11/8/95 3:30 PM

Difference between OBJ4 and OBJ5

FLORIA L. ROSS

LIBGS

3DS Beta 1.0

Can someone explain what is the difference between GsDOBJ4 and GsDOBJ5? I know that GsDOBJ3 is for PMDs. Thanks.

---

11/8/95 10:49 AM

Re: GsLinkObject4

William Botti

Chris E. Reese

LIBGS

Hi Chris- I believe the "problem" is that the GsLinkObjectX routines convert the relative TMD data addresses into absolute addresses. This should be in the documentation - check under GsLinkObject2. Will B Agile

---

11/9/95 2:51 PM

Re: 3D Clipping

Dan Burnash

LIBGS

Yoram Berkowicz

>I frequently run into 3D clipping problems when using LIBGS. >The NEAR CLIP value is always set to half the PROJECTION distance. >Any attempt to change this value by calling GsSetNearClip renders no result. >It seems that LIBGS insists on using the same value and ignores calls to GsSetNearClip.

Check out the new docs. You won't find GsSetNearClip or GsSetFarClip, they are dummy functions in the library now. They set static variables that are never used. Page 147 of the 3.0 overview doc sums it up pretty well: "in libgs, 3-dimensional clipping is performed at the application level. Accordingly, library level 3-dimensional clipping is not supported for other than the default values."

Time to punt. :-)

Dan Burnash

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11/9/95 5:21 AM

3D Clipping

Yoram Berkowicz

LIBGS

Hello,

I frequently run into 3D clipping problems when using LIBGS. The NEAR CLIP value is always set to half the PROJECTION distance. Any attempt to change this value by calling GsSetNearClip renders no result. It seems that LIBGS insists on using the same value and ignores calls to GsSetNearClip.

If anyone has an insight on how to change the NEAR CLIP value used by LIBGS this would be most helpfull. Any advise about how to avoid the problem would also be welcomed.

Thanks, Yoram.

---

11/10/95 12:12 PM

formal enhancement request

Blake E. Senftner

LIBGTE

Kristine Severson

I'd like to formally request an enhancement to all the routines that place rendering primitives into ordering tables. Specifically the routines like RotRMD\_XXX, RotRMD\_SV\_XXX and RotPMD\_XXX are the ones I'd like to see modified.

Note that I'm requesting a TRANSPARENT modification that will not affect anyone's current usage of these routines, only add new capability.

All the specified routines use the following logic to place a rendering primitive into an ordering table:

```
orderingTableHashLocation = primitiveZLocation >> (14 - orderingTableBitLength) if
(orderingTableHashLocation < 0 || orderingTableHashLocation >= (1 <<
orderingTableBitLength)) { clip this primitive } else { place primitive into ordering table }
```

The enhancement that I would like is the ability to specify my own hashing function. If a callback function could be specified that performs this logic, then only those people that want to specify their own hash function would have their use of the GTE library affected.

Additionally, if that hash function were in charge of placing the primitive into the ordering table itself, then I'd be able to catch primitives comming "out the back door" of these routines and perform some special processing that I have in mind.

Is this enhancement possible? Probable? No way possible with current schedules? Any information about this I would be happy to receive.

Thanks. -Blake

---

11/12/95 8:18 PM

Re: formal enhancement request

Silas S. Warner

LIBGTE

I would like to second this request. And I would especially like it if it would also intercept the ROT\_ calls done during GS library functions as well as the raw calls.

Silas Warner

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11/13/95 4:41 PM

Question about Packets

FLORIA L. ROSS

LIBGS

3DS Beta 1.0

I am still somewhat confused as to what packets are and how they work. Am I right in assuming that they are like primitives that are created when you GsSort an object? If so, then can someone explain to me why this happens:

In the tmdview/tmdview5/tuto1.c demo which does a split-screen mode, they use 2 seperate copies of the same object (but still using the same model data for each copy) to draw the top and bottom screens. I am wondering why they need to do this. If you GsSort an object, then lets say maybe move the camera, and then GsSort the same object again, to a seperate OT, and then draw both OTs, won't that draw the original object and the new translated object? When I tried this all it did was draw the translated object twice. So does this mean that when you GsSort an object, unique copies of that object's primitives are created? So that when you GsSort the same object again, it will just modify the same packets? Or am I just totally confused and not know what I'm talking about?

---

11/13/95 4:16 PM

What is value 1 in SCALE in GSCoord2PARAM?

Silas S. Warner

Developer Support  
LIBGS

I am rewriting this question because I did not get a previous answer, and the question was buried deep inside another message.

What is the value that should be put in the SCALE vectors of a GsCOORD2PARAM to get a scale of 1:1? Is it ONE, or 4096?

Please note that the original note complained that GsCOORD2PARAM is not explained in the documentation.  
Silas Warner

---

11/14/95 2:13 PM

MORE Packet Questions

Sky Lounge

Silas S. Warner

FLORIA L. ROSS

If I'm mucking with the vertices & normals within a TMD-specified object, but I'm not mucking with the vertex & normal indices specified in the packets, is there any "safe" time that I can do so? It seems that when I have attempted doing so, the vertex & normal changes are completely correct & manifested on the screen, but the lighting effect is very, very erroneous.

Clues?

---

11/14/95 12:53 PM

Re: Question about Packets

Silas S. Warner

FLORIA L. ROSS

LIBGS

Packets are the primitive instructions sent to the GPU (graphics processor, or drawing unit) that actually change the video RAM and thus draw to the screen. Each packet, or primitive, has a pointer that gives the address of the next packet. The GPU, independently of the main processor, follows the thread of packets and obeys each one.

When you do any of the GsSort functions, you start with an OT. This is just a set of entry points for lists of packets. The GsSort function converts all these lists to just one, by setting the pointers at the ends of each list to the primitive at the start of the previous list. (Note that the LAST list is done FIRST: that way, primitives placed in earlier lists will overdraw ones placed in later lists.) Then the GsSort function passes the address of the very start of the unified list to the GPU, and goes away.

While you are preparing the next frame, the GPU runs through the list of primitives in memory and uses each one to alter video RAM, and therefore the screen. The DrawSync function tells you when the GPU is through with this process. Until the GPU is through, anything you do to the primitives in memory will change the way the GPU draws the screen. Especially changing the links to the packets (like reusing them in another OT) will cause the GPU to lose track of the structure, and in general to mess up.

For that reason, structures like PMDs include two copies of each primitive. One of the copies is being set up by your CPU, while the GPU executes the other copy.

Hope this helps.

Silas Warner

---

11/14/95 1:54 PM

Re(2): Question about Packets

FLORIA L. ROSS

Silas S. Warner

LIBGS

Thanks!! IT cleared things up quite a bit. BTW I think I found the solution to the problem I was having. Guess if I use GsDOBJ5 it uses preset packets (whatever those are) which are different from the packets in GsDOBJ2. If I use GsDOBJ2 I can resort the same object to create separate drawing primitives, not so with GsDOBJ5.

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11/14/95 5:39 PM

Re: MORE Packet Questions

Silas S. Warner

Sky Lounge

FLORIA L. ROSS

The "packets" in TMDs are NOT the packets sent to the GPU. They are skeleton structures, values from which are copied to the GPU packets before sending. Therefore, manipulating data inside a TMD (but NOT a PMD) should have no effect on the packets already drawn.

I have no idea how the lighting effects are computed inside a TMD. I suspect that they are done by some kind of external table, computed once, that alters the R,G,and B values of the packets as sent. I do know that the vertex normals are crucial to calculating lighting effects, so I suspect that you are messing up the normal table somewhere. But I have no idea of the details.

Silas Warner

---

11/14/95 9:04 AM

Re: What is value 1 in SCALE in GSCCOORD2PARAM?

Dan Burnash

LIBGS

>What is the value that should be put in the SCALE vectors of a GsCOORD2PARAM >to get a scale of 1:1? Is it ONE, or 4096? The correct value is ONE, which is #define'd in libgte.h as 4096.

---

11/17/95 7:35 PM

Problem with Active Sub-Division functions

Roy Eltham

LIBGS

Angus

I attempted to use the new Active Sub-Division functions in Lib 3.3 and I found that any object drawn thru those new functions end up in the wrong place in the OT. Basically, everything that's drawn via the Active Sub-Div functions ends up in front of everything else that is drawn via the non sub-div functions. It may be that the Sub-Div functions are not using a reversed OT like the other GS functions. Or maybe I just missed something.

They do work as far as sub-dividing goes. However, it appears that the lib (or whatever) is clipping the poly(s) based on the original non-divided poly's vertices. For example, when any vertex in a "large" poly gets closer than  $h/2$  in z then the whole thing clips instead of the single sub-division containing the vertex that crossed the boundary. Is this as intended? I hope not.

Again maybe I've missed something.

Roy Eltham Regal Productions

p.s. If it matters, I'm not using the "normal" sized OT, I use a bigger one because I currently have enough memory. I believe I'm using a 13 and the norm is 12 (something like that).

Perhaps the active sub-div functions are hard coded for a normal sized OT? I'll have to experiment.

Any help will be appreciated!

---

11/20/95 5:01 PM

GsSetRefView2 doesn't work for me

Silas S. Warner

Developer Support

LIBGS

I have the following structures set up in my program: WORLD | V

GsCOORDINATE2 -> GsCOORD2PARAM | V GsRVIEW2

where GsRVIEW2.super points to GsCOORDINATE2, GsCOORDINATE2 points to WORLD, and GsCOORDINATE2.param points to GsCOORD2PARAM. In my code I do the following: 1) Alter rotation or translation values in the GsCOORD2PARAM. 2) Set the flag in GsCOORDINATE2 to zero. 3) Call GsSetRefView2(GsRVIEW2). 4) Project some POLY\_FT4s onto the screen with RotAverage4.

Problem 1: the GsCOORDINATE2 does NOT respond to changes in the GsCOORD2PARAM. The matrix values remain the same, even though the recomputation flag is set. In order to change the GsCOORDINATE2, I have to manually RotMatrix, ScaleMatrix and TransMatrix from the GsCOORD2PARAM values to the GsCOORDINATE2.coord matrix.

Problem 2: the GsRVIEW2 does not rotate or translate even when the GsCOORDINATE2 matrix is changed. Changing the parameters in the GsRVIEW2 will change the position on the screen, but the existence of the parent matrix is ignored even though the parent GsCOORDINATE2 is recomputed (and the flag set) when GsSetRefView2 is called. This is true even if the GsCOORDINATE2 matrix parameters are manually changed.

Clearly, I'm doing something wrong. I am using the sample program TMDVIEW2 as my template: is there some step I'm leaving out?

I'd be glad to forward sample code to you, but be warned: the code is embedded in some complex structures and I would have to spend several days making the simple example.

I'm just looking for suggestions at this point. The links have been tested and they do point to the correct points.

Silas Warner

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11/20/95 6:19 PM

Re: GsSetRefView2 doesn't work for me

Silas S. Warner

Developer Support

LIBGS

Further investigation yields the following results:

Yes, it is necessary to manually transfer data from a GsCOORD2PARAM to a GsCOORDINATE2. I have now done this.

RotAverage4 does NOT make use of the LIBGS transform vectors. In theory, I should be able to do as follows: PushMatrix(); SetRotMatrix(&GsWSMATRIX); SetTransMatrix(&GsWSMATRIX); : the RotAverage4s : PopMatrix();

In practice, this yields a totally wacked-out vector transformation. What am I doing wrong?

Silas Warner

---

11/27/95 11:13 AM

Re(2): 3D Clipping

Roy Eltham

Dan Burnash

LIBGS

If LIBGS "expects" the application to do the 3D clipping, then shouldn't it follow that LIBGS would provide a mechanism to allow the application to do so? I've been grappling with this for a while now. Since LIBGS functions read TMD data, do the Transformations, calc the lighting,

and perspective all in one call for a whole OBJECT, there seems to be no place to "insert" code to deal with the TMD primitives that LIBGS decides not to draw.

Currently, I've been trying to modify the TMD data before passing it to LIBGS, then restoring the TMD data afterward. It seems like this should work, but it doesn't, yet.

Please if there is something I've missed, or something anyone out there can suggest, let me know.

Roy Eltham

p.s. I'm using the GsLinkObject4/GsSortObject4 stuff that uses GsOBJ2 structures.

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11/27/95 3:54 PM

Forcing GsCOORDINATE2 to recompute

Silas S. Warner

LIBGS

Developer Support

Is there a call in LIBGS or LIBGTE that forces the recomputation of a GsCOORDINATE2? I have a GsDOBJ2 that points to a GsCOORDINATE2. When I call GsSortObject4 with this GsDOBJ2, the associated GsCOORDINATE2 is not recomputed. The values of GsCOORDINATE2->workm remain at zero, the value of GsCOORDINATE2->flg remains at zero, and the GsDOBJ2 is displayed in world coordinates -- i.e. facing the same way at 0.0 with respect to the view, no matter how the view is reoriented.

The only way I can force the GsCOORDINATE2 to be recomputed is to use a dummy GsRVIEW2. I point this GsRVIEW2->coord2 temporarily at the GsCOORDINATE2 I want, and do GsSetRefView2. Then, before doing any sorts, I reset the view to my intended direction.

This seems to be the only way to force the GsCOORDINATE2 to recompute.

I have checked that the GsDOBJ2 pointer really points to the GsCOORDINATE2, that the GsCOORDINATE2->coord is being reset and that the GsCOORDINATE2->flg is zeroed before calling GsSortObject4. What am I doing wrong?

Silas Warner

---

11/27/95 9:33 AM

How to do an on-screen check

David Cartt

LIBGS

Is there an example of how to check if a point (a sphere would be better) will be visible on the display screen?

I am using the LIBGS routines to draw many objects. I think I could improve the frame rate if I could determine if an object is visible before drawing it. If it was not visible then it wouldn't have to be drawn.

Thanks for any help you can give.

---

11/27/95 11:37 AM

Re: GsLinkObject4

Roy Eltham

Chris E. Reese

LIBGS

I have discovered (via looking at the sample\graphics\tmdview\lowlevel example) that the LIBGS link and/or map modeling data functions modify the "priminfo" field of the TMD primitives. What it does is change the lower word (normally ilen and olen) to me the number of primitives of that type.



Example, if you have a TMD that has 4 flat colored tri's followed by 3 flat textured tri's, the "priminfo" of the first of the 4 flat colored tries will have the lower word changed to 4, and the "priminfo" of the first of the flat textured tri's will be changed to 3. If used these values in the "sort" functions. They are passed into the "GsTMDfast/div???" type functions that are in libgte.lib, to indicate how many TMD primitives to attempt to create packets for.

If you need to know the ilen and olen of a TMD prim that's been modified you can use the ilen and olen of the next TMD primitive. I'm guessing that LIBGS doesn't used the ilen and olen values, and just determines the values based on the "mode" or "code" part of the priminfo dword.

Roy Eltham

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11/27/95 5:30 AM

Re: MORE Packet Questions

Yoram Berkowicz

Sky Lounge

Silas S. Warner

I have an educated assumption to why the lighting is effected.

When you manipulate the normals of a model this changes the way it responds to light. The direction of the normal is important but all light calculations assume that the normals are normalized. That means that the length of the normal vector is ONE. If your manipulation of the model's normals does not preserve the unit length of the normals lighting is incorrect.

Renormalize the normals after manipulating them or manipulate in a manner that preserves length.

At your service,

Yoram.

---

11/28/95 4:02 PM

Re: How to use active sub-division

Silas S. Warner

David Cartt

LIBGS

If you are in LIBGS, using GsDOBJ2s or GsDOBJ5s, you set bits in the attribute field of the GsDOBJ2 or GsDOBJ5. The attribute bits are called GsDIV1 thru GsDIV5. They are defined in LIBGS.H, and are ORed with the attribute field to divide the polygons. NOTE that they will ALWAYS divide up the polygons: you can't leave them on permanently!

Silas Warner

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11/28/95 4:51 PM

Re: How to use active sub-division

Roy Eltham

David Cartt

LIBGS

You can only use active subdivision with the Gs????Obj4 calls (i.e. GsOBJ2). You also need to use the GsLinkObject4J() call (note the extra J) which requires you to init a \_GsFCALL4 data structure. An example of setting up this structure is in LIBGS (it's at the end called jt\_init4).

There is also an example of setting up this structure for active subdivision. Once you setup all that, then you need to set the attributes of your object for subdivision (using the GsDIV1 - GsDIV5 defines). There is also a macro in LIBGS called something like GsSetzwh(), that you use to set the Z, width and height you want the active subdivision to kick in at.

I figured all this out myself via trial and error, and it does only divide polys that fit the criterion

set by the macro above. However, I found that it doesn't seem to put the primitives into the OT correctly (anything drawn via the active-subdivision functions ends up on top of anything not drawn with active subdivision for one, and other OT ordering problems occurred). I also found that it didn't help with near clipping. If any part of the undivided poly gets closer than H/2 in Z or any part of the poly goes outside of the 2d ranges (+-1023/+511) or the poly is wider than 1024 or taller than 512 then the whole poly clips (this I think is done before the subdivision, which is the problem). I would think that it could subdivide the poly and only clip the parts that violate the above limitations.

Oh well, I'm still waiting for a response from SONY on this and other issues.

Roy Eltham

p.s. I wish they would at least acknowledge my messages, as far as I know they haven't seen em yet.

---

11/28/95 1:02 PM

Duh...(Was:Re: Forcing GsCOORDINATE2 to recompute

Silas S. Warner

Silas S. Warner

LIBGS

Thanks to Developer Support, I got the problem fixed. I was unaware that I had to do GsSetLsMatrix for each object: I thought GsSetLsMatrix needed only to be done once for each view.

A more complete example in the library overview might be helpful.

Silas Warner

---

11/28/95 3:59 PM

GsSetRefView2...what matrix?

Silas S. Warner

LIBGS

Is GsLSMATRIX the matrix set by GsSetRefView2? If so, can I modify this matrix directly, changing the view as necessary?

I need to use RotTransPers to transform some 32-bit vectors. They will be within 32767 of my viewpoint (or I can check to make sure they are) but RotTransPers persists in adding the 32-bit values of the T part of the ViewMatrix. If I just chop off the upper 16 bits of the T, then replace the view matrix, what I want to do will work.

Can I do this by grabbing GsLSMATRIX, chopping the T values, then replacing it... and restoring GsLSMATRIX after I've done with it?

Silas Warner

---

11/28/95 3:58 PM

How to use active sub-division

David Cartt

LIBGS

How do you use the active sub-division of polygons that was mentioned in an earlier message?

I found references to it in LIBGS.H and the 3.3 update doc but nowhere else. There was not enough information in these two places to figure out how to use it.

Do you have any examples?

---

11/29/95 7:02 PM  
Re: Messages Read? (was How to use active sub-division)  
Roy Eltham  
Dave R. Scheele  
LIBGS  
Thanks for the tip. :)  
Roy Eltham

---

11/29/95 8:31 AM  
Messages Read? (was How to use active sub-division)  
Dave R. Scheele  
Roy Eltham  
LIBGS  
>> p.s. I wish they would at least acknowledge my >> messages, as far as I know they haven't seen em yet.  
I use the "History" selection from the Message menu in FirstClass to see who has read my messages. That way, I can see that Sony employees HAVE actually read my messages, and just decided to ignore them ;)  
Dave

---

11/30/95 1:01 PM  
Re(3): 3D Clipping  
Angus  
Roy Eltham  
Dan Burnash  
Libgs has no mechanisms for 3d clipping. If you want to do 3d clipping you can use the ClipXXX functions. Those functions have problems because the GPU does some strange clipping on the results. You will see some strange warping with the textures. You will therefore need to sit on the libgte and libgpu with your own libraries. The libgs is a general purpose library and can not be everything to everybody. Sorry. So the general solution is to do polygon subdivision and sit on the libgte and do your own 3d clipping if you want.  
Angus

---

12/5/95 2:53 PM  
tmd file for prev msg  
cary hammer  
LIBGS

tri1.tmd           1K  
LIBGS  
Sorry, pilot error. Here is model with FCE set that won't display back polygon face.

---

12/5/95 2:51 PM  
Double sided polygons  
cary hammer

LIBGS

According to the TMD file format docs, one should be able to make a polygon double sided by setting the FCE bit in the flag portion of the primitive packet header (the 18th bit, i believe). If we set this bit, nothing seems to change. Our one sided polygon remains a one sided polygon. We tried with both GSOBJ2 and GSOBJ5. I've included the test tmd model -- the 1st polygon is the one with FCE set.

Are we doing something wrong? Is the FCE a fantasy bit? Do we just need to explicitly declare another polygon with the same vertices but in opposite order?

Thanks in advance. Mark Nicely Unexpected Development

---

12/7/95 7:40 PM  
Light Source Shading  
Chris E. Reese  
LIBGS

Is there a way I can selectively turn off light source shading for certain objects, specifically TMD data? I have objects that are texture mapped that lose a lot of their color and become muddy looking due to the light source shading. I want those objects to display at their full brightness level. Anyone have any suggestions?

Chris Reese Eidetic, Inc.

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12/8/95 8:45 AM  
Re: GsSetRefView2...what matrix?  
Thomas Boyd  
Silas S. Warner  
LIBGS

Yes, let me know if this does not work. Tom -----

Is GsLSMATRIX the matrix set by GsSetRefView2? If so, can I modify this matrix directly, changing the view as necessary?

I need to use RotTransPers to transform some 32-bit vectors. They will be within 32767 of my viewpoint (or I can check to make sure they are) but RotTransPers persists in adding the 32-bit values of the T part of the ViewMatrix. If I just chop off the upper 16 bits of the T, then replace the view matrix, what I want to do will work.

Can I do this by grabbing GsLSMATRIX, chopping the T values, then replacing it... and restoring GsLSMATRIX after I've done with it?

Silas Warner

---

12/11/95 10:25 AM  
Re: How to do an on-screen check  
Dan Burnash  
LIBGS

The Gs library isn't setup to accomplish this, but you may want to look through the gte functions to see if they can be used with your game to save time drawing.

Dan Burnash

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12/11/95 10:28 AM

Re: Double sided polygons  
Dan Burnash  
LIBGS

I am looking into this, and will get back to you.  
Dan Burnash

---

12/12/95 1:05 PM  
Shared point groups  
Kerry J. Ganofsky  
LIBGS

What is the advantage of the shared point groups in PMD format?  
I would like to be able to batch-transform all vertices, group by group, and then use the vertex indices stored with each primitive to look up the transformed vertices.  
It looks like the current situation is either: a. Independent vertices (3 transformations per triangle) b. shared vertices (3 vertex lookups + 3 transformations per triangle)  
Of course what I want is one batch of vertex transformations per object and then 3 lookups per triangle, but I don't see a way of doing that with the libraries currently. Does this have to be done manually?  
Thanks Scott HVS

---

12/15/95 7:43 AM  
Fwd: Re(2): Dual sided polygons  
Tim Crossman  
LIBGTE

This is not sounding too promising. Do we or do we not have this documented feature? I'm sure someone has run into this before, unless it is a recently introduced bug in the latest library revision. I'm sorry to press, but I have to do something about my lampshades, and doubling the poly count on them is my least favorite solution. Tim

---

12/20/95 2:18 PM  
Re: Fwd: Re(2): Dual sided polygons  
Mark Slemko  
Tim Crossman  
LIBGTE  
I have tested this before in lib 2.6 and earlier... Two sided poly's were not possible.

---

12/28/95 4:24 PM  
Problem with PMDs  
Teh Kao Yang  
LIBGS

I am trouble with displaying the PMD objects that I have created with the TMD2PMD utility. When I try to display certain PMD objects they cause massive polygon flickering all over the screen, even on objects that would otherwise display ok by themselves. For example when I ran

the shuttle1.tmd object (then one with the shuttle demo) through TMD2PMD the resulting PMD object worked fine. But when I tried some of the objects I created on my own I get this flickering problem. It's not a high polygon count object or anything. Does anyone have any ideas what I might be doing wrong? BTW I am using the GsDOBJ3 routines to display my PMD objects.  
-TK

---

12/29/95 8:53 AM

Re: Fwd: Re(2): Dual sided polygons

Dan Burnash

LIBGS

cary hammer

Double Sided polys set via the TMD file appear to still not be possible. I have been unable to confirm this with SCE, and they are now on vacation until January 8th or 9th. When I do get an answer, I will forward it on.

Dan Burnash

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12/29/95 8:50 AM

Re: Problem with PMDs

Dan Burnash

LIBGS

Teh Kao Yang

It sounds like a Z ordering problem. Since only one Z value is used for each polygon, certain objects need to be subdivided, or Z ordered in some other way, to avoid this problem.

If this does not appear to be the problem, send me your example, including PMD, and I will check it out here.

Dan Burnash

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1/3/96 3:03 PM

GsPresetObject Errors

Michael K. McCarty

LIBGS

When I'm loading my TMD data I've been getting the error "GPU CODE 41H not assigned" while I'm calling GsPresetObject. The data appears correctly, but after a long delay and hundreds of those messages. I think the error is in the TMD, but where should I start looking.

Michael McCarty

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1/4/96 5:39 PM

Re(2): Problem with PMDs

Teh Kao Yang

Dan Burnash

LIBGS

PMD.ZIP 19K

LIBGS

Hi Dan, Thanks a lot for your response. I have included a sample program which tries to display PMDs. Right now I have it set up to display 1 or 2 PMDs. You can change the # by changing the OBJS definition in the beginning of the program. When I display 1 PMD everything is fine. But

when I try to display 2 then both PMDs are barely visible. BTW this is a slightly modified version of the tuto2.c program found in psx/sample/graphics/pmd/ BTW, I am trying to use PMDs because I have found that TMDs, even with GsDOBJ5, doesn't provide sufficient performance. I have only been able to put around 3000 textured polys on screen with TMDs at 60fps.

Overall it seems that when I try to use PMDs with LibGS it is much less efficient than with LibGPU. Is there really a big difference? I am hoping to be able to stick with LibGS for most of my graphic routines. Thanks again for your help....

---

1/5/96 3:08 PM

Re: GsPresetObject Errors

Dan Burnash

LIBGS

Michael K. McCarty

>When I'm loading my TMD data I've been getting the error "GPU CODE 41H not assigned" while I'm calling GsPresetObject. The >data appears correctly, but after a long delay and hundreds of those messages. I think the error is in the TMD, but where >should I start looking. The 41H refers to the primitive command located in the TMD file. For some reason the TMD file has a bad primitive type in its list. The primitive type is one or more of: Flat, Textured, 3 sided, Gouraud, etc...

Hopefully this helps,

Dan Burnash

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1/8/96 7:44 PM

LIBGS performance limits?

Teh Kao Yang

LIBGS

Hi there, I am really interested in finding out what are the performance specs of polygon rendering with LIBGS. I am working mostly with GS, and I have only been able to render the following # of polys while maintaining a steady 60 fps:

a max of around 2500 gouraud shaded polys a max of around 1800 texture mapped polys

And this is with lighting effects being used. Are these specs way off what GS is supposed to be able to do? I am using GsDOBJ5 by the way. I set my OT length to 10. Am I not doing something right, or is GS really this slow?

-TK

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1/9/96 12:26 PM

Re: LIBGS performance limits?

Angus

Teh Kao Yang

LIBGS

I guess "only" is a relative statement. Anyway, using the latest libraries you should get the best performance. At 1800 texture mapped polys at 60, that is about 108,000 polys/second which is about the performance you can expect. This is pretty much hard coded.

What is not hardcoded is "how the polygons appear." With effective use of textures, you can make your game appear richer than it is. You can reuse textures effectively throughout a frame and you can "angle" your polys so you get the best picture with the least amount of textures.

With techniques like MIP mapping in software, I think you can gain better images.

My point is this: the hardware is "limited" at some point in how many polys it can do. There are software techniques that you can use to optimize the appearance of these polys on the screen. That's the point: do some of your own homework in the software realm and you will get better Playstation games.

The Playstation game console is an awesome price performance machine. Developers erroneously think they need more polygon numbers out of the hardware than they really do. By using Gouraud shading effectively, you can use less polygons. Please do not whine about polygon numbers and limited vram.

You can also do software MIP mapping. You can swap texture resolutions at different distances in order to get great looking images.

I am not being polemical: I am just challenging developer's notions of what is possible. The Playstation like any other computer in creation has hardware limitations. But those limitations set a new high water mark, and in combination with effective software, games running at 60 frames and 320x480 resolution are possible. You just have to do the most with what you got.  
angus

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1/9/96 11:56 AM

Re: LIBGS performance limits?

Blake E. Senftner

Teh Kao Yang

LIBGS

How to get speed from GS:

1) use PMD objects, or your own PMD like preinitialized prim object structure 2) seriously question the bit depth of each texture, choosing the lowest possible or no texture 3) break up your model's prims such that each texture being referenced fits into the texture cache Point 1's "PMD like preinitialized prim object structure" is simply using the primGroup portion of a PMD and bundling that into your own structure. The internal routines to handle PMD primitive groups is documented. (RotSMD\_XXX()...)

Basically... that's it... besides reducing your polygon counts and choosing when a model could really just be a 2D card in 3 space... Any other enhancements would be going under GS and doing things yourself.

-Blake

---

1/10/96 7:52 AM

Re: LIBGS performance limits?

Jay Stelly

Teh Kao Yang

LIBGS

To gauge the effectiveness of your rendering, I'd recommend the following:

Use whatever methods you are currently using to create and render your ordering table. Count how many scanlines it takes with VSync(1); (or use some other timing mechanism). No, draw your OT again without doing any calculations, call DrawSync(0), and time this. This should give you an indication of whether your game is CPU bound or GPU bound. If it's GPU bound (i.e. the 1st number is smaller than the second), then you must draw less polygons, remove semi-transparency, make some of your polygons smaller, make better use of the texture cache, etc. If you are CPU bound, then it is possible to draw more polygons with a better rendering algorithm.

Also, a frame has about 262 scanlines, so if your second count is less than 262 then you can increase the number of polygons you're rendering by roughly the percentage that it differs from 262. Remember though, 262 is ideal and you have to allow for a couple of scanlines for



synchronization/overhead.

Also, your polygons per second figures mean nothing without the output size of the polygons taken into account. The number of output pixels has a huge effect on how long a particular polygon takes to render. The 360,000 pps figure often quoted is for 10x10 single color triangles (50 output pixels). I have written a program that renders well over 300,000 of these per second, so I believe the GPU is capable of approaching that number, but in a real game, few of my polys are that small and almost none of them are single color.

Jay Stelly Tetragon

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1/16/96 1:57 PM

Re(4): Problem with PMDs

Teh Kao Yang

Dan Burnash

LIBGS

Thanks a lot for the answers!!

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1/16/96 12:15 PM

Re(3): Problem with PMDs

Dan Burnash

LIBGS

Teh Kao Yang

>I have included a sample program which tries >to display PMDs. Right now I have it set up to display 1 or 2 PMDs. You can >change the # by changing the OBJS definition in the beginning of the program. When I display 1 PMD everything is fine. But when I try to display 2 then >both PMDs are barely visible. BTW this is a slightly modified version of >the tuto2.c program found in psx/sample/graphics/pmd/ Your problem is the result of overwriting the primitive area within the PMD data. Since PMD data has a built in double buffered primitive area, only one copy of the object can be drawn at once. This doesn't make much sense to me, but that is the way the GS libs appear to handle PMD's. You need to load multiple copies of the PMD file into memory if you want more than one to be displayed in memory. This means you get multiple copies of the vertex data, but the primitive area needs its own space anyhow. The double buffering is provided so that one set of primitives can be rendered while the other is being built. >Overall it seems that when I try to use PMDs with LibGS it is much less >efficient than with LibGPU. Is there really a big difference? I am hoping >to be able to stick with LibGS for most of my graphic routines. In general, libgs is better for prototyping than for your final game. It can work, but places restrictions on your code based on the functions supported. Libgpu/libgte can be tuned better for your game, because you can design the code to fit your data. You also avoid the above mentioned duplicate data.

Dan Burnash

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1/17/96 8:17 PM

Changing Screen Modes

Chris E. Reese

LIBGS

QUESTION:

In the middle of a game, how do we change between screen resolutions and between interlace and non-interlace modes when using the Extended Graphics Library (libgs)--without resorting

to GsInitGraph()?

P.S. The effects of functions from the low level of the Basic Graphics Library (libgpu)--such as PutDispEnv() and PutDrawEnv()--don't seem to "filter up" to the higher level of the extended library. In other words, if I set the resolution and interlace mode using PutDispEnv() and PutDrawEnv(), the function GsSwapDispBuff() seems to put the screen back to the settings made previously with GsInitGraph().

Chris Reese Eidetic, Inc.

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1/18/96 7:57 PM

Re(2): Changing Screen Modes

Dan Burnash

LIBGS

Chris E. Reese

Silas is correct. GsDRAWENV and GsDISPENV, externed in libgs.h, function as the display and draw environment structures. If you change them, you change the gs environment.

I have not tried specifically what you are trying, so let us all know if it works.

Dan Burnash

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1/18/96 2:42 PM

GsCOORDINATE2->Param?

Silas S. Warner

LIBGS

Is the "Param" pointer member in a GsCOORDINATE2 (to a GsCOORD2PARAM) ever used by any LIBGS calls? I am currently changing the GsCOORDINATE2 myself whenever the GsCOORD2PARAM is changed. Will later versions of LIBGS (I am on Lib 3.2) ever pursue this link?

If not, I would like to use this "Param" pointer in an animation system, pointing it to an "AnimC2Param" structure of my own design. If so, I want to make sure the "AnimC2Param" structure includes the GsCOORD2PARAM structure, even though this will waste a number of bytes in the structure.

Silas Warner

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1/18/96 2:32 PM

Re: Changing Screen Modes

Silas S. Warner

Chris E. Reese

LIBGS

Remember that the GS functions, including GsSwapDispBuff, use a DispEnv and DrawEnv contained in LIBGS. I believe they're called GSDRAWENV and GSDISPENV. Setting your own DrawEnv and DispEnv will be overridden when the GS call is made. You might see if changing the equivalent members of GSDRAWENV and GSDISPENV will work, or if they are assumed to be non-interlaced higher up in the code.

Silas Warner

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1/19/96 9:27 AM

Re: GsCOORDINATE2->Param?

Dan Burnash

LIBGS

Silas S. Warner

The param pointer member in a GsCOORDINATE2 is used during TOD animation. That is the only place it is used, though it can be set via GsInitObjTable2(). Please check out the Library 3.0 reference, page 507, where this is documented.

Dan Burnash

---

1/23/96 3:06 AM

Camera View

wayne townsend

LIBGS

I am unclear about the GsRVIEW Structure. I am wondering what the Viewpoint (.vp?) and Viewreference (.vr?) parameters mean exactly.

I also wonder what the "Viewpoint Twist" (.rz) does.

I want to point the camera toward the center of an object, with a slight down angle (15 deg) then rotate evenly around this center point.

Ya, I know my lack of 3D experience is showing, but we all had to start somewhere, I know how the camera works in 3D studio, how does this compare with this one.

Thanks, C!

---

1/23/96 5:25 PM

Re: Camera View

Teh Kao Yang

LIBGS

I think the .vp coordinates specify the point where you are looking FROM. And the .vr coordinates is where you are looking AT. So if you want the camera to tilt at an angle you could manipulate the .vp values until you get what you want.

-TK

---

1/24/96 7:29 PM

View based on LookAt, LookUp ???

Tim L. Lowery

LIBGS

We are porting a game whose camera view is defined by these three vectors:

VECTOR CameraPosition; VECTOR LookAtDirection; VECTOR LookUpDirection;

I want to implement this on PSX. My first attempt was to use a simple GsRVIEW2.

CameraPosition and LookAtDirection mapped quite nicely into view.vpx/y/z and view.vrx/y/z, but I couldn't implement LookUpDirection because view.rz is undefined whenever you look down the Y axis, and therefore is not useful in our game.

My next stab at this was to change view.super from WORLD to a GsCOORDINATE2. Is this the right way to go? The math for calculating the view rotation matrix for given pair of LookAt and LookUp vectors eludes me. Does anybody have an example of how to do this?

Or should I set up a GsCOORD2PARAM? Does anybody have an example of how to do this, from a LookAt and LookUp vector?

Dave Howell Pablo Media

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1/25/96 9:06 PM  
World coordinate limits?  
Teh Kao Yang  
LIBGS

I was just wondering what is the range of values for the coordinates of objects in GS. It seems to be 32bit, but when I try to move an object past the range of about 65000 units or so, they disappear from view. So is the real limit around 64500 or so?  
-TK

---

1/26/96 1:22 PM  
Hey! Slower Libs?  
Paul Masters  
LIBGTE

What gives? we downloaded the new libraries and lost framerate in our 3D engine. We're not doing anything that tricky and indications were that we should have gained some ground. Any advice would be helpful...

Tim Ray (Speaker for The Pablo)

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1/26/96 3:29 PM  
Re: World coordinate limits?  
Silas S. Warner  
Teh Kao Yang  
LIBGS

The real limit for viewing is 16 bits, because of the size of the rotation matrix.  
Silas Warner

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1/29/96 6:06 PM  
VRAM X,Y Coordinate Question  
Teh Kao Yang  
LIBGPU

Sorry if this is a boneheaded question, but I am sort of confused about the way we can assign X,Y coordinates in VRAM to our texture. For example let's say I am trying to fit in a bunch of textures in one texture page. I know that a 256X256 texture only takes up 128X256 in VRAM if it is 8bit, 64X256 if it is 4 bit, and so on. If I have a bunch of 8 bit texture, I know their sizes, but how does this translate to VRAM size? Suppose I put the first texture at 640,0 in VRAM. The texture is 32X64 pixels. But in VRAM, what does this actually translate to? Where can I put in the next texture?

-TK

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2/8/96 2:51 PM  
Re: Strange TMDs  
Dan Burnash  
LIBGS  
LIBGPU

I haven't tried it. However, if you want to do something unusual with the tmd file format, why not just use your own, and not use libgs? That is probably best route in the long term, anyhow. If you want to try it, let us know if it works. The tmd file format is documented in the library 3.0 overview, if you need specifics on the format.  
Dan Burnash

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2/8/96 8:52 AM  
Strange TMDs  
Paul Masters  
3D Development

Is it possible to build a TMD file with no polys only vertices? Will the libraries handle such abuse? Has anyone tried it? Thanks. Pablo !Picasso

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2/9/96 1:14 PM  
TMD\_P\_F3  
Alex J. Garden  
LIBGS

Perusal of some older SONY documentation has shown that there may be a speed advantage to using the functions associated with the TMD\_P\_F3 ect... data structures. (ie. GsPrst etc...) The functions have 'ample' documentation, and the data structures are defined in the header files (TMD\_P\_F3 can be found in v3.4 libgs.h), however, there is no documentation for TMD\_P\_F3 in acrobat format. There are some data members whose functions are not obvious. Can anyone provide a description of the contents of this structure?  
Thanks in advance...  
Alex Garden@Radical Entertainment.

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2/12/96 9:48 PM  
Back Face for Primitives and TMDs  
Jose R. Villeta  
LIBGPU  
Dan Burnash

1. Is there a way to back clip faces at the primitive level (i.e., GT4, etc...). Case in example is a mesh terrain with polys hanging on the backside of the mountain. They still get drawn!!  
2. For GsSortObject4 using GsDOBJ2s no back facing is allowed unlike with GsSortObject2 which allows back facing. Is this true for all new libraries releases? If so, can we get the feature back. Any information, greatly appreciated!! Jose Villeta Black Ops

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2/13/96 3:27 PM  
Re: TMD\_P\_F3  
Michael Koziniak  
Alex J. Garden  
LIBGS

>functions associated with the TMD\_P\_F3 ect... data structures. (ie. GsPrst etc...) The functions have 'ample' >documentation, and the data structures are defined in the header files (TMD\_P\_F3 can be found in v3.4 libgs.h), >however, there is no documentation for TMD\_P\_F3 in acrobat format. There are some data members whose >functions are not obvious. Can

anyone provide a description of the contents of this structure?

As near as I can tell the TMD\_P\_F3 structure is used to receive the packet data of a TMD. That info is used a lot in the subdivision of polys and to build primitive list.

Now the members like in, out, and dummy are not easy to figure out. I can see that dummy is used in cases to determine what type of coordinate transformation should be used. I don't know what in and out does.

I will work on finding out more for you.

Michael

---

2/14/96 10:25 AM

Re(2): TMD\_P\_F3

Michael Koziniak

Michael Koziniak

Alex J. Garden

Here is a more detailed look at the TMD\_P\_F3 structure.

out : Length in words of drawing primitives : created by intermediate processing in : Length in words of the packet data block dummy : Option information to be used when rendering : is carried out cd : Class of primitive r0, g0, b0 : RGB value code : GPU-packet code n0 : Normal value v0, v1, v2 : Vertex value

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2/15/96 12:09 PM

Re(3): TMD\_P\_F3

Alex J. Garden

Michael Koziniak

Michael Koziniak

Michael, you rock the world. Could you provide some additional information about the dummy and the cd fields...

a) what possible values can they hold? b) what do these values do? c) what is the average rainfall of the amazon basin?

Thanks again

Alex Garden@Radial Entertainment.

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2/21/96 5:18 PM

Any LIBGS fans out there?

Teh Kao Yang

LIBGS

I am just wondering how many people out there are (be honest) using LIBGS to develop their games. Yes I know that it's taboo and a big no-no to use GS and that I should be writing my own libraries, but for someone like myself who is not a 3D GURU, I probably would not be able to write a better library than GS anyway. I know that GPU is more flexible, but I have not seen proof yet that GPU is significantly faster than GS. For programs doing similar things, I have not been able to detect much difference at all in speed. I guess the thing I like most about GS is how it sets up the camera and object hierarchies. I guess what I need is something to convince me that I REALLY need to be using GPU. So far the only thing I've found that I could not do in GS that I can do in GPU is changing my dispenv and drawenvs in the middle of a draw loop and not being able to use meshes.

-TK

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2/26/96 4:53 PM

Re: Any LIBGS fans out there?

Michael Koziniak

Teh Kao Yang

LIBGS

>I am just wondering how many people out there are (be honest) using LIBGS >to develop their games.

I think that most people are not using LIBGS. It has its advantages and disadvantages. Most game developers have been doing 3D development for awhile and have their way of doing it. However, if you are new to 3D or are on a tight schedule then LIBGS is a good option.

Michael

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2/29/96 6:06 PM

Re: Any LIBGS fans out there?

Tim L. Lowery

LIBGS

>I am just wondering how many people out there are (be honest) using LIBGS >to develop their games.

I think Michael Koziniak is right; most of us have run into some limitation or other in GS and cannot use it. But GS is sometimes useful for getting a prototype up and running. If your code is modular enough, it's not too big a deal to implement your rendering using GS and then to change it later.

Sony's official position has been "GS is a general-purpose library and cannot be all things to all people" or something like that. Unfortunately, being all things to all people is really the definition of general-purpose. If it's only a few things to a few people, it's special-purpose.

Dave Howell Pablo Media

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3/1/96 3:02 PM

Re(2): Any LIBGS fans out the

Teh Kao Yang

LIBGS

Well, I am just wondering what are some of these "limitations" that you have run into while trying to develop a game in GS. I have ran into limitations too but with a little research I was able to get around a lot of them. Sony also seems to be providing new functions and structure definitions for the GS library that is making it more flexible.

As for the speed issue, I have tried running speed tests on programs doing the same thing but running GS or GPU and have noticed negligible difference only in speed. I am talking about 1-2 H-scanlines difference in speed. Which is less than a 1% difference. Also I have thought about writing my own higher level libraries using GPU and GTE, but since I am not a 3D guru, what are the chances of me coming up with something more efficient than GS? I am not trying to be a GS advocate, but I have just not heard any specific reasons from people about the deficiencies of GS.

-TK

---

3/1/96 10:54 AM

Re(2): Any LIBGS fans out there?  
Dan Burnash  
LIBGS

>Sony's official position has been "GS is a general-purpose library and cannot be all things to all people" or >something like that. Unfortunately, being all things to all people is really the definition of general-purpose. If it's >only a few things to a few people, it's special-purpose. Unfortunately, any library that is "all things to all people", is SLOW, and by definition useless for a games engine. Only by making the gs library special-purpose can the speed come anywhere near what a real game should have. Another alternative would be to make a bunch of independent GS libraries to fit all possibilities, but in our real world that won't happen either. So you are stuck with a limited library that almost has the speed to make a competitive game, and works well for prototyping. Eventually most people make the leap to the gte/gpu code, and those that don't would have a faster game if they did.  
Dan Burnash  
P.S. - Angus isn't here, so someone has to write this stuff! :-)

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3/2/96 11:33 AM  
Re(3): Any LIBGS fans out the  
Blake E. Senftner  
Teh Kao Yang  
LIBGS

> but I have just not heard any specific >reasons from people about the deficiencies of GS. Actually, its more like special needs. If you're pushing alot of polygons around, having the polygons double buffered takes alot of memory. I've read where several developers have logic where they know that half of their polys are going to be clipped (back facing) so they only have enough polys in memory to handle the max actually displayed for their models. This means that their code is actually running slower than GS, because they are initializing all their polys every render, but they are pushing memory limits.  
You can also expect many developers are porting rendering engines from other platforms, so they want GPU direct access. As far as that goes, if a company is developing a game engine they hope to port to other platforms, the GPU is the best level to attack. Once you're at the GS level, the object structure (double buffered polys) is too PSX specific.  
-Blake

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3/4/96 1:42 PM  
Re(3): Any LIBGS fans out the  
Jay Stelly  
Teh Kao Yang  
LIBGS

>Well , I am just wondering what are some of these "limitations" that you have >run into while trying to develop a game in GS. I have ran into limitations >too but with a little research I was able to get around a lot of them. Sony >also seems to be providing new functions and structure definitions for the >GS library that is making it more flexible.  
There are lots of things about GS that can be made more effeicent. Many of these things could probably be built on top of GS, but building them into your own library is usually easier because of the greater control you have.  
One example is the hierarchy. GS's hierarchical coordinate systems are not implemented very efficiently; you shouldn't need to walk the tree when rendering. Another great place to optimize is object and polygon clipping. GS has no object clipping and there's no place to insert your own polygon clipping. Usually, there's something specific about your rendering that makes it easy



to reject certain objects/polygons. Some of these rejections may require intermediate results of calculations that are only available at render time. Others (like BSP trees or other hierarchical geometry definitions) require a different model data structure (not TMD). Lots of stuff can be added on to GS to make it as good as custom stuff, but when you're done all you're using GS for is camera definition and simple object rendering...  
Jay Stelly Tetragon

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3/6/96 4:57 PM  
missing backface support in GS  
Borden Covell II  
LIBGS

Has anyone solved/fixed the problems with LibGS supporting the no-backface testing flag? Is this going to be fixed???  
If we want to write our own GsSortObject5 code, can we get help from Sony?

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3/13/96 3:51 PM  
Inefficiencies in GsSortObject4,GsSortObject5  
Silas S. Warner  
LIBGS  
Tom Boyd

In looking at the definition of GsSortObject4 and GsSortObject5, a rather obvious inefficiency stands out. Both of these routines sort TMD-type objects, which are defined with a list of points plus a list of polygons with pointers to these points. In the usual type of TMD object, three or four polygons meet at a point. The coordinates of each of these polygons are computed separately using the GTE. This means that in most cases, the coordinates of a single point are computed three or four times. This is somewhat mitigated by the GTE. The operation RotTransPers3 is an atomic operation that does three coordinates at once, in about twice the time of a single RotTransPers. But in most cases, the number of polygons is roughly equal to the number of points. Even at the time savings in a RotTransPers3, the same number of RotTransPers3s takes more time than single point RotTransPers. So... Wouldn't GS sorts go faster if the points in the entire figure were transformed first, in list order, and THEN applied to the polygons -- instead of the points being multiply recomputed for each polygon? This would also help eliminate "cracking" which does happen when the same point, computed in two different RotTransPerss, creates two different 2-D values. This discussion arose during the debate at the Developers' Conference. Tom asked me to place it in a note on the BBS: here is that note.

Silas Warner

---

3/14/96 7:04 AM  
Re: Inefficiencies in GsSortObject4,GsSortObject5  
Carl Ferreira  
LIBGS  
Tom Boyd

Wouldn't the processing of each point individually require that the screen Z of each component be stored somewhere? Only in that way would each face be able to determine its Z (using AverageZ3 or AverageZ4). This means that each point would have to be transformed using RotTransPers rather than RotTransPers3 or RotTransPers4. This is quite inefficient and in my tests resulted in a huge loss of speed.

Sony -- Is there some way of performing a RotTransPers3 and obtaining the screen Z of each point? If this cannot be done, then I don't understand how such a process could work.  
Carl

---

3/14/96 2:57 PM

Re(2): Inefficiencies in GsSortObject4,GsSortObject5

Jay Stelly

Carl Ferreira

LIBGS

>Sony -- >Is there some way of performing a RotTransPers3 and obtaining the screen Z of each point? >If this cannot be done, then I don't understand how such a process could work.

>Carl

Carl,

That's what RotTransPersN() and RotTransPers3N() do. The only disadvantages to transforming your entire model before modifying your packets are that you need a heap to store all of the output points, screen zs, and flags, and you have to compute the Z-sort and depth cueing separately after you're done.

I'm using this type of method in my graphics library though for lots of mesh-like objects...

Jay Stelly Tetragon

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3/15/96 9:30 AM

Re(3): Inefficiencies in GsSortObject4,GsSortObject5

Carl Ferreira

Jay Stelly

LIBGS

>Sony -- >Is there some way of performing a RotTransPers3 and obtaining the screen Z of each point? >If this cannot be done, then I don't understand how such a process could work.

That's what RotTransPersN() and RotTransPers3N() do. The only disadvantages to transforming your entire model before modifying your packets are that you need a heap to store all of the output points, screen zs, and flags, and you have to compute the Z-sort and depth cueing separately after you're done.

I'm using this type of method in my graphics library though for lots of mesh-like objects...

Jay Stelly

=====

Sony - What I'm wondering is not how to create a routine to transform multiple points, but rather is there any way the HARDWARE can effectively perform a RotTransPers3 and return 3 screen z points?

Carl

---

3/15/96 9:40 AM

Re(4): Inefficiencies in GsSortObject4,GsSortObject5

Blake E. Senftner

Carl Ferreira

Jay Stelly

In my logic for casting points into the screen I use:

```
RotTransPer3_nom( &v[i+0], &v[i+1], &v[i+2] ); ReadSXSyfifo( (INT32 *)&xy[i+0], (INT32 *)&xy[i+1], (INT32 *)&xy[i+2] ); ReadSZfifo3( &scrnZ[i+0], &scrnZ[i+1], &scrnZ[i+2] );
```

loop iteration: i+= 3;

This projects my array of points to the screen and stores their screen Z for point group usage.  
-blake

---

3/27/96 9:49 AM

Shameful SONY libraries!

Ayo A. Orimoloye

Sam Black

Bugs

Well, in response to the message sent to me by Sam Black replying to my atoi message about octal numbers - I stand corrected. The octal sequence 202 in decimal IS 130! I thought it was converting my DECIMAL number 00202 (which I WANTED to have leading zeros, because I just like doing things like that and it's a free country!) to octal (and getting the result "312" wrong). But I would now clarify the reason for my confusion:

THE SONY LIBRARIES ARE SO BUGGED IT'S UNBELIEVABLE!

STANDARD C represents an octal sequence as 0oNNN where NNN is the octal number. You can also represent it as oNNN. Hex numbers are represented as 0xNNN or xNNN.

IMPORTANT: note that 0oNNN is "zero - oh", ie the NUMBER zero and the LETTER oh.

NOW FOR THE DEPRESSING NEWS:

SONY C represents octal numbers as 00NNN ie zero-zero! THIS MEANS THAT IF YOU EVER HAPPEN TO HAVE 2 OR MORE LEADING ZEROS FOR YOUR DECIMAL NUMBERS, THEY WILL BE TREATED AS OCTAL!! As a matter of fact, if you have more than one leading zero before your DECIMAL number, it would immediately be "OCTALIZED"!

I WAS STUNNED!!!!!!

I tried adding two numbers: 0010 and 002 and I received the result 10 (decimal!). Don't take my word for it - TRY IT YOURSELF!

```
printf("The Sony answer is %d\n", 0010 + 002 );
```

YOU WILL BE SHOCKED!

This makes sense if you think of 0010 as 0o10 (octal) which is 8 decimal and 002 as 0o2 which is 2 decimal. Unfortunately, those numbers ain't OCTAL dammit!

Note also Sony that standard C allows oNNN and xNNN for representing octal and hex numbers respectively but Sony C does not - something to bear in mind for whenever you plan to fix this bug.

---

3/27/96 3:37 PM

Re(2): Shameful SONY libraries!

Ayo A. Orimoloye

Sam Black

Bugs

Actually, one last thing I must point out:

the Sony atoi function also prints the atoi("0x202") as 514. This is correct right? Wrong! ANSI C does not support hex strings. The correct thing to print out in this case is 0.

In trying to explain the atoi("008") phenomenon, I got a bit carried away. ANSI C (well, okay Borland C++) says it should be 8. If the Sony takes it to octal, (in which case it is meaningless because 8 is not a valid octal digit), it should print 0. This is what happens. My point is the Sony should not be taking this value to octal because ANSI says parameters passed to atoi are DECIMAL. That is why the hex number 0x202 should return a 0 and not a 514.

---

3/27/96 3:06 PM

Re(2): Shameful SONY libraries! - A retraction

Ayo A. Orimoloye

Sam Black

Bugs

Yep! The "OCTAL USING GUY" has been taken out and shot!

Actually, I found out this was the case when I tried the same test on Borland C++ and got the same result. It actually all started when someone else (always blame someone else when you eat crow) was trying to get filenames with weird names like "001" to "009" on the PSX and was having problems with the atoi function on filenames "008" and "009". I immediately assumed this was Sony's fault but it is actually a "quirk" of C. When PRINTING octal numbers, you use %o (percent-oh) but when specifying them you use a leading 0 (zero). Of course with HEX numbers you use %x when printing and 0x when specifying. Obviously this strange language C was designed to be logical to aliens from Mars.

Due to the fact that I am such an assembly freak (and we have a really old K & R C book in the office) I rarely use C or octal numbers so a thousand apologies to Sony.....

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3/27/96 2:30 PM

Re: Shameful SONY libraries!

Sam Black

Ayo A. Orimoloye

Bugs

Sorry, but once again you are mistaken. The ANSI C standard (again, unless this has changed between my printing of K&R covering the draft standard and the adoption of the actual standard) specifies that numbers with leading zeros (1 or more) are to be interpreted as OCTAL. Further, my copy of K&R makes no mention of 0o, o, or x being legal prefixes for integer constants. Specifically: 0NNN -- octal 0xNNN -- hexadecimal 0XNNN -- hexadecimal NNN -- decimal anything else -- error. I don't know which compiler you're used to, but Sony's compiler is pretty much just GNU CC -- a very well tested and standards conforming compiler (when used with the -ansi switch). Whatever else may be wrong with the Sony libraries (and it seems there is a legitimate bug with atoi -- it should always work in base 10), there is nothing wrong with the compilers interpretation of character constants.

---

4/18/96 8:47 AM

Re: tim utility

Carl Ferreira

Brett Butler

Graphic Art Tools

This is a cruel joke in the worst possible taste. As every PSX programmer knows, VRAM is worth its weight in gold and to taunt us with the possibility of having a noticeably greater amount of it is a torture beyond words.

Don't toy with me. I know that Black Magic exacts a heavy toll.

Now-- on the off-chance that you are serious, why not post the methodology used and we'll let you know if it would actually help us in a real situation.

BTW-- Who the Hell \*are\* you, anyway? This seems to be your first posting and there is no resume on file for you.

Carl Ferreira (resume on file, albeit brief) =====>Just a little feeler here.

>>Would anyone be interested in a Sony Utility that would allow you >to go through your texture art files and replace those Vram & Dram >memory eating textures with just a few bytes of data? [snip] >This package would include all structure formats, examples how to >load in, AND the tool is Visual in nature. You could take all your >textures that your artist or your publisher dumped on ya, and toss >out the unneeded ones. >>This puts a major smile on your face when it comes time to make >room in Dram & Vram for all those model textures you're using. >>-Lemme know if this is something you would be interested in.

---

4/18/96 11:28 AM

Re(2): tim utility

Brett Butler

Carl Ferreira

Graphic Art Tools

i filled out my resume. check it out.

ps. I'm about to complete a DOS version tool of "VAGS2VAB.exe"

This would allow you to take your vags and pack them together into a vab FROM DOS. Then from there, just run VABSPLIT.exe to get your .VH and .VB files.

So, if anyone out there is tired of leasing a Mac just to do sound,...here's your tool.

Is anyone interested in this VAB tool?

Send me mail.

:) Bretto

---

4/18/96 8:19 AM

tim utility

Brett Butler

Graphic Art Tools

Just a little feeler here.

Would anyone be interested in a Sony Utility that would allow you to go through your texture art files and replace those Vram & Dram memory eating textures with just a few bytes of data? ex: converts .tims to a new file format that only a few of the new files actually contain a texture, which saves memory BigTime.

1. Texture remains the same (keep this texture). 2. Texture and Texture (keep this texture, and reference another one that would be on top of it at a varied translucency level. Which is all stored in the new file.) (This is Great for Gun shots/burns/holes on textures & saves memory!) 3. Texture combined with flat shade data to create darkness level in file. 4. Texture combined with gouraud shading data stored in file. 5. Texture tossed, store flat shade data in file instead. 6. Texture tossed, store gouraud shading data instead.

Instead of your models reading .tim files, they would read this new .JAT format.

This package would include all structure formats, examples how to load in, AND

the tool is Visual in nature. You could take all your textures that your artist or your publisher dumped on ya, and toss out the unneeded ones.

This puts a major smile on your face when it comes time to make room in Dram & Vram for all those model textures you're using.

-Lemme know if this is something you would be interested in.

:) Bretto

---

5/23/96 1:54 PM

controlling Z sort values / funcD() calls

Ken Bretschneider

LIBGS

I have a question that hopefully someone out ther in Sony land can help me with. In the Sony Developer's Conference (in the GTE class), it was mentioned that quads almost edge-on in view may sometimes be clipped out due to a cross-product round off error in the first triangle of the quad. The solution was to use the 'funcD()' calls so that both tris of the quad are checked for normal clipping. Okay, here's my question; where are these mysterious 'funcD()' calls? I

assumed that they would be named as the conventional routines followed by a capital D, but apparently I am wrong. Can someone help me here?  
Also, while I'm in the forum, is there a way to force the libgs routines so place the polygon in the gsOT based on a value other than the average Z value, such as the closest or farthest Z value?  
Thanks in advance,  
Greg Bennett Morpheus Interactive (801) 224-8228

---

5/23/96 5:54 PM

Re: controlling Z sort values / funcD() calls

Mike Fulton

Ken Bretschneider

LIBGS

Greg Bennett @ Morpheus Interactive (801) 224-8228 says...

I have a question that hopefully someone out there in Sony land can help me with. In the Sony Developer's Conference (in the GTE class), it was mentioned that quads almost edge-on in view may sometimes be clipped out due to a cross-product round off error in the first triangle of the quad. The solution was to use the 'funcD()' calls so that both tris of the quad are checked for normal clipping. Okay, here's my question; where are these mysterious 'funcD()' calls? I assumed that they would be named as the conventional routines followed by a capital D, but apparently I am wrong. Can someone help me here?

I've looked through the notes I have for the GTE talk and I don't see any reference to "funcD" calls. Can you provide more context?

The closest thing I can find is a bit on "Near Clip Polygon Dropout" that says "Polygons that are almost in edge view may be removed by cross-product round off error." The slide from the presentation shows a wide triangle with the top point only barely above the two side points. It says the solution is to test two vertex orders instead of one.

Also, while I'm in the forum, is there a way to force the libgs routines so place the polygon in the gsOT based on a value other than the average Z value, such as the closest or farthest Z value?

Not that I can see... If you need that sort of control over the sorting mechanism, you may not be able to use LIBGS routines to do it. But there may be another solution. Usually when mid-point Z value sorting doesn't give the right results, the problem is that the polygon(s) involved are either too large or too close to the viewpoint/camera position, or both. In such cases, subdividing the polygons will give you much better results even if you continue to use mid-point Z value sorting.

Mike Fulton

---

5/28/96 7:57 AM

Re(2): controlling Z sort values / funcD() calls

Ken Bretschneider

LIBGS

Okay, here's my question; where are these mysterious 'funcD()' calls? I assumed that they would be named as the conventional routines followed by a capital D, but apparently I am wrong. Can someone help me here?

I've looked through the notes I have for the GTE talk and I don't see any reference to "funcD" calls. Can you provide more context?

The closest thing I can find is a bit on "Near Clip Polygon Dropout" that says "Polygons that are almost in edge view may be removed by cross-product round off error." The slide from the presentation shows a wide triangle with the top point only barely above the two side points. It says the solution is to test two vertex orders instead of one.

That's the page I'm looking at. At the bottom of the diagram it says 'Note: In libgs, use funcD()

calls, which means "doublecheck" '

---

5/30/96 11:28 AM

Re(3): controlling Z sort values / funcD() calls

Ken Bretschneider

Ken Bretschneider

LIBGS

Just in case anyone's interested, I just got a call from Sony concerning the 'funcD()' calls.

Apparently these mysterious functions mentioned in the GTE class at the Dev conference are in the upcoming 3.5 libraries. I was told that they will be released ~4 weeks.

Greg Bennett Morpheus Interactive

---

6/5/96 9:53 AM

near and far clip

Borden Covell II

LIBGS

We are trying to use Object3 and have not been able to control the near and far clipping. We call the GsSetNearClip and GsSetFarClip routines which set the GsCLIP3near and GsCLIP3far variables but there is no change in what we see. There appears to be a default far clipping that is giving us unacceptable results.

Any ideas??? Thanks!!!

---

6/28/96 11:43 AM

Re(2): Any LIBGS fans out there?

Mark Slemko

Tim L. Lowery

LIBGS

I used it because it was sufficient for the purposes of the game we are/have developed. It seems fast, simple and reliable. Some of the new additions are not any of these and the documentation is lacking, but on the whole, I am satisfied.

---

6/28/96 11:53 AM

converting to PAL mode

Mark Slemko

LIBGS

I am having some trouble converting our game to run in PAL mode with a screen height of 256 pixels using libgs.

I used the demos and added the call "SetVideoMode(MODE\_PAL)" before initialization of the 3D graphics system. Also the buffers were adjusted to be 256 high. Regardless, the system would not be 256 high; The height is forced to be 240 pixels.

Is there a LIBGS.LIB for PAL that I could get or another call I should be aware of to fix this problem, or an extern reference to some variable that is undocumented to switch this to be PAL.

---

7/5/96 11:21 AM

Transparency

Albert Neuburger

LIBGS

Just Recently I started programming the playstation. I picked up where another programmer had left off, so I get to wade through someone else's code. Anyway, I have a quickly approaching deadline and I need some tips. I am trying to make a texture semitransparent. Do I need to use SETSEMITRANS on every primitive that this texture is applied to, or can I somehow make the texture semitransparent? I don't really have convenient access to the primitives as they are stashed way below the tmd pointer that I found. I need to effect an array of GsDOBJ2's and I have tried altering their attribute using the constants found in the library header. But this didn't change anything. Any help will be greatly appreciated, Jason Overgard Regal Productions  
I can also be mailed at Overgard@earthlink.net  
Thanks

---

7/17/96 2:07 PM

Backfacing with GsSortObject4

Jose R. Villeta

LIBGS

Mike Fulton

What's the status on backfacing with GsSortObject4 on libgs 3.5? The functionality is not supported and more over GsSortObject2 was eliminated from the libraries? jose

---

7/22/96 4:29 PM

Re: Backfacing with GsSortObject4

Mike Fulton

Jose R. Villeta

LIBGS

What's the status on backfacing with GsSortObject4 on libgs 3.5? The functionality is not supported and more over GsSortObject2 was eliminated from the libraries?

Jose Villeta @ Black Ops

Jose,

As I stated in my earlier message, the GsSortObject4 function has not changed.

I also stated that that the GsSortObject2() function was not removed from the v3.5 library, but the situation turns out to be more complicated. As it turns out, the SORT.C source file with this function is still included with the library sources for v3.5, which led me to think that the function was still in the library. But when you said you could not find it listed with PSYLIB, I took a look and discovered that the SORT object module is not included in the library.

Therefore, your best solution may be to extract the SORT module from the v3.4 LIBGS.LIB file and either link it in separately or merge it into a working copy of the v3.5 LIBGS.LIB library file.

Mike

---

8/23/96 5:56 PM

GsTMDdivTG3L Example

Jose R. Villeta

LIBGS

Mike Fulton

Is there any example of automatic subdivision using TMDs and GsTMDdivTG3L ? Thanks in advance, Jose Villeta Black Ops

---



9/3/96 11:42 AM

Re: GsTMDdivTG3L Example

Mike Fulton

Jose R. Villeta

LIBGS

Is there any example of automatic subdivision using TMDs and GsTMDdivTG3L ? Thanks in advance...

Jose Villeta @ Black Ops

All the examples we have would be on the new programmer's CD. I did a search, and found that there is a sample that uses this call. Here's the path to the source file:

\PSX \SAMPLE \GRAPHICS \TMDVIEW \TMDVIEW4 \TUTO7.C

I've added spaces to make the path more readable. I hope this helps.

Mike

---

9/17/96 10:26 AM

Scaling TMDs

Dane Emerson

LIBGS

Ayo A. Orimoloye

I am using GsDOBJ5 to display a TMD model. I store the modelling data into RAM using GsMapModelingData(). How do I scale this model during runtime (not through a conversion process)? I should be able to multiply each of the vertices located in the VERTEX section of the model data by a scale factor after I load the data to RAM but before GsSortObject5. Is this correct? I may be accessing and changing the wrong part of the model data. How is the TMD data changed when run through GsMapModelingData()?

Jesse B. Perrin

---

9/17/96 3:23 PM

Re: Scaling TMDs

Brian Dawson

Dane Emerson

LIBGS

I am using GsDOBJ5 to display a TMD model. I store the modelling data into RAM using GsMapModelingData().

GsMapModelingData() does not store the data. It takes a pointer to a TMD already stored in main memory and converts the addresses within that file.

How do I scale this model during runtime (not through a conversion process)? I should be able to multiply each of the vertices located in the VERTEX section of the model data by a scale factor after I load the data to RAM but before GsSortObject5. Is this correct? I may be accessing and changing the wrong part of the model data

If you were to use this approach you would also have to recalculate the normal, and U,V data for the object. Though this should work there may be a more elegant way to do this using the Scale member of the struct object in a TMD, which as of my last check wasn't used by LibGS but may be now. I will check on how this value is handled and get back to you. I also believe the GsCOORD2PARAM \*param may be another method of applying a scaling factor to the object. In the meantime, if the object has an exclusive coordinate system, you can scale the coord member of the coordinate system structure via ScaleMatrix(scale vertex, Matrix). If you do it this way remember that your vertex and matrix elements are interpreted as fixed-point with 12 points of precision and don't overflow the coordinate system.

How is the TMD data changed when run through GsMapModelingData()?

The only thing that is changed is addresses stored in the TMD files, referencing the top address of each objects normal, vertex, and primitive lists. Prior to applying GsMapModelingData() the files components are referenced as offsets from the start of the object. After applying GsMapModelingData() they are stored as real addresses. This modification to a TMD can be detected by checking the FIXP bit of the header (The Least Significant Bit of the second word of the file). 1 = actual addressing, 2 = offset from top.

Brian Dawson@SCEA

---

10/4/96 12:32 PM

BG covers up my 3d objects

Mark Harmon

LIBGS

My BG is covering up my polys. When I GsSortBG I set the priority to 15 which the lowest for my program. I've tried setting priority to 1000, 10000, but nothing changes.

How do I get my background to show up behind the polys. Is there a z-value for the GsBG?

---

10/23/96 12:04 PM

Re: BG covers up my 3d objects

Mike Fulton

Mark Harmon

Mark Harmon Writes:

My BG is covering up my polys. When I GsSortBG I set the priority to 15 which the lowest for my program. I've tried setting priority to 1000, 10000, but nothing changes. How do I get my background to show up behind the polys. Is there a z-value for the GsBG?

I'd sort of like to see a simple example with just a few objects which demonstrates this. What does your call to GsSortBG() look like? What do the calls that add your primitives look like? The Z-depth value for the GsBG is the depth you specify in the 'pri' parameter with GsSortBG. In order to place this behind everything else, this value should be higher than any of your other objects. (Higher Z-depth values = farther away from viewpoint.)

Mike

---

10/23/96 4:29 PM

Re(2): BG covers up my 3d objects

Mark Harmon

Mike Fulton

LIBGS

Thanks for answering my email. I have already figured out what my problem was. It was located between the chair and the computer. hehe. Just one of those dumb mistakes that seem to sneak in when your not paying attention.

---

## Non-Tech Talk

3/29/95 10:05 AM

Re: Betacam SP Recording from Playstation

Bill "Angus" Guschwan

Mike Bartholomew

Steve Ackroyd

Man you got me here. I don't know.

ANgus

---

3/29/95 4:47 PM

Re(2): Betacam SP Recording from Playstation

Brian Greenstone

Non-tech talk

We had the exact same problem. I called SONY - the division that deals with the Betacam units. They told me that the reason the Beta deck has a hard time syncing is because the PSX is not true NTSC. It's frequency is off a little bit. He said that monitors work because they allow for a certain amount of variation, but the Beta deck expects a true NTSC signal. The only solution is to use a TBC or some other device that will tune the frequency to true NTSC.

We had to tape it onto Hi-8 and then dump it to Beta.

-Brian

---

3/29/95 4:12 PM

Controller Change?

Christopher Deel

Non-tech talk

Are there any plans to change the symbols on the Joypads that ship with the US PlayStation?

We are making up our shell artwork using the current symbols and we want to make sure we won't have to change it.

---

3/29/95 7:05 AM

Betacam SP Recording from Playstation

Mike Bartholomew

Steve Ackroyd

I've been trying to connect a SONY UVW-1800 Betacam SP recorder to our PSX development environment to record imagery, and have been unable to get the Betacam unit to lock on the video signal. I have successfully connected VHS, S-VHS, and Hi-8 VCRs. Anyone having success getting this process to work (that is, without resorting to buying and placing a TBC frame buffer in between)?

Thanks

---

3/31/95 10:41 AM

Re(2): Betacam SP Recording from Playstation

William Botti

Non-tech talk

Jose's reply brings up another point. We recorded the betacam using the tbc because the Playstation's NTSC output is not there, which is fine, but: When using the development system boards and connecting them to a monitor through the "S-Video" jack we have "Blown-Up" 2 separate monitors. What happened is not clear, but in both cases the monitor "popped" and the vertical hold chip seemed to short out. Both monitors now roll uncontrollably. This seems to have happened only a monitors that have digital v-hold circuits. Has anyone else seen this? It is annoying, to say the least... lasky

---

3/31/95 9:36 AM

Re(3): Betacam SP Recording from Playstation

Jose R. Villeta

Non-tech talk

PlayStation output has a very weak or non-existing genlock signal. To record on a Betacam SP use a TBC and loop the reference signal into the deck. The results are extremely good. Pay attention to the TBC model that you use. Some might sell or rent you cheap ones but they have reduced frequency band. The corrected output signal looks great jose boe

---

4/2/95 8:47 AM

PSX Has Good Taste?

Erick S. Dyke

Non-tech talk

The production Japanese PSX we have wont play in CD player mode my Ramones - ALL THE STUFF (And More) - VOL 1. -- CD (78 Minutes)  
This may just be a matter of good taste, but who knows :)  
NOTE : Black Flags Greatest Hits does seem to work.

---

4/3/95 2:13 PM

Re: PSX Has Good Taste?

Bill "Angus" Guschwan

Non-tech talk

Aren't Black Flag and Greatest Hits mutually exclusive?  
angus

---

4/3/95 6:21 PM

Re(2): PSX Has Good Taste?

Erick S. Dyke

Non-tech talk

Well its not called Greatest Hits, it called :  
Black Flag - Wasted Again!  
So I guess your correct....BTW : The BEST disc to put in while playing Ridge Racer is the Sound Track from Repo Man...Works quite well.  
Erick

---

4/18/95 12:33 PM  
Re(2): PSX Has Good Taste?  
Erick S. Dyke  
Non-tech talk

Figures as much -- Probably a 74 minute disk instead of a 71 minute disk.  
Now the real test will be will I still be able to program the PSX after going to see the Ramones on Friday night?  
Is it a 71 minute brain or a 74 minute brain.....Hmm

---

4/18/95 9:51 AM  
Re: PSX Has Good Taste?  
Ian Morrison  
Non-tech talk

The ramones greatest hits (sounding very similar to each other it must be said!) has too many tracks for some normal CD players to deal with, for example when recording to tape they 'cop out' on track 27. Maybe the problem is related.

---

5/4/95 9:38 AM  
Re(3): PSX Has Good Taste?  
Kirk Bender  
Non-tech talk

The best CD for Ridge Racer is Sammy Hagar's VOA album, track 1, "I can't drive 55"!

---

5/5/95 5:56 AM  
Re(4): PSX Has Good Taste?  
Erick S. Dyke  
Non-tech talk

Great suggestion, but will Ridge Racer play track 1 of a disc?  
Hmmm....Might have to try that....

---

5/10/95 11:53 AM  
Sure is quiet..  
Ian McGee  
Non-tech talk

... while everyone's at the show! I feel like I'm Buzz talking to myself!  
Can't wait to see the Sony booth!

---

5/11/95 11:02 AM

BBS Messages  
Dave R. Scheele  
Non-tech talk

Are the BBS messages being backed up somewhere? I've checked out a few of the "February Archive" folders and they all seem to be empty. Is someone, somewhere, compiling all the message traffic into a handy Q&A reference volume (wishful thinking!)?  
Dave

---

5/15/95 11:17 AM  
Re: BBS Messages  
John Phua  
Non-tech talk

Along with archiving the questions in the backup folders, we are trying to gather the useful information into a FAQ. Stay tuned.  
John Phua

---

5/19/95 9:27 AM  
Sony Employees  
Dave R. Scheele  
Non-tech talk

Would it be possible for all you Sony employees to put a short blurb on yourselves into the "resume" area on this BBS, maybe stating what areas of expertise you may be able to share? (or, maybe, a "do not disturb" sign!)  
It would help us get to know you better, since there seems to be more of you all the time now (great!) and maybe help speed up communications a bit, with more directed questions, etc. Just a thought. Any comments from the other lurkers out there?  
Dave

---

5/23/95 6:36 PM  
Video capture services?  
Dean M. Grandquist  
Non-tech talk  
CD

What video capture methods are being used for live video? Does Sony recommend a video capture service?  
We tried Radius Video Vision board on the Mac to capture real time JPEG. The quality is low coming through JPEG in real time.  
Thanks --Dean Grandquist Spectrum HoloByte Inc.

---

5/23/95 12:15 PM  
Re: Sony Employees  
Mark Beardsley  
Non-tech talk

Actually it might be a good idea for all of us to set up some info into the resume area. It helps to make for a kindler, more gentle world.

---

5/24/95 6:17 PM  
"standard" controller buttons  
Borden Covell II  
Non-tech talk

Are there any guidelines for the controller buttons? Other than select and start, what seems to be the std usage for the other button? Is there a std "fire" button? "grab" button? etc...

---

5/25/95 12:01 PM  
Re(2): "standard" controller buttons  
Dave R. Scheele  
Scott Berfield  
Non-tech talk  
>> Talk to your Account Executive. There is a >> User Interface Standards document which >> that person should be able to supply.  
What other interesting documentation might exist that we could receive from our Account Exec? Is there a list somewhere of what's available so we can make sure we're up to date?  
Dave

---

5/25/95 1:00 PM  
Re(3): "standard" controller buttons  
Kristine Severson  
Dave R. Scheele  
Scott Berfield  
The Account Execs have published a "sourcebook", which includes info on the standard controller interface, product approval procedures, ratings, info on support services, etc. They are working on a more complete version as we speak, so it will contain everything you need to know to develop and publish games for the PlayStation.  
I am trying to get the controller guidelines posted here within the next day or so. Once the latest revision of the sourcebook is completed, I will post it here in its entirety. (Look for this after June 1.)  
Kris

---

5/25/95 9:23 AM  
Re: "standard" controller buttons  
Scott Berfield  
Borden Covell II  
Non-tech talk  
Talk to your Account Executive. There is a User Interface Standards document which that person should be able to supply.  
-sb

---

5/30/95 9:07 AM  
Re(3): "standard" controller buttons  
Scott Berfield

Dave R. Scheele

Non-tech talk

I don't know what all docs the AE's have that you should be getting beyond the programming docs. The only reason I am aware of the UI Standards doc is because I wrote it for 1st party and they adopted it for third party as well. Basically, I would just make sure to bug your AE regularly to make sure you are getting everything.

-sb

---

5/30/95 8:45 PM

PlayStation price in Japan

Jose R. Villeta

Non-tech talk

For your information, we heard from Japan that the Sony Playstation price in Japan went down to match approximately \$299. If this is true, this is really good and hopefully we will have more people playing fun games on PlayStations. Jose & will Black Ops Entertainment, Inc. ps. We think that we should share more news within the development community, so everybody gets psyched for launch.

---

7/11/95 6:54 AM

Early Release?

Mark Beardsley

Non-tech talk

There have been various rumors on the internet about an early test release of the playstation to some markets (L.A., N.Y., Chicago) on or about July 15th. One posting was supposedly from an employee of SCEA. Is there any truth to this? There has been another rumor that the console will be called the PowerStation in the US. Any comments?

---

7/11/95 8:44 AM

Re: Early Release?

Kristine Severson

Non-tech talk

No truth to either one of those rumors! But they make for good comic relief in our hallways...got any more?!

Kris

---

7/21/95 9:37 AM

Re: Japanese Software Availability

Thomas Boyd

Non-tech talk

Randy X. Thompson

Unfortunately, we have no system in place to do this. Tom

---

7/21/95 9:56 AM

Re: Japanese Software Availability



Lord Angus  
Non-tech talk

If we were to distribute software to developers, we would become a distributor. Sony's policy is not to be a distributor for Japanese games. We may distribute Sony label PSX games in the future, but that is not announced yet.

LA

---

7/21/95 9:18 AM  
Japanese Software Availability  
Randy X. Thompson  
Non-tech talk

Can you (Sony) sell us (the developers) copies of PSX software from Japan? I'd like to get my hands on any or all of the titles currently available for the PlayStation. Is there a policy on this?  
-Randy

---

7/25/95 9:38 AM  
Re: Japanese Software Availab  
Kirk Bender  
Non-tech talk

There are many importers for Japanese games. try: Buy-Rite 919 850-9473 NCS 718 523-5774 Tronix 212 447-5980 or Ads in game magazines. Prices and service vary widely.

---

7/26/95 7:57 AM  
Re(2): Japanese Software Availab  
Randy X. Thompson  
Non-tech talk

Thanks for the info.  
>There are many importers for Japanese games. >try: >Buy-Rite 919 850-9473 >NCS 718 523-5774 >Tronix 212 447-5980 >or Ads in game magazines. >Prices and service vary widely.

---

7/27/95 10:21 AM  
Lord Angus is dethroned!  
Angus  
Non-tech talk

Lord Angus has been dethroned. The short-lived reign of Lord Angus was overthrown by the surly insurrection of the residents of lovely Seeyabibbis. Seeyabibbis is a thriving town of mostly engineers, who like the villagers of the book Snow Crash, live on pizza, listen to music, watch movies, and write software. Oh, yeah, and overthrow Lords.

Lord Angus was last seen brooding in the shadowing corners of Seeyabibbis. We believe he is on a mission to find the holy veil. The Lord is believed to have ambitions to overthrow the all-powerful King Kookaruggi, though he will need many powerups to achieve this almighty feat. We wish him well on his travels -- Godspeed.

And on to other news of the day -- Tom Boyd is seeking the throne once occupied by Lord

Angus. Coronation has not taken place. Stay tuned.  
Til next time, I remain your humble servant  
Angus

---

8/3/95 11:51 AM  
PlayStation Release  
Mark Beardsley  
Non-tech talk

Just was curious about the upcoming release. Several months ago there was some talk that the controllers might be enlarged for american hands. Was this ever done? Also, are the US and Japan Systems going to look identical (or will they be different colors or something like the systems from that four-letter-word company)?

---

8/11/95 4:36 PM  
Re: U.S. Playstation launch  
Angus  
Non-tech talk

Same name.  
Longer cable.  
Same hardware.  
Japanese games don't work on U.S. units.  
Lots of games at launch.  
Angus

---

8/11/95 3:26 PM  
U.S. Playstation launch  
chris m. coffin  
Non-tech talk  
Kristine Severson  
Anybody know how many games are REALLY going to be available when the Playstation shows up in the U.S. ? Will japanese games work on the U.S. system ? (I hope so) Is Sony changing the appearance or name of the system when it comes out? (hope not)  
bye! :)

---

8/15/95 8:05 PM  
Goodbye  
Scott Berfield  
Non-tech talk

I am leaving SONY at the request of the new head of PD. I wish all of you the best and encourage you to keep plugging away at the system. Make great games... it's the best revenge. See you all around. -sb

---

8/15/95 4:43 PM  
Re: Windows  
Blake E. Senftner

Non-tech talk

Win'95 seem to work OK for everything except for the emulation/printf issue. The compiler, etc. all work fine... see my note in the CD forum "tips..."

-Blake

---

8/15/95 11:22 AM

Windows

Mark Beardsley

Non-tech talk

Has anyone out there tried running the debugger/compiler/assembler, etc. under Win95 ? Just curious. Does it run, does it burp, does it crash?

---

8/16/95 1:24 PM

Re: CD with latest eveything?

Carl Ferreira

Non-tech talk

Or how about making the stuff available via Internet FTP?

Carl

---

8/16/95 1:04 PM

CD with latest eveything?

Rusty Buchert

Non-tech talk

For me it is a long-distance call to access this BBS, and to download all the new stuff requires that I sit here for hours downloading file by file.

Would it be possible that someone could archive everything that is on the BBS once a month or so, and put it on a CD and ship it to developers that want it? It would be nice to get a CD and know that I have the latest version of the compiler, libs, and docs.

What do you think, Sony?

John Slagel Parallax Software Savoy, Illinois

---

8/16/95 1:59 PM

Re(2): CD with latest eveything?

John Phua

Non-tech talk

Hi Carl,

That was brought up and we're not set up for it yet.

Thanks, John

---

8/16/95 1:58 PM

Fwd: Re: Fwd: CD with latest eveything?

John Phua

Non-tech talk

Hi John S ( Rusty),.

Thanks for the request. Actually we are in the process of putting together the process in which we can distribute CD's with all of the information for that is packaged with the Programmer Tool Kit (DTL-K1) product (i.e. libraries, compiler, debugger, utilities and on-line developer reference series). Due out in Sept.

We will be delivering it quarterly.

Thanks, John

Hi John S ( Rusty),.

Thanks for the request. Actually we are in the process of putting together the process in which we can distribute CD's with all of the information for that is packaged with the Programmer Tool Kit (DTL-K1) product (i.e. libraries, compiler, debugger, utilities and on-line developer reference series). Due out in Sept.

Thanks, John

---

8/24/95 3:05 PM

Peripheral Release Schedule

David Minogue

Non-tech talk

What information is available regarding the release schedule for PlayStation peripherals, such as the multi-tap and mouse?

-- David Minogue, Acclaim Entertainment.

---

8/30/95 1:17 PM

Re(3): U.S. Playstation launch

chris m. coffin

Non-tech talk

They won't say but my sources say Ridge Racer Tohshinden Kileak the Blood MK 3 (pretty good version!) Raiden Air Combat Cybersled NBA JAM

On an interesting note: There's an article in the wall street journal that says sega(losers) might dump their saturn(i say the name with disgust) and buy 3D0's M2 system upgrade(ha ha). I guess they like making their loyal(dumb) customers buy new hardware every 6 months :)

---

8/30/95 12:09 PM

Re(2): U.S. Playstation launch

Don Walters

Non-tech talk

Hey Sony,

Can you tell me the names of the titles that will be released in the initial U.S. launch?

Thanks,

dw

---

8/31/95 8:00 AM  
Re(4): U.S. Playstation launch  
Shaival Varma  
Non-tech talk

From : R. Brett Butler  
i think the 3do m2 is supposed to be  
faster than  
the PS-X (@33mhz).

---

8/31/95 10:26 AM  
Re(5): U.S. Playstation launch  
chris m. coffin  
Non-tech talk

It may be faster but specs don't really mean squat! Its the quality of the games on the system which count! Good programming=good games is what makes a system successful. LONG LIVE THE PLAYSTATION !!!!!!!!!!!!!!! :)  
Why has motor toon GP been cancelled for US release?

---

9/1/95 11:51 AM  
Re(6): U.S. Playstation launch  
chris m. coffin  
Non-tech talk

I've seen the playstation ads on tv recently... at the end it says. (e)NOS lives.  
what does it mean?

---

9/2/95 7:37 AM  
Re(7): U.S. Playstation launch  
Thomas Boyd  
chris m. coffin  
Non-tech talk

>I've seen the playstation ads on tv recently... >at the end it says. > > (e)NOS > lives. >  
>what does it mean?  
It is supposed to make people ask what it means. Best as I can figure, it is Sony, said backwards.

---

9/5/95 4:15 PM  
Re(7): U.S. Playstation launch  
chris m. coffin  
Non-tech talk

> Its the quality of the games on the system which count! > Good programming=good games is what makes a system successful.  
--Ya know, people have been thinking it's good programming that makes games --good ever since I got into the industry in 1982, and probably before that.  
--I guess I'm still a wild-eyed rebel for thinking it's good game design that makes games --good.

Maybe in another decade or two the industry will agree?  
That goes without saying of course! :) Creating a game with bad gameplay is absolute blasphemy!!! Just look at all those games based on licences!--> NO GAMEPLAY :( We need more original games in this industry! NOT another bad licence-arcade portover-part 3000-turbo- special hyper ultimate edition!!!! yeeechhh! Why doesn't anybody fill out their on-line resume???? what are you hiding?? :) Chris :)

---

9/5/95 4:48 PM

Resume Pic  
chris m. coffin  
Non-tech talk  
Administrator

I would like to put a little picture next to my online resume! Please tell my how to do this?! :)

---

9/5/95 3:04 PM

Re(6): U.S. Playstation launch  
Dr. Cat  
Non-tech talk

> Its the quality of the games on the system which count! > Good programming=good games is what makes a system successful.  
Ya know, people have been thinking it's good programming that makes games good ever since I got into the industry in 1982, and probably before that.  
I guess I'm still a wild-eyed rebel for thinking it's good game design that makes games good.  
Maybe in another decade or two the industry will agree?

---

9/5/95 11:43 AM

PlayStation Piracy  
Jay Stelly  
Non-tech talk

On the internet I have read many messages about swapping disks to fool the PlayStation's license checking (and I'm sure some developers have discovered this as an easy way to test CD-Rs on grey PSXs). Unfortunately this allows for piracy, and there have been some messages in the rec.games.video.sony group suggesting that counterfeit titles are already being sold in Hong Kong. Does Sony have any plans to disable this trick? Is it possible? It seems to me that the new .EXE naming policy may disable this technique as each executable is no longer named PSX.EXE. However, a couple of US titles were released this week that (according to users on the internet) still work with this method.

Jay

---

9/6/95 3:13 PM

Re: Resume Pic  
Administrator  
chris m. coffin  
Non-tech talk

I will get back to you regarding your question.  
Thanks.  
Kathleen

---

9/7/95 1:56 PM  
Re(2): Resume Pic  
Ian McGee  
Non-tech talk

Kathleen,  
So when are you going to put in \*your\* picture? ;-)

---

9/7/95 9:33 AM  
Re: Resume Pic  
Administrator  
Non-tech talk

Yes you are able to put a picture next to your resume. First you find the graphics you would like to use then you CUT -- open your resume and PASTE..  
Kathleen

---

9/7/95 10:37 AM  
how come???  
Mark D. Hirsch  
Non-tech talk

Why is it that when I log onto the BBS, certain areas that have new information have red flags, but areas that are inside of other areas don't show the red flag all the way to the root folder. ie. I will open conferences, and there won't be a red flag on releases, but I have to go into authoring tools, artists, to see that something under artists has a red flag. I think there should be a red flag all the way to the root, notifying me that I need to go look inside of that folder. Is there some preference that I am not setting? Is there something that does what I want it to do?  
the way it is now, I still have to go flipping around through folders, just to see if something down deep inside has something new that I am missing.

---

9/7/95 12:21 PM  
Re(2): Resume Pic  
Thomas Boyd  
Non-tech talk

PS: It only works on a Mac! (Till the BBS software is updated) T

---

9/8/95 4:06 PM  
Re(3): how come???  
Administrator

Ian McGee

Mark D. Hirsch

Thanks for the input. I will call First Class on Monday to follow-up with this problem. Your right, it does only occur on the PC version. There is now a new version of First Class which we will download and hopefully this will resolve the problem, I will let you know.

Thanks,

Kathleen

---

9/8/95 4:05 PM

Fwd: Re(2): how come???

Administrator

Non-tech talk

I've had problems with the red flags too. Problems only appear on the PC version, from what I hear.

As he mentioned, red flags aren't carried "down" the chain, so if there's a new message in Releases, the Conferences box in the main menu won't have a red flag. (The Releases box \*does\* have a red flag.)

Worse is the red flags on the files, which don't generally carry down to the next level. So a new file in a folder in the Releases area won't show up unless you open the Releases folder.

Lastly, sometimes you read a message and the red flag \*doesn't\* get cleared. I don't know much about why this happens, but generally selecting Message Unread from the menu will clear it.

I can show you these problems on my machine if you like...

---

9/8/95 12:17 PM

Re: how come???

Administrator

Non-tech talk

Mark,

I never had any complaints regarding the red flags before. Usually when a new message is posted it alerts the conference with a red flag - - then when you open that conference, the message inside also has a red flag indicating that it has not been read yet. Once you have opened that conference or folder the red flag will disappear. I am going to check on your account and do a few tests and see what the problem is, and I will let you know.

Kathleen

---

9/8/95 4:10 PM

Auto Reply

Administrator

Non-tech talk

First Class is in the process of updating the software. Therefore, soon enough we will be able to reply automatically with the previous message present instead of copying the previous message in your reply with >>>.

We'll keep you posted.

Kathleen

---

9/12/95 12:09 PM

Butchering Playstation games



chris m. coffin  
Non-tech talk

To Sony: I want to know why Sony screwed up the voice acting in Tohshinden!!!!!! Changing the music was a good idea but all the other changes were unnecessary. Did you really think having american voices yelling Japanese battle cries was gonna be better? (At least match the voices' gender to the character please!!) Are we going to see this disgusting trend continue? I don't mean to go off on a rant, but I think Japanese games should be changed as little as possible. Translate the language where necessary and then STOP! That is the main reason I only buy japanese versions of playstation games. Why complain here? Maybe I'll get an explanation for this blasphemous translation. That's my opinion. Nobodys still told me why motor toon GP is cancelled for U.S release.

---

9/13/95 11:33 AM  
territory lock out code  
David Minogue  
Non-tech talk

Has anyone tried plugging a US game into a Japanese system? Know what happens? Nothing. Wouldn't it be a good idea to display a message saying something explaining why the game doesn't work?  
-- David Minogue, Acclaim Entertainment.

---

9/13/95 3:35 PM  
FMV Problems?  
Michael K. McCarty  
Non-tech talk

I've read a lot on the FMV problems of the US Playstations, I even have a unit that exhibits the same problems (until I turn it upside down). What's are Sony's comments on this?  
M.McCarty

---

9/18/95 11:36 AM  
CD-ROM Failures?  
Chris E. Reese  
Non-tech talk

I have been hearing from retail store that a significant number of the Playstation units sold on Sept. 9th have been returned due to defective CD-ROM drives. Not only have I heard this but I was actually stung by it myself when I got in line to purchase a machine. In my experience the CD-ROM played discs, both PSX games and music, for about 4 hours and then suddenly it just stopped reading the disc. It would not even recognize the disc was in the machine. This was the case for music CD's as well. I returned the unit and managed to get another one and so far it seems to be working.  
Has anyone else run into this problem?  
Chris Reese Eidetic, Inc.

---

9/18/95 12:55 PM

Re: CD-ROM Failures?  
Jay Stelly  
Non-tech talk

We got 4 of the retail units and so far two of them have begun skipping (audio and video) while playing back FMV. They all worked fine for the first week or so. So far the other two show no signs of any trouble, and the two that skip still play games fine, just not streams.  
Jay Stelly Tetragon

---

9/19/95 7:39 AM  
Re: CD-ROM Failures?  
Travis Hilton  
Non-tech talk

Of the 4 PlayStations we purchased from the retail store one CDROM quit working after about 12 hours, and the second CDROM would not even turn out of the box.

---

9/20/95 10:10 AM  
Mini-games  
chris m. coffin  
Non-tech talk

Does anybody know if there is a way to play a complete game of galaxian on ridge racer?? Same thing for tekken, you can keep playing the challenging stage in galaga if you keep getting perfects but i'd like to play the whole thing! Does Sony know?? :) I heard namco is supposed to make a game compilation CD with galaxian,galaga,dig dug and pac man on it. Anybody know about this? Have a day, Chris

---

9/21/95 8:16 AM  
Re: Butchering Playstation games  
Sky Lounge  
Non-tech talk

I agree! Why did they butcher the Toshinden voices!?!?!? Blech. The Japanese versions were far superior. And I like Motor Toon GP & the Japanese versions of Jumping Flash & Parodius.

---

9/21/95 11:32 AM  
Re(2): Butchering Playstation games  
chris m. coffin  
Non-tech talk

Amen Brother! [start ranting] The American versions of Japanese games usually suck because some Non-gamer,wanna-be game designer-out of touch executive thinks that a straight exact translation is "not appropriate" for american audiences. And so they butcher the game voices,rewrite the story and give it a lame ass title. Sound familiar people? A few games come to mind.... KILEAK THE BLOOD butchered into->(kileak the DNA imperative(crap name)) TOHSHINDEN butchered into->(battle arena tohshinden(OK but why change it in the 1st place?)  
Sony, Don't you dare screw up ARC the Lad when you bring it here! Anybody know where I

can get that sampler disc floating around that has wipeout on it? I like Sony and their Playstation the best still, I just question their judgement sometimes. :)

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9/21/95 5:18 PM

Re(4): Butchering Playstation games

chris m. coffin

Non-tech talk

Ian McGee

Now that I finally got your attention.... [ being nice now :) ] >>I believe everyone is entitled to their opinion when it comes to games as long as they don't get >>nasty. It is easier to critique than create. Thats just my way of provoking a response. A bit extreme I admit >didn't mean to get so personal :).....I see your reasons now. I buy the Japanese versions of the games so change 'em all you want, Just don't change them too much.

>> As far as Arc the Lad goes, it's an RPG so what do you expect we do? Include a >>Japanese/English >> dictionary in with every copy? Or maybe a coupon for some free Japanese >>lessons at Berlitz?

Translate the Japanese to English of course! I Just don't want to see a game changed so much it hardly resembles its Japanese counterpart(SEGAgames). To make an Analogy... Lets say somebody writes a 'book' (Japanaese Playstation game) people hear this 'book' is really great and can't wait to get it here(America) before the book gets here, somebody tears out some pages,re-writes some sections,changes some names and gives it to you.(American release)

How would this make you feel? I don't want THAT to happen to ARC the Lad. I just don't want the American gamer to be robbed of the game play experience it was meant to be. (with Japanese translated to english of course) Title names are trivial indeed but people hear about these games as they're being made in Japan though.

>>So, relax. Games sometimes need to be translated. We do our best not to mess with too much but to >>quote Mr. Spock, "The needs of the many outweigh the needs of the few". Thats what I wanted to hear. Thanks. Long live the Playstation! Where's motor toon GP???? What is eNOS?

---

9/21/95 3:31 PM

Re(3): Butchering Playstation games

Ian McGee

Non-tech talk

<Gary Barth>

Hi there, Chris....Butcher here,

I thought I'd take this opportunity to respond to your little rant session. First of all, I've been playing videogames since my mother dropped me in front of a Pong machine at the local Gemco when I was six and the closest I've ever been to even looking like an executive was wearing a suit at a funeral so spare me the stereotypical "it must have been a non-gamer decision" crap.

The name changes for the most part were Marketing-based (with the exception of TSD, which was Takara's decision). As a gamer, I really couldn't care less whether the game has a new subtitle as long as the game is decent. You see, as a gamer, that's what I care about most. I'm sorry you were attached to those original titles, but with a little therapy, I'm sure you'll get over it. As far as the voices go, most of the people on the Net who have never played the game before either like them or were indifferent. I know this might sound a little bizarre to you but I wasn't about to let Rungo, a mountain man from the US yell in Japanese. Something about the inconsistency between that and the background info in the manual didn't sit right with me. I was far more concerned that everyone thought that the game was so easy, their little sister could beat it in an hour after purchasing it. That's what I focused on. Now I dare people to try

being it in an hour. And as far as the Japanese storyline went.....well,...we're still trying to decypher the original. Besides, we didn't change it that much.

I believe everyone is entitled to their opinion when it comes to games as long as they don't get nasty. It is easier to critique than create. As far as Arc the Lad goes, it's an RPG so what do you expect we do? Include a Japanese/English dictionary in with every copy? Or maybe a coupon for some free Japanese lessons at Berlitz?

So, relax. Games sometimes need to be translated. We do our best not to mess with too much but to quote Mr. Spock, "The needs of the many outweigh the needs of the few".

Gary Barth Producer & Butcher of Battle Arena Toshinden & Kileak: The DNA Imperative

---

9/22/95 4:05 PM

Re(4): Butchering Playstation games

stephen chaplin

Non-tech talk

I believe that later Spock conceded that at times "The good of the few (or the one) outweigh the needs of the many" ;)

Romesh, Celeris Inc.

---

9/25/95 5:45 PM

Controller assignments

Mike Gomez

Non-tech talk

Is anyone interested in adopting a non-official standard for controller buttons? It seems like every game is different, and even the Sony sample programs are all different. There is even one game that uses one button for selecting in one menu, and a different button for selecting in another menu (in the same game!).

It seems like the Square button is good for menu selections, and the X button is good for menu exit.

Top Right Shift seems good for accelerate, but then would brake be Bottom Shift Right, or Top Shift Left?

How about Fire, Shield, Kick, Punch, Block, etc. ?

(Yes, I know controller buttons are programmable, it's just that consistent defaults would be cool)

Ideas anyone?

---

9/26/95 6:02 AM

Re: Controller assignments

Mark Beardsley

Non-tech talk

There's a Sony doc somewhere here that talks about standard control functions. I plan on following it as much as possible. For the most part, it states the obvious, but it's got a couple of good ideas. I think that it's in the RELEASES folder somewhere.

---

9/27/95 11:10 AM

Re(2): Controller assignments

Robert w. Calfee

Non-tech talk

For many games the Standards are ok, & I understand the desire to make a general controller usage-- BUT the current standard is "use the X button for everything, and use the other buttons for everything else..." I'm not sure how Panzer General interface menus are going to work with only one button useable. (right now I use 3: one for selecting an option, one for OKAY, and one for EXIT--silly me, I chose X for EXIT...)  
Any ideas? rwc

---

10/1/95 6:35 AM

It's fuzzy

Gene Sewell

Non-tech talk

Hi,

I must say that as you are getting more organized, I'm getting more confused.

Your current system has many folders in many places with the same files in them. First class flags unread posts with a flag, but now I may have to read the same message in many folders to make sure I see everything. Be nice if you could figure out how to tell First Class that the message has been read and not to flag it in all the other folders.

Anyway, in your release folders, you are now giving too little information about the contents of zip files. You've been repackaging the same files in new zips, and I don't feel like downloading all the new zips to find I'm getting files I already had.

For example: CONTENT: \*psx\doc directory

This is the only clue to the content of the "Prog.Tools CD"/PSX/\*Doc folder.

Please consider being more informative. A nice directory of all the files in the zip with date/time stamp would really help.

Thanks

Gene

---

10/1/95 2:54 PM

Re: It's fuzzy

Silas S. Warner

Non-tech talk

I'd like to add my own 2 cents to Gene's complaint.

It appears that Sony regs (or equivalent) require you to place a copy of the README.TXT file in the body of the note. Most of the time, the S/W download messages I've seen have SOME README.TXT file in the note body, but not necessarily the README.TXT file that corresponds to what is actually in the ZIP, or even the same README.TXT file as is in the ZIP file! More than once I've downloaded a long file on the basis of a release announcement, only to find that the file is nothing but old data when I look at the actual ZIP file with PKUNZIP -V. In one case, I downloaded what was advertised to be a BIN directory update, only to find that the ZIP contained nothing but README.TXT. Please, in future, be more careful with what README.TXT you place in the body of your download notes. At least PKUNZIP -V the actual ZIP file, and place this data in the README.TXT file AND in the body of the message.

Silas Warner

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10/2/95 11:47 AM

Re(2): It's fuzzy

John Phua

Non-tech talk

Hi Silas,

Thanks for the info. Please let us know the specifics so we can correct the necessary files.

Previously, we had a number of releases that were going out under the old release format which we may have placed the wrong readme for the zipped files.

Thanks, John

---

10/2/95 11:35 AM

Re: It's fuzzy

John Phua

Non-tech talk

Hi Gene,

Thanks for the input. Some background of where we are at.

>> I must say that as you are getting more organized, I'm getting more confused

We are still transitioning into the new release area. We will be moving items to the OLD RELEASE area and all new releases will be done under Product Releases. There may be some documents that have not been categorized by the product therefore we may create a separate folder outside of the product release.

>>Your current system has many folders in many places with the same files in them. First class

>>flags unread posts with a flag, but now I may have to read the same message in many folders

>> to make sure I see everything. Be nice if you could figure out how to tell First Class that the

>> message has been read and not to flag it in all the other folders.

We understand that we are repackaging some of the items that have been released in the previous format, but this is to provide our initial mirror image of the Product CD's that are being distributed to the developers. This will hopefully provide a more unified directory structure that we all can be familiar with. The release 1.5 is basically the zipped files existing on the CD's. The overall readme.txt contains a brief overview of the contents of the CD. The folders are setup in the same way as the CD's directory structure.

With the new upgrade to First Class 3.0, the flag problem should be fixed where the sub-conference would be flagged and the parent folder not flagged.

>>Anyway, in your release folders, you are now giving too little information about the contents of >> zip files. You've been repackaging the same files in new zips, and I don't feel like downloading >> all the new zips to find I'm getting files I already had. .... The items released under 1.5 are basically the collection of files that are on the CD based on the same directory structure as mentioned above. The readme's at the moment under the new release are just notices that refer the user to the main README.TXT file for the product.

>>Please consider being more informative. A nice directory of all the files in the zip with date/time >> stamp would really help.

First Class along with the size of the files have been a challenge in trying to make the releases more intuitive. Each zip file that is released has an associated release number and date/time stamp. I am not sure if we are able to do it, but we are checking if we could link the mail files associated with each other to the main release note (readme.txt) This way a user can just read the readme and know what directories are being updated with the release. Presently, the release number is the mechanism being used.

Thanks, John

---

10/3/95 1:39 PM

Re(2): That big bad black car...  
Dave R. Scheele  
Non-tech talk

When we bought our Jap. PS, we got it with RR and a memory card, and the guy was nice enough to put "El Daiblo" on it as a saved game...  
It's a REALLY NICE car to drive!!!  
Dave

---

10/3/95 10:52 AM  
Re: THE JUICE IS LOOSE!  
Mark Beardsley  
Non-tech talk

Justice has been on sale for a long time. Anyone remember Mary Jo and Ted Kennedy?

---

10/3/95 11:03 AM  
Re(3): THE JUICE IS LOOSE!  
David W. Marshall  
Non-tech talk

I knew all along it was those Space Aliens that did it.  
;-)

---

10/3/95 5:56 PM  
Game Genie for the PSX...  
mickey everts  
Non-tech talk

Has anyone heard about another PSX developer who is making a GameGenie-style of program? I heard about the company, but didn't get a name... I know they're based out of the UK somewhere. Any help in tracking them down would be appreciated! Please reply in email...  
Thanks-

---

10/3/95 2:04 PM  
Re(6): THE JUICE IS LOOSE!  
chris m. coffin  
Non-tech talk

"Gee brain, do you think it'll work?" I think OJ stands for " Outta Jail " ;)

---

10/3/95 2:45 PM  
Re(3): That big bad black car...  
Ian McGee  
Non-tech talk

So why not hack something together to read a memory card save game out & store as a binary PC file?

Then we can start a library here of favorite save games!

I can't imagine that there's a copyright problem with save games... Er, I guess, anyway... And it's not like anyone could use them without a development system anyway...

[The above in no way reflects the opinions of any component of Sony, as far as I'm aware...]

---

10/3/95 1:24 PM

Re(5): THE JUICE IS LOOSE!

stephen chaplin

Non-tech talk

No, my sources indicate that two laboratory mice framed O.J, so that while the entire world watches the trial on T.V, they can try to take over the world.

God, I've got to stop watching Animaniacs ;)

Romesh, Celeris Inc.

---

10/3/95 10:19 AM

THE JUICE IS LOOSE!

chris m. coffin

Non-tech talk

For those of you that are out of touch with the TRIAL, OJ is a free man. Justice is on sale now...

:|

---

10/3/95 9:51 AM

That big bad black car....

chris m. coffin

Non-tech talk

Anybody know how to beat that black ferrari in ridge racer? Is there a code to get the car? Even without crashing or slowing down he still passes me up! Eh? :)

---

10/3/95 10:53 AM

Re: That big bad black car....

Mark Beardsley

Non-tech talk

I have heard that the way to beat the black car is to weave back and forth so that he can't pass you. Never been able to do it myself though.

---

10/3/95 11:58 AM

Re(4): THE JUICE IS LOOSE!

Mark Beardsley

Non-tech talk



Yeah, they just happen to have O.J.'s DNA.

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10/3/95 4:07 PM

Re(4): That big bad black car....

chris m. coffin

Non-tech talk

Is there a way to use a memory card with a dev system?? I have a friend that has the black car saved on a memory card. Also the sony sampler disc doesn't work with dev systems for some reason. I can get MK3 and WWF 4 to work on it though. I'm running the correct EXE file but it just hangs up! What gives ? Where do you get a mouse for the dev system?? Eh? ;)

---

10/3/95 10:55 AM

Re(2): THE JUICE IS LOOSE!

Alan D. Lasky

Non-tech talk

Or how about "Fatty" Arbuckle?

---

10/3/95 8:47 PM

Re: Game Genie for the PSX...

chris m. coffin

Non-tech talk

I think you're referring to DATEL electronics, they made the pro action replay for SNES / GEN systems. I don't know where in the UK they are but Tommo Inc. a game distributor in Los Angeles carries their products- maybe they know. DATEL is supposed to be making a device for the U.S playstation that lets you play japanese (unbutchered ;) <- just joking) games. :)

---

10/4/95 10:02 AM

Re: That big bad black car....

Dan Burnash

Non-tech talk

chris m. coffin

It sounds like you need a faster car! Beat the Galaxians to get the extra cars, they are a little better. I use the second Galaga car, which isn't the fastest, but works if you make every turn perfectly. You also have to minimize your slide time, so you don't lose too much speed.

The other alternative is to bribe me to upload my save game. :-)

Good luck, that's what it took for me to beat the black car.

Dan B.

---

10/4/95 9:53 AM

Re(5): That big bad black car....

Thomas Boyd

Non-tech talk

chris m. coffin

Yes, buy a DTL-H2080. It uses commercial mem cards and commercial controllers (your mouse).  
PS: Dan Burnash beat the black car, and now he has it saved on a card at Sony. haha.

Tom ===== Is there a way to use a memory card with a dev system??  
I have a friend that has the black car saved on a memory card. Also the sony sampler disc doesn't work with dev systems for some reason. I can get MK3 and WWF 4 to work on it though. I'm running the correct EXE file but it just hangs up! What gives ? Where do you get a mouse for the dev system?? Eh? ;)

---

10/4/95 12:24 PM

Re(2): That big bad black car....

chris m. coffin

Dan Burnash

Non-tech talk

I'm using the galaga/dig dug/blue/orange car that goes up to 233kph and I make nearly every turn without slowing down by using the slant banks to go through the corners. It seems the black car starts up a number of seconds after the yellow car passes him up, not when I pass him. I'm getting lap times around 1'02"891 -> 1'04"00 but this doesn't seem to be fast enough! I've found the black car races on only certain lanes of the track so if you stay on those he can't pass you. Sliding through the corners seems to be worse than holding the gas down and tapping on the brake. Any suggestions? I also don't like the fact that the black car can drive right through the yellow one without registering a collision! Whats up with that!

---

10/4/95 12:03 PM

Developer's Conference Agenda

Thomas Boyd

News

Dear developers,

SHAPE YOUR OWN DEVELOPER'S CONFERENCE!!

What topics do you want to see covered at next year's development conference? I am lining up the technical content now, and I want your input to ensure relevance of covered material. Please EMail me (Thomas Boyd) on this BBS with your input.

I am hoping for lots of Q+A sessions, presentations, and training sessions

To give you an idea of how much info can be covered, we have 2 days, one auditorium, 4 rooms that hold about 200+, five tech support engineers, a few guests from SCEE. SN Systems, SCE Japan, and other vendors, and a zillion info-hungry developers.

Send ideas/suggestions/etc to Thomas Boyd on this BBS.

Thanks,

Tom

---

10/5/95 1:50 PM

sony cd & docs

Shaival Varma

Non-tech talk

has the sony stuff CD & docs been shipped yet?

are the docs printed or on the CD?

how many programs (that were shipped on the CD) do we need to replace with working versions from the BBS? Is there a list & their locations on the BBS to download from?

---

10/5/95 1:47 PM  
car  
Shaival Varma  
Non-tech talk

there is a black car in your parking lot, lic plate PSX-001.  
your head lights are on.

---

10/6/95 11:18 AM  
FTP  
David Vronay  
Non-tech talk

How would one go about gaining access to the Sony FTP site? Got the address fine, but cannot access any of the directories/files.  
Thanks

---

10/6/95 4:27 PM  
Re: sony cd & docs  
John Phua  
Non-tech talk

Hi,  
We were target mid-week this week and it we were unable to begin shipping do to some problems were having at the printers. As soon as we get it all together it will be shipped out. Sorry.  
The mirror image of the CD is on the BBS under Product Releases : Prog. Tools CD and Graphic Artist CD  
>> how many programs (that were shipped on the CD) do we need to >> replace with working versions from the BBS? Is there a list & their >> locations on the BBS to dnload from?  
The documents are on the CD's as well as being printed. Both will be sent to you. As for working versions, I'm not quite sure what is meant by that statement. There have some updates on the BBS since the compilation of the CD's and the version number rolls with each update (e.g. 1.5 , 1.5.1, 1.5.2)  
The readme.txt which is mailed to the actual Conference , Prog. Tools CD. Contains information of each release and the contents of the CD.  
Hope it helps, John

---

10/6/95 12:13 PM  
Re(6): THE JUICE IS LOOSE!  
William Botti  
Non-tech talk

I'm a black male, and I don't understand why all you white folk think OJ is guilty. Don't all those rushing yards and records count? And what about Furman? How many TD's did he score?

Just kidding. I'm white. But the verdict caused me to search my own table of values. Am I a rascist? Do I assume OJ's guilty just because he's black? After deliberating for about 4 hours, (actually it took me less, but like the jury I want it to seem like I tried) I realized: No. I'm not prejudging him. He fuckin' did it. Lets pray for the victims. WB

---

10/12/95 9:46 AM  
v-cd?  
Kirk Bender  
Non-tech talk

I heard on the internet that the demo disc that comes with the european PSX has a program called "v-cd". It supposedly shows cool graphics that change in time with audio cds, similar to the Atari Jaguar VLM. Anyone know who makes this program, and how we can get it? If it is a sony demo, is the source available?

---

10/13/95 6:29 PM  
Re: Library source  
Blake E. Senftner  
Non-tech talk

Motor tune GP was written before many of the libs were available, and in fact was the test bed for the sony library engineers to understand what they needed to put into the libs.  
-Blake (former Sony guy)

---

10/13/95 5:37 PM  
Library source  
chris m. coffin  
Non-tech talk

I have spoken with an ex-sony tech support person which told me that sony does not use the same libraries all of us are using(libgte,etc.) I heard motor toon GP was not written with the sony libraries and that the tech guys(angus?) have the library source but are not allowed to give it to the developers(it took them months to wrestle it from sony japan in the first place) Doesn't seem fair that sony writes games that 'bang on the hardware' while we have to do everything through their libraries. How's that for starting a fire? :)

---

10/13/95 6:33 PM  
Re: Library source  
Angus  
Non-tech talk

>>I have spoken with an ex-sony tech support person which told me that sony does not use the same >>libraries all of us are using(libgte,etc.) Any improvements made to the libraries are made available to ALL developers. We do work with developers with requests for features, and we put them in for all the developer community to use. At this point in the evolution of games, all games have equal access to the same libraries technology. If a developer requests a feature

they may get it earlier only because they requested it. If other developers request the same feature, then it gets put in. Games can be written in assembly, but need to use our libraries for the rest.

>>I heard motor toon GP was not written with the sony libraries and that the tech guys(angus?) have >>the library source but are not allowed to give it to the developers(it took them months to wrestle it >>from sony japan in the first place) This is wrong. Certainly, GP had some enhancements requested and they were put in the general libraries for use now. Also, they wrote their own tools, but everyone does that. There is no unfair advantage.

>>Doesn't seem fair that sony writes games that 'bang on the hardware' >>while we have to do everything through their libraries. On a personal note, I think it is unfair of you to use an ex-Sony employee in such a manner to make Sony and the person look bad. Now, I don't think that is fair.

>>How's that for starting a fire? :) I'd rather you be writing a game. :-)

Angus

---

10/13/95 11:18 AM

Re: FTP

Developer Support

Non-tech talk

Dear David,

In answer to your question (sorry its taken so long), but there is no FTP Site., but if you want World-Wide Web - you can access it as follows:

[HTTP://WWW.SONY.COM](http://WWW.SONY.COM)

If this doesnt work - please EMail WEBMASTER @ SCEA.SONY.COM.

I hope this helps.

Krystyna Irving

---

10/17/95 2:36 PM

cd

R.Brett Butler

Non-tech talk

has anyone received the sony CD of tools yet?

has anyone had inconsistent compiles? sometimes when i compile, after a while it stops, then i have to compile again to complete it. Am i missing something here?

---

10/17/95 3:18 PM

Game Over

Mark Beardsley

Non-tech talk

As some of you may know, Absolute Entertainment has been struggling of late. Today, the remaining dozen or so of us have been laid-off. The future (if any) of the company is just a question mark now. It was not a surprise, just a disappointment. So this will apparently be the last posting from this account. Hopefully I will be able to work on a PlayStation project somewhere, sometime in the future.

I've really enjoyed my years here, and especially the PSX work. Knowing how in-bred this

industry is, I'm sure that I'll bump into some of you elsewhere.  
Good Luck, Godspeed, etc. Mark Beardsley (201) 279-5017  
P.S. -> if anyone is looking for a programmer (slightly used), give me a call.

---

10/23/95 10:28 AM  
PlayStation Sales  
Randy X. Thompson  
Non-tech talk

Any further word on how PlayStation sales are doing after that first blockbuster weekend?  
-Randy

---

10/30/95 10:43 AM  
Re: PlayStation Sales  
Thomas Boyd  
Non-tech talk  
Randy X. Thompson

>Any further word on how PlayStation sales are doing after that first blockbuster weekend?  
The below-included press release states over 300,000 ----- FOR IMMEDIATE  
RELEASE

SONY PLAYSTATION GAME CONSOLE SALES REACH 300,000 UNITS More Than One  
Million Pieces of Software Sold In Six Weeks Since Debut -----  
----- FOSTER CITY, Calif., October 30, 1995 -- Sony Computer Entertainment America  
(SCEA) today announced that 300,000 Sony PlayStation game consoles have been sold since the  
system's landmark introduction on September 9 of this year. Additionally, high software sales  
of more than one million game titles have resulted in an unprecedented 4:1 tie ratio (four titles  
per game console). "This is phenomenal news -- exciting for everyone involved in the launch of  
the PlayStation, especially our retailers and consumers," said Jim Whims, senior vice president,  
SCEA. "Several retailers are still in a sold-out situation, and demand for software continues to  
increase as the installed base grows. Our goal is to gear up for what we anticipate will be a  
fabulous holiday season." "These hardware statistics, coupled with impressive software sales,  
are going to make the PlayStation a difficult package to beat."

The one million units of software sold to date include Sony titles, as well as titles from third-  
party developers, including Acclaim, Crystal Dynamics, Electronic Arts, Namco, Ocean of  
America and Ubi Soft. Specifically, Battle Arena Toshinden and Namco's Ridge Racer are  
currently selling in at a ratio of nearly 1:1 (one title for every PlayStation game console). In  
addition to the success of PlayStation hardware and software, performance and convenience  
"peripherals," such as extra game console controllers and memory cards (which allow players to  
"save" advanced stages of game play to be reaccessed at a later date), have sold exceptionally  
well. "Demand for PlayStation peripherals continues to exceed supply," said Whims.  
"Incredibly, we have shipped the same number of memory cards to retailers as actual hardware  
units." With record sales of more than a quarter of a million units in just over six weeks, SCEA  
is anticipating that the PlayStation will be this year's leader among the next-generation video  
game platforms. According to Peter Roithmayr, merchandising director at The Electronics  
Boutique, "The Sony PlayStation continues to be the dominant video game hardware at our  
stores, by far outselling the Sega Saturn. Every new piece of PlayStation software we get goes  
straight to the top of our sales charts. We are ecstatic with the sell-through." Sony Computer  
Entertainment America, a division of Sony Interactive Entertainment Inc., is based in Foster  
City, Calif. The company markets the PlayStation for distribution in North America, publishes  
PlayStation software for the North American market, and manages the U.S. third party licensing

program. Sony Interactive Entertainment Inc., a subsidiary of Sony Corporation of America, is headquartered in New York.

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11/22/95 9:59 AM  
memory card support  
Kirk Bender  
Non-tech talk

The new games that just came out, Doom, Warhawk, and Twisted Metal are very good but they don't support the memory card to save progress or options, they are password only. As a game player, I would hope that Sony would strongly encourage developers to use the memory cards. As a game developer, does this mean I don't have to support the memory card in order to pass Sony QA?

---

11/22/95 11:22 AM  
Japan->US conversion?  
Crystal Dynamics  
Non-tech talk

hi folks. my producer (yeah, that's the ticket!) heard that you can convert a Japanese PSX to a US one. does anyone know the deep dark secret to doing this? (private email if it's a taboo subject! ;)  
thanx - Chuck

---

11/27/95 8:56 PM  
Re(2): memory card support  
Roy Eltham  
Non-tech talk

Sometimes it's not laziness. Sometimes it's deadlines that are too tight to allow the extra time needed to figure out yet another thing (that isn't essential to the gameplay). Most of us are more worried about figuring out LIBGS/GTE/GPU so we can make our games look good...

Roy Eltham

p.s. maybe after your libraries are matured and when your docs cover everything well enough and everything works as described, then I'll be willing to support every gizmo for the playstation.

---

11/27/95 11:38 AM  
Re: memory card support  
Dan Burnash  
Non-tech talk

We are **STRONGLY ENCOURAGING** memory card usage.  
>As a game developer, does this mean I >don't have to support the memory card in >order to pass Sony QA? Why does everyone ask what is **REQUIRED!** Why not ask what makes the game

BETTER!!

Using the memory card makes it easier for the player, and allows more data to be stored, so the game will be better. Don't you hate writing down stupid passwords all over the manuals, then trying to figure out which one puts you back just where you want to be?

Think of new ways to use the card to make the game better, not ways to get away with being lazy. For those who can't help but be lazy, the standards are being updated to require memory card game saving, where appropriate.

Dan Burnash

---

11/28/95 9:45 AM

Re(3): memory card support

David W. Marshall

Roy Eltham

Non-tech talk

I agree.

Hopefully someday we will be using Lib 5.7 and actually have docs for Lib 5.7.

dave

---

11/28/95 9:52 AM

Re(4): memory card support

John Phua

Non-tech talk

David W. Marshall

Hi,

In striving to catch up with the documents update books which bring the manuals 3.0 to 3.3 have been previously released in alpha/beta format in the release area.

Please let me know if there are any questions and/or concerns.

Thanks for you help, John

---

11/29/95 7:02 PM

Re: Messages Read? (was How to use active sub-division)

Roy Eltham

Dave R. Scheele

LIBGS

Thanks for the tip. :)

Roy Eltham

---

11/29/95 8:31 AM

Messages Read? (was How to use active sub-division)

Dave R. Scheele

Roy Eltham

LIBGS

>> p.s. I wish they would at least acknowledge my >> messages, as far as I know they haven't seen em yet.

I use the "History" selection from the Message menu in FirstClass to see who has read my messages. That way, I can see that Sony employees HAVE actually read my messages, and just



decided to ignore them ;)  
Dave

---

12/8/95 8:05 PM  
Re(4): memory card support  
Roy Eltham  
Joe J. Toolman  
Non-tech talk

From the past messages from some developerson memory cards, it seems your were lucky to get it working in 12 minutes. I've not even had time to look at the memory card stuff. If really is that easy then perhaps it might make it into my game. However, there is more to saving and restoring games then reading and writing to the memory card.

Roy

---

12/8/95 5:52 PM  
Re(3): memory card support  
Joe J. Toolman  
Non-tech talk

The memory card was hard for the first 12 minutes, but then it got easier, because I was done. Somebody posted a that gigantic mem card example in one of the news groups. The biggest problem I had was weeding out all of the crap-ola I did not need! It would have to be an amazingly tight deadline to make the mem-card a problem.

JJ (the singing druid)

PS: don't try to write anything that is not in increments of 8K or it will not work at all.

---

12/14/95 3:17 PM  
BRender Developers?  
Robert w. Calfee  
Non-tech talk

Is anyone else doing development using BRender?

Maybe we could share notes...

rwc

---

12/15/95 1:05 PM  
Password Standard  
David W. Marshall  
Non-tech talk  
SIO

I believe there is a standard which says all games which use the memory card must also have a password feature for owners that don't have memory cards.

I just got Konami's "In The Zone" 3D basketball game. This game uses the memory card but has no password feature that I could find. Since this is a released game, can I assume that a password system is now an option and no longer a must have standard for approval of a title?

---

12/15/95 2:21 PM  
Re: Password Standard  
Thomas Boyd  
Non-tech talk

No. It means that Konami got away without it for some reason. This is the exception rather than the rule. Sorry.

Tom ===== I believe there is a standard which says all games which use the memory card must also have a password feature for owners that don't have memory cards.

I just got Konami's "In The Zone" 3D basketball game. This game uses the memory card but has no password feature that I could find. Since this is a released game, can I assume that a password system is now an option and no longer a must have standard for approval of a title?

---

12/15/95 1:02 PM  
Re: BRender Developers?  
John Phua  
Non-tech talk

Hi Robert,  
Presently, we do not support 3D graphics libraries such as BRender.  
John

===== Is anyone else doing  
development using BRender?  
Maybe we could share notes...  
rwc

---

12/19/95 9:03 AM  
Re(2): Password Standard  
David W. Marshall  
Non-tech talk

>>>No. It means that Konami got away without it for some reason. This is the exception rather  
>>>than the rule. Sorry. >>>Tom  
PGA Tour 96 by EA has memory card support but no password support. How can you enforce  
a standard on some developers while letting others release without it?

---

12/19/95 9:19 AM  
Re(3): Password Standard  
Kristine Severson  
Non-tech talk

There are always exceptions to the rule, but generally, we strive to have everyone adhere to the standards as stated in our Sourcebook. You can be assured that whenever a title is submitted, a full test report is sent back to the developer/publisher. All standards violations are documented and we ask that they be fixed. Sometimes, other issues pop up, and we make exceptions here and there, but one of our top priorities is to get everyone to adhere to the standards. It makes for a better game, and more consistency and ease-of-play for the consumer, which is what we all want, afterall.

We have a new Sourcebook that will be released very soon. It outlines the standards more

clearly, so they should be easier to follow. And as always, if you have any questions, just let us know.

---

12/27/95 8:20 PM  
Re(4): Password Standard  
clearwater  
Non-tech talk

I'm working on an RPG conversion from the PC. The saved game files vary in size from 100k - 1.2M in size. I've got a few ideas about fitting everything I need onto a memory card, but you seriously can't expect people to waste time developing exotic code just to "adhere" to an unworkable standard.  
sorry, I'll go back to my padded cubicle now.  
mick delaney (clearwater)

---

12/28/95 6:18 PM  
Glossary  
David Vronay  
Non-tech talk

Could Sony provide a glossary, or could this bulletin board somehow combine to create a glossary of common terms that could all be found in one place. Terms such as gold disk, blue box, development station, debugging station, ... , and whatever else confuses people for a day.

Richard Maurer @ImaginEngine

---

12/28/95 9:35 AM  
Re(5): Password Standard  
Thomas Boyd  
Non-tech talk

I am sorry, but you will have to have a 300,000 character password. Kids just love to type them in with a joystick. Did I mention that the password has to be in cyrillic?  
...Just kidding. Some RPGs obviously cannot adhere to the psswd std.

-----  
I'm working on an RPG conversion from the PC. The saved game files vary in size from 100k - 1.2M in size. I've got a few ideas about fitting everything I need onto a memory card, but you seriously can't expect people to waste time developing exotic code just to "adhere" to an unworkable standard.  
sorry, I'll go back to my padded cubicle now.  
mick delaney (clearwater)

---

12/28/95 8:27 PM  
Re: Glossary  
Kerry J. Ganofsky  
Non-tech talk

blue box? shouldn't this be in the Telephony conference?  
Happy Holidays Scott HVS -----  
Could Sony provide a glossary, or could this bulletin board somehow combine to create a

glossary of common terms that could all be found in one place. Terms such as gold disk, blue box, development station, debugging station, ... , and whatever else confuses people for a day.

Richard Maurer @ImaginEngine

---

1/2/96 3:52 PM  
PlayStation Holiday Sales  
Randy X. Thompson  
Non-tech talk

Any word on how the PlayStation's sales were over X-mas?  
-Randy

---

1/5/96 5:36 AM  
Forwarding mail to the internet?  
David Minogue  
Non-tech talk

Is this First Class BBS configured to allow messages to be forwarded to Internet addresses? That is, can I set up my account to automatically forward my incoming mail to my Internet address, so that I don't have to constantly log-in to check for a response to a question?  
Thanks.  
-- David Minogue, Acclaim Entertainment (dminogue@aklm.com)

---

1/5/96 1:55 PM  
Re: Forwarding mail to the internet?  
Thomas Boyd  
Non-tech talk  
Administrator  
No, but I can ask if it is possible. T ----- Is this First Class BBS configured to allow messages to be forwarded to Internet addresses? That is, can I set up my account to automatically forward my incoming mail to my Internet address, so that I don't have to constantly log-in to check for a response to a question?  
Thanks.  
-- David Minogue, Acclaim Entertainment (dminogue@aklm.com)

---

1/8/96 11:06 AM  
Re: Snow  
Rob Vawter  
Non-tech talk

>>Why is it whenever we get a foot or more of snow I'm the only one that comes in to work?  
>>Dave  
Let me make a suggestion for next year's company Christmas bonus - tire chains and snowshoes for all!

---

1/8/96 9:06 AM  
Re: Snow

Mark DeSimone  
Non-tech talk

Try moving to Phoenix.  
Glenn O'Bannon Rainbow America Phoenix, Arizona

---

1/8/96 6:12 AM  
Snow  
Dave R. Scheele  
Non-tech talk

Why is it whenever we get a foot or more of snow I'm the only one that comes in to work?  
Dave

---

1/9/96 2:31 PM  
Re: Startup Screen Standard  
John Phua  
Non-tech talk

Hi David,  
You are correct in your assumption that the SCE and the PSX logo screen are in the BIOS and they are not part of your game itself. The PlayStation log (PSX logo) appears when you have correctly used the licensea.dat file during your cd mastering process.  
The first screen that you would be able to display is your legal screen as you mentioned. As for the display length time for the SCE and the PlayStation logo, they are fixed.  
Please let us know if you have any additional questions.  
thanks, John

=====  
Can someone please clear up my confusion.  
The Startup Sequence standard says that the screen order upon boot is SCE LOGO, PSX SCREEN, then publisher/game/legal screens. I thought that the sce logo screen and the psx screen were in the bios and the first screen that I would be able to display would be my legal screen.  
The paragraph that talks about how much time each screen must stay on screen seems to imply that the sce logo and psx screens are inside my game and I have control over how long they stay on screen.  
So, are the sce and psx logo screens in the bios or do they belong in my game?  
thanks,  
dave

---

1/9/96 4:48 PM  
MemCard Error Screens  
David W. Marshall  
Non-tech talk

Are there standards for the actual text that must appear on the different error screens when dealing with the memory card?  
The docs I have say things like "a dialog box that asks if the user would like to format the card", but doesn't give any standard text for that dialog box.

thanks,  
dave

---

1/9/96 1:44 PM  
Startup Screen Standard  
David W. Marshall  
Non-tech talk

Can someone please clear up my confusion.  
The Startup Sequence standard says that the screen order upon boot is SCE LOGO, PSX SCREEN, then publisher/game/legal screens. I thought that the sce logo screen and the psx screen were in the bios and the first screen that I would be able to display would be my legal screen.  
The paragraph that talks about how much time each screen must stay on screen seems to imply that the sce logo and psx screens are inside my game and I have control over how long they stay on screen.  
So, are the sce and psx logo screens in the bios or do they belong in my game?  
thanks,  
dave

---

1/10/96 4:11 PM  
Re: MemCard Error Screens  
Thomas Boyd  
David W. Marshall  
Non-tech talk

The message must be clear and free of content violations. That is all. T ----- Are there standards for the actual text that must appear on the different error screens when dealing with the memory card?  
The docs I have say things like "a dialog box that asks if the user would like to format the card", but doesn't give any standard text for that dialog box.  
thanks,  
dave

---

1/23/96 9:28 PM  
Re(2): Forwarding mail to the internet?  
John Hwee  
Thomas Boyd  
Non-tech talk  
Sorry but we currently don't have internet e-mail available via FirstClass. I don't see a need in the future but will keep your request in mind.  
Thanks  
John Hwee

---

1/24/96 12:43 PM  
Re(4): Forwarding mail to the internet?  
Dan Burnash  
Non-tech talk

Didn't you know? Sony is looking into buying AT&T, and we want to increase our business. :-)  
Actually we have looked into other options, but for reasons out of our control, it won't happen

right now.  
Dan Burnash

---

1/24/96 11:09 AM

Re(3): Forwarding mail to the internet?

Carl Ferreira  
Non-tech talk  
John Hwee

How about providing Internet access so that non-local developers don't incur a huge phone bill in order to stay in touch?

Carl Ferreira

---

1/26/96 4:21 PM

Re(6): Forwarding mail to the internet?

David Minogue  
Non-tech talk

There is a shareware Macintosh program for reading FirstClass messages off-line it's called BulkRate. I found it on another FirstClass server (I won't say which). It was written by Greg Neagle of 1924 Mentone Ave, Pasadena CA, 91103. I don't know if there is a PC version, but I could upload the Mac SEA if anyone wants it.

-- David.

---

1/26/96 9:16 AM

Re(5): Forwarding mail to the internet?

Dave R. Scheele  
Non-tech talk

Then how about at least providing a system that supports offline mail reading, like the european one? It's almost cheaper to call there for support than to call here, because it's a 5-minute call instead of a 1 hour one.

Dave

---

1/29/96 3:20 PM

Crashing Acrobat

Silas S. Warner  
Non-tech talk

Acrobat Reader will consistently crash after I install ANY new Windows app. Apparently, installing a new app displaces the font "Zapf Dingbats" that Acrobat Reader needs, and the reader will not run until completely unzipped and reinstalled.

Silas Warner

---

1/29/96 12:29 PM

Re(8): Forwarding mail to the internet?

David Minogue  
Non-tech talk

BulkRate 2.0.sea 240K

Non-tech talk

I've attached a Macintosh Self-Extracting Archive (.sea) for BulkRate 2.0. This shareware program lets you download all of the new messages from whichever conferences you select in bulk, letting you read the messages off-line. You can also reply in bulk. Pretty handy for saving on phone bills.

I didn't write it, and I don't make any warrantee to it's fitness for any particular purpose, etc, etc.

-- David Minogue.

---

1/29/96 11:33 AM

Re(7): Forwarding mail to the internet?

Kristine Severson

Non-tech talk

David,

If it's shareware, please post it.

Thanks, Kris

---

1/30/96 11:23 AM

"Developer" newsletter

David Minogue

Non-tech talk

I've seen a reference to a newsletter titled "Developer" which is being distributed by SCEE. Does SCEA have any similar plans? It would be a welcome addition to the already excellent support which SCEA provides via this BBS.

-- David.

---

1/30/96 5:27 PM

Re: "Developer" newsletter

Kristine Severson

Non-tech talk

You're clairvoyant. SCEA IS planning a Developers Newsletter. The first edition should be out sometime this quarter.

Kris

---

3/7/96 11:05 PM

Re: PSX Conference hands-on tech support ???

John Phua

Non-tech talk

Hi Tim,

Is it possible to be more specific on what the issues are before the actual conference. This way we can determine if we adequately allocate some time to help out.

Thanks, john

---



3/7/96 8:03 PM  
PSX Conference hands-on tech support ???  
Tim L. Lowery  
Non-tech talk

Will there be any hands-on tech support at the conference? We'd love to bring in a ZIP cart, or a CD, or a big fat printout, and then sit down with a Sony tech support guru to pore over our rendering code to weed out weirdness and add sneaky hacks to tweak performance. Is that a crazed pipe dream, or is such a thing possible?  
Dave Howell Pablo Media dshowell@aol.com

---

3/27/96 11:07 AM  
Memory Card percentage  
David Vronay  
Non-tech talk

A problem that often comes up in the design of possible new game titles is the percentage of consoles that have memory cards. Can Sony tell us, or is this something they want to keep from us and the rest of the world?  
Richard Maurer @ImaginEngine

---

9/10/96 4:22 PM  
Re: PlayStation 64  
Blake E. Senftner  
Non-tech talk

1. Get rid of the current libraries and forget any ideas of "backward compatibility". Ever tried playing a Genesis game on a Saturn or a SNES game on a Nintendo 64? Progress is what this planet wants (look at what the crappy PC did to superior machines and how it keeps us in the dark ages of computing with bloody segmented 64K memory and all that).
2. Fix the gouraud shading. Or better yet, just REPLACE the current GPU and GTE with a better unit.
3. Trilinear mip-mapping.
4. Hardware anti-aliasing.
5. Hardware polygon sub-division (I believe it's possible)
6. 2 R4000 chips so it kicks Nintendo 64s butt.
7. Release the hardware docs early cos it's lifetime would probably be shorter than the current PlayStation's (my estimate is about 1 year) before were all screaming for 128bit machines! THE MADNESS IS JUST BEGINNING!!!!

My wish list for PSX64:

1. same as Ayo, restart the libs and OS from scratch
2. fix the texture mapping to be perspective correct, as well as mip-mapping and alpha channel support.
3. Allow for textures to be run-length encoded (or some other not-just-clut compression) in VRAM
4. z-buffer support!!! forget ordering tables!!! (Or at least allow for one to not need them)
5. re-engineer the MDEC to not require CPU for decompression, or even better give us a huffman co-processor that we can use for any data we want in addition to the .bs data.
6. real 4x4 floating point matrices. (these wishes are all of equal importance)
7. hey! floating point!!!
8. memory is cheap now, I WANT 8-16 MEGS RAM!!!

Actually, I'd take the existing PSX with 16 megs ram and create a mario killer out of it.

-Blake

---

9/10/96 7:46 AM  
PlayStation 64  
Ayo A. Orimoloye  
Non-tech talk

With the impending arrival of Nintendo 64 and M2 with it's 2 PowerPC chips, the current PlayStation shall soon be "yesterday's hardware". Here's my wish list for PlayStation 64 (the next level):

1. Get rid of the current libraries and forget any ideas of "backward compatibility". Ever tried playing a Genesis game on a Saturn or a SNES game on a Nintendo 64? Progress is what this planet wants (look at what the crappy PC did to superior machines and how it keeps us in the dark ages of computing with bloody segmented 64K memory and all that).
  2. Fix the gouraud shading. Or better yet, just REPLACE the current GPU and GTE with a better unit.
  3. Trilinear mip-mapping.
  4. Hardware anti-aliasing.
  5. Hardware polygon sub-division (I believe it's possible)
  6. 2 R4000 chips so it kicks Nintendo 64s butt.
  7. Release the hardware docs early cos it's lifetime would probably be shorter than the current PlayStation's (my estimate is about 1 year) before were all screaming for 128bit machines! THE MADNESS IS JUST BEGINNING!!!!  
Don't you just love hardware wars?
- 

9/11/96 3:48 PM  
Re: PlayStation 64  
player 1  
Non-tech talk

I don't want higher poly counts in my Playstation 64, but real 3d clipping would be nice (so we don't have to subdivide), as well as perspective correct texture mapping and z-buffering would all that would really be needed, since it seems like everything else but anti-aliasing can be done in software... Tom Ketola PSX Lead Programmer Player 1, Inc.

---

9/17/96 7:26 AM  
Sony font copyright issues  
John A. Slagel  
Non-tech talk

For our port of Descent 1 to the PS-X, we used the Kanji fonts that Sony ships on the dev CD in the form of an include file in the KANJI directory.

I was wondering what the copyright issues are with these fonts and where the fonts came from for quite a few reasons: 1. I would like to use these fonts in our Sega Saturn port of Descent, since the code to use these fonts is already done. 2. I would like to find out where I can get more fonts like this in different sizes, typefaces, etc for the future. 3. I am writing a magazine article on how to port U.S. titles to Japanese, and I would like to include some sample code that uses these .H font files from Sony. But I do not know, if anyone, I have to get permission from. I had called someone from Sony about this about 1/2 year ago and never did get a reply. Or does anyone know where there are public domain

fonts equivalent to the ones Sony ships? I searched all over and couldn't find any so far.  
Thanks!

---

9/21/96 12:09 PM  
"Developer" magazine?  
player 1  
Non-tech talk

Did the developer magazine ever come out? If so, where can I get a copy?  
Tom Ketola

---

9/21/96 1:50 PM  
Re: "Developer" magazine?  
Rob Vawter  
player 1  
Non-tech talk

Did the developer magazine ever come out? If so, where can I get a copy?  
No.

---

## OS/Architecture

3/17/95 4:07 PM

globals ... tell us about them...

Blake E. Senftner

OS

OS / Architecture

Angus & others:

What is known about globals? I remember at one of the technical conferences someone was saying that each 32bit global occupies 8 bytes rather than the expected four, yet I heard no confirmation on that fact from Sony.

Messing about some, I moved some of my local variables in my main loop to be globals, and I received a significant speed gain...

So, What Do We (Or Should We) Know About Globals?

-Blake

---

3/20/95 5:15 PM

Re(4): threads

Bill "Angus" Guschwan

Dave Feldman

Daniel L. Berke

OS / Architecture

Here is the response from Okamoto, the kernel guy in Japan. I am translating. It is about how you can't call changethread in an interrupt, why, and what to do about it.

angus

3 issues 1) PSX can not have an interrupt in an interrupt. 4 routines call a SW interrupt. They are: a) ChangeThread() b) Exception() c) EnterCriticalSection() d) ExitCriticalSection() Thus, calling ChangeThread() in an interrupt won't work. Also, printf() and pollhost() also cause an SW interrupt.

Instead you should use a pointer to the TCB. There is a routine below to do it. After execution of this routine, context will be switched. Be careful about losing information from original context. You should store it yourself to restore later.

This is all I have. Hope this helps. Let me know. Angus

```
#include <r3000.h> #include <asm.h> #include <kernel.h> struct ToT *tot = (struct ToT *)
0x00000100; long next_tcb;
_schr() { struct TCB *tcb0, *next; struct TCBH *tcbh;
tcb0 = (struct TCB*) (tot+2)->head; next = tcb0 + next_tcb; tcbh = (struct TCBH*)
(tot+1)->head; tcbh->entry = next; }
```

---

3/21/95 1:39 PM

Re(6): threads

Borden Covell II

Dave Feldman

Bill "Angus" Guschwan

OS / Architecture

We have taken some code that Angus sent us yesterday and are now able to change threads in both threads and event handlers. We have not tried to reproduce your error recently, however. Will try again today or tomorrow.

---

3/21/95 5:39 PM  
Re(7): threads  
Dave Feldman  
Borden Covell II  
Bill "Angus" Guschwan

OS / Architecture

That would be much appreciated, are you able to have more than 8 threads? Kevin Seghetti at PF.Magic / Cave Logic Studios

---

3/21/95 10:58 AM  
Re(5): threads  
Dave Feldman  
Bill "Angus" Guschwan  
Daniel L. Berke

OS / Architecture

The example I posted does not use interrupts, so I don't think that is the problem. I was planning on using ChangeTH in an interrupt, so I am glad to get this info, though. Has anyone attempted to run the example I posted and re-produce the problem? Kevin Seghetti at PF.Magic / Cave Logic Studios

---

3/22/95 11:00 AM  
Fwd: Re(2): Fwd: Re(2): VSync timeout?  
Bill "Angus" Guschwan  
OS

OS / Architecture

We have discovered the cause of the repeated VSync: timeout messages in the message window.

It seems that with v2.6, in direction contradiction to the way you had to order things in v2.5, the calls to InitPAD and StartPad must come before the initial call to ResetGraph.

Thanks anyway. .Steve

---

3/22/95 4:44 PM  
getting bak to the main thread  
Borden Covell II  
Bill "Angus" Guschwan

OS / Architecture

We have managed to get multi-threaded stuff to work, including changing thread in a event handler. However, we can not figure out how to get control to return to the main thread. We tried to use thread id 0 but the did nothing. Any ideas???

---

3/22/95 7:46 PM  
What does snpatch do?  
Administrator  
OS

OS / Architecture  
> Please can you tell me about PATCHX.CPE > I have only recently heard about this program. Okamoto-san said that patchx.cpe does followings, 1. to set up a device driver for a memory card, 2. to set up access functions for Kanji font data in the ROM, 3. to make patch for hung up of exit() in the ROM.

---

3/22/95 5:34 PM  
Cool R3000 Information  
Bill "Angus" Guschwan  
OS

OS / Architecture  
Hi, Angus. I hope you had a good flight from Tokyo.  
Followings are my quick translation of "Introduction to R300" written by Okamoto-san. I hope this would be helpful for you.  
As I told you, we are not positive that someone make his program in assembler. This is why we do NOT supply assembler syntax in our development tools. Please be advised on this.

-----  
#####  
Introduction to R3000 by Shin'ichi Okamoto (translated by Masa Chatani)  
#####  
(1) R3000 CPU Features  
(A) Prioritized to implement high level programming languages efficiently, based on the software development with compiler.  
- Fixed instruction execution time and paralleled execution.  
# Non-single clock instruction is not guaranteed to be executed without inconsistency with the instructions which follows.  
# Except multiply, divide and GTE instructions.  
- Quick subroutine call.  
# Return address is stored in register # No stack concept  
- No operation flag concept  
# No carry nor overflow flag (Overflow make interrupt occurs) # Many conditional branch instructions which register comparison instruction and conditional branch are combined.  
(B) Design as a pool of co-processors  
# Basic CPU is CP0 (co-processor 0) # GTE is CP2  
<<< Side Effect >>>  
Readability of machine language level. Also difficult to coding.  
-> Approach to overcome this: Separation of machine language and assembler language  
(2) R3000 Assembler Features  
A bare CPU which execute machine language is called "basic machine". Assembler is designed, assuming a "virtual CPU

machine" which is similar to "basic machine."  
 -> Consequently, R3000 assembler is not identical to machine language, but a sort of high level language.

(A) One assembler instruction is converted into more than two machine language instructions.

|       |                               |                                 |                               |
|-------|-------------------------------|---------------------------------|-------------------------------|
| e.g.  | Assembler Word                | Machine language                | -----                         |
| ----- | 32bit jump                    | 1 Put 16bit value to upper half | of a register                 |
| 2     | Put 16bit value to lower half | of a register                   | 3 Jump to address in register |

To optimize the efficiency of use of internal resources, order of the generated machine language is quite different from the order in assembler.

## Manuals in LSI manufacturer describe only the system of the machine language of "basic machine."

## Assembler instruction of "Virtual machine" is explained in "RISC NEWS Assembler Language Programmers' Guide" (NWM- 653).

(B) Instruction decode functionality is enhanced as an assembler is separate from a machine language.

- Some multiply instruction can be converted into the one which does not use a multiplier which is relatively slow.

- Flexible addressing system

- Several sort of operand form for one instruction -> good orthgonality

e.g. Following all "sub" instructions can be used

|                          |                         |                          |                          |
|--------------------------|-------------------------|--------------------------|--------------------------|
| sub R2, R30, R17         | # among three registers | sub R5, R10, 0x4321      | # 16 bit immediate value |
| # and two registers      | sub R5, R10, 0x87654321 | # 32 bit immediate value |                          |
| # and two registers      | sub R6, R9              | # between two registers  | sub R2, 0x9876           |
| # 16 bit immediate value |                         |                          |                          |
| # and 1 register         | sub R2, 0xFEDCA987      | # 32 bit immediate value |                          |
| and 1 register           |                         |                          |                          |

Followings are machine language list for six instructions above.

|                         |                         |                    |
|-------------------------|-------------------------|--------------------|
| Assembler               | Machine Language        | -----              |
| sub R2, R30, R17        | sub R2, R30, R17        |                    |
| sub R5, R10, 0x4321     | addi R5, R10, 0xffffbcd |                    |
| sub R5, R10, 0x87654321 | lui R1, 0x8765          | ori R1, R1, 0x4321 |
| sub R5, R10, R1         |                         |                    |
| sub R6, R9              | sub R6, R6, R9          |                    |
| sub R2, 0x9876          | li R2, 0x9876           | sub R2, R2, R1     |
| sub R2, 0xfedcba98      | lui R1, 0xfedc          | ori R1, R1, 0xba98 |
| sub R2, R2, R1          | -----                   |                    |

3/23/95 1:37 PM

Re(8): threads

Daniel L. Berke

Dave Feldman

Borden Covell II

OS / Architecture

Dave, We have tried to re-create your problem. We were unable to get more than 4 threads running. Even doing that SetConf() call didn't seem to help much. We could create as many threads as we wanted, but when we tried to change to any thread beyond the 3rd one, the system would die.

Dan

---

3/23/95 2:04 PM  
YMQ (Yet more questions)  
Daniel L. Berke  
OS

OS / Architecture

Time to flush the "question queue"...

1. Although this is already being discussed in another thread, what's the deal with having greater than 4 threads? This still doesn't seem to want to work. 2. What and where is the system.cnf file (or whatever it's called)? From what I gather, it will be read off of the cd and it is used to set the number of TCBs, initial stack pointer, etc. Does it exist in the debugging environment? 3. Angus mentioned a possible fourth parameter to OpenTh()... any news on this? 4. Is it possible to use PCRead() asynchronously? That way we can simulate a cd... 5. I think this was also asked, but... can you ChangeTh() back to the main() function? I tried to change to thread descriptor 0xff000000 since all of my threads started at 0xff000001. That didn't work. Is this possible, or once we leave main() are we gone for good?

Thanks!

Dan

---

3/23/95 7:46 PM  
Re: What does snpatch do?  
Unni Pillai  
Administrator  
OS

OS / Architecture

SNPATCH also does the following: It flushes the I-CACHE & D-CACHE.

---

3/23/95 10:06 PM  
using open with sim:  
Borden Covell II  
OS  
Bill "Angus" Guschwan

OS / Architecture

is anyone using the open/read/close routines to access files on the PC? if so, do you add the "sim:" prefix or is there another technique. I can open and read files just fine with PCopen and PCread, but it does not work with open. thanks in advance...

---

3/23/95 10:11 PM  
PCopen/PCread in windows  
Borden Covell II  
OS  
Bill "Angus" Guschwan



OS / Architecture

I have a program that reads 15 bs files from the PC. It uses PCopen/PCread/PCclose. When I run it without windows running, it works great, both run from the prompt and running in the debugger.

As soon as I try to run the program in the debugger under windows it reads 4 or 5 files and then stops. After a short while I am back at the C prompt and windows is GONE!

I have an interrupt on the development card, but this problem also occurs without using an interrupt.

Anybody got any ideas???

thanks!

---

3/24/95 7:32 AM

Re: using open with sim:

Chris J. Pink

Borden Covell II

OS

OS / Architecture

I have encountered the same problem using the sim: option for loading files.

It worked fine with the old libs but does not work any more with version 2.6 so I returned to the PCopen method.

---

3/24/95 6:34 PM

Re(2): PCopen/PCread in windows

Borden Covell II

Bill "Angus" Guschwan

OS

OS / Architecture

OK, thanks. What about open/read/close working at all?

---

3/25/95 10:24 PM

Re: YMQ (Yet more questions)

Bill "Angus" Guschwan

Daniel L. Berke

OS

OS / Architecture

PcRead is not asynchronous though it is a nice suggestion. I'll send it to SN Systems.

I answered the OpenThr and the 4 threads problem in OS.

System.cnf is described in the docs and you can make it yourself. It is just 4 fields.

To change back to main, I think you just remember the information you start from. Anyone have any code?

Angus

---

3/25/95 10:21 PM

Re(8): threads

Bill "Angus" Guschwan

Dave Feldman

Borden Covell II

OS / Architecture

Sorry for the delay on this answer.

Angus

The key point of th.c is that the initialization of TCB in OpenTh() has one lack.

TCB[m].reg[R\_SR] which stores the content of control register of R3000 is not initialized in OpenTh(). This is no a bug. The initial value of this register is dependent on system and has much variation. So you would decide how to get the exact value. In current kernel, 0x404 is the exact initial value. You must store this magic value to each TCB[m].reg[R\_SR] except 0th (m=0) element of TCB[m] in kernel. The th.c contains the initialization function for reg[R\_SR]. I attach the part of th.c this mail.

Regards,

okamoto

```
#include <r3000.h> #include <asm.h> #include <kernel.h>
struct ToT *tot = (struct ToT *) 0x00000100;
InitTcb() { struct TCB *tcb; struct TCB *tcb_tab = (struct TCB*) (tot+2)->head; long
i;
for(i=1;i<4;i++) { tcb = &tcb_tab[i]; /* enable interrupt in interrupt
context */ tcb->reg[R_SR] = 0x404; } }
```

---

3/26/95 4:10 PM

Re(2): PCOpen/PCread in windows

Visual Concepts

Bill "Angus" Guschwan

Borden Covell II

OS / Architecture

PCOpen works fine for us running in windows, although there is a problem with nested file opens (I think!). We found that if we opened a movie for streaming before loading our sprites in, the PSX puked up and died on us (I suspect it was a lack of valid data for decompressing!)! Moving the opening of the movie file to be the last file open made it work fine however.

MCC @Visual Concepts.

---

3/27/95 9:50 PM

What happened to malloc.obj?

Administrator

OS

OS / Architecture

From : SCE SUPPORT (Support) To : MILLENIUM PSX Subj : Malloc() again Numb : 142 of 312 Date : 21/02/1995 11:19am Read : 21/02/1995 12:27pm

Reference : 138 Conf : 1 - PSX Common Private : NO

-> Can I assume that malloc() is definitely fixed in libs 2.6, and that -> don't have to link with MALLOC.OBJ anymore. It's just that the MALLOC -> module in the libraries is dated the same as MALLOC.OBJ...

Well, I just checked it (taking all of 5 minutes - no offense meant, but couldn't you just maybe have checked it yourself?), and it works fine with libraries 2.6, so you can use malloc() and free() without fear and without linking with malloc.obj.

Allan.

---

3/27/95 9:36 AM

Re(2): YMQ (Yet more questions)

Borden Covell II

Bill "Angus" Guschwan

Daniel L. Berke

OS / Architecture

Where do we put the system.cnf file? root?

borden

---

3/27/95 4:39 PM

Re(2): using open with sim:

Todd Blackburn

Chris J. Pink

Borden Covell II

OS / Architecture

I am using open/read with sim: and it works fine with lib 3.0 and the latest SNPATCH. I tried it with PATCHX/lib 2.6 and it did not work.

Todd Blackburn, Sculptured Software

---

3/27/95 11:19 AM

Re(3): YMQ (Yet more questions)

Bill "Angus" Guschwan

Borden Covell II

Daniel L. Berke

OS / Architecture

root is fine.

angus

---

3/27/95 9:35 AM

Re(3): PCopen/PCread in windows

Borden Covell II

Visual Concepts

Bill "Angus" Guschwan

OS / Architecture

pcopen works for us as well. the open routine is the one that we are having a problem with.

---

3/27/95 11:19 AM

Re(4): PCopen/PCread in windows

Bill "Angus" Guschwan

Borden Covell II

Visual Concepts

OS / Architecture  
what's the problem with open?  
angus

---

3/28/95 8:45 AM  
Re(5): PCopen/PCread in windows  
Borden Covell II  
Bill "Angus" Guschwan  
Visual Concepts

OS / Architecture  
we can specify a full file name in a PCopen call and are able to open and then read the file. We tried to open the file with the open routine by adding "sim:" on the front of the file name and it does not get opened.

---

3/28/95 4:21 PM  
Re: Code Org  
Bill "Angus" Guschwan  
Henrik Markarian  
OS

OS / Architecture  
8001000 is fine. Don't know why 80080000 is used.  
Angus

---

3/28/95 2:46 PM  
Re(4): using open with sim:  
Administrator  
Borden Covell II  
Todd Blackburn

OS / Architecture  
Borden,  
This is solved. I told you the problem with libc2.h. I am getting the file. That is the only problem. It is understandable and there is a workaround. If there are routines you need you can write them out.  
There are no other problems, other than you need to have the latest cpsx 1.10, and you need to add libc2.lib to your psyq.ini because printf moved from libgpu.lib to libc2.lib.  
Angus

---

3/28/95 4:18 PM  
Code Org  
Henrik Markarian  
Bill "Angus" Guschwan

OS / Architecture  
Looking through all the sample code supplied by Sony, the Org value varies greatly from one program to another. The documentation states that the first 64K is used by the operating

system, so I assume that the first valid address to start at is \$80010000. A fair number of the demo programs start at \$80080000, other than setting aside the RAM from \$80010000 to \$80080000 to later load into, is there any special reason not to start on \$80010000?  
Henrik @ Mindscape

---

3/28/95 8:47 AM  
Re(3): using open with sim:  
Borden Covell II  
Todd Blackburn  
Chris J. Pink

OS / Architecture  
That's great... now all we have to do is get v30 working. We tried it and found missing .h files so gave up for now. Do you or anyone else have a complete v30 update that works???  
btw, we use snpatch.  
thanks

---

3/29/95 12:55 PM  
Re(2): YMQ (Yet more questions)  
Daniel L. Berke  
Bill "Angus" Guschwan  
OS

OS / Architecture  
Angus,  
I still can't seem to get the system to support more than 4 threads. I can create as many as I want, but if I switch to any thread beyond #4, it dies.  
I've tried making a system.cnf file which has the line "TCB = 10" in it, but it doesn't seem to have any effect. Where does the system.cnf file need to be located on the PC for it to be read? I've tried in the directory I'm running from, in the C:\ root directory, and in the same directory as the psyq.ini file. Is there any way to verify that it's even getting read in?  
Resolution of this thread thing is important... we have an immediate need for about 6 or 7 threads.  
Thanks, Dan Visual Integration

---

3/29/95 5:10 PM  
Re(6): using open with sim:  
Bill "Angus" Guschwan  
Borden Covell II  
Administrator

OS / Architecture  
There is no problem. Libc2.h was accidentally added. Just ignore it.  
Angus

---

3/29/95 5:21 PM  
Re(8): using open with sim:  
Bill "Angus" Guschwan

Borden Covell II  
Administrator

OS / Architecture

You don't need libc2.h. It won't hurt anything. Ignore it and I'll get around to fixing the zip file.  
In the meantime this should not hold up your use of lib3.0.

angus

---

3/29/95 6:26 PM

Re(9): using open with sim:

David R. Sullivan

Bill "Angus" Guschwan

Borden Covell II

OS / Architecture

Ok, sim: works great for me; but when I switch to cdrom: it does not work...

---

3/29/95 10:06 AM

Re: Where did printf go in 3.0?

Bill "Angus" Guschwan

Brian Greenstone

OS

OS / Architecture

Include libc2.lib.

Angus

---

3/29/95 10:30 AM

Re(2): Where did printf go in 3.0?

Brian Greenstone

Bill "Angus" Guschwan

OS

OS / Architecture

Okay, but where'd the header for printf go? The new <stdio.h> doesn't have it anymore.

-Brian

---

3/29/95 5:08 PM

Re(5): using open with sim:

Borden Covell II

Administrator

Todd Blackburn

OS / Architecture

I'm sorry, but I don't understand what you mean by "this is solved". Do you mean that there is a fix coming or that the version of the software that I have is fixed or that it is fixed in 3.0? I'm hoping that it is fixed in 3.0 in which case I'll wait for the libc2.h file from you and then chg to v3.0

thanks

---

3/29/95 5:12 PM

Re(7): using open with sim:

Borden Covell II

Bill "Angus" Guschwan

Administrator

OS / Architecture

OK. so I should take the v3.0 stuff as I originally downloaded it and just use it. Is that what you mean? I'm confused. Sorry!

borden

---

3/29/95 3:33 PM

PCOpen & Windows

Bill "Angus" Guschwan

OS

OS / Architecture

If you have problems with PCOpen try this test. If it fails let me know the details of your situation.

Angus

I've just tried lots of fileserver tests running on the DTL-H2000 PSX boards in a PC with DBUGPSX running in a windowed DOS session under Windows For Workgroups 3.11 and everything seemed to work just fine.

Is there some common factor amongst people that can't get this to work?

Attached is one of the test programs I have been using. Please try that and let me know what happens.

Also attached is GCC.BAT - a little batch file that I use for building one-off test programs.

Command line to build is:-

```
gcc testfs
```

This will produce TESTFS.CPE and TESTFS.SYM I ran this under the debugger using:-

```
dbugpsx testfs /e
```

You can either just execute it. Or if you single step through it you should notice that handle is assigned the value 5 every time around the loop. This is what I would expect. Please let me know if you see anything different.

Note that if using the DEXBIOS for new message handlers (ver 1.21 or later) you will need to have mess1 or mess3 installed also to see the text output from printf().

-- Andy Beveridge Andy@snsystems.co.uk

----- Attached file TESTFS.C #include <libs.h>

```
char buff[4096];
```

```
main() { int n,handle,len; int count=0;
```

```
for(n=0;n<100;n++) { handle=PCopen("C:\\autoexec.bat",0,0); if (handle<0)
```

```
printf("Iteration %d failed.\n", n); else { len=PCread(handle, buff, 4096); if(len<0)
```

```
printf("Bad length on %d\n", n); PCclose(handle); } }
```

```
} ----- End of Attached file
```

```
----- Attached file GCC.BAT if '%2'==" goto default ccpsx -comments-c++ -v -g -Xo$%2 %1.c -o%1.cpe,%1.sym goto fini
```

```
:default ccpsx -comments-c++ -v -g -Xo$80080000 %1.c -o%1.cpe,%1.sym
```

```
:fini ----- End of Attached file
```

---

3/29/95 9:43 AM  
Where did printf go in 3.0?  
Brian Greenstone  
OS

OS / Architecture  
What happened to printf in lib 3.0? I found GPU\_printf, but it doesn't seem to accept normal printf parameters. Wassup?  
-Brian

---

3/30/95 3:16 PM  
Why 5 Threads Suck? ANSWER, FINALLY.  
Bill "Angus" Guschwan  
Bill "Angus" Guschwan  
Dave Feldman

OS / Architecture  
Dear Angus,  
I found the cause of trouble.  
In the boot sequence of H2000, a block of system heap is allocated for Psy-Q's downloader. And SetConf() ( and writer of it, me ) clear the allocation database whitout any care of this allocated area , and rebuild the database with new configuration. The download does not know this change and use the block, but extended TCB's are put on the block. So TCB array from element number four to seven are broken by the donwloader.  
I suppose I would supply a module to reset the downloader at the end of April.  
Because the size of system heap area allocated for the downloader is fixed, you can use TCB[8],[9],.... in current system.  
Regards,  
Okamoto

---

3/30/95 4:37 PM  
Re: Why 5 Threads Suck? ANSWE  
Daniel L. Berke  
Bill "Angus" Guschwan  
Bill "Angus" Guschwan  
tasktest.c 2K  
OS / Architecture  
Angus, The minute I saw the possible thread solution, I dove into my code and tried it. Unfortunately, no dice. Changing to a high numbered task (which would be using a TCB > 8) didn't seem to work. Here's the code I used:

---

3/30/95 5:25 PM  
DumpThread/Tasks Code  
Administrator  
OS





```

    {
        printf(" ToT Entry %2d, ptr=%08X, length = %08d, name =
%s\n",i,tot[i].head,tot[i].size,totNames[i]);
    }
#endif
}

/*-----*/
----- /

char* tcbStatusStrings[4] =
{
    "Unused ",
    "Unknown",
    "Unknown",
    "Active "
};

/*-----*/
----- /

void
DumpThreads(void)
{
#ifdef PRINTDEBUG
    struct ToT *tot = (struct tot*)0x00000100;
    struct TCB* tcb,*tcb_tab;
    struct TCBH *tcbh,*tcbh_tab;

    int i,status;

    printf(("Thread Dump:\n"));
    /* display the threads related part of ToT */

    tcb_tab = (struct TCB*) (tot+2)->head;
    tcbh_tab = (struct TCBH*) (tot+1)->head;

    for(i=0;i<HAL_MAX_TASKS;i++)
    {
        tcb = &tcb_tab[i];

        if(tcbh_tab->entry == tcb)
            printf("-->");
        else
            printf(" ");

        printf("TCB %2d address = %08X, ",i,tcb);

        if(tcb->status!=TcbStUNUSED && tcb->status!=TcbStACTIVE)
            status = 2;
        else
            status = (tcb->status>>12)-1;
        printf("Status = %08X (%s), ",tcb->status,tcbStatusStrings[status]);
        printf("Mode = %08X\n",tcb->mode);
    }
}

```

```
printf("TCBH entry = $%8X\n\n", tcbh_tab->entry);
#endif
}
```

---

4/3/95 11:14 AM  
killer speed enhancement from UK BBS!  
Blake E. Senftner  
OS

OS / Architecture  
All:

In reading through the UK BBS I found a snippet of code that really helps speed things up!  
Try the following code:

```
unsigned long gOldSp; // must be a global, a heap variable
in my main VSync loop:
while (continue_looping) { // other stuff unrelated
    gOldSp = SetSp(0x1f8003fc); fastModelSort(); SetSp(gOldSp);
    // other VSync like stuff, buffer rotation, bla, bla, bla... }
```

What this does is place the program's stack in the D-Cache, giving fast-fast RAM for use as calling parameters, local variables, and return addresses. Try it! I received a respectable speed up, and it can be "turned off/on" at will by just keeping the old stack value around. (And making sure that you keep your fast-stack and slow-stack states straight!) Additional issue of note, while using the fast-stack, make sure your stack usage does not exceed the D-Cache size.  
-Blake

---

4/4/95 5:30 PM  
Re: killer speed enhancement from UK BBS!  
Brian Greenstone  
Blake E. Senftner  
OS

OS / Architecture

One problem I've found with this speed-up method. printf will bomb if you do the following:

```
gOldSP = SetSp(0x1f8003fc); printf("Ready to go!\n");
Upon calling printf, it makes room for $18 bytes on the stack, but then it does:
sw a2,$20(sp)
```

This references above the stack which is an illegal address.. thus a BUS ERROR.  
It's a minor point, but I'd guess that other system calls play tricks with the stack which would result in a BUS ERROR if the stack was empty upon calling them.  
-Brian

---

4/4/95 1:18 PM  
Re(2): RAM Standard C Libraries  
Bill "Angus" Guschwan  
Robert w. Calfee  
OS

OS / Architecture

I don't think they are going to support va c routines. Let me know your thoughts.  
Angus

---

4/4/95 9:54 AM  
Re: RAM Standard C Libraries  
Robert w. Calfee  
Bill "Angus" Guschwan  
OS

OS / Architecture  
I'd like to have access to the va\* functions, esp. the ones for pulling variable args off of the stack.  
rwc

---

4/6/95 8:40 PM  
d-cache speedup  
Andrew Summerfield Copies:  
OS

---

I've tried numerous times to use the d-cache stack with no increase in speed

---

What percent increase are people getting with this modification

---

I'm not having any problems with the code failing. I'm pretty certain tha

OS / Architecture

---

4/7/95 10:05 AM  
Re: d-cache speedup  
Brian Greenstone  
Andrew Summerfield  
OS

OS / Architecture  
By putting the stack in D-cache, I got around 5% or so improvement. May not sound like much, but it was actually noticable.  
-Brian

---

4/7/95 2:01 PM  
Re(2): d-cache speedup  
Andrew Summerfield

Brian Greenstone  
OS

OS / Architecture

Thanks for the info Brian. I don't think anyone will complain about a 5% increase, but I haven't even gotten that. I'll try some more, hopefully with a bit better results.  
Andrew

---

4/7/95 10:39 AM  
ORG'ing vars in d-cache  
Dave Ross  
OS

OS / Architecture

I recall awhile ago a posting (I think it was here) about how to "ORG" certain variables in d-cache; and I can't find it anywhere on the BBS. Can anyone help me remember where I saw that? Or tell me I was dreaming? Was it as simple as using assembler to actually define the variables with an ORG there?

---

4/10/95 11:38 AM  
Re: ORG'ing vars in d-cache  
Dave R. Scheele  
Dave Ross  
OS

OS / Architecture

Here's what I snagged off the SCEE bbs dump that's posted elsewhere on this BBS. I haven't tried it yet!

----- cut here -----

From : MILLENIUM PSX To : DID PSX Subj : The d-cache Numb : 261 of 312  
Date : 11/03/1995 1:40pm Read : 13/03/1995 10:55am Reference : 277 Conf : 1 -  
PSX Common Private : NO

The way I did this was to have a file called 'fastram.s' that basically did...

```
FASTRAM_BASE EQU $1f800000  
    rset F
```

```
ASTRAM_BASE dcache_word_1 rw 1 dcache_word_2 rw 2 dcache_short rh 1
```

... and then I made sure this file's entry in the makefile had the asmpsx option set that writes equates to the symbol/linker file (/w, I think).

I then have a file that just externs my dcache variables

```
extern unsigned long dcache_word_1 extern unsigned long dcache_word_2 extern  
unsigned short dcache_short
```

Just make sure you link with fastram.obj and you'll have no problems. We currently have our Dcache set up for both C variables, and a small stack too... makes a big difference!

Hope this helps,

Dean @ Millennium

----- cut here -----

Ditto ... Dave

---

4/11/95 4:35 PM

Re(3): d-cache speedup  
Brian Greenstone  
Andrew Summerfield  
OS

OS / Architecture

Okay, I've run into a potentially bad conflict with the d-cache stack trick and the sound drivers. If I have the stack in the d-cache SsVabOpenHead crashes big-time. The stack is relatively empty when I call that routine. One of the following is happening:

1. The sound library uses the d-cache for some mystery purpose 2. SsVabOpenHead needs more than 1K of stack space for local variables 3. I'm a moron and I'm doing something else wrong.

Is anyone else out there using the d-cache stack also using the sound libraries? Have you run into anything similar?

-Brian

---

4/11/95 4:49 PM  
Re(4): d-cache speedup  
Brian Greenstone  
Brian Greenstone  
Andrew Summerfield

OS / Architecture

Well, with further investigation I've found that it was guess #2 that caused the Sound thing to go boom!

SsVabOpenHead calls SsVabOpenHeadWithMode which allocates \$438 bytes of stack space. It is more stack space than exists in the d-cache, thus... BOOM!

-Brian

---

4/14/95 6:26 PM  
Re(2): ORG'ing vars in d-cache  
Dave Ross  
Dave R. Scheele  
OS

OS / Architecture

Thanks for the tip on org'ing variables. However, what I want to place in the cache is an array of some mildly complex structures...no tvery convenient for describing in assembly. Which leads to my question, has anyone toyed with getting structure info in assembly (ie, I could compile to assembly the structures in question, hack that compiler output into legal assmby and hopefully then use assembly to org the vars where I want - what a hack!). Or how about using in line assembly to cause the compiler to output an assembler directive to simply place the structure in a named section that I can the org at link time (much more palatable to me than the above option). Or, even better, is there a hidden "variable attribute" in GNU C lilke the "align" or "packed" attribute, but is it's link section name?

---

4/18/95 2:14 PM  
Re(3): ORG'ing vars in d-cache  
Robert w. Calfee  
Dave Ross  
Dave R. Scheele

OS / Architecture

What would happen if you described your structure in C, then declared a structure pointer that you set to point to this D-cache?

Would this work?

rwg

---

4/19/95 6:11 PM

SetConf Call it first

Bill "Angus" Guschwan

OS

OS / Architecture

\*About the Contents They sent me a photo-copy of source code, but I could not find any trouble in it. They use SetConf() in their code. This function must be called ahead of any other initialization functions in PS library, because it destroys almost of internal data structure of the kernel to rebuild it. This is not mentioned in our documentation explicitly.

Regards,

Okamoto

---

4/19/95 10:06 AM

PMD Stuff

Brian Greenstone

Bill "Angus" Guschwan

OS

OS / Architecture

Angus-

Thanx for your help yesterday when you guys were here at Mindscape. I've been looking into the PMD functions that you said would greatly improve performance in Harbinger.

Off hand, it looks like these functions would actually slow the game down rather than speed it up, simple because most of the stuff in the game is treated as a mesh. The RotPMD functions appear to be rather self-contained in that they're going to ignore any shared vertices in a mesh. RotPMD looks like it will only work for single polygons like sprites, but not for meshes with many shared vertices.

In any case, I'd like to know more about how to use the PMD functions. The documentation I have doesn't tell me enough to work from. What is a "PRIMITIVE Gp", and a "double buffer ID". What exactly does this function do anyway?

Thanx!

-Brian

---

4/20/95 5:56 PM

open, read. (fopen, fscanf?)

Alex Dommasch

OS

OS / Architecture

I have been able to open and read a file from the cd-emulator. However, it only works if you read 2048 bytes at a time. (This has been mentioned before.) Of course, this makes it awkward if you want to read one character at a time (necessating doing your own buffering, etc.) Are there any plans to implement the stdio functions (fopen, fread, fscanf, etc)? Please say yes!  
Thanks, alex

---

4/20/95 10:01 PM  
PCOpen and PCRead errors  
Borden Covell II  
Bill "Angus" Guschwan

OS / Architecture

We have been having a lot of intermittent failures of the PCOpen and PCRead routines. Sometimes the PCOpen call fails to open an existing file. Sometimes PCRead returns a -1. It appears that when there is other disk activity the BIOS is sometimes unable to read the requested data and it returns -1 to indicate an error. We have added a retry loop that seems to "get around" the problem, but would like to know if there are any known problems with these routines. We are running rls 3.0. Should we use open/read instead? aren't they really the same, i.e. doesn't one call the other to read files from the PC?

---

4/21/95 4:32 PM  
Re(4): ORG'ing vars in d-cache  
Dave Ross  
Robert w. Calfee  
Dave R. Scheele

OS / Architecture

Thanks for the reply: I'll give your thought a try and let you know, but as I sit here and read this, the problems I foresee are that I have an array of these structures (I guess I could fill in each arrays pointer element) and they also have initializers - but I could do that myself also....There are probably other kludgy kinds of things like this to do what I want - I think it really leads to bigger issues of the development system designed to support embedded applications and the seamlessness of integrating assembly and high-level languages. (I've recently been frustrated in trying to use another mildly complicated structure from both C and assembly or something as simple as sharing equates/defines between them - there are hacky kinds of things I can do, but I'd much prefer to have an environment similar to CrossCode C where there was at least a little bit of support for these kinds of things...)

---

4/21/95 7:06 PM  
Re: PMD Stuff  
Administrator  
OS

OS / Architecture



Brian,

Try the Rot\_PMD\_SV calls. Jack, where is the 2.6 docs on the GTE calls? We have it don't we?

Angus

Angus-

Thanx for your help yesterday when you guys were here at Mindscape. I've been looking into the PMD functions that you said would greatly improve performance in Harbinger.

Off hand, it looks like these functions would actually slow the game down rather than speed it up, simple because most of the stuff in the game is treated as a mesh. The RotPMD functions appear to be rather self-contained in that they're going to ignore any shared vertices in a mesh. RotPMD looks like it will only work for single polygons like sprites, but not for meshes with many shared vertices.

In any case, I'd like to know more about how to use the PMD functions. The documentation I have doesn't tell me enough to work from. What is a "PRIMITIVE Gp", and a "double buffer ID". What exactly does this function do anyway?

Thanx!

-Brian

---

4/21/95 5:59 PM

Re(5): ORG'ing vars in d-cache

Bill "Angus" Guschwan

Dave Ross

Robert w. Calfee

OS / Architecture

I have made a modification to Gnu C and ASPSX to allow the user to define the section that their global variables are placed in. There is a new version of gnu c (version 2.6.3.SN.2) on our BBS in GNU263.ZIP and a new version of ASPSX.EXE in ASPSX.ZIP

This GNU-C extension can be used as follows :

```
int x __attribute__ ((section("cachedata"))) = 0;
```

This will declare an integer called x and place it in the user defined section called cachedata (any name can be substituted here).

Note : Any variables declared with a section attribute must also be initialised otherwise the attribute is ignored. Here x is initialised to 0.

You must also use your own linker control file which would look something like this :

```
org $80080000
text group dcache group obj($1f800000) bss group bss
section .rdata,text section .text,text section .data,text section .sdata,text section .sbss,bss
section .bss,bss
section cachedata,dcache
include main.obj
inclib c:\gnumips\lib\libgs.lib inclib c:\gnumips\lib\libgte.lib inclib
c:\gnumips\lib\libgpu.lib inclib c:\gnumips\lib\libetc.lib inclib c:\gnumips\lib\libapi.lib
inclib c:\gnumips\lib\libsn.lib
regs pc=__SN_ENTRY_POINT
```

The initial values for the variables in the cachedata section will follow the text section but the code will be compiled as if they were at the address \$1f800000 (this is what the obj() attribute does). The other thing you need to do is to copy the initialised values from the area just after the text group to the \$1f800000 area.

If you need any more information or examples please let me know.

---

4/21/95 1:54 PM

Re: PCOpen and PCRead errors  
Bill "Angus" Guschwan  
Borden Covell II  
OS

OS / Architecture

I would suspect the version of your `libs.n.lib`. Do a `psylib /l libs.n.lib` and see if a `__pure_virtual` is listed as an Externals Defined. If it is, you have the latest `libs.n.lib`. If not, there might be a bug and Martin from Snsystems will be here Tuesday and we can discuss it then.

---

4/21/95 2:03 PM  
PC READ Problems  
David Schwartz  
OS

OS / Architecture

Has anyone noticed that occasionally PCREAD will read garbage data. Every once in a while, when I am reading 700K+ files some data gets trashed. Is this a true bug or am I do something wrong?

David Schwartz Williams Entertainment

---

4/21/95 1:45 AM  
Re: open, read. (fopen, fscanf?)  
Alex Dommasch  
Alex Dommasch  
OS

OS / Architecture

By the way, even without `fscanf()`, etc., `SSCANF()` would still be incredibly useful. I can do my own file reads one block at a time, but I really don't want to write a scanning function. I am trying to use someone else's code that uses `sscanf()`, and I'm hoping to avoid a total rewrite. Thanks, alex

---

4/21/95 5:59 PM  
Re(5): ORG'ing vars in d-cache  
Bill "Angus" Guschwan  
Dave Ross  
Robert w. Calfee

OS / Architecture

Hi all

I was asked about the following feature of the GNU C compiler by a developer recently so I thought I'd pass on this information to everyone. Further information is in the Gnu docs under C extensions.

Global register allocation :

It is possible to reserve a register to hold/point to a global variable throughout all the modules of your code. This obviously makes access to the variable very fast but there are a limited number of registers available.

One way to use this on the playstation is to use a register to point to a structure stored in the high speed data cache memory. Accesses to elements of this structure will then be made by displacements from this register rather than by loading the absolute address of the variable. This is similar to the way that the global pointer register optimisation works except that it gives you control of exactly which variables are placed in this memory.

The register used should be one of the saved registers \$16 - \$23 (s0-s7). If you are not using the GP register optimisation and you specify -G0 when compiling your code then you could use register \$28 (gp) for this purpose.

Here is an example :

```
struct fast_data { int i; char z[16]; };

register struct fast_data *f asm("$23");
void main () {
```

```
...
  f->i = 3;
... }
```

Here the assignment `f->i = 3` will code as

```
li $8,3 sw $8,0($23)
```

rather than

```
li $8,3 sw $8,f
```

where the `sw` instruction expands to

```
lui $1,(f+$8000)>>16 sw $8,f&$ffff($1)
```

Points to note :

You can't generate a pointer to something held in a register.

It is up to the programmer to initialise the register. This could be done as follows :

```
void main() { asm("li $23,0x1fff0000");
```

or whatever.

The compiler will not make any other use of the register in modules in which the declaration appears. In modules that were compiled without the declaration (e.g. libraries) the compiler may have generated code that makes use of the register. This is not generally a problem since the s0 - s7 registers must be saved and restored by any function that makes use of them.

However, the register may not be set correctly in an event handler or call back or any other function which is called through a pointer by code that was not aware of the global register allocation (e.g. library code). It will therefore be necessary to reload the register if the variables need to be accessed in these type of routines. This is similar to the problem with the global register.

---

4/21/95 10:06 PM

Re(2): PCOpen and PCRead errors

Borden Covell II

Bill "Angus" Guschwan

OS

OS / Architecture

our version of libsn has the `pure_virtual` entry.

The reliability of PCOpen and PCRead varies from day to day and hour to hour.

borden

---

4/25/95 6:09 PM

Re(6): ORG'ing vars in d-cache

Dave Ross  
Bill "Angus" Guschwan  
Robert w. Calfee

OS / Architecture

Excellent!!! That's exactly the kind of thing I'm looking for! However, I can't seem to find the versions of the compiler you mentioned (that support the section names for variables). In PSYQ TOOLS, there's a 2.6.3 C Compiler data 3/7/95. Is it hiding somewhere I'm not looking? Thanks for the fix though, I'm anxious to try it.

---

4/25/95 5:04 PM

abs() macro is WRONG!!!!

Alex Dommasch  
Development Env.

OS / Architecture

In ABS.H, the absolute value macro is defined as:

```
#define abs(x) (x>=0)?x:-x
```

THIS IS INCORRECT! If x is a complex expression, or if the abs() is part of a larger expression, OPERATOR PRECEDENCE MAY GIVE YOU AN UNEXPECTED VALUE!

Parentheses must be added inside and out. The correct definition is:

```
#define abs(x) (((x)>=0)?(x):-x)
```

I would recommend that everyone change this in their ABS.H, and that the official version be corrected also. I spent the better part of a day tracking down this bug. >:-(

- alex

---

4/26/95 10:53 AM

pcread is "fixed"

Borden Covell II

Bill "Angus" Guschwan

OS / Architecture

We have fixed our problems with PCRead by disabling the 32bit file access capability of WfW.

All of our systems are now working.

Thanks for your help, Angus.

Borden

---

4/26/95 3:57 PM

Start Location of Program Memory

David Schwartz

OS

OS / Architecture

Where can we start our program. Does it have to be at \$80010000 or can it be at \$80000000. If it needs to be at \$80010000, what is in the first 64K of memory.

David

---

4/28/95 3:26 PM  
Re: Start Location of Program Memory  
Bill "Angus" Guschwan  
David Schwartz  
OS

OS / Architecture  
First 64 k is the kernel.  
angus

---

4/28/95 12:12 PM  
NON VOLITILE RAM...  
Mike Heilemann  
OS

OS / Architecture  
Is there any sort of development card for Non-volatile ram??? or do you have to code for it then hope it all works out till you can test it off a debugging station???  
Mike Heilemann GameTek

---

4/28/95 4:53 PM  
1st 64k and Debugger  
David R. Sullivan  
OS  
Bill "Angus" Guschwan

OS / Architecture  
Bill, a request..  
Can you forward to PSY-Q and SN Systems that it would be appropriate if the DEBUGGER and any OTHER development RAM usage could be above the 2meg boundary. The best case would be at top of mem (end of 8meg). Since no TRUE playstation will have more than 2meg (at this time) and surely not 8meg -- wouldn't it make sense that the debugger/development tool ram usage be moved up there instead of clobbering the Kernel ram (such as with threading)???

Dave Sullivan

---

5/2/95 7:17 PM  
Heap and memory map  
Daniel L. Berke  
OS

OS / Architecture  
Ok, here's today's crisis:  
For some reason, the heap appears to be starting at \$1cb4e0 or some oddball address like that. This, of course, means that I have something like 200k of heap available under the real system, since memory ends at \$200000. (I would assume I'll collide with the stack since it's growing down from there, too.)

So, my questions are:

1. Why is the heap there? Can I safely change it with InitHeap() or will that screw up the OS and any other system functions? 2. All of the example code I've seen ORGs the code at \$100000. Is there any reason for this? Or can I start my code at something like \$00010000 (second 64k)? 3. What is in the 2mbyte.obj, exactly? This nasty problem didn't appear until we started to use it... and of course, addresses above \$200000 are not legal. 4. There always is some "preamble" code which gets executed before our code does. (I think this is where InitHeap() is being called by the OS.) Where is this code? Is it in ROM, and is it present in the real PSX and debugging stations?

Thanks for the info

Dan

---

5/5/95 9:38 AM

Does lseek() work???

Montgomery Singman

OS

OS / Architecture

Does the lseek() routine work? Whenever I try to seek to the end of a file to get the length, the routine always returns a length of 0.

```
fp = open("sim:test.tim",O_RDONLY);
```

```
len = lseek(fp,0L,SEEK_END);
```

len is always 0.

thanks

---

5/24/95 3:32 PM

Re(2): Root Counter

Ian McGee

Bill "Angus" Guschwan

Mark DeSimone

OS / Architecture

Be careful of 60 VBL counts if you have a PAL version planned...

---

5/24/95 12:27 PM

Root Counter

Mark DeSimone

OS

OS / Architecture

How do you determine when one second has past using the Root Counter. Specifically

RCntCNT2.

Jim Hatfield

---

5/24/95 12:46 PM

Re: Root Counter

Bill "Angus" Guschwan  
Mark DeSimone  
OS

OS / Architecture

Root Counter 2 is speced at 33.8688 mhz/8. So when Root Counter 2 reaches 4.23 Million it will be a second. I think it wraps to 16 bit. So that's not going to happen there. Try 60 counts of VBL.  
Angus

---

5/26/95 1:31 PM

Root Counter info

Thomas Boyd

OS

Borden Covell II

OS / Architecture

Root counter stuff:

The counters: RCntCNT0 Pixel clock. - changes with screen resolution RCntCNT1 H-Blank  
RCntCNT2 Sys clock/8 = 33.8688 mhz/8 RCntCNT3 (not really a counter) init interrupt by  
vertical blank

How to set up counter event (example from Japanese PSX 3.0 manual) Run this with testmess  
and watch it count! (amaze your friends!)

```
#include <kernel.h> long count;
```

```
static handle3() { if (++count > 1000) count=0; }
```

```
main() { unsigned long e3; long i;
```

```
count=0; e3=OpenEvent(RCntCNT3, EvSpINT, EvMdINTR, handle3); EnableEvent(e3);
```

```
SetRCnt(RCntCNT3, 1, RCntMdINTR); StartRCnt(RCntCNT3); while(1) { for (i=0; i<10000;  
i++) i=i; EnterCriticalSection(); printf("count:%d\n", count); ExitCriticalSection(); } }
```

---

5/30/95 2:52 PM

Re(3): Root Counter

David R. Sullivan

Ian McGee

Bill "Angus" Guschwan

OS / Architecture

Root Counter 2,

Counts a 4.2336 million ticks per second, set the target value to 42336 (33.8688/8 \* 10000) for  
1/100th of a second.

Set TARGET value to 42236

INTERUPT CODE:

```
MyInt() { MUST CORRECT GP or use NON-GP based vars.
```

```
100secondticks++;
```

```
if (100secondticks >= 100) { 100secondticks-=100; seconds++; }
```

```
}
```

---

6/5/95 12:43 PM

qsort fix

Bill "Angus" Guschwan

OS

OS / Architecture

Dear Angus and tech-supporters,

> > I have a report that the ram version of qsort is broken. Can you verify and > tell me when it might be fixed? > > Angus

The BUG of qsort() is caused by malloc() in ROM. Therefore, we can't fix this problem by modifying the library.

Then, please change the application program as follows to avoid it.

1)Call InitHeap() at the top of the program. 2)Link the malloc.obj.

Best regards,

---

6/5/95 12:37 PM

Interrupt handling

Bill "Angus" Guschwan

OS

OS / Architecture

> > Hi Kaol > > Thanks for answering my last question so quickly > >> Dear Kaol > >> >

>> Could you explain what the functions SysEnqIntRP and SysDeqIntRP are for > >> ? > >

>These functions are for the Interrupt handler, and they are used in > Libcomb and others at

present. > >But they are not open to the licensees. > > The reason I asked is that one of our developers is using an > interrupt-driven music system, and finds that interrupts are sometimes > missed (if another interrupt is in progress) - this makes the music play > wrongly. He wants to know if there is any way to queue the interrupts so > that this does not happen. Do you know if this is possible ? > > Thanks > > Harry >

PlayStation has a holding hardware with a single depth queue for each interrupt sources (an interrupt source is a device that can generate an interrupt). Both of the kernel and the library does not support any queueing mechanism for interruption.

When an interrupt-source delivers an interruption while an interruption from another interrupt-source is processing, the later interruption is handed over to the holding hardware normally. ( If a leading interruption was already stored in the holding hardware, nothing is done. If no leading interruption was stored, the interruption is stored in the holding hardware. )

When an interrupt-source delivers an interruption while a leading interrupt from the same interrupt-source is processing, the behavior of system depends on the interrupt-handling-software.

If a interrupt occurs, other interrupts are kept waiting until finishing the process that is related with the first-occurred interrupt, thus other interrupts will be handled LATER than original timing. Interrupt manager has queueing mechanism for DIFFERENT interrupts.

But if the interrupt occurs while the same interrupt is kept waiting, as the result, this interrupt occurs only once. Interrupt manager has NO queueing mechanism for SAME interrupt. We use interrupt mechanism for sound processing. Interrupt may be sometime missed because other interrupt-related heavy processing (graphics ? or CD ?) may mask the two interrupts for sound (thus the interrupt of sound occurs only once), but if the frequency of missing is once a second, it may not be noticed.

Lastly, I think that using VSyncCallback() is more stable though sound resolution is 1/50s[PAL] (or 1/60s[NTSC]).

----- End of forwarded message

---



6/7/95 9:42 AM  
Re(4): Root Counter  
Dave Ross  
David R. Sullivan  
Bill "Angus" Guschwan

OS / Architecture

When you mention "MUST CORRECT GP" how, specifically, is that done? I'm still trying to find out how to initialize the GP so I don't have to continue to use -G0 with the new compiler/assembler. Is there a SetGp similar to the SetSp function (I've not found one).

---

6/7/95 1:28 PM  
Problems with exiting and resetting...  
Carl Ferreira  
OS

OS / Architecture

Why does the resetting sequence work sometimes and not others? I have already increased my delay to 15.

Why does the program allow a restart (after normal exit) sometimes, and not other times? The program is the same.

Why does the pqpload process sometimes fail with a SCSI error? Retrying almost always works.

Thanks,  
Carl Ferreira

---

6/7/95 2:59 PM  
malloc  
Mark DeSimone  
OS

OS / Architecture

I am trying to malloc a 1.6meg buffer, but it fails. If I malloc a smaller buffer, the address returned is 0x800B7644. And subsequent mallocs return an address that is higher than the previous malloc. Why is malloc starting at such a high address? What happened to the first 700 to 800K of RAM? I am loading my code at 0x80010000. I am linking with 2MBYTE.OBJ.

Any suggestions would be appreciated,  
Jim Hatfield

---

6/12/95 1:27 PM  
Re(5): Root Counter  
David R. Sullivan  
Dave Ross  
Bill "Angus" Guschwan

OS / Architecture

Dave Ross, to answer your reply:

Properly accounting for the (GP) register within GNU C is as follows:

```
static int MyVarNonGp __attribute__((section("data"))) = 0;
```

This will cause all optimized and non-optimized code to use direct addressing when referencing this function. Other methods will work, however, this is clean and should work properly in all cases.

DaveS.

---

6/20/95 9:14 AM

Re: Problems with exiting and resetting...

Thomas Boyd

Carl Ferreira

OS

OS / Architecture

>Why does the resetting sequence work sometimes and not others? I have already >increased my delay to 15.

I have found that occasionally, when I have run code through the PSX with a particularly nasty bug (or even after simple goofs like forgetting to call ChangeClearPad after StartPad) in my code, I have to turn my machine off for over a minute to be able to start again. I still do not know why myself.

>Why does the pqbload process sometimes fail with a SCSI error? Retrying almost >always works.

This is the same deal as "cannot connect to target" for pqbload. It just means that you need to wait longer for the previous command to clear. The most typical problem is using resetps version 1.02 instead of 1.03. Version 1.03 waits for the PSX to reset before relinquishing control to the PC. Additionally you can use the /w option in the resetps and run commands to delay instead of the delay commands. To ensure utter and complete victory, I have batch files with pauses in them so I can masterfully press the space bar when the Force tells me that the PSX is indeed ready for the next command. (People make fun of me for taking this approach - beware of ridicule). This always works unless the previous program toasted the PSX boards as described above. Then I have to reboot.

In the end, I have found the necessary delay lengths to be completely arbitrary, even for the same CPE on the same machine with the same startup sequence.

>Why does the program allow a restart (after normal exit) sometimes, and not other >times? The program is the same.

Do you mean a sequence like this?

```
RESETPS 1 RUN SNPATCH PQBLOAD xxxxx yyyy (optional) RUN MAIN (execute till complete) RUN MAIN
```

I always reset before I run again, so this is not a problem. If you want to not load your data again (and it has not been modified) you can do the following with no problem:

```
RESETPS 1 RUN SNPATCH PQBLOAD xxxxx yyyy RUN MAIN (execute till complete)
RESETPS 1 RUN SNPATCH RUN MAIN
```

Tom

---

6/21/95 9:54 PM

FlushCache

David Schwartz

OS

OS / Architecture

We are using Code overlays and have been told that we need to run the FlushCache command to make sure that we do not have any cache coherency problems. So, when I added the following section of code to my program, the program always hangs in the FlushCache routine. Does anyone of any idea what is going wrong.

Code Snippet: EnterCriticalSection(); FlushCache(); ExitCriticalSection();

Thanks,  
David

---

6/22/95 7:09 PM

overlying libs  
Crystal Dynamics  
OS

OS / Architecture

hi again. a better question I thought up was: is it possible to overlay library code, and if so, are there examples for doing it? e.g. we use libpress.lib only in the intro sequence, and it'd be cool if it were not eating up space while the game is running.  
thanks in advance - Chuck Woo - Illusions Gaming Co.

---

6/27/95 11:10 AM

Re: malloc  
Alex J. Garden  
Mark DeSimone  
OS

OS / Architecture

Hey there...

Allocating a 1.6 MEG buffer is possible only if your program size is less than 400k - 64k. There is 2 megs of RAM (as I am sure you are aware). The first 64k is the OS kernel so there is actually addressable space from 0x80010000 to 0x80200000. The stack grows from 0x80200000 down, which makes your addressable space even smaller. I have not found a good way to determine exactly where the stack is, so I cannot really tell how much memory is available, however, if you malloc 1 byte, the ram location you get is most likely the base of your heap. Also keep in mind that the PS-X memory manager does not perform heap compaction, so even if you have 1.6 megs in total, it may not be in one contiguous block.

Hope this helps a bit... ...Alex Garden@Radical Entertainment.

---

6/28/95 3:32 PM

Fwd: Threading working!  
Bill "Angus" Guschwan  
OS

GOODTHR.ZIP 4K

OS / Architecture

I have a threading example which works with more than 4 tasks. All 3 of the fixes discussed here need to be applied to the OS to get it to work. Thanks everyone for their efforts, I have enclosed the example so everyone else won't have to go through this. I hope these problems are

solved in the long term, but for now I do have something that works. Kevin Seghetti at Cave Logic Studios

---

6/28/95 3:16 PM  
Re: Threading  
Dan Burnash  
David W. Marshall  
OS

OS / Architecture  
A sample was posted and is in the march/april archive under the dev environment. Look for "threading working".

---

6/28/95 11:49 AM  
Threading  
David W. Marshall  
OS

OS / Architecture  
Back in March, there seemed to be quite a bit of discussion about getting Threads to work. Eventually it seemed like someone got the code to work.  
Was there ever any documentation or sample code put together on the subject of Multi-Tasking and threading?

---

6/29/95 5:43 PM  
do Load() or Exec() work?  
Crystal Dynamics  
OS

OS / Architecture  
has anyone used these or related functions with any success? I can't get Load() to work, and Exec() seems to have some pretty bad behavior (eg. it doesn't set the stack pointer to what you specify). I'm using lib 3.0 (haven't gotten around to installing 3.1).  
- Chuck Woo - Illusion Gaming Co.

---

6/30/95 8:31 AM  
malloc bugs  
David Foley  
OS

OS / Architecture  
Angus,  
We are having problems with the MALLOC function in the 8Mb memory model in emulation mode.  
During the 4th memory allocation of our TIM list, MALLOC fails to return either a - 1 or 0, and disappears off to NOP land.

If you know of any problems with MALLOC, please let us know. Alternatively, we can avoid using MALLOC if there is a method of finding the address immediately above the .EXE, where we can start to store our TMD and TIM files.

Thanks for your help  
Tim Glasser Foley Hi-Tech

---

7/1/95 9:28 AM  
QSORT WARNING

Erick S. Dyke  
OS  
Bill "Angus" Guschwan

OS / Architecture

Quick warning -> QSORT sucks.

Im running V3.0 of the libs (close to milestone, so havent switched yet).

The one in libc is really really slow (The implementor must have thought that since bubble sort was the quickest sort that he knew.....)

The one in libc2 just crashes now and again.

I wrote a quick shell sort in c that is quicker by a factor of 4....If you are using qsort in your code, you might want to try the same.....

---

7/7/95 5:28 PM

need example:writing to ram card

Robert w. Calfee  
OS

OS / Architecture

I couldn't make heads or tails of the code in samples... Has anyone got a simple, self-contained example of the Sony way to do these ram card thingies?

rwc

---

7/7/95 10:47 AM

NEED PAL BAD, Beta depends on it

Mike Bartholomew  
Bill "Angus" Guschwan

OS / Architecture

We are in desperate need of "working" PAL libraries. We tried LIB3.1 and PAL does work, however the 3.1 library adds 200 K to our executable. This is unacceptable. We also tried libpal.lib for lib 3.0, but this library overscans both horizontally and vertically past our specified frame display buffer of 320 X 256. This is also unacceptable. We MUST have working PAL support before our BETA deadlines for Twisted Metal and WarHawk on August 1, 1995. Please help!!!!!!

---

7/10/95 9:46 AM

Re: NEED PAL BAD, Beta depends on it

Dan Burnash  
Mike Bartholomew  
Bill "Angus" Guschwan

OS / Architecture

I would like to find out why the 3.1 libraries are taking up 200k more memory than the 3.0 libraries. We need to reduce the memory usage of 3.1, in NTSC or PAL mode. Please send me a map file with the external symbols, or let me know what routines have increased in size.  
Dan Burnash

---

7/11/95 6:17 PM

Re: overlay example again?

Ben Lee  
Crystal Dynamics  
OS

OS / Architecture

I've been using code overlays for sometime ... I just started using the bbs ... so if you still need an example ... reply to dis one

---

7/12/95 9:57 PM

Is read() buffered?

Mike Benna  
OS

OS / Architecture

Help: I've noticed read() must read full sectors when reading from cdrom: but I need to read in smaller chunks.

More details: I've just recently installed my CDROM emulator and switched to reading files from the emulator instead of the PC's drive by reading from cdrom:filename instead of sim:filename. I'm using open(fname, O\_RDONLY) and read(descriptor, bufferptr, length) to read from the files but I've found that when reading from the cdrom: device I must read in blocks of 2048 bytes (and they must be aligned to a 2048 byte boundary). I thought read() was supposed to handle buffering so I could read in smaller chunks (for example, 2 bytes or 256 bytes at a time). How do I get buffered I/O? Must I write the buffering routines myself?

If it matters, I'm using lib 3.1.

Also, what are \_96\_remove() and \_96\_init() for? I've started calling them now that I've switched to using the emulator but I don't know why I need to call them, nor where during initialization I should be calling them from.

---

7/12/95 7:50 AM

Dir. of Production Technology  
Christopher C. Rywelski  
Documentation

OS / Architecture

I am in the process of putting together a Dev PC with the DTL-H2000 boards, and a CD-ROM emulator board. (This hardware was on loan to another developer and came back to me without documentation).

I need to find the document that explains the installation of the OS for the DTL boards (to include directory and file structures). In addition, if there exists updates to this process (e.g. software and documentation) please point me to them.

Thanks, Christopher 212.846.6495

---

7/12/95 10:27 AM

Re: Dir. of Production Technology

John Phua

Christopher C. Rywelski

Documentation

OS / Architecture

Hi Christopher,

We have faxed you a copy of the installation sheet is shipped with the boards. This will give you some background on the boards. Also you can find the tools in the Release folder along with documentation of the software. However to get you started with the DTL and emulation board you should download the DTL and CDEMU releases. Enclosed in the cdemu release is a readme for basic setup and walk through to running a sample using the dtl and emulator boards.

Hope this helps. John

---

7/17/95 2:04 PM

sscanf(), fopen() & fscanf()

Alex Dommasch

OS

OS / Architecture

Any plans to implement sscanf() soon? PLEASE SAY YES! I really don't want to have to take time to convert an existing piece of code that uses sscanf() everywhere.

Also, any plans to implement fopen(), fread(), fscanf(), etc, etc? These would make it a lot easier to use free form data files from the CD.

-Alex

---

7/18/95 9:03 AM

open("cdrom:") & read() are bad w/ 3.1

Alex Dommasch

OS

OS / Architecture

I just upgraded to the 3.1 Libraries, and now file reading from the CD Emulator is really slow and unreliable. Half the time, open() fails, and the rest of the time, read() takes a long time (lots of retries?). All that's changed is the software. I'm going to have to go back to 3.0 if I can't find a solution, but I'd prefer it if I didn't have to.

On startup, I execute CdInit(0), and \_96\_init(). Is there anything else I have to do to initialize?

What is the parameter in CdInit() supposed to do?  
Thanks for any help. -Alex

---

7/18/95 10:21 AM  
Re: open("cdrom:") & read() are bad w/ 3.1  
Bill "Angus" Guschwan  
Alex Dommasch  
OS

OS / Architecture

Well, I would avoid using open(). I am afraid to fix the plug, when the plug doesn't fit the hole. What are you using open and read for? I suggest using the low level sector read routines. Agreed, the routines should work, and I will look to get them resolved, but man PSX needs to avoid ISO.  
angus

---

7/27/95 8:19 PM  
Re: Which EnterCriticalSection ???  
Borden Covell II  
John Brandwood  
OS

OS / Architecture

I can tell you that interrupts are OFF when you are in an interrupt callback.

---

7/27/95 1:33 PM  
Which EnterCriticalSection ???  
John Brandwood  
OS

OS / Architecture

I've been writing a mult-tasking kernel on top of the thread-switching functions. This has brought up a few questions that aren't covered by the sample code, or fully explained in the current documentation. What exactly are the differences between the EnterCriticalSection() and SwEnterCriticalSection() routines ? What are the circumstances under which I should use EnterCriticalSection() instead of SwEnterCriticalSection() ? The documentation gives me the impression that only 1 callback interrupt routine can be executed at once, and that interrupts are effectively disabled during the callback's execution. Is this correct or do I still need to have an SwEnterCriticalSection() around my task-switching code ?  
Thanks,  
John.

---

7/28/95 6:15 AM



Re: overlay example AGAIN?!?

Dave R. Scheele  
Crystal Dynamics  
OS

OVERLAY.ZIP 5K

OS / Architecture

Here's what I have .. the files in the zip are dated 2/14/95 at the latest. If there's a newer one out there, post it, somebody!!

Dave

p.s. you can keep your firstborn, but a copy of your game when finished would be nice ...

p.p.s. a copy of your game's SOURCE would be nicer still ... Here's what I have .. the files in the zip are dated 2/14/95 at the latest. If there's a newer one out there, post it, somebody!!

Dave

---

8/2/95 1:15 PM

Re(2): Which EnterCriticalSection ???

John Brandwood  
Borden Covell II  
OS

OS / Architecture

Thanks for the info Borden.

Anyone know the answers to my other questions ???

John.

---

8/4/95 1:12 PM

Re: call ResetCallback() first dont use K0, K1

Thomas Boyd  
Thomas Boyd  
OS

OS / Architecture

To be more specific, here are the R3000 registers and what they do

reg mips.h usage ----- \$0 zero constant zero \$1 AT Assembler temp  
\$2-\$3 v0-v1 Function return \$4-\$7 a0-a3 Incoming arguments \$8-\$15 t0-t7 Temporaries \$16-\$23  
s0-s7 Saved temporaries \$24-\$25 t8-t9 Temporaries \$26-\$27 k0-k1 Exception handling \$28 gp  
Global data pointer \$29 sp Stack pointer \$30 s8 Saved temporary \$31 ra Return address

Tom

---

8/4/95 10:16 AM

call ResetCallback() first dont use K0, K1

Thomas Boyd  
OS

OS / Architecture

We have had titles fail test because they did not call ResetCallback() before using callbacks. The manuals explicitly state that ResetCallback MUST be called. Some library initialization functions call this for you, so you do not have to. The calls that call ResetCallback are the following: CdInit(); PadInit(); ResetGraph(mode) - if (mode&3) DecDCTReset(0) - and only 0 SsInit(); (call to ResetCallback may be removed in future libraries) SpuInit(); (call to ResetCallback may be removed in future libraries)

Next: DO NOT use the K0, and K1 registers (these are exception handling registers) on the R3000. They are reserved. Bad bad bad! You will fail test Sorry.

Tom

---

8/7/95 9:06 PM

open ? PCopen ?

Montgomery Singman

OS

OS / Architecture

Is there a reliable way to read PC files on playstation development station ?

Thanks for any help, Monte

---

8/7/95 9:04 PM

argc & argv

Montgomery Singman

OS

OS / Architecture

Do argc and argv[] work on psx ? Can I use it with the debugger ?

Thanks, Monte

---

8/8/95 4:00 PM

Re: Why is memcpy so slow?

Angus

Mark Beardsley

OS

OS / Architecture

memcpy is in rom. Writing your own is best.

Angus

---

8/8/95 10:03 AM

Re: open ? PCopen ?

Angus

Montgomery Singman

OS

OS / Architecture

You can use PCRead et al. 32 bit accessing in Windows sometimes does not work so you might need to turn it off and things like After Dark et al might cause problems. Otherwise it works

fine.

ANgus

```
.int ReadFile(char *fileName) { #define REL_TO_END 2 #define REL_TO_CUR 1 #define  
REL_TO_START 0 #define OFFSET_0 0  
long fd; long length; int bytesRead; int err;  
fd = PCopen(fileName,0,0); if (!fd) goto endian;  
/* find length */ length = PCseek(fd,OFFSET_0,REL_TO_END);  
/* after finding length, go back to start */ PCseek(fd,OFFSET_0,REL_TO_START);  
/* read to end of file */ bytesRead = PCread(fd,(char *)MODEL_ADDR,length); if (bytesRead !=  
length) goto endian;  
err = PCclose(fd); if (err < 0) goto endian;  
return 1;  
endian: return -1; }
```

---

8/8/95 2:59 PM

Why is memcpy so slow?

Mark Beardsley

OS

OS / Architecture

It seems that memcpy is extremely slow.

```
memcpy (destin, source, 26);
```

is much slower than

```
for (i=0; i<26; i++) *destin++ = *source++;
```

This seems real strange. Is there some other function/operation that could be used for faster memory copies?

---

8/11/95 4:28 PM

Re: argc & argv

Angus

Montgomery Singman

OS

OS / Architecture

I dont' know have you tried it? I'll look into it some more.

Angus

Do argc and argv[] work on psx ? Can I use it with the debugger ?

Thanks, Monte

---

8/11/95 4:25 PM

Fwd: Re: open ? PCopen ?

Angus

OS

OS / Architecture

You can use PCRead et al. 32 bit accessing in Windows sometimes does not work so you might need to turn it off and things like After Dark et al might cause problems. Otherwise it works fine.

```
ANgus
.int ReadFile(char *fileName) { #define REL_TO_END 2 #define REL_TO_CUR 1 #define
REL_TO_START 0 #define OFFSET_0 0
long fd; long length; int bytesRead; int err;
fd = PCopen(fileName,0,0); if (!fd) goto endian;
/* find length */ length = PCseek(fd,OFFSET_0,REL_TO_END);
/* after finding length, go back to start */ PCseek(fd,OFFSET_0,REL_TO_START);
/* read to end of file */ bytesRead = PCread(fd,(char *)MODEL_ADDR,length); if (bytesRead !=
length) goto endian;
err = PCclose(fd); if (err < 0) goto endian;
return 1;
endian: return -1; }
```

---

8/21/95 6:10 PM  
Re(2): argc & argv  
Montgomery Singman  
Angus  
OS

OS / Architecture  
It did not work for me, it would be nice if it does.  
Monte

---

8/24/95 10:41 PM  
Profiler  
Mike Gomez  
Administrator  
OS

OS / Architecture  
I thought I saw a discussion about the profiler somewhere, but now I don't see it. Anyway, could you please help me with this. I get these undefined symbols when I try to link the demo protest program (compile is fine).  
symbol EXIT undefined symbol PRINTF undefined symbol SETJMP undefined  
I am using lib V3.1  
Thanks  
Mike

---

8/25/95 3:17 PM  
Re: Overlays and i-cache  
Rusty Buchert  
Mark D. Lyons  
OS

OS / Architecture  
There is a C routine to FLush the i-cache... I forget the name, something like FlushICache, maybe. Check the OS library docs.

---

8/25/95 3:11 PM  
Re(2): Profiler  
Mike Gomez  
Rusty Buchert  
Administrator

OS / Architecture  
Thank you. The profiler sample requires libc.lib.

---

8/25/95 12:24 PM  
Overlays and i-cache  
Mark D. Lyons  
OS

OS / Architecture  
I'm messing around with some of the overlay code someone stuck here and I'm having some weird stuff happen sometimes when I execute newly loaded code. I'm hoping its an i-cache thing and I was wondering if anyone has any cache flushing code lying around.

---

8/25/95 10:48 AM  
Re: Profiler  
Rusty Buchert  
Mike Gomez  
Administrator

OS / Architecture  
You need to link in libc1 or libc or libc1 or something like that. Check is your psx/lib directory.

---

8/29/95 4:47 PM  
Re(2): Why is memcpy so slow?  
Jim Rogers  
Angus  
Mark Beardsley

OS / Architecture  
Could you post a list of which functions are in rom and should be avoided. Or is there a location were this information exists. Also we have found a bug in memmove where it sometimes copies an extra byte of data when copying overlapping areas.  
Thanks Jim Rogers

---

8/29/95 10:16 AM  
Multitasking and GTE  
Thomas Boyd  
OS

OS / Architecture

The following has been brought to my attention:

If you want to do multitasking and use the GTE, you need to be sure that the coprocessor usable bits of the R3000 coprocessor 0 (System-control processor) status register (bits SR\_CU0 - SR\_CU3 of C0\_SR in MIPS.H) are set correctly to enable the GTE.

For more info see page 335 of The MIPS Programmer's Handbook, by Erin Farquhar and Philip Bunce (or any other MIPS book)

Tom

---

9/1/95 3:56 PM

Rom Functions

David R. Sullivan

OS

OS / Architecture

Could we get a list of functions that are re-entrant as well as a list of functions that can behave well when multi-tasking. The new reference refers to a part 2 of the document that lists these, unfortunately this does not exist...at least in English.

DaveS.

---

9/2/95 12:11 PM

Re: Rom Functions

david eader

David R. Sullivan

OS

OS / Architecture

What's the point of having routines in ROM if they're so slow ?

How many bytes of RAM are actually being saved ?

Is there a way to copy ROM routines into RAM, and set function pointers to them ? (Not practical if ROM routine calls another ROM routine, i.e. is not a leaf function)

Is ROM just memory-mapped? If so, what are the address ranges ? If so, does that mean that not all of the 2megs is writeable?

Is there anything unique about code executing in ROM, other than being much slower ?

In general, what is the design philosophy/engineering reasons for ROM routines ?

deader

(hi David S., yeah I remember, stop by if you're in the city!)

---

9/6/95 6:15 AM

profiling

Sam Black

OS

OS / Architecture

Is there a real profiler for the PSX? Something which will tell me how much time I'm spending in each routine? I tried to write a simple sampling profiler, but it only works if it samples on VSync, which isn't quite good enough. When I trigger it off of any of the other root counters, it's useless -- it counts up to the target value the first time, but it seems to call my interrupt handler for every tick after that, which slows things down to the point that it's useless. I'd keep working on it, but for the time being, I have even more critical stuff to be doing. So, back to my original question, is there a real profiler for the PSX?

---

9/11/95 3:21 PM  
Re: Fwd: How to set GP in interrupt  
David R. Sullivan  
John A. Slagel  
OS

OS / Architecture

`int32 myownGP __attribute(section("data")) = 0; // THIS EXACT LINE WILL DO IT`  
Now you may use Get and SetGP.  
DaveS.

---

9/11/95 9:41 AM  
Fwd: How to set GP in interrupt  
John A. Slagel  
OS

OS / Architecture

I downloaded a new version of the compiler, and my timer interrupt handler seems to have broken. I suspect that my old version of the compiler didn't use the GP method of optimization, so I didn't have to set the GP register in my timer interrupt.

The GP optimizations seem like a good idea, so I figured I'd fix it by saving the GP register before I set up my handler and then use SetGP at the beginning of my interrupt routine. But, how do I know that the variable that saved my GP doesn't get put into a memory address referenced off of the GP?

John Slagel Parallax Software

---

9/12/95 3:46 PM  
Re(2): Fwd: How to set GP in  
John A. Slagel  
David R. Sullivan  
OS

OS / Architecture

Hmmm... I used that \*exact\* line, and then when I tried to reference `myownGp`, I got an "undefined symbol" error when compiling? Do I need newer libs or am I misunderstanding something?

Thanks, John`

---

9/13/95 3:17 PM  
Re(3): Fwd: How to set GP in  
David R. Sullivan  
John A. Slagel  
OS

OS / Architecture

Well...? You got me there. I can tell you that you should have a later version of the assembler and comiler for the attribute line to work. (gnu 2.6.3.sn.2 and aspsx 2.20 or 2.21 work for me).

All we said was (2 '\_'s each end) int32 variablename \_\_attribute\_\_  
((section("data"))) = 0;  
DaveS.

---

9/16/95 10:38 AM  
Re(4): Fwd: How to set GP in  
John A. Slagel  
David R. Sullivan  
OS

OS / Architecture

Ok... I must not be using the latest compiler... the actual error I was getting was that "attribute section" not implemented in this compiler, then a later error said "variable myGp not defined"

Ooops.  
-John

---

9/26/95 10:30 AM  
Re(5): threads  
Byrt Martinez  
Bill "Angus" Guschwan  
Dave Feldman

OS / Architecture

"Instead you should use a pointer to the TCB. There is a routine below to do it. After execution of this routine, context will be switched. Be careful about losing information from original context. You should store it yourself to restore later."

Above is an excerpt from an archived message about the switching tasks in an interrupt. It makes reference to saving the context; does someone have a code sample that performs a context save.

Here is the problem I am having (not even sure if it is caused by a corrupt context; open to thoughts, suggestions, guesses):

1. Multitasking; message driven. Tasks switch in one of three places. If a higher priority task is "runnable" (ie has a message), task switch to the scheduler inside vblank. The scheduler simply transfers control to the highest priority runnable task. All tasks block on a call to GetMessage() if there are no messages available and switch control to the scheduler.
2. The scheduler is initialized first, then any support tasks. What I am running into is that the first task following the scheduler will hang or crash on the second switch back to it. I traced it in the debugger and it appears to be hanging/crashing inside ChangeTh() at the jr k0 towards the end of the context switching code. This leads me to believe that the context is some how corrupt(?).



3. I have managed a work around. If I leave the first task following the scheduler active, the system will run as long as I only use the first task once or not at all.

That's it.

Appreciate any help.

thanks in advance.

Greg Kearney, Maxis

---

9/29/95 4:05 PM

InitHeap

Chris E. Reese

OS

OS / Architecture

The docs state that there is a some overhead taken up by the OS when using InitHeap. Exactly how much overhead is it? I specified 500000 bytes for the InitHeap routine and when I tested to see how much heap I really had available I found that the largest chunk of I could malloc was approx. 310000 bytes. Please tell me that I have done something wrong.

Chris Reese. Eidetic, Inc.

---

10/4/95 3:55 PM

Re: Intr timeout????

Angus

Dean M. Grandquist

OS

OS / Architecture

You will get the "intr timeout(0020:002D)" error if the number of interrupts is greater than a maximum value.

First value is the interrupt register, and the second is the interrupt mask register. The 20 means there is an extra interrupt or something from root counter 1. The 2D means there is an interrupt mask for dmac, cd ready, and vblank, as well as counter 1.

otherwise, I would have to see what you are doing to figure it out.

Angus

---

10/4/95 2:51 PM

Re: InitHeap

Angus

Chris E. Reese

OS

OS / Architecture

InitHeap is called in the Sn Entry point and should InitHeap the whole thing. If you are doing something different, I will have to see a bit of code.

Angus

---

10/4/95 11:56 AM

Intr timeout????

Dean M. Grandquist  
OS

OS / Architecture

I just started to get some "intr timeout(0020:002D)" from testmess. Does one of you nice "I have the source" sony persons know what intr timeout is and what this intr timeout means?  
Thanks much --Dean G.

---

10/6/95 11:08 AM  
DrawSync() == constant???  
Dean M. Grandquist  
LIBGPU  
OS

OS / Architecture

I am having trouble with DrawSync(1), after I run for a while the value returned is a constant. My game is running with threads and lots of callbacks (all the root counters and drawsync). One thread is the render and draw calls the other is the ai's and movement. The vsync is checking if the drawsync call back is done and the render is done befor swapping the frame buffers.  
What does the DrawSync(1) do realy, or is this a classified? Please don't quote the manual 8-)  
Thanks bunches. --DeanG

---

10/11/95 9:48 AM  
MultiTap errors?  
Christopher Deel  
OS

OS / Architecture

I am trying to get the MultiTap working and I am having some errors. What am I doing wrong and what LIBs do I need to link with?  
When I try to compile the MultiTap test code I get:  
Error : Symbol 'SendPAD' not defined Error : Symbol 'StopCARD' not defined Error : Symbol '\_new\_card' not defined Error : Symbol '\_card\_write' not defined Error : Symbol '\_new\_card' not defined Error : Symbol '\_card\_read' not defined  
When I try to link with LIBCARD I get:  
C:\PSX\LIB\LIBCARD.LIB : Error : File c:\psx\lib\libcard.lib is not in PsyLink file format

---

10/11/95 10:39 AM  
Re: MultiTap errors?  
Angus  
Christopher Deel  
OS

OS / Architecture

Sounds like you have an old psylink.  
Angus

---

10/12/95 2:42 PM  
Re(3): MultiTap errors?  
Angus  
Christopher Deel  
OS

OS / Architecture  
I am running 1.45. Looks like you are a bit behind. Thus, I think those errors you report.  
Angus

---

10/12/95 1:31 PM  
Re(2): MultiTap errors?  
Christopher Deel  
Angus  
OS

OS / Architecture  
I am running version 1.17 of PsyLink What version should I have.

---

10/13/95 1:00 PM  
GPU primitive ordering  
Silas S. Warner  
LIBGPU

OS / Architecture  
I am running into problems in which primitives are not being drawn in the order in which I place them in the OT. Specifically, in order to make the foreground of my scene, I am placing these primitives, in the following order, into entry 0 of an OT. (Other objects are placed in positions further back in the OT, including a GsBG in entry 255.) All drawing is done in 8-bit CLUT mode. 1. 64x32 POLY\_FT4 2. 64x32 POLY\_FT4 3. 192x160 POLY\_FT4 4. DR\_MODE (changes tpage only) 5. SPRT\_8 6. SPRT\_8 7. SPRT\_8 8. SPRT\_8 9. SPRT\_8  
On the screen, these objects are being displayed in the order 4,5,6,7,8,9,1,3,2. In other words, the small SPRTs are done first, then one medium POLY\_FT4, then the humongous POLY\_FT4, then the other medium POLY\_FT4.  
Now this would make sense if the GPU were somehow multiprocessing the entries: in other words, one GPU process might be handling the small SPRTs and another two processes sharing the large POLY\_FT4s. Is this actually the case? If it is so, is there any FLUSH primitive that I can deliver to the GPU to prevent groups from being displayed in the wrong order?  
Note that distributing the primitive entries among the first 3 entries in the OT has no effect.  
Silas Warner

---

10/18/95 3:18 PM  
complete memory map  
Blake E. Senftner  
OS  
Angus

OS / Architecture

Guys;

I remember seeing a complete memory map of the PSX somewhere... can I get another copy of it?

-Blake

---

10/19/95 10:14 AM

Re: Win 95 & PCRead problems

Angus

Borden Covell II

Thomas Boyd

OS / Architecture

Don't use Windows 95.

Angus

---

10/19/95 10:08 AM

Win 95 & PCRead problems

Borden Covell II

Thomas Boyd

OS

OS / Architecture

We are experiencing intermittent errors when reading data from the PC (using PCOpen, PCread, etc.) under Windows 95.

The code works fine under DOS and Windows 3.1/3.11.

It seems that the PCread routine fails to complete properly and returns a read length of -1. It does not always fail in exactly the same place (i.e. file).

HELP!!!! We have developers without CD emulators that need to be able to read data from the PC.

Thanks, Borden

---

10/30/95 6:22 PM

Re(2): Win 95 & PCRead problems

Jose R. Villeta

Angus

Borden Covell II

OS / Architecture

What is the latest update on Borden Cove message on PC read failures with Win95. I am testing the upgrade path for Black Ops but run into the same problem as the one Borden reported on 10/19. The reason I am trying to make it work is to integrate the new MIMe wave editor preview function. It requires PlayStation dev boards. I thought Win95 could be the solution for both. Are there any work arounds, if not the MIMe wave editor preview utility is pretty much useless, unless you jump back and forth from DOS to Win311. Any comments/ideas greatly appreciated. Jose Black Ops

---

10/31/95 1:58 PM

Re(3): Win 95 & PCRead problems

Dan Burnash

Jose R. Villeta

Angus

OS / Architecture

>What is the latest update on Borden Cove message on PC read failures with Win95. I am testing the upgrade path for Black Ops but run into >the same problem as the one Borden reported on 10/19. The reason I am trying to make it work is to integrate the new MIME wave editor >preview function. It requires PlayStation dev boards. I thought Win95 could be the solution for both. Are there any work arounds, if not the >MIME wave editor preview utility is pretty much useless, unless you jump back and forth from DOS to Win311. Any comments/ideas greatly >appreciated.

See the win95 statement posted almost everywhere on this bbs. Part of it is listed below. We are trying to get this problem fixed, but quick fixes are not expected.

Win 95 statement \_\_\_\_\_ We currently do not officially support Windows 95. If you use it, you use it at your own peril. However, we are working towards getting it fixed, and we will accept bug reports you may find. Please post any problems in the Bugs Conference. But we can not promise any specific turnaround because we do not officially support it yet. Most things work with Windows 95. The list below only includes tools from SCE. Additional information to follow on the remaining tools. \_\_\_\_\_

---

10/31/95 8:19 AM

How to create a file using PCOpen

Carl Ferreira

OS

Thomas Boyd

OS / Architecture

How can I create a file using the PCOpen function? Everything I do returns a value < 0.

What I want to do is to create a text or binary file on the PC to store values that may have been changed during the course of the program.

Thanks,

Carl Ferreira

---

11/1/95 11:02 AM

Re(3): How to create a file using PCOpen

Dan Burnash

Carl Ferreira

Thomas Boyd

OS / Architecture

>I wish to create a new file (NOT overwrite an existing file). >My process:

>int fd;

>PCinit(); >fd = PCOpen("newfile.nam"); >if (fd < 0) > return(0); >return(1); > >The above will always return 0 if 'newfile.nam' does not already exist. >I want to be able to write a new file, if necessary.

You are correct, this doesn't work. However, it should be simple to create a dummy file on your hard drive before running the program, which allows the program to work just fine. I am passing the bug on to get it fixed, and hopefully a new libsn.lib will be forthcoming.

---

11/1/95 3:04 PM

Re: How to create a file using PCOpen  
Dan Burnash  
Carl Ferreira  
OS

OS / Architecture

>How can I create a file using the PCOpen function? Everything I do returns a value < 0.  
You can't. Use PCcreat instead. The following prototype should have been in libsn.h, but isn't.  
this will also work if the file exists.

```
/* ** create (and open) a file on PC host ** ** passed: PC file pathname, open mode, permission  
flags ** ** return: file-handle or -1 if error ** ** note: perms should be zero (it is ignored) */ int  
PCcreat (char *name, int perms);
```

Here is what is happening:

You need to call PCcreat to create a file that doesn't already exist (it will still work if the file exists).

The PCxxx calls follow the PC file system standards for parameters and results. Briefly :

PCcreat corresponds to int 21h, ah = 3ch - open file for writing - if it doesn't exist then create it -  
if it does exist then truncate it to zero length.

PCopen corresponds to int 21h, ah = 3dh - open file for reading / writing / reading and writing  
- file must already exist.

libsn.h will be updated, as well as the docs, for the next revision.

Dan Burnash

---

11/2/95 4:46 PM

how to use Exec() - the menu example working

Thomas Boyd

OS

Mark A. Fong

EXECMENU.ZIP 31K

OS / Architecture

Hi menu fans,

Here is the menu example in fine working order (attached). I took out anim, because I did not  
want to upload the movie. If you check out GOMENU.BAT and fix your path, you are set.

Seems the mysterious RET2.OBJ and BOOT.OBJ were missing.

Any questions? EMail me.

Tom

---

11/2/95 3:23 PM

Heap Problems

Byrt Martinez

OS

OS / Architecture

We appear to be having problems with the Heap. malloc/free are leaving large holes in  
memory.

the following code snippet will create holes in heap memory:

```
UInt8* a,b; for(int i=0;i<50;i++) { a = malloc(512); b = malloc(1024); printf("a = %p,b= %p  
\n",a,b); free(a); free(b); }
```

If the loop end condition is increased this will eventually crash the system.

Has anyone else run into this? Any suggestions?  
thanks, greg kearney, Maxis

---

11/2/95 1:36 PM  
LIBGS.H  
Montgomery Singman  
OS

OS / Architecture  
Has anyone notice that LIBGS.H is in unix format ? I don't know if this is the only file that's not converted to DOS format.  
Monte

---

11/2/95 5:20 PM  
Scratch pad and I-Cache examples?  
FLORIA L. ROSS  
OS

OS / Architecture  
Hi, I was wondering if there are any sample code available showing how the scratch pad and I-cache works. The scratch pad sample code I downloaded from the samples section was full of Japanese text. Is there a English version available?

---

11/3/95 6:56 PM  
libpress bug  
Blake E. Senftner  
OS  
Angus

OS / Architecture  
I've been getting a situation where the routine DecDCTBufferSize() returns a required buffer size, and a buffer sized exactly that is too small.  
I have a set of frames I want to loop through, so I call DecDCTBufferSize() on each, remembering the max value. If that value is less than my statically allocated buffer, I raise it to that point. I've just run into a situation where my max buffer size is 8192 longs... But when I decompress the buffer after this is getting stepped on.  
-Blake

---

11/13/95 10:14 PM  
Re: libpress bug  
Colin Lewis  
Blake E. Senftner  
OS

OS / Architecture  
I have the same problem as Mr. Senftner. I am compressing to .BS files and some of them (but not all) overrun the buffer size given by DecDCTBufferSize().

The docs say something cryptic about calling DecDCTBuffSize() \_after\_ DecDCTvlc, but that doesn't make a lot of sense; you need to know the size of the buffer necessary before you decompress into it.  
I have been working around by doubling the buffer size, but that I won't be able to afford that luxury in the final product.

---

11/14/95 3:51 PM  
Re(2): libpress bug  
Thomas Boyd  
Colin Lewis  
Blake E. Senftner

OS / Architecture

OK, the libpress thing. It just grabs the numbers for the buffersize from the .STR (or whatever). See the format of the sector (below). So you get to fix this field yourself till the tools are repaired. I will ask for this. (I assume movconv did this to you).

Tom ----- This sector format will help you write you STR reducing function:

STR With audio (without audio has no subheader): -----

TotalSector size 2336 bytes subheader 8 bytes sector header 32 bytes data 2016 bytes ECC 256 bytes

Video header description: ----- subheader = (00 01 42 80 00 01 42 80) in hex  
header =

BYTE format ID (0x60) BYTE format version (0x01) WORD undefstrformat (0x8001)

WORD Current sector number in current frame WORD Total number of sectors in this frame

DWORD Current frame number DWORD size of .BS frame in bytes WORD frame width in

pixels WORD frame height in pixels DWORD HEADM = first DWORD of .BS frame DWORD

HEADV = second DWORD of .BS frame DWORD ????? (0x00000000)

I assume that you want to just edit out frames from the STR files, which means that you will be taking out specific sector ranges.

You need to change the current frame numbers to be continuous after you cut sectors out.

remember that the values are in reverse endian order (so frame one will be 0x01000000).

If you need more information, please EMail me at

thomas\_boyd@scea.sony.com

or call me at

(415) 655-8181

I hope this helps. Let me know if you need more.

Tom

---

11/16/95 8:41 AM  
OS call speed  
Carl Ferreira  
OS

OS / Architecture

I recall someone telling me at one time that the memcpy function is in ROM and should be avoided for maximum speed.

My question:

What (if any) routines are implemented in (slow) ROM? If any such routines exist, could you



post code (or an obj module) so that they can be moved into RAM?  
Carl Ferreira

---

11/16/95 2:44 PM

Re: Scratch pad and I-Cache examples?

John Phua

FLORIA L. ROSS

OS

MAIN.C 6K

OS / Architecture

Hi,

Attached is the main.c file from the Scratch example. The Japanese comments has been translated. Additional translated source files will be released in the release area.

John

---

11/16/95 11:00 AM

malloc()

James C. Leiterman

OS

OS / Architecture

1) Is the MMGM.OBJ malloc update on the 1.5 CD merged into the malloc() call in the 1.5.7 update?

2) If I write a lil loop which malloc(1024), when I run out of memory I don't get a NULL, I get a lock up! Is this a bug? (Note: I'm using 1.5.7 not MMGM.OBJ!)

I need to build a true heap mgmt system and need this information!

---

11/16/95 11:51 AM

re: malloc()

James C. Leiterman

OS

OS / Architecture

Seems through a little experimenting I've answered my own question. The MMGM.OBJ module is NOT in the latest release.

Being used to standard malloc() behavior I was NOT calling InitHeap(). Once I did a full pull allocation would return 0xffffffff not NULL! But when including the MMGM.OBJ and using InitHeap2() allocations from top down would occur and a NULL would be returned when the pool was empty!

Question: When will this be fixed! MMGM.OBJ is dated back in 7 Sep 95.

Most games use a complex heap system with garbage collection in a Flat memory world. I need to build one now but is Sony planning to build one in the near future?

PS:

I found that the function:

void SystemError( char, long );  
is in the Run-time Library but seems to have its typedef missing from the header files!

---

11/22/95 12:38 PM  
Re: Return address  
Angus  
OS

OS / Architecture  
use the map option on the compiler. it gives addresses. also try a sym file too. also try the stack option in the debugger by use the arrow keys.  
angus

---

11/22/95 2:54 PM  
memcmp.bcmp fail!  
Silas S. Warner  
Developer Support  
OS

OS / Architecture  
After painstakingly tracing through the code which performs memcmp and bcmp, I have discovered that these functions are BUGGY!  
This is what happens in the code: A1 and A0 are set to the addresses to be compared. A2 is set to the block length.  
V1 is set to the byte at A1, and A1 is incremented. V0 is set to the byte at A0. V1 and V0 are compared. If they are equal, A0 is incremented and we return to the next comparison.  
If they are not equal, V1 is loaded with the byte at A1. V0 is loaded with the byte at A0. V1 is subtracted from V0 to give a return value. BUT... A1 has already been incremented, so V1 does NOT contain the byte that was compared with V0! If it happens to be the same as V0, bcmp will return a zero (blocks equal) value when in fact the blocks are UNEQUAL! Let's hope this is not a ROM function, and you can fix it quickly.

Silas Warner

---

11/22/95 3:29 PM  
Re(3): Return address  
Jay Stelly  
Matt Brown  
OS

OS / Architecture  
>Sorry, I meant dynamically in the code. I need to set a variable >to the address of the calling function.  
Why not just pass it in as a parameter?  
Jay

---

11/22/95 1:29 PM

Re(2): Return address  
Matt Brown  
Angus  
OS

OS / Architecture  
Sorry, I meant dynamically in the code. I need to set a variable to the address of the calling function.

---

11/22/95 12:11 PM  
Return address  
Matt Brown  
OS

OS / Architecture  
Is there a way to obtain the address of code that called a given C function? If so, could somebody please post it? Thanks in advance.  
Steve Cox

---

11/27/95 4:59 PM  
Re: memcmp.bcmp fail!  
Dan Burnash  
OS  
Silas S. Warner

OS / Architecture  
You are right, they do fail, in possibly multiple ways. They are simple C functions, so just write your own for now. They are in RAM anyhow, so you aren't losing anything. I will show the developers how to fix the bug, and hopefully it will be in the next rev of the libraries.  
Dan Burnash

---

11/27/95 10:52 AM  
Re(4): Return address  
Thomas Boyd  
OS

OS / Architecture  
Just look in the RA register on the R3000. Tom

---

11/28/95 10:16 AM  
Overlays, InitHeap() and malloc()  
Jay Stelly  
OS

OS / Architecture

I'm trying to get overlays working, but they seem to have a conflict with malloc() and InitHeap().

In a program with overlays, the first call to malloc() actually returns a pointer to memory inside the overlay section. For example:

In the map file, my first overlay is listed at: 0x80011858 This seems to be fine since the program (a testbed) is small and it agrees with the rest of the data in the map file.

However, if the first line of code calls malloc(), malloc returns a pointer like 0x80011860.

Obviously InitHeap() is not taking overlays into account. Sure enough, if I call InitHeap() myself with an address I know is valid, everything works.

My questions are: Is/Will the startup code be fixed to call InitHeap() with the correct data for code with overlays?

How do I calculate the proper values to call InitHeap() at runtime? I can pretty much figure them out from the map file, but that's not a very good method. Is there some description of the program header somewhere?

Thanks,

Jay Stelly Tetragon

---

11/28/95 10:09 PM

Re: Overlays, InitHeap() and malloc()

John Brandwood

Jay Stelly

OS

OS / Architecture

> How do I calculate the proper values to call InitHeap() at runtime? I can pretty much figure them > out from the map file, but that's not a very good method. Is there some description of the > program header somewhere?

InitHeap() is called by the PsyQ startup code that also clears out the BSS segment (i.e. \_\_SN\_ENTRY\_POINT). Once you have got the link file sorted out as per the last message, then you probably won't need to call InitHeap() yourself.

If you do, then you might like to replace InitHeap() and the rest of the memory package with the one I've uploaded to the Bugs conference. Since source is provided, you can modify it to do whatever you like. It also fixes the bugs present in the library routines.

John.

---

11/28/95 10:26 PM

Replacement memory heap functions

John Brandwood

OS

OS / Architecture

I've uploaded a 'C' source file to the Bugs conference which contains a complete replacement for the library's memory management functions, InitHeap(), malloc(), calloc(), realloc() and free().

Advantages over the library are ...

1) Bug free (as far as I know)

2) Allows a configurable heap size so that you can debug with the same amount of memory as a production machine, but still leave full debugging on.

3) Provides a DumpHeap() function to show you the state of the memory heap. This simplifies finding memory leaks and fragmentation.

Enjoy,  
John.

---

11/28/95 8:44 PM  
Re: Overlays, InitHeap() and malloc()  
Dean M. Grandquist  
Jay Stelly  
OS

OS / Architecture

>In a program with overlays, the first call to malloc() actually returns a pointer to memory  
>inside the overlay section. For example:  
Did you declare all sections and groups? I had problems with this until I got the groups in the  
"right" order. Post your link file an I will compare it the one I have.  
--Dean Thats all you get for 30 seconds of work.

---

11/30/95 3:31 PM  
Re(2): Overlays, InitHeap() and malloc()  
Jay Stelly  
OS

OS / Architecture

Thanks for the tips.

I had originally set up my link file like the overlay example that was posted to this BBS (go  
figure!). When I moved my .bss segment after the overlay group in memory, it all began to  
work properly.

So, I think the lesson here is that the beginning of the heap is not calculated correctly by the  
startup code if an overlay is the last group...

Jay Stelly Tetragon

---

12/6/95 10:11 PM  
ResetGraph(0) causes LoadExec() to crash  
Mike Benna  
OS

OS / Architecture

This program works:

```
main() {    _96_remove();    _96_init();    LoadExec("cdrom:test.exe;1", 0x801fff00, 0); }
```

This one does not:

```
main() {    ResetGraph(0);    _96_remove();    _96_init();  
LoadExec("cdrom:test.exe;1", 0x801fff00, 0); }
```

It crashes sometime during the LoadExec() call. Sometimes the debugger reports "unexpected  
interrupt 0001" but eventually it always crashes with "Bus Error on data reference".

I'm guessing ResetGraph() installs some event handlers or something but there does not appear  
to be a corresponding function to remove them. Any ideas?

Also, what's the deal with \_96\_remove(), \_96\_init(), and CdInit()? Many examples I've seen use

\_96\_remove() and then \_96\_init() (like above), but I can't find any documentation which tells me whether these calls should be needed or not. Do they internally call CdInit() or is that something I should be doing myself?

References to documentation would be appreciated. Thanks in advance for any information you can provide.

Mike Benna Mike@MindSpan.com

---

12/7/95 3:50 PM

SYSTEM.CNF

Mark DeSimone

OS

OS / Architecture

I am trying to generate a CD which uses the required SYSTEM.CNF file rather than using PSX.EXE for my executable name, but I can't get it to work.

What is the relationship between SYSTEM.CNF and the following code: \_96\_remove... \_96\_init... LoadExec("Same name as in SYSTEM.CNF???",.....) ??

What do I name my executable? What do I put in the SYSTEM.CNF file? Do I need the above code somewhere?

What DOESN'T seem to work is renaming the executable to the filename mentioned in BOOT = name.

Confused in Phoenix

Glenn O'Bannon Rainbow America

---

12/7/95 4:36 PM

Re: ResetGraph(0) causes LoadExec() to crash

Rob Vawter

Mike Benna

OS

OS / Architecture

>>I'm guessing ResetGraph() installs some event handlers or something but there does not appear to be a corresponding function to >>remove them. Any ideas? >>Also, what's the deal with \_96\_remove(), \_96\_init(), and CdInit()? Many examples I've seen use \_96\_remove() and then \_96\_init() >>(like above), but I can't find any documentation which tells me whether these calls should be needed or not. Do they internally call >>CdInit() or is that something I should be doing myself?

You need to call \_96\_init in order to use LoadExec, (check out the comments in psx\sample\module\execmenu\menu.c) so that things like open() and read() can be used. The \_96\_ functions do NOT call CdInit, you need to do that (see section 3.3, Patch Module for DTL-H2000 of Programmer Board Set manual). No ideas on the ResetGraph problem yet. Get back to you.

---

12/7/95 5:18 PM

Re: SYSTEM.CNF

Rob Vawter

Mark DeSimone

OS

OS / Architecture

>>What is the relationship between SYSTEM.CNF and the following code: >>\_96\_remove...

>>\_96\_init... >>LoadExec("Same name as in SYSTEM.CNF???",.....) ??

Everything after the "BOOT =" should be the first argument of LoadExec

>>What do I name my executable?

To quote the Mastering Docs: >>11)Boot File Name >> Please name your boot file based on following rule at SYSTEM.CNF;1 file. Then please put the SYSTEM.CNF;1 in the root

>>directory, so that the file can transmit the boot file name change to OS. >> >> <Boot File

Naming Rule> >> Assuming the product code of a title is XXXX-AAAAA, please put . (period)

between the 8th character and the 9th character >>and put \_ (under bar) between the alphabetic part and the numeric part. Then final boot file name have to be XXXX\_AAA.AA;1. >> >> eg.

>> >> Product code Boot file name >> SLPS-12345 SLPS\_123.45;1

\* Please make sure the full path is specified.

>>What do I put in the SYSTEM.CNF file?

Once again, the Mastering Docs: >> <Contents of SYSTEM.CNF;1> >> >> BOOT =

cdrom:\XXXX\_AAA.AA;1 >> TCB = 4 >> EVENT = 10 >> STACK = 801fff00 >> \*

Please make sure the full path is specified.

>>Do I need the above code somewhere?

Yes.

---

12/8/95 1:40 PM

Re(2): ResetGraph(0) causes LoadExec() to crash

Mike Benna

Rob Vawter

OS

OS / Architecture

Here's some further information about ResetGraph(0) causing LoadExec() to crash...

I found that if I called StopCallback() before \_96\_remove() that LoadExec() would begin working. Again I ask... is this the right thing to do?

---

12/8/95 8:21 AM

Re(3): libpress bug

Thomas Boyd

Thomas Boyd

Colin Lewis

OS / Architecture

Message from Koji describing your dilemma and upcoming solution. -----

----- Tom,

I found DecDCTvlc writes extra data at the end of valid intermediate data. This extra data is a kind of padding data for MDEC input.

Obviously, it is strange that the size returned from DecDCTvlcSize doesn't fit the size of data created by DecDCTvlc. So, we decided to change DecDCTvlcSize or DecDCTvlc. But it was too late for lib version3.4. It will be fixed in version 3.5, may be.

The size of extra data is 32 long word. So, developer should allocate

DecDCTvlcSize() + 32 (long word)

for intermediate data for MDEC decompression before the bug described above is fixed.

Thanks, Koji

---

12/11/95 12:01 PM

Re(3): ResetGraph(0) causes LoadExec() to crash

Rob Vawter

Mike Benna

OS

EXEC\_E.TXT 11K

OS / Architecture

There are two ways to open EXE files - LoadExec() and cdload(); I have included a text file from the directory psx\sample\module\execmenu which includes sample code and details. I think this should answer your questions - if not, I'm sure you will let me know.

- Rob

---

12/11/95 9:34 AM

Re(2): ResetGraph(0) causes LoadExec() to crash

Dave R. Scheele

Rob Vawter

OS

OS / Architecture

>> You need to call `_96_init` in order to use LoadExec, (check out the comments in >> `psx\sample\module\execmenu\menu.c` ...

How about putting this information in the LoadExec section of the manuals ... it'd be much easier to find!

Dave

---

12/12/95 10:18 AM

Re(3): ResetGraph(0) causes LoadExec() to crash

Thomas Boyd

Mike Benna

Rob Vawter

OS / Architecture

I think this relates to what I was saying earlier in the CD newsgroup. Don't use the ISO-6990 stuff (open, read, etc...) (see below)

Tom

----- Here's some further information about ResetGraph(0) causing LoadExec() to crash...

I found that if I called `StopCallback()` before `_96_remove()` that `LoadExec()` would begin working. Again I ask... is this the right thing to do? ----- >> Besides being an incredible hassle to hard-code file locations, having >> a file system is a great convenience; it would be very unfortunate if >> it could not be used.

> It was my impression that `open()` and `read()` were buggy and were not > recommended to be used for CDROM reading. I also thought that > `CdSearchFile()` had been fixed in the latest library and was now > functional. I, however, use neither of these 2 functions now, so I may > not be the best person to speak for their usefulness.

Avoid `open`, `read` and `cdinitfilesystem`. They never bring home the bacon. Use `CdRead2` and `CdGetSector` instead. As for locations, Dave is 99% right. In `lib3.3`, `CdSearchFile` works now....



except right after streamed movies; and then it only bombs on a debug stn. So you can emulate your heart out with it, and save your hardcoding of the directory structure for when you begin debug debugging.

Tom

---

12/14/95 10:37 AM

Re(4): ResetGraph(0) causes LoadExec() to crash

Mike Benna

Thomas Boyd

Rob Vawter

OS / Architecture

>I think this relates to what I was saying earlier in the CD newsgroup. Don't use the ISO-6990

>stuf (open, read, etc...)

How about with the backup card? I assume open(), read(), and write() are OK to use for it.

---

12/14/95 8:10 PM

Re(2): Win 95 & PCRead problems

Kevin T. Seghetti

Angus

Borden Covell II

OS / Architecture

The only way I could get win95 to work with the dev station was to put the tsr calls in the dos box, instead of autoexec.bat. I made a new batch file called psxstart.bat which loads the tsr's, and made a seperate msdos shortcut with psxstart.bat in the batch field (under properties:program). Seems to work fine. Kevin Seghetti

---

12/14/95 1:34 PM

Re(5): ResetGraph(0) causes LoadExec() to crash

Thomas Boyd

Mike Benna

Rob Vawter

OS / Architecture

>>I think this relates to what I was saying earlier in the CD newsgroup. Don't use the ISO-6990

>stuf (open, read, etc...) >How about with the backup card? I assume open(), read(), and write() are OK to use for it.

The card works. Just be sure to use Dan's example in the SIO group so you do not have to re-invent the wheel.

Tom

---

1/10/96 4:06 PM

URGENT: Threads bug (board set dependent)

Sam Black

OS

MAKEFILE 3K

OS / Architecture

Description of problem: (lifted from enclosed threads.c sample code)

When this is called for the first time, either ChangeTh() will wedge, or it won't. (It seems to depend only on what we've termed Board "A" of the three board set. Board "A" in our terminology is the one which contains the NTSC/PAL jumper. In the ONE Board "A" which we have that this demo runs properly on, the large Sony chip numbers are CXD...Q and the board has a jumper wire and a jumper (cap?) on the back.

All of our other Board "A"s do NOT work. (We have four others!!!)

Note: we have another Board "A" with the two jumpers on the back and the Q ending, which doesn't work.

The board that works has serial #: 102103 A Board that doesn't work has serial #: 102838

A Board that doesn't work has serial #: 101073 A Board that doesn't work has serial #: 101074 A

Board that doesn't work has serial #: 102791 Note: The Board "A" that works works with all combinations (statistically sampled at least) of Boards "B" and "C", the serial numbers do not have to match. We're at wits end, having exhausted our ability to debug the problem, believing that since it fails in the ROM code, (We execute the syscall 0 at 0x00000650 and apparently enter ROM at 0x1fa0035c.) that we are not able to properly debug Sony's ROM, nor should we have to do so. ROM dumps from the Board that works and one that doesn't work are identical from 0x1fa00000 to 0x1fa00800.

Contact: Jim Sokoloff or Doug Muir (617) 528-1102 or 528-1101 Papyrus

Design Group (NASCAR Racing, IndyCar Racing, IndyCar Racing II)

ANY HELP WOULD BE GREATLY APPRECIATED!!!

---

1/11/96 3:56 PM

Threads too...

Robert w. Calfee

OS

OS / Architecture

I can change threads okay, but some how the thread is losing the stack value that I'm giving to it. typedef struct tProcess { struct tProcess \*pNext; unsigned int timer; unsigned char type; unsigned char status; unsigned int flags; unsigned long threadId; unsigned long pStack[2048]; unsigned long stackErrorCheck; } tProcess; // get a new thread EnterCriticalSection(); id = OpenTh(pRoutine,&gProcCurrent->pStack,gProcGlobalPointer); ExitCriticalSection(); if(id != -1) { gProcCurrent->threadId = id; if(!ChangeTh(gProcCurrent->threadId)) { // Couldn't ChangeTh } } Then I get to the correct procedure, but my stack has the value 16! ( which quickly goes to 0xffffffffe when the frame for the locals is set.

thanks rwc

---

1/12/96 1:31 PM

Re: Threads too... OOPS

Robert w. Calfee Copies:

OS

---

<sound of face being slapped

---

---

I found my error, and the error in the threading example

---

the stack variable passed to OpenTh needs to be at the \*END\* of any array o

---

allocated block of memory

---

The structure memb

OS / Architecture

---

1/15/96 12:21 PM  
Re(2): Threads too... OOPS  
Sam Black  
Robert w. Calfee  
OS

OS / Architecture  
Robert w. Calfee: <sound of face being slapped>  
I found my error, and the error in the threading example:  
the stack variable passed to OpenTh needs to be at the \*END\* of any array or allocated block of  
memory. =====  
We do that in our code, and it still doesn't work. We wrote a simple drop-in replacement for the  
Sony OpenTh() and ChangeTh() that seems to work for us.  
(It doesn't save & restore all registers, so I can't guarantee that it will work for all cases.) What  
I'm curious about is can anyone else run the code that I posted and have it work? Is it a  
development environment issue?  
I gather that at least someone has shipped code using threads, and I can't figure out why I can't  
get Sony's OpenTh() and CHangeTh() to work. ChangeTh() wedges on all but two of our board  
sets. Our threads replacement works on all five board sets and on the blue debugging stations.  
---Jim Sokoloff, Papyrus 617-528-1102

---

1/19/96 12:44 PM  
Crazy Blown-up Start-up Picture  
Mark DeSimone  
OS

OS / Architecture

I'm not sure where to exactly place this message. I hope it gets to someone that can help. Upon start-up of our game on the Debugging Station, and directly after the display of the Black SONY logo screen, but BEFORE any screen from the game is displayed, the picture expands so that all that is showing for several seconds is the left-lower quadrant of the black screen expanded to fill the screen.

I tried to completely clear the entire video memory as soon as my program started, but it had NO EFFECT.

1. Will this problem occur in the production version? 2. If so, how can I get rid of it?

Frustrated in Phoenix,  
Glenn O'Bannon Rainbow America

---

1/22/96 10:58 AM

Bug In FontPrint() ?

David W. Marshall

OS

OS / Architecture

Could someone tell me if I have found a bug in FontPrint().

I put my stack in dcache by calling SetSP(\$1f8003fc). Everything works fine. When I make a call to FontPrint() the system crashes with a data reference error. The first thing FontPrint() does when called is:

```
sw a0, $0(sp) sw a1, $4(sp) sw a2, $8(sp)
```

However, FontPrint doesn't make any space for these stores. \$4(sp) will try to access \$1f8004000, which will cause a crash.

thanks,  
dave

---

1/22/96 9:20 AM

Re: Crazy Blown-up Start-up Picture

Dan Burnash

OS

Mark DeSimone

OS / Architecture

The same thing will happen on a production unit, so it must be fixed. It is probably related to the ordering or content of your startup code. Make sure that you have a Resetgraph(0) near the top of your code. Make sure your display area is set up before calling SetDispMask(1), which enables the display. Check out the sample code for complete startup information. If none of this helps, send me your startup code and I will take a look at it.

Dan Burnash

---

1/22/96 12:59 PM

Re: Bug In FontPrint() ?

Jay Stelly

David W. Marshall

OS

OS / Architecture

It looks like you have your stack in DCACHE. FntPrint() will blow the stack if it's only 1K, at least in my experience.  
Jay Stelly Tetragon

---

1/22/96 12:23 PM  
Re(2): Crazy Blown-up Start-up Picture  
Mark DeSimone  
OS

OS / Architecture

Dan:

I have corrected the problem of the blown-up picture. Thank You for pointing me in the right direction.

The problem was that I was calling SetDispMask(1) TOO soon (a couple of seconds before I was actually ready to display anything).

Thanks Again, Glenn O'Bannon Rainbow America

---

1/22/96 1:30 PM  
Re: Bug In FontPrint() ?  
David W. Marshall  
David W. Marshall  
OS

OS / Architecture

Oops. Okay, so maybe there isn't a bug in fontprint. My setting of the stack was incorrect. Instead of SetSP(\$1f8003fc) it should have been SetSp(\$1f8003fc - ( 6 \* sizeof(long))); According to the MIPS book, the stack pointer must be 24 bytes below the top to allow for the standard save area (for a0-a3, etc).  
dave

---

1/30/96 3:42 PM  
firstfile() bug?  
Mike Benna  
OS

OS / Architecture

We've run into the following problem:

1) open a file (for instance on the PC's hard drive). 2) reading from that file works fine. 3) call firstfile("bu00:\*", &direntry). 4) further reads from the original file fail. 5) close original file, reopen it, reading now works again.

It's acting as if firstfile() closes the already open file. Is this a bug in firstfile() or is there some other cause we should be aware of?

---

1/31/96 2:17 AM

player 1  
OS

OS / Architecture

I'm trying to install a profiler one of the other programmers wrote, and I'm having this problem. I am attaching an event handler to the Vertical Sync interrupt with the following code:

```
EnterCriticalSection();  
TimerHandler=OpenEvent(RCntCNT3,EvSpINT,EvMdINTR,SystemClockHandler);  
EnableEvent(TimerHandler); SetRCnt(RCntCNT3,1,RCntMdINTR); StartRCnt(RCntCNT3);  
ExitCriticalSection();
```

my interrupt handler looks like this

```
void volatile SystemClockHandler() { if(currentProfiledFunction!=-1) { /* execute profiler  
code stuff here */ } }
```

the problem is that the debugger says the the if returns true (my profiler code is executed) even though when I look at currentProfiledFunction it is equal to -1. Anyway had any similar problems? I haven't been able to figure out if possible the code is wrong and is executing incorrectly, but at the same time the debugger might be broken as well, so I don't even know if the the values I'm looking at are correct. Anyone have any advice/tips/hints/obvious fixes, etc.? I'm under a crunch and only have so much time to finish this so a quick response would be appreciated.

Tom Ketola PSX Programmer Player 1, Inc.

---

1/31/96 3:29 AM

Re:

Dean M. Grandquist

player 1

OS / Architecture

Why not use the vblank callback?

```
ResetCallback(); VSyncCallback(verticalBlankHandler);
```

Or if you want more resolution use the cpu clock interrupt:

```
/* start the veryfast event task handler */ EnterCriticalSection(); EHbl =  
OpenEvent(RCntCNT1, EvSpINT, EvMdINTR, veryfastEventHandler); EnableEvent(EHbl);  
SetRCnt(RCntCNT1, 200, RCntMdINTR); StartRCnt(RCntCNT1); ExitCriticalSection();
```

I think this is about every 50 scan lines.

Ta --Dean Grandquist

---

2/1/96 4:10 PM

Questions about CriticalSection

Geoffry R. Meek

OS

OS / Architecture

On other platforms we have worked with, the documentation generally identifies which procedures are safe to call at interrupt time and which are not. However we have so far not been able to find this information for the Sony PlayStation. The best information I have found so far is in the Runtime Library overview, p21. It says not to call functions which generate exceptions themselves. But it is not documented which functions generate exceptions. What exactly is the difference between SwExitCriticalSection and ExitCriticalSection? Both of the disable interrupts, but it says that ExitCriticalSection destroys an interrupt context. We don't understand exactly what that means ... does the "critical section" code execute in some other task

or something?

In other words, does being in a "critical section" mean something more than just interrupts being disabled? If so, what?

Is there any difference between being in a callback function and an exception handler in terms of what one can do?

What we want to do is call our own function every 10 milliseconds. It is OK for interrupts to be enabled for most of this code.

We are using the root counter interrupt (RCntCNT2) to give us a millisecond clock, this works fine when all the exception handler does is increment a counter. But if the exception handler calls either ExitCriticalSection, OR SwExitCriticalSection, the application crashes. Actually, we can't tell what it is doing, the debugger says the program isn't responding any more and dumps us out.

Thanks in advance.

Vernon Miller Virtual Music Entertainment Inc.

---

2/1/96 1:09 AM

Interrupt Timeout?

player 1

OS

OS / Architecture

I get a message that says "intr timeout (0040:0049)" printed in the debugger's message window occasionally. I assume this means that my interrupt handler is not running fast enough and missed a tick, but I want to make sure. Thanks

Tom Ketola PSX Programmer Player 1, Inc.

---

2/12/96 9:04 AM

how many registers

Thomas Boyd

Psyq Tools

OS / Architecture

>Martin, >How many register variables can you have in a routine? Currently using 6 (all >verified as being in registers). ===== Simple question but unfortunately there's no simple answer.

In a simple function you may get as many as 23 register variables. As the function becomes more complex (e.g. requires the evaluation of complex expressions or calls other functions) this will be reduced, possibly to none at all if the function is complex enough. Genrally 8 is a reasonable number.

If you compile with no optimisation ( -O0 ) then the compiler will only put those variables that you specify as 'register' into registers. All others are stored on the stack.

If you compile with optimisation ( O1 or more ) then the compiler will store all variables in registers that it can. It's not clear whether it will take any notice of the register keyword in this case so it may not be worth bothering with anyway.

---

2/12/96 10:48 AM

Re: Questions about CriticalSection  
Ayo A. Orimoloye  
Geoffry R. Meek  
OS

OS / Architecture

Hi! Just a few tips about the exception handler.

I am using RCntCNT1 in an R3000 assembly interrupt routine as a timer because it is one of the few counters that CAN actually time as accurately as milliseconds. RCntCNT3 is simply too slow and RCntCNT2 was highly unreliable. This was my discovery when experimenting with RCntCNT2 but I might be wrong because it says in the manual that it is unaffected by the VBlank. I haven't tried SwEnter or SwExitCriticalSection so I can't comment on those.....

Anyway, the thing to be aware of is that you usually do not need to Enter or ExitCriticalSection in the HANDLER. You only need to do this when setting up the Event in the MAIN program. If you look at the example in the Sony manual, you will notice that the actual event handler "count" does NOT Enter or ExitCriticalSection. I believe this is the cause of your crashes. As long as your handler code is fast enough, it should complete before the next interrupt. You might want to try writing the handler in assembly like I have - it is quite easy to learn and it runs circles around anything you can get with the silly C compiler which uses 2 registers only when you have optimisation turned off.

---

2/12/96 1:08 PM  
prnt low level lib routine  
David W. Marshall  
OS

OS / Architecture

Is there any way the printf() routine can be changed/fixed in the next rev of the libs? The library call printf() eventually calls prnt(). prnt() allocates 448 bytes for itself on the stack. Well, my stack is in the DCACHE. Therefore, my stack is only 1k in size. So depending on where I'm at in my code, calling printf() can cause the psx to crash.

So, can prnt() be changed so it doesn't allocate 448 bytes for itself on the stack.  
thanks,  
dave

---

2/13/96 2:11 PM  
Re(2): prnt low level lib routine  
Rob Vawter  
Dean M. Grandquist  
OS

OS / Architecture

I have passed your concerns, questions, and requests on; I'll let you know what I hear back.  
- Rob

---

2/13/96 1:41 PM  
Re: prnt low level lib routine  
Dean M. Grandquist  
OS



OS / Architecture

Is there any way the printf() routine can be changed/fixed in the next rev of the libs? The library call printf() eventually calls prnt(). prnt() allocates 448 bytes for itself on the stack.

It is much worse. I ran printf("hello world %d\n",10) and got a 628 byte stack frame that was 80-90% unused. This makes me very curious about what printf does on the grey box. You would think that allocating that much space that printf would be reentrant, but it is not. We had several routines that printed (debugging) in vblank and would cause random crashes. The last one was on our XA track restart code, the code printed when it restarted the track 8-(

Sony what does printf do on the different boxes? Blue? Black? Grey?

Is there a way to see the printf's on a grey/blue box?

Our current plan is to kill printf in the libs and hack a printf() {return 0;} into our code for final release.

--DeanG Spectrum HoloByte

---

2/15/96 1:56 PM

Kanji font questions

Geoffry R. Meek

OS

OS / Architecture

We want to use the Kanji output routines to write Japanese subtitles for our natively English game, however we have some questions about the Kanji output.

1. The documentation for KanjiFntOpen (p184 of RTL reference) describes using part of the video frame buffer for font pattern and CLUT. The addresses of these areas are specified by (x,y) position in the frame buffer.

However we are also using the frame buffer for storing other information, so we need to know the width and height of the font buffer and the width and height of the CLUT.

Is this described somewhere?

2. The documentation of KanjiFntOpen also refers to a procedure called KanjiFntLoad. This procedure is included in the header files and libraries, but it is not described in the reference manual, nor is it used in any of the sample programs. Do we need to worry about this?

3. The documentation for KanjiFntPrint (p185 RTL REF) describes the first argument as a stream ID. However none of the sample programs use a stream ID - they seem to work like printf, not fprintf.

4. The documentation for KanjiFntFlush says it takes a print stream ID as its only argument. All the sample programs just call it with -1 instead of the stream ID returned by KanjiFntOpen. Why -1? Does it have some special action or meaning?

5. We are very short of space in the video buffer, and will only rarely need to show Kanji text.

Does it make sense to use SaveImage to save the part of the frame buffer used by Kanji and then restore it with LoadImage when we are done? This also requires that we know the size of the font buffer.

Vernon Miller Virtual Music Entertainment Inc.

---

2/20/96 9:23 AM

Re(2): prnt low level lib routine

Rob Vawter

Dean M. Grandquist

OS

PRNT0219.OBJ 5K

OS / Architecture

Here is the word back from Japan and a new linkable version of prnt. Enjoy.

#1(Marshall): Sorry, prnt() allocates too many buffer on the stack certainly. I modified prnt() and I will release new printf() in LIBC2.LIB Ver.3.5. (I cannot modify printf() in LIBC.LIB because it's function inside PlayStation boot-ROM.) For the time being, I'll send new prnt.obj to you. If you link prnt.obj, stackframe-size may decrease. Please let me know if you find any problems with this.

#2(Grandquist): At present, there is no way to see printf's output on a gray/blue box. Printf() is the function for debugging on H2000(PC-board). When you make a module for running on gray or blue box, you should not call printf(). (I like to use conditional compile, #ifdef...)

> Our current plan is to kill printf in the libs and hack a printf() {return 0;} > into our code for final release."

Yes, I think your plan is good, too.

---

2/20/96 5:19 PM

overlay example

Borden Covell II

Thomas Boyd

John Brandwood

MAIN.MAP 3K

OS / Architecture

I am trying to run the latest overlay example code that was released in one of the 1.5.x releases (I don't remember which one). I have updated all of my executables and am using v3.4 libs and include files. However, the linker is not resolving the symbol "loadaddress" correctly. Since this is the key to getting the overlays loaded at the right place, the code does not work

The attached map file shows the 3 overlay areas each starting at 800208C0 but the loadaddress symbol, which is supposed to be part of the l1 overlay, is at 800204C8. Why???

I hope someone can give me a clue, as our project is counting on this and I've already spent way too much time trying to get something that was supposed to be working to work.

Thanks!

---

2/20/96 12:01 PM

printf & critical sections

Borden Covell II

Thomas Boyd

OS / Architecture

We are running in a multi-threaded environment and need to be able to call printf from various places in our code (It is actually a port). In the past we have put calls to our enter and exit critical section routines around any calls to printf but in this case it would be very nice to be able to compile the code that we are porting without having to change it every time we get a new version.

Does anyone have any ideas on how to do this? Basically, I need to translate

printf(.,...); into enterCritical(); printf(.,...); exitCritical();

I could write a macro or wrapper routine that calls the internal printf routine after calling our enter critical section routine, but I don't know what it is called.

Any suggestions would be greatly appreciated. Thanks.

---

2/26/96 1:39 PM

Copying functions into scratch pad problem

player 1

OS

OS / Architecture

I'm having a problem copying a function into the scratch pad memory. I set up a function pointer to the beginning of scratch pad memory, and then I copy my function into the scratch pad. When I execute the function using the pointer, I get a crash. The debugger will not trace into the code either. Anyone had any experience doing this and know what my problem might be? Thanks in advance.

Tom Ketola PSX Lead Programmer Player 1, Inc.

---

2/27/96 6:35 PM

Re(2): Copying functions into scratch pad problem

Blake E. Senftner

player 1

OS

OS / Architecture

Tom:

If I'm remembering correctly, isn't all code executed from the i-cache?

Copying functions into the scratch pad would just be a waste of time, because upon execution they get copied into the i-cache.

Is that right?

-Blake

---

2/27/96 12:30 PM

Re: Copying functions into scratch pad problem

Colin Lewis

player 1

OS

OS / Architecture

Here's one guess:

There may be an absolute jump in your function. I found that an if/then/else will do an absolute jump around the else clause. The linker has some obscure options to link some modules correctly for copying to another place in memory.

Let us know if and how you get it working.

---

2/27/96 7:32 PM

Re(3): Copying functions into scratch pad problem

player 1

Blake E. Senftner

OS

OS / Architecture

But to copy it into the i-cache, the memory still has to be read, the scratch pad has faster memory access than the regular memory does, not to mention it's actually onboard memory on the CPU (I think) so you're not gonna be doing too much with the bus, both of which should speed up the code considerably. I was told that a possible solution is some sort of compiler and linker flag because it puts in absolute address at times, and memcpy'ing the function breaks it real nice. :) If you have any other advice, lemme know. BTW, I've been meaning to get in touch with you, I met you a while back at the Sony Developer's conference in the Sony Music building. I'm a friend of both Ira's and Marco's, and wouldn't mind picking your brain for some of the PSX knowledge you have. Anyway, thanks for the message, I'll hopefully talk to you soon.

Tom Ketola PSX Lead Programmer Player 1, Inc.

---

2/28/96 5:44 PM

Re(4): Copying functions into scratch pad problem

Blake E. Senftner

player 1

OS

OS / Architecture

Tom(s):

> But to copy it into the i-cache, the memory still has to be read, the scratch pad has >faster memory access than the regular memory does, not to mention it's actually >onboard memory on the CPU

Both caches are on the CPU and there is no bus between them. I'll wager that's that cause of your crash.

Tom Boyd: can you confirm?

-Blake

---

2/29/96 4:18 PM

Re(5): Copying functions into scratch pad problem

player 1

Blake E. Senftner

OS

OS / Architecture

I was under the impression that it was possible to do so, since both the manual states that it's possible, and I've heard of other programmers doing it as well, but then again since I haven't actually seen it, I can't say for sure.

---

2/29/96 10:55 AM

Re(5): Copying functions into scratch pad problem

Thomas Boyd

OS

OS / Architecture

Blake and Tom,

I believe Blake is right, but I am confirming via SCEI engineers.

Tom Boyd

=====

Tom(s):

> But to copy it into the i-cache, the memory still has to be read, the scratch pad has >faster memory access then the regular memory does, not to mention it's actually >onboard memory on the CPU

Both caches are on the CPU and there is no bus between them. I'll wager that's that cause of your crash.

Tom Boyd: can you confirm?

-Blake

---

3/4/96 9:40 AM

Re(6): Copying functions into scratch pad problem

Thomas Boyd

player 1

Blake E. Senftner

OS / Architecture

Hmmm, Mike Fulton has pointed out that the manual DOES say you can do it. It says the I-Cache is invalid for that region of the memory map, which seems to imply that it will not load it, but work anyhow.

I will not have time to explore this till after the dev conference, so if anybody gets this to work, please feel free to chime in.

Tom

---

3/9/96 4:35 PM

Re: Questions about CriticalSection

Rob Vawter

Geoffry R. Meek

OS

OS / Architecture

What exactly is the difference between SwExitCriticalSection and ExitCriticalSection?

Both DO enable interrupts. However, ExitCritical Section destroys the interrupt context. This means that in a multi-threading situation, your process that you need to return to would be lost. SwExitCriticalSection is to be used during event handlers and callbacks to avoid this problem.

---

3/14/96 3:07 PM

Re(2): Questions about CriticalSection

David Minogue

Rob Vawter

Geoffry R. Meek

OS / Architecture

What exactly is the difference between SwExitCriticalSection and ExitCriticalSection?

Both DO enable interrupts. However, ExitCritical Section destroys the interrupt context. This means that in a multi-threading situation, your process that you need to return to would be lost. SwExitCriticalSection is to be used during event handlers and callbacks to avoid this problem.

I thought that callbacks and event handlers were critical sections anyway. If so, what is the benefit of these calls?

-- David

---

3/15/96 3:22 PM  
Problems with Scratch Pad  
Paul Masters  
OS

OS / Architecture

For some reason, I cannot write to a scratchpad that I have accessed with `my_struct = (MY_STRUCT *)getScratchAddr (0);`  
MY\_STRUCT is well below the 1K limit, and I can see the data members in the debugger, but if I try to write anything into the struct, I just get 0's.  
I'm not sure if I'm missing a mystery header or whatever. Any suggestions would be GREATLY appreciated.  
Paul Masters ALG

---

3/18/96 2:36 PM  
Re: Problems with Scratch Pad  
Dan Burnash  
OS  
Paul Masters

OS / Architecture

I believe the problem is that the data is not visible within the debugger, but actually is in the scratchpad.  
Check out this long post and let me know if it helps.

---

>One problem I've found is that if you're putting the stack into the d-cache >(fast ram), then any local variables that get pushed onto the stack appear as >0x00 in the debugger. Apparently the debugger cannot access variables in the >d-cache correctly. >>Whenever I need to step through code that does this, I always have to >temporarily define the variables as static in order for them to show up with >the correct values in the debugger.

Ah, that's because the debugger default 'accessible memory list' does not include the d-cache area. It's pretty easy to add it, you just need to edit the debugger config file (file DBUGPSX.C0\* is the current one, also SONY\_PSYX.CFG in the PSYQ executable directory is the default template to be used if no config file is found). This is just a text file, and you will see a section like:-

```
----- #readram0 00000000 007FFFFFFF 1FC00000  
1FC7FFFF 80000000 807FFFFFFF 9FC00000 9FC7FFFF A0000000 A07FFFFFFF BFC00000  
BFC7FFFF #writeram0 00000000 007FFFFFFF 80000000 807FFFFFFF A0000000 A07FFFFFFF #update  
FF 0003 #video 03 50 32 #label level 02 7F 7F #colour attributes 17 1F 3E B0 4F 5E 0C 70 C0 87  
8E 8E F0 90 4F 87 7C 0E 0A 28 2F 70 #mono attributes 07 0F 70 70 07 70 0F 70 01 07 0F 0F 70 0F  
07 07 70 07 07 0F 70 #default tabs ASM 0F 17 28 30 00 00 00 00 S 0F 17 28 30 00 00 00 00 C  
08 00 00 00 00 00 00 00 H 08 00 00 00 00 00 00 00  
-----
```

Just add the extra range to the readram and writeram tables. Note that these lists must be kept in order (i.e. sorted) so be careful to add the new entries at the correct point.

---

\*\*\*\*\* Some more information on this problem, if you still have problems. \*\*\*\*\*

The example given here...

```
> > _____ message 1 _____ >Is there any way to display DCache variables
in the watch window? > >I define the DCache as follows: > >In a .S file >DCACHE_BASE
EQU $1f800000 ;dcache starts here > rset DCACHE_BASE > >dc_MatPtr rw 1 > > >In a .H
file > >extern MATRIX* dc_MatPtr; > >If I look at dc_MatPtr in the watch window, it gets the
correct address in the >dcache but resolves the variable as an unsigned long. I was hoping that
>it would use the extern to resolve the type of the variable. >
```

... does not do what the developer was hoping for because the compiler does not generate any C variable debug info for external variables. If you think about it this is sensible - because that data would be provided by the symbol data in the external module; if this main module defined it too then you'd have two symbol definitions in the symbol file - the one from the external would be the correct one. In this case however the external module is assembler and therefore it does not have any C typing info.

The correct solution is to declare your dcache variables with a piece of C. This gets a bit fiddly because in order to put them at a specific address you need to use a linker control file that specifies the groups. You also need to compile the dcache section separately and rename its sections so they will be distinct from those of the main compilation. Note also that although Psy-Q CPE format is quite happy to allow initialised data in this separately addressed dcache data section, the PSX .EXE file format does not allow this so if you wish to be compatible with PSX .EXE file format you must only put uninitialised data into the dcache section. We can easily tell PSYLINK the dcache size limit and bss restriction by putting that information in the group attributes for the dcache.

It's probably best if I stop woffling at this point and just give you an example; just snip between the lines and paste to the filename detailed at the top of each section. Just execute BUILD.BAT to build it. But before you do that it is important that you note the following:-

1) Note the use of

```
-Wa,sdcache1
```

on the cpsx command line to tell the ASPSX assembler to prepend "dcache1" to all of the section names and put them into a new group called "dcache1" Also note the dcache group definition in MAIN.LNK

2) note that the .LNK file defines the dcache group as having a limited size. The linker will raise an error if you exceed this size

3) You must have the latest PSYLINK (2.31) and ASPSX (2.26) in order to make use of features detailed in 1) above. You can get these from our BBS or FTP site if you don't already have them.

OK, here are the 5 files that make up this small example:-

```
----- FILE: MYTYPES.H ----- typedef struct _matrix { short a; short b;
short c;
short d; short e; short f;
short g; short h; short i;
} matrix;
```

```
----- FILE: DCACHE.C ----- /* this file DCACHE.C defines the vars in
dcache */
```

```
#include "mytypes.h"
matrix* MatPtr; matrix MyMatrix; int testint1; char* testarray1; /* this is OK because it
is uninitialised */
/* char testarray2[]="Test String"; this is *not* OK */
```

```
----- FILE: MAIN.C ----- /* this is a main source file that refers to the
dcache data */
```

```
#include "mytypes.h"
extern matrix* MatPtr; extern matrix MyMatrix;
```

```

int main() {
    MatPtr=&MyMatrix; /* initialise it here cos can't have it already valid */
    MatPtr->a=0; MatPtr->b=1; MatPtr->c=2; MatPtr->d=3; MatPtr->e=4; MatPtr->f=5;
    MatPtr->g=6; MatPtr->h=7; MatPtr->i=8;
}
----- FILE: MAIN.LNK ----- org $80010000
text group bss group bss dcache group org($1F800000),size(1024),bss
section .rdata,text ;sections created by C compiler section .text,text ;specifying them here is
not strictly necessary section .data,text ;but does ensure that they appear in tyhe correct
section .sdata,text ;order in the linked output file
; section .ctors,text ;only needed for C++ ; section .dtors,text ;only needed for C++
section .sbss,bss ;the standard bss sections section .bss,bss
include "main.obj" ;my main program object file(s) include "dcache.obj" ;the dcache object
file
; and now the libraries I want to link to:- inclib "c:\gnumips\lib\libs.n.lib" inclib
"c:\gnumips\lib\libapi.lib" ; inclib "c:\gnumips\lib\libgpu.lib" ;other psx libs as required...
regs pc=__SN_ENTRY_POINT
----- FILE: BUILD.BAT -----
ccpsx -c -g -Wa,sdcache1 dcache.c ccpsx -c -g main.c psylink /c
@main.lnk,main.cpe,main.sym,main.map
----- END OF FILES -----
ENJOY!
Dan Burnash

```

---

3/19/96 10:00 AM  
 Re(3): Questions about CriticalSection  
 Rob Vawter  
 David Minogue  
 Geoffrey R. Meek

OS / Architecture  
 What exactly is the difference between SwExitCriticalSection and ExitCriticalSection?  
 Both DO enable interrupts. However, ExitCritical Section destroys the interrupt context. This means that in a multi-threading situation, your process that you need to return to would be lost. SwExitCriticalSection is to be used during event handlers and callbacks to avoid this problem. I thought that callbacks and event handlers were critical sections anyway. If so, what is the benefit of these calls?  
 David - You are correct. As yet, I have been unable to get a satisfactory answer to that question. I will post as soon as I come up with one. (Note - at the conference, it was my assumption that interrupt flags were set during callbacks and event handlers but not during explicitly defined critical sections. This is not the case. When a critical section is exited, whether that critical section was user-specified or system-specified, all flagged callbacks and interrupts will then be handled. Sorry for the confusion.)

---

3/19/96 9:57 AM  
 Re: Root Counters (important)  
 Rob Vawter  
 Carl Ferreira  
 OS

OS / Architecture



I gave the OS session and this was new information at me to the time. I happened to give a very poor explanation at the session, so let me clarify now. The pixel display and h-blank counters have NOT actually been replaced. Instead, there is a mode setting which has always existed which will allow you to use the system clock for these counters instead.

On pages 22-23 of the 3.0 Overview, the Root Counter Mode settings are explained. There are three different mode settings which need to be specified.

Mode 1 signifies whether interrupts are permitted (RCntMdINTR) or polling (RCntMdNOINTR) will take place.

Mode 2 chooses which type of counter will be used for RCntCNT0 and RCntCNT1. The default mode (RCntDtMdSP) means that Pixel Display will be used for RCntCNT0 and H-blank will be used for RCntCNT1. This mode need not be explicitly specified, as it is the default. RCntMdSC (Root Counter Mode System Clock) must be explicitly specified and ensures that the System Clock will be used as the counter for RCntCNT0 and RCntCNT1. This is the mode that you need.

Sorry for the lack of comprehensibility on this issue in the OS session.

HELP!!!!

It was indicated in last week's conference that the Root Counters RCntCNT0 (incremented per pixel) and RCntCNT1 (incremented per horizontal blank) are 'unstable'; I have recently discovered that the timings DO appear unstable.

It was suggested that RCntCNT0 and RCntCNT1 be tied to the system clock (as RCntCNT2 is), but I don't know how to do this!!!

Please! I need this information as soon as possible.

---

3/19/96 8:45 AM

Root Counters (important)

Carl Ferreira

OS

Thomas Boyd

OS / Architecture

HELP!!!!

It was indicated in last week's conference that the Root Counters RCntCNT0 (incremented per pixel) and RCntCNT1 (incremented per horizontal blank) are 'unstable'; I have recently discovered that the timings DO appear unstable.

It was suggested that RCntCNT0 and RCntCNT1 be tied to the system clock (as RCntCNT2 is), but I don't know how to do this!!!

Please! I need this information as soon as possible.

Thank you.

Carl Ferreira

---

3/20/96 10:06 AM

all sorts of stuff

Thomas Boyd

Carl Ferreira

OS

OS / Architecture

Carl,

Things we owe you:

1) I asked to get you a hardware breakpoint ROM made. It is in the queue for this week. 2)

There is supposed to be a way to get the far Z out easily - I will find out 3) Perspective correct texture mapping: I am trying to get it from Angus, but it will be released as an actual example in April. I am raiding the PC he used to try and find it now... 4) I think that what Okamoto told us was that they added a mode to the sys clock to make up for the crumminess of the pix clk and the H-clk. Rob knows more.. =====

HELP!!!!

It was indicated in last week's conference that the Root Counters RCntCNT0 (incremented per pixel) and RCntCNT1 (incremented per horizontal blank) are 'unstable'; I have recently discovered that the timings DO appear unstable.

It was suggested that RCntCNT0 and RCntCNT1 be tied to the sytem clock (as RCntCNT2 is), but I don't know how to do this!!!

Please! I need this information as soon as possible.

Thank you.

Carl Ferreira

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3/20/96 10:34 AM

Re(2): Root Counters (important)

David Vronay

Rob Vawter

Carl Ferreira

OS / Architecture

We use RCnt1 for timing. Does anyone know how "unstable" these are and conditions when they are definitely stable and conditions when definitely unstable. Also, is this instability a matter of 2%, 10%, 25%, 100%? Are my previous timings and profiles useless?

Thank you Richard Maurer @ ImaginEngine We use RCnt1 for timing. Does anyone know how "unstable" these are and conditions when they are definitely stable and conditions when definitely unstable.

Thank you Richard Maurer @ ImaginEngine

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3/21/96 1:58 PM

SetConf and system configuration

Rob Vawter

OS

OS / Architecture

In the OS session at the developer's conference, a helpful anonymous developer pointed out that you could use the function SetConf () to change the configuration that had previously been set up by the parsing of the SYSTEM.CNF file. SetConf () takes three arguments - TCB (Task Control Blocks), Events, and Stack Pointer.

While surfing my Programmer's CD today, I noticed a section (PSX\BETA\SETCONF on 1.5, BETA\SETCONF on 1.6 which will be shipping this week) which I must relay to all of you who thought that SetConf () was a good idea. There is now an .obj file which contains SetConf2 ().

SetConf2 () is meant as a replacement for SetConf () and is not able to change the stack pointer. Not only that, but the formula used to calculate the maximum number of combined event management blocks and task management blocks has been changed. Please turn to page 18 of the 3.0 Overview and replace it with the following formula (which can be found in the above-stated directory) : (Task management block number X 192) + (Event Management block number X 28) + 52 < 4096.

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3/25/96 9:48 AM

Re(3): Root Counters (important)

Rob Vawter

David Vronay

Carl Ferreira

OS / Architecture

We use RCnt1 for timing. Does anyone know how "unstable" these are and conditions when they are definitely stable and conditions when definitely unstable. Also, is this instability a matter of 2%, 10%, 25%, 100%? Are my previous timings and profiles useless?

Here is a quote from Mr. Shinohara in Japan: When these counters are read or written, sometimes it fails and incorrect value is get or set. Beacase there is the difference between system clock and GPU clock and these clocks is not arbitrated by hardware. Then, these counters are unstable permanetly.

---

3/26/96 7:22 AM

Re(4): Root Counters (important)

Carl Ferreira

Rob Vawter

David Vronay

OS / Architecture

We use RCnt1 for timing. Does anyone know how "unstable" these are and condititions when they are definitely stable and conditions when definitely unstable. Also, is this instability a matter of 2%, 10%, 25%, 100%? Are my previous timings and profiles useless? ----- Here is a quote from Mr. Shinohara in Japan: When these counters are read or written, sometimes it fails and incorrect value is get or set. Beacase there is the difference between system clock and GPU clock and these clocks is not arbitrated by hardware. Then, these counters are unstable permanetly. ===== In my experience, the returned value from RCnt1 would occasionally (for reasons completely mysterious) return a much higher number than expected. Since I was using this timer to determine whether I could draw more on the screen or not, occasionally I would get nothing on the screen (this would occur for some reason in particular locales of my 3D world). The number seemed to be consistently wrong until I moved my viewpoint, then suddenly the world would re-appear. When I removed the 2 lines of code for early exit based on the counter, the world became stable.

I have no idea what this means, but I would not rely on the RCnt1 value in a production game.

---

3/26/96 5:26 PM

Re(5): Root Counters (important)

David Vronay

Rob Vawter

Rob Vawter

OS / Architecture

From this discussion I get the idea that the counts may occassionaly( < one out of 10,000?) be wildly wrong, and that they are accurate to within 1%, being subject to some drift as they are on different clocks. Is this correct?

>>We use RCnt1 for timing. Does anyone know how "unstable" these are and condititions when they are >>definitely stable and conditions when definitely unstable. >>Also, is this instability a matter of 2%, 10%, 25%, 100%? Are my previous timings and profiles useless? >>-----

>>Here is a quote from Mr. Shinohara in Japan: >>When these counters are read or written,

sometimes it fails and incorrect value is get or set. >>Beacase there is the difference between system clock and GPU clock >>and these clocks is not arbitrated by hardware. >>Then, these counters are unstable permanetly.

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4/4/96 12:17 AM  
Malloc questions  
Steven Stadnicki  
OS

OS / Architecture

Greetings, Does malloc/free do the right thing when dealing with contiguous blocks of memory? That is, does it identify two contiguous free blocks as one block and allocate accordingly?

I could write a function to determine the answer, but I'd much rather simply hear it from a knowledgeable source... It's important for me to know this soon, however, so I know whether to code around it or not for upcoming demos.

-- Morgan/Steve

---

4/4/96 1:08 AM  
Using a memory-card to patch the game...  
Steven Stadnicki  
CD Creation

OS / Architecture

Greetings, Does Sony have any standard guidelines on recommended methods of using a memory card to do 'in-memory' patches of a game? Also, and I'll freely admit I haven't looked too deeply into this on my own yet, but any suggestions on ways to put patches and interesting updates to a game in a memory card and NOT have it copyable...? I.e. standard formats other than the normal 'save-game' oriented formats?

Mostly just a random question right now, but we've really been thinking about the option of using memory cards to supply enhancements, updates, interesting new features or even bugfixes for the games... If Sony has or plans to have a standard format for this sort of thing, it'd be good to know about...

-- Morgan/Steve

---

4/4/96 2:20 PM  
Re: Using a memory-card to patch the game...  
Dan Burnash  
SIO  
Steven Stadnicki

OS / Architecture

>Does Sony have any standard guidelines on recommended methods of using a memory card to do >'in-memory' patches of a game?

No, and at \$20 each it doesn't seem worth selling one just to put your in memory game patch onto it.

> Also, and I'll freely admit I haven't looked too deeply into this on my >own yet, but any suggestions on ways to put patches and interesting updates to a game in a memory >card and NOT have it copyable...? I.e. standard formats other >than the normal 'save-game' oriented formats?

If you want to sell memory cards preloaded with information, it should be in the standard file format. You may be able to be given an exception to this rule if you are using the whole memory card for your "special" feature. If you want to pursue this, then contact Todd Colletti at (415) 655 - 8133, as he handles some of the licensing issues at Sony.

Dan Burnash

---

4/5/96 1:40 AM

Re: Malloc questions

Dean M. Grandquist

Steven Stadnicki

OS

OS / Architecture

Well I wont say anything about the sony lib malloc, but the malloc posted by John Brandwood in the bug folder (archives) works. The only thing is that is very hard to read 8-)

The other nice thing about John's malloc is that you can reinit it any time you want. This put my mind at ease knowing that the malloc system was just inited before every level.

Ta --DeanG

----- Does malloc/free do the right thing when dealing with contiguous blocks of memory? That is, does it identify two contiguous free blocks as one block and allocate accordingly?

I could write a function to determine the answer, but I'd much rather simply hear it from a knowledgeable source... It's important for me to know this soon, however, so I know whether to code around it or not for upcoming demos.

---

4/8/96 3:24 PM

Re(2): Malloc questions

John Brandwood

Dean M. Grandquist

Steven Stadnicki

OS / Architecture

> Does malloc/free do the right thing when dealing with contiguous blocks of memory? That is, > does it identify two contiguous free blocks as one block and allocate accordingly?

All the malloc/free implementations that I've seen will coalesce the two contiguous blocks of free memory into a single block at the time the 2nd block is freed.

I'm not 100% sure that the Sony implementation does this, but I'd be very surprised if it didn't.

I posted my malloc/free stuff because there were complaints of the Sony code having bugs when you started getting out-of-memory conditions. I guess that we probably both based our code on the method that GNU uses, but I did find and fix 2 bugs in the GNU implementation that could have caused the reported problems with the Sony routines.

My versions also have stuff in them to help you detect memory overruns and underruns, and other heap corruption that can be a real bitch to find otherwise. Also there are stats in there that you can look at to detect memory leaks at runtime. Once you find a leak, you can fix it, and won't need to re-init the heap (although paranoia is probably a good safety measure).

I've kept on moving stuff from our high-level memory code into these low-level routines, and so there is now code in there to walk the heap at any time, checking for corruption.

I'm also tempted to put in the code that identifies which source file/line each block was allocated from.

One thing that I left out of my routines was to protect them with SwEnterCriticalSection and SwExitCriticalSection calls. These probably won't be needed if you don't use the tasking features of the Sony OS, but my routines are definitely not reentrant.

Unfortunately, even protecting the memory calls this way still left the system with rare random crashes (often in library code) so I was forced to rip out the multi-tasking code from our game (Slam'n'Jam 96) at the last minute. Since then we have had no crashes, and we hope to get notification of Sony approval today.

Looking through the disassembly of the library routines where we had crashes makes me suspect that the the Sony OS doesn't do a good job of protecting itself from getting called by 2 tasks either.

Good luck,  
John.

---

4/9/96 11:39 AM

Re: PSX System timers

Rob Vawter

Pat Quinn

OS

OS / Architecture

Note to all - yes this is a long post and contains some duplicate info. Read it anyway, you will probably learn something new.

PQ: At the recent Developer's Conference, you touched on a few subjects we have not yet explored in detail. One that has immediately become prominent for us is the issue of the system timers. I'll bet what I will ask here was mentioned in the \*very\* crowded OS/Kernel session on the last day, but the details were kind of lost on me then.

We have, of course, been using the vertical blank timer RCntCNT3 for some time. We now also want to use a faster timer. We've used the horizontal blank timer for profiling, but that was useful for testing the relative speed of sections of code. What we need now is a timer with a reliable (i.e. constant) frequency. But there is some confusion still about the usefulness of the first three counters.

Your handouts very clearly state that RCntCNT0 and RCntCNT1 no longer rely on the pixel clock and horizontal blank timers, but rather now use the system clock at 33.8688MHz.

However, with just a simple test of four successive polls of RCntCNT1 -- using the 1.5.19 release of the Programmer's Tools CD -- I could see that macro was not anywhere near 33 MHz. So one question is, with what software library release do RCntCNT0 and RCntCNT1 begin running at 33MHz? And how is this accomplished without changing the hardware (perhaps they are simply made equal to RCntCNT2)?

RV:Okay, okay. I admit it. I lied at the conference. Actually, I was just as confused as you. Now quoting from a recent post to OS folder on this BBS: "...This was new information at me to the time. I happened to give a very poor explanation at the session, so let me clarify now. The pixel display and h-blank counters have NOT actually been replaced. Instead, there is a mode setting which has always existed which will allow you to use the system clock for these counters instead.

On pages 22-23 of the 3.0 Overview, the Root Counter Mode settings are explained. There are three different mode settings which need to be specified.

Mode 1 signifies whether interrupts are permitted (RCntMdINTR) or polling (RCntMdNOINTR) will take place.

Mode 2 chooses which type of counter will be used for RCntCNT0 and RCntCNT1. The default mode (RCntMdSP - it is listed as "RCnDtMdSP" in the docs - a typo) means that Pixel Display will be used for RcntCNT0 and H-blank will be used for RCntCNT1. This mode need not be explicitly specified, as it is the default. RCntMdSC (Root Counter Mode System Clock) must be explicitly specified and ensures that the System Clock will be used as the counter for RCntCNT0 and RCntCNT1. This is the mode that you need.

Sorry for the lack of comprehensibility on this issue in the OS session.

PQ: We would just skip that issue and use the system clock timer that has always been there -- RCntCNT2. However, the handout implies the frequency of that is either 33.8688MHz or 33.8688/8 MHz, "depending on mode." You must have mentioned this at the conference but, for me: What "mode" are you referring to, and how do we know which state of that mode we are using?

The documentation only deepens the mystery of RCntCNT2... In the Kernel Library chapter of the Run-time Library Overview, one table mentions "RCntCNT2 System clock (8 spaces)," another says "RCntCNT2 System clock 8 second cycle," and in between is a statement (at the top of page 22) "One tick is approximately equal to 0.03 microseconds when counting by the system clock. This is an interval of 8 spaces, with 8 divisions."

There is clearly something magic about the system clock and the number 8, but what is all this about "spaces," "divisions" and "second cycles"?

I'm sure there's a simple explanation to all this. I'd be very grateful for any enlightenment you can provide.

RV:Here's where the NEW information comes in. Mode 2 is not fully documented. Mode 2 is also used to define whether RCntCNT2 is set to 33.8688 MHz or 33.8688/8 MHz. If the default is chosen (RCntMdSP), it will be the former. If RCntMdSC is chosen it will be the divide by 8 mode. I have no idea what all that other gibberish about the number 8 really means.

---

4/29/96 9:48 AM

Scratchpad Example program..  
stephen chaplin

---

Hello

---

I have tried to compile the example program in the cmplr/scratch director

---

and it gives me the following error

---

"Section Attributes are not supported by this target", on lines 98 and 99

---

int loop1 \_\_attribute\_\_((sect

OS / Architecture

---

4/29/96 6:55 PM  
Threads (revisited)  
tim m. edwards  
OS / Architecture

OS / Architecture

Hey, Guys.

The Question: How do I change threads from within the interrupt context?

The reason for it: I wrote a general purpose sound manager, and it works fine if its maintenance function is executed in the main flow. unfortunately, I'm having difficulty decoupling its update from the application's frame rate. When I try to manage the CD from within an event handler (for XA stuff), I get all sorts of CD errors, and only my midi/spu stuff works. In an earlier post, Angus said that it was possible to change threads from within an event handler. I tried the included code, but his technique of setting the tcb->entry to the desired tcb doesn't do the job. I have about a day to fix this, so your prompt response is very much appreciated.

Thanks, -Erik Strickland.

Also, I'd really appreciate it if you can tell me why and what libcd calls fail from within an interrupt context. With such info, I might be able to work around this.

---

4/30/96 11:15 AM  
Org at 800010000  
David Vronay  
OS / Architecture

OS / Architecture

Can anyone tell us again why we org programs at 80001000 as in the examples rather than 00001000. In the overview I cache is supposed to be effective in both. ?

---

4/30/96 11:33 AM  
Changing Text Color of FntPrint  
John Harris  
OS / Architecture  
Developer Support

OS / Architecture

How can I change the color of the text that gets printed with FntOpen(), FntPrint() etc. It is very hard to read in interlace.

John Harris Tachyon Studios, Inc.

---



4/30/96 3:11 PM  
Re: Changing Text Color of FntPrint  
Rob Vawter  
John Harris  
OS / Architecture

OS / Architecture  
How can I change the color of the text that gets printed with FntOpen(), FntPrint() etc. It is very hard to read in interlace.  
Load a clut over the clut which is loaded by FntLoad(tx, ty) --> clut = LoadClut(font, tx, ty+128); It's a 4 bit clut.

---

5/1/96 9:12 AM  
Re: Segment S  
Rob Vawter  
Carl Ferreira  
OS / Architecture

OS / Architecture  
Q: On page 339 of the Runtime Library 3.0 / Overview, under "Increasing execution speed", it references Segment S as follows: "The use of segment S, which consists of high-speed CPU internal memory, is also important to consider for high-speed processing." Can anyone explain what segment S is? How it's used? What it does?  
A: From looking at page 12 of the 3.0 PlayStation Hardware manual, segment S is the Scratchpad. And we are working on your other q's Carl.

---

5/1/96 6:53 PM  
Re: Scratchpad Example program..  
Mike Fulton  
OS / Architecture

OS / Architecture  
>>I have tried to compile the example program in the cmplr/scratch directory and it gives me the following error:  
>>"Section Attributes are not supported by this target", on lines 98 and 99:  
>>int loop1 \_\_attribute\_\_((section(spad.text))) = LOOP\_CNT;  
>>Does anyone know why this is choking?  
Well, as you know, we figured this out Monday evening when I visited, but for anybody else who's listening, the problem was that there was an older version of the C compiler still installed and pointed to by the system environment variables. Once we changed the environment to fix this, everything worked OK.  
Mike

---

5/1/96 8:09 AM  
Segment S  
Carl Ferreira  
OS / Architecture

OS / Architecture

On page 339 of the Runtime Library 3.0 / Overview, under "Increasing execution speed", it references Segment S as follows:

"The use of segment S, which consists of high-speed CPU internal memory, is also important to consider for high-speed processing."

Can anyone explain what segment S is? How it's used? What it does?

Thanks

Carl Ferreira Atari Games

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5/9/96 4:31 PM

Re: Cool R3000 Information

Craig Erickson

Bill "Angus" Guschwan

OS

OS / Architecture

Hi Bill,

Do you know where I can get a book on R3000 assembler?

---

5/9/96 4:50 PM

Re(2): Cool R3000 Information

Rob Vawter

Craig Erickson

Bill "Angus" Guschwan

OS / Architecture

Angus is still in Japan. Go to Stacy's in SF or Palo Alto and get The MIPS Programmer's Handbook by Farquhar and Bunce.

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5/10/96 12:25 PM

Re(2): Cool R3000 Information

Mike Fulton

OS / Architecture

OS / Architecture

Try Stacey's in San Francisco (on Market near 3rd) or Cupertino (on Steven's Creek near the Vallco mall) or the Computer Literacy stores in Sunnyvale (on Lawrence Expw. across from Fry's), Cupertino (In the Apple Computer campus), and San Jose (corner of Trimble & First). Computer Literacy has a web page at: <http://www.clbooks.com>. Here is some information taken from the database search function regarding the book you want (it's the one I've got and I recommend it, at any rate... with an annotation or two of my own).

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Information on Specific Book

TITLE : MIPS RISC ARCHITECTURE 2/E [ 2.0 ed] AUTHOR: KANE/HEINRICH ORDER#:

DZ429179 ISBN #: 0135904722 PUB BY: PRENTICE HALL YEAR : Sep 1991

SUBJECT: MICROPROCESSORS PRICE : \$ 39.00 STOCK : IN

STOCK at San Jose, Ca LOW STOCK at Tyson's Corner, Va

Western US/Int'l Eastern US General Info: 1.408.435.1118 1.703.734.7771

Order Desk : 1.408.435.0744 1.703.734.7772 Corp. Acc'ts: 1.408.435.5017

1.703.734.7772 Fax : 1.408.435.1823 1.703.734.7773 -----

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Mike

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5/12/96 4:00 PM

malloc questions

Dave Elton

OS / Architecture

Dan Burnash

OS / Architecture

I am trying to grab as much memory as possible for my program, but I found I can barely get 640,000 bytes maximum. Here are my questions:

1. Malloc() returns -1 when it cannot grab any more memory. I remember somebody mentioned before we have to link some object module to get rid of this -1 and always return 0 if malloc() fails. Is this real? If so, where is this module?

2. I manage to take both -1 and 0 as fail result when malloc() returns, and I keep malloc memory from 2M down to 16K until I cannot malloc any more modules. I found the first time system gives me a maximum of 640K, but then I cannot even malloc any memory after that. Does this mean the most amt of free memory I have is only 640L?

3. Thinking that I might need to do initheap myself before I use malloc to grab memory, I start to use initheap() before all the malloc(s). As system takes 64K and my code is loaded at 80010000, my code is about 350K, I set the address in initheap() as 80060000. But I found the debugging information in CdInit() shows that an address close to 80050000 is used, looks like system functions is putting something in my code area. So where exactly should I start my heap? If I burn a CD, where is the playcode loaded in memory in Cd-ROM, is it still from 80010000?

4. Is there any sample code somewhere we can refer to for maximum memory allocation for playstation?

Thanks for any advice!

Simon ReadySoft Inc.

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5/13/96 12:41 PM

Re: malloc questions

Mike Fulton

OS / Architecture

OS / Architecture

Simon @ Readysoft

It's quite possible that the problem you're seeing is not a question of free memory but rather memory fragmentation. Changing the way you use malloc() can help. By the way, you shouldn't need to call InitHeap() at all and doing it before each malloc() is a bad idea.

Let me give you an overview of the way malloc() works. First of all, the InitHeap() call is made by the system as part of the startup code sequence, with the heap beginning at the end of your program's BSS space. So unless you're not using the default startup code, you shouldn't need to do an InitHeap() call yourself. And if you are using different startup code, please let us know why, because it may not be necessary.

The malloc() routines take the heap and divide it into a number of same-sized blocks of memory. In the Playstation version of malloc() these blocks are 32K each. This is done for a variety of reasons, but the main point is to make things more manageable.

Assuming we start off with no memory allocated yet, let's go through what happens when we

try to malloc() a few buffers. Let's say the first buffer we want needs to be 20k. The malloc() function will check its internal structures to see if any of the 32k blocks are used yet and if there's enough leftover space to satisfy the request. When it doesn't find an existing block with enough free memory, it takes one of the unused 32k blocks, gives you a 20k chunk, and marks it as being used. It also uses a bit of the end of the block to keep track of the allocations that have been done.

Now you try to malloc() another 20k. It sees that the first 32k block only has about 12k remaining, which isn't enough. So it grabs a second 32k block and gives you a 20k chunk. So now we have two 32k chunks used, even though you only asked for 40k. So far, then, we're wasting 24k of memory

Now let's malloc() 100k. That's going to take up four of our 32k memory blocks. The first three will be completely used, and the first 4k of the fourth block.

So now we have:

block # used free ----- 1 20 12 2 20 12 3 32 0 4 32 0 5 32 0 6 4 28

Now if you try to malloc() another 20k, it will see that there is still enough room in block #6 to satisfy this request, so it doesn't have to use up another 32k block. This cuts down on memory wastage, but it should be obvious that this depends a lot on the sizes of the blocks you malloc() and the order in which you do it.

The way around this is to change the way you use malloc().

First of all, see if you can consolidate your calls together. Rather than do three small malloc() calls in a row, do one larger one and then assign the pointers to the appropriate places within the larger block. The more you can consolidate things together like this, the better.

Secondly, you may wish to allocate a small static buffer that can be used in place of small blocks that you temporarily malloc() and then free() relatively soon.

Give those changes a try and see what happens.

Mike

---

5/13/96 1:39 PM

Re(2): malloc questions

Dave Elton

Mike Fulton

OS / Architecture

OS / Architecture

Thanks for enlightening me on malloc(). I understand Playstation doesn't consolidate memory itself and keep using malloc() might cause memory fragmentation. As of this, I am trying to malloc a biggest chunk at the very beginning of my code and after that I will start to manage the memory myself with the biggest chunk of memory. But... what bothers me is I start from 2M and gradually reduce my required size to see what is the biggest size I can get from malloc(). I found the most I can get is 640K. My code is only 350K, system takes 64K, stack default to 2K, so where does the other memory left go? Even the memory is equally divided into 32K pieces, I should be able to get more than 1Mb in theory. Why I cannot malloc() 1Mb at the beginning of my code, when nothing gets executed yet?

I am trying to use Lib3.4 and \_\_heapsize, \_\_heapbase as Dan B. told me, but once I use these two variables, the linker complains about E:\PS-X~~~\ETC\SRC\Vsync(0) multiple defines of \_SN\_ENTRY\_POINT and \_main(). This must be some conflicts in memory modules. I don't know how to get rid of this.

I am using the default start up code, BTW.

Thanks and hoping for further advices!!!

Simon ReadySoft Inc.

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5/14/96 7:01 PM

Re(4): malloc questions

Mike Fulton

John Brandwood

OS / Architecture

OS / Architecture

Simon @ ReadySoft,

Keep in mind that the biggest size you can get from malloc() is the largest single contiguous block not already allocated, not the total amount of memory available. You may have a total of 1.6mb available, with 640k in the largest single block.

As for your linker errors, please send me a copy of the code which uses "\_\_heapsize" and "\_\_heapbase" as well as the linker command file and MAKEFILE you are using.

----- Dylan Cuthbert,

... it hardly creates desire to program in a flexible dynamic way does it? Also, on a machine that only gives you 1.5 meg at most of usable ram this seems particularly wasteful.

On the contrary, part of the idea behind this implementation of malloc() is to reduce the amount of memory, on average, that is required to maintain the required information about allocated memory. It also makes it much easier and faster to do garbage collection this way, since at any given time, it's very easy for malloc() to determine if larger amounts of memory are available by checking the status of the 32k (or whatever size) blocks.

Most malloc() routines I've seen divide the heap into a finite number of blocks in this same fashion, so the PlayStation library version isn't particularly unusual in that regard.

Also please keep in mind that there's certainly nothing keeping anybody from using their own memory allocation routines, if the library ones do not suit their purposes.

Considering the PlayStation's OS at some point or another was considered (and designed) to be flexible (multi-threading/multi-tasking etc) you wouldn't have thought they'd have used such a regimental memory allocation system. It seems someone must have 'bolted' it on.

For a truly sophisticated memory manager in a multitasking system, you need a few more things, mainly, the concept of handles, where you get back a pointer to a pointer to your allocated memory. This method allows the system to move things around in memory and just update the pointers, so it's possible to consolidate small non-contiguous blocks of free memory into larger free blocks.

Sure, it would be nice to have something like that for the PlayStation, but frankly it would be overkill for a console system that doesn't really have full pre-emptive multitasking. Again, however, you're free to come up with your memory handling routines if you want. but what about the hundreds of programmers out there who have to write code to allocate blocks in big chunks...

Well, first of all, if you allocate your biggest chunks first, you're less likely to see this sort of problem anyway, because the smaller chunks will fit into the space left over more easily than the other way around.

Secondly, if you're doing a number of malloc() calls together, it's fairly simple to consolidate them. Instead of:

```
ptr1 = malloc(100000); ptr2 = malloc(200000); ptr3 = malloc(100000);
```

you just do:

```
ptr1 = malloc(400000) ptr2 = ((void *)ptr1 + 100000); ptr3 = ((void *)ptr2 + 100000);
```

That should be a fairly easy way to fix the problem in most cases.

In a lot of cases on a console system like the Playstation, you're probably better off using static allocations where possible, rather than dynamic. Dynamic memory allocation is useful for computer applications where you don't know where you'll be loaded into memory, what other

programs are loaded, and what memory will be available, but none of those situations apply to programming a console like the PlayStation.

-----  
John Brandwood,

Normally, Sony recommends that we link with the 2mbyte.obj or 8mbyte.obj to define the memory size. These object files contain versions of the startup code routines \_\_SN\_ENTRY\_POINT and main() and set up the desired memory size.

We aren't really recommending the use of 2MBYTE.OBJ or 8MBYTE.OBJ anymore, as these files do not really contain full-blown versions of the startup code. For example, they won't work right with C++. However, he said that he was using the default startup code, so that shouldn't include either 2MBYTE.OBJ or 8MBYTE.OBJ, unless he has a mistaken idea that they are the default.

There should be no reason at all to use 2MBYTE.OBJ or 8MBYTE.OBJ, as you can simply define the appropriate variables in your source code and the normal default startup code will use them instead of the versions in the library. And even then, you really only need to do that in the case of wanting to use a full 8mb.

In particular note that 2MBYTE.OBJ/8MBYTE.OBJ does not work correctly with C++ as it does not call constructors and destructors for global objects. The proper way to adjust a program for 2MB memory (or any other amount for that matter) is to set the \_ramsize and \_stacksize variables in the source and just build your program normally (ie. use the standard LIBSN startup module and \_\_SN\_Entry\_Point entrypoint).

```
#include <libs.h>
```

```
int _ramsize=0x00200000; // 2 Megabytes of main memory int _stacksize=0x00002000; // and reserve 8K of that for stack
```

```
main() { ... }
```

Mike

---

5/14/96 3:19 PM

Re(2): malloc questions

Dylan Cuthbert

Mike Fulton

OS / Architecture

OS / Architecture

Mike Fulton writes:

The malloc() routines take the heap and divide it into a number of same-sized blocks of memory. In the Playstation version of malloc() these blocks are 32K each. This is done for a variety of reasons, but the main point is to make things more manageable.

ouch... more manageable from the library programmer's point of view, but what about the hundreds of programmers out there who have to write code to allocate blocks in big chunks... it hardly creates desire to program in a flexible dynamic way does it? Also, on a machine that only gives you 1.5 meg at most of usable ram this seems particularly wasteful.

Considering the playstation's OS at some point or another was considered (and designed) to be flexible (multi-threading/multi-tasking etc) you wouldn't have thought they'd have used such a regimental memory allocation system. It seems someone must have 'bolted' it on.

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5/14/96 12:50 PM

Re(3): malloc questions

John Brandwood

Dave Elton

Mike Fulton  
PSXMEM.C 28K  
OS / Architecture

> My code is only 350K, system takes 64K, stack default to 2K, so where does the other  
>memory left go? Even the memory is equally divided into 32K pieces, I should be able to get  
>more than 1Mb in theory. Why I cannot malloc() 1Mb at the beginning of my code, when  
>nothing gets executed yet?

I'm not sure if your 350KB figure includes your program's BSS segment. This is an area of uninitialized data that doesn't get included in the .CPE or .EXE file. It is allocated when your program loads into memory, and then cleared to zero. If your 350KB doesn't include it, then you could be losing a lot of memory there.

> I am trying to use Lib3.4 and \_\_heapsize, \_\_heapbase as Dan B. told me, but once I use >these two variables, the linker complains about E:\PS-X~~~\ETC\SRC\Vsync(0) multiple >defines of \_\_SN\_ENTRY\_POINT and \_main(). This must be some conflicts in memory modules. >I don't know how to get rid of this.

I recently had to do a magazine demo version of our game and came across this problem. Normally, Sony recommends that we link with the 2mbyte.obj or 8mbyte.obj to define the memory size. These object files contain versions of the startup code routines \_\_SN\_ENTRY\_POINT and main() and set up the desired memory size.

Unfortunately, to get versions of the startup code with the \_\_heapsize or \_\_heapbase variables, you need to include the startup code in snlib.lib. This code conflicts with versions in 2mbyte.obj/8mbyte.obj, and you get the error messages that you mentioned.

If you do need the \_\_heapsize or \_\_heapbase variables, you stop linking with the 2mbyte.obj/8mbyte.obj files, and just accept the 2mbyte memory range that the versions in snlib.lib seem to give you. Note that the 8mbyte.obj defaults to putting your program stack at the top of the 8mbyte range, and that the 2mbyte.obj and snlib.lib versions both default to putting your stack at the top of the 2mbyte range.

To solve your problems, or at least to better see what is going on, you might try my replacement memory functions. I first posted these last year, and I'll attach the latest release here. They provide detection for memory corruption, and also allow you to dump the heap to the debugger to see where your memory has gone. Another thing is that memory granularity is much smaller than 32KB.

Good luck,  
John.

---

5/18/96 11:15 AM  
Re(4): malloc questions  
Dave Elton  
John Brandwood  
Mike Fulton

OS / Architecture

A quick follow to my last reply message. I just found out the error in my code for \_\_heapsize because it is supposed to be an integer instead of pointer. Now I get my heapsize id about 6M, \_\_bsslen is about 1M. This seems to make some sense to be why I can only get 640K even my code is only 350K. But here are two questions I am still at loss:

A. the amount I got above is after I hard code \_ramsize to 2M, apparently libsn ignore what I set and still takes 8M as default memory size. I am hoping I don't have to edit sn.h or anmain.s to recompile libsn.obj. What's the proper way to set up 2M for my code then?

B. I don't think my globals are as much as 1M (I have to do a precise calculation). What does

unintilaized data in .bss section mean? Uninitialized global variables or all uninitialized data included locals? Is this a duplicate copy in memory for overlay stuff? I though my 350K code already reserves space for globals. Maybe I am just wrong.  
Simon ReadySoft Inc.

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5/18/96 10:24 AM  
Re(4): malloc questions  
Dave Elton  
John Brandwood  
Mike Fulton

OS / Architecture

Thanks for the help,John!

I take out the 2mbyte.obj and successfully linked my code. I printf the `__heapbase` and `__heapsize` through `dbugpsx`. But.... The `__heapsize` is only 120 bytes, obviously wrong. I am wondering whether `snlib` knows whether it is taking 2M or 8M. In other words, how can I make sure my code after linking with `snlib` module is running in 2M since `2mbytes.obj` has been taken out in linking. Should I hard code `__ramsize` to 2M ?

When you mentioned .bss segment is mot included in .cpe or .exe file, I have to say the previous quoting of my code size 350K is the size of .cpe file size. So what else is excluded form the .cpe file besides .bss section and how can we find out exactly how much memory our code actually takes and where in memory they are located. I though before it just grows after the first 64K of OS and take about the same size as .CPE or .EXE file.

To use the code you provided ( I appreciate you contribute your code to us), do we still need to use `__heapbase` and `__heapsize` or we just need to do `Initheap()` and `malloc()`?

Thanks for the help!  
Simon ReadySoft Inc.

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5/20/96 2:56 PM  
Re(5): malloc questions  
John Brandwood  
Dave Elton  
Mike Fulton  
PSXMEM.C 28K  
OS / Architecture

> A quck follow to my last reply message. I just found out the error in my code for `__heapsize` because it is suposed to be >an integer instead of pointer. Now I get my `heapsize` id about 6M, `__bsslen` is about 1M. This seems to make some >sense to be why I can only get 640K even my code is only 350K. But here are two questions I am still at loss: > > A. the amount I got above is after I hard code `__ramsize` to 2M, apparently `libs` ignore what I set and still takes 8M as >default memory size . I am hoping I don't have to edit `sn.h` or `anmain.s` to recompile `libs.obj`. What's the proper way to >set up 2M for my code then?

As Mike Fulton posted earlier, `__ramsize` and `__stacksize` are just integer variables. All you need to do is to set them up somewhere in your code.

For convenience, I've attached an updated version of my code which now uses the 'official' `__ramsize` and `__stacksize` method of setting memory size. If you use this code you will get a 2mbyte machine with an 8kbyte stack.

Remember that you don't need to call `InitHeap()` yourself, since the `LIBSN` startup code at `__SN_ENTRY_POINT` does it for you.

> B. I don't think my globals are as much as 1M ( I have to do a precise calculation). What does unintilaized data in .bss >section mean? Uninitialized global variables or all uninitialized data included locals? Is this a duplicate copy in memory >for overlay stuff? I though my 350K code



already reserves space for globals. Maybe I am just wrong.

The .bss section includes all global and static variables and arrays that you haven't actually given an initial non-zero value to.

For example ...

```
1) int my_var1 = 32; 2) int my_var2 = 0; 3) int my_var3;
```

my\_var1 will go into the data segment, and it will be somewhere within your CPE file. Both my\_var2 and my\_var3 will go into the bss segment which is not stored in the CPE file (it would be a waste of space).

Your best way to find out where your memory has gone is to look at the .map file that the linker outputs. Perhaps you are defining a lot of global or static buffers that would be better off being allocated dynamically.

As for overlays, you'll have to ask someone else, since I've not had to use overlays yet.

Good luck,

John.

---

5/20/96 1:53 PM

Re(5): malloc questions

Mike Fulton

OS / Architecture

OS / Architecture

Simon @ Readysoft writes...

A quick follow to my last reply message. I just found out the error in my code for \_heapsize because it is supposed to be an integer instead of pointer. Now I get my heapsize id about 6M, \_\_bsslen is about 1M. This seems to make some sense to be why I can only get 640K even my code is only 350K. But here are two questions I am still at loss:

A: the amount I got above is after I hard code \_ramsize to 2M, apparently libsn ignore what I set and still takes 8M as default memory size . I am hoping I don't have to edit sn.h or anmain.s to recompile libsn.obj. What's the proper way to set up 2M for my code then?

How exactly did you hardcode "\_ramsize" to 2 megabytes? You don't have to edit SN.H or SNMAIN.S. This variable is defined in a separate module which simply does not get included at link time if you have defined the variables in your own code. See my earlier message of May 14.

B: I don't think my globals are as much as 1M ( I have to do a precise calculation). What does uninitialized data in .bss section mean? Uninitialized global variables or all uninitialized data included locals? Is this a duplicate copy in memory for overlay stuff? I though my 350K code already reserves space for globals. Maybe I am just wrong.

The BSS segment is used for variables which do not have a specific value assigned to them during the compile & link stage. They are assumed to start out live with a value of zero, and so rather than include this space in the executable program file, most systems simply specify the address and length of the BSS segment(s) and rely on the program loader routine to clear the appropriate memory area(s) to all zeroes.

Look at the MAP file created by your linker. It will show you all the details regarding the static memory usage of your program (i.e. the sizes of your various program segments including the BSS). This is right at the top of the MAP file.

While the text and data segments for overlays share the same area of memory, I'm not certain the same is true for the BSS segments of overlays, because the BSS memory space wouldn't normally be together with the text and data. But I doubt if that's really what's happening.

You may find it helpful to declare all your uninitialized variables together in a separate file and then define them as EXTERN in your other source files. This will make it easier to keep track of how much space you're using, and you may more easily identify things that can share the same

space because they don't get used at the same time, like small temp work buffers of various sorts.

Mike

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5/21/96 4:59 PM

Re(5): malloc questions

Dylan Cuthbert

Mike Fulton

John Brandwood

OS / Architecture

Mike Fulton writes:

In a lot of cases on a console system like the Playstation, you're probably better off using static allocations where possible, rather than dynamic. Dynamic memory allocation is useful for computer applications where you don't know where you'll be loaded into memory, what other programs are loaded, and what memory will be available, but none of those situations apply to programming a console like the PlayStation.

You can't use static allocations if your program has several loadable modules, it is far more sensible, simpler and easier to use dynamically allocated memory... even if this \*is\* a console. It really doesn't take any time to convert separately freed blocks into one large contiguous block. How often do you malloc and free memory anyway?

Dyl

---

5/22/96 5:21 PM

Re(8): malloc questions

Dylan Cuthbert

John Brandwood

Mike Fulton

OS / Architecture

John Brandwood writes:

I can't disagree more.

We aren't creating a general purpose OS, we are creating games. Their behaviour is extremely deterministic and predictable.

You have a shell which uses memory. You free up unneeded memory when leaving the shell, and then execute your game code. When the game code is finished you free up its memory and return to the shell.

In such a system heap fragmentation is fairly simple to avoid. In practice, this is made much more difficult if you can't actually see the heap to determine when and where fragmentation occurs.

This seems obvious to me too... the current memory handling routines seem somehow loose and insecure, not really letting the programmer in on what's going on. How do we tell how much heap is still available? I want to allocate a linked list of dynamic data structures depending on eg. what level I'm on, these data structures are all 2k or so in size... with the current system god knows how much memory I'll be allocating.

Dyl

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5/22/96 5:53 PM

Re(10): malloc questions

John Brandwood

Dylan Cuthbert

Mike Fulton

OS / Architecture

>>In such a system heap fragmentation is fairly simple to avoid. In practice, this is made  
>>much more difficult if you can't actually see the heap to determine when and where  
>>fragmentation occurs. > >This seems obvious to me too... the current memory handling  
routines seem somehow loose and >insecure, not really letting the programmer in on what's  
going on. How do we tell how much heap >is still available? >I want to allocate a linked list of  
dynamic data structures depending on eg. what level I'm on, >these data structures are all 2k or  
so in size... with the current system god knows how much >memory I'll be allocating.

Well perhaps you should give my heap replacement routines a try. They seem to do everything  
that you want of them, and they keep track of memory in 16-byte chunks with an overhead of  
16-bytes per malloc(). They just slot right in and take over from the library versions (although  
you have to do a little more work if you want to take full advantage of all their features).

>I'd just like to see the libraries fixed and made standard.

I wouldn't hold out much hope. Even the beta memory routines on the new Programmer's CD  
aren't much of an improvement.

John.

---

5/22/96 1:04 PM

Re(6): malloc questions

Mike Fulton

Dylan Cuthbert

John Brandwood

OS / Architecture

You can't use static allocations if your program has several loadable modules, it is far more  
sensible, simpler and easier to use dynamically allocated memory... even if this \*is\* a console.  
Please note that I said you were better off using static allocations "where possible". Of course  
that means there are some situations where it's not going to be possible and others where it is  
not the best solution.

Even if you have several loadable modules, you're still better off using static allocations for  
items in the main module or shared between modules.

It really doesn't take any time to convert separately freed blocks into one large contiguous block.

How often do you malloc and free memory anyway?

It's not mainly a question of how much time it takes, it's a matter of how fragmented your  
memory gets. When you are using malloc and free for everything, you're giving up a lot of  
control over your memory situation. If you do enough dynamic allocations, you'll eventually  
run into some sort of problem regarding memory fragmentation. Sure it's easier to use malloc  
and free, but in a system with limited memory like the PlayStation it's not always the best  
solution.

Mike

---

5/22/96 5:04 PM

Re(8): malloc questions

Mike Fulton

John Brandwood

Dylan Cuthbert

OS / Architecture

We aren't creating a general purpose OS, we are creating games. Their behaviour is extremely deterministic and predictable.

I agree. In a game, memory usage is usually a predictable thing. That's why I'm saying it's a good idea to avoid extensive use of a general-purpose memory allocation routine like malloc. It's the general-purpose OS with less-predictable memory usage that requires a heavy-duty general-purpose malloc() routine, not a game.

A game generally knows in advance what its memory requirements are, so unless they come in quite a bit below the 2mb limitation, you'll get better results by doing your own specialized memory management. Sure, it requires you to write some code, but sometimes that is what you need to do.

I do agree that it couldn't hurt for us to have a more robust version of malloc() in our library. But the decision to use malloc() or your own custom routines for memory allocation in a game program is something everybody needs to decide on their own. It may arguably be more portable to use malloc, but in a program aimed at a console system, the portability of the memory allocation routines is not likely to be a major concern compared to everything else. And I think the payoff of using your own custom routines is worth the extra work involved. I think we've gotten to the point where we are discussing it from a philosophical viewpoint more than anything else, and I don't really want this to degrade into a bigger argument. Perhaps we would be better off agreeing to disagree.

Mike

---

5/22/96 1:34 PM

Re(7): malloc questions

John Brandwood

Mike Fulton

Dylan Cuthbert

OS / Architecture

>You can't use static allocations if your program has several loadable modules, it is far >more sensible, simpler and easier to use dynamically allocated memory... even if this >\*is\* a console. >>Please note that I said you were better off using static allocations "where possible". >Of course that means there are some situations where it's not going to be possible >and others where it is not the best solution. >>Even if you have several loadable modules, you're still better off using static >allocations for items in the main module or shared between modules.

Careful selection of which bits of memory should be static, and which dynamic is important. But saying 'where possible' is somewhat over-generalization. Perhaps 'where sensible' would be better.

>It really doesn't take any time to convert separately freed blocks into one large >contiguous block. How often do you malloc and free memory anyway? >>It's not mainly a question of how much time it takes, it's a matter of how fragmented >your memory gets. When you are using malloc and free for everything, you're giving >up a lot of control over your memory situation. If you do enough dynamic allocations, >you'll eventually run into some sort of problem regarding memory fragmentation. Sure >it's easier to use malloc and free, but in a system with limited memory like the >PlayStation it's not always the best solution.

I can't disagree more.

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You have a shell which uses memory. You free up unneeded memory when leaving the shell, and then execute your game code. When the game code is finished you free up its memory and return to the shell.

In such a system heap fragmentation is fairly simple to avoid. In practice, this is made much more difficult if you can't actually see the heap to determine when and where fragmentation occurs.

This is one of the big failings of the library code. In my code (and in various PC compiler's code) there are routines to display the heap, and even show where each block of memory was allocated. There is also code to detect heap corruption.

All these functions should be available (perhaps conditionally) in the library routines.

John.

---

5/22/96 9:42 PM

Re(4): Win 95 & PCRead problems

Pat Quinn

OS / Architecture

Jose R. Villeta

OS / Architecture

See the win95 statement posted almost everywhere on this bbs. Part of it is listed below. We are trying to get this problem fixed, but quick fixes are not expected.

I don't know if this helps, but I discovered that if I have one & only one DOS-shell running (the one in which I invoke run.exe), I don't have a problem under Win95. However, leaving the game running idle on the dev system for too long may cause problems with subsequent PCRead attempts.

David Crain NuFX, Inc.

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5/22/96 5:30 PM

Re(9): malloc questions

Dylan Cuthbert

Mike Fulton

John Brandwood

OS / Architecture

Mike Fulton writes:

A game generally knows in advance what its memory requirements are, so unless they come in quite a bit below the 2mb limitation, you'll get better results by doing your own specialized memory management. Sure, it requires you to write some code, but sometimes that is what you need to do.

Which general game is this?

I have one level which is texture map and data intensive and one which isn't, but has more interactive enemy objects. I'm using the same engine for both obviously. I want to allocate dynamically at start up by reading from map files the texture maps and data for the level and then allocate the interactive enemy objects. If I do it the way you say I have to pre-allocate a buffer that caters for the maximum amount of enemy objects and another buffer that caters for the maximum amount of texture maps (that incidentally will be loaded on the fly into VRAM).

I do agree that it couldn't hurt for us to have a more robust version of malloc() in our library. But the decision to use malloc() or your own custom routines for memory allocation in a game program is something everybody needs to decide on their own. It may arguably be more

portable to use malloc, but in a program aimed at a console system, the portability of the memory allocation routines is not likely to be a major concern compared to everything else. And I think the payoff of using your own custom routines is worth the extra work involved. If malloc is being used as little as you say it is, then what difference would it make to make the libraries into proper dynamically allocated calls.

Also, because the malloc'd blocks are so much larger than the block actually requested memory splats or overwrites might not be trapped for months after the code has been written because of the extra safe space.

I think we've gotten to the point where we are discussing it from a philosophical viewpoint more than anything else, and I don't really want this to degrade into a bigger argument.

Perhaps we would be better off agreeing to disagree.

I'd just like to see the libraries fixed and made standard.

Dyl

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5/23/96 10:56 AM

Re(5): Win 95 & PCRead problems

Dylan Cuthbert

Pat Quinn

OS / Architecture

OS / Architecture

Pat Quinn writes: See the win95 statement posted almost everywhere on this bbs. Part of it is listed below. We are trying to get this problem fixed, but quick fixes are not expected.

I don't know if this helps, but I discovered that if I have one & only one DOS-shell running (the one in which I invoke run.exe), I don't have a problem under Win95. However, leaving the game running idle on the dev system for too long may cause problems with subsequent PCRead attempts.

DEXBIOS does definitely have a problem if there is more than one dos shell open.

The best solution is asking snsystems to sign up for the beta test of their win95 software - it's

\*so\* much better to use, and you get a nice debugger too.

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6/1/96 1:23 PM

Re(11): malloc questions

John Brandwood

John Brandwood

Dylan Cuthbert

PSXMEM.C 28K

OS / Architecture

Whilst going through my multi-tasking routines I found a problem with the assembly macro code that I was using to disable interrupts.

After a long hunt through the GNU documentation, I found the legal method for including assembly into 'C' functions, and I've rewritten the macros to follow this method.

The same code was used to disable interrupts during the memory routines that I previously uploaded, and although the problem that I found didn't seem to occur in the memory code, I thought that I'd better fix the code.

So here is the new updated version of my memory handling routines.

Hope they're useful to someone.

John.

---

6/11/96 2:32 PM

Re: Scratchpad Example program..

Mike Fulton

OS / Architecture

OS / Architecture

You aren't using the current version of CCPSX. It's possible you may have both an old and a new version, but the old version is being pointed to by some environment variable. Get rid of the old versions because it doesn't support the "attribute" keyword.

Also try using the other scratchpad example in the attached file for the recent message I left in the "Development Env." conference.

Mike

---

6/19/96 6:32 AM

CD and memcpy

Pat Quinn

CD/Decompression LIB

OS / Architecture

We have been attempting to stream user data using our own ring buffer and data packer -- rather than using the `St*` functions & `MovConv` -- and have experienced two problems that keep it from running smoothly. Each problem causes a halt or hesitation to varying degrees. I'll detail each problem in a separate post. This post will focus on the problem of copying data from one place in main memory to another place in main memory.

We are using the `memcpy()` function to copy data out of a statically allocated ring buffer to a particular item like an animation frame. In theory, we would like to copy as much data out of the ring buffer, and disburse it to individually malloc'ed items, as possible at one time so we will avoid a ring buffer overflow condition -- but we don't expect to be able to get more than 15K at a time. What is happening, though, is by the time one `memcpy()` operation completes, the asynchronous write-to-ring-buffer callback has been called many times. This produces either an overflow or, with a humongous ring buffer, a condition where our CD access code keeps dipping back into the ring buffer to process items all at once because it sees there is so much data available. In the latter case, this happens in one or two background (per game loop) calls rather than many, gathering up to 70K at a time. Each dip into the ring buffer -- i.e. each `memcpy()` operation -- slows the game down and in the meantime, the ring buffer fills up.

The root of the problem, we discovered, is the `memcpy()` function. I timed each one and calculated a data rate, and the result was surprising: While the CD is streaming, `memcpy()` averages only 265K bytes/sec! That's slower than the CD! The maximum rate is only 413K bytes/sec, and the minimum is as slow as 24K bytes/sec (for comparison, when the CD is not operating, `memcpy()` averages 1.6M bytes/sec, and gets as high as 3.7M bytes/sec). It doesn't seem to help that `memcpy()` is implemented in the kernel.

We are speculating that this slow rate is the result of the priority that the CD's DMA access has to main memory. It seems `memcpy()` or any other ordinary RAM access is pretty much locked out when the CD is busy, which leaves the rest of the game high & dry.

If we are correct about this -- that DMA has a higher priority to RAM than the main process -- than this suggests we should also use DMA to read from the ring buffer. Is there a DMA function for moving data from one part of main memory to another, in place of `memcpy()`? If there is, I suppose it would have to work asynchronously to avoid contention with the CD DMA. Perhaps we should use VRAM as an intermediary, using the asynchronous DMA `LoadImage()` followed by the `DMA StoreImage()`...

I imagine a simplistic response to this problem would probably be to not copy data -- use it straight out of the ring buffer. But this is easier said than done. We would lose most of the flexibility that our CD access module (for data management) is designed to give us. I would just like to ask for any other suggestions, or hear from others who implemented their own streaming and confronted this problem, before I embark on such a radical course. Any help would be greatly appreciated.

David Crain NuFX, Inc.

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6/20/96 4:33 PM

Reserved Memory

Chris E. Reese

OS / Architecture

OS / Architecture

Does anyone know if there is a way I can have a section of memory set aside that will not get overrun when I load an executable? It seems that when an executable is loaded by the OS it tromps on memory according to the size specified in the memory map. If I try to load the executable at a higher address, say 80020000, and put values below that address they are wiped out when the next executable is loaded.

Chris Reese. Eidetic, Inc.

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6/24/96 12:17 PM

Re: Reserved Memory

Mike Fulton

OS / Architecture

OS / Architecture

Chris Reese @ Eidetic, Inc. writes:

Does anyone know if there is a way I can have a section of memory set aside that will not get overrun when I load an executable? It seems that when an executable is loaded by the OS it tromps on memory according to the size specified in the memory map.

I'm not sure I understand what you mean... it sounds like you're surprised that the memory that the new program loads into is being overwritten by the new program itself. And that doesn't make sense.

Do you mean to say that whenever you load an executable, that ALL of memory is getting wiped out? That seems unlikely, because it would result in a crash as soon as the Load call returned, and you haven't mentioned that. Precisely what do you mean by "according to the size specified in the memory map"?

If I try to load the executable at a higher address, say 80020000, and put values below that address they are wiped out when the next executable is loaded.

When you say you try to load the executable at a higher address, do you mean that you are relinking the executable, or just trying to load it to a different address? And by the way, 80020000 is an extremely LOW address for something like loading an executable unless the parent program is very small. If the parent program has the usual start address of 80010000, then that's only 64k higher in memory.

How exactly are you determining what sections of memory are being used by your program and which are free and available to load another program into? And are you using the Load() function to load your executable, or are you doing something else?



Mike Fulton

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6/24/96 12:42 PM  
Re: CD and memcopy  
Mike Fulton  
OS / Architecture

OS / Architecture

David Crain @ NuFX,

First of all, how exactly are you reading data from the CD? You may be moving stuff around in memory twice, not once. The CD read places the data into a sector buffer and CdGetSector() transfers it to the desired program buffer. If you're moving it again after that, it's very inefficient. It might be worthwhile to redo your code to avoid the intermediate step whenever possible. Either using the data directly from the ring buffer, or else avoiding the ring buffer in the first place and reading it directly to the desired location, would be the best solution, simplistic or otherwise.

Regarding your question about a DMA function to move data around rather than using memcopy(), the problem you're seeing may in fact be due to the fact that memcopy() is wanting to use DMA itself already.

I'm not positive and everybody else who would know is at lunch right now, but I think we determined sometime back that memcopy does use DMA. If that is the case, then obviously the problem is that memcopy is waiting for other DMA operations, like the CD read, to finish. Have you tried writing your own memcopy() function to see what the difference is?

Finally, why did you decide to skip the Sony libraries for streaming? I'm not saying that it might not be the correct decision for your products, but maybe it is based on somebody not being aware of the full capabilities of the streaming library.

Mike

---

7/9/96 5:45 PM  
Warm-reboot crashes  
Mark A. Fong  
OS / Architecture

OS / Architecture

I am having a problem using LoadExec(). My action game is one executable and the menu system is another. When running on a blue debugging station, it can run in it's attract loop forever. But if I hit the RESET button to do a WARM reboot, then it usually dies in about 20-30 minutes. Does anyone know of any reason why this happens? A little more info: The menu side plays a streamed movie, then goes to a static title screen with CD audio playing, after 30 seconds it calls LoadExec() to go to the action game side. Currently I have a test program replacing the action game that basically just calls the menu side again.

Any ideas? Thanks.

Mark A. Fong Stormfront Studios

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7/11/96 9:52 AM  
Re: Warm-reboot crashes  
Mike Fulton

OS / Architecture

OS / Architecture

I am having a problem using LoadExec(). My action game is one executable and the menu system is another. When running on a blue debugging station, it can run in it's attract loop forever. But if I hit the RESET button to do a WARM reboot, then it usually dies in about 20-30 minutes. Does anyone know of any reason why this happens? A little more info: The menu side plays a streamed movie, then goes to a static title screen with CD audio playing, after 30 seconds it calls LoadExec() to go to the action game side. Currently I have a test program replacing the action game that basically just calls the menu side again.

Any ideas? Thanks.

Mark A. Fong @ Stormfront Studios

I'm afraid there's no way we could determine why it's crashing from that small amount of information. The only sort of guess I can make is that something is relying on some portion of memory being zeroed out, and is crashing when that's not the case.

What have you done to debug this so far? I know it's hard to debug on a blue machine, but have you at least got some sort of print statements tracking what's happening? Does it happen at all when you boot the same disc .on a DTL-H2000?

Mike

---

7/12/96 8:44 PM

DrawOtag from DrawSyncCallback

Montgomery Singman

OS / Architecture

Rob Vawter

OS / Architecture

I would like call a DrawOt from inside a DrawsyncCallback.

It looks as if it is dropping every other frame ( it sort of works!)

I would like to try SWEnterCriticalSection and SWExitCriticalSection.

I cant find a .h file with the prototypes! Where are they?

---

7/13/96 12:01 PM

SetConf fails in 3.5

Borden Covell II

BUGS

OS / Architecture

We are using the multi-threading features of the OS. We developed code a LONG time ago that overcame a bug in the OS that made some of the thread ID unusable. We also call SetConf to change the number of threads from 4 to 20.

When I installed the 3.5 release this code not longer works. I get an error returned from OpenTh when I try to open the fourth thread.

Please let me know what I need to do to use 3.5, as it has some new features that we would like to use.

Thanks.

---

7/15/96 8:18 AM

Re: DrawOtag from DrawSyncCallback

Randy X. Thompson

Montgomery Singman

OS / Architecture

OS / Architecture

Montgomery Singman writes: I would like call a DrawOt from inside a DrawsyncCallback.

It looks as if it is dropping every other frame ( it sort of works!)

I would like to try SWEnterCriticalSection and SWExitCriticalSection.

I use DrawOT from inside a DrawsyncCallback and do not use SWEnterCriticalSection. I do, however, "kick start" the callback everytime I have a new set of OT lists queued up by calling the callback function myself. One would think that you would only have to kick start the callback once to get it rolling. If I don't manually trigger the interrupt myself once a frame, however, I get the same every-other-frame problem you describe.

-Randy

---

7/22/96 4:55 PM

Re: DrawOtag from DrawSyncCallback

Mike Fulton

OS / Architecture

OS / Architecture

The DrawOTag function is non-blocking... it just sets up the operation and returns. If you're calling it from a callback routine, there should not be anything else you need to do.

What do you hope to accomplish via SWEnterCriticalSection / SWExitCriticalSection ? (They are in KERNEL.H by the way.)

Mike

---

7/23/96 10:58 AM

section attributes

Borden Covell II

OS / Architecture

Developer Support

OS / Architecture

I recently discovered that the gp register was not being set up correctly in my ISR routines. In order for my ISR code to access globals, I needed to compile all of my code with the -G0 options.

However, I believe, based on an earlier post I found in the archives, that there is another way to accomplish this with a compiler `__attribute__` statement. I tried to use the statement `static`

```
uint32 myVar__attribute__((section("data")));
```

in my code and got the following error message:

```
module.c:143: section attributes are not supported for this target
```

Is there another way to get section attributes to work or do I need to use G0???

Thanks for anyone's input.

---

7/23/96 4:20 PM

Re: SetConf fails in 3.5  
Rob Vawter  
Borden Covell II  
BUGS

OS / Architecture

We are using the multi-threading features of the OS. We developed code a LONG time ago that overcame a bug in the OS that made some of the thread ID unusable. We also call SetConf to change the number of threads from 4 to 20.

When I installed the 3.5 release this code not longer works. I get an error returned from OpenTh when I try to open the fourth thread.

The new SetConf does NOT allow you to change the stack pointer. Is this the code of yours that I have seen?

---

7/23/96 4:16 PM  
Re(3): section attributes  
Mike Fulton  
Borden Covell II  
OS / Architecture

OS / Architecture

Do you know if anyone has looked into the problems with SetConf in 3.5? I posted bug report in the Bugs area over a week ago.

Thanks, Borden

Well, I don't know myself, but this was brought up at yesterday's morning meeting so I know somebody is looking into it.

You have to understand that there are times when we have to find out what the answer is ourselves, before we can pass it along to you.

Mike

---

7/23/96 4:47 PM  
Re: section attributes  
Mike Fulton  
OS / Architecture

OS / Architecture

I recently discovered that the gp register was not being set up correctly in my ISR routines. In order for my ISR code to access globals, I needed to compile all of my code with the -G0 options. However, I believe, based on an earlier post I found in the archives, that there is another way to accomplish this with a compiler `__attribute__` statement. I tried to use the statement `static uint32 myVar__attribute__ ((section("data")));`

in my code and got the following error message:

```
module.c:143: section attributes are not supported for this target
```

Is there another way to get section attributes to work or do I need to use G0???

Thanks for anyone's input.

Another question just came to mind. You said for your ISR code to access "globals"...

Did you mean to include the static variable "myVar" with the globals? Because it isn't, after all, a global.

Mike

---

7/23/96 2:43 PM  
Re(2): section attributes  
Borden Covell II  
Mike Fulton  
OS / Architecture

OS / Architecture

I will verify my compiler versions and get back to you.

You are right, I was referring to my callback routines. They execute in an ISR state, so I called them ISR routines. More importantly, the gp register is no good. BTW, do you know why this would be?

Do you know if anyone has looked into the problems with SetConf in 3.5? I posted bug report in the Bugs area over a week ago.

Thanks, Borden

---

7/23/96 3:32 PM  
Re: section attributes  
Borden Covell II  
Mike Fulton  
OS / Architecture

OS / Architecture

I little more info...

We use quite a few Callback routines. The only one that I am aware of that is having a problem with the gp register is the callback for the system root counters. The other callbacks (mdec, drawsync, vsync, etc.) all access global variables and they seem to work just fine.

---

7/23/96 1:46 PM  
Re: section attributes  
Mike Fulton  
OS / Architecture

OS / Architecture

Borden Covell writes:

I recently discovered that the gp register was not being set up correctly in my ISR routines. In order for my ISR code to access globals, I needed to compile all of my code with the -G0 options. However, I believe, based on an earlier post I found in the archives, that there is another way to accomplish this with a compiler `__attribute__` statement. I tried to use the statement `static uint32 myVar__attribute__((section("data")));`

in my code and got the following error message:

```
module.c:143: section attributes are not supported for this target
```

Is there another way to get section attributes to work or do I need to use G0??? Thanks for anyone's input.

This message indicates that the problem is that you are running an old version of the C compiler. If you think you've got the latest & greatest, then make sure you do not have more than one version installed. You may not be executing the version you think you are if any of your environment variables point at the old version.

If this doesn't help, then please provide more detailed information about the problem you're having with the "gp" register and your ISR code. For one thing, what ISR code are you doing?

You're not talking about a callback routine are you? Callbacks are not actually ISR routines. They are subroutines called by the main ISR.  
Mike

---

7/23/96 3:20 PM  
Re: section attributes  
Borden Covell II  
Borden Covell II  
OS / Architecture

OS / Architecture

This is the output of from running the compiler

```
ccppsx.exe -undef -D_GNUC_=2 -Wall -DDEBUG -DSHOW_STATS -D__OPTIMIZE__ -DPSX  
- DUSE_PC -I.\H -IW:\psx_cmn\h -IZ:\vi\vi_cmn -v -lang-c-c++-comments -Dmips -D__m  
ips__ -D__mips -Dpsx -D__psx__ -D__psx -D__EXTENSIONS__ -D_MIPSEL -  
D__CHAR_UNSIG NED__ -D_LANGUAGE_C -DLANGUAGE_C timer.c  
c:/TEMP/APBCBDEH GNU CPP version 2.6.3 [AL 1.1, MM 40] Sony Playstation #include "..."  
search starts here: #include <...> search starts here: .\H W:\psx_cmn\h Z:\vi\vi_cmn  
w:/sony_sw/include /usr/local/include /usr/local/go32/include /usr/local/lib/gcc-  
lib/go32/2.6.1/include /usr/include End of search list. cc1psx.exe -quiet -Wall -O3 -mgpopt -  
G0 -version c:/TEMP/APBCBDEH -o c:/TEMP/APB CBIEC GNU C version 2.6.3 [AL 1.1, MM  
40] Sony Playstation compiled by GNU C version 2.6.3. timer.c:143: section attributes are not  
supported for this target  
Any ideas??? Thanks.
```

---

7/24/96 12:36 AM  
Re(2): DrawOtag from DrawSyncCallback  
Montgomery Singman  
Mike Fulton  
OS / Architecture

OS / Architecture

what i hope to accomplish is : when I launch my first drwot, i clear a semaphore. at  
dsynccallback if that semaphore is clear i set it, and launch another drawot now my logic can  
check that semaphore to see if it is ok to re-do the ot ( i am single buffering one of my ot's  
becuase it is just too large, and only changes slightly between frames)  
at first it didn't seem to work, so i wanted to trySWEnter/ExitCriticalSection to make sure it  
was safe to twiddle my semaphore. It works now! But it is nice to know where to find those  
functions as my callback use is getting more complicated , and it is procedurally sound to use  
them sometimes.  
thanks

---

7/24/96 1:22 PM  
Malloc.h from Lib 3.5  
Ayo A. Orimoloye  
OS / Architecture

OS / Architecture

In the new Includes (Libraries 3.5), InitHeap is prototyped in KERNEL.H as InitHeap( void \*, long ), as in the docs. However, in MALLOC.H, it is prototyped as InitHeap( unsigned long \*, unsigned long).

This results in an annoying "Conflicting Types" error whenever you include kernel.h in your code. It is easily corrected by replacing the incorrect version in malloc.h with the correct version from kernel.h.

Just thought you might like to know.....

---

7/25/96 7:45 PM

Re(2): section attributes for functions

Montgomery Singman

Mike Fulton

OS / Architecture

OS / Architecture

by putting functions into sections, i can put sections into groups. This should be a way to get the linker to put them close to each other in memory. I am hoping to improve I-cache latency.

In it simplest form I could get several small functions which call each other within 4K.

In general if we can put functions into sections we can org them. Then we can control the placement of data and code.

extern void update\_col0\_\_attribute\_\_((section(".boo"))); complise without error or warning, but does not produce section .boo

ps the gcc.inf file says that functions can be put into sections if user defined sections are available.

---

7/25/96 6:08 PM

Re: section attributes for functions

Mike Fulton

OS / Architecture

OS / Architecture

While \_\_attribute\_\_(section("section\_name")) is working fine for data, I can't seem to get it working for routines. Is there some obvious thing I am overlooking? How do I do this?

Huh? I don't understand... what exactly are you trying to do with the "\_\_attribute\_\_" keyword.

Why would you want it to work on a function instead of a variable? Chances are you're going about something the wrong way. Please let us know in detail what you are trying to accomplish.

Mike

---

7/25/96 4:00 PM

section attributes for functions

Montgomery Singman

OS / Architecture

OS / Architecture

While \_\_attribute\_\_(section("section\_name")) is working fine for data, I can't seem to get it working for routines

Is there some obvious thing I am overlooking?

How do I do this?

---

7/26/96 8:31 AM

Re(3): section attributes for functions

Ayo A. Orimoloye

OS / Architecture

Mike Fulton

OS / Architecture

Montgomery Singman writes: by putting functions into sections, i can put sections into groups. This should be a way to get the linker to put them close to each other in memory. I am hoping to improve I-cache latency.

Yesssss, I would be very interested as to how to accomplish this as well. I have a LOT of assembly routines and it is simplicity itself to use the SECTIONs to improve their I-cache latency by shuffling them around in the LINKER COMMAND FILE but I am totally stumped as well when it comes to trying to do the same thing with C routines. And unfortunately, the assembly code is called from the C code so I can't "just get rid of the C", much as I'd love to.....

A nice example showing a typical makefile or linker command file for a typical C function (such as "main") which has been "SECTIONed" would be handy (yeah I know it's wishful thinking).

---

7/26/96 9:57 AM

Re(3): section attributes for functions

Mike Fulton

OS / Architecture

OS / Architecture

By putting functions into sections, I can put sections into groups. This should be a way to get the linker to put them close to each other in memory. I am hoping to improve I-cache latency. In it simplest form I could get several small functions which call each other within 4K. In general if we can put functions into sections we can ORG them. Then we can control the placement of data and code.

```
extern void update_col()__attribute__((section(".boo")));
```

compiles without error or warning, but does not produce section ".boo"

PS: The GCC.INF file says that functions can be put into sections if user defined sections are available.

Well, I wouldn't expect something declared "extern" to create a section... it's just making the compiler aware that this symbol is external and doesn't really affect code generation, except for creating the appropriate symbol in the symbol table.

Is this particular function within the same source code file as the prototype? If so, then there's no need for the "extern". What happens when you cut out the "extern"? Are you using the "\_\_attribute\_\_" on both the prototype and the actual function definition?

This certainly is an interesting an innovative approach to the problem of grouping your functions together for the I-cache. But even if you're doing all this, I would think that the first step should be to group functions together in the same source module. That way there's no question about whether they'd be linked next to each other or not.

Mike

---

7/26/96 9:28 AM

Re(2): section attributes

Borden Covell II

Mike Fulton



OS / Architecture

OS / Architecture

Weel, you are right that myVar is really a static, but it is accessed with the gp register, so I think of it as a global. Does this help?

---

7/26/96 10:21 PM

Re(4): section attributes for functions

Montgomery Singman

Mike Fulton

OS / Architecture

OS / Architecture

your right - i didn't realize.

if one function in a module is called, all functions in that module are linked in the order in which they appear in the source file.

that means that in order to get code close in the memory, i just put them close in the source.

---

7/27/96 4:13 PM

Re(5): section attributes for functions

Ayo A. Orimoloye

Montgomery Singman

Mike Fulton

OS / Architecture

Montgomery Singman writes: your right - i didn't realize.

if one function in a module is called, all functions in that module are linked in the order in which they appear in the source file.

that means that in order to get code close in the memory, i just put them close in the source.

This is true but unfortunately, if the C function calls an ASSEMBLY function (for example if MAIN calls an assembly routine called RENDER), chances are they are nowhere close to each other in memory when linked so it's not possible to simply "cut-and-paste" like this. It would still be nice to have an example of how you can "sectionize" C functions for the linker please. I know the linker is not really a Sony product but an SN Sytems' product but surely someone out there knows how to do it.....

---

7/28/96 11:18 PM

caches and buffers

Montgomery Singman

OS / Architecture

OS / Architecture

dear sir : I could use some clarification of information provided in the 'Run-time Library 3.0/ Overview. Specifically the parts App. B, MainMemory Access ( p.347 )

1) the I cache paragraph 7 implies that no instructions are executed ( read into the cpu ) until all 4 words are read. that would mean that it takes 11 cycles to execute 4 instructions. is that correct? i am hoping that as soon as an instruction is valid, it is read to the cpu, taking 8 cycles for 4 instructions.

2) R buffer here it clearly states that ALL reads take five cycles. this does not correspond with my reading of section Page crossing of the Access timing table do all data reads take 5 cycles?

3)W buffer paragraph 8 states that write operation timing is not generally guaranteed. I can live with that. This section implies that a write operation takes five cycles- 1 to write to the W buffer, and 4 to write to Ram. again, the acces timing table indicates otherwise!

4)Scratch pad no questions here- as straightforward as i could want!

5)Page crossing para 1 ok ok, no contradiction with section 1. para 2 precisely what is meant by 'second or subsequent read'? consecutive addresses? addresses with the same a10-a31? implies that 'second or subsequent read's take only 1 cycle! this implication agrees with the table, but conflicts with section 2! para 3 more-or-less the same situation as section 5,para 2 the clear implication here is that writes to the same page take 1 cycle to write to the buffer, and 2 cycles to write to ram 3 cycles for same page cpu-ram,5 cycles for new page cpu-ram agrees w/ table, conflicts w/ section 3

Access timing in general, this table is slightly more optomistic that the coresponding preceeding text!

A little ( a big ) bit of clarification on these apparent contradictions would greatly assist in optomization! the compiler doesn't seem to be aware of these timing constraints!

thank you Tod Frye,CAPCOM USA

---

7/28/96 4:34 PM

Re(6): section attributes for functions

Montgomery Singman

Ayo A. Orimoloye

Mike Fulton

OS / Architecture

you can always just put chunks of C code in a section with the -WaS directive. this will work. in put the functions you want in one file and compile with -waS.

nonetheless, GNU C implies that the \_\_attribute\_\_(section())) will work, and it would be nice.

---

7/29/96 5:39 PM

Seem to be missing VSyncs -- URGENT

Sam Black

LIBGPU/GTE

OS / Architecture

We've recently found a bug in our product (due to go to Sony for approval very soon) which manifests itself as a SEVERE slowdown in the game. My initial investigations lead me to believe that something happens to cause us to miss the VSync interrupt. I have been unable to look at this in the debugger, since as soon as the bug manifests when running in the debugger, the entire system locks up and needs to be rebooted (running in a DOS box under Win95). The bug is also very difficult to reproduce, so I'm not sure what is happening immediately beforehand to trigger the behavior. However, I feel certain that what ends up happening is that we begin missing several VSync interrupts (we get approx. every tenth VSync -- If our framerate counter is reporting 10fps, we're seeing about 1fps).

What might cause our VSync handler to not be called at 60hz? Except during program startup, there are no calls to EnterCriticalSection anywhere. Any ideas that might help me track down what is going on would be greatly appreciated.

---

7/29/96 12:00 PM

CdRead failures

Mark A. Fong  
OS / Architecture

OS / Architecture

Hi,

I'm trying to go final, but am being held up by a nasty bug where CdRead() is not reading big files (> 300K) properly. Basically, the way we found this bug is we direct seek to all of our data files and added a checksum to verify that every bit of info read in is correct. Most of the time (99%) it works fine, but every once in a while, the checksum fails. We tried looping back and retrying on checksum failures, but it then seems to hang.

The way I see it is that the CD system is getting trashed somehow. I thought I might have been writing over something, but then I moved the libcd.lib around in my link file and it still happens so it seems unlikely that that is the problem. So I was wondering if there is some interrupt conflict that could cause this. I don't set any callbacks myself, so a conflict would need to come from the OS. I do use the libSPU and libSND functions, as well as InitPAD stuff.

Any help or advice would be much appreciated.

Thanks,

Mark A. Fong

---

7/29/96 10:09 AM

Re: caches and buffers

Dylan Cuthbert

Montgomery Singman

OS / Architecture

OS / Architecture

Montgomery Singman writes: dear sir : I could use some clarification of information provided in the 'Run-time Library 3.0/ Overview. Specifically the parts App. B,MainMemory Access ( p.347 )

1) the I cache paragraph 7 implies that no instructions are executed ( read into the cpu ) until all 4 words are read. that would mean that it takes 11 cycles to execute 4 instructions. is that correct? i am hoping that as soon as an instruction is valid, it is read to the cpu, taking 8 cycles for 4 instructions.

Isn't the I-cache read in 'lines' which means that no instructions are executed until the entire line has been read in?

2) R buffer here it clearly states that ALL reads take five cycles. this does not correspond with my reading of section Page crossing of the Access timing table do all data reads take 5 cycles? All reads take 5 cycles as far as I know. It takes 4 cycles to read from main ram and then 1 cycle to read from the R buffer. (basically there isn't a data cache)

Try to utilize the scratchpad as much as possible!

3)W buffer paragraph 8 states that write operation timing is not generally guaranteed. I can live with that. This section implies that a write operation takes five cycles- 1 to write to the W buffer, and 4 to write to Ram. again, the access timing table indicates otherwise!

5-2-2 (for consecutive writes without a page break)

(arrange your writes to ram in four long word bursts for optimum speed)

Dylan Cuthbert Sony Interactive Studios America

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7/30/96 11:10 AM

Re(2): SetConf fails in 3.5

Borden Covell II  
Rob Vawter  
BUGS

OS / Architecture

We are not trying to change the stack pointer. we only change the number of tchs.

---

7/30/96 10:23 AM

Re(2): Seem to be missing VSyncs -- URGENT  
Sam Black  
Rob Vawter  
LIBGPU/GTE

OS / Architecture

We have not ourselves installed any other handlers. I don't know if any get installed by the libraries. The bug appears both on our CD builds (using the CD filesystem, etc.) and our development builds (using the host PC filesystem in place of the CD).

Our intention was that the only processing done in an interrupt context is what is called from the vsyncHandler -- this includes swapping buffers (PutDrawEnv and PutDispEnv) checking for drawing completion (DrawSync(1) -- non-blocking), and reading the controllers. 99% of the time we have no problem, but then something happens and we just don't get the VSyncs. Is there any way to tell what the PSX is doing during this time given that the debugger seems useless (since it cannot talk to the target once the bug manifests)?

---

7/30/96 10:14 AM

Re: Seem to be missing VSyncs -- URGENT  
Rob Vawter  
Sam Black  
LIBGPU/GTE

OS / Architecture

What might cause our VSync handler to not be called at 60hz?

Do you have some other callback or interrupt which may be taking too long to process?

---

8/1/96 8:57 PM

Re(2): caches and buffers  
Montgomery Singman  
Mike Fulton  
OS / Architecture

OS / Architecture

sorry for the perhaps excessive ambiguity in my request for clarification.

when i used section numbers i was referring to sections of Appendix B, Main Memory Access, Buffer Memory. by 'section 1', i meant the section labeled I cache, section 2- R buffer, section 3- Wbuffer, and so on.

the confusion arises from the fact that the section labeled R buffer and W buffer make no mention of the fact that second and subsequent accesses are faster if there is no 1k page fault! R buffer, paragraph 1, sentence 3 clearly states "Therefore, total latency for a data read is five cycles.". Similarly, W buffer, paragraph 8, sentence 1 indicates that all writes take five cycles to reach main ram. Further reading brings us to Page crossing, which brings up 'second and subsequent', and Access timing, which gives times for reads and writes, and second and

subsequent reads and writes.

Because there is NO mention of the faster access within 1 page in the sections specifically documenting the buffers, there is a contradiction in this documentation, as it is currently written! Basically it seems that the Access timing table is (almost entirely) correct, and lack of mention of second and subsequent reads confused only me!

thanks. I feel better now, and am (somewhat) more confident that I can design around limitations in an informed manner.

thank you Tod Frye CAPCOM, USA

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8/1/96 12:23 PM

Re: caches and buffers

Mike Fulton

OS / Architecture

OS / Architecture

dear sir : I could use some clarification of information provided in the 'Run-time Library 3.0/ Overview. Specifically the parts App. B, MainMemory Access ( p.347 )

1) the I cache paragraph 7 implies that no instructions are executed ( read into the cpu ) until all 4 words are read. that would mean that it takes 11 cycles to execute 4 instructions. is that correct? I am hoping that as soon as an instruction is valid, it is read to the cpu, taking 8 cycles for 4 instructions.

No instructions are executed until the entire line has been read. This takes between 4 and 7 ticks. So the first instruction will execute in somewhere from 5 to 8 ticks.

2) R buffer here it clearly states that ALL reads take five cycles. this does not correspond with my reading of section Page crossing of the Access timing table do all data reads take 5 cycles? The first reads from a particular page of RAM take 5 cycles... 4 to fill the R buffer and another 1 to get the data into the CPU from there. However, subsequent reads are faster.

In the "Access Timing" table below that, the entry to look at is the 3rd one down, "main memory to CPU", which does say 5 (4+1) cycles. Additional reads that take place subsequently, with no intervening page faults, will only take 2 cycles... 1 to fill the R buffer and 1 to move it to the CPU.

There may be some confusion due to the fact that the table doesn't break down the steps of "RAM to R Buffer" and "R buffer to CPU" the way it does for the "W buffer" stuff. And it sort of implies that the entire operation takes 1 cycle for subsequent reads when it means just the "RAM to R Buffer" step.

We'll probably fix that in the documentation revision we're working on. In the meantime, replace the "main memory to CPU" entry with the following text and things may become more clear.

R buffer to CPU 4 1 main memory to R buffer 4 4 1 (second and subsequent read operations in a series)

Another thing to note. I don't think it really says this explicitly in the docs, but I'm pretty sure that the instruction queue and CPU data read/write operations share the same pipeline to RAM as far as page faults are concerned. That is, if your code is running from RAM and not the I-cache, then you'll get a page fault when you execute an instruction from one page, then read or write data to a different page. I think you get a page fault each time you go back and forth like this. Since your code and data are unlikely to be in the same page very often, you'll get a LOT of page faults... the moral of this story is: keep that code in the I-cache!

3)W buffer paragraph 8 states that write operation timing is not generally guaranteed. I can live with that. This section implies that a write operation takes five cycles- 1 to write to the W buffer, and 4 to write to Ram. Again, the access timing table indicates otherwise!

The "Access Timing" table indicates that it takes 1 cycle to write to DRAM where it says "CPU to W Buffer". The next entry, "W buffer to main memory" says it takes 4 cycles to write from the W

buffer to DRAM. That's a total of 5 cycles... what's the confusion? If you keep writing to the same page, then the "W buffer to main memory" step jumps down to 2 cycles instead of 4; is this what you mean?

4)Scratch pad no questions here- as straightforward as i could want!

5)Page crossing para 1 ok ok, no contradiction with section 1. para 2 precisely what is meant by 'second or subsequent read'? Accessing the same 1 kilobyte page again, without having read or written anything to any other address range in the mean time. consecutive addresses? Not necessarily. addresses with the same a10-a31? No... a page is a 1 kilobyte region... so addresses 0x00000000 to 0x000003FF would be one page, addresses 0x00000400 to 0x000007FF are the next page, and so forth. implies that 'second or subsequent read's take only 1 cycle! This is correct. this implication agrees with the table, but conflicts with section 2! Section 2? Please be more precise. I don't know where you mean. Please provide a page number and section name.

para 3 more-or-less the same situation as section 5,para 2 the clear implication here is that writes to the same page take 1 cycle to write to the buffer, and 2 cycles to write to ram The first write takes 1+4 cycles, additional writes to the same page take 1+2 cycles. (By "1+4" I mean that it's 1 cycle to write to the W buffer and 4 cycles to write from the W buffer to DRAM.) 3 cycles for same page cpu-ram,5 cycles for new page cpu-ram agrees w/ table, conflicts w/ section 3 Again, you're not precise enough. What do you mean by section 3? Please provide a page number and section name.

Access timing in general, this table is slightly more optimistic than the corresponding preceding text!

Well, there is the bit of confusion I mentioned earlier (where I provided the replacement text) but otherwise, as far as I can tell, this table agrees 100% with the preceding text.

A little ( a big ) bit of clarification on these apparent contradictions would greatly assist in optimization! the compiler doesn't seem to be aware of these timing constraints!

thank you Tod Frye,CAPCOM USA

Well, I hope I've answered more questions for you than I've created.

Mike Fulton @ SCEA

---

8/12/96 3:41 PM

Re: SetConf fails in 3.5

Robert w. Calfee

Borden Covell II

BUGS

OS / Architecture

I'm also using the multi-thread functions, and I'm going to hold off upgrading until I see a post that addresses this problem.

rcw

---

8/20/96 7:20 PM

Re: Org at 800010000

Adrian Jones

OS / Architecture

OS / Architecture

David Vronay writes: Can anyone tell us again why we org programs at 80001000 as in the examples rather than 00001000. In the overview I cache is supposed to be effective in both. ?

This has been bugging me too. What has been bugging me more is why we are using different

orgs for code that doesn't seem appreciably different (in the examples)  
AJ

---

8/22/96 8:17 AM  
Re(2): Org at 800010000  
Ayo A. Orimoloye  
Adrian Jones  
OS / Architecture

OS / Architecture

I-cache is valid for 80000000 to 80200000 (which is a 2MB range for the target PlayStation). 00000000 to 00200000 is also valid but rarely used probably because most people are "used" to the "8s" thanks to the Sony examples. The bottom 64K is used by the Kernel so you find programs usually start at 80010000 (NOTE: not 800010000!). If your program is small, you can usually "ORG" it anywhere above this address (80020000, 80040000), which is what they've done in many cases in the Sony examples. Of course on the dev station you have 8MB so you can have I-cached addresses 80000000 to 80800000 or 00000000 to 00800000. The default stack grows down from the top (80200000 or 80800000 depending on if you're using the dev system or target machine).

Incidentally, all this information is in the manuals and the PlayStation Developer's Guide (which I think is in Conferences/ Tools, Docs & Info/ Docs/ Tech Notes ) and it's always a good idea to look in these first when you have a question like this.....

---

8/22/96 1:44 PM  
GTE Specifications  
Paul Masters  
LIBGPU/GTE  
Developer Support

OS / Architecture

I'm bothered by the lack of nRT macro nop nop dw \$000000ff endm in inline\_a.h. Is there a reason for this? The \$000000ff comes from INLINE\_C.H, so I can only assume this is valid. Why are only the commands in inline\_a.h included in the GTE Specifications?

The following is a list of commands that seem to be being referenced directly as GTE commands. These come from the inline\_ files from run-time library 3.5. Where are the specifications for these commands?

I've excluded the commands that are actually in the GTE Command Reference. As you can see, there are 61 commands that have no (direct) specifications for them. Some of them are partially referenced (OP, GPF, GPL), but not in the form that they are used (OP0, OP12, GPF0, GPF12, GPL0, GPL12). When are these specifications going to be published, and why haven't they already been published?

```
rt rtv0 rtv1 rtv2 rtir rtir_sf0 rtv0tr rtv1tr rtv2tr rtirtr rtv0bk rtv1bk rtv2bk rtirbk rtv0fc rtv1fc
rtv2fc rtirfc ll llv0 llv1 llv2 llir llv0tr llv1tr llv2tr llirtr llv0bk llv1bk llv2bk llirbk llv0fc llv1fc
llv2fc llirfc lc lcv0 lcv1 lcv2 lcir lcv0tr lcv1tr lcv2tr lcirtr lcv0bk lcv1bk lcv2bk lcirbk lcv0fc lcv1fc
lcv2fc lcirfc dpcl - DCPL? sqr12 sqr0 op12 op0 gpf12 gpf0 gpl12 gpl0
```

\*Pablo

---

8/23/96 3:59 PM  
Re: GTE Specifications

Mike Fulton  
Paul Masters

OS / Architecture

Pablo @ American Laser Games asks...

I'm bothered by the lack of (the equivalent of)

```
nRT macro nop nop dw $000000ff endm
```

in inline\_a.h. Is there a reason for this? The \$000000ff comes from INLINE\_C.H, so I can only assume this is valid. Why are only the commands in inline\_a.h included in the GTE Specifications? The following is a list of commands that seem to be being referenced directly as GTE commands. These come from the inline\_ files from run-time library 3.5. Where are the specifications for these commands? I've excluded the commands that are actually in the GTE Command Reference. As you can see, there are 61 commands that have no (direct) specifications for them. Some of them are partially referenced (OP, GPF, GPL), but not in the form that they are used (OP0, OP12, GPF0, GPF12, GPL0, GPL12). When are these specifications going to be published, and why haven't they already been published?

```
rt rtv0 rtv1 rtv2 rtir rtir_sf0 rtv0tr rtv1tr rtv2tr rtirtr rtv0bk rtv1bk rtv2bk rtirbk rtv0fc  
rtv1fc rtv2fc rtirfc ll llv0 llv1 llv2 llir llv0tr llv1tr llv2tr llirtr llv0bk llv1bk llv2bk llirbk  
llv0fc llv1fc llv2fc llirfc lc lcv0 lcv1 lcv2 lcir lcv0tr lcv1tr lcv2tr lcirtr lcv0bk lcv1bk lcv2bk  
lcirbk lcv0fc lcv1fc lcv2fc lcirfc dpcl - DCPL? sqr12 sqr0 op12 op0 gpf12 gpf0 gpl12 gpl0  
*Pablo
```

-----  
Correction on my last rant... OP, GPF, GPL, and SQR do support the 0 and 12 formats... Just missed that on my first read through. Still concerned about the rest of those functions, though.  
\*Pablo

-----  
We will forward your questions to the engineers at SCEI and let you know when we've got a response.  
Mike

---

9/3/96 3:44 PM  
Threads, SetConf() in lib 3.5  
Rob Vawter  
Borden Covell II

OS / Architecture

Borden et al,

Enjoy this post from Okamoto. Hope it works for you.

BEGIN POST: "magic value" is 0x404, not changed, and the thread mechanism works fine.

Attached, please find the sample program.

The bug that SetConf in libapi(library 3.5) requiring to skip 4th or 7th thread has been fixed. Instead it can now allocate fewer threads. When it is set to "SetConf(10,5,0x00)" in a program, for example, number of thread that can be opened is 4. The first thread structure is used for the main flow(Psx.EXE).

With SetConf(), approximately 10 threads can be allocated. If more than 10 threads are required, use the method attached. (I have mailed you before). -- thread sample -----

```
----- #include <r3000.h> #include <asm.h> #include <kernel.h> #include  
<sys/types.h> #include <libetc.h>  
long sub_0(); long sub_1(); long sub_2(); long sub_3();  
static long color; static long master;
```



```

long th[5]; static struct ToT *tot = (struct ToT *)0x100;
main() { struct TCB *q,*p = (struct TCB *) tot[2].head; struct TCBH *h = (struct TCBH *)
tot[1].head; unsigned long n,i,gp,*addr,sr;
  SetConf(10,5,0x00);
  master = 0xff000000; /* thread 0. this main flow */
  gp = GetGp(); EnterCriticalSection(); th[0] = OpenTh( sub_0, 0x80100000, gp); th[1] =
OpenTh( sub_1, 0x80110000, gp); th[2] = OpenTh( sub_2, 0x80120000, gp); th[3] = OpenTh(
sub_3, 0x80130000, gp); ExitCriticalSection();
  for (i = 0; i < 4;i++) printf(" th No %d %x %d addr %x\n", i, th[i],th[i],p+(0xffff&th[i]));
  p = (struct TCB *) tot[2].head; h = (struct TCBH *) tot[1].head; /** set magic number **/ for
(i = 0; i < 4 ; i ++ ) { n = th[i] & 0xffff; q = p + n; q->reg[R_SR] = 0x404; } i = 0; while
(1) { printf("go to %d ", i); ChangeTh(th[i++]); if (i > 3) i = 0; }}
#define COUNT 3000000
long sub_0() { long count; while (1) { printf("Sub_0 \n");count = COUNT;while(count--);
ChangeTh(master); }}
long sub_1() { long count; while (1) { printf("Sub_1 \n");count = COUNT;while(count--);
ChangeTh(master); }}
long sub_2() { long count; while (1) { printf("Sub_2 \n");count = COUNT;while(count--);
ChangeTh(master); }}
long sub_3()
  long count; while (1) { printf("Sub_3 \n");count = COUNT;while(count--);
ChangeTh(master); }}
-- many thread sample -----

```

It is not able to allocate 60 threads area in system memory. Therefore it is must be allocated 60 TCB(thread control block) area in the begining of application and managed this area without distroy by application programmer.

The following is sample code. ---- sample code -----

```

#include <kernel.h>
struct ToT *systot = (struct ToT *) 0x100; /* Table of Tables */
#define Th_Num 60 /* number of Thread */
struct TCBH *headTCBH; struct TCB *headTCB,*t0,*end; int size;
EnterCriticalSection();
/* allocate TCB area */ size = sizeof(struct TCB) * Th_Num; if ((headTCB = (struct TCB *)
malloc (size)) == NULL) { printf("Can't malloc \n"); exit(-1); }
/* set TCB status */ for (t0 = headTCB,end = headTCB+Th_Num;t0 < end;t0++) t0->status =
TcbStUNUSED; headTCB->status = TcbStACTIVE;
/* set current TCB */ headTCBH = (struct TCBH *) systot[1].head; headTCBH->entry =
headTCB;
/* set TCB chain */ systot[2].head = (unsigned long *) headTCB; systot[2].size = size;
ExitCriticalSection();

```

9/5/96 8:58 AM

Re: Threads, SetConf() in lib 3.5

Borden Covell II

Rob Vawter

OS / Architecture

OS / Architecture

Thank you for the info. I have removed the code that "fixed" the old problem and the game runs OK now.

However, I did notice one thing. The number of tcbs returned by the GetConf routine does not match the number I have requested. The OS starts with 4, I ask it to make it 8 and it tells me there are 16. I am ignoring this for now but wonder if it might not indicate some sort of a

problem.  
Thanks again. See ya in a few weeks (?) at the seminar?  
Borden

---

10/7/96 1:13 PM  
Booting from OS Menu  
Chris E. Reese  
OS / Architecture

OS / Architecture

We have just recently noticed that if we boot our program from the PSX OS menu, where you can do memory card management and play music cd's, our movies will play with garbage mixed in with the image. It looks as though they aren't decompressing correctly. This is not a problem when you boot the PSX with the disc in the machine. Any ideas of what may be causing this? We do a resetcallbacks at the very beginning of the program along with the standard graphics initialization.  
Chris Reese Eidetic, Inc.

---

10/8/96 10:43 AM  
Re: Booting from OS Menu  
Mike Fulton  
OS / Architecture

OS / Architecture

We have just recently noticed that if we boot our program from the PSX OS menu, where you can do memory card management and play music cd's, our movies will play with garbage mixed in with the image. It looks as though they aren't decompressing correctly. This is not a problem when you boot the PSX with the disc in the machine. Any ideas of what may be causing this? We do a resetcallbacks at the very beginning of the program along with the standard graphics initialization.  
Chris Reese @ Eidetic, Inc.

Chris, I have two ideas which may help.

- 1) Relying on memory to be zeroed out when it has not been zeroed out explicitly by your program. Use memset() at the start of your program to clear out your buffers.
  - 2) Not resetting the MDEC before starting. If you don't do this, then the quantization tables won't necessarily be correct and you could get the garbage results. Make sure you do DecDCTReset(0) before you start your movies.
- Mike @ SCEA
- 

10/10/96 2:04 PM  
Re(2): Booting from OS Menu  
Jay Stelly  
Mike Fulton  
OS / Architecture

OS / Architecture

Chris, I have two ideas which may help.

1) Relying on memory to be zeroed out when it has not been zeroed out explicitly by your program. Use memset() at the start of your program to clear out your buffers.

So, if we want to zero out our BSS section, how can we calculate it's address and size at runtime?

Jay Stelly Tetragon

---

10/11/96 8:39 PM

Re(3): Booting from OS Menu

Brian Dawson

OS / Architecture

OS / Architecture

You can obtain the address of your BSS group at assembly level. Create an external assembler file that derives this from a call to the group(BSS) instruction. For further details refer to the Dev Conference Seminar Notes on Overlays. The Address File does basically that. Also check the Psy-Q Dev Environment Manual.

Brian Dawson@SCEA

---

10/13/96 5:07 AM

Re(3): Booting from OS Menu

Mike Fulton

OS / Architecture

OS / Architecture

So, if we want to zero out our BSS section, how can we calculate it's address and size at runtime?

Jay Stelly @ Tetragon

Jay, I didn't really have in mind the BSS section as an area that might not be cleared out.

Provided you're not using 2MBYTE.OBJ or 8MBYTE.OBJ (PLEASE DON'T USE THESE!!!!!!!!!!!!!!!!!!!!!!) then the BSS will get cleared by the runtime startup.

Mike

P.S. Don't use 2MBYTE.OBJ or 8MBYTE.OBJ because these contain INCOMPLETE versions of the startup code that do not initialize everything they should, and they will NOT work right with C++. Instead, use your own variable declaration to control the RAM size used by the heap:

```
_ramsize=0x00100000; /* 1MB ram */ or _ramsize=0x00200000; /* 2MB ram */ or  
_ramsize=0x00800000; /* 8MB ram */
```

I know that these object modules were provided as short cuts in the past, but really, they are a BAD idea.

---

10/14/96 2:44 AM

Cold and Warm boot

Lobotomy Software

OS / Architecture

OS / Architecture

When my game boots on a blue playstation, the usual SONY logo appears, then an ugly SONY logo appears, then my code takes over and sets up the pages in VRAM it intends to use which almost always causes the playstation to display part of the ugly SONY logo on the screen while I load the first intro screen from CD.

My question is very general, but, what is a good method for taking control of the playstation after a cold and warm boot. Can I rely on any of the systems being initialized (sound, graphics, cd)? should I blank out the screen until I have generated my first frame? What differences occur during a warm boot (reset)? Why is there an ugly logo on the blue station? Etc...

If anyone has any suggestions for making a clean entry into a first screen, I would really appreciate the help...

thanks,  
Jeff Blazier

---

10/15/96 12:06 PM

Re(5): Booting from OS Menu

Mike Fulton

Jay Stelly

OS / Architecture

OS / Architecture

We're not linking with those, so that takes care of the main BSS, but not the overlays. I should be able to obtain the addresses of the BSS sections for the overlays with assembler directives as Brian Dawson mentioned. e.g.:

```
Level1BSS dw group(LEV01.bss) Level1BSEnd dw groupend(LEV01.bss)
```

Since the OS doesn't actually load overlays I'm assuming that their BSS is not cleared, is that correct (empirical data suggests this is the case).

Thanks,  
Jay Stelly @ Tetragon

Jay, since your program is responsible for loading overlays, and since they do not have their own startup code per se, then you are responsible for clearing the overlay BSS.

Mike

---

10/15/96 12:45 PM

Re: Cold and Warm boot

Mike Fulton

OS / Architecture

OS / Architecture

When my game boots on a blue playstation, the usual SONY logo appears, then an ugly SONY logo appears, then my code takes over and sets up the pages in VRAM it intends to use which almost always causes the playstation to display part of the ugly SONY logo on the screen while I load the first intro screen from CD.

My question is very general, but, what is a good method for taking control of the playstation after a cold and warm boot. Can I rely on any of the systems being initialized (sound, graphics, cd)? should I blank out the screen until I have generated my first frame? What differences occur during a warm boot (reset)? Why is there an ugly logo on the blue station? Etc...

If anyone has any suggestions for making a clean entry into a first screen, I would really appreciate the help...

thanks, Jeff Blazier

While "ugly Sony logo" isn't very specific, I suspect what's happening here is that you have not included LICENSEA.DAT when making your disc. Normally, you should see the SCE logo followed by the PlayStation logo with the licensing text, on either a cold boot (power-on) or warm boot (reset pressed).

To include LICENSEA.DAT file on your disc properly, you must specify it in a special dialog box in CDGEN, not include it as part of your directory structure. To do this, from the main opening screen of CDGEN, click on the "Additional Information" button. In the small dialog that appears, you must enter the pathname to LICENSEA.DAT in the "System Area File" field.

Mike

---

10/15/96 11:04 PM

Re(2): Cold and Warm boot

Lobotomy Software

Mike Fulton

OS / Architecture

OS / Architecture

Thanks for the quick response...

I'll try to find and burn the file on my next CD...

-Jeff Blazier

---

10/15/96 10:40 AM

Re(4): Booting from OS Menu

Jay Stelly

Mike Fulton

OS / Architecture

OS / Architecture

Jay, I didn't really have in mind the BSS section as an area that might not be cleared out.

Provided you're not using 2MBYTE.OBJ or 8MBYTE.OBJ (PLEASE DON'T USE THESE!!!!!!!!!!!!!!!!!!!!!!) then the BSS will get cleared by the runtime startup.

We're not linking with those, so that takes care of the main BSS, but not the overlays. I should be able to obtain the addresses of the BSS sections for the overlays with assembler directives as Brian Dawson mentioned: e.g.:

```
Level1BSS dw group(LEV01.bss) Level1BSEnd dw groupend(LEV01.bss)
```

Since the OS doesn't actually load overlays I'm assuming that their BSS is not cleared, is that correct (empirical data suggests this is the case).

Thanks,

Jay Stelly Tetragon

---

10/24/96 11:07 AM

Re: return from .exe

Mike Fulton

OS / Architecture

OS / Architecture

I am using Exec to execute a .exe file ( loads fine ). No problems starting .exe file up, but I can't seem to get it to return! I suppose this is similar to the live parent samples. It seems to be related to the stack. What procedure am I supposed to use to call and return from a .exe?

P.S. I would prefer to use overlays, but my boss won't let me!

Andrew Ayre

Andrew, first of all, is the child process using the same stack as the parent? If not, is it using the same memory for the stack as the parent? (i.e. the first idea is the child using the stack it gets as-is without changing the pointer at all, the 2nd idea is the child resetting the stack to the original starting position that is the same as what the parent set. The 2nd idea does not preserve the stack information that the parent needs to resume operation.)

I would presume that the child process does not overlap the memory space of the parent, right? Otherwise there is no way to return to the parent other than by having the child load and exec it.

Mike

---

10/24/96 9:39 AM

return from .exe

Andrew Ayre

OS / Architecture

OS / Architecture

I am using Exec to execute a .exe file ( loads fine ). No problems starting .exe file up, but I can't seem to get it to return !

I suppose this is similar to the live parent samples. It seems to be related to the stack.

What procedure am I supposed to use to call and return from a .exe?

P.S. I would prefer to use overlays, but my boss won't let me!

---

10/24/96 12:35 PM

Re(2): return from .exe

Andrew Ayre

Mike Fulton

OS / Architecture

OS / Architecture

1) child process is org'ed at 80010000 and is less than 64k ( i am reduced to using small test routines ) 2) parent process is org'ed a 80400000 ( 4meg - i thought this should be safely out of the way ! )

in any case what i am seeing is that the .exe starts at \_\_SN\_ENTRY\_POINT.

\_\_SN\_ENTRY\_POINT ends w/ jal main nop break \$1

it seems as if main is returning to its calling address and hitting the break! ( stand-alone or child process )

i am trying to use the parent stack - how else could i expect the .exe to return to Exec, and from there to my call to Exec?

i have tried leaving exec\_head.s\_addr at 0, and tried setting it to the base address of the parent stack.

assuming that i wasn't going to hit the break at the end of \_\_sn\_entry\_point, what should i be setting s\_saddr to?

---

## PAL

10/16/95 6:58 PM

latest archive  
chris m. coffin  
UK BBS

PAL

Just wondering when the next archive(7/95 - 10/95) for the uk bbs will be posted here Very interesting inquiries over there....

---

2/20/96 2:19 PM

still No color on monitoe screen  
Dave Elton  
PAL

PAL

I am trying to convert my program to PAL version. I switch the jumper on PC/ISA board from NTSC to PAL and also set the pad element in my display structure to 1 (for soft switch), still there's no color on my monitor screen. I did notice that the displaying color bar changes into black and white and also the vertical scan line changes from 525 to 625 because my displaying area shift downward a little bit. But why still I cannot get any color output. Do I need to download new libspu and libsnd to get color output for the PAL mode?  
Simon ReadySoft Inc.

---

2/21/96 3:42 PM

Re(2): still No color on monitoe screen  
Dave Elton  
PAL

PAL

I am using lib3.1, do you know which version has the SetVideoMode() function you mentioned? BTW, I guess what I meant in my last message is if I don't have a pal monitor, should I get color display even after I did both hard and soft switch to PAL mode ( by switch the PAL/NTSC jumper on dev board and set pad0 in display structure to 1) ?  
Simon ReadySoft Inc.

---

2/21/96 11:08 AM

Re: still No color on monitoe screen  
Mark D. Lyons  
PAL

PAL



I ran into the same thing. The older versions of the libraries used the pad field in the display structure. The newer versions have a SetVideoMode() function. After your ResetGraph(), do a SetVideoMode(MODE\_PAL). You then set up the display structure as normal and don't mess with the pad field.

Mark

---

3/3/96 6:45 PM

Re(3): still No color on monitoe screen

Tim L. Lowery

PAL

PAL

<< I am using lib3.1, do you know which version has the SetVideoMode() function you mentioned? BTW, I guess what I meant in my last message is if I don't have a pal monitor, should I get color display even after I did both hard and soft switch to PAL mode ( by switch the PAL/NTSC jumper on dev board and set pad0 in display structure to 1) ? >>

I don't think you can see color when you look at PAL on an NTSC monitor. And the sync should be off as well.

By the way, for anybody doing a PAL version, you can view PAL on any AV Macintosh with any QuickTime program like Fusion Recorder that lets you preview live video and lets you set the Video Input Settings.

Dave Howell Pablo Media

---

4/11/96 9:44 AM

warning.tim

Dave Elton

PAL

PAL

Does anybody know where I can download the abti-piracy screen warning.tim file? Do I have to program to load this screen at the beginning of the game or should I put it in somewhere in system area like licensee.dat and it will load up when the game boot up? In other words, is there any program to load up this screen I can use provided by SONY?

Simon ReaduSoft Inc.

---

4/11/96 11:00 AM

Re: warning.tim

Rob Vawter

Dave Elton

PAL

PAL

Does anybody know where I can download the abti-piracy screen warning.tim file? In this conference, in the PAL Docs folder, there is a message dated 11\4\95 labeled Template for SCEE Anti-piracy.

Do I have to program to load this screen at the beginning of the game or should I put it in somewhere in system area like licensee.dat and it will load up when the game boot up? You must load the warning from within you game code, right after the PSX logo.

In other words, is there any program to load up this screen I can use provided by SONY? No.

---

6/28/96 11:58 AM

Re: still No color on monitoe screen

Mark Slemko

PAL

PAL

you need to use the call SetVideoMode(MODE\_PAL): somewhere at the beginning of your code.

It works... you don't need the pad bit set. It seems to do nothing.

---

9/27/96 12:39 AM

PAL Q&A

Paul Holman

PAL

PAL

Hi PAL-people, The process for converting your games to PAL is fairly simple these days (see PALGUIDE.DOC), provided you plan in advance to think about VRAM space and motion capture data.

The policy for answering questions in this area is to contact your local support group (in this case SCEA), who will always be able to help you out.

In cases of dire emergency (submission/QA question), you can E-mail SCEE Developer support - dev\_support@interactive.sony.com - but please mention your SCEE product code and title, and company name so that we know who we're speaking to !

You can also scan our BBS download on the latest CD (1.7), where you'll get the unedited truth about developers in Europe !

Regards,

Paul Holman, Manager, Developer Support

---

## Peripherals

3/21/95 6:36 PM

Multi-player adaptors

Dave Ross

Hardware

Bill "Angus" Guschwan

Any info on four player adaptors? Are they available in Japan? We'd like to get one soon, if possible.

---

3/22/95 10:59 AM

Re: Multi-player adaptors

Bill "Angus" Guschwan

Dave Ross

Hardware

Don't have any of those yet. They will be 4 way units on each control port for up to 8 players.

I'll keep you posted. \ Angus

---

3/22/95 5:26 PM

3rdparty Peripherals

Bill "Angus" Guschwan

SIO

If you are interested in 3rdparty peripherals, here are US contacts for both Ascii and Horiden. It's the old chicken and egg problem: they won't make it until developers use it, developers won't use it until they make it. So tell them to make it.

I have got a name of contact person in ASCII USA as shown below.

Mr. Hide Irie President Ascii Entertainment Software, Inc. 366-A Ladeside Drive Foster City California 94404

Phone: 415.570.6200 x 805 Direct Line: 415.513.5805 Fax: 415.570.6433

Mr. Kazuhiro Yasutomi, President of Horiden U.S.A., Inc. kindly permitted us to introduce Horiden to your licensees. Therefore you can introduce him as a contact. Your licensees can contact directly to him. Horiden USA was established last year, and at the moment, there are only two person, Mr. Yasutomi and his secretary, in the office. But he told that he will hire more people soon.

Followings are the address and telephone number.

Mr. Kazuhiro Yasutomi President Horiden U.S.A., Inc. 17145 Von Karman Ave., Suite 107 Irvine, California 92714 U.S.A. TEL: 714-252-0579 FAX: 714-252-0637

Ms. Kyoko M. Shimizu is his secretary.

According to Mr. Yasutomi, Horiden is planning that they will introduce all of their PlayStation controller in US (for Europe, still under consideration).

---

3/27/95 9:26 PM

A UK BBS Talk On Combat Cable

Administrator

SIO

Here's a dialog I cut out of the UK BBS. Good stuff for the combat cable.  
Angus

From : DIGITAL PSX To : ALL Subj : Serial Link Numb : 174 of 312 Date :  
28/02/1995 12:51pm Read : NO Reference : NONE Conf : 1 - PSX Common  
Private : NO

Hi

I'm trying to write some serial link code and I was using the notes from the developers conference as reference. However, at the top of the page, it says that the code is for version 2.5 of the libraries and that I have to link with SIO.OBJ, but I don't have it.

I'm using libs 2.6 now, but the linker still barfs at things like AddCOMB() so I'm presuming that 2.6 doesn't contain the necessary functions.

Can somebody either please give me the obj file or tell me what I'm doing wrong.

Ta much

Graeme

From : SCE SUPPORT (Support) To : DIGITAL PSX Subj : Serial Link Numb : 179 of 312  
Date : 28/02/1995 4:11pm Read : 01/03/1995 9:38am Reference : 182 Conf : 1 -  
PSX Common Private : NO

-> I'm using libs 2.6 now, but the linker still barfs at things like -> AddCOMB() so I'm presuming that 2.6 doesn't contain the necessary -> functions. -> Can somebody either please give me the obj file or tell me what I'm -> doing wrong.

Well, firstly I have to ask how you're going to test your code without a link cable (unless you've built one yourself).

I have the sio.obj file, but until now I haven't put it on the BBS because it would probably cause more problems than it solves (eg 'What's this sio.obj', 'When can we get a link cable', etc etc).

However, if you've made a link cable (in an enterprising way) you're welcome to sio.obj - give me a shout if you want it.

Allan. From : DIGITAL PSX To : SCE SUPPORT (Support) Subj : Serial Link Numb : 183 of 312  
Date : 01/03/1995 9:43am Read : 01/03/1995 11:20am Reference : 187 Conf : 1 -  
PSX Common Private : NO

Well we've made up a cable, as we need to get the link sorted quickly, but as yet we have not plugged it in!

We used the pin outs listed in the pamphlet that came with the DEX boards

From : DIGITAL PSX To : SCE SUPPORT (Support) Subj : Serial Link Numb : 220 of 312  
Date : 06/03/1995 2:07pm Read : 07/03/1995 11:17am Reference : NONE Conf : 1  
- PSX Common Private : NO

Hi Allan!

Thanks for the serial stuff. A couple of questions though ( aren't there always :-).

Can you tell me what baud rates are available ? AND

What is SONY's policy for games which use the link-up i.e. does the player just select that he wants a link up and the programs has to configure itself as either the master or slave, or can we get the player to specify which machine is in control of the link. Ideally for the player it should be the first alternative, but it's a tad more complex to handle :-)

-- any suggestions would be helpful.

See Ya

Graeme

From : DIGITAL PSX To : SCE SUPPORT (Support) Subj : Re: Serial Link Numb : 229 of 312  
Date : 07/03/1995 10:39am Read : 07/03/1995 11:22am Reference : NONE Conf : 1  
- PSX Common Private : NO

Hi Allan.

Just tried compiling the sample code that you gave us and it doesn't work. I keep getting linker errors and I can't find any way to resolve them. The errors are

COMB.OBJ : Error : Symbol '\_ioabort' not defined COMB.OBJ : Error : Symbol '\_sioopen' not defined

I'm using libs 2.6 so I'm presuming everything is up to date. Could you have a quick check to

see if there was something that you forgot to give me ( or to see if I'm a stupid idiot :-)

Ta much

Graeme

From : SCE SUPPORT (Support) To : DIGITAL PSX Subj : Serial Link Numb : 249 of 312  
Date : 09/03/1995 4:34pm Read : 09/03/1995 5:30pm Reference : 230 Conf : 1 -  
PSX Common Private : NO

-> Can you tell me what baud rates are available ?

As far as I know you can just configure it. I'm out of my depth here, because I've not yet tried linking two machines together. The maximum baud rate is 2073600 bps. Apparently its been tested and runs fine at this speed.

-> What is SONY's policy for games which use the link-up i.e. does the -> player just select that he wants a link up and the programs has to -> configure itself as either the master or slave, or can we get the pla -> to specify which machine is in control of the link. Ideally for the -> player it should be the first alternative, but it's a tad more comple -> to handle :-)

I believe we leave this entirely up to you. I think if we made a decision for you it would be bound not to suit some case somewhere. I could be wrong, since I've not had an official release of serial link software or cables yet.

Allan.

From : DIGITAL PSX To : SCE SUPPORT (Support) Subj : Re: Serial Link Numb : 257 of 312  
Date : 10/03/1995 12:51pm Read : 13/03/1995 9:03am Reference : NONE Conf : 1  
- PSX Common Private : NO

Hi Allan!

Thanks for the serial stuff, we've got the example code up and running now. If we're successful in getting it up and running properly then we'd be happy to help anybody else with any queries that they (or you :-) might have.

TTFN

Graeme

From : SCE SUPPORT (Support) To : DIGITAL PSX Subj : Re: Serial Link Numb : 262 of 312  
Date : 13/03/1995 9:04am Read : 13/03/1995 1:06pm Reference : 274 Conf : 1 -  
PSX Common Private : NO

-> Thanks for the serial stuff, we've got the example code up and runnin -> now. If we're successful in getting it up and running properly then w -> be happy to help anybody else with any queries that they (or you :-) -> might have.

Thanks a lot, thats really helpful. Can you tell me a little about what you're up to? How fast have you got it running ? What kind of protocol have you defined for yourselves (master/slave, packets, whatever). Any other problems I should know about ?

Allan.

From : DIGITAL PSX To : SCE SUPPORT (Support) Subj : Serial Link Numb : 275 of 312  
Date : 15/03/1995 12:15pm Read : 15/03/1995 12:18pm Reference : NONE Conf :  
1 - PSX Common Private : NO

Hi Allan.

We've managed to get a bi-directional link going between our two kits but we've found a problem with data already being in the sio buffer.

If one of our machines tries to connect while other machine is not even runnin the program, these attempts are buffered and instantly reported to the other machine which leaves data still in the buffer.

We've tried using ioctl ( fr, TIOCFLUSH, 0 ) to flush the input buffer when we open it, but it doesn't seem to work. We weren't sure about the third parameter so we left it at 0, but changing it doesn't make a difference.

We'd appreciate any insight that you have into this ( if any ), or any alternative way of flushing the serial buffer.

BTW.. it seems that you can only send a multiple of 8 bytes between the machines, as the serial port keeps anything less than this in it's internal buffer and doesn't trigger the read event ( took us a while to get that one :-)

TTFN

Graeme

From : DIGITAL PSX To : SCE SUPPORT (Support) Subj : Serial Link Numb : 281 of 312  
Date : 16/03/1995 1:33pm Read : 16/03/1995 4:36pm Reference : NONE Conf : 1  
- PSX Common Private : NO

Hi. Just a few questions about the link :-)

We've programmed a system for communication which should cater for a master/slave relationship or a bi-directional link and it works flawlessly when data is being sent one way. When we try to send data both ways it locks the machine. We can't really see a valid reason for this unless the serial link is only half-duplex. Are you able to tell us if the serial connection is full or half-duplex ?

Also according to the documentation the link uses XON/XOFF flow control. This would surely crash when you tried to send binary data as it might interpret your data as either the XON or XOFF character. We've tried to disable it using `ioctl( fd, TIOCRAW, 0)` but it always fails. Any ideas ?

If the link is half-duplex then we're going to have to do a slightly more complex protocol and check that all our writes have finished. This brings me to a question about event queueing. If I set up an event to detect the end of a write and then do 5 writes, will there be 5 events in the queue which will have to be cleared or will I only be notified of the last write ?

As ever, any help that you can give us will be greatly appreciated.

See Ya  
Graeme

---

3/27/95 9:52 PM

ioctl bug? Sorry.

Administrator  
SIO

Dear Angus,

I found a large bug of spec. of `ioctl()` for sio device just before the release of version 3.0 library and deleted it from CD-ROM. (The `ioctl()` can not return any value, but document of libcomb says that it returns some results. The `ioctl()` should store these values to `*arg`.)

Now I am working to update the library but do not have done it. The release of libcomb.lib based on document of version 3.0 would be middle or end of April.

Current version of libcomb is 2.1 which released at the end of February. The difference between version 2.0 and 2.1 is only bug-fix of the sample program you said to me in your mail. Version 2.1 also contains the `ioctl()` spec. bug but you can release it to your licensees. (I have supposed that you have already released it.)

---

4/26/95 2:47 PM

Bi-directional example  
William Botti  
SIO

In order to make E3 w/ combat cable play, we need a working bi-directional code example now! If you have any more info, please send it. Also, can you post the "uni-directional" example you told me about? It would be better than nothing Gracias amigo como siempre CODARE

---

5/1/95 5:48 PM

About Link Cable  
Bill "Angus" Guschwan  
SIO

Now I answer your questions about serial link cable driver.

> I need to sync without sending data because it seems that the link > gets confused if both machines try to send at the same time which > results in deadlock. I suppose so too and am studying electric specification of control lines.

> \* Can the user connect/disconnect the link with the power on? If so is > there a way to detect this. Perhaps ioctl(TIOSTATUS)? Any specific mechanism is not prepared to detect connect/unconnect status. Only DTR/DSR and CTS/RTS could be used for this purpose. Now I am studying this method. > \* Is the link fully bi-directional or can only one machine > send/receive at a time. Only one machine send/receive at a time. > If the answer to the above is no (single duplex) then I'll need to set > up some sort of hand shaking, possibly using RTS and DTR which I > believe cross over in the link cable? Current version of libcomb has already support RTS/DTR handshake method. > \* Is there a means of detecting whether the cable is connected. > Will ioctl(TIOEXIST) do this? It would do this. See the answer for your first question. > \* What does the ChangeClearSIO() fn - mentioned in functions.txt do? This function handles an internal flag. This flag assigns whether SIO interrupt signal is cleared by the link-cable-driver or not. This would be called when you use second SIO driver with the link-cable-driver.

> \* The abstract.txt file mentions "9600bps, 8bit/character" amongst the > Kanji. What does this refer to? Default setting of SIO port.

> I thought the SIO system was only synchronous? So I presume the async > options only refer to the serial link. Also I get the feeling these > have something to do with a keyboard connection? I have a plan of implementation of synchronous driver for SIO. It would be easy for programmer using this type driver. > Also O\_NBLOCK is defined as 4 in this file (fcntl.h), but 128 in the > example code? Some complication exist about O\_NBLOCK and O\_ASYNC macros now. I would replace all the O\_NBLOCK macro with O\_ASYNC in future release. > \* In ioctl.h there are lots of parameters for the ioctl() fn. However, > only TIOCPARITY and TIOCBAUD are mentioned in appendix.txt in the > Japanese example doc.s. Does this mean that the others aren't > implemented yet? The link-cable-driver is expanded yet. Now I try to define BIOS level interface instead of current slow ioctl(). > What is the default for this and what is the xon and xoff char in hex. Current version does not support XON/XOFF flow control. I select RTS/CTS 'hardware' control. > I presume this is the buffer set by TIORLEN. Is this the same as the > eight byte buffer we have already discovered? Yes. The SIO controller can deliver an interrupt when 1/2/4/8 characters are received. You can change this parameter. > Is there a hardware buffer for the actual transfer (larger than 1 byte)? Transfer buffer is only one byte long. > By control do they mean set RTS and read DTR - I guess we need a lib > update to use these. Current lib does not support these control. > #define TIOCLEN ((t'<<8)|8) /\* stop<<16 | char \*/ > /\* stop 0:none 1:1 2:1.5 3:2bit \*/ > /\* char 0:5 1:6 2:7 3:8bit \*/ > #define TIOCPARITY ((t'<<8)|9) /\* parity 0:none 1:e 3:o \*/ > > What are the defaults for the above. 8bit/char and none parity. > Doc.s or explanation on all the TIO parameters would be useful. But I > realize that would involve a translation from the Japanese. I think so too. Now some translators are working for translation of version 3 documentation in Japan. You could get English language version via SCEA soon.

---

5/2/95 11:40 AM  
InitPAD problems  
Bill "Angus" Guschwan  
SIO

> Perhaps you can help me with this question. > > [libetc / libcd] > > - When I initialise the PlayStation subsystems like this: > ResetCallback(); /\* Reset all of the callbacks. \*/ > CdInit(); > CdSetDebug(0); > > InitPAD(&buffer1,MAX\_CONTROLLER\_BYTES,&buffer2,MAX\_CONTROLLER\_BYTES); > StartPAD(); > > ResetGraph(0); /\* Reset the GPU. \*/ > SetGraphDebug(0); /\* Turn off GPU debugging mode. \*/ > SetDispMask(1); > > I get repeated VSync timeouts from the development system. If I rearrange > the code, the > CdInit() will fail. What is the correct way to initialise both the CD > subsystem and also to use > InitPAD() and StartPAD() ? > > Do you have an example of this ? > > Thank you for your help. > > Allan.

After StartPAD(), please call `ChangeClearPAD (0);' as shown below:

```
InitPAD(&buffer1,MAX_CONTROLLER_BYTES,&buffer2,MAX_CONTROLLER_BYTES);  
StartPAD(); ChangeClearPAD (0);
```

In future version of runtime library, this problem between `pad' and `vsync timeout' will be solved, maybe (this answer and this plan latter I heard from Mr.Suzuoki).

---

5/4/95 9:18 AM  
Cannot Set BaudRate  
Carolyn Wales  
SIO

Setting the baudrate for the sio via ioctl() does not work. The baudrate seems stuck at 9600 regardless of what value I try to set. Is this that the sio driver was not completely implemented or is this a limitation of the serial port ? Is there a chance we could get an updated library to fix this problem ? Is there a workaround (like setting the rate on the chip register directly) we could use until this problem has been fixed ?  
Thanks for any help you can provide.

---

5/5/95 4:28 PM  
Re: Cannot Set BaudRate  
Bill "Angus" Guschwan  
SIO

NEWCOMB.ZIP 6K  
Peripherals  
Please try this library. Hopefully it will work. It is what Japan is using, and they have no problems. This is different from the 3.0 library comb.  
Angus

---

5/18/95 10:42 AM  
Analog Controllers  
Carl Ferreira  
SIO

How are analog controllers accessed by the Playstation?

---

5/22/95 5:16 PM  
Re: Analog Controllers



Thomas Boyd  
SIO

CONTROLS.ZIP        32K  
Peripherals

Analog controllers are accessed using InitPAD. I have included an example that works with analog, digital (standard), mouse, and (in lib 3.1 - when released) multitap controllers. It dumps controller data to the screen over the old "balls" demo so you can watch the values move as you wiggle the controller in addition to changing sprite direction and other fun stuff.

Also attached is an MS Word document describing initpad and how controller data is stored.

Note that it is helpfull to review the example program to see how to use this data with libetc.

Under "format of recieved data," the document mentions a byte #2 which is 0x01 for multitap, and 0x00 otherwise. I find no evidence of this. (See example program).

For analog controllers, the document lists two channels for analog data. I have a controller that uses three, and it seems there is provision for four (see note at bottom of doc).

Let me know if there are any further questions about this example,    Tom

---

5/23/95 4:21 PM  
SIO info  
Borden Covell II  
SIO

Is there a single place that we can go to get the specs on the serial cable and how to program it?  
We would like to be able to output debugging info on the debugging station and thought that the serial port might be a good way to do it.

Borden Covell Visual Integration

---

5/25/95 3:52 PM  
Serial port  
Daniel L. Berke  
SIO

I'm trying to use the serial port on the back of the development boards for some debugging. My hope is to connect a dumb terminal to the port and get some printf type information sent to it.

Questions of the day:

1. Is the DB9 connector on the development board (the one with the video connector) really a serial port? 2. If the answer to question #1 is yes, is it treated the same as the connector on the blue debugging station? 3. Which of the ports on the blue debugging station is the serial connector? I can't read Japanese... 4. Can the serial port be used for generic output? I'm trying to connect the port to a terminal and when I use the example program given in the ABSTRACT.COMB document file, the program just sits there waiting for the completion event. Does the completion event only occur when the psx receives a message back from the other psx?  
Thanks Dan

---

5/26/95 4:14 PM  
"standard" controller interface document  
Kristine Severson  
SIO

As promised, the specification on the user interface standard for the PlayStation controller has been posted in this conference. Enjoy.  
Kris

---

5/30/95 8:18 AM  
Re: "standard" controller interface document  
Mark Beardsley  
SIO

Thanks for the info, but.... when I look at this document (using word, brief or various others), the symbols for the buttons are missing. I assume that you had some kind of graphical symbol for them in your original. I therefore end up with many sentences like ->  
"When selecting menu options, use the button or the button, but not the button."  
Maybe you could re-post the memo using text for the button names instead of symbols. Thanks.

---

5/30/95 3:23 PM  
Re: Serial port  
Mike Benna  
SIO

I have a similar need with the serial port but I've gotten a little further along than you have... As I mentioned before, the debugger is continually dying with divide by zero errors so I'd like to be able to send debug text output through the serial port and display it with a terminal program on my PC. I've called AddCOMB0 and opened a file called "sio:" and as near as I can tell, that part works just fine. I soldered up a cable connecting TxD, RxD and Ground, hooked it up and ran my test program. The terminal program receives nothing but gibberish from my test program. It's as if the bps rate is incorrect but I've tried all rates supported by the PC between 1200 and 115200. 19200 seems to print the gibberish the fastest but it's nowhere near what I'm actually sending out. Is what I'm attempting even possible? Any suggestions about what the source of the problem is?  
Is it even possible to do what I'm trying to do?

---

6/1/95 7:13 AM  
Re(2): Serial port  
Robin H. Seaver  
SIO

Keep in mind that the signal coming out of the SIO connector is 3.3v TTL ... not RS-232. You'll need a line driver in order to talk to your PC's RS-232 port

---

6/5/95 3:44 PM  
Re(2): "standard" controller interface document  
Robert w. Calfee  
SIO

I got a look at the actual document.  
The part you were asking about read something like:  
"... choose the item with the X button. Back out one layer by pressing the X button."  
Not much help.

What it DID say was to use X most, O and Square next and Delta as least. Steering -wheel stuff was the top buttons an Select and Start should be used as little as possible.  
rwc

---

6/5/95 4:22 PM

Control doc  
Scott Berfield  
SIO

CONTROLS.ZIP 23K

Peripherals

This is the original Word document (Word 6 for PC) with graphics intact. This is not a sanctioned posting by SCEA 3rd Party, but having read the document provided here, it looks like nothing was changed from this original. Caveat emptor - you should still get the sanctioned documetn from your AE.

-sb

---

6/14/95 5:59 PM

SIO and other H/W specs  
Josh I. Pine  
SIO

What document and where do I find it that which describes all the PlayStation I/O ports (SIO/PIO/Game port) at the hardware level (ie. pin-outs, signal levels, capability.) This theory, which is mine, is that the documentation I seek is still in Japanese. Please let it not be true.

---

6/19/95 7:26 PM

Battle Cable dev system requirements?  
Dean M. Grandquist  
SIO

I need to know what kind of a setup is required to do Battle Cable development. Is it possible to use one dev system and one standard Playstation, or are two dev systems required?

-Dean

---

6/19/95 10:28 AM

Memory Card Code  
David Foley  
SIO

We just recieved our Memory Card/Controller adapter for the Dev Station and we tried compiling the card manager demo that came with 2.5 version of the libraries. We put in a memory card in both slots but the card demo 1.3 program claims it can't find a card in the machine. Any suggestions on how to make this demo work with the adapter?

David

---

6/23/95 11:32 AM  
Re(2): Memory Card Code  
Thomas Boyd  
SIO

>What exactly is the memory card/ controller adapter ? Is it something that lets you use memory cards with the dev boards? Thanks  
The DTL-H2040 is a memory card box for the development system Tom

---

6/23/95 11:34 AM  
Memory card bug fix  
Thomas Boyd  
SIO

Russ, Here's the scoop on the memory card ROM bug fix: Tom -----  
----- >There is a bug in the ROM of the debug and consumer playstations. >I need to know > the nature of the bug (what problems does it cause? What functions does it > interfere with? How can developers work around it?) so that I can detect and > avoid this problem for titles who need to submit their disks for > mastering. The mastering requirements state that they MUST test > memory card functionality. Unfortunately, this bug is included in not only the debugging station but PlayStation because both use the same ROM. Therefore, we cannot replace the ROM. Makoto TANAKA Sony Computer Entertainment Inc. ----- Forwarded message SUBJECT: Notes for Creating Titles with Memory Card (Problem on Debugging Station and PlayStation)  
This document will give you the notes and explanations of a library to meet the problem of the memory card on DTL-H1000, the debugging station, and PlayStation.  
\*Brief The problem of the memory card operation on DTL-H1000 has been reported. This is regarded as a bug caused by the boot ROM on it, and PlayStation has the same problem. As for DTL-H2000(PS board), a patch program, patchx.cpe, reflects the original specifications. Thus, the memory card operates appropriately on PS board with patchx.cpe, but not on the debugging station and PlayStation.  
In order to meet this problem, a part of the specifications of the memory card library is changed, and a cause descriptor, HwCARD, is introduced.  
This change will give the same appropriate operations to the debugging station, PS board, and PlayStation.  
\*Modifications 1. A cause descriptor, HwCARD, is disclosed. Events related to the cause descriptor are cleared automatically every a vertical synchronous interrupt. Therefore, when testing the event occurrence by sandwiching the function which wait for the vertical synchronization like the Vsync() function, the event occurrence can not be searched.  
2. A cause descriptor of an event which informs the completion of the asynchronous function, \_card\_clear(), is changed. The source of supply of this function is changed from libcard.lib to card.obj. However, since libcard.lib is given no changes, never forget to link card.obj.  
old SwCARD new HwCARD  
\*Summary We have described before that the problem above occurred only on the debugging station. However, after our investigation, it has become clear that the same problem occurred on PlayStation. This modification is essential to create titles with the memory card. We would like you to follow it.  
----- End of forwarded message

---

6/23/95 7:17 AM  
Re: Memory Card Code

Andrew Summerfield  
SIO

David,  
What exactly is the memory card/ controller adapter ? Is it something that lets you use memory cards with the dev boards? Thanks  
Andrew Summerfield Silicon Knights

---

6/25/95 1:10 PM  
Re(3): Memory Card Code  
Andrew Summerfield  
SIO

>The DTL-H2040 is a memory card box for the development system Tom  
Thanks Tom. Sounds like a must have!  
Andrew

---

6/26/95 9:53 AM  
Re(3): Memory Card Code  
Scott Berfield  
SIO

But, to get back to the original question that prompted this thread - is there sample code which works for driving the memory cards on a DTL-H2080? This is the new controller adaptor with two standard controller ports and two RAM card slots and which plugs into the controller ports on the dev system. Foley has the hardware, but the sample code provided with the 3.0 release doesn't work with it.  
-sb

---

6/28/95 7:39 AM  
Re(2): Memory Card Code  
David Foley  
Andrew Summerfield  
SIO

It is an adapter that plugs into the dev cards and lets you use production controllers and memory cards  
David

---

6/29/95 1:59 PM  
Re(3): Memory Card Code  
Andrew Summerfield  
David Foley  
SIO

Thanks David. We'll definitely be snagging one of those!  
Andrew

---

7/7/95 5:28 PM  
need example:writing to ram card  
Robert w. Calfee  
OS

I couldn't make heads or tails of the code in samples... Has anyone got a simple, self-contained example of the Sony way to do these ram card thingies?  
rwc

---

7/10/95 12:22 PM  
memory card and multi-tap  
Thomas Boyd  
SIO

The original releases of lib 3.1 (the only library to work with the tap) did not contain the library LIBTAP.LIB. You need this to run the multi-tap. It will be released shortly to the BBS. (An earlier release of libtap, from June, did not work with the memory cards. The new one does).  
Tom

---

7/20/95 9:14 AM  
Re: memory card and multi-tap  
Dave Ross  
SIO

Is multi-tap hardware available for developers???? How do we get ahold of one?

---

7/20/95 9:19 AM  
Re(2): memory card and multi-tap  
Thomas Boyd  
SIO

Multi-taps are available. You can order them through your usual channels. T

---

8/17/95 5:20 PM  
Re(3): memory card and multi-  
Karen Paik  
SIO

Using the code from balls2, the buffers padA and padB are being filled; unfortunately, they can't be read during the v-blank interrupt, which is where our code is set up to read sticks. I am using the -mgpopt -G0 option, which was discussed in Angus' message 13 (Globals in C) 4/21/95, but it still doesn't help. If you can be of any assistance I would appreciate it. Our product will be one of the first mto use this important peripheral, and information is at a premium.  
Matthew Hubbard (415)638-0800 x216

---

8/18/95 10:49 AM

Re(4): memory card and multi-  
Dan Burnash  
SIO

Karen Paik

Please send me a sample of what your specific code is trying to do, so we can investigate it further here.

Dan Burnash

---

8/24/95 9:07 AM

What hardware needed for mem cards

David W. Marshall

SIO

There was a thread on this earlier, but it didn't seem to answer my basic questions.

What hardware do I need to program the Ram cards?

How does this hardware interface with the current dev boards?

Can standard PSX production Ram cards be used with the hardware?

What is the cost of this hardware?

Sorry if these are basic questions, but I haven't had time to research the Ram card stuff. I need to find out what equipment I will need so I can do some better allocation.

thanks,

dave

---

8/24/95 10:03 AM

Can I hook combat cable to PC?

Rusty Buchert

SIO

This isn't really a can I question...

People at Sony told me that it wouldn't work... but if it is just a serial connection, there is no reason that a convertor couldn't be built to allow this.

I have seen some people discussing this and was wondering if anyone knows the real problems with hooking to a PC and where I can get tech specs on the Sony serial port, so we could hire someone (electric engineer) to build a convertor for us.

Being able to hook one side of this to a PC would save us a lot of debugging time trying to get serial play to work, since we already would have one side of the connection (the PC version) working correctly.

Thanks, John Slagel Parallax Software

---

8/24/95 3:30 PM

Re(2): Can I hook combat cabl

Rusty Buchert

Thomas Boyd

SIO

Thanks for the info... I'll get one built and go from there... John Slagel Parallax Software

---

8/24/95 11:53 AM

Re: What hardware needed for mem cards

Thomas Boyd

David W. Marshall

SIO

buy:

DTL-H2080 (\$200) converts dev sys to 2 commercial ports (exactly like commercial playstation) commercial memcards (~\$20) you can order them from us - they work with DTL-H2080 commercial joypads (\$?) you can order them from us - they work with DTL-H2080 That's all.

Tom =====>There was a thread on this earlier, but it didn't seem to answer my basic questions. >What hardware do I need to program the Ram cards? >How does this hardware interface with the current dev boards? >Can standard PSX production Ram cards be used with the hardware? >What is the cost of this hardware?

---

8/28/95 12:24 PM

More on hooking Combat cable to PC...

Rusty Buchert

SIO

Ok, I made a simple serial cable that converted the appropriate pins on the PSX output to the PC. I finally got the two to communicate by realizing that the PSX assumes DTR,CTS, etc are active high instead of the normal RS232 standard of low meaning active. I got the PC to receive a character when the Playstation sent one, but it was not the original data, and I couldn't see a pattern, such as incorrect parity or stop bits would cause. But if I sent the same character twice on the PSX, I got a different character on the PC, but the two were the same.

Then, after sticking a cheap RS232 line analyzer in the cable, I noticed that the lines from the Playstation never seemed to trigger the negative voltage light, which makes me wonder if the PSX uses 0V as low, and 3.3V as high, unlike the PC, which uses -3.3V and 3.3V as low and high.

Now, I'm most certainly not an electronics wizard and all my above deductions could be wrong. So, before we hire someone to build a voltage convertor, could I get a detailed list of the output specs for the PSX? Ie... high/low voltages, whether low or high is on, and stuff like that?

Is there a document I can download with all the technical specs on the port?

Has anyone else attempted this, and did you figure anything out?

Thanks, John Slagel Parallax Software

---

9/19/95 10:55 AM

Sample Code for Combat Cable

David W. Marshall

SIO

Can someone point me to the latest sample code for using the Combat Cable?

Not sure if I should look in the RELEASES or OLD RELEASES or PROGRAMMER CD or ARCHIVE or OLD RELEASES OF THE NEWER RELEASED PROGRAMMER CD VER 1.55.12  
dave

---

9/19/95 11:58 PM

Re: Sample Code for Combat Cable



John Phua  
David W. Marshall  
SIO

Hi David,

We will make a note of listing the sample readme in the PROGRAMMER TOOLS CD folder. All the latest samples are included in the following directory structure (folders in the BBS)

PRODUCT RELEASE : PROG. TOOLS CD : PSX : SAMPLE

Please read the readme.txt included in the \*.zip file. The readme.txt contains a short description of all the samples.

I know the directories are not clear, but hopefully once everyone gets the CD's and becomes familiar with the same directory structure it would be easier to find things.

Thanks John

---

9/27/95 3:52 PM

Re: Sample Code for Combat Cable

Dan Burnash

SIO

David W. Marshall

BALLGAME.ZIP 11K

Peripherals

Here is a sample that shows how to use the combat cable. It passes control pad information, but should be adaptable to just about any data. It will be released officially soon, so send me your feedback for changes/requests quickly.

---

9/28/95 3:41 PM

Pad reading w/ low framerate

Lobotomy Software

SIO

Does anyone have some sample code for installing an interrupt function which can read the control pads during a v-blank (or shortly after) which can then be used to read the pads at 60 fps even if the main loop only runs at 20fps (or slower)?

Jeff Blazier

---

9/29/95 3:59 PM

Re: Pad reading w/ low framerate

Micheal W. Gomez

SIO

Here is a snippet of code I have been using for vsync interrupt (courtesy of Sony tech support). You need to #include <kernel.h>, and enter your routine name instead of vsync\_callback (unless that's what you called it). Let me know if it works.

```
long ret_val; unsigned long EV; EV = OpenEvent(RCcntCNT3, EvSpINT, EvMdINTR, vsync_callback); ret_val = EnableEvent(EV); ret_val = SetRCnt(RCcntCNT3,-1,RCcntMdINTR); ret_val = StartRCnt(RCcntCNT3);
```

---

10/2/95 1:59 PM

Re(2): Use of 2 devices for 1 user permitted?

stephen chaplin  
SIO

Thanks for the reply!  
Romesh, Celeris Inc.

---

10/2/95 11:53 AM  
Re: Use of 2 devices for 1 user permitted?  
Angus  
SIO

As long as a player can play with 1 joystick, and does not need both ( it is an option), then you will be ok with the use of 2 peripherals in the manner you describe.  
Angus

---

10/2/95 10:00 AM  
Use of 2 devices for 1 user permitted?  
stephen chaplin  
SIO

Since I didn't see anything about this subject in the Sony Guidelines, I have a question to ask:  
We have an interface thought up for using the controller by itself, BUT we would also like to support a mouse if the user has one as well. But, here's the catch: We would like to be able for the mouse to COMPLEMENT the controller (use the mouse for controlling the cue stick, and the controller to select options and the like). Is this permitted by Sony? I need an answer, as it will change quite a few things in the interface if it is not permitted (the standard controller is not very good for controlling the cue stick!)  
Thanks, Romesh, Celeris Inc.

---

10/3/95 5:01 PM  
Re(3): Pad reading w/ low framerate  
Micheal W. Gomez  
Dave R. Scheele  
SIO

> Is there a reason why I shouldn't use it?  
No, that should be fine. For some reason I thought that reading the pads might not work in an interrupt. If anyone has a problem with it I'm sure they will post it here for us.

---

10/3/95 2:08 PM  
Re(2): Pad reading w/ low framerate  
Dave R. Scheele  
SIO

I've just been using VsyncCallback to specify the name of my routine, and it works fine. I got the prototype of the callback function from a source file in the controls subdirectory of either etc. or sample, not sure which. This has worked fine for me. Is there a reason why I shouldn't use it?

Dave

---

10/9/95 7:12 PM

What do I need to link dev systems?

Mark A. Fong

SIO

Hi, I'm trying to write code to link Playstations. I'm using a standard RS-232 cable (male to male) to link two dev systems together. Is this ok because none of the sample programs work. Or am I supposed to buy some special cable or do I have to build one? If I have to build one, how do I do it?

Thanks, Mark A. Fong

ps. Why isn't anything posted on these specs here?

---

10/10/95 10:32 AM

Re: What do I need to link dev systems?

Kristine Severson

SIO

You need special cables for the PlayStation. For development system link cables, contact your Account Executive at Sony. For consumer system link cables, go to your local retailer.

Kris

---

10/11/95 2:50 PM

async mem card

David B. Brickhill

SIO

I'm looking into making the memory card work asynchronously. I've got working code for synchronous control. I've tried opening the device in "O\_NOWAIT" state, but with only limited success. Testing for IOE, IOEW, IOER events does not seem to work for determining the completion of card IO. Also, reading from a card seems to stop after 8K (one slot). Are multiple calls to read()/write() necessary? Is there any example mem card code that uses asynchronous access? Is there a way to set up callbacks? Please advise.

David Brickhill Sony Interactive Studios America

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10/11/95 11:13 AM

Analog Joystick

Mark DeSimone

SIO

Is there any available info on the analog joystick shown on the side of the playstation box?

Where to get one? How to interface to it?

---

10/12/95 6:07 PM

Re(2): async mem card

Dan Burnash  
SIO

>>Tom Boyd said (a couple weeks ago) that you and him were working on a new mem card  
>>example, and that it would be ready "in a day or two".  
>>Is this really happening, or are your days just longer than mine? :)  
They just seem longer. The example is being written, and is "almost" finished. Unfortunately, I haven't had time to finish it off. If you are really lucky, I will get it done tonight. If not, then it will have to wait until early next week.  
Dan Burnash

---

10/12/95 6:00 AM  
Re: async mem card  
Mark Beardsley  
SIO

Tom Boyd said (a couple weeks ago) that you and him were working on a new mem card example, and that it would be ready "in a day or two". Is this really happening, or are your days just longer than mine? :)

---

10/13/95 5:54 PM  
Re(2): async mem card  
David R. Sullivan  
SIO

On memory cards, were you trying to Test the async read/write done with the HwCARD event or SwCARD event...this may make a difference...also, multiple reads and writes are suggested. I use 128 byte multiples with CRC in each 128 bytes....this was done due to enormous READ errors...I do not know consumer units show this .. however, the development systems sure do...reads and write fail often.  
DaveS.

---

10/17/95 10:37 AM  
Re: Analog Joystick  
Dan Burnash  
SIO

An analog joystick similar to the one on the side of the box will be released in the U.S., but not the one on the box. It will have two flight style sticks, and support all of the standard controller buttons. It will have 4 analog volumes, each a 1 byte value. When we have them to distribute, we will let you know. For now, here is what the stick returns:

```
char not_present; // 0x00 if controller is present  char id; // analog controller id = 0x53
u_short data; // digital data same as standard controller  char analog_1; // right stick analog
x value  char analog_2; // right stick analog y value  char analog_3; // left stick analog x
value  char analog_4; // left stick analog y value
```

In general, the byte value increases to 255 as the stick is moved to the right, or back, respectively. The values decrease to 0 as the stick is moved to the left or forward.

If you have any questions, let me know.

Dan Bunash

P.S. The combat cable example I posted in the SIO conference on 9/27 shows what the analog stick returns.

---

10/18/95 5:36 PM

Re(2): Fwd: multitap documentation/samples  
Dan Burnash  
SIO

MEMMENU3.ZIP        15K

Peripherals

This is the new example. Let me know what I can do/add to improve it. Positive feedback is also accepted. :-)

Dan Burnash

---

10/18/95 10:15 AM

multitap documentation/samples

David Minogue

Tom Boyd

SIO

Tom,

What documentation and/or sample code is available for libtap? The sample code in sample/etc/multitap doesn't build with the latest libtap; there is a unresolved reference to SendPad(). Is this (SIO) the appropriate conference for peripheral questions?

Is it just me, or are things getting harder and harder to find on this BBS?

-- David.

---

10/18/95 3:55 PM

Mem card & Multitap

David Minogue

SIO

Dan,

There seems to be a problem calling InitCARD(1) with the multitap. As soon as I do this, the multitap starts acting like a standard controller, just passing through the status of whatever's plugged into socket 1. Have you seen this problem? Do you have a solution? (How's that demo coming??)

-- David Minogue, Acclaim Entertainment

---

10/18/95 10:38 AM

Re: Fwd: multitap documentation/samples

Thomas Boyd

Tom Boyd

David Minogue

TAP\_EXAM.ZIP        54K

Peripherals

>What documentation and/or sample code is available for libtap? >The sample code in sample/etc/multitap doesn't build with the >latest libtap; there is a unresolved reference to SendPad(). Is >this (SIO) the appropriate conference for peripheral questions?

SIO is good enough. I can send you the crummy example now (bird in the hand), and the good example in th PM (two in the bush) when Dan finishes it. (see attachment for the crummy one and note that is is centered around memcard and multitap usage).

I will erase this message and re-post as soon as the cool example is done to keep this crummy example from perpetually rearing its head.

Tom

---

10/19/95 7:33 AM

Re(3): Fwd: multitap documentation/samples

David Minogue

SIO

Dan,

I notice that your example uses InitCARD(0) rather than InitCARD(1). The documentation is a bit vague on the meaning of this parameter; do you have any insight to offer? Is it just something to avoid?

-- David.

---

10/19/95 7:35 AM

Re(2): What do I need to link dev systems?

David Minogue

SIO

Are the combat cables available in retail yet? I haven't seen any.

-- David.

---

10/19/95 4:14 PM

memcard format

Dan Burnash

SIO

A recent Q&A from japan.

>The format() function is designed to return a "1" if it succeeds, and > a "0" therwise. When I try to format a memory card port that DOES NOT > contain a memory card, format returns a "1". Why? When will format() > return a '0'?

The format() function does not return a '0'. It is a bug. But unfortunately, it can't be modified because the format() function is in ROM. So, please check connection between PS and the memory card, and confirm connect of memory card before this function is used.

---

10/19/95 9:59 AM

Re(3): What do I need to link dev systems?

Dan Burnash

SIO

The "consumer" link cables should be at stores now. That is the best place to get them. If you need a "dev system" link cable, order it through Sony/your Account Executive.

---

10/20/95 9:48 AM  
Re(4): Fwd: multitap documentation/samples  
Dan Burnash  
SIO

I have not been able to get InitCARD(1) to work with the multi-tap either. I have asked for a clarification on when InitCARD(1) should be used, but have not yet received a response. When I receive an answer from SCE, I will post it.  
For now, empirical evidence suggests that initCARD(0) works correctly. It may be safer to call the pad initialization functions before initializing the memory card. Either way gives correct access to the multi-tap, so I plan to change my example program by moving the call to `init_memcard_system()` below the pad initialization calls.  
Dan Burnash

---

10/23/95 12:29 PM  
Questions about game saving  
Dave Elton  
SIO

I am implementing my game saving according to Sony guide lines. But seems I am lost .  
1. The guidelines says game saving should provide a password feature for players without access to RAM card and this could be a less complete game saving. Is there another way of saving data besides using RAM card? To my understanding, you have to use RAM card to save a game. Please give me advice on this. If there is another way, how?  
2. When use RAM card, the guidelines says a player cannot overwrite another one's game saving without explicit approval. Does this mean we have to embed a password for each game saving? What if the player forget his own password? Actually, how can a player set his password using the joystick?  
Thanks in advance!  
Simon ReadySoft Inc.

---

10/23/95 12:55 PM  
Mem Card File Format?  
Mark Slemko  
SIO

Does anyone have any information regarding the file format of memory card files or the file naming convention? I would like my files to work with the card manager and display their own icons.

---

10/23/95 8:27 AM  
Re(5): Fwd: multitap documentation/samples  
Dan Burnash  
SIO

More info on use of InitCARD with the multi-tap:  
When `libtap.lib` is not linked in, use InitCARD(0) to disable the controllers while the memory card is being accessed. Use InitCARD(1) when the controllers and memory cards will be used together.

When libtap.lib IS linked in, you must use InitCARD(0). This causes the new RAM based pad reading routines to be used, which support the multi-tap. Therefore you automatically get both memory card and multi-tap pads supported. If InitCARD(1) is used, a flag is set which causes the old ROM based pad routines to be called, and the multi-tap will not be accessible.

Time to update the docs.

Dan Burnash

---

10/24/95 5:05 PM

Re: Mem Card File Format?

Dan Burnash

SIO

Check out the example I posted on the 18th. It uses the data file header that allows the card manager to display the icon and show the game name.

Dan Burnash

---

10/24/95 5:03 PM

Re: Questions about game saving

Dan Burnash

SIO

Dave Elton

>1. The guidelines says game saving should provide a password feature for players without >access to RAM card and this could be a less complete game saving. Is there another way of >saving data besides using RAM card? To my understanding, you have to use RAM card to >save a game. Please give me advice on this. If there is another way, how?

Display a password to the screen that the player can write down and enter back in during another session. The password will be the encoded game state information, though maybe with less detail then the memory card data.

>2. When use RAM card, the guidelines says a player cannot overwrite another one's game >saving without explicit approval. Does this mean we have to embed a password for each >game saving? What if the player forget his own password?

Each game will use a unique filename, and the header in the saved game file will contain the name of the game. Either/both of these may be used to determine if a data file was created by YOUR game. If it was NOT created by your game, it may not be overwritten. If not enough room is left on the memory card for your file, the user may be prompted to delete files from the card, or to insert a different memory card. Read the new library overview document, about libcard, as well as the library reference.

> Actually, how can a player set his password using the joystick? Have you ever entered your initials for a high score using the standard controller?

Dan Burnash

---

10/25/95 1:34 PM

Re(2): Questions about game saving

Dave Elton

SIO

Thanks for the info! I still want to know: Is it a mandatory for us to set up password for game saving? Is it a mandatory to setup different game saving files for different players? Our game in other platforms only use one unique file to save game, considering it is possible the



players will have their own memory card, is it acceptable to use one unique file for game saving?

Simon ReadySoft Inc.

---

10/25/95 1:48 PM

More about final release standards.

Dave Elton

SIO

Here is more questions about the final release:

A. Demo Sequence: Is it a mandatory to include the PlayStation logo in demo sequence? If so, where can we get the images for PlayStation Logo?

B. Options: Is it a mandatory to have controller setup, audio tests and music volume, sound effects adjusting in game? C. Controllers: The doc says the game should pause when the player press start button during game play ... the game should reset to the title screen by pressing the start button and then the select button....Does this mean the game will enter pause mode first then go to title screen ?

For the option screen with "Continue" and "Quit" appears, "Continue" continue game play from the same point at which the user paused... As in our game, there is a pause screen already if player press start button during game to enter pause mode, do we still need to set up "Continue" option the same as pause mode? Is it acceptable if we start the game from the same play level if player choose "Continue" from the option screen?

Simon ReadySoft Inc.

---

10/26/95 3:16 PM

Re(3): Questions about game saving

Dan Burnash

SIO

>I still want to know: Is it a mandatory for us to set up password for game saving? If you save a game at all, the password is a mandatory part of it.

>Is it a mandatory to setup different game saving files for different players?

You cannot overwrite a file without prompting the user first. A reasonable part of this is to allow a new filename to be used.

>Our game in other platforms only use one unique file to save game, considering it is possible

>the players will have their own memory card, is it acceptable to use one unique file for game

>saving? This is not allowed for current titles. You must allow multiple game saves under different filenames.

---

10/27/95 2:50 PM

Re(5): Questions about game saving

Dan Burnash

SIO

John Brandwood

>>If you save a game at all, the password is a mandatory part of it.

>I'm finishing off a basketball conversion. The save game is 11KB in order to store season >stats.

Even ignoring player and team stats and just storing team results will require a >password of longer than 32 >characters.

>I hope that realism is going to win over dogma, and that a password is not going to be  
>mandatory for sports >games.

It sounds like a reasonable limitation for that type of game, but I didn't set the policy. Call your Account Executive and talk it over with him/her.

Dan B.

---

10/27/95 12:45 PM

Re(4): Questions about game saving

John Brandwood

SIO

>If you save a game at all, the password is a mandatory part of it.

I'm finishing off a basketball conversion. The save game is 11KB in order to store season stats. Even ignoring player and team stats and just storing team results will require a password of longer than 32 characters.

I hope that realism is going to win over dogma, and that a password is not going to be mandatory for sports games.

John.

---

10/28/95 9:11 AM

firstfile() and nextfile()

Dave Elton

SIO

I tried to use firstfile then nextfile to find out all the files on memory card, but most of the time the nextfile() returns null before it reached the last file on card. And every time it stops searching at different files. Does anybody have the same problem? I am sure the file system is loaded and the card information is read in, otherwise it won't start searching. Is it possible the nextfile() could fail and not reliable?

Simon ReadySoft Inc.

---

10/30/95 4:23 PM

Re: Memory Card programming

John Brandwood

SIO

Hello Craig, long time no see :-)

The device you want is the DTL-2080 Controller Box. It plugs into the 2 9-pin joypad ports on the dev card and provides you with 2 standard PlayStation joypad and memory card slots.

And while you're at it, download the software updates to come up to Lib 3.2 and also the new libtap library.

John.

---

10/30/95 4:28 PM

Re(3): Fwd: multitap documentation/samples

John Brandwood

Dan Burnash  
SIO

> This is the new example. Let me know what I can do/add to improve it. Positive feedback is also > accepted. :-) > > Dan Burnash

Dan, what is the difference between the libtap.obj file in your example code and the official libtap.lib released on 16th October ? Which should I use in production code ?

Thanks,  
John.

---

10/30/95 11:02 AM

Memory Card programming

Craig Ewert

Developer Support

SIO

Name: Craig Ewert Company: Alexandria Telephone: (805) 781-6200 Game Title: Frankenstein

Host machine (supplier/model/type of hard drive): Generic PC / Pentium 90 / 1Gig Quantum SCSI

Library Version: 3.1

Priority (Urgent or Routine): Routine

Topic of Question: Memory Card Programming

Question:

I am developing a title that will use the Memory Card. What setup do I use to test such code on my Development System? I don't see any part described as "Memory Card Interface/Emulation". Does the Dev system already emulate the cards? If so, how would I simulate a card removed, etc?

---

10/31/95 9:47 AM

Re(4): Fwd: multitap documentation/samples

Dan Burnash

SIO

John Brandwood

>Dan, what is the difference between the libtap.obj file in your example code and the official >libtap.lib released on 16th October ? Which should I use in production code ? They are the same. I used psylib /x libtap.lib, which extracted tap.obj from the library. THAT ONE OBJECT IS THE WHOLE LIBTAP.LIB LIBRARY. I link it in directly to avoid the possibility of linking in the same routine names from libtap.lib.

Dan Burnash

---

10/31/95 1:10 PM

Re: firstfile() and nextfile()

Dan Burnash

SIO

>I tried to use firstfile then nextfile to find out all the files on memory card, but most of the time the nextfile() returns null before it reached the >last file on card. And every time it stops searching at different files. Does anybody have the same problem? I am sure the file system is

>loaded and the card informaton is read in, otherwise it won't start searching. Is it possible the nextfile() could fail and not reliable?

This has been working reliably for me. Do you have the same problem with the example I uploaded? It uses firstfile and nextfile when listing the files, and with other operations.

Dan Burnash

---

11/2/95 9:49 AM

Re: More about final release standards.

Dan Burnash

SIO

>>A. Demo Sequence: Is it a mandatory to include the PlayStation logo in demo sequence? If so, where can we get the images >>for PlayStation Logo? No it is not required any longer. It has been changed in the current version of the Standards (not yet released).

>>B. Options: Is it a mandatory to have controller setup, audio tests and music volume, sound effects adjusting in game? It is mandatory to let the user re-configure his/her controller (Standard # 7.2). It is also mandatory to allow the user to adjust the volume of both the music and SFX (Standard # 7.3) It is NOT mandatory to include an Audio Test function. >>C.

Controllers: The doc says the game should pause when the player press start button during game play ... the game should >>reset to the title screen by pressing the start button and then the select button....Does this mean the game will enter pause mode >>first then go to title screen ? The Standard says (#13.4) that pressing and holding down SELECT, and then pressing START returns the user to the title screen, not pressing START first.

>> For the option screen with "Continue" and "Quit" appears, "Continue" continue game play from the same point at which the user >>paused... As in our game, there is a pause screen already if player press start button during game to enter pause mode, do we >>still need to set up "Continue" option the same as pause mode? Is it acceptable if we start the game from the same play level if >>player choose "Continue" from the option screen? I am not clear on the question being asked here. We are asking that when you pause the game, a menu appear with the options "Continue" and "Quit". If the user chooses "Continue", the gameplay resumes where it was paused. If the user chooses "Quit", a prompt must appear asking the user to confirm whether he/she wishes to quit the game. If the user confirms, then the game must return to the title screen.

Dan Burnash

---

11/3/95 9:51 AM

MEMORY CARD SPEC CHANGE

Dan Burnash

SIO

Memory Card File Header Specification Change

27 Oct.

1995 R&D Division

SCE The specification on a title name ("text name" in the Reference) in the description of the memory card file has been changed. Note the following explanation when displaying the name.

[Description change] PlayStation Programmer Tool Library Reference Vol. 1 (Library Overview) Page 205 The note below "Table 13-6-2: Memory Card File Header"

OLD: \*1: Non-kanji and primary standard kanji only, fullsize 32 characters.

NEW: \*1: Up to 32 characters can be set. All the character strings must be set with either fullsize or halfsize characters. If the number of characters are less 32, the character

string must be finished with a null character (0x00), or unused space within the 32 characters must be padded with blanks. The code specifications are given below.  
 Fullsize: Non-kanji (Shift-JIS code) and primary standard kanji only, 32 characters (64 bytes)  
 Halfsize: ASCII code only, 32 characters (32 bytes)  
 [Explanation] In the previous versions, all the title names had to be set with fullsize (Shift-JIS code) 32 characters. In addition to it, halfsize (ASCII code) characters are usable hereafter. However, using both the fullsize and halfsize characters at a time for setting one title name is prohibited. In either setting, the character string must be finished with a null character or unused space within the 32 characters must be padded with blanks. Furthermore, since the built-in font data in PlayStation is fullsize only, if a character string is set with halfsize characters, it is displayed with FULLSIZE characters. In other words, on the memory management screen of PlayStation, the title name set with halfsize characters are converted to fullsize ones. If there is necessity to display a title name by an application, the processing to convert halfsize codes to fullsize characters must be added.

-----  
 11/3/95 11:43 AM  
 NegCon Specs  
 Dan Burnash  
 SIO

NegCon Controller Button Assignment

The input data is transmitted as 6-byte serial data and the contents are as follows:

| Button Assignment                     | Byte No. | Type                   | Bit No./Value              |
|---------------------------------------|----------|------------------------|----------------------------|
| 1 (8 bits) b7: Left (on cross button) | 1        | Digital No.            | b6: Down (on cross button) |
| b5: Right (on cross button)           |          |                        | b4: Up (on cross button)   |
| b3: S (Start)                         |          |                        | b2: none                   |
| b0: none                              | 2        | Digital No. 2 (8 bits) | b7: none                   |
| b5: A                                 |          |                        | b4: B                      |
| b2: none                              |          |                        | b3: R (side button)        |
| 0-255 Center (I) 4                    | 3        | Analog                 | b0: none                   |
| 0-255 L (side button)                 | 4        | Analog                 | 0-255 II 6                 |

Note 1: The value varies by twisting NegCon not by pressing a button.

NegCon Controller Data Format

| Byte No. | Description   |
|----------|---|
| 1        | Switch data<br>0 is returned when the button is pressed and 1 is returned otherwise. Unused bits returns 1. The return values comply with the standard controller specifications, however, they can be changed by BIOS if necessary.  |
| 2        | Switch data<br>Same as above  |
| 3        | Twist data<br>NegCon must be designed so that the value would be around 128 when it is released. However, in consideration of product variations in manufacturing, around +/- 8 (this might change later) must be handled as dead (play) zone by software. To eliminate the product variations, by setting an adjustment mode in a game, setting offset by software is recommended. |
| 4        | I button data<br>The more this button is pressed, the bigger value is returned. NegCon must be designed so that 16 or less would be returned when it is released. When the return value is 16 or less (this might change later), software considers that the button is not pressed. The maximum value must be 192(C0H) or more.   |
| 5        | II button data<br>Same as I button  |

11/4/95 10:54 AM

Re(2): More about final release standards.

Dave Elton  
SIO

>>B. Options: Is it a mandatory to have controller setup, audio tests and music volume, sound effects adjusting in game? >It is mandatory to let the user re-configure his/her controller (Standard # 7.2). It is also mandatory to allow the user to adjust the >volume of both the music and SFX (Standard # 7.3) It is NOT mandatory to include an Audio Test function. Our game is made of movie, so the music and SFX are mixed together and it is impossibl to adjust them separately, maybe this should be an exception for this standard?

Also out game only use "Left, Right, Up, Down and Fire" button, I am not clear how to let the user to re-configure the controller to rearrange the left, up, down and buttons because it is natural to use the four left handside buttons for thse directions. Maybe this standard is applied to those games with complicated button combo pressing?

Simon ReadySoft Inc.

---

11/6/95 11:14 AM

Re(3): More about final release standards.

Dan Burnash  
SIO

Dave Elton

> >>B. Options: Is it a mandatory to have controller setup, audio tests and music volume, sound effects adjusting in game? >>It is mandatory to let the user re-configure his/her controller (Standard # 7.2). It is also mandatory to allow the user to adjust the >>volume of both the music and SFX (Standard # 7.3) It is NOT mandatory to include an Audio Test function.

> Our game is made of movie, so the music and SFX are mixed together and it is impossibl to adjust them separately, maybe this should be an exception >for this standard?

> Also out game only use "Left, Right, Up, Down and Fire" button, I am not clear how to let the user to re-configure the controller to rearrange the left, >up, down and buttons because it is natural to use the four left handside buttons for thse directions. Maybe this standard is applied to those games with >complicated button combo pressing?

If you want an exception to the standards made for your game, talk to your Account Executive.

---

11/17/95 3:15 PM

Re: MEMORY CARD SPEC CHANGE

Dan Burnash  
SIO

News

If single byte per character text is used, the title string MUST be null terminated within the first 16 bytes. This limits the displayable title to 15 characters when using this mode. If a longer string is used, the ROM card reader program may incorrectly display other memory card file titles. Our test department will be looking for this problem, and will reject titles that do not follow this standard.

Details:

The header of a memory card data file is made up of the following structure members.

```
/* header is 512 bytes */ typedef struct { char Magic[2]; char Type; char BlockEntry;  
char Title[64]; char reserve[28]; char Clut[32]; char Icon[3][128]; } _CARD;
```

The title is 64 bytes so that it can hold up to 32 double byte characters. These may be English if the shift JIS double byte form is used. If single byte ASCII is used for this, only 15 bytes of text may be used, with a null terminator. The ROM card reader displays the title when files are chosen to be copied or deleted. This display gets confused when more than 15 ASCII characters are used. A string >16 bytes will be truncated, and the rest of the files on the card may show up incorrectly, or garbled, or not at all.

If you need more than 15 characters, use the shift JIS characters. The reference I found for this is "Understanding Japanese Information Processing", by Ken Lunde. isbn #1-56592-04300.

Dan Burnash

---

11/24/95 11:46 AM

Memcard I/O retry

Dave Elton

SIO

Dan Burnash

I found the number of times you need to retry for memory card reading and writing varies a lot. For writing it is better, usually less than 4 times it will succeed. But reading a slot (8K) sometimes takes as many as 16 times, and the retry varies from 1 to 16 times. Mostly more than 7 times. I check my code, and make sure has close() follow each file creation and reading. Could it be something else will affect memcard I/O. I checked Dan's code, usually it takes less than 7 times it will succeed in reading.

Simon ReadySoft Inc.

---

11/27/95 11:00 AM

Re: Memcard I/O retry

Dan Burnash

SIO

Dave Elton

Compare your algorithm for reading the data to mine. I don't see retries occurring frequently, so either the data itself is making a difference, or the algorithm is different. When you figure out why your routine has a higher retry rate, let me know why. Maybe there is a way to make it more reliable.

Dan Burnash

---

11/29/95 5:45 PM

Mark Slemko

SIO

Hi,

Is there any "Link Cable" documentation other than the simple stuff in the docs ?

Any help at all would be useful.

---

11/30/95 2:10 PM  
Re(2): MEMORY CARD SPEC CHANGE  
Blake E. Senftner  
SIO

Where is the entire "Memory Card Spec" document?  
I've been looking around for the document that details this... all I can find is this one "change" document...  
-Blake

---

11/30/95 10:57 AM  
CTRLER.H  
Paul Holman  
SIO

CTRLER.ZIP        6K  
Peripherals  
Attached, easy means of accessing controllers - now updated for Analog Joysticks (from SCEE).

---

12/1/95 5:05 PM

Re:  
Dan Burnash  
SIO  
Mark Slemko  
LINKNTAP.ZIP        14K

Peripherals  
>Is there any "Link Cable" documentation other than the simple stuff in the docs ?  
Not much. However, an example is worth 1000 pages of docs. Try the attached example, also previously posted in this conference. if you have any more questions after that, let me know.  
Dan Burnash

---

12/4/95 11:15 AM  
Re(3): MEMORY CARD SPEC CHANGE  
Dan Burnash  
SIO

The change document that started this thread lists changes to the Runtime library 3.0 overview document. Chapter 13 documents the memory card usage. If you have any questions about it ask me.

The new sourcebook, when it is ready to be released, will contain guidelines for the memory card, but not technical information. Ask your account executive about the sourcebook release date.

Dan Burnash

---

12/6/95 6:29 PM  
Re(2): Memcard I/O retry



David R. Sullivan  
Dan Burnash  
SIO

Memory Card io is very dependant upon initialization order, interrupts that are running, etc. I was having problems, then I inited the memory EXACTLY like that in Dan Burnash'es example -- most have now gone away.

Error RATES: In my experience

1) Don't read 8k blocks (just the retry time only will kill you) 2) The ASYNC Stuff is very goofy, I suggest not using it unless you !NEED! to. 3) Use 128byte BLOCKS. This is the best that I have found so far.

NOTE: Looking at the Sony DOCS in the manual you will find examples of how to add a chksum to your data. This method uses 128 byte reads. (Maybe there is something we don't know).

Retry:

You need to retry ALL commands relating to memory IO, this includes Open, Read and Write.

Good Luck,

DaveS.

---

12/11/95 4:29 PM  
Re(3): Memcard I/O retry  
Dave Elton  
SIO

Another weird thing I found is the retry time for Memcard I/O obviously reduced when I use the debugging station. Usually in development system it will take about half minutes, but it only take less than 5 second for me to retrieve my saved information. Of course I am happy about this. After all the game will be played on a real machine instead of development system. I do read and write 8k block though, maybe that is my problem.

Simon ReadySoft Inc.

---

12/15/95 2:21 PM  
Re: Password Standard  
Thomas Boyd  
Non-tech talk

No. It means that Konami got away without it for some reason. This is the exception rather than the rule. Sorry.

Tom ===== I believe there is a standard which says all games which use the memory card must also have a password feature for owners that don't have memory cards.

I just got Konami's "In The Zone" 3D basketball game. This game uses the memory card but has no password feature that I could find. Since this is a released game, can I assume that a password system is now an option and no longer a must have standard for approval of a title?

---

12/15/95 1:05 PM  
Password Standard  
David W. Marshall  
Non-tech talk

SIO

I believe there is a standard which says all games which use the memory card must also have a password feature for owners that don't have memory cards.

I just got Konami's "In The Zone" 3D basketball game. This game uses the memory card but has no password feature that I could find. Since this is a released game, can I assume that a password system is now an option and no longer a must have standard for approval of a title?

---

12/19/95 12:33 PM

Re(2): Sample Code for Combat Cable

David Minogue

Dan Burnash

SIO

>Here is a sample that shows how to use the combat cable. It passes control pad information, but should be adaptable to just about any data. It will be released officially soon, so send me your feedback for changes/requests quickly.

Dan,

Has this sample code been updated since you posted this message, or is this still the latest and greatest combat cable example?

-- David Minogue.

---

12/19/95 1:28 PM

Re(3): Sample Code for Combat Cable

Thomas Boyd

David Minogue

SIO

Dave,

Dan's out today, but the newest is LINKTAP.ZIP posted in the SIO conference on 12/1/95. It is pretty close to BALLGAME.ZIP with a few changes. I will fwd the post to you.

T

---

12/21/95 11:18 AM

Combat Cable functions

David Minogue

SIO

Dan,

Between the documentation and your example, I've made some progress in understanding the combat cable library functions. But my explorations have also generated some new questions; here they are:

- What is ChangeClearSIO() used for? Do you have any examples? - How can I do a no-wait write? When I open the output stream as NO\_WAIT, it hangs on the write. - Is it possible to set the "unit-number of characters for receiving?" Whenever I attempt to change it using \_comb\_control(1,4,xxx) it changes, but always to a value of 4. Maybe a bug in this function, using "parm" instead of "arg" as the value? I understand that, in general, the default value of 8 should always be used. - Is it possible to read the "communication mode?" The value returned by \_comb\_control(1,2,0) is always 0.

That's all for now.

-- David Minogue, Acclaim Entertainment.

---

12/22/95 12:19 PM

Re: Fwd: Multitap lib docs

Dan Burnash

David W. Marshall

SIO

1)How you knew the hex values of the different periph. id's? A1. Use printf's or FntPrint's to display the id field returned by any controller. A2. Ask me/Japan.

2)Why the m\_pad\_type and pad\_buff\_type data structures were setup the way they were. A. They worked for me. I created them, so that is why they aren't in any standard header files or documents.

>I was assuming that the file format, ID values, and structure format were in a library document somewhere that I can't find. The example/structure is the best document.

Essentially: When the multitap is plugged in, the not\_present flag is cleared and the id is set to 0x80. Each of the 4 multitap ports then return their data. Each pads data starts with the not\_present flag, followed by the id to determine controller type. The data comes next, which depends on the controller type. Graphically it is:

```
mtap_not_present_flag mtap_id controller_1_not_present_flag controller_1_id controller_1_data
controller_2_not_present_flag controller_2_id controller_2_data controller_3_not_present_flag
controller_3_id controller_3_data controller_4_not_present_flag controller_4_id
controller_4_data controller_1_not_present_flag controller_1_id controller_1_data
```

I set up the structures in my example because each controller type has different sizes for the data section, so one structure doesn't work for all controllers. This same list may be repeated if a second multitap is plugged into the Playstations second controller port.

Dan Burnash

---

12/28/95 11:51 AM

Re: Combat Cable functions

Dan Burnash

SIO

David Minogue

- What is ChangeClearSIO() used for? The first and second bits of the argument determine how the interrupt processing occurs. For now, it is automatically set to 3(both bits on), which is all that is needed. If I find a reason to change the setting to something else, I will let you know.

Do you have any examples? No.

- How can I do a no-wait write? When I open the output stream as NO\_WAIT, it hangs on the write. Don't do it. It doesn't work, and should be avoided.

- Is it possible to set the "unit-number of characters for receiving?" Whenever I attempt to change it using \_comb\_control(1,4,xxx) it changes, but always to a value of 4. Maybe a bug in this function, using "parm" instead of "arg" as the value? I understand that, in general, the default value of 8 should always be used. Always use 8. It is the only size that transfers correctly.

- Is it possible to read the "communication mode?" No, you can only set it.

The value returned by \_comb\_control(1,2,0) is always 0. For those arguments, zero is always returned.

---

12/29/95 4:20 PM

Re(2): Combat Cable functions

David Minogue

Dan Burnash

SIO

Dan,

Thank you for the response.

I've got some communication between Playstations going (now that I've borrowed a 2nd dev system), but I encountered an interesting bug in the process. It seems that during the callback for no-wait reads, it is impossible to reference any static variables. Apparently, the GP register is trashed. I've gotten around the problem for now by putting all of my static variables in a structure, which apparently is accessed differently. Maybe this will save someone else some frustration.

Have a great New Year!

-- David.

---

1/2/96 11:53 AM

Re(3): Combat Cable functions

Dan Burnash

SIO

David Minogue

>I've got some communication between Playstations going (now that I've borrowed a 2nd dev system), but I encountered an >interesting bug in the process. It seems that during the callback for no-wait reads, it is impossible to reference any static >variables. Apparently, the GP register is trashed. I've gotten around the problem for now by putting all of my static variables in >a structure, which apparently is accessed differently. Maybe this will save someone else some frustration.

This is a feature. If you don't want the gp optimization to be used, compile with the -G0 option. It sets the maximum size of a variable to put into the sbss and sdata sections to zero. -G4 sets it to 4, etc..

It is faster to use the gp optimizations, but the gp register is not going to be set correctly within a callback function.

The psyq conference has more info on the -G option.

Dan B.

---

1/8/96 2:02 PM

Multi-tap demo with libtap.lib

David W. Marshall

SIO

Dan Burnash

If I compile the multi-tap demo and link with the provided libtap.obj, the demo works correctly. It sees the multi-tap plugged in and will give the proper controller ID's.

If I compile and link with libtap.lib, the demo no longer sees the multitap. It gives 0x41 ID with a multitap plugged in and a joystick plugged into the A port. It will never return an ID of 0x80, no matter what configuration of things plugged in.

So, what is libtap.obj and why doesn't the demo work when linking with libtap.lib? Am I doing something wrong?

dave

---

1/9/96 10:17 AM

Multi-Tap really slow?

David W. Marshall

SIO

Development Env.

I was doing some more performance measuring with the multi-tap and, unless I am doing something wrong, the multi-tap sucks. For the following tests, I turned off my code that parses

the joybits that the kernel returns. So the only code that should be running for joypad data is the library code. Timing numbers were found using `Cnt = Vsync(0)`; before swapping the buffers. I am using `libtap.lib` from lib 3.3

a) With no multi-tap and a standard controller plugged into both ports, TIME = 760 b) With multi-tap plugged in port 1 (controller in port A on tap) and standard in port 2, TIME = 790 c) With multi-tap plugged into both ports (controller in port A on both taps), TIME = 806  
For `libtap.lib` from lib 3.4 the times were: a)796 b)814 c)829

Any thoughts on this? I'd really like to hear that I screwed up somewhere and that the multi-tap is really not that bad. I even tried putting the buffers that the kernel fills into the DCache. It made no difference.

dave

---

1/9/96 6:36 AM

Fwd: Mad Katz joystick problem?

David Minogue

SIO

Dan,

Iguana tells me that multitap library isn't working with the Mad Katz joystick. Apparently, it just isn't recognized. Is there a known problem? Any suggestions?

-- David.

---

1/9/96 9:21 AM

Re: Multi-tap demo with `libtap.lib`

David W. Marshall

David W. Marshall

SIO

I put the multi-tap code back into my game. The game is linking with `libtap.lib` from lib 3.3.

The multi-tap code works and sees the multi-tap correctly.

Is there some type of timing or setup issue that is causing the multi-tap code to fail in the demo when linked with `libtap.lib`?

The only thing different about the demo code and my game code for the multi-tap is that the multi-tap code in the game code is being called less often than in the demo code.

dave

---

1/10/96 4:05 PM

Re: Fwd: Mad Katz joystick problem?

Dan Burnash

SIO

>Iguana tells me that multitap library isn't working with the Mad Katz joystick. Apparently, it just isn't recognized. >Is there a known problem? Any suggestions?

I don't know about the Mad Katz joystick specifically. I think it is time to go out and buy some new controllers.

In general, the multi-tap will work fine as long as a controller is plugged into port A. There is another problem being investigated that causes the multi-tap to stop working when it is used in port 2 of the Playstation, with a standard controller in port 1. There are other pieces to the puzzle, so I will let you know the details as I find them out. The fix will most likely be a new `libtap.lib`, so don't worry about changing your code if the multi-tap doesn't function quite right in port 2. Please send me a note if you have encountered this problem, however, so I know how big a problem it is.

Dan Burnash

---

1/10/96 3:42 PM

Re(2): Multi-tap demo with libtap.lib

Dan Burnash

SIO

David W. Marshall

>If I compile the multi-tap demo and link with the provided libtap.obj, the demo works correctly. It sees the multi-tap >plugged in and will give the proper controller ID's.

>If I compile and link with libtap.lib, the demo no longer sees the multitap. It gives 0x41 ID with a multitap plugged >in and a joystick plugged into the A port. It will never return an ID of 0x80, no matter what configuration of >things plugged in. >So, what is libtap.obj and why doesn't the demo work when linking with libtap.lib? Am I doing something wrong?

>I put the multi-tap code back into my game. The game is linking with libtap.lib from lib 3.3. The multi-tap code >works and sees the multi-tap correctly. >Is there some type of timing or setup issue that is causing the multi-tap code to fail in the demo when linked with libtap.lib?

>The only thing different about the demo code and my game code for the multi-tap is that the multi-tap code in the game >code is being called less often than in the demo code.

First: Libtap.OBJ is TAP.OBJ, the one and only module that makes up libtap.LIB. They are identical, which is why they will function identically when either is LINKED into your program. Now for the fun part. If you specify libtap.LIB in your link, you may not get it. Since the same routine names are also defined in LIBAPI.LIB, the linker may decide you really wanted the routines in libapi.lib, and not the ones from libtap.lib. There is no way for the linker to know which one you REALLY wanted, so you get the luck of the draw.

THE ONLY WAY TO GUARANTEE WHICH PAD ROUTINES ARE LINKED IN, IS TO LINK THEM IN AS OBJECT MODULE(S).

The linker always links in an object module before checking for that name in a library. Since libtap.lib is made up of 1 object module, it is simple to extract it, and link it in as a .obj file. the only way to get around the problem, is to rename the functions, which hasn't happened yet.

Dan Burnash

---

1/11/96 11:17 AM

Basic Memcard questions

David W. Marshall

SIO

The manual and the sample code shows that the Magic Number is always "SC". However, in the test\_memcard\_format() routine, a check for "MC" is done. Is this a typo?

Is there anything I can do to the memory card board to make it a "bad card" so the bios will return EvSpError events?

thanks,

dave

---

1/11/96 9:11 AM

Re(3): Multi-tap demo with libtap.lib

David W. Marshall

Dan Burnash

SIO

>>>The linker always links in an object module before checking for that name in a library.  
>>>Since libtap.lib is made up of 1 object module, it is simple to extract it, and link it in as a .obj  
>>>file. the only way to get around the problem, is to rename the functions, which hasn't  
>>>happened yet.  
Since this seems to be causing problems, can I assume that version 3.5 of libtap.lib will have the  
functions renamed?  
dave

---

1/11/96 1:13 PM  
Re: Basic Memcard questions  
Dan Burnash  
SIO

>The manual and the sample code shows that the Magic Number is always "SC". However, in  
the test\_memcard\_format() >routine, a check for "MC" is done. Is this a typo? This is not a typo.  
The formatting sets the file area header to "MC". This is not the same memory area that user  
files are saved into. User files are saved with the header Magic Number set to "SC". So actually  
both the example and the documentation are correct.  
Is there anything I can do to the memory card board to make it a "bad card" so the bios will  
return EvSpError events? Depending on what you want, try using an invalid channel. It may  
give you what you want. If you need a bad card, I can think of several ways to destroy them,  
none of which I have tried.  
Dan Burnash

---

1/11/96 1:16 PM  
Re(4): Multi-tap demo with libtap.lib  
Dan Burnash  
SIO  
David W. Marshall  
>can I assume that version 3.5 of libtap.lib will have the functions renamed?  
My advice. NEVER assume anything. If it is fixed, it will be obvious. Your multi tap program  
won't work without changing the functions you are calling.  
Dan Burnash

---

1/22/96 8:39 AM  
NEW LIBTAP  
Dan Burnash  
SIO

The new libtap in prog. tools release 1.5.16 will BREAK your code!!! The names of the routines  
that control the multi tap have changed. Since the old names are still present in libapi.lib, your  
code won't give any linker errors, but the multi tap will stop working. To fix your code,  
rename the three functions below to their new names.

Old Name New Name \_\_\_\_\_ InitPAD InitTAP StartPAD StartTAP StopPAD  
StopTAP

Note: Do this ONLY if you are using the multi tap, as these routines are not needed for  
supporting other controllers.

---

1/22/96 8:43 AM  
Re: NEW LIBTAP  
David W. Marshall  
SIO

I tried the latest library and it does correct the speed problem that the 3.4beta had. The latest library runs at about the same speed as the 3.3 libtap.lib.  
I still show that it will take about 50 scan lines of library processing time to support the multi-tap. Does SCE think this time will improve or is this just something I have to live with.

thanks,  
dave

---

1/25/96 7:33 PM  
Need pin-out of controller port connector  
Geoffry R. Meek  
SIO

Our game has a unique input device that we need to port to the PlayStation. In order to do this, I need to find the pin diagram for the controller port and the logic levels each pin uses or supplies.

I've looked through what hardware docs I have, and there's no mention at all of info like this. Is there additional doc that I should get that describes the actual hardware more fully?

Thanks.

---

1/27/96 9:46 AM  
Re: Need pin-out of controller port connector  
Dan Burnash  
SIO

Geoffry R. Meek

If you are designing your own controller, you need to go through a separate "tools licensing agreement". At that point you get access to the info necessary to design your own controller.

Dan Burnash

---

1/30/96 1:14 PM  
Shift-JIS codes for the memcard ?  
John Brandwood  
SIO

Dan Burnash

Dan (or any other kind soul),

Could you post a list of the shift-JIS codes that equate to ASCII A-Z, a-z, 0-9 and SPACE ?

Is there a full list available electronically anywhere ?

Thanks,  
John.

---



1/30/96 2:34 PM

Re: Shift-JIS codes for the memcard ?

Dan Burnash

SIO

UTIL.ZIP 2K

Peripherals

The releases->docs->tech\_notes "memory card spec + util" message details the requirement, and attaches a sample program that converts between ascii and sjis. I have attached it here for convenience.

---

2/8/96 3:10 PM

120-block Memory Card

John Brandwood

SIO

The March issue of Next Generation has an advert for a memory card called the "Memory Card Plus" which stores 120-blocks of information.

The advert is by ...

InterAct Multimedia Products - (410) 785 5661

They say the card is being developed by ...

Datel (an English company) - (44) 1782 744182

Since I can't see how you can do a 120-block card within the current Sony specs, I wonder if Sony has heard of this device, and if so, do games currently in development have to do anything to support it ?

John.

---

2/8/96 5:05 PM

Re: 120-block Memory Card

Dan Burnash

John Brandwood

SIO

It is news to me. I will have to check out the magazine. Sounds like a big "not supported" answer is due from SCE. If I find out more, I will post it.

Dan Burnash

---

2/22/96 4:26 PM

MemCard Init

David W. Marshall

SIO

Just wanted to confirm the following about initing a memory card.

1)The proper way to handle a brand new card is to Init and then format.

2)If the user says "Yes, please format my card" you can init and format in the same routine. The card demo has init and format broken into two different tasks.

3)The NEWCARD bit only tells you that a new card was put into the slot and doesn't tell you anything else about the card's status.

thanks,

dave

---

2/22/96 3:32 PM  
Detecting controllers  
Pat Quinn  
SIO

I'm having a problem detecting how many control pads there are. The following is the source that is being used to detect how many pads there are :

```
/*  
int GetNumPads() { char pad1[4], pad2[4];  
  InitPAD(pad1, pad2, 4, 4);  if (!StartPAD()) { Assert(FALSE, "StartPAD failed.\n"); }  
  VSync(0);  
  NumControlPads = (*pad1 | *pad2) ? 1 : 2;  StopPAD();  
  return (NumControlPads); }  
*/
```

pad1 in memory will have these values after StartPAD called : 00 41 FF FF. So evidently, pad1 is hooked up. As for pad2, well that's where the problem is. No values are outputted to the pad2 buffer. If anybody has any idea as to what my problem might be, I'd appreciate any help.

Thanks again for any help,  
Gordon Read NuFX, Inc.

---

2/23/96 9:14 AM  
Better Memcard Standards  
David W. Marshall  
SIO  
John Phua

I was wondering if and when better standards for the memcards will be available. The current standards for the memory card is filled with phrases like "should include", "may be done", and "such as". There is also the word "must".

So I interpret the standards as things that say "must", must be in the game or the title will be rejected. Items with all the other phrases would be cool to have and might make your game better, but are not needed to get the title past QA. Does this sound correct?

The current standards say that copying cards should be done from inside the game. Why would you need to do this when the BIOS interface already does a great job?

It seems logical that my game must be able to: 1)Load a saved game 2)Save a game 3)format a new card 4)Check for enough space on a memory card 5)Let the user delete only MY games from the card.

Any other "must" items to add to this list?

thanks,  
dave

---

2/26/96 6:05 PM  
Re: MemCard Init  
Dan Burnash  
SIO

David W. Marshall

>1)The proper way to handle a brand new card is to Init and then format.

Correct.

>2)If the user says "Yes, please format my card" you can init and format in the same routine.

The card demo >has init and format broken into two different tasks.  
Until you init a card, how do you know if it needs formatting? If you don't know, then why would you be prompting them to format it? But to answer your question. Once a user agrees to the format, both init and format can be done in the same routine.  
>3)The NEWCARD bit only tells you that a new card was put into the slot and doesn't tell you anything else about >the card's status.  
Correct.

---

2/27/96 12:09 PM  
Re(2): MemCard Init  
David W. Marshall  
Dan Burnash  
SIO

>>>Until you init a card, how do you know if it needs formatting?  
I was using the TestFormat() routine in the demo that does a \_card\_read() and then looks for MC for the system header marker. If the header is not there, then the card is not formatted. I then load the file system (init) and format the card.  
Is this incorrect?  
thanks,  
dave

---

3/1/96 8:48 PM  
Re: More basic mem card questions...  
Dan Burnash  
SIO  
Jeff Davies

Is there a place where we can find the up to date specs for the memory card and mem card interface requirements?  
The standards doc, which I am not sure where is; and the memory card specification, which is in releases->docs\tech notes, under the message "memory card spec + util"..  
I've heard you are only suppose to delete your own files, and not files from other games even with confirmation. Is this true? Check the standards, but I believe you can delete other game files, after prompting the user about it.  
Dan Burnash

---

3/1/96 8:52 PM  
Re: \_card\_load question  
Dan Burnash  
SIO

David W. Marshall  
>Does \_card\_load() load info onto the memory card or read info from the memory card?  
Reads info FROM the memory card.  
>I found that, if a new card is inserted and no \_card\_load() is done, the firstfile() and nextfile() return the file info >from the previous memcard.  
The file system is read during card\_load, to avoid needing to access it whenever file info is needed. So your result is what I expect.  
>I had thought that \_card\_load() was putting info onto the card and you only had to do it once.  
A closer look in >the manual does show that \_card\_load() should be called every time a new card is inserted.

Correct.  
Dan Burnash

---

3/1/96 11:22 AM  
More basic mem card questions...  
Jeff Davies  
SIO

Is there a place where we can find the up to date specs for the memory card and mem card interface requirements? I've heard you are only suppose to delete your own files, and not files from other games even with confirmation. Is this true? If so the I suppose we are unable to format a card if there are saved games on the card. Sorry I can't remember if this file deletion statement was sony policy or user rumor... Can we get a memcard i/o and interface requirements listing from sony? -Jeff

---

3/1/96 4:05 PM  
Re: More basic mem card questions...  
David Minogue  
SIO

We had some difficulty with one of our games which allowed you to display and delete other game's saves when we ported it to the Japan market. The problem was, it didn't display Kanji characters. So if you are going to list other games saves, this might be something you'll want to think about.  
-- David.

---

3/1/96 11:34 AM  
\_card\_load question  
David W. Marshall  
SIO

Could someone clear up my confusion, please.  
Does \_card\_load() load info onto the memory card or read info from the memory card?  
I found that, if a new card is inserted and no \_card\_load() is done, the firstfile() and nextfile() return the file info from the previous memcard.  
I had thought that \_card\_load() was putting info onto the card and you only had to do it once.  
A closer look in the manual does show that \_card\_load() should be called every time a new card is inserted.  
thanks,  
dave

---

3/5/96 9:25 PM  
Re: Detecting controllers  
Dan Burnash  
SIO  
Pat Quinn

Here is what gets filled into your buffers every vsync:  
char not\_present\_flag; // this is 0 when a controller is present  
char id; // the id of the controller attached ???  
data // the data for that controller, depends on id. It is two bytes for a

std controller

In your case, check the first byte of each buffer. If it is zero, a controller is present, otherwise no controller is attached.

---

3/5/96 3:25 PM

Re(3): MemCard Init

Dan Burnash

SIO

David W. Marshall

>I was using the TestFormat() routine in the demo that does a \_card\_read() and then looks for MC for the system >header marker. If the header is not there, then the card is not formatted. I then load the file system (init) and >format the card.

>Is this incorrect?

What you are doing is correct.

---

3/11/96 2:11 PM

Question regarding the serial port.

Mark Slemko

SIO

Here are a couple of questions that I would like to have answered, so here it goes :o)

1. The PSX manuals state that the serial port device runs at 9600 bps, after rereading the messages posted to the SIO conference previously, some people have achieved much higher bit rates. So, are developers allowed to use bit rates higher than 9600 bps for their games? Is the combat cable rated for higher speeds, in other words, is the cable electrically suitable for speeds faster than 9600bps?

2. Why doesn't the O\_NOWAIT settings work when writing to the SIO device? Is it a hardware or software problem? I am quite concerned over this because at 9600 bps, an eight byte packet will take a little more than 8ms to transfer over to the remote machine. Eight milliseconds is a lot of CPU time wasted waiting for a write to the serial port to finish.

3. In Dan Burnash's SIO demo program (ballgame.zip?), the program creates two events, one for the reading and the other for writing to the SIO device. Why do we need to create an event for the write, I don't see this event being used anywhere in the rest of the code?

4. Is full duplex communication reliable/possible on the PSX? I've create some test programs send packets across the combat cable at the same time. Occasionally, it works. Unfortunately, more often, it doesn't work. It looks like eight bytes get lost somewhere and some data gets corrupted. (Hopefully, my PSX does not have a hardware defect :o)

5. For those who have dissected the SIO demo program I just wanted to confirm with you that the communication between the PSX was only in one direction at a time right?

Hmm, I hope these questions are understandable, if need clarifications please send me a message. Thanks in advance.

---

3/13/96 5:53 PM

Re: Question regarding the serial port.

Dan Burnash

SIO

Mark Slemko

1. The PSX manuals state that the serial port device runs at 9600 bps, after rereading the messages posted to the SIO conference previously, some people have achieved much higher bit rates. So, are developers allowed to use bit rates higher than 9600 bps for their games? Is the

combat cable rated for higher speeds, in other words, is the cable electrically suitable for speeds faster than 9600bps?

Higher baud rates are acceptable. 2Mbps is the highest setting. The real limiting factor is the interrupt processing.

2. Why doesn't the O\_NOWAIT settings work when writing to the SIO device? Is it a hardware or software problem? I am quite concerned over this because at 9600 bps, an eight byte packet will take a little more than 8ms to transfer over to the remote machine. Eight milliseconds is a lot of CPU time wasted waiting for a write to the serial port to finish.

The writing of data is fast enough, provided the lines are set correctly, that you may slow the system down by adding an event generation to notify you of its completion. If your write is slow, it is because it can't happen until the read is posted on the other machine, or because you are sending data in larger than 8 byte chunks.

3. In Dan Burnash's SIO demo program (ballgame.zip?), the program creates two events, one for the reading and the other for writing to the SIO device. Why do we need to create an event for the write, I don't see this event being used anywhere in the rest of the code?

The write event is not used, and can safely be eliminated. You could try using it if you want, but I doubt it will be of much help. See above.

4. Is full duplex communication reliable/possible on the PSX? I've create some test programs send packets across the combat cable at the same time. Occasionally, it works. Unfortunately, more often, it doesn't work. It looks like eight bytes get lost somewhere and some data gets corrupted. (Hopefully, my PSX does not have a hardware defect :o)

Yes, but not currently using libcomb. My alternate library using a ring buffer system does it just fine. It will be made available very soon(1 to 2 weeks).

5. For those who have dissected the SIO demo program I just wanted to confirm with you that the communication between the PSX was only in one direction at a time right?

That is currently correct when using libcomb.lib. See above.

Dan Burnash

P.S. You should have come to the conference so you wouldn't need to ask these questions.

Don't waste your time and ours by missing the next one!

---

3/20/96 10:54 AM

Re(2): Detecting controllers

Pat Quinn

Dan Burnash

SIO

Dan,

Thanks for your help.

Pat

---

4/4/96 1:08 AM

Using a memory-card to patch the game...

Steven Stadnicki

CD Creation

Greetings, Does Sony have any standard guidelines on recommended methods of using a memory card to do 'in-memory' patches of a game? Also, and I'll freely admit I haven't looked too deeply into this on my own yet, but any suggestions on ways to put patches and interesting updates to a game in a memory card and NOT have it copyable...? I.e. standard formats other than the normal 'save-game' oriented formats?

Mostly just a random question right now, but we've really been thinking about the option of using memory cards to supply enhancements, updates, ininteresting new features or even

bugfixes for the games... If Sony has or plans to have a standard format for this sort of thing, it'd be good to know about...

-- Morgan/Steve

---

4/4/96 2:20 PM

Re: Using a memory-card to patch the game...

Dan Burnash

SIO

Steven Stadnicki

>Does Sony have any standard guidelines on recommended methods of using a memory card to do >'in-memory' patches of a game?

No, and at \$20 each it doesn't seem worth selling one just to put your in memory game patch onto it.

> Also, and I'll freely admit I haven't looked too deeply into this on my >own yet, but any suggestions on ways to put patches and interesting updates to a game in a memory >card and NOT have it copyable...? I.e. standard formats other >than the normal 'save-game' oriented formats?

If you want to sell memory cards preloaded with information, it should be in the standard file format. You may be able to be given an exception to this rule if you are using the whole memory card for your "special" feature. If you want to pursue this, then contact Todd Colletti at (415) 655 - 8133, as he handles some of the licensing issues at Sony.

Dan Burnash

---

4/17/96 10:26 AM

AddCOMB and LoadExec bombs!

Mark A. Fong

Peripherals

Dan Burnash

I'm using the combat cable functions in my action game and whenever I try using LoadExec() to get back to my menu screen code, it blows up. I tried writing a simple program that simply attaches the driver (AddCOMB) then removes it (DelCOMB) and then goes thru the normal steps to LoadExec() from the CD. I watch the messages from the debugger and just after the LoadExec(), I get a message like, "warning, unknown PSX return status value = 0x3049d003" then some messages from PadInit() ("Pad Driver ver. 3.0 6-button or Flying V-form"), then boom!

Are there any known bugs using AddCOMB() and LoadExec() together? Are there any extra steps that need to be taken before calling LoadExec()?

Here is a sample of my LoadExec() call:

```
CDInit(); StopCallback(); PadStop(); _96_init(); LoadExec("cdrom:\\PSX.EXE;1", 0x801FFFF0, 0);
```

Note: This works great if I don't call AddCOMB.

Thanks,

Mark A. Fong

---

4/19/96 11:25 AM

looking for basic InitPAD usage

Blake E. Senftner

Peripherals

Dan Burnash

I'm looking for a basic example of using the InitPAD() logic when I simply want standard controllers support. The various examples I've located show full support for various other controller types... But what if I only want the basic controller? Do I need logic to detect all other controller types and handle them?

I want the faster access that InitPAD() & StartPAD() offer, but do I need all this extra logic to handle any controller type?

-Blake

---

4/22/96 12:35 PM

Re: looking for basic InitPAD usage

Dan Burnash

Peripherals

Blake E. Senftner

>I'm looking for a basic example of using the InitPAD() logic when I simply want >standard controllers support. The various examples I've located show full support >for various other controller types... But what if I only want the basic controller? >Do I need logic to detect all other controller types and handle them?

>I want the faster access that InitPAD() & StartPAD() offer, but do I need all this >extra logic to handle any controller type?

No, you don't need to support all controllers when using InitPAD. Here are my drop in replacements for PadInit and PadRead, using InitPAD. It only supports the standard controllers, and copies the pad data to local storage so it will not be overwritten during a v blank. The key is specifying the limit on the amount of data you are willing to accept, by using the InitPAD function and passing the size of your buffer.

I hope this helps,

```
Dan Burnash typedef struct { char not_present; char id; u_short data; } pad_type;
pad_type padd[2]; u_long pad;
void danb_pad_init() { InitPAD(&padd[0], sizeof(pad_type), &padd[1], sizeof(pad_type));
StartPAD(); ChangeClearPAD(0); }
u_long danb_pad_read() { int i; u_short tmp[2]; for(i = 0; i < 2; i++) {
if(padd[i].not_present || (padd[i].id != PADID_CON)) continue; tmp[i] =
~(((padd[i].data&0x00ff) << 8) | ((padd[i].data&0xff00) >> 8)); } pad = (((long) tmp[1])
<<16) | ((long) tmp[0]); return(pad); }
```

---

4/22/96 6:03 PM

Re(2): looking for basic InitPAD usage

Blake E. Senftner

Dan Burnash

Peripherals

Very cool Dan. Thanks for the quick reply. -Blake

---

4/22/96 12:42 PM

Re: AddCOMB and LoadExec bombs!

Dan Burnash

Peripherals

Mark A. Fong

There is a known bug in DelComb, that prohibits you from using the link cable system after it has been called. It may cause a program failure just by being called, but definitely will fail if you call AddComb after calling DelComb. For now you have a few options:

1) Wait for lib 3.5, where the bug SHOULD be fixed. Note: This is not a guarantee. 2) Switch



over to using ringbuff.lib, a replacement for the libcomb link cable system. Note: Let me know if you want this new library. It will be on the bbs by the middle of the week, but is not here now. 3) Change your code so you never need to unload the link cable driver.  
Dan Burnash

---

4/23/96 3:39 PM

Re(2): AddCOMB and LoadExec bombs!

Mark A. Fong

Dan Burnash

Peripherals

Dan,

Thanks for replying. Will ringbuff.lib fix the problem I'm having with LoadExec(). Because my biggest problem is just calling AddCOMB() and then going thru a LoadExec() this bombs. I don't even need to call DelCOMB() for it to die. Is there any known bug with AddCOMB and/or LoadExec()?

Thanks,

Mark A. Fong

---

4/29/96 4:26 PM

Re(4): AddCOMB and LoadExec bombs!

Mark A. Fong

Dan Burnash

Peripherals

Dan,

Thanks for the reply. You mentioned that ringbuff.lib should fix the problem. Where is "ringbuff.lib"? Is it on the board? And if it isn't will it be on soon? Again, thank you for all of your help.

Mark

---

4/29/96 1:41 PM

Re(3): AddCOMB and LoadExec bombs!

Dan Burnash

Peripherals

Mark A. Fong

> Will ringbuff.lib fix the problem I'm having with LoadExec(). It should.

>Because my biggest problem is just calling AddCOMB() and then going thru a LoadExec() this bombs. I don't even need to call DelCOMB() for it to die. Is

>there any known bug with AddCOMB and/or LoadExec()? My best answer is, NOW there is a known bug. Yours. Since AddCOMB hooks in various handler functions to the I/O system, Calling LoadExec and trashing the actual function locations would undoubtedly cause problems. You need DelCOMB to work, so I will check on the status of the fix.

Dan Burnash

---

4/30/96 11:08 AM

Re(5): AddCOMB and LoadExec bombs!

Dan Burnash

Peripherals

Mark A. Fong

LIBCOMB.LIB 12K

Peripherals

>You mentioned that ringbuff.lib should fix the problem. Where is "ringbuff.lib"? Is it on the board? It isn't on the board yet. I need half a day to polish off the docs and a sample program for the latest changes I made. It has to be done by the end of this week. Hopefully I will finish it tonight.

Okamoto-san has made the fix to DelCOMB, and sent me the advance library. It is a new libcomb.lib with the fix, so here it is. It definitely works in my sample, so hopefully it will do the same in your program.

Dan Burnash

---

5/3/96 12:32 AM

Re(7): AddCOMB and LoadExec bombs!

Mark A. Fong

Dan Burnash

Peripherals

Dan,

You truly are the greatest! The new libcomb.lib you gave me did the trick, and not a moment too soon. You see I'm going Alpha tomorrow, uh, scratch that I mean today. Thanks again!

Actually, perhaps you can save me again. I just started using the InitPAD and StartPAD functions and every once in a while it just refuses to return any info into the pad data buffer I passed into InitPAD. I call ChangeClearPAD(0); and even run a VSync(0) before I check the buffer. Now I still have a call or two to PadInit(); but I call PadStop() just before InitPAD().

Could that be causing it? Has anyone else had this problem?

Thanks,

Mark

---

5/3/96 10:37 AM

Re(8): AddCOMB and LoadExec bombs!

Dan Burnash

Mark A. Fong

Peripherals

> Actually, perhaps you can save me again. I just started using the InitPAD and StartPAD functions and every once in a while it just refuses to return any >info into the pad data buffer I passed into InitPAD. I call ChangeClearPAD(0); and even run a VSync(0) before I check the buffer. Now I still have a call >or two to PadInit(); but I call PadStop() just before InitPAD().

Could that be causing it? Has anyone else had this problem?

Mixing usage of PadInit and InitPAD sounds dangerous to me. I don't know of any problems with it, but that may be because nobody else is mixing the calls. Try going with just InitPAD.

Dan Burnash

P.S. - I am glad the new DelComb library fixed the problem.

---

5/7/96 4:44 AM

New libcomb.lib

Dave Footitt  
Peripherals

Hi!

I just wanted to tell that the bug in libcomb.lib was reported to Oka\*\*\*-san at the developers conference, and that his bugfix worked right along.

Is your ringbuff.lib ready now, and if so, where is it? (Please send it to SCEE as soon as possible, because I know a lot of developers over here having problems with the link cable libraries.

Paal -Kristian Engstad FUNCOM Oslo A/S engstad@funcom.com

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5/8/96 2:16 PM

memcards, multi-tap & \_card\_load()

Mark Slemko

Peripherals

I've been working with multiple memcards using the multi-tap adapter and have found some interesting & strange stuff out that I thought I would share with everyone.

Basically I have found that I need to do a \_card\_load(channel) before doing I/O operations to THAT card. When switching to the next card another \_card\_load() must be done. The documentation and Dan's memmenu example seem to indicate you need to do this only when a new card is inserted but this does not seem to be the case for multi-tap.

I figure the original system only reserved enough internal storage for file info from 2 cards. So when you add more cards with the multi-tap each card needs to be \_card\_load()'ed before the I/O operations are used.

Can anyone confirm this?

---

5/8/96 8:02 PM

Re: memcards, multi-tap & \_card\_load()

David W. Marshall

Mark Slemko

Peripherals

Since card\_load() loads the file system info from the card into PSX kernel memory, it seems to be correct that you would need to do a card\_load() whenever you want to access the file system on any card.

dave

---

5/15/96 4:45 PM

Mem card manager 1.5

John Harris

Peripherals

I read about this utility to view and/or test memory card functionality, and it was supposed to be available on the BBS, but I have been unable to find it. Could someone direct me to where this is? (Administrator: if I need special access for this area, can you clear that at the same time?)

I have a 2080 box with two memory cards plugged into it, and all memory card functions return errors. (I tried Sony's example under MAKECARD). If someone can directly provide some suggestions for what I might be doing wrong, that would be much appreciated as well.

John Harris Tachyon Studios, Inc.

---

5/15/96 11:02 AM

Re: memcards, multi-tap & \_card\_load()

Dan Burnash  
Peripherals

Yes, you do need a card\_load() call whenever you access a different card on the same multi tap. In the current version of my memcard example, whenever I choose a new card to access, I do a card\_load() so I have the correct information.

Dan Burnash

---

5/21/96 1:59 PM

Multi-tap & Development systems

Randy X. Thompson  
Peripherals

Considering that the PSX development system uses DB9 ports for its controllers, is it possible to purchase a multi-tap from Sony with DB9 plugs? Are there adapters available? Also, what are the multi-taps called in the stores (so I can tell our purchasing department what to order when picking up production units)?

Thanks, -Randy

---

5/22/96 5:26 PM

Re: Multi-tap & Development systems

Mike Fulton  
Peripherals

There is no developer-only version of the Multitap. You'll have to plug a standard multi-tap into a DTL-H2080 controller box, and then plug that into your DTL-H2000 card.

Mike

---

5/22/96 6:48 PM

Mem card problems

John Harris  
Peripherals

I apparently had a bad memory card, because after replacement of the card, the sample code for the memory card access works. My own program however is still failing, and I don't know why. I get a valid file descriptor back from the open(), but any write() or read() operations return 0. This is the code I'm trying:

```
// the setup code is copied from the example in library reference 3.0
if (fd=open(filename,O_CREAT | (1<<16)); printf("err: create\n"); close(fd);
fd=open(filename,O_WRONLY); printf ("Open=%d\n",fd); // this prints "Open=2" if
(fd>=0) { nbytes=write(fd,buffer,length); printf("%d ",nbytes); // this prints "0"
if (nbytes < length) printf("err: write\n"); close(fd); }
```

Why is my write() not working?

John Harris Tachyon Studios, Inc.

---

5/23/96 5:57 PM  
Re: Mem card problems  
Mike Fulton  
Peripherals

I'd want to change the printf() call following the write() to:  
printf( "write(%d,0x%08lx,%d) = %d\n", fd, buffer, length, nbytes );  
To get more information and confirm what 'length' and 'buffer' are set to when the write() call is done.

Mike

---

5/23/96 7:52 AM  
Re(2): Multi-tap & Development systems  
Randy X. Thompson  
Peripherals

Mike Fulton writes: There is no developer-only version of the Multitap. You'll have to plug a standard multi-tap into a DTL-H2080 controller box, and then plug that into your DTL-H2000 card.

Mike  
Thanks for the quick response.  
-Randy

---

5/24/96 10:19 AM  
Re(2): Mem card problems  
John Harris  
Mike Fulton  
Peripherals

>I'd want to change the printf() call following the write() to: > > printf( "write(%d,0x%08lx,%d) = %d\n", fd, buffer, length, nbytes );  
Results: write(2,0x8008cc88,440) = 0  
It showed that buffer and length were okay. In fact, the code has a condition switch that replaces the memory card code with PCcreat() and PCwrite(), and that works perfect when going to the PC.

---

5/24/96 11:34 AM  
Re(4): Mem card problems  
Dan Burnash  
Peripherals

What is the length you are writing? It must be a multiple of 128 bytes, as the memcard is accessed in 128 byte blocks. Any write not on this boundary will fail.  
Dan Burnash

---

5/24/96 10:28 AM

Re(3): Mem card problems  
John Harris  
Peripherals

I forgot to mention this message I saw under "known bugs" in the library 3.0 summary.  
"If read() or write() is issued immediately after open(), an error occurs."  
This might be the problem I'm running into, but I don't know what I'm supposed to do between the open() and the write(). I'm doing a printf() right now, which on the dev system takes a significant amount of time. But that depends on whether the above bug refers to a timing issue or whether some specific piece of code should be executed between an open() and a read() or write(). Could you get clarification on that bug report?  
Thanks,  
John Harris Tachyon Studios, Inc.

---

6/4/96 5:43 PM  
Unformatted Card Status  
Mark Slemko  
Peripherals

There seems to be a bug with the card status returns. I've been using Dan's MemMenu as reference for my own memory routines and there is little deviation. It is working perfectly so far except for this bug.  
What I am experiencing is the failure to report an unformatted memory card. It appears that when an unformatted card is inserted into the machine "a bit" is set saying that it is an unformatted card. When the card status is read the first time it does indeed indicated an unformatted card but this action seems to clear the "unformatted card bit" as subsequent card status inquiries report a formatted card.  
If this is true, it would seem that the system assumes a format or some other operation will be done when an "unformatted card" status is returned.  
Could someone clarify what needs to be done if an unformatted card is detected?  
If the card status is not reliable for detecting an unformatted card what is the accepted mechanism? I notice in Dan's code he loads in block 0 (file system info) of the memory card and looks for the id codes "MC" at the beginning. This seems kinda like a hack, is this necessary?  
What I would like to do is perform a format automatically whenever the unformatted card status is returned, but SONY is saying we MUST request to the user to confirm the format operation. If the user decides not to the system goes on merrily thinking the card is properly formatted.  
And why the hell should we have to confirm the format operation when the systems own builtin memcard program does the format automatically???  
I really hope someone can help out here, this is holding back our release of the game.  
-ross

---

6/7/96 1:07 PM  
Re(2): Unformatted Card Status  
Mark Slemko  
Peripherals

Ok here's what I am doing to detect an unformatted memory card. See Dan's Memmenu example ( 10/18/95 in this archive) for more information. It is loading in the file information block of the card and examining it for the "MC" keyword. What you must be careful of is the

possibility that the read will fail (this was missing from Memmenu). Since there appears to be no checksum for the block we have to repeatedly read in the block to be sure there is no read error. This isn't exactly elegant or efficient but if RETRY\_COUNT is sufficiently large it could work reliably.

```
-ross
BOOL memcard::unformatted_card( LONG port, LONG card ) { LONG channel =
MC_CHANNEL( port, card ); LONG i; char buf[128]; BOOL rc = TRUE;
  for( i=0; i<RETRY_COUNT; i++) { clear_event_x0();
    _new_card(); _card_read( channel, 0, buf );
    if(card_event_x0()==0) { if( buf[0]=='M' && buf[1]=='C' ) { rc =
FALSE; break; } } }
  return rc; }
```

---

6/7/96 4:34 PM  
Multitap (InitPad vs InitTap)  
Craig Erickson  
Peripherals

Let me get this straight. If we are going to support the multitap, then we should always use InitTap. Right? In other words, we shouldn't try to InitTap only when the multitap is present and InitPad when the multitap is not present.

---

6/7/96 11:02 AM  
Re: Unformatted Card Status  
Rob Vawter  
Mark Slemko  
Peripherals

Q: There seems to be a bug with the card status returns. I've been using Dan's MemMenu as reference for my own memory routines and there is little deviation. It is working perfectly so far except for this bug. What I am experiencing is the failure to report an unformatted memory card. It appears that when an unformatted card is inserted into the machine "a bit" is set saying that it is an unformatted card. When the card status is read the first time it does indeed indicate an unformatted card but this action seems to clear the "unformatted card bit" as subsequent card status inquiries report a formatted card. If this is true, it would seem that the system assumes a format or some other operation will be done when an "unformatted card" status is returned. If the card status is not reliable for detecting an unformatted card what is the accepted mechanism? I notice in Dan's code he loads in block 0 (file system info) of the memory card and looks for the id codes "MC" at the beginning. This seems kinda like a hack, is this necessary? What I would like to do is perform a format automatically whenever the unformatted card status is returned, but SONY is saying we MUST request to the user to confirm the format operation. If the user decides not to the system goes on merrily thinking the card is properly formatted.

And why the hell should we have to confirm the format operation when the system's own builtin memcard program does the format automatically??? Could someone clarify what needs to be done if an unformatted card is detected?

A: Prompt the user whether they would like the card to be formatted or not. If they choose "No", they won't get to save any info. Use Dan's "hack" as the way to check whether a card has REALLY been formatted or not. Otherwise, you will run across the problem you described above. As for user confirmation, think about the case where card reads as unformatted once when it actually has data, or the user THINKS the card has data; the user will be angry if he believes data has been deleted.

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6/10/96 10:04 AM  
Re: Multitap (InitPad vs InitTap)  
Rob Vawter  
Peripherals

Q: If we are going to support the multitap, then we should always use InitTap. Right? In other words, we shouldn't try to InitTap only when the multitap is present and InitPad when the multitap is not present.

A: Yes.

---

6/11/96 12:14 PM  
Multitap and ChangeClearPAD  
Craig Erickson  
Peripherals

Since there is no ChangeClearTAP function, should ChangeClearPAD be called after StartTap?

---

6/12/96 6:47 AM  
Re(3): Unformatted Card Status  
David Minogue  
Peripherals

No hack is necessary to determine whether or not a card is formatted; you just need to keep track of the most recent status returned by `_card_load()`. Reread the Testing for card presence and testing logical formats procedure on p200 of the Run-time Library 3.0/Overview. This provides the best description I've found of how the memory card library functions work, but it requires careful reading.

The `_card_info()` function is only useful to determine whether a card has been removed or replaced since the last call to `_card_clear()` or since initialization. The IOE event returned by `_card_info()` does not indicate that the card is formatted, just that it hasn't been replaced.

Good Luck.

-- David Minogue.

---

6/24/96 11:07 AM  
Analog Joystick  
Mark DeSimone  
Peripherals

A quick question which should have a quick answer:

If we support the analog joystick, is it necessary or required to have a joystick calibration screen?

Thanks for any help you can give me, Glenn O'Bannon Rainbow Studios

---

7/2/96 10:40 AM  
Re: Combat Cable  
John Phua  
Peripherals



Borden Covel II writes: A while back there was mention of a new set of routines that were going to make combat cable access easier. A ringbuffer, I think it was. Is this still in the works or not?

Hi Borden,

We will be releasing a followup BETA version of the libcomb.lib. This is not the library that is referenced above. It is still in the works and we'll pass on any additional information on its release.

Thanks, John

---

7/2/96 9:19 AM

Combat Cable

Borden Covel II

Peripherals

A while back there was mention of a new set of routines that were going to make combat cable access easier. A ringbuffer, I think it was. Is this still in the works or not?

---

7/4/96 3:34 PM

\_card\_clear() generate HW events?

Mark Slemko

Peripherals

Ok I've been looking at my memcard routines more closely found something that seems to contradict the documentation. That \_card\_clear() generates HWCARD events not SWCARD events.

I just copied my card\_init() routine from Dan Burnash's Memmenu example where he was using HW events for \_card\_clear(). Thinking that this might be an error I tried changing it to SW events like the docs show. So i did this:

```
clear_event_sw(); _card_clear(); event = card_event_sw();
```

But it would just hang on the card\_event\_sw() statement waiting for a SWCARD event.

Here's the whole init routine if you'd like to have a look:

```
LONG memcard::init_card( LONG port, LONG card ) { LONG channel = MC_CHANNEL(
port, card); LONG timeout_retry = 3; LONG event;
```

```
while(1) { _card_info(channel);
switch(card_event_sw()) { case 1: /* Error */ break;
case 2: /* Timeout - No Card */ if( --timeout_retry == 0 ) {
return(MC_CARD_MISSING); } break;
case 3: /* New Card */ do { clear_event_hw();
_card_clear(channel); // THIS WORKS event = card_event_hw(); /*
clear_event_sw(); _card_clear(channel); // THIS DOES NOT WORK
event = card_event_sw(); /* } while( event == 1 ); // retry on error
// falls through to case 0
case 0: /* Card Exists */
clear_event_sw(); _card_load(channel); /* load file system */
switch(card_event_sw()) { case 0: /* Formatted */
return(MC_CARD_PRESENT);
case 1: /* Error */ break;
case 2: /* No Card */ return(MC_CARD_MISSING);
break;
case 3: /* Unformatted */ return(MC_CARD_UNFORMATTED);
```

```
break;      }      break;  }  }
```

---

7/4/96 3:07 PM

Re(4): Unformatted Card Status

Mark Slemko

Peripherals

Thanks David, you are right about `_card_info()` and using `_card_load()` to determine if the memory card is formatted.

>The `_card_info()` function is only useful to determine whether a card has been removed or >replaced since the last call to `_card_clear()` or since initialization. The IOE event returned by >`_card_info()` does not indicate that the card is formatted, just that it hasn't been replaced.

Regarding the Run-time Library 3.0/Overview, as always its sparse on details and downright misleading on the matter.

---

7/9/96 5:47 PM

Re(2): Combat Cable

Borden Covell II

Peripherals

Thanks for the info, John.

Any schedule for it?

Also, will it have the same problem running in a multi-threaded environment that the existing libcomb has? The latest Beta abstract.txt document states that it does not work with multi-threading, which we are using.

Borden

---

7/9/96 5:50 PM

Combat Cable & multi-threading

Borden Covell II

Peripherals

The latest Beta abstract.txt document states that the combat cable will not work with multi-threading, which we are using. Is this really true? What the &\*(\*)&( do we do????

Help!!!!!!!!!!

---

7/11/96 9:53 AM

Memory card read problems

Craig Galley

Peripherals

I've been working on memory card routines for the playstation and I've ended up with something that looks quite nice (auto card detect, continuous scanning etc etc). Anyway, the problem that I'm currently having is when writing about 32K, the readback fails quite frequently. I have a data file that expands from about 8K potentially up to 50K (note: I noticed if you try to write 16K to a file which has been created as 1 8K block, it trashes the card! - but this is not the problem).

How can I make the readback more reliable? What is the phantom code that needs to be placed between the open and the read?  
I'm using all the standard read/write calls to the card.

---

7/11/96 10:05 AM  
Tim images of peripherals  
Heather Barclay  
Peripherals

Does Sony have any standard graphic images of the controller, mouse, etc. that we should use for a screen which allows the player to remap the button functionality?  
Thanks, HB

---

7/11/96 6:15 AM  
Re: \_card\_clear() generate HW events?  
David Minogue  
Peripherals

I came to the same conclusion (that \_card\_clear() generates a HW event, and not a SW event). So I dug a little deeper.  
I tried setting up callback functions for all of the SwCARD and HwCARD event (4 and 5 respectively), and had each one count the number of times it was entered. This was instructive. It seems all of the functions which generate a SwCARD event, also generate one or more HwCARD events. My guess is that the SwCARD event is being generated by a HwCARD event handler which is conducting the higher level operation. \_card\_clear() is exceptional in that it doesn't use a SwCARD event, so completion is detected using the HwCARD event instead (it only generates one HwCARD event). A diagram from Sony describing this relationship would have saved a lot of developers a lot of time (and probably would have helped avoid some bugs). So, if you can afford to spare 9 event handlers, this approach seems to work fairly well. You don't need the entry counters, just record the identity of the most recently called SwCARD and HwCARD event handlers, and use this value within your memory card control logic. You can either spin on the value, or test it periodically.  
-- David.

---

7/12/96 3:32 PM  
Re: \_card\_clear() generate HW events?  
Rob Vawter  
Mark Slemko  
Peripherals  
Mark,  
You are correct. \_card\_clear uses \_card\_write and does a dummy write. \_card\_write generates HW events. Sorry for the documentation error. It has been fixed for the next doc releases.  
Thanks for pointing it out.

---

8/5/96 8:25 AM  
DTL-H2080 Problem  
Scott Osborn  
Peripherals

Been using the dev controllers, hooked up to the DTL-H2000 board, for some time now with no problem. But now we need to use the DTL-H2080 (for mem cards and other things), so we've plugged it into the board. Unfortunately, none of our CPEs (including the sample programs) acknowledge any input when using it. What am I doing wrong?

In advance, thanks for the input. (Place your pun here)....

Scott Osborn

---

8/6/96 5:08 PM

Re: DTL-H2080 Problem

Michael Koziniak

Peripherals

Scott Osborn

Scott Osborn writes: Been using the dev controllers, hooked up to the DTL-H2000 board, for some time now with no problem. But now we need to use the DTL-H2080 (for mem cards and other things), so we've plugged it into the board. Unfortunately, none of our CPEs (including the sample programs) acknowledge any input when using it. What am I doing wrong?

I think there is something wrong with the H2080. There is nothing you have to do to get it to work besides plug it into the serial connectors and then plug in a regular playstation controller.

---

8/7/96 2:49 PM

Mem card lockup problem with open()

Craig Galley

Peripherals

I've been attempting to track down a memory card problem, the best I've been able to do is to know that it is inside the open() call when the system hangs. This happens moderately infrequently but one of our testers can get it to happen often enough.

What could cause the open() call to lock up? I have checked all other things within my program just to make sure I'm not doing anything undocumented (ha ha ha - pretty much counts for anything!). I have no way of actually finding the PC at which it's locked as the pollhost call does not use the main process stack (it's called within the vblank).

I have determined it is the open that is failing by placing counters around all calls and it never returns from the open. A reply sometime soon would be greatly appreciated.

---

8/8/96 5:39 PM

Re(2): Mem card problems

Craig Galley

Rob Vawter

Peripherals

What I mean about counters is just a line number marker. The line number prior to the open call is logged but not the one after.

I am not using any timers or anything like that, the sequence of events is something like:

```
if (firstfile(Filename, &_dir_buffer)==&_dir_buffer) { VSync(0); delete(Filename); VSync(0); }
fd = open(Filename,O_CREAT | (1<<BlockSize)); VSync(0); if (fd==-1) { fd =
open(Filename,O_CREAT | (1<<BlockSize)); VSync(0); if (fd==-1) return(BUP_ERROR); }
```

.....

The VSync calls are there because something somewhere said you had to put something in between the open and write calls otherwise it could fail. As is typical in the PSX manuals, it doesn't tell you what you have to do so the VSyncs seem to be the best bet.

Anyway, I have modified the code so that the file will only be re-created when the file needs to extend in size. This appears to solve the problem but I have a nasty feeling it's still lingering

round.

I apologise if I sounded too sarcastic about the response but the last message I put up about memory cards was never replied to.

The next time the error occurs I will be able to give you more details such as which O/S routine it is stuck in (at least a close approximation of the PC address) since I finally found out where the TCB is held!

---

8/8/96 2:41 PM

Re: Mem card problems

Rob Vawter

Craig Galley

Peripherals

I've been attempting to track down a memory card problem, the best I've been able to do is to know that it is inside the open() call when the system hangs. This happens moderately infrequently but one of our testers can get it to happen often enough.

What could cause the open() call to lock up? I have determined it is the open that is failing by placing counters around all calls and it never returns from the open. A reply sometime soon would be greatly appreciated.

Hello??? is there anyone out there??? A response would be nice.

Are you using root counter 2 while memory card access is occurring. It was recently discovered that a conflict exists (somehow) between these two. If not, let me know; I am still looking into how open() can fail, but I'm hoping that the root counter may be your problem. Also, I know you have been waiting for this answer for a while, but 20 hours between posts (with most of those hours being non-working hours) is unrealistic when we are busy.

---

8/9/96 6:59 AM

Re(2): DTL-H2080 Problem

Scott Osborn

Michael Koziniak

Peripherals

Michael, >>"I think there is something wrong with the H2080. There is nothing you have to do to get it to work besides plug it into the serial connectors and then plug in a regular playstation controller."

You're right. We ended up plugging and re-plugging the various cords until we got a combo that worked (only the #2 slot is working).

Thanks for the input.

Scott

---

8/12/96 10:59 PM

\_card\_load() question?

Tom Braski

Peripherals

Hello everybody in Memory card land,

Is there any harm in calling \_card\_load() more than once for a card that is already connected (that is, \_card\_info() generated a connected event)?

Also, does anyone know what \_card\_load() does besides testing the card format?

Thanks in advance,  
Tom

---

8/19/96 5:48 PM  
Re: \_card\_load() question?  
Mark Slemko  
Peripherals

>Is there any harm in calling \_card\_load() more than once for a card that is >already connected (that is, \_card\_info() generated a connected event)?  
Should be OK. Card load seems to load in the directory information for the card. And must be used before any IO can be done to the card.  
I posted not too long ago on my experience with \_card\_load(). Check the archive for more information.  
-ross (although it says mark)

---

8/29/96 12:00 PM  
LibTap & RCnt2 problem  
Kerry J. Ganofsky  
Peripherals

I've been using an RCnt2 timer interrupt without a problem for timing different things (most notably to time the end of the vertical blank interval).  
Now that I have linked in the new libtap.lib (the one with InitTAP, StartTAP, etc. functions), my system will hang if I call StartTAP after calling StartRCnt, and it will also hang if I call StartRCnt after calling StartTAP. Both the multitap and the timer interrupt work fine independently.  
Any suggestions...  
Thanks Scott Corley High Voltage Software

---

9/11/96 12:54 PM  
Re: LibTap & RCnt2 problem  
Mike Fulton  
Peripherals

I've been using an RCnt2 timer interrupt without a problem for timing different things (most notably to time the end of the vertical blank interval).  
Now that I have linked in the new libtap.lib (the one with InitTAP, StartTAP, etc. functions), my system will hang if I call StartTAP after calling StartRCnt, and it will also hang if I call StartRCnt after calling StartTAP. Both the multitap and the timer interrupt work fine independently.  
Any suggestions...  
Thanks Scott Corley @ High Voltage Software  
It would help if you more precisely specified the version number of the library. I'll presume you mean v3.5. Let me know if that's not right. (Let me know BOTH versions involved.)  
I looked at the library sources and I don't see anything different from v3.4 to v3.5 that would account for something like this. The body of the function is the same, and there do not appear to be any big changes to the other functions which get called along the way.  
Can you outline the code a bit?

Mike

---

9/26/96 4:03 AM  
Namco (not NegCon) rotary controller  
Brian McGroarty  
Peripherals

It's my understanding that Namco Arcade Classics No. 2 (Japan release) shipped with a rotary controller of some sort.

Does anyone know anything about this controller? Tempest/X currently supports joystick, mouse, NegCon and (hopefully -- I need to get one to verify my code) analog joystick. I'd like to know if there's another mode I'd need to support for the occasional fellow with access to one of these critters.

Thanks -- brian@pobox.com

---

10/3/96 1:07 PM  
Memcard problems with open  
player 1  
Peripherals

I'm having some problems getting the memory card to act consistently. I have a file created on the memory card (from a previous save), but when I initialize the card (at the start of the program) and then try and open the file, there's a roughly 50% chance that it will fail on the open, even if the file exists. The program is set to retry about 10 times, with a short delay between each retry, but once the first one fails, all the rest of the retries will fail as well. I am using Root counter 2, but I don't have a choice in the matter, but could this be what is causing the problem? Anyone got any ideas? If you want to see the code, I'll post it, but I'd didn't want to have to do it unless someone wanted to see it.

Tom Ketola PSX Programmer Player 1, Inc.

---

10/7/96 12:13 PM  
Re: Memcard code  
player 1  
Brian Dawson  
Peripherals  
NEW.C 3K  
Peripherals

Thanks! I've included the code we use to initialize the memory card, close the memory card, and open a file for reading. Using just these functions I can cause it to fail on opens...Let me know if you figure anything out, and thanks for the help....

Tom Ketola PSX Programmer Player 1, Inc.

---

10/7/96 9:43 AM  
Memcard code  
Brian Dawson  
player 1  
Peripherals

Please send please send me a code snippet and I'll see if i code identify the problem. Thanks  
Brian Dawson@SCEA

---

10/16/96 9:45 AM  
Re(2): Memcard code  
David R. Black  
Peripherals

Tom,

I took a look at the code you posted for your MemCard support, and have a few ideas that may help you resolve your problems.

First off, your initialization order may be wrong. In my code, I open all of the events, start the MemCard libs (initcard/startcard/buinit), and then enable the events. I am also not calling the `_card_auto` function at all. (this sets auto-format, and probably should be removed ultimately)

Also, a stupid question. You are calling `_card_load` to load the filesystem for the memory card before attempting to read your file, correct?

One problem I was having was that in my card status gathering function, I needed to make two passes at card detection (`_card_status` w/ result and `_card_load` w/ result) in order to properly determine if a card was present and formatted.

Anyway, hope these suggestions help. I am just finishing memory card support in my title, and this stuff is still fresh in my mind. Let me know if there are any questions I can answer for you.  
David R. Black Lead Programmer Prestom Studios, Inc.

---

10/18/96 6:57 PM  
Re(3): Memcard code  
player 1  
Peripherals

Ok, I fixed my memory card problem. It ended up being interrupt handler. All I had to do was remove the interrupt handler and voila, problem solved. (The reason it was so difficult to track down was the interrupt was hidden in some API code that I don't have source code for).

Anyway, by disabling my handler the code works 100% reliably.

Tom Ketola PSX Lead Engineer Player 1, Inc.

---



## Sample Code

5/24/95 4:32 PM

Re: japanese characters?

Dan Burnash

Kirk Bender

Samples

We are using the following,

DOS J6.3/V WINDOWS 3.1 for MS-DOS 5.0V

Unfortunately, using Japanese DOS is not usually a viable option. We are working on translations, so check the BBS regularly for the updates.

Dan Burnash

---

5/24/95 9:17 AM

japanese characters?

Kirk Bender

Samples

What software do I need to view the sample comments and readmej.txt in their original katakana and kanji characters? I am learning japanese (katakana anyway) and anything would help to decipher the comments. thanks.

---

8/18/95 9:58 AM

Re: japanese characters?

brian l. schmidt

Kirk Bender

Samples

oky boku mo nihon-go o benkyo shimasu. anata no kaisha wa nan desuka? Watashi wa bideo-game no ongaku o program suru kaisha de hatarakimasu (jibun no kaisha desu). Denwa bango wa 708-256-0044; email address wa bschmidt@mcs.com

ja mata Brian

---

8/26/95 12:07 PM

Re: japanese characters?

Shaival Varma

Kirk Bender

Samples

actually from: R. Brett Butler Lion Entertainment Austin Tx

its good that you're learning japanese. Learn hiragana first, then katakana, then kanji. There is more to read in hiragana, which means there is more to practice on.

---

8/26/95 12:09 PM

Re(2): japanese characters?

Shaival Varma

brian l. schmidt

Kirk Bender

from : R. Brett Butler  
beeru wa nomimashoo n desu ka?

---

8/31/95 7:42 AM  
Can developers help each other?  
Carl Ferreira  
Samples

Since Sony will not provide source code (dig, dig) to their GS library, nor provide adequate examples without using the GS library, would it be reasonable / desirable to set up another conference folder for developers to post questions and source for each other to explain technical aspects of 3D development?  
Is there any interest in this?  
Carl

---

8/31/95 4:29 PM  
Re(4): Shoving GS  
Angus  
Mike Gomez  
LIBGS  
2 comments:  
We have sample code. Libgs routines are in libgte.lib and begin with Gs.  
Angus

---

8/31/95 4:08 PM  
Re(3): Shoving GS  
Mike Gomez  
LIBGS  
Samples  
I am yet another developer who has no use for the GB lib. However the general subject of developers collaborating has come up a few times, and is appealing. I don't think it is feasible to do anything as ambitious as spec-ing out an entire library. For one thing that would be Sony's domain. For another thing there are so many developers that it would be a nightmare to try to make everyone happy.  
I believe that there are two areas in which developers (Sony also) can contribute: Sample code, and Q&A style docs. These should be categorized by subject, not hodge-podge. Either have individual subject folders under the samples and doc conferences, or have a samples folder and a Q&A doc folder under each conference.  
For starters there is much information in the existing conferences, but it is hard to find and sometimes strung out across months of discussions.  
- Disclaimer -  
I will incur no liability for the lack of knowledge of items contained in FAQ's. I eagerly await PC readable TEXT docs.  
Later  
- PSX rules

---

8/31/95 8:56 AM  
Re: Can developers help each other?  
Dave R. Scheele  
Carl Ferreira

## Samples

>> Since Sony will not provide source code (dig, dig) to their GS library, >> nor provide adequate examples without using the GS library, >> would it be reasonable / desirable to set up another conference folder >> for developers to post questions and source for each other to >> explain technical aspects of 3D development?

Personally, I'd rather see Sony start giving more examples of doing things such as camera motion without the GS library. That alone would help new developers who don't want to use GS to get moving faster. It woulda saved me a lot of time!

Dave

---

9/1/95 10:15 AM

Re(5): Shoving GS

Dave R. Scheele

Angus

LIBGS

>> 2 comments:

2 responses:

>> We have sample code.

Often sample code is provided using LibGS, with no equivalent GPU/GTE example. The most irksome example of this is the object->camera transformation process. This has been asked for & discussed with no \*public\* resolution for quite some time now (see Carl Ferreira's LIBGTE message "Object -> Camera transformations"). I'd like to see how Sony suggests doing this.

>> Libgs routines are in libgte.lib and begin with Gs.

Excuse me for being dense, but your point is??? ;-)

Dave

---

9/6/95 8:00 AM

Re(2): Fwd: Can developers help each other?

Carl Ferreira

Samples

Kristine Severson

>> Since Sony will not provide source code (dig, dig) to their GS library, nor provide adequate >> examples without using the GS library, would it be reasonable / desirable to set up another >> conference folder for developers to post questions and source for each other to explain technical >> aspects of 3D development?

>> Is there any interest in this?

> Actually, that's what the GS and GPU conferences are for. Or you could use private email.

> If I set up another private conference, everyone will request access anyway, and it will become > equivalent to what the GS and GPU conferences are now.

> Kris

The obvious use for the GS conference is to ask questions / discuss the GS library. The GPU conference is for questions / problems with the GPU library.

What I'm suggesting is a 'conference' in which technical details can be discussed which may or may not be specific to the PSX, for example, how to move the damn camera around in the world without using the GS library, or how to display a scrolling background as a 3D concept, not as a PSX concept.

My thought would be to have technical problems posted in the conference, with solutions remaining in an examples folder forever to demonstrate things which may be obvious to Brian Hook or Michael Abrash (or any other technical 'guru'), but may be clear as grass to the rest of us.

Things I could imagine being posted here: PC source code equivalents for PSX functions, working examples of high level routines available in the GS library which are implemented using only the GTE and GPU libraries; useful add-ons such as the profiler, timer, large font text display, etc.

How about it? Does this sort of thing deserve its own forum, or should we try to seek out those few people who might have the information we need and have the time and inclination to respond?

Carl

---

9/6/95 12:43 PM

Re(5): Fwd: Can developers help each other?

Dr. Cat

Samples

> i think we have an opportunity to help each other & ourselves(sp) here. >> The PS-X support team is under staffed, and usually points to the documentation. > The Sony Playstation comes out in 4 days. > I've got ETA's to meet. >> (do you find yourself relating much here? or am i just whinin'?)

I can definitely relate. I have a near-impossible deadline to meet, and am just getting up to speed on the PSX, and still have a fair amount of finishing up work to do on the port of this same product to another platform at the same time! Thankfully the game is \*very\* simple, and I might make it. But it would save me a LOT of time to have good basic pieces of sample code I can adapt to throw up a simple 2D background image, play a 1 megabyte sampled sound by feeding it to the sound chip memory in little pieces, throw up a single texture mapped quad on the screen, etc. I'm not sure how much of what I need I'll be able to take from the provided samples, as I haven't been able to go through them and try them yet until I get my header file problems resolved. But I'm sure the vast majority of the things I need to do & could spend hours wrestling with are trivial to most of the developers on here who are already experienced with the machine, and probably have routines lying around already they could show me.

-- Dr. Cat

---

9/6/95 10:47 AM

Re(4): Fwd: Can developers help each other?

Kristine Severson

chris m. coffin

Carl Ferreira

We'll set up a new conference called "3D Dev". It will be "your" conference...i.e., we can't promise responses to queries there, like we do in the PSX-specific folders.

Kris

---

9/6/95 1:22 PM

3ds2tmd

Mike Gomez

Samples

(This originated in the Sound conference, but is getting a little off-subject so I sent it here)

>>p.s. I have written a replacement for 3ds2rsd because the one from SONY didn't work. I'm currently a >>couple days away from making it 3ds2tmd so I don't have to use the brain dead rsdlink thing (not worthy of >>being called a program).

Roy,

3ds2tmd would be extremely handy. Would you consider posting it when it is complete? I would be most grateful.

---

9/6/95 2:10 PM

Re(5): Fwd: Can developers help each other?

Carl Ferreira

Kristine Severson

chris m. coffin

>>We'll set up a new conference called "3D Dev". It will be "your" conference...i.e., we can't >> promise responses to queries there, like we do in the PSX-specific folders.

>>Kris

Thanks, Kris! We are not looking for Sony responses here -- in fact, that's the whole idea, to let developers share knowledge which may not be PSX related.

Of course, should someone from Sony want to contribute...

Thanks again!

Carl

---

11/2/95 5:25 PM

Scratch Pad sample not working?

FLORIA L. ROSS

\*Samples

The scratch pad sample program doesn't seem to compile properly. I get "circular dependencies" and "missing attributes" errors. Has anyone been able to get it to work?

---

11/7/95 10:50 AM

Movie+Sound samples?

FLORIA L. ROSS

Samples

3DS Beta 1.0

Are there any samples available that show how to stream both video+sound at the same time from the CD? Also are there any movie samples available with English comments?

Thanks

---

11/8/95 3:27 PM

Re(2): Movie+Sound samples?

FLORIA L. ROSS

Thomas Boyd

Samples

Sorry but I'm not sure where this cdmovie directory is. I have a MOVIE diretory and under that I have ANIM, CDTUTO, SIM, EARTH, and something else but I haven't seen a directory called cdmovie. Can you please direct me? Thanks!

---

11/8/95 3:14 PM

Re: Movie+Sound samples?

Thomas Boyd

FLORIA L. ROSS  
Samples  
yes. tuto1.c in the cdmovie directory

---

11/8/95 4:21 PM

Re(3): Movie+Sound samples?

Thomas Boyd

FLORIA L. ROSS

Samples

MAKEFILE.MAK 1K

Sample Code

on the newly released CD,

\psx\sample\cd\movie\tuto1.c

I have attached it in case you don't have the CD yet, but you need to make a movie with sound (only a silent movie exists on your dev disk).

T

---

2/9/96 4:12 PM

Fwd: where is xa7v.xa

jeffrey Hall

Samples

In one of the cd tutorials a cdxa file is referenced (xa7v.xa). I've looked around and couldn't find it. Where is it? Thanks, Jeff Hall

---

3/15/96 1:49 PM

Re: Fwd: where is xa7v.xa

John Phua

jeffrey Hall

Samples

Hi Jeff,

The file is quite large so wasn't posted on the BBS. You can create an XA file and use it in its place.

Thanks, John

---

## Sound Artist

3/23/95 5:38 PM

\*Sound Board

Brian Greenstone

Sound

Sound Artist

We just got our sound dev board and we're a bit confused. Is the digital output the ONLY output from the board or should it be playing thru the Mac's internal speaker?

-Brian

---

3/23/95 5:53 PM

\*Re: Sound Board

Bill "Angus" Guschwan

Sound

Sound Artist

Here's a post from an earlier post. SOund board only has digital optical out.

To convert your digital optical out to audio, you can use the DAC-in-the-Box from Audio Alchemy. The price is less than \$200, and it is really small. It takes a digital optical in and converts to the audio RCA cables out. It also takes coax in. There is an external power supply connected to the cable.

The address is

31133 Via Colinas Suite 111 Westlake Village, California 91362 818 707 8504

Angus

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3/27/95 9:13 PM

\*What is default adsrs in SoudDeli?

Administrator

Sound

Sound Artist

> 5) In SoundDeli in what data structure do you store the default adsrs of typ1, > typ2, oneshot, etc.?

from Mr.Hashimoto:

In SoundDeli(upto v1.5), the list of the default adsrs is as follows:

|        |              |                |                |                |         |         |
|--------|--------------|----------------|----------------|----------------|---------|---------|
| type   | ADSR1, ADSR2 | original       | 0x0000, 0x0000 | cut            | 0x00ff, |         |
| 0x1fc0 | typ1         | 0x80ff, 0x09ce | typ2           | 0x988c, 0x9fd0 | 1shot   | 0x00ff, |
| 0x9fff |              |                |                |                |         |         |

SoundDeli(-v1.5) has a problem that if you click the default adsrs' button, the value does not be redisplayed. I will fix it in the next version.

(from Kaol: ADSR1 and ADSR2 are the same as the member of structure VagAttr or SpuVoiceAttr that I explained above.)

---

3/31/95 7:40 AM  
\*Raw2XA Tool speed  
Mike Bartholomew  
Sound

Sound Artist

When using the MAC sound tool "raw2XA" to convert a 3 minute 44.1 stereo file to ~37 stereo, it took about an hour and a half. Is this the normal speed for this conversion tool? Are we doing something wrong, or is there any way to speed up this tool?

Thanks,  
Sandi

---

4/11/95 10:39 AM  
\*XA conversion  
Buzz Burrowes  
Sound

Sound Artist

Am I the only one who's noticed how much faster MovConv is at converting audio to XA format than RAW2XA on the MAC?

example: source: 10 second stereo, 44.1k, 16bit sound file (RAW for RAW2XA and Wave for MovConv)

destination: 37.8k stereo XA

Test 1: PowerMAC 8100/80Mhz 32meg RAM; conversion took 3 minutes and 20 seconds and created a file that was 513,920 bytes in length.

Test 2: P5-90Mhz with 16meg RAM; conversion took 22 seconds and created a file that was 439,168 bytes in length!

For those of you tired of waiting for XA conversions on your MAC... It looks to me like the way to go is to use MovConv on a P5!

NOTE: I haven't yet done A/B comparisons of the resulting xa files to check for quality of compression. That's next. If anyone else has any insight let's hear it.

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4/11/95 10:41 AM  
\*Re: XA conversion  
Buzz Burrowes  
Sound

Sound Artist

BTW: this test was done using MovConv 1.8e

---

4/19/95 10:20 AM  
\*AIFF2VAG  
iain macanulty  
Sound

Sound Artist



we're using AIFF2VAG v.1.3 dated Oct 26, 1994, and it crashes consistently with a bus error when converting more than one sample. Is there a newer version we should have?  
ian.

---

4/19/95 10:44 AM

\*Re: AIFF2VAG  
Buzz Burrowes  
Sound

Sound Artist

I'm using the same version and have had no such problems. When I'm working with Sound Delicatessin I usually leave AIFF2VAG running and constantly switch back and forth to convert samples.

Are you running any other software when this happens? What's your MAC system like?

---

4/29/95 2:50 PM

\*CD DA Tools  
Jose R. Villeta  
Sound

Sound Artist

Are there any tools that can do raw2da and raw2xa for the PC. Even using wave files will be OK. Thanks in advance, jose Black Ops

---

5/1/95 10:00 AM

\*Re: CD DA Tools  
Buzz Burrowes  
Sound

Sound Artist

raw2da: 16bit 44.1k stereo wave files are already in the proper byte order for DA. you simply need to strip off the wave header. This header is typically 44 bytes in length but could possibly be different since we are talking about an IFF file.

Look at the file and look for the text 'data'. Following that text there is a DWORD that has the size of the data (in bytes). Strip off everything through the 'data' and the DWORD size and the head of you file should be the start of audio data. Make sure this file is the same size as that shown in the DWORD after 'data' and you should be all set.

AIFF files are obviously a different story as the format of the header info is different and the data is in the wrong 'endian' format.

raw2xa: Well, there is no raw2xa converter for the PC, but MovConv can convert wave format files to XA...

- 1) Enter your wave file name into the Input - File name box. (I've only used 16bit, 44.1k, stereo files for input, but I'm told that the only real stringent requirement is the 16 bit part.)
- 2) Select 'wav' in the Input - Format drop down list box.
- 3) Specify an Output - File name.
- 4) Select XA in the Output - Format drop down list box.
- 5) Click the 'Detail' button and select the desired output sample rate and channel format.

6) Click the >> button and you're off.

BTW: I've found the MovConv is atleast 7 times faster at doing XA conversion than the MAC RAW2XA converter is!  
GOOD LUCK

---

5/24/95 4:34 PM

\*RAW or SD2?

Rex Baca

Sound

Sound Artist

I remember hearing controversy about whether or not the Raw2DA and Raw2XA utilities could handle Sound Designer II files (like it states in the manual) or whether you need to remove the header first (to make it Raw). I've burned CDs for the Playstation using both methods, and have never heard a problem. Has anyone found out if headers are removed from SD2 files with the Raw2DA utility?

---

6/9/95 4:09 PM

\*Re: Batching Aiff to VAG

Bill "Angus" Guschwan

Sound

Sound Artist

Yes. Use AIFF2VAG v. 1.6. It has a Auto menu item in the Output Mode menu which lets you do batch without dialogs. You can then drag and drop your AIFF files. Make sure you have enough memory specified. 1.6 is in the Sound Conference.

Angus

---

6/9/95 1:23 PM

\*Batching Aiff to VAG

Jim Rogers

Sound

Sound Artist

We have around a thousand samples to convert from aiff 2 vag format. The vag format is not available from sony to allow us to write our own batch aiff2vag.

aiff2vag is selecting the loop box by default on some of the aiff2vag files but not all. Is there a batch aiff2vag available that allows loop to always be specified off and doesn't ask for saving confirmation?

What criteria causes Aiff2Vag to select loop when converting?

Thanks Jim R.

---

6/19/95 10:34 AM

\*SoundDelicatessen problems

Yoram Berkowicz

Thomas Boyd  
Sound

Sound Artist

Dear Thomas

1) We are trying to employ direct communication between any MIDI Manager aware sequencer and the DTL H-700 (Via Sound Delicatessen). This is indispensable in the music creation process for the PlayStation. This feature is mentioned in chapter 3 p 31 of the Sound Artists Tools manual. Unfortunately the only external MIDI data the delicatessen is willing to react to comes from our external keyboard and only to Program 0. We tried several versions of Cubase and Band-In-A-Box with no success.

2) We are trying to locate the sequencer software FREEMIDI that is mentioned in the Sound Artists Tools manual.

3) We are experiencing tempo fluctuations during playback of a sequence on the DTL H-700 with the SoundDelicatessen, this in addition to over all slow playback. We tested your sample VAB's and SEQ's and our self made SEQ's and the results are the same. We have experienced this phenomena on 2 different Mac's.

We are using SoundDelicatessen V1.6

Thanks for your fast reply,

Yoram Ariel and Yoram Berkowicz VIP

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6/20/95 5:27 PM

\*Re: SoundDelicatessen probles

Buzz Burrowes

Sound

Sound Artist

>> We tried several versions of Cubase and Band-In-A-Box with no success.

It could be a problem with an old version of Apple MIDI Manager. You should be running version 2.01

>> We are trying to locate the sequencer software FREEMIDI that is mentioned in the >> Sound Artists Tools manual.

I believe this is a MIDI manager type thing that comes with Mark of The Unicorn Products (e.g. Performer)

>> We are experiencing tempo fluctuations during playback of a sequence on the DTL >> H-700 with the SoundDelicatessen

The seq playback functionality in SoundDeli is basically useless. You really need to get Apple MIDI Manager working and use your own sequencer to send info to SoundDeli.

For those not familiar Apple MIDI Manager... It's no more sophisticated than a MIDI cable! You should see your sequencer's icon and Sound Deli's icon in the patchbay window. Drag a line from your sequencer's MIDI output to Sound Deli's MIDI in.

Now, be sure each track in your sequencer is set to send on a different MIDI channel (yeah, I know, you can have multiple tracks sending on the same MIDI channel, but I'm trying to make this simple;-). Also, make sure that the first event on each track is a MIDI program change message with a program number which corresponds to the desired program in SoundDeli ("Program" page, left column).

Now add some MIDI note on/off pairs and you should be set.

Good luck!

---

6/27/95 5:27 PM

YooEdit

Montgomery Singman  
Sound  
Bill "Angus" Guschwan

Sound Artist

I am trying to read some of the text files that came with my Sound Artist board and the Mac is telling me I need a program called YooEdit.  
What and Where is it?

---

7/18/95 12:59 PM

\*aiff2vag  
iain macanulty  
Sound

Sound Artist

hello,

I know you can't tell us how to do aiff to vag conversion, but we're starting to find the aiff2vag tool is a roadblock in our development system. One way to improve it would be to make it apple scriptable. If we could tell it which file to read and where to stick its output, we'd be further ahead than we are now. Is this a possibility in the near future? Are there other options you/we could look at? Working on the mac is preferable.

Once you've got the vag format patented will you tell us how to do it ourselves?  
thanks, iain.

---

7/18/95 4:37 PM

\*Re: aiff2vag  
Buzz Burrowes  
Sound

Sound Artist

In case you hadn't tried it...

The latest version of AIFF2VAG can do batches of files with a single "drag-and-drop".

- First run AIFF2VAG. - Set the compression option to the desired format. - Under the OutputMode menu select Auto. - Go back to the finder and drag multiple AIFF files onto the AIFF2VAG program icon. - You will be presented with a file save dialog for the first file to allow you to select the destination. - Once you've selected the destination, ALL of the files you dropped onto the icon will be converted.

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7/19/95 11:55 AM

\*Fwd: Sound Setup Problems  
Byrt Martinez  
Sound

Sound Artist

We are just starting PSX development and have a couple of questions:

1. Are the Sound Tools Power Mac compatible? (I am using a Power Mac 7100). 2. What is the most stable digital audio editor to use? Running Alchemy 3.0 when AIFF2VAG is running (and

vice-versa) locks everything up. 3. Are there any plans to create an Opcode MIDI System driver for the DTL card so that OMS can see it (like the MacProteus or SampleCell cards)? I am unable to record MIDI when using Apple MIDI manager and Vision. This may be a problem with Apple's MIDI Manager, but Apple is no longer supporting MIDI Manager. 4. Is there more documentation (english) available on SoundDelicatessen's patch editing features (ADSR section).  
thanks in advance.

---

7/20/95 3:06 PM

\*Re: Fwd: Sound Setup Problem

Buzz Burrowes

Sound

Sound Artist

>> 1. Are the Sound Tools Power Mac compatible? (I am using a Power Mac 7100).

Yes... I'm running them on a PowerMAC 8100/80

>> 2. What is the most stable digital audio editor to use? Running Alchemy 3.0 when >> AIFF2VAG is running (and vice-versa) locks everything up.

I have been running Vision, SoundDeli., AIFF2VAG, AND SoundDesigner II all at the same time! No crashes to speak of.

I have just recently got a copy of the latest Alchemy and found that it alone crashes from time to time when I direct its audio output through either my ProTools system or the Apple Sound Manager. I'm not sure what the deal is, but I'm not real happy.

>> 3. Are there any plans to create an Opcode MIDI System driver for the DTL card so >> that OMS can see it (like the MacProteus or SampleCell cards)?

I have asked the Japanese engineers to look into this, and have directed their attention to the FREE oms development kit. I don't know what they will do.

>> I am unable to record MIDI when using Apple MIDI manager and Vision. This may be >> a problem with Apple's MIDI Manager, but Apple is no longer supporting MIDI Manager. I've been using Vision 2.0.8, Apple MIDI Manager 2.01, and Sound Deli with no problems recording or playing back MIDI.

---

8/20/95 9:45 AM

\*About aiff2vag

Dave Elton

Art Tools

Sound Artist

I am trying to convert wave files using aiff2vag and found it needs tons of memory, virtually the same amount as the source audio file. Say you have a 30 Meg aiff source file (which usually is normal in game), you have to have 30 Meg memory (I don't know yet whether virtual mem works or not) and then change the minimum memory requirement for aiff2vag to 30meg to actually convert. Is this a SPECIAL requirement for aiff2vag or am I missing something in setup? Also I have read before you can drag the source file on the icon and convert, which is good to do batch converting, but it does not work for me. Even after I change the converting mode to Auto Mode, any idea there? Thanks in advance!  
Simon ReadySoft Inc.

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9/1/95 8:45 AM  
\*AIFF2VAG Parameters  
Mark D. Hirsch  
Sound

Sound Artist

Is there a way to batch process the AIFF2Vag files without having to set all the parameters for each file independently, at the time you drop them onto the Icon. Possibly there is a configuration file that I don't know of, that can be set for the different files, ahead of time???

Please let me know if I am missing something important.. Thanks

---

9/1/95 8:31 PM  
\*Sound and Music development ithout a Macintosh  
Roy Eltham  
Sound

Sound Artist

Are there any tools available for creating the PSX sequence and sound files on a dos/windows system? Perhaps from MIDI files (for sequences) and WAV (or countless other formats) for sounds?

We currently do not own or plan to buy a Macintosh computer so it is extremely important for us to get dos/windows version of the sound tools.

On a related note, we just recently purchased the sound artist board from SONY and all we received was a card that plugs into a Mac. NOTHING ELSE. No software, no docs, ZILCH. The card appears to be just a digital input or output card, but I can't really say without any documentation. Is this the way it goes for everyone? Did we not get something we were supposed to? Are there plans for a PC card for sound development? (like all the rest of the dev cards?) Currently we have paid a couple thousand dollars for a practically useless Macintosh PC board and access to the sound areas on this BBS which contain all Mac software and two useless PC utils that operate on files we can't create.

Any info, help, or comments would be greatly appreciated.

Roy Eltham Lead Programmer Regal Productions

p.s. I'm already in the process of writing my own 3ds2rsd / tmd utility (that works), do I need to add SEP/VAB/VAG/SEQ/etc. file converters to my already insane list of things to do?

---

9/11/95 2:57 PM  
\*Re: Anyone have an answer  
Buzz Burrowes  
Sound

Sound Artist

I believe that if you start AIFF2VAG and set the parameters as you want them (which compression mode you want to use) you can then switch back to the Finder (with out quitting AIFF2VAG) and "Drag-and-Drop" the AIFF files in question on to the AIFF2VAG icon and AIFF2VAG will use these settings.

(I'm not sure I understand what I just wrote 8-)

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9/11/95 3:03 PM

\*Re: MIDI Channels in .SEQ file

Buzz Burrowes

Sound

Sound Artist

>> When two separate tracks on two separate MIDI channels share the same patch (or >> program change), it appears that channel independent volume, pan, etc., is not >> possible. One effects the other, which normally should not be the case. Are there >> any plans to fix this? I've run into this problem myself. I don't know that the problem will be addressed. There is a fairly straight forward solution...

- In SoundDeli Put the cursor in the title field of the patch (program) in question and select "Copy This Line" from the Edit menu.

- Put the cursor in an empty program slot and select "Paste This Line" from the edit menu  
You now have two identical patches. The second DOES NOT use any more sound ram and only minimal (if any) additional main memory. Use this new, identical program for that second track and you should be ok for separate volume, pan, etc.

Good luck.

---

10/3/95 4:26 PM

\*Does the Sound Artist board work with a PowerMac?

stephen chaplin

Development Env.

Sound Artist

I was wondering if the Sound Artist board works okay with the PowerMac 8100 (we just got one for Mac development, and I thought that this would be a good time to finally plug in the Sound Artist board that was sitting on a shelf). While I'm at it, I have some MIDI files (PC format) that I need to get converted to the SEQ format. How do I go about doing this? And what exactly is an SMF (Standard MIDI File??) and how does it differ from a .MID file on the PC? Then, where do I get instrument definition files for my MIDI files, are there any standard MIDI patches I can use?

Thanks for listening to my questions, I am not a musician or MIDI freak as you can probably tell!

Romesh, Celeris Inc.

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10/5/95 9:53 AM

\*Re: Does the Sound Artist board work with a PowerMac?

Angus

Sound

Sound Artist

>>I was wondering if the Sound Artist board works okay with the PowerMac 8100 (we just got one for Mac development, and I thought that >>this would be a good time to finally plug in the Sound Artist board that was sitting on a shelf). Yes.

>>While I'm at it, I have some MIDI files (PC format) that I need to get converted to the SEQ format. How do I go about doing this? SMF2SEQ. SEQ is a sequence file and is our midi file format. We support General MIDI.

>>And what exactly is an SMF (Standard Midi File??) and how does it differ from a .MID file on the PC? SMF is a standard midi file which supports MIDI file format 1.

>>Then, where do I get instrument definition files for my MIDI files, are there any standard MIDI patches I can use? You have to make your own.

---

10/6/95 2:33 PM

MIDI control of VAB during sequencing

Mark D. Hirsch

Buzz Burrowes

Sound Artist

Am unable to get midi controller (Roland JV-30) to trigger more than one vab program from within Opcode Vision 2.0. I am using midi manager and have checked my patchbay routing. All seems to be in order and yet currently controller only triggers program 0 of a 15 program vab. Keyboard window in SoundDeli is functioning normally but I need direct midi input asap. Vision is not recognizing SoundDeli but is mounting instruments Mngr-1, 2, etc. Is this right? Any help you could provide would be appreciated.

Thanks,

Joe Lyford

---

10/16/95 3:59 PM

\*Re: Does the Sound Artist bord work with a PowerMac?

Buzz Burrowes

Sound

Sound Artist

>> And what exactly is an SMF (Standard Midi File??) and how does it differ from a .MID file on the PC?

I believe the .MID files will convert OK but I'm not 100% sure. If they don't it will be easy to load the .mid's into a program like CakeWalk and re-save them as standard MIDI files.

>> Then, where do I get instrument definition files for my MIDI files, are there any standard MIDI patches I can use?

Angus is correct... you have to create your own. One option that will get you moving along quickly would be to purchase a sample library meant for DigiDesign's SampleCell II card. These are usually collections of AIFF files which are a prime starting place for building a bank for the PlayStation. If not AIFFs they will be in SoundDesigner II format and those can easily be converted into AIFFs.

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10/16/95 3:53 PM

Re: MIDI control of VAB during sequencing

Buzz Burrowes



Mark D. Hirsch  
Sound

Sound Artist

>> Am unable to get midi controller (Roland JV-30) to trigger more than one vab program from within Opcode Vision 2.0. <<

I assume you are aware that the program numbers DO NOT correspond to MIDI channel numbers...

To make note messages coming down MIDI channel 0 sound program 15 in SoundDeli. you need to send a program change message with a value of 15 down MIDI channel 0 FIRST. Then you will hear the correct sound.

If you start SoundDeli and send NO program change messages I believe ALL note messages down ALL channels will sound program 0.

>> Vision is not recognizing SoundDeli but is mounting instruments Mngr-1, 2, etc. Is this right? <<

I've found that when using Vision with Apple's MIDI Manager you need to select "To Mgr - x" (where x is the channel number) for the instrument on a given track to get that tracks messages to go to the MIDI Manager. Yes... this is correct.

So, in conjunction with the answer to your first question...

Let's assume you have a bass sample as program 3 in sound deli. To get a Vision sequence track to trigger that sound on MIDI channel 6...

- Select "ToMgr-6" in the instrument column for the given sequence track. - Open the event window and add a program change event at the very beginning of the sequence. Set it's value to 3 (our bass sample). - Play the sequence once to force this program change message to reach SoundDeli. - Put the track in question into record and play your MIDI controller. You should now be triggering the Sound Artist Tool and hearing the correct sound.

(note... if you put the track into record and record from the beginning you will probably overwrite your program change message. Don't worry... go ahead and record your track and then go back and put it back in later. Once SoundDeli got that message the first time it won't change again until told to do so. BUT DON'T FORGET TO PUT IT BACK IN! You could go about your business and build a complete sequence this way and if you don't put the program change messages back in you will be VERY unhappy when you come back tomorrow, reboot, and try to play your masterpiece.)

---

10/20/95 6:04 PM  
Optical Digital Out  
Dan Chang  
Sound

Sound Artist

Our sound guy wonders if it is possible to connect the optical digital out from the sound development card to an RCA-style digital input of a Panasonic SV-3700 DAT? Is there a cable or box that will do this?

Thanks, Dan Chang Boss Game Studios

---

10/23/95 10:16 AM  
Re: Optical Digital Out  
Angus  
Sound

Sound Artist

You need to hook your optical out to the optical in on a dat player. Then you need to hit pause record and you can play it. Or go to radio shack and get an optical to rca converter.

Angus

---

10/24/95 5:44 PM

VAG questions

Montgomery Singman

Sound

Sound Artist

1. It's mentioned in the document that the loop points have to be in the 28 samples boundry. Here's my questions : a. Is each sample 16 bits ? In that case, 28 samples = 56 bytes. I just would like to clarify this. b. Does the length of a VAG file have to be the multiple of 28 samples ? If the length of source sample is not multiple of 28 samples, will AIFF2VAG tool pad zero to the last block ?

2. Is VAG data ADPCM ? If so, is the following data valid for PSX ? We would like to find out what kind of ADPCM is being implemented on PSX.

| Sample Rate               | Bit Width | Mode              | Compression Ratio -----   |
|---------------------------|-----------|-------------------|---------------------------|
| ----- CD-DA               | 44.1Khz   | 16 bit            | Stereo                    |
| 1:1 ADPCM Level B 37.8Khz | 4 bit     | Stereo            | 1:3 ADPCM Level B         |
| 37.8Khz                   | 4 bit     | Mono              | 1:7 ADPCM Level C 18.9Khz |
| 4 bit                     | Stereo    | 1:7 ADPCM Level C | 18.9Khz                   |
|                           |           | 4 bit             | Mono                      |

1:15

3. What's the sampling rate for a VAG file when sampling rate for a source AIFF is 44.1Khz ?

4. Why is the source AIFF file has to be mono ? Is it because a VAG can only take one channel ?

Thanks, Monte

---

10/26/95 3:49 PM

Re: VAG questions

Rob Vawter

Sound

Sound Artist

>> Q 1. It's mentioned in the document that the loop points have to be in the 28 samples boundry. Here's my questions : a. Is each sample 16 bits ? In that case, 28 samples = 56 bytes. I just would like to clarify this. b. Does the length of a VAG file have to be the multiple of 28 samples ? If the length of source sample is not multiple of 28 samples, will AIFF2VAG tool pad zero to the last block ? A 1. a. Yes. b. The VAG file has to be in a multiple of 28 ONLY when you are looping. This will create a smooth looping effect (provided that the sin wave at beginning and end of loop are equal value, the pitch and volume are the same etc). If you are not looping, the length of the VAG is "Any" (see pg. 50 in the Sound Artist Tool Manual).

>> Q 2. Is VAG data ADPCM ? If so, is the following data valid for PSX ? We would like to find out what kind of ADPCM is being implemented on PSX.

| Bit Width | Mode | Compression Ratio ----- | Sample Rate |
|-----------|------|-------------------------|-------------|
|-----------|------|-------------------------|-------------|

| ----- CD-DA   |                   |         |                   |                   |       |
|---------------|-------------------|---------|-------------------|-------------------|-------|
| 44.1Khz       | 16 bit            | Stereo  | 1:1 ADPCM Level B | 37.8Khz           | 4 bit |
| Stereo        | 1:3 ADPCM Level B | 37.8Khz | 4 bit             | Mono              | 1:7   |
| ADPCM Level C | 18.9Khz           | 4 bit   | Stereo            | 1:7 ADPCM Level C |       |
| 18.9Khz       | 4 bit             | Mono    | 1:15              |                   |       |

A 2. Yes. Yes. There are 3 kinds of implemented data - VAG, DA, and XA (which are level B and C above in your table)

>> Q 3. What's the sampling rate for a VAG file when sampling rate for a source AIFF is 44.1Khz ?

A 3. 44.1 Khz.

>> Q 4. Why is the source AIFF file has to be mono ? Is it because a VAG can only take one channel ?

A 4. Yes. If you want stereo, use two channels.

10/27/95 12:00 PM

Re: VAG questions

Buzz Burrowes

Sound

Sound Artist

>> 2. Is VAG data ADPCM ? If so, is the following data valid for PSX ? We would like to find out what kind of ADPCM is being implemented on PSX.

Well, I've heard that the VAG data is ADPCM compressed, but that it is a Sony flavor (read - proprietary). Now, don't confuse this with the XA that is supported. This, I believe, is a standard ADPCM compression and in this case your chart is valid.

The AIFF audio data input to AIFF2VAG can be sampled at nearly any rate (no, I haven't tried them all but I have used 44100, 22050, 11025, 32000 and 30000 successfully.) You simply need to twiddle the "center note" parameter in SoundDeli. to be sure your sample sounds at the correct pitch. Keep in mind that the data DOES have to be 16bit.

11/2/95 12:47 PM

Callback marks

Rob Vawter

Sound

Sound Artist

>> 2. Callback: What is the best way to send a flag (MIDI controller) to the programmer to instruct him/her to do something. What does the programmer need to do on their end to set it up as well?

To use the callback, you need to set a marker with NRPN data. CC99 followed by a 40 (28 hex) marks sets the mark and then CC98 followed by any value between 0 and 127. This value will be the value passed to the callback function. When this mark (63 28 62 x - where x is the value passed to the callback function) is detected, the function registered for the mark is called. The programmer needs to use the library function SsSetMarkCallback to set a specific function to be called when a mark is detected within a specific song. I hope this answers your question.

- Rob

11/7/95 3:25 PM  
SoundDeli  
Rob Vawter  
Sound

Sound Artist

>> b. Sometimes all of my patches get off by one or more units (i.e. patch 5 is now patch 6 in the programs) due to copying and pasting of patches. That's okay, but when I try to get things back into order by using the "Insert new line" and "delete this line" commands, things just get more out of wack. I end up having to go through each patch and copying it manually to the adjacent line. A: I am going to assume that you are not using SoundDeli version 1.6. I know this was a problem in earlier releases, but have seen it work reliably in 1.6. Let me know. As for portamento, vibrato, and pitch bend response, I am still experimenting.

---

11/8/95 8:11 AM  
SMF2seq/p  
Andy Hsiung  
Sound  
Sound

Sound Artist

How do you make a sequence package (SEP)? My documentation says that you select SEP in the "format" menu, but there isn't one. I've noticed that in my original tools (v1.3) the program is called 'smf2seq/p' but in v1.6 it is just 'smf2seq'. Thanks for your help.  
Greg Turner Realtime Associates, Inc.

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11/8/95 11:29 AM  
Re: SMF2seq/p  
Rob Vawter  
Andy Hsiung  
Sound

Sound Artist

>> How do you make a sequence package (SEP)? My documentation says that you select SEP in the "format" menu, but there isn't one. I've noticed that in my original tools (v1.3) the program is called 'smf2seq/p' but in v1.6 it is just 'smf2seq'.  
A: The PC tool "SEQ2SEP" converts SEQ files into a package (SEP). It's available under for download in the following area - Conferences\Releases\Product Releases\Sound Artist Tool\\*PC Sound Utilities.

---

11/14/95 6:02 PM  
seq2sep #2  
Andy Hsiung  
Sound

Sound Artist

Rob --- Thanks for the info re: 'seq2sep'. I have it now. What is the procedure for making the sequence bank? I've followed the format that it tells you to use ( seq2sep -o ..... etc.) but I need to make a bank of more sequences than the Dos prompt lets you enter. Do I make a text file, etc.???

Nothing I've tried seems to work.

Thanks. --- Greg Turner/ Realtime Assoc.

---

11/15/95 2:15 PM

Re: seq2sep #2

Rob Vawter

Andy Hsiung

Sound

Sound Artist

>> What is the procedure for making the sequence bank? I've followed the format that it tells you to use ( seq2sep -o ..... etc.) but I need to make a bank of more sequences than the Dos prompt lets you enter. Do I make a text file, etc.???

Nothing I've tried seems to work.

I'm embarrassed to tell you of the only method I know how to get around this. Rename your SEQs as follows: greg1.seq -> 1, greg2.seq -> 2 etc. Just give them single digit names with no extension and then you can fit them all on the stupid Dos prompt. Sorry.

- Rob

---

11/16/95 2:22 PM

Several Questions

Peter J.H. Alau

Sound

Sound Artist

Hello all.

I am researching sound libraries for our music team and wanted to know if anyone could recommend a sound library (preferably one that I can convert to .vag format easily).

Likewise, I need to get a DAC to work with the audio tool. Are there any suggestions.

Now that I look at this message, I realize that I should make a few things clear. We are just getting our sound department geared up, and I am looking for hardware suggestions that would be useful for all our platform development, but for the moment, anything that would be helpful for PSX development is my priority.

Thanks.

-Peter

---

11/16/95 10:59 AM

Re: SEP

Rob Vawter

Andy Hsiung

Sound

Sound Artist

My preferred way of playing sfx is to play them from midi sequences so I can do more than trigger just one note of any given sample. So here are some more questions for ya:

1) What is the max number of 'seq's that can be in 1 SEP? 2) Can multiple SEPs be used at one time? 3) If multiples can be used, what steps does the programmer need to take in order to play them?

I guess that's it for now. Thanks. --- Greg Turner/Realtime

Answers: 1) 16. [See SsSetTableSize pg 707 of Library 3.0 Reference Guide, among other places]

2) Yes. A total of 32 SEPs and SEQs can be open (and thus ready to play) simultaneously. [See SsSepOpen pg. 671 of Library Reference Guide among other places] 3) See page 177-178 of Library 3.0 Overview (Here it is in partial form): 1. Initialization - Initialize with the SsInit function. - Use the SsSetTableSize function to maintain the SEQ attribute data area. 2. Tick Mode Setting - Set tick mode with the SsSetTickMode function. 3. Opening Data - Use SsSepOpen/ SsSepOpen functions. 4. Starting the Sound System - Start the sound system by executing the SsStart () function. Use SsStart2 () if Tick Mode is 60. 5. Required Processing - Set Main volume. Execute required processing, such as SsSepPlay/SsSeqPlay. 6. Closing Data - SsSepClose/SsSepClose. 7. Terminating the Sound System - SsEnd. SsQuit.

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11/17/95 11:02 AM

Re: Several Questions

Rob Vawter

Sound

Peter J.H. Alau

Sound Artist

>> I need to get a DAC to work with the audio tool. Are there any suggestions. Easy answer - Get in touch with Audio Alchemy Inc. to get one of their DAC-in-the-Boxes. You will also need an optical cable to hook between the box and the Mac, and some speaker-like objects. Call them at (818) 707-8504, fax them at (818) 707-2610, or write them at 31133 Via Colinas #111, Westlake Village CA 91362. Be sure and tell them to send me my commission check for all the sales I send their way. :)

>> I am researching sound libraries for our music team and wanted to know if anyone could recommend a sound library (preferably one that I can convert to .vag format easily). Unfortunately, our 1st party sound guru isn't around today, so I'll have to give you my puny suggestions. I'm not sure whether you want SFX or music, but if its SFX, try calling Sound Ideas at 1-800-387-3030. Hopefully, they can help you figure out how to convert whatever format their CD-based sounds are into AIFFs which you can then convert into VAGs. If its music you seek, you may have to wait a few days for a better answer or ask Sound Ideas if they have any sound ideas.

- Rob

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11/17/95 2:57 PM

How to make AIFF files from prerecorded material

Rob Vawter

Peter J.H. Alau

Sound

Sound Artist

Peter - In answer to your question about using prerecorded material, you will need a sampler and/or waveform editing software. There are shareware and freeware programs available for PCs which can save the material as AIFF files. You can then transfer them to the Mac as long as you use a program like FixCreatorPro to properly re-type the file. FixCreatorPro asks for a file

type (AIFF) and a creator (I think it shouldn't really matter what you input here). Or, you can get software for the Mac like Alchemy etc. (see the Sound Tool manual pg. 5).

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11/20/95 7:38 PM

Re: How to make AIFF files from prerecorded material

Axel Brown

Sound

Sound Artist

>Peter - In answer to your question about using prerecorded material, you will need a sampler and/or >waveform editing software. There are shareware and freeware programs available for PCs which can >save the material as AIFF files. You can then transfer them to the Mac as long as you use a program >like FixCreatorPro to properly re-type the file. FixCreatorPro asks for a file type (AIFF) and a >creator (I think it shouldn't really matter what you input here). Or, you can get software for the Mac >like Alchemy etc. (see the Sound Tool manual pg. 5).

why do you need to go to MAC format... FYI: I recently discovered "last week" that an AIFF2VAG.exe exists after believing I HAD to go to the Mac... guess I missed the announcement of its existance and wanted to make sure others were aware...

Conferences : Sound : Sound Tools : PC Sound Utilities

(Paul Isaac)

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11/21/95 9:23 AM

Re(2): How to make AIFF files from prerecorded material

Rob Vawter

Sound

Sound Artist

>>why do you need to go to MAC format? FYI: I recently discovered "last week" that an AIFF2VAG.exe exists after believing I HAD to go to the Mac... guess I missed the announcement of its existance and wanted to make sure others were aware...

You are right Paul. I did not mean to imply that you MUST use a Mac. There are 3 tools available for the PC - AIF2VAG, SEQ2SEP, and VABSPLIT. Additionally, XA and DA are done on the PC, using MOVCON.

---

11/28/95 3:10 PM

Atemporal seq playback in SoundDeli

Mark D. Hirsch

Sound

Sound Artist

I am having the following seq file playback difficulties in SoundDeli:

1. ...in my archival meanderings I came accross this misdelivered message from long ago: "our sequences are extrememely slow when played back in SoundDellicatess...Also, all of the tracks seem to be playing back at their own free-floating rate , not synched together as they should". I'm experiencing this, too but I've been unable to find a response to this. The unofficial manual encryptically mentions that SoundDeli cannot playback seq files without tempo problems. Is there a way to work around this or some new versions of SoundDeli or Smf2seq? I hate to bug programmers just to play these things back if I don't have to.

2. Pitchbend controller info in the seq file not playing back either. Is there a way saving/preserving this type of data through smf2seq conversion I don't know of?  
Joe Lyford 47-Tek, Inc.

---

11/28/95 5:12 PM  
Re: Atemporal seq playback in SoundDeli  
Angus  
Sound

Sound Artist

I believe you can drive the timing through your sequencer instead of the Mac using MIDI. What are you doing to store the pitchbend controller info? What is the format? Maybe you got that wrong.  
angus

---

11/29/95 10:48 AM  
Re: Atemporal seq playback in SoundDeli  
Rob Vawter  
Mark D. Hirsch  
Sound

Sound Artist

>>I am having the following seq file playback difficulties in SoundDeli:  
>>1. ...in my archival meanderings I came across this misdelivered message from long ago: "our sequences are extremely slow >>when played back in SoundDelicatess...Also, all of the tracks seem to be playing back at their own free-floating rate, not synched >>together as they should". I'm experiencing this, too but I've been unable to find a response to this. The unofficial manual >>encryptically mentions that SoundDeli cannot playback seq files without tempo problems. Is there a way to work around this or >>some new versions of SoundDeli or Smf2seq? I hate to bug programmers just to play these things back if I don't have to. I quote here from Buzz Burrowes from a June 20th post: >> Q: We are experiencing tempo fluctuations during playback of a sequence on the DTL >> H-700 with the SoundDelicatessen >>A: The seq playback functionality in SoundDeli is basically useless. You really need to get Apple MIDI Manager working and use >>your own sequencer to send info to SoundDeli. He used the playback functionality once, wasn't happy with it, and so he now uses the Apple MIDI manager and an external sequencer, keeps the file formats SMF as long as possible while editing the sounds and then converts to SEQs. I'll check and see if anyone had previously informed the Sound Artist Tool creators of this problem before, and pass it on if not.  
2. Pitchbend controller info in the seq file not playing back either. Is there a way saving/preserving this type of data through smf2seq conversion I don't know of? The Playstation dev system plays back pitchbend just dandy, I have been informed. So, once again it could be the lack of usefulness of the seq playback. Sorry.

---

11/30/95 4:12 PM  
MOVCONV for .wav->.xa?  
Crystal Dynamics  
Sound



Sound Artist

hi folks. I need to convert ibm .wav format voices to .xa's en masse. MOVCONV will do batch conversions, but I have found that it is limited in the number it can do at once, which is somewhat of a problem. what is the limit of conversions MOVCONV can do at once? if it is less than 100 at a time, would someone like to make it handle more? I have to convert around 2500 voices for an adventure game and (naturally) I'd like to be as quick about it as possible!  
thanks in advance - Chuck - IGC

---

12/4/95 12:52 PM

Re: Sound Libraries

Angus

Sound

Sound Artist

You have to do your own midi instruments. Bummer huh?

Angus

---

12/4/95 11:30 AM

Sound Libraries

Tim L. Lowery

Sound

Sound Artist

Are there any third party sound libraries available? What I'm looking for is a library of VAG's structured around the General MIDI spec for porting General MIDI files to the PSX.

---

12/4/95 2:15 PM

Re: Doing loop points with SPU lib

Rob Vawter

Montgomery Singman

Sound

Sound Artist

>>How do you get loop back to work with SPU lib functions ? There is a loop\_addr , but how do you get the loop information from AIFF >>over to VAG ? I could not find any loop info in the VAG file format.

Depends on which AIFF2VAG you are using. If you are using the MAC, check out page 20 of the Sound Artist Tool Manual. If the AIFF file has a loop, the Loop Start box should automatically contain the address of the (first) loop and the Loop box should automatically be checked.

For the Pc version of AIFF2VAG you can use the [-L] option to force looping (read the AIFF2VAG.MAN file for other options.

You need to set up looping for the AIFF file using a waveform editor. Attr.loop\_addr is used to set a loop point dynamically. Page 646 from the Run-Time Library 3.0 Document:

>>If waveform data is created with a loop specified, and if the waveform starting address is set, the loop start address is usually >>automatically identified and set. Explicit setting is unnecessary. >>However, when you wish to set a loop start address dynamically at the time of execution, you must set the address that is the >>starting of the loop in the sound buffer in

attr.loop\_addr. >>If a loop was not set at the time of waveform data creation, even if SPU\_VOICE\_LSAX is specified and set in attr.loop\_addr, that >>setting is invalid.

---

12/4/95 10:25 AM  
Re: MOVCONV for .wav->.xa?  
Thomas Boyd  
Sound  
Crystal Dynamics

Sound Artist

Hi,

I talked to Koji (Mr. movie converter) and he said that it is in the script file, the number of files is limited by the string size. He will modify it, but in the meantime, just remove the "#" comments from the lines there will be room for longer subscripts.

Tom -----

hi folks. I need to convert ibm .wav format voices to .xa's en masse. MOVCONV will do batch conversions, but I have found that it is limited in the number it can do at once, which is somewhat of a problem. what is the limit of conversions MOVCONV can do at once? if it is less than 100 at a time, would someone like to make it handle more? I have to convert around 2500 voices for an adventure game and (naturally) I'd like to be as quick about it as possible!  
thanks in advance - Chuck - IGC

---

12/5/95 11:18 AM  
Re: Midi/Vab  
Buzz Burrowes  
Sound

Sound Artist

>> The notes trigger correctly (w. pan, vol, etc) when soloing the >> individual midi channel, but when both are played together >> (different notes, same patch) the pan on one channel is ignored >> and both notes are played using the other channels's midi controllers.

I'm afraid your fix (copying the patch to another VAB slot) is your only solution. The libraries are set up such that each patch in a VAB has only one structure containing information about that patch. So, as you've found, if two MIDI channels reference that patch, any vol, pan, etc. messages supercede any older message regardless of which channel the message came down. Having the additional patch in SoundDeli shouldn't be the end of the world because it does not consume anymore SPU RAM and the additional main RAM used should be tiny.

---

12/5/95 10:32 AM  
Midi/Vab  
Andy Hsiung  
Sound

Sound Artist

TO Sound:

I'm experiencing a problem when I play the same patch on 2 different midi channels. I'm

sequencing in Dig. Performer w. Midi Manager. The notes trigger correctly (w. pan, vol, etc) when soloing the individual midi channel, but when both are played together (different notes, same patch) the pan on one channel is ignored and both notes are played using the other channels's midi controllers. We have tried copying the patch to another VAB slot which works, but it would be nice not to have to do that. Any suggestions?

Also, I want to use 2 VABs at once, which I understand is fine --Question: What midi controller do I use to set the VAB bank to play? - I'm assuming it's a midi controller - if not what is the procedure?

Thanks for your help. -- Greg Turner, Realtime Associates

---

12/7/95 11:54 AM

VAG clicks/pops - NRPN lockup

Micahel L. Henry

Sound

Sound Artist

I've got a couple of problems.....

1. Upon converting many AIFF files into VAG format, I have noticed that depending on the nature of the source material(harmonic content, length of sustain, etc.) I get an audible "click" or pop, upon playback. It also seems to be sensitive to release velocity, i.e. a quick/hard release (noteoff) is more likely to result in a click.

2. If I understand the documentation correctly, I should be able to use the NRPN Controller Change to change reverb settings during sequence playback. I have thus been unsuccessful in getting this to happen from Vision (sending CC99, CC98 and CC06 - data) in fact my system locks up every time at precisely the moment that the CC message is sent. Any ideas?

Thanks, Michael Henry Viacom New Media

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12/8/95 1:17 PM

Re: VAG clicks/pops - NRPN lockup

Rob Vawter

Micahel L. Henry

Sound

Sound Artist

>>2. If I understand the documentation correctly, I should be able to use the NRPN Controller Change to change reverb settings during >>sequence playback. I have thus been unsuccessful in getting this to happen from Vision (sending CC99, CC98 and CC06 - data) in >>fact my system locks up every time at precisely the moment that the CC message is sent. Any ideas?

Send me your code which shows the reverb setting change callback procedure. I think that's where your problem must lie.

---

12/11/95 12:42 PM

Re(2): VAG clicks/pops - NRPN lockup

Micahel L. Henry

Sound

Sound Artist

Rob -

I'm not sure I was correctly understood. I'm not a programmer. I'm simply trying to send the NRPN via my Mac sequencer, as follows:

Meas/beat message data 1:1:0 NRPN (CC99) :16 (MSB) 1:2:0  
NRPN (CC98) :15 (LSB) 1:3:0 data entry (06) :4 (0-9 to change reverb mode/type)

The values are from the tabel on page 74 of the recent documentation. as I mentioned before, my mac locks up at precisely the moment that the NRPN data is sent. Perhaps it is not possible to change the reverb settings in this manner?

Thanks,

Michael Henry Viacom New Media

---

12/13/95 2:08 PM

Voice dropouts

Micahel L. Henry

Sound

Sound Artist

I seem to have a problem with voices dropping out even though it appears that I'm not using anywhere near the maximum polyphony.

I have been playing sequences in Vision patched through MIDI manager to trigger sounds on the Sound Artist Board. I can leave the Sound Deli windows active in the background, and can see the little meter on the right hand side of the Keyboard window, which shows the number of voices being used by the Sound Artist Board. It is showing me that I'm not even using half the voices available yet I'm experiencing a great deal of notes dropping out. My sequence is pretty active, but at no time am I giving 24 simultaneous note-ons.

Any suggestions??

Thanks

Michael Henry Viacom New Media

---

12/18/95 11:18 AM

Deli Crashing

Mark D. Hirsch

Buzz Burrowes

Sound Artist

Am hoping there is a way around this..

I'm experiencing bigtime lockup in SoundDeli...about once every 15 minutes. Additional programs running are Patchbay and Vision 2.0.

We ran Zone Ranger on my system and indicators suggested that SoundDeli is not locking areas of memory so that when dereferenced Deli memory is compressed or moved and then rereferenced the program crashes. I am most frequently experiencing lockup while sequencing in Vision.

I switched to the most recent version of SoundDeli 1.6.0 (uploaded 12/8) and this problem persists. It appears there is no resource that manages memory for this application.

I'm spending most of my time saving every edit and restarting. Anything you might know about this problem that would help is urgently appreciated.

Joe Lyford 47-Tek, Inc.

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1/5/96 9:53 AM

Re: Sound Development System  
Rob Vawter  
Dave R. Scheele  
Sound

Sound Artist

>>Is the sound development system available for Power Macs (does it work in Power Macs), or is the board, software etc. Mac only? We're getting a Power Mac in, which makes the remote chance we had to get a cheap old regular Mac even more remote ...

Yes...Buzz Burrowes has the tools plugged into a PowerMac8100/80

---

1/5/96 9:19 AM  
Sound Development System  
Dave R. Scheele  
Sound

Sound Artist

Is the sound development system available for Power Macs (does it work in Power Macs), or is the board, software etc. Mac only? We're getting a Power Mac in, which makes the remote chance we had to get a cheap old regular Mac even more remote ...

Dave

---

1/10/96 4:01 PM  
Sound Artist Board Midi connections....  
Micahel L. Henry  
Sound

Sound Artist

Rob -

Sorry to continue bothering you with such trivial matters, but I've got a couple of additional questions.

1. I suppose the chances are remote, but do you suppose we could someday get an OMS driver for the Sound Artist Board, thus negating the need to use Apple MIDI Manager? I would assume this would greatly simplify communications and setup for the majority of Artists/Musicians using the board. I have been successful in using Opcodes Vision with the Opcode MIDI Manager driver, version 1.2. However, I have been tremendously unsuccessful in getting OMS 2.0 to work in this manner. Since I would venture to guess that most users are working in an OMS environment, having an OMS driver for the Sound Artist Board would save us a lot of time and perhaps solve some problems we're encountering as well. As they say, in terms of performance, using most sequencers with Apple's MIDI manager is a lot like driving a Porsche on tricycle tires, only not as efficient!

2. I would really prefer to use the Logic Audio sequencing environment as opposed to Vision. However, I have thus far been unsuccessful in getting Logic to talk to the Board through OMS or Apple's MIDI manager. Do you or anyone else out there perhaps know of anyone else using the Logic sequencer with the Sound Artist Board?

Thanks,

Michael Henry Viacom New Media

---

1/10/96 4:57 PM

Re: Sound Artist Board Midi connections....

Rob Vawter

Micahel L. Henry

Sound

Sound Artist

Michael, Questions here are never trivial. 1) Many developers have railed against the continued use of Apple MIDI Manager. I (and others) have passed on the word to Sony Japan.

The response:

"In Japan, Mark of the Unicorn(MOU)'s Performer is the major sequence software and MOU promotes FreeMIDI. I know that OMS also supports FreeMIDI compatibility.

As you said, we should support OMS than Apple MIDI Manager. But I think it takes few months to implement OMS." I hope that this will occur sometime soon.

2) No, I personally do not. Talked to someone else who vaguely remembers a deeloper in the past NOT being able to use Logic. Sorry.

---

1/12/96 10:39 AM

Sound Deli features

Rob Vawter

Chris Stevens

Sound

Sound Artist

Time to answer some VERY old questions: >>1. Sound Deli: >> a. Can't get portamento or vibrato to work. What am I missing?

Nothing. Vibrato and Portamento don't seem to be supported. Have passed this onto the Deli Programmer and hopefully it will be implemented soon.

>> c. Pitch bend response is strange. The note must be struck first >> before any pitch-bend data is recognized. Any plans to address this?

Once again, have passed on this request to the Deli programmer. It certainly would be nice to have pitch bend requests occur before the note is struck.

---

1/12/96 10:50 AM

Re(3): VAG clicks/pops - NRPN lockup

Rob Vawter

Micahel L. Henry

Sound

Sound Artist

Michael,

>> I'm trying to send the NRPN via my Mac sequencer, as follows:

>>Meas/beat message data >>1:1:0 NRPN (CC99) :16 (MSB) >>1:2:0  
NRPN (CC98) :15 (LSB) >>1:3:0 data entry (06) :4 (0-9 to change reverb

mode/type)

>>The values are from the tabel on page 74 of the recent documentation. My mac locks up at precisely the moment that the NRPN data >>is sent. Perhaps it is not possible to change the reverb settings in this manner?

You are correct. That particular feature does not currently work. I have notified the Deli programmer and hope to hear back from him soon regarding a fix. I have not tested other NRPN Control Changes except for Reverb Depth which functions correctly.

---

1/12/96 1:05 PM  
PC Sound Tools  
Greg G. Gibson  
Sound

Sound Artist

I am starting our Sony Development Audio department and our entire system is currently PC-Based with many great tools. How much of the mac sound tools are available for the PC. Is there a way to get around adding a mac to our studio..??Which things would I be missing ?

---

1/17/96 2:06 PM  
AIFF sound conversion  
R.Brett Butler  
Sound

Sound Artist

ok, so i'm a dos guy.  
i just plugged in my nifty sound board in a mac. i ran aiff2vag i go to file -> select [convert] and then select my aiff sound file.  
THEN,  
I GET THIS JAPANESE GARBAGE in a window and a ( ( boing ) ). then, that's it. no conversion, no nothin'  
What am i missing? midi drivers for the board?  
-bretto

---

1/19/96 12:27 PM  
Re(2): AIFF sound conversion  
Buzz Burrowes  
Sound

Sound Artist

>> I had to fiddle around for quite a while to determine what format AIFF I needed to have. I believe that it was 16-bit unsigned, and the sampling rate may have been important. The AIFF files MUST be 16bit. The sample rate can vary. (despite the manual saying that they must be 44.1khz)

---

1/19/96 11:00 AM  
Re(2): AIFF sound conversion  
Sam Black  
Sam Black  
Sound

Sound Artist

I looked up an AIFF that I have lying around on my PC drive.  
It's 16 bit, PCM encoded (Signed, Motorola Endianess), 11.025 KHz, mono.  
I don't know for sure that that one is convertable by AIFF2VAG, but I think it is. (note: I've

never tried the DOS conversion utils, I've done the conversions on the Mac, which is what I believe you are trying to do.)

---

1/19/96 10:38 AM  
Re: AIFF sound conversion  
Sam Black  
Sound

Sound Artist

No, Macs don't need any crap like that.

The problem is very likely that the AIFF is not in the proper format, or doesn't have the right type/creator. (If it doesn't have the right type/creator, I would think that it shouldn't appear in the file picker dialog on the Mac. To change these two attributes, use ResEdit or Resourcer (Mac developer-type programs; ResEdit is free from Apple.)

I had to fiddle around for quite a while to determine what format AIFF I needed to have. I believe that it was 16-bit unsigned, and the sampling rate may have been important. In any case, I was able to create an AIFF that worked by using Sound Forge on Windows, and frobbing the knobs until I got one that magically worked. (Unfortunately for you and me, I have lost the settings, since converting the sound samples for my game. I'll have to go back and rediscover the settings when it comes time to regenerate my sounds.)

If I still have the AIFs, I can open them and see if the settings are preserved. I'll check when I'm offline and if I have them as AIFs still, I'll let you know the magic runes.

In general, it seems that the Sony tools could stand better error messages. (In particular, it took us about a day and a half to figure out that AVIs couldn't be compressed at all for MOVCONV to work. No error messages at all, MOVCONV just silently failed. At least it didn't GPF I suppose....)

---

1/22/96 4:16 PM  
Chunk Read Fail  
Joe J. Alemanni  
Sound

Sound Artist

I get the following message from the AIFF2VAG convertor:

"Chunk read failed"

on what seems to otherwise be (to SoundEdit 16 2.0) a perfectly okay 22050khz 16-bit mono sound sample. I don't know what this is saying about my source file.

---

1/23/96 3:02 PM  
Looping Controllers  
Andy Hsiung  
Sound

Sound Artist

I am using Digital Performer to create sequences for sound effects (more interesting than just triggering samples). What Controller #s (and their subsequent values) do I insert in a sequence to get it to loop? I would rather do this than have the programmers worry about it.



Thanks a lot.  
Wendy Kurko/Realtime Associates

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1/23/96 3:49 PM  
Re: Looping Controllers  
Rob Vawter  
Andy Hsiung  
Sound

Sound Artist

\_\_\_\_\_ I am using Digital Performer to create sequences for sound effects (more interesting than just triggering samples). What Controller #s (and their subsequent values) do I insert in a sequence to get it to loop? I would rather do this than have the programmers worry about it.

\_\_\_\_\_ See the Library Overview 3.0, pg. 175:  
Loop Start: CC99 20 CC06 (0-127) [for continuous looping, set 127] Loop End: CC98 30  
Multiple loops may be set, but loops may not be contained within loops.  
Loop away.

---

1/26/96 4:42 PM  
Re: PC VERSION OF AIFF2VAG  
Borden Covell II  
Sound

Sound Artist

We have now discovered that it is necessary to modify the length word in the header (i.e. swap from little endian to big endian) for the sounds created by the PC version of AIFF2VAG to play. This is a nasty problem. We hope that our method of determining that a VAG file has been created by the PC tool is valid. If it isn't, we could be in a world of hurt.  
SONY, PLEASE FIX THIS.

---

1/26/96 2:19 PM  
PC VERSION OF AIFF2VAG  
Borden Covell II  
Sound

Sound Artist

We have been using the PC version of aiff2vag because the Mac version fails to convert a couple of our aiff files correctly. However, the VAG file that is created by the PC tool has a different header than the Mac. Specifically, the vag length word is in little endian rather than big endian form.  
The PC tool should output files that are IDENTICAL to the Mac tool.  
Anyone got any input? Help Sony!!!

---

1/26/96 5:10 PM  
Re(2): PC VERSION OF AIFF2VAG

Rob Vawter  
Sound

Sound Artist

I have forwarded this problem to Japan with an URGENT stamp on it. Hopefully, this will help.  
- Rob

---

1/29/96 9:54 AM  
SoundDeli Crashes  
Buzz Burrowes  
Sound

Sound Artist

Well, I've been through 3 days of hell trying to compose through SoundDeli, and now I've seen for myself all of the crash bugs everyone's been complaining about. Specifically, SoundDeli Crashing A LOT when playing back sequences from Vision (through Apple's MIDI Manager.) It seems things a pretty stable until you reach a certain level of complexity (in your MIDI score) and then all hell breaks loose. I found that it crashes most often when you press stop while recording new MIDI data. That led me to try the following... I enabled the "Send Sync" option and sent song pointer & beat clock to SoundDeli. This helped! It didn't cure the problem.... I still had crashes from time to time, but no where near as often. This may be yet another clue for Japan as to where the problem is in SoundDeli. They probably do some memory management when the sequencer sends the "sequence stop" message that OFTEN prevents the memory problem that causes the crash. Anyway, those of you using Vision might want to try this out.

---

2/2/96 2:07 PM  
Re: SoundDeli Crashes  
Buzz Burrowes  
Sound

Sound Artist

Well, I don't know for sure that "Send Sync" helped. I was still getting plenty of crashes. But I've now been running SoundDeli for one and a half days with NO CRASHES! How did I do it you ask? Well, I just turned off those little flashing dots that appear in the keyboard window of SoundDeli. The options are "all", "prog", or "off" and it defaults to "all". After turning it off I haven't crashed once! The memory leak must be in some handler that deals with flashing those little lights (could be someone is using a window handle or GrafPort incorrectly!). Not only has the system not crashed, but I'm now running it with ALL of my inits (including SpeedDoubler). (I had turned all system extensions off when I was trying to debug the crash and it didn't help.) Am I glad I can get back to work!

---

2/5/96 10:35 AM  
Re: 3D sound  
Buzz Burrowes  
Sound

Sound Artist

>>Revealing my foolhearty idiotness here, but are there any built-in capabilities for 3D or surround sound on the Playstation, say a handy high-level routine to place sampled sfx in a 3D field without having to sample them that way? How about MIDI music?

No.

You'll have to pre-encode any 3D effects.

There is one possible alternative... write your own routine using SpuReadDecodeData to suck in PCM samples from the sound chip, process the samples with your 3D algorithm, re-ADPCM encode your result, and feed it back to the sound chip. (as long as you aren't showing any graphics at the time ;-)

BTW: I know I've recieved some info from QSound here somewhere on their process which involves some pre-encoding and some real-time work to achieve their 3d effect. I believe they've worked up a little example code for a PlayStation port. You might want to give them a call.

---

2/5/96 10:24 AM

Re: loading VAG's into SoundDeli...

Buzz Burrowes

Sound

Sound Artist

I've had this problem myself. In my case I was able to narrow it down to the following...

The MAC OS keeps track of 2 pieces of information in regard to a file's size... 1) The "logical" file size is the actual size of the file's data...that data written to the file by an application. 2) The "physical" file size is thethe number of bytes that the file is taking up on the hard disk.

You see, these two sizes are nearly always different. If you were to create a file and write one byte of data into it, the MAC OS would allocate a block of disk space for the file and then write the single byte. As further bytes are written to the file they fill up the rest of that block. Once a block is full the OS allocates another block.

In the case of our one byte file, the "logical" file size is one byte but the "physical" file size is 1 block (I believe the size of that block can vary depending on the media, driver, formatting, etc. ... e.g. 1024 bytes)

Anyway, when you load an AIFF file into AIFF2VAG and convert it SAVING IT OVER the old .vag file I believe that the physical file size remains the same even though the data within the file is actually smaller. this may or may not be what confuses SoundDeli when it reloads the .vag. In any case, I found that if I converted the smaller AIFF into a new file (either a new name or deleting the original file first) I then got the correct data size in SoundDeli.

---

2/5/96 7:45 PM

Minimum Mac System Configuration

Matt Brown

Sound

Sound Artist

I'm trying to set up an old Mac SE to run the sound tools and was wondering what the minimum system requirements are. It's a Mac SE with 1 MB ram running system 6.0.5. I assume, since I'm getting an "AppleEvent" not supported error that I'll need to be running System 7 (minimum of 2 MB ram). If I upgrade my SE, will I be able to run the tools, or are

there other requirements I should know about?  
Steve Cox DreamWorks Interactive

---

2/6/96 10:21 AM  
Re: Minimum Mac System Configuration  
Sam Black  
Matt Brown  
Sound

Sound Artist  
You also need a free NuBus slot, which to be honest I can't remember if the Mac SE had or not.  
You'll then need an external D/A convertor with a TOS-Link input. (Various ones are available,  
generally starting around \$200.)

---

2/9/96 1:55 PM  
Sound File Formats  
Matt Brown  
Sound

Sound Artist  
I was wondering if there's any possibility of getting information on the .vag and the .seq file  
formats (specifically the "waveform data" and "score data" sections respectively.)  
Is the source code for the PC tool aiff2vag.exe available?  
Is there going to be a version of smf2seq for the PC (maybe mid2seq.exe)?  
Steve Cox

---

2/13/96 10:02 AM  
Re: Sound File Formats  
Rob Vawter  
Matt Brown  
Sound

Sound Artist  
Q1>>I was wondering if there's any possibility of getting information on the .vag and the .seq  
file formats (specifically the "waveform data" and "score data" sections respectively.)  
A1>>I'll see what I can do. Sony has so far been loathe to release its ADPCM encoding format so  
don't hold your breath.  
Q2>>Is the source code for the PC tool aiff2vag.exe available?  
A2>>See above answer.  
Japan's answer: The format for encoding VAGs will not be available. If you want to make your  
own encoding tool, we may release the encoding routine in .obj or .a form.  
Note: I aksed that they make this tool for DOS or MAC - sorry, Windows users.  
Q3>>Is there going to be a version of smf2seq for the PC (maybe mid2seq.exe)?  
A3>>This might be in the works. I am awaiting an answer from Japan.  
Japan's answer: We have plans to release SMF2SEQ.EXE for DOS in April or May. We will  
release VABMAKE.EXE for DOS at the same time. VABMAKE.EXE will make VAB files from  
VAB definition files and VAGs.

---

2/16/96 9:38 AM  
Sound Libraries  
Rich Goldman  
Sound

Sound Artist

Hello, We have recently obtained Sony DTL H700 card and will soon begin developing music and SFX with it. We have several important questions before we begin: 1. Are there any existing Instrument and or SFX libraries developed for Sound Deli that we can download? 2. We have found that Apple Midi Manager can not exist with the Opcode Studio 5 & Free Midi drivers currently employed by Mark of the Unicorns Digital Performer. Do you know of any options or work arounds? Thanks in advance for your help, Dave Schwinn Goldman Productions

---

2/20/96 9:36 AM  
Re: Sound Libraries  
Rob Vawter  
Rich Goldman  
Sound

Sound Artist

Q1. Are there any existing Instrument and or SFX libraries developed for Sound Deli that we can download? A1: Unfortunately, not from Sony. Q2. We have found that Apple Midi Manager can not exist with the Opcode Studio 5 & Free Midi drivers currently employed by Mark of the Unicorns Digital Performer. Do you know of any options or work arounds? A2: Most developers in Japan are using: MIDI Manager 2.0.1 FreeMIDI 1.23 Performer 5.0.2 Here some developers are using: Vision - 2.0.8 (Vision 3.0 has OMS 2.0 which no longer supports MIDI Manager) OMS - 1.2.3 MIDI Manager - 2.0.1 The Sound Deli authors are currently working on supporting Free Midi rather than Apple MIDI Manager and hopefully will also support OMS soon after. Look for this sometime in early spring.

---

2/23/96 11:34 AM  
Bugs in new Sound Delicatessen  
Tim L. Lowery  
Sound

Sound Artist

Sound Deli crashes whenever I send reverb NRPN's using MIDI Manager. How exactly should these messages be sent?

---

2/23/96 11:41 AM  
Playback problems in PSX  
Tim L. Lowery  
Sound

Sound Artist

I recently created a set of VABs and SEQs and we are having problems getting them to play in the PSX- they work great in Sound Deli.

I suspect the Reverb and/or Looping NRPNs...the Developer Reference is pretty vague about how to use these messages- is there anything I need to do beyond what is in the Developer Reference to make the music play reliably?

Also, are there any examples of SMFs and VABs that are known to work properly that I can compare my own work to?

---

2/23/96 12:41 PM

Re: Bugs in new Sound Delicatessen

Rob Vawter

Tim L. Lowery

Sound

Sound Artist

Q: Sound Deli crashes whenever I send reverb NRPN's using MIDI Manager. How exactly should these messages be sent?

A: Changing Reverb mode via NRPNs did not work in the previous release either (although reverb depth is OK). The bug has been reported to the tool engineer. Sorry.

---

2/29/96 4:13 AM

Problem with the program changes using smf2seq

Jason Friedman

Sound

Sound Artist

If we convert a smf file to seq we lose the program change info , because the all seq file used the first sample of the vab file .

Andras Magyari

---

3/1/96 10:46 AM

SMF2SEQ - Problems to avoid

Rob Vawter

Sound

Sound Artist

Here are a few problems with SMF2SEQ and ways to avoid them.

1) Unrecognized non-standard MIDI events. For example, Cakewalk records MIDI events which SMF2SEQ cannot recognize. As a result, the SEQ playback will not match the .MID file.

Workaround: If you are using Cakewalk, imort and save the .MID file under Vision or Performer.

2) Event order problem. If you have many events occuring at the same Bar Beat and Tick, the order may not be converted as you want it to be. For example, the note on may occur before a

reverb change.

Workaround: Always place the note on one tick after the pile of events. It may throw off the rhythm, but only a miniscule amount.

---

3/20/96 2:40 PM

Re: Set Reverb Controllers

Rob Vawter

Chris Stevens

Sound

Sound Artist

I have this information already, but I could use some re-confirmation. First of all, what are the controllers used to set reverb in the sequence?

99 16 98 15 06 (0-9) for reverb mode 99 16 98 16 06 (0-127) for reverb depth See page 174 of 3.0 Overview (which I am sure you have)

Secondly, is it normal for SoundDeli to lock up when I send these values via MIDI manager?

Yes. This function does not work properly currently. I have informed the tool engineer.

I would also like to know how the "Depth" amount (when set with a CC message) relates to the hash marks in SoundDeli (seeing as how there are 128 values in MIDI and only 20 or so in SoundDeli, and I have no way of testing the MIDI values, since SDeli locks up).

Best method: estimate what percent of the 20 or so marks are taken up and convert this to a percentage. Apply this percentage to 128. Fudge for better results.

---

3/21/96 11:04 AM

Sequencers and their little problems with Sound Deli

Rob Vawter

Sound

Sound Artist

Just a quick overview on some workarounds:

Performer Problem: Timing for composition poor Workaround: Use version 1.61. Use "Just MIDI" option to turn off Digital Audio.

Vision Problem: Frequent crashes. Workaround: On Sound Deli keyboard, change "lights" setting from "all" to "off." Cakewalk Problem: Samples created by Cakewalk have timing problems. Workaround: Cakewalk is sending unrecognized controller messages. Open and save the file in some other sequencer.

If anyone has experienced other problems, or uses other sequencers, please email me. Thanks

---

4/18/96 11:36 AM

VAB sound tool

Brett Butler

Sound Programmers

Sound Artist

I'm about to complete a DOS version tool of "VAGS2VAB.exe"

This would allow you to take your vags and pack them together into a vab FROM DOS. Then from there, just run VABSPLIT.exe to get your .VH and .VB files.

So, if anyone out there is tired of leasing a Mac just to do sound,...here's your tool.

Is anyone interested in this VAB tool?  
Send me mail.  
.:) Bretto

---

4/30/96 11:23 AM  
Re(2): Sound Artist Board Mid  
Andy Armer  
Sound Artist

Sound Artist  
am just now recieving tools. Is there a problem w/ using Logic w/ sound artist sys.? andy

---

4/30/96 2:53 PM  
Re(3): Sound Artist Board Mid  
Rob Vawter  
Sound Artist

Sound Artist  
Is there a problem w/ using Logic w/ sound artist sys.?  
Not sure. Is anyone out there using Logic??

---

5/2/96 3:25 PM  
Re(5): Sound Artist Board Mid  
Andy Armer  
Sound Artist

Sound Artist  
ood info. I'll let U know what happens.  
AA

---

5/3/96 10:27 AM  
Re: Logic works!  
Buzz Burrowes  
Sound Artist

Sound Artist  
Just one more tid-bit for you Andy,  
If you do start to get crashes, hangs, etc. try turning the lights off in SoundDeli's Keyboard window. There are a few radio buttons right in the window giving the options of all, program or off. When I turned them off all of my crash problems went away.

---

5/3/96 9:51 AM  
Logic works!  
Andy Armer  
Sound Artist



Sound Artist  
ot it to work thru MIDI Manager. Thanks again for the help.  
AA

---

5/7/96 3:32 PM  
Re: AIFF2VAG 1.8 Looping Problems  
Rob Vawter  
Greg Turner  
Sound Artist

Sound Artist  
Q: I've done a lot of work with the ver. 1.6 tools. After getting the ver. 1.8 Sound Deli, AIFF2VAG, etc., I've been finding that loops that sound fine in Sound Designer II often have clicks at the loop point after being converted by AIFF2VAG ver1.8. I tried converting them with AIFF2VAG 1.6 and then bringing them into Sound Deli 1.8, and they sounded fine -- therefore the problem seems to be in the new AIFF2VAG.  
Any suggestions?  
Wendy,  
I'm looking into it. Will let you know ASAP. - Rob

---

5/7/96 2:30 PM  
AIFF2VAG 1.8 Looping Problems  
Greg Turner  
Sound Artist

Sound Artist  
Rob,  
I've done a lot of work with the ver. 1.6 tools. After getting the ver. 1.8 Sound Deli, AIFF2VAG, etc., I've been finding that loops that sound fine in Sound Designer II often have clicks at the loop point after being converted by AIFF2VAG ver1.8. I tried converting them with AIFF2VAG 1.6 and then bringing them into Sound Deli 1.8, and they sounded fine -- therefore the problem seems to be in the new AIFF2VAG.  
Any suggestions?  
Thanks for your time.  
Wendy Kurko Realtime Associates

---

5/15/96 10:29 PM  
Re: Sound Development System  
dan w. forden  
Sound Artist

Sound Artist  
I know this is an old thread, but I am about to get a PowerPC, and would like to get a PCI machine, but not if the Sound Artist board (DTL-H700) won't work. Does anyone have any

experience with the Nubus to PCI converters? Will there ever be a full sound tool/system for the PC. Thanks for any info.... dwf

---

5/20/96 2:22 PM

Re(2): Sound Development System  
John Phua  
Sound Artist

Sound Artist

dan w. forden writes: I know this is an old thread, but I am about to get a PowerPC, and would like to get a PCI machine, but not if the Sound Artist board (DTL-H700) won't work. Does anyone have any experience with the Nubus to PCI converters? Will there ever be a full sound tool/system for the PC. Thanks for any info.... dwf

Hi Dan,

I believe SCE had worked with a company in Japan that had a converter. We are checking into it. At this present time there is no plans for sound tool/system for the PC.

thanks, John

---

5/24/96 11:26 PM

Re(3): Sound Development System  
dan w. forden  
Sound Artist

Sound Artist

any info regarding a nubus-to-PCI converter that works with the sound artist card would be greatly appreciated...please send mail either here or to "cavedan@aol.com", thanks... dwf

---

6/5/96 10:56 AM

Studio Vision Pro  
Buzz Burrowes  
Sound Artist

Sound Artist

I seem to recall talking to someone who had gotten Studio Vision Pro to work with SoundDeli. Something about using some of the old OMS drivers with the new OMS 2 stuff.

Has anyone gotten this to work? What bits of the old OMS did you need to keep around?

---

6/6/96 9:56 AM

Re(2): Sound File Formats  
Matt Brown  
Sound Artist

Sound Artist

Is there anything new on this? What's the current status of these DOS tools?

Also, yes, I would like to write my own encoding tool and would like to get the .obj/.a file you

refer to. How should I go about this?

+ + +

Q1>>I was wondering if there's any possibility of getting information on the .vag and the .seq file formats (specifically the "waveform data" and "score data" sections respectively.)

A1>>I'll see what I can do. Sony has so far been loathe to release its ADPCM encoding format so don't hold your breath.

Q2>>Is the source code for the PC tool aiff2vag.exe available?

A2>>See above answer.

Japan's answer: The format for encoding VAGs will not be available. If you want to make your own encoding tool, we may release the encoding routine in .obj or .a form.

Note: I aksed that they make this tool for DOS or MAC - sorry, Windows users.

Q3>>Is there going to be a version of smf2seq for the PC (maybe mid2seq.exe)?

A3>>This might be in the works. I am awaiting an answer from Japan.

Japan's answer: We have plans to release SMF2SEQ.EXE for DOS in April or May. We will release VABMAKE.EXE for DOS at the same time. VABMAKE.EXE will make VAB files from VAB definition files and VAGs.

---

6/7/96 10:32 AM

Re(3): Sound File Formats

Rob Vawter

Sound Artist

Sound Artist

Is there anything new on this? What's the current status of these DOS tools?

Also, yes, I would like to write my own encoding tool and would like to get the .obj/.a file you refer to. How should I go about this?

Nope, sorry. I also haven't seen the .obj file yet. Will add you to "THE LIST".

---

6/11/96 12:32 PM

VAB Header (.VH) File Format

Rob Vawter

Sound Programmers

Brett Butler

Sound Artist

This is a corrected update of the VAB Header (.VH) file format. I left out a whole 2 bytes earlier and didn't put quite enough info in before either. Sorry! Changes are in red.

This message is important for those of you building VABs in a non-standard way, whether it is pre-disk burning on a PC, or during gameplay.

ID ("VABp") 4 bytes\* Version 4 bytes VABID 4 bytes\*\* Waveform Size 4 bytes Reserved 2 bytes No. of Programs 2 bytes No. of Tones 2 bytes No. of VAGs 2 bytes Master Volume 1 byte Master Pan 1 byte Reserved 6 bytes Program Attr. Table 16 bytes x 128 (Max # of programs) Tone Attr. Table 512 bytes (32 bytes \* 16 (maximum tones per program)) # of programs VAG Size Table 512 bytes

\* Actually shows up as "pBAV" if viewed in hex. \*\* [not sure, but think that this is updated in the .vh file which resides on main RAM when an ID has been assigned after transferring .vb to SPU RAM. SO, it looks like it always starts out 00 00 00 00].

You can get each VAG data size from the "VAG Size Table." 3 bit right-shifted VAG data size is stored in short (16 bit), so you can get the actual VAG size shifting the size in the table.

Example: VAG #1 #2 #3 ... VAG Size Table 0x1000 0x0800 0x0200... actual size 0x8000

0x4000 0x1000... offset 0x8000 0xc000 0xd000...

---

6/18/96 8:16 PM  
Re(4): Sound Development System  
John Phua  
Sound Artist  
dan w. forden

Sound Artist  
dan w. forden writes: any info regarding a nubus-to-PCI converter that works with the sound artist card would be greatly appreciated...please send mail either here or to "cavedan@aol.com", thanks... dwf  
Hi Dan,  
Here is the info  
SCE had tested the DTL-H700 with a PCI-to-NuBus bridge box called Xpanse PN200/400/800 developed by Second Wave, Inc.  
The company located in Austin Texas.  
<http://www.macfaq.com/vendor/hardware/> - - - - - Second Wave Inc.  
2525 Wallingwood Drive #13 Austin TX 78746  
Main: (512) 329-9283 FAX: (512) 329-9299  
Main: D0864@applelink.apple.com  
Applelink email: D0864 - - - - -  
In Japan, there is a reseller called iMMe Inc.  
Xpanse is an external NuBus expansion box. Xpanse PN200 has 2 NuBus slots, PN400 has 4 slots, PN800 has 8 slots. It is not fully compatible with Apple NuBus but almost all sound cards are supported. For example, they said AudiomediaII, ProTools worked fine with it.

---

7/11/96 10:58 AM  
Direct MIDI volume for .SEQ sound effects  
Chris Stevens  
Sound Artist

Sound Artist  
Our programmer is having trouble sending realtime distance-based volume commands to .SEQ files. We have a collection of one-track single note MIDI sequences (not using direct MIDI triggering at this time). The first time the sfx is played there is no volume response, the second time it is played, there is. Any thoughts?  
p.s. there is a single volume command at the front of the .SEQ file, but since the programmer is sending a steady stream of volume commands, I would suspect this would be okay.  
Chris Stevens

---

7/11/96 7:25 AM  
Re(3): Sound File Formats  
Matt Brown  
Sound Artist

Sound Artist

Okay, it's been over a month since the last time I asked. Is there anything new on the status on these DOS tools, etc.?

Steve Cox

+ + +

Is there anything new on this? What's the current status of these DOS tools?

Also, yes, I would like to write my own encoding tool and would like to get the .obj/.a file you refer to. How should I go about this?

+ + +

Q1>>I was wondering if there's any possibility of getting information on the .vag and the .seq file formats (specifically the "waveform data" and "score data" sections respectively.)

A1>>I'll see what I can do. Sony has so far been loathe to release its ADPCM encoding format so don't hold your breath.

Q2>>Is the source code for the PC tool aiff2vag.exe available?

A2>>See above answer.

Japan's answer: The format for encoding VAGs will not be available. If you want to make your own encoding tool, we may release the encoding routine in .obj or .a form.

Note: I aksed that they make this tool for DOS or MAc - sorry, Windows users.

Q3>>Is there going to be a version of smf2seq for the PC (maybe mid2seq.exe)?

A3>>This might be in the works. I am awaiting an answer from Japan.

Japan's answer: We have plans to release SMF2SEQ.EXE for DOS in April or May. We will release VABMAKE.EXE for DOS at the same time. VABMAKE.EXE will make VAB files from VAB definition files and VAGs.

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7/22/96 10:26 AM

Dos Sound Tools

Rob Vawter

Sound Artist

Sound Artist

We are in the process of checking the follwing sound tools for DOS and will post them at the end of the week:

MKVAB.EXE (new tool) SMF2SEQ (new tool) AIFF2VAG (new version) VABSPLIT.EXE(new version)

The .obj file for encoding will show up mid August.

---

7/24/96 4:38 PM

Re: Direct MIDI volume for .SEQ's

Rob Vawter

Chris Stevens

Sound Programmers

Sound Artist

Our programmer is having trouble sending realtime distance-based volume commands to .SEQ files. We have a collection of one-track single note MIDI sequences (not using direct MIDI triggering at this time). The first time the sfx is played there is no volume response, the second time it is played, there is. Any thoughts? p.s. there is a single volume command at the fron of the .SEQ file, but since the programmer is sending a steady stream of volume commands, I would suspect this would be okay.

This sounds like a NoteOn volume response MIDI problem. Changes to the volume which occur

after a NoteOn do not affect the currently sounding note. For example, a decrescendo will leave the currently playing notes at their current volume, while future NoteOn commands will decrescendo

---

7/26/96 4:22 PM  
Re(3): Dos Sound Tools  
Jay Stelly  
Sound Artist

Sound Artist  
DOS RAW2DA is probably unnecessary. RAW2DA seems to be a glorified byte-order swapper. It just converts MAC samples from motorola (hi-byte, lo-byte) order to intel order (lo-byte, hi-byte). Anything you save on your PC as RAW is probably already DA.  
So try: copy con RAW2DA.BAT ren %1.RAW %1.DA ^Z  
:)  
Jay Stelly Tetragon

---

7/26/96 4:46 PM  
Re: Dos Sound Tools  
Rob Vawter  
Sound Artist

Sound Artist  
The DOS Sound Tools have still not been checked completely. They will be released early next week instead. Sorry for the delay.

---

7/26/96 2:51 AM  
Re: Dos Sound Tools  
Dave Scheele  
Sound Artist

Sound Artist  
Is there any chance of a DOS version of RAW2DA? That would make our suite complete ... since it's the only thing we would have to use a Mac for right now, we won't be using CD-DA audio.  
Dave

---

7/26/96 9:23 AM  
Re(2): Dos Sound Tools  
Rob Vawter  
Dave Scheele  
Sound Artist

Sound Artist

Is there any chance of a DOS version of RAW2DA? That would make our suite complete ... since it's the only thing we would have to use a Mac for right now, we won't be using CD-DA audio.

As yet there is not a DOS RAW2DA. I will ask to see if one is in the works.

---

7/27/96 4:59 PM

Re(4): Dos Sound Tools

Buzz Burrowes

Sound Artist

Sound Artist

Jay Stelly writes: DOS RAW2DA is probably unnecessary. RAW2DA seems to be a glorified byte-order swapper. It just converts MAC samples from motorola (hi-byte, lo-byte) order to intel order (lo-byte, hi-byte). Anything you save on your PC as RAW is probably already DA. Yes... this is true.

Most PC sound editing programs can export raw sound samples. Make sure your file is 16bit, 44.1k, stereo and export as raw (intel order). Just burn that file to disk as your DA track.

Note: a WAV file is NOT ready to be burned as DA... it is a "chunky" file which contains header info about sample rate and such. It is VERY simple to right a little tool that yanks the data out of a WAV format file.

---

8/13/96 11:20 AM

Sound Artist Tools

Rob Vawter

Sound Artist

Sound Artist

ATTENTION ALL SOUND PEOPLE:

Any of you NOT using the latest version of tools?

1) If so, and you think you have a valid reason (mmmm...for example, not looping properly), please private email me here or at [robert\\_vawter@interactive.sony.com](mailto:robert_vawter@interactive.sony.com) with the suspected problem AND the files which you are having problems with (example - original AIFFs, VAGs, VABs , whatever), so I can easily duplicate any problems, and get them tracked down and killed.

2) This is also your chance to kvetch and proclaim what new features you want added and what old "features" you want removed. Take advantage.

---

8/15/96 10:37 AM

Re: Sound Artist Tools

Buzz Burrowes

Sound Artist

Sound Artist

Well, the first thing that comes to mind is the notorious problem AIFF2VAG has with opening certain AIFF files (Chunk Read errors.) I would hope that someone is addresssing this problem.

---

9/10/96 3:16 PM  
Unresolved Questions???  
Micahel L. Henry  
Sound Artist

Sound Artist

Howdy-

Just wondering what the status is regarding some old issues.....

1. Does/will the portamento/vibrato feature ever work(see mail 1/12/96)?
2. Does/will pitch bend be fixed so that a note on doesn't have to be given before pitch bend data is sent(see mail 1/12/96)
3. Will we ever be able to change reverb type during sequence playback using NRPN without locking up? (see mail 3/20/96, 12/11/95)
4. Has the problem with voices dropping out even though nowhere near 24 are being used been addressed? (see mail 12/13/95)
5. How did you get Logic to work with Sound Deli? (see Andy Armer mail 5/3/96)

Just wish to confirm whether or not these problems still exist, as I will be participating in the Playstation portion of the interactive audio platform review at next week's IMA expo in NY.

Thanks,

Michael Henry Viacom New Media

---

9/11/96 12:02 PM  
using stargate nubus adaptor with Sound Artist board  
Chris Stevens  
Sound Artist

Sound Artist

Before I sink money into a PCI powermac with a Stargate nubus adaptor I thought I'd ask: Does anybody know of any compatibility problems with the Sound Artist board using this connection??

Chris Stevens, LoudMouth, Inc.

---

9/11/96 11:49 AM  
Re: Unresolved Questions???  
Rob Vawter  
Micahel L. Henry  
Sound Artist

Sound Artist

1. Does/will the portamento/vibrato feature ever work(see mail 1/12/96)?

The reason portamento and vibrato don't work in Sound Deli is that they have been coded but not implemented in the libraries. So the answer to the above question is: No/not unless enough developers have a desire for them. As yet, very few have expressed interest here in the U.S., which is the only gauge I'm tapped into.

2. Does/will pitch bend be fixed so that a note on doesn't have to be given before pitch bend data is sent(see mail 1/12/96)

Hasn't been. I'll find out a timeline (if ever) and repost before you head to the conference.

3. Will we ever be able to change reverb type during sequence playback using NRPN without locking up? (see mail 3/20/96, 12/11/95)

I hope so. This is a problem that the writers of libsnd are aware of (it's listed as a known bug in



lib 3.5). As for a timeline I'll ask today.

4. Has the problem with voices dropping out even though nowhere near 24 are being used been addressed? (see mail 12/13/95)

I've reread that message and I really don't have any ideas. Perhaps you are sending some controller changes that PSX hardware doesn't recognize? If you can send out any more info such as does this occur on the PSX itself or just the sound board with Vision and the MIDI manager?

5. How did you get Logic to work with Sound Deli? (see Andy Armer mail 5/3/96)

Andy Armer did. I've been in touch with him and I'll get his info up on the big board here soon.

---

9/11/96 12:15 PM

Re(2): Unresolved Questions???

Micahel L. Henry

Rob Vawter

Sound Artist

Sound Artist

Rob -

Thanks for taking the time to check on this stuff. I want to make sure that I don't disseminate any erroneous info at the conference.

Regarding the voice dropout problem, we did notice that it was a problem only on the sound artist board with Vision and Midi Manager, and not on the development system or the PSX. I'm definitely NOT sending any controller info that the PSX doesn't recognize.

One other thing. I read that at the next developer conference you'll be covering some issues pertaining to audio. Is there anything you can divulge regarding "using less main RAM for SFX" and "maximizing your VAGs"?

Thanks once again,

Michael Henry Viacom New Media

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9/14/96 10:35 PM

Re: using stargate nubus adaptor with Sound Artist board

Scott Lawrence

Chris Stevens

Sound Artist

Sound Artist

Before I sink money into a PCI powermac with a Stargate nubus adaptor I thought I'd ask: Does anybody know of any compatibility problems with the Sound Artist board using this connection??

Just in case anyone's scratching their head, "Stargate" is Power Computing's 2 PCI/2 Nubus riser card for a few of their older models (by default they shipped with a 3 PCI riser). And it did have some compatibility problems with certain video cards.

BTW Chris, sorry, I don't know anyone who opted for that riser, otherwise I'd check into it for you...

---

9/19/96 10:51 AM

Ellen Meijers

Sound Artist

Sound Artist

Can anyone help me with the looping of a MIDI file? We're trying to loop a MIDI file with two loop points. The file doesn't want to loop between the loop points, it just loops the whole file. I'm using Vision. For more details, just post me a message.

Ellen Meijers Oddworld Inhabitants

---

9/20/96 3:19 PM

Re: Fwd:

Rob Vawter

Ellen Meijers

Sound Artist

Sound Artist

Can anyone help me with the looping of a MIDI file? We're trying to loop a MIDI file with two loop points. The file doesn't want to loop between the loop points, it just loops the whole file. I'm using Vision.

Use NRPN data to set up loops. data1 CC99 data2 CC06 loop start 20 0-127\* loop end 30

\*(127 for continuous looping)

See page 175 of the 3.0 Overview (hard copy or acrobat file from CD release 1.7)

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10/27/96 9:39 PM

PCI Sound Artist Card

dan w. forden

Sound Artist

Sound Artist

Just wanted to either start a chorus or add my voice to one demanding a PCI Sound Artist Card for sound development... don't really want to have to buy yesterday's technology just to do PSX games, when the rest of the music/computer industry is moving on. Does Sony want to keep its developers in the dark ages? Please, give us a PCI card, and software that works correctly as well....

Touching on other topics:

- i would definitely be interested in seeing vibrato/portamento implemented in Sound Deli

- I also use up all the voices well before 24 are playing (voices cut off when i'm sequencing but not when reproduced on the game system) - i use performer diddling Sound Deli via Apple Midi Manager...

- haven't checked yet, but is there a PC downloadable latest version of Sound Deli? I currently am running ver 1.6

thanks for any info, don't mind my rant... dwf

---

10/28/96 11:43 AM

Re: PCI Sound Artist Card

Mike Fulton

Sound Artist

Sound Artist

Just wanted to either start a chorus or add my voice to one demanding a PCI Sound Artist Card for sound development... don't really want to have to buy yesterday's technology just to do PSX games, when the rest of the music/computer industry is moving on. Does Sony want to keep its developers in the dark ages? Please, give us a PCI card, and software that works correctly as well...

Touching on other topics:

\* I would definitely be interested in seeing vibrato/portamento implemented in Sound Deli

\* I also use up all the voices well before 24 are playing (voices cut off when i'm sequencing but not when reproduced on the game system) - i use performer diddling Sound Deli via Apple Midi Manager...

\* I haven't checked yet, but is there a PC downloadable latest version of Sound Deli? I currently am running ver 1.6

Thanks for any info, don't mind my rant... dwf

What do you mean by "PC downloadable latest version"? Do you mean a version that runs on the PC? I'm afraid we don't have such an animal.

Mike

---

# Sound Programmers

3/22/95 8:07 PM

Spu Architecture Overview

Administrator

Sound

## SPU ARCHITECTURE OVERVIEW

Sony Computer Entertainment Inc.

R & D Division

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Inc.

### Abstract

SPU is the Sound Processing Unit of PlayStation, supports ADPCM waveform data, playbacks the ADPCM waveform data stored in sound buffer with 44.1 kHz sampling frequency, and handles 24 voices at the same time. SPU also provides digital reverberation as a sound effector that makes ADPCM's sound more effectively.

#### 1. SPU

SPU is the Sound Processing Unit of PlayStation. Basic specification of SPU is shown below.

|                          |   |                                       |
|--------------------------|---|---------------------------------------|
| SPU basic specification: | -----   | Waveform Data Format                  |
| ADPCM                    | Number of voices* 24                              | Sampling Frequency (fs) 44.1_kHz ---- |
| -----                    | *: `Voice' means ADPCM waveform real-time decoder |                                       |

in PlayStation.

SPU has no clock for managing key on/off in itself, therefore time management, e.g. playing the sound of a score, is handled by periodical interrupt of CPU such as root counter, VSync, or HSync interrupt.

#### 2. Sound buffer

SPU has 512 KB (4 Mb) local memory (so called `sound buffer').

ADPCM waveform data is saved in the sound buffer. A part of the sound buffer is also used as the work area of digital reverberation, and as the temporary buffer for transmitting the sound data of CD/DA and the sound data decoded by SPU to main memory. Regarding DMA transfer, both directions, from main memory to sound buffer, or from sound buffer to main memory, are available. ADPCM waveform data is transferred to the sound buffer through main memory, and then decoded by SPU, ADPCM waveform data is performed as the sound. DMA transfer is available even during playing the sound.

#### 3. Attributes of voice

Each voice among 24 voices can be set many attributes and can be controlled individually. Each attribute is explained below.

##### 3.1. Assignment of ADPCM waveform data to voice

ADPCM waveform data can be assigned to any voices, and the voice assignment of ADPCM waveform data can be changeable at any time.

##### 3.2. Pitch translation

The pitch of ADPCM waveform data that is assigned to voice is changeable at any time. The range of pitch is from 12 octave lower to + 2 octave higher than original pitch, and pitch can be set more fine than half tone.

##### 3.3. Pitch LFO

The pitch of one voice can be changed by the volume of the other voice.

$$\text{NewPitch}(n) = (1 + V(n-1)) \text{Pitch}(n)$$

NewPitch(n) : Final pitch of Voice(n)                      V(n-1) : Volume of Voice(n-1)

Pitch(n) : Original pitch of Voice(n)

##### 3.4. Noise generator

SPU has one noise generator. Noise source can be set to voice with envelope instead of ADPCM waveform data. Noise source also can be assigned to multiple voices, but only one acoustic pitch of noise source can be set. Similar to other attributes, the acoustic pitch of noise

source can be changeable during the state of key on.

### 3.5. Envelope (ADSR)

Any envelope curve can be set with 5 parameters that is shown the figure below: rate parameter can be set for attack, decay, sustain, release, and can be chosen one curve type between two: linear, or exponential (Decay: exponential curve only). Level parameter also can be set for sustain.

----- Figure: Envelope curve -----  
-----

### 3.6. Volume of each voice

Volume curve can be set separately from envelope. Transition curve can be chosen one among the five types: constant, linear increase, linear decrease, reverse exponential increase, and exponential decrease.

----- Figure: Volume -----  
-----

## 4. Common Attributes with all voices

The common attributes with all voices can be set below.

### 4.1. Digital Reverberation

Digital reverberation is provided as a sound effector. When reverberation is active, a part of sound buffer is used as the work area of reverberation. So sound buffer is shared between the store area of ADPCM waveform data and reverberation work area (memory sharing is managed by sound library). Each voice can be set reverberation on or off, and two external input (mentioned below) also can be set reverberation on or off individually. The three volumes that return from reverberation are provided, one is for all voices, two is for the CD input, and the rest is for the external input.

[Notice: SPU can hold only one set of parameters about reverberation at a time, so, reverberation of CD and voices are the same effect (but, return volume can be set for CD and voices respectively).]

### 4.2. External input

Two external input that are shown below are available in SPU.

- o CD input
- o External digital input

Sampling frequency is both 44.1 kHz. Mixing these external input with ADPCM sound is possible through the SPU, and reverberation also can be active for these external input. So three parameters that are shown below can be set.

- o Mixing on/off
- o Mixing volume
- o Reverberation on/off

### 4.3. Transfer the sound data generated by SPU to main memory

SPU especially writes the two types of sound data to particular area of sound buffer (0x0000 to 0x0fff) at an interval of 44.1 kHz: one is the volume-changed CD input, the another is envelope- changed special voices (one and three). These sound data can be transferred to main memory by DMA transfer, can be modified it, and by sending sound buffer with real-time ADPCM encoding (supported by compression library), SPU can handle these data to waveform data.

### 4.4. Signal flowchart

The signal flowchart from sound buffer to final D/A converter is shown below.

----- Figure: Signal flowchart -----  
-----

# \$Id: spu-arch-e.txt,v 1.1 1995/01/24 06:33:56 kaol Exp \$

```

%%%%%%%%%%
%%%%%%%%%%
%%%%%%%%%%
%%%%%%%%%%
%%%%%%%%%%

```

%%%%%%%%%%  
%%%%%%%%%%  
%%%%%%%%%%

### SPU Library functional specification

=====  
Copyright (C) 1994-95 by Sony Computer Entertainment Inc. All Rights Reserved.  
\$Id: funtheadE.txt,v 1.2 1995/03/08 11:45:52 kaol Exp \$  
(\* you can set/get the value about each voices. (+) you can set/get the value about only one voice. ----- Name: | Explanation: -----  
-----+----- SpuInit (void) | Initialize SPU SpuStart (void)  
| Start SPU process SpuQuit (void) | Stop (quit) SPU process -----+-----  
----- SpuSetMute (long) | Set mute on/off SpuGetMute (void) | Get status  
[on/off] of mute -----+----- SpuSetIRQ (long) | Set  
SPU interrupt on/off SpuGetIRQ (void) | Get status [on/off] of SPU interrupt SpuSetIRQAddr  
(unsigned long) | Set SPU interrupt address SpuGetIRQAddr (void) | Get SPU interrupt  
address SpuSetIRQCallback (SpuIRQCallbackProc) | Set SPU interrupt callback function -----  
-----+----- SpuSetVoiceAttr (SpuVoiceAttr \*) | Set voice  
attributes (\*) SpuGetVoiceAttr (SpuVoiceAttr \*) | Get voice attributes (+) SpuSetKey (long,  
unsigned long) | Set key on/off (\*) SpuSetKeyOnWithAttr (SpuVoiceAttr \*) | set key on with  
attributes (\*) SpuGetKeyStatus (unsigned long) | Get key on/off status (+) SpuGetAllKeysStatus  
(char \*) | Get key on/off status (\*) -----+-----  
SpuWrite (unsigned char \*, | Transfer data unsigned long) | [main mem. -> sound buffer]  
SpuWrite0 (unsigned long) | Clear sound buffer SpuWritePartly (unsigned char \*, | Transfer  
data (partly) unsigned long) | [main mem. -> sound buffer] SpuRead (unsigned char \*,  
| Transfer data unsigned long) | [sound buffer -> main mem.] SpuSetTransferStartAddr  
(unsigned long) | Set transfer start address | in sound buffer SpuGetTransferStartAddr  
(void) | Get transfer start address | in sound buffer SpuSetTransferMode (long) | Set  
transfer mode of sound buffer SpuGetTransferMode (void) | Get transfer mode of sound buffer  
SpuIsTransferCompleted (long) | Check whether transfer is finished -----  
-----+----- SpuReadDecodeData (SpuDecodeData \*, | Transfer the data  
decoded by SPU long) | to mein memory -----+-----  
----- SpuSetNoiseVoice (long, unsigned long) | Set noise on/off (\*) SpuGetNoiseVoice (void)  
| Get status [on/off] of noise (\*) SpuSetNoiseClock (long) | Set noise clock SpuGetNoiseClock  
(void) | Get noise clock -----+-----  
SpuSetPitchLFOVoice (long, | set pitch LFO on/off (\*) unsigned long) |  
SpuGetPitchLFOVoice (void) | get status of pitch LFO (\*) -----+-----  
----- SpuSetReverb (long) | set reverb used/unused SpuGetReverb (void) | get  
status of reverb (\*) SpuSetReverbModeParam (SpuReverbAttr \*) | set reverb mode & parameters  
SpuGetReverbModeParam (SpuReverbAttr \*) | get reverb mode & parameters  
SpuSetReverbDepth (SpuReverbAttr \*attr) | set reverb depth SpuSetReverbVoice (long,  
unsigned long) | set reverb on/off (\*) SpuGetReverbVoice (void) | get status [on/off] of reverb  
(\*) SpuReserveReverbWorkArea (long) | reserve/free of reverb workarea  
SpuIsReverbWorkAreaReserved (long) | get status [reserve/free] of reverb | workarea  
SpuClearReverbWorkArea (long) | clear reverb workarea -----+-----  
----- SpuSetCommonAttr (SpuCommonAttr \*) | set common attributes  
SpuGetCommonAttr (SpuCommonAttr \*) | get common attributes -----  
-----+----- SpuInitMalloc (long, char \*) | Initialize memory management of |  
sound buffer SpuMalloc (long) | allocate area in sound buffer SpuMallocWithStartAddr  
(unsigned long, | allocate area in sound buffer long) | with specify start address SpuFree  
(unsigned long) | release area in sound buffer -----+-----  
-----

---

3/22/95 5:31 PM  
Streaming Sound & Tidbits  
Bill "Angus" Guschwan  
Sound

There is a new libsnd call -- SsSetTableSize-- which allocates a separate MIDI channel table for each sequence. So you should not bash midi channels with 2 sequences.  
Second, no libsnd routines allocate memory after initialization. The Japanese developers had them change their code to this model. You can be happy now.

For streaming, you have 2 choices.

If you really have to go to DRAM, you will have to use VAG audio. XA has no mechanism to go through DRAM. Remember there are 2 ADPCM decoders: one for XA and one for MIDI. The VAG format uses MIDI. However this is difficult to do as far as syncing and it may be slow.  
A second and better way would be to use one of the 32 channels of XA. If you use 37.8 stereo sound, you can place 1 sector in 8 with XA audio. You can use 2 more sectors for 2 other sound channels, and you can then only play one of the channels at a time. In this way you can do interactive sound. It does not use the main CPU at all. And you don't need to use libspu. The libcd calls for using it are called the filter and it is located in the status word of the libcd. Look through libcd to find out about it.

Angus

---

3/27/95 9:15 PM  
Can you queue SpuWrites?  
Administrator  
Sound

> 2) Can you queue the SpuWrite DMAs? We want that.  
Hardware does not support queueing DMA request, thus if implement by software, I must rewrite many part of libspu ... so I say 'Not yet decided' whether I will implement this faculty.

---

3/27/95 9:17 PM  
How to turn off SpuIRQ?  
Administrator  
Sound

> 1) SpuSetIRQ(SPU\_OFF) does not turn off the IRQ callback until you set the > callback to NULL with SpuSetIRQCallback(NULL). Is that correct?  
I send the sample that is based on sample\sound\lowlevel\tuto3.c. In this sample the two pad assigns are added:  
PADRight (circle): Interrupt is set to be available. PADRdown (cross): Interrupt is set to be not available.  
Default is 'Interrupt is set to be available.' and I do use only SpuSetIRQ(SPU\_OFF), not use SpuSetIRQCallback(NULL). Please try this sample.  
This is the IRQ on/off sample that modified sample\sound\lowlevel\tuto3.c.  
I marked /\* NEW \*/ or /\* NEW BEGIN \*/ - /\* NEW END \*/ for additional part in this sample.  
Please replace this sample with tuto3.c when compile this file.

```
=====  
/***** * *_c_*_ * SRCfile: tuto3.c,v $ * *
```

Copyright (C) 1994 by Sony Computer Entertainment Inc. \* All Rights Reserved. \* \* Sony  
Computer Entertainment Inc. R & D Division \*

```
***** / * $PSLibId$ */
#ifndef lint static char rcsid [] = "$Id: tuto3.c,v 1.2 1995/03/11 12:51:48 kaol Exp $ : \ Copyright
(C) by 1994 Sony Computer Entertainment Inc."; #endif
#include <r3000.h> #include <asm.h> #include <kernel.h>
#include <libetc.h> #include <libspu.h> #ifdef __psx__ #include <libs.h> #else #define
pollhost() #endif
/* #define DEBUG /**/
#ifdef DEBUG #define PRINTF(x) printf x #else #define PRINTF(x) #endif
int quitF;
#ifdef True #define True 1 #endif #ifndef False #define False 0 #endif
#define SIN_DATA_SIZE (0x10 * 10) unsigned char sin_wave [] = { #include "sin.h" }; #define
PF_DATA_SIZE 18704 unsigned char pf_wave [] = { #include "pf_wave.h" };
SpuIRQCallbackProc spu_intr (void);
void padHandle (unsigned long);
#define MALLOC_MAX 2 char spu_malloc_rec [SPU_MALLOC_RECSIZ * (MALLOC_MAX +
1)];
main (void) { unsigned long s_addr, p_addr, i_addr; unsigned long size; SpuVoiceAttr
s_attr; SpuCommonAttr c_attr;
long top;
/* ----- * Initialize Graphics system * -----
----- */
ResetGraph (0);
/* ----- * Initialize SPU * -----
----- */
SpuInit (); SpuInitMalloc (MALLOC_MAX, spu_malloc_rec);
/* ----- * Initialize Control pad * -----
----- */
PadInit (0);
/* ----- * Set common attributes * -----
----- */
c_attr.mask = (SPU_COMMON_MVOLL | SPU_COMMON_MVOLR);
c_attr.mvol.left = 0x3fff; c_attr.mvol.right = 0x3fff;
SpuSetCommonAttr (&c_attr);
/* ----- * Transfer waveform data * -----
----- */
/* transfer mode */ SpuSetTransferMode (SpuTransByDMA);
/* * transfer sin wave */
s_addr = SpuMalloc (SIN_DATA_SIZE);
/* start address */ top = SpuSetTransferStartAddr (s_addr); PRINTF ("Set start addr :
%08x\n", s_addr); PRINTF ("Return start addr : %08x\n", top); PRINTF ("Get start addr
: %08x\n", SpuGetTransferStartAddr ()); /* transfer */ size = SpuWrite (sin_wave,
SIN_DATA_SIZE); SpuIsTransferCompleted (SPU_TRANSFER_WAIT);
PRINTF ("Send size : %08x\n", SIN_DATA_SIZE); PRINTF ("Return size : %08x\n",
size);
/* * transfer piano wave */
p_addr = SpuMalloc (PF_DATA_SIZE);
/* start address */ top = SpuSetTransferStartAddr (p_addr); PRINTF ("Set start addr :
%08x\n", p_addr); PRINTF ("Return start addr : %08x\n", top); PRINTF ("Get start addr
: %08x\n", SpuGetTransferStartAddr ()); /* transfer */ size = SpuWrite (pf_wave,
PF_DATA_SIZE); SpuIsTransferCompleted (SPU_TRANSFER_WAIT);
/* ----- * Set interrupt callback function * ---
----- */
i_addr = SpuSetIRQAddr (p_addr + (PF_DATA_SIZE / 2)); SpuSetIRQCallback
```



```

(SpuIRQCallbackProc) spu_intr);
    PRINTF ("Set IRQ addr  :%08x\n", p_addr + (PF_DATA_SIZE / 2));  PRINTF ("Return
IRQ addr :%08x\n", i_addr);  PRINTF ("Get IRQ addr  :%08x\n", SpuGetIRQAddr ());
    /* ----- * Set voice attributes. * -----
----- */
    /* attibutes mask */ s_attr.mask = (SPU_VOICE_VOLL | SPU_VOICE_VOLR |
SPU_VOICE_PITCH | SPU_VOICE_WDSA | SPU_VOICE_ADSR_AMODE |
SPU_VOICE_ADSR_SMODE | SPU_VOICE_ADSR_RMODE | SPU_VOICE_ADSR_AR |
SPU_VOICE_ADSR_DR | SPU_VOICE_ADSR_SR | SPU_VOICE_ADSR_RR |
SPU_VOICE_ADSR_SL );
    /* for piano wave */
    s_attr.voice = (SPU_0CH);
    s_attr.volume.left = 0x1fff; s_attr.volume.right = 0x1fff; s_attr.pitch = 0x1000;
s_attr.addr = p_addr; s_attr.a_mode = SPU_VOICE_LINEARIncN; s_attr.s_mode
= SPU_VOICE_LINEARIncN; s_attr.r_mode = SPU_VOICE_LINEARDecN; s_attr.ar
= 0x0; s_attr.dr = 0x0; s_attr.sr = 0x0; s_attr.rr = 0x0; s_attr.sl =
0xf;
    PRINTF ("set voice attr (piano):\n"); SpuSetVoiceAttr (&s_attr);
    /* for sin wave */
    s_attr.voice = (SPU_1CH);
    s_attr.volume.left = 0x1fff; s_attr.volume.right = 0x1fff; s_attr.pitch = 0x2000;
s_attr.addr = s_addr;
    PRINTF ("set voice attr (sin):\n"); SpuSetVoiceAttr (&s_attr);
    /* ----- * Key on/off * -----
----- */
    quitF = False; while (! quitF) { VSync (0); pollhost (); padHandle (PadRead (0)); }
    SpuSetKey (SpuOff, (SPU_0CH | SPU_1CH));
    SpuSetIRQ (SpuOff); /**/
    SpuQuit ();
    PadStop (); /* pad stop */ }
SpuIRQCallbackProc spu_intr (void) { SpuSetIRQ (SpuOff); /* stop interrupt */
    SpuSetKey (SpuOn, (SPU_1CH));
    PRINTF ("."); }
void padHandle (unsigned long padd) { static int key_q = False; static int key_h = False;
static int key_k = False; static irq_flag = True; /* NEW */
/* Quit */ if ((padd & PADk) && (padd & PADh)) { if ((key_q == False)) { key_q =
True; } } else { if (key_q == True) { key_q = False; quitF = True; } }
/* NEW BEGIN */ /* Interrupt is set to be available */ if ((padd & PADRright)) { if
((irq_flag == False)) { irq_flag = True; } }
/* Interrupt is set to be not available */ if ((padd & PADRdown)) { if ((irq_flag == True)) {
irq_flag = False; } } /* NEW END */
if (padd & PADh) { if ((key_h == False)) { if (irq_flag == True) { /* NEW */ SpuSetIRQ
(SpuOn); /* set interrupt */ } SpuSetKey (SpuOn, (SPU_0CH)); key_h = True; } } else
{ if (key_h == True) { key_h = False; } }
if (padd & PADk) { if ((key_k == False)) { SpuSetIRQ (SpuOff); /* stop interrupt */
SpuSetKey (SpuOff, (SPU_0CH | SPU_1CH)); key_k = True; } } else { if (key_k == True) {
key_k = False; } } }
/* ----- * End on File * -----
----- */ /* DON'T ADD STUFF AFTER THIS */

```

Loop?  
Administrator  
Sound

> 2) When you start a voice with the vag data and it gets to the start loop (and > presumably stuffs it in a register), and when it gets to end of data packet, it > looks for a loop and jumps to it. If you turn the voice off, it would still > process the data and get to the end of the loop. Even though you turn off the > voice, and you turn it on later, it starts playing wherever it is. So how do > you stop looping. > In other words, if you have a sample with a loop point, and you turn it off, > and then you start it again, it does not start from the beginning.  
Please refer sample\sound\lowlevel\tuto3.c. In this sample, piano waveform data is used and this data has a loop point. Always piano starts from the beginning. And if you use VAG file, please remove header part of VAG file when transfer to sound buffer.

---

3/27/95 9:18 PM  
Spu likes to free-run.  
Administrator  
Sound

> If you have a sample that is looping, how do you get it to stop looping? If you > turn the voice off, the sound stops but the data will still be processed. For > example IRQs will still be called back. What register is it or is there a call > to stop looping?  
Yes, SPU do free-run even if you turn the voice off, thus, if you set IRQ address in the loop area of waveform data, You must turn IRQ off when IRQ interrupt is occurred. For avoid this problem, we will modify libSPU memory management routine and AIFF2VAG in next version or later.

---

3/27/95 9:12 PM  
SpuWrite I/O Speed  
Administrator  
Sound

> 6) DMA to SPU is 512k/sec. How fast is i/o to the SPU?  
I/O write is very slow, depend on arbitration of DMA, DMA may be 5 times or more faster than I/O.

---

3/27/95 9:14 PM  
What is adsr1 & adsr2?  
Administrator  
Sound

> 4)What does adsr1 adsr2 do in the voice attributes?  
'adsr1' and 'adsr2' is the same as the member of VagAtr structure 'adsr1' and 'adsr2'. if you get the value of adsr1 and adsr2 by using SsUtGetVagAtr(), you can set adsr1 and adsr2 in

SpuVoiceAttr.

---

3/27/95 9:13 PM  
Does Spu Slow CPU?  
Administrator  
Sound

> 7) What is the effect of SPU DMA on the CPU performance? 50% 75%?  
Hummm, I guess that you can not feel CPU performance down in SPU DMA because SPU transfer rate is slow as compared with CPU.  
\*\* Yeah, that answer does not make sense to me either. Angus

---

3/27/95 9:15 PM  
SpuSetTransferStartAddr bug  
Administrator  
Sound

> 1) Bug: > > If you pass 0x1000 to SpuSetTransferStartAddr, it will return 0x1009 and flag > it as an error.  
I tested, and 0x1000 is ok, but if set 0x1001, address is set to 0x1008 but return value is 0x1009.  
This bug of return value calculation is already fixed in ver.3.0.

---

3/27/95 9:14 PM  
Who calculates sample\_note?  
Administrator  
Sound

> 3) Are the calculations done with sample\_note and note (which involves a lot > of divisions) done on the DSP or the CPU?  
Converting from sample\_note and note to pitch is by libspu internal (so, by software, by CPU).

---

3/29/95 3:19 PM  
Voice Assignment  
Bill "Angus" Guschwan  
Sound

Voice assignment basic policy in libsnd -----  
The voice assignment basic policy for the new key-on waveform data that the priority value is 'x' is:  
1. First, if there are some voices that envelope value is 0 and key on/off attribute is 'key off', the smallest voice number of them is assigned.  
2. Secondly, if there are some voices that key on/off attribute is 'key off', but the envelope value of each of them is not 0, the voice that has the smallest priority value in them, and the

smallest current envelope value in them is assigned (selecting by priority value is given higher priority than by envelope value).

3. Thirdly, now all voices are in 'key on' status, in the voices that have lower priority than 'x' that is the priority value of new key-on waveform data, the voice that has the smallest priority value in them, and the smallest current envelope value in them is assigned (selecting by priority value is given higher priority than by envelope value).

4. Finally, if all of conditions above are failed, all voices have higher priority value than new key-on waveform data, thus key on request is failed (that means 'ignored').

---

3/31/95 3:57 PM

Re: VAG Realtime Encode

Blake E. Senftner

Sound

Angus wrote:

> I'm now developping the function 'EncSPU' for realtime encoding from > 16-bit PCM to VAG, so please wait for 3.0.

Well, lib 3.0 is here... do we have real time encoding capability? I was unable to locate EncSPU() in the new libs...

-Blake

---

4/3/95 2:05 PM

Low-level sounds: Converting .raw files

Sam Black

Sound

I've been trying to get "low-level" sound working. (Using the samples/lowlevel/tuto1.c as my guide)

The problem I'm running into is not knowing the format of the sound waveforms. (The sin.h file contains a waveform, and that works just fine.)

I'm trying to convert my .raw files into any format that the PSX can play.

In using the .raw files, the best results have come from 16 bit, signed, mono, motorola-endianness, but there is still massive "scratching" atop the desired waveform.

Do I need to convert the files into VAGs? Converting to VAGs and loading them was a no-go.

Do I need to do something else to them? Magic runes, maybe?

Also, how do I specify the loop point for a waveform?

Thanks.

---

4/4/95 5:32 PM

Loop Points

Brian Greenstone

Sound

Do loop points in sounds have to be on any particular boundary? Or, do the loops have to be of a multiply of some particular size?

-Brian

---

4/5/95 5:53 PM

Re: Loop Points

Sam Black

Sound

Brian Greenstone

>Do loop points in sounds have to be on any particular boundary? Or, do the >loops have to be of a multiply of some particular size?

How do you enter/edit loops in your sample? I've managed to strip the 48 byte header from a VAG a play it using VoKeyOn, but haven't found anyway to intelligently enter looping information. (Nor can I decipher the sin.h file to determine how that sample loops...)

---

4/5/95 5:56 PM

Re: Low-level sounds: Converting .raw files

Sam Black

Sound

Well, I guess I can follow up my own questions (most of them)

I converted the .raw files to the Mac AIFF format in Sound Forge (a Windows app) Changed the type with ResEdit to be AIFF. Converted to VAG with AIFF2VAG Stripped the 48 byte header from the VAG and loaded the rest of the file into sound RAM Use VoKeyOn to play it...

Still haven't gotten the loop points set.

Hoping to save someone some time...

---

4/5/95 11:29 AM

End of Program detection

Raul Quezada

Sound

1. how does one determine when a program has ended?

2. is there a simple formula for computing how long a program is, based on the size, sample rate and pitch of the program?

3. how does one use SsUtGetProgAtr & SsUtSetProgAtr to set program attributes? seems like these functions have not been implemented yet. correct?how does one determine when a program has ended?

is there a simple formula for computing how long a program is, based on the size, sample rate and pitch of the program?

---

4/6/95 11:37 AM

Adjusting Pan

Raul Quezada

Sound

is there a way to adjust the pan w/o keying off and then keying on the program? i know this can be done with the volume using SsUtSetVol. there doesn't seem to be such a function for adjusting pan.

---

4/11/95 2:51 PM  
SsUtAutoVol() ??  
iain macanulty  
Sound

I can't seem to get this function to work. any ideas?  
iain.

---

4/11/95 2:55 PM  
Re: SsUtAutoVol() ??  
Bill "Angus" Guschwan  
Sound

you need to use lib3.0.  
angus

---

4/12/95 1:27 PM  
Re(2): SsUtAutoVol() ??  
iain macanulty  
Sound

I am using libs 3.0. I notice it doesn't work in the Sony demo under XSE in main.c.  
iain.

---

4/12/95 7:50 PM  
General questions on Sound Library  
Joe J. Alemanni  
Sound

Hello,  
I have a couple of questions that I've been unable to get info on:  
- What happened to function EncSPU? Is there no PCM/VAG conversion support at runtime?  
- Is there any documentation on the SPU functions?  
- Are there any code examples regarding playing .XA data?  
Thanks.

---

4/13/95 6:50 PM  
SsUtKeyOn  
Buzz Burrowes  
Sound

I've got a vab that has layered tones (multiple tones in the same program that sound in overlapping key ranges) thus a single "NoteOn" in a MIDI sequence causes those multiple tones all to sound. This is exactly what I want... BUT...

I want the same thing to happen from my program when I issue a KeyOn with one of the libsnd functions (e.g. SsUtKeyOn). The problem is that this call takes a tone number as an argument as well as the program number. So, in this case I hear only that single tone of the program.

Is there a way to do a KeyOn and hear all appropriate tones in the program (as I would if the key on came in a MIDI sequence)?

I would think the best way to do this would be to allow me to specify -1 as the tone argument in the SsUtKeyOn call and have the lib interpret this to mean play all tones which should sound for the specified key.

I really need to find a way to do this.

---

4/14/95 1:53 PM

Re: General questions on Sound Library

Jon Burgstrom

Sound

Hi,

Sorry it's taken so long for the reply.... but hopefully this helps.

>>Hello,

>>I have a couple of questions that I've been unable to get info on:

>>- What happened to function EncSPU? Is there no PCM/VAG conversion support at runtime?

>>- Is there any documentation on the SPU functions?

>>- Are there any code examples regarding playing .XA data?

>>Thanks.

1. EncSPU, although documented has not been implemented yet. Maybe version 3.1 ???

2. YES!!! look in the documentation section, there is a zip file with translated .txt files.

3. We should have a demo disk, which has tons of CD examples, (well a few any way) and there is in fact a couple of demos dealing with XA audio. We will hand these disks out at the Game Developer's Conference, next week. If you won't be attending the GDC in Santa Clara next week, contact your account exec. and we will make arrangements to get one to ya.

Hope it helps...

You can turn back the music, but you can't turn back time....

Jon Burgstrom

SONY PSX Developer Support.

---

4/14/95 10:07 AM

Re: SsUtKeyOn

Buzz Burrowes

Sound

Well, I guess I answered my own question. For those interested...

SsVoKeyOn(...) does not take a tone number as an argument, only vabID and program number.

This call does in fact play all appropriate tones for the given program/note combination.

When you think about it, this actually makes sense. A program with 2 tones layered would require 2 voices to play. Somehow SsUtKeyOn would have to return 2 voice IDs for the

channels allocated to play the sound.

The only real problem this may create would be in the following scenario...

If you want to play a LOOPING sound that is made up of multiple, layered tones and want to modify that sound's volume, pan or pitch while it is playing.

Since SsVoKeyOn would have to be called to make all tones sound, and this call does not tell you which voices are being used, you can't call any of the SstUt... functions that do volume, pan and pitch changes.

Moral of the story... any sound that will be looping and may need its volume, pitch or pan changed during playback should be a single tone which requires only one voice to reproduce.

---

4/18/95 4:48 PM

SsUtChangePitch

Buzz Burrowes

Sound

Has anyone had much luck with the SsUtChangePitch call?

If I call it with a new note/fine combination that is higher than the original I get a half step change in pitch at the most - even if I specify a pitch that is an octave higher.

If I call it with a new note/fine combination that is lower than the original I don't get any change at all.

---

4/18/95 4:04 PM

Re(3): SsUtAutoVol() ??

Buzz Burrowes

Sound

Angus,

I've also found that SsUtAutoVol doesn't seem to work and I also have the latest libs. Any idea?

---

4/18/95 3:56 PM

Re(3): Adjusting Pan

Buzz Burrowes

Sound

>> i don't want to have to key off, adjust the pan and then key it on again. i >> was hoping there was a function like SsUtSetVVol, which works great for >> volume adjustment, for adjusting pan, but there doesn't seem to be one. do

>> you know of any way to do this?

I have resorted to making calls to SsUtSetVVol to do pan changes. This function takes separate left and right volumes as arguments. I keep track of a single volume and single pan for each sound effect. Then, when I make a call to a function like this which requires separate values for left and right volume, I call a function which translates my volume and pan to two volumes. My system is event driven, so when I want to pan a sound over time, I add an event to my event list with information regarding destination, rate, etc. and make calls to SsUtSetVVol to actually set the pan. It will certainly be nice when SsUtAutoPan works again so that we can use that function instead.



Actually, what I would prefer to see is SsUtAutoVol changed from taking a start volume and a stop volume to taking separate left and right volumes for both ...

SsUtAutoVol (short vc, short start\_vol\_l, short start\_vol\_r, short end\_vol\_l, short end\_vol\_r, short delta\_time)

For two reasons... 1) SsUtKeyOn takes separate volumes for left and right, this being the case I would stick with that method. I would actually prefer a volume - pan scheme, but I would bet that since SsUtKeyOn works it won't be changed. In any case, pick a method and stick with it. 2) The Single function SsUtAutoVol could be used for straight volume changes and straight pan changes AS WELL AS complex changes in volume and pan. Think of it... One call to change a sound's apparent location AND volume.

>> i had another quick question. is there any way to easily find out how long a program >> will play for, or to detect when a program has ended?

I haven't tried to do this, but it doesn't look easy. I'd be interested in knowing what you come up with.

---

4/19/95 11:45 AM  
Re: SsUtChangePitch  
Buzz Burrowes  
Sound

A little more detail on the problem...

I'm trying to change pitch by very small amounts over time. I've got a function called SoundSetPitch() which takes a new pitch and delta\_time as arguments. This function sets up an event which is processed x times a second which continuously calls SsUtChangePitch(...) with new note & fine values yielding a pitch bend effect. So if the new pitch is higher than what is already sounding the fine value is incremented and the function is called. This happens continuously, when the fine value gets greater than 127 I modify the note parameter, reset fine to 0 and keep going until I reach my destination pitch.

If I start a sound playing and then just call SsUtChangePitch once with a note an octave higher the function works, but if I try to call the function with only the small changes in the new\_fine parameter (as described above) nothing changes, and further calls with higher new\_note values also produce no change in pitch.

I'm beginning to look at using SsUtPitchBend as a replacement. There are a few reasons that this won't be as nice a solution in my situation.

---

4/19/95 8:01 PM  
Re(4): SsUtChangePitch  
Bill "Angus" Guschwan  
Sound

In order to achieve a continuous change in pitch, e.g. motorcycle engines, I am starting a note with SsUtKeyOn (returns a voiceID). I can then tweak the pitch via SsUtChangePitch(voiceID, oldNote, oldFine, newNote, newFine...).

However, when newNote DOES NOT EQUAL oldNote, the routine fails. Actually, after the Fine has reached Max (127) and it's time to bump the note set fine to 0 (e.g., 10:127 --> 11: 0), SsUtChangePitch apparently does NOT "remember" the NEW NOTE as it's current note number. SO, the next time you call SsUtChangePitch with the new note (e.g., 11:0 --> 11:1) the routine fails probably because it doesn't remember that it's note "state" is newNote (e.g., 11).

I tried calling `SsUtKeyOnV(voiceID, newNote, newFine, ...)` when the `newNote` is changing (instead of `SsUtChangePitch`) but that causes a "glitch" in the sound.

The solution seems to be that `SsUtChangePitch` should always record `newNote` as it's "state" note.

The work around is to use `LibSPU` for this type of thing. The problem with this is that the audio content must now be separated (e.g., engine samples as separate VAG files, having the programmer deal with Allocating `Spu` memory, and transferring the data to the SPU via `SpuWrite`, etc)), as opposed to simply calling `TransVabBody(...)`.

---

4/19/95 8:00 PM

Re(3): `SsUtChangePitch`

Bill "Angus" Guschwan

Sound

David Stokes suggested we try and fool `SsUtChangePitch` by always passing the INITIAL noteNumber that we pass to `SsUtKeyOn` (so `SsUtChangePitch` won't complain): IT WORKS! Perhaps that's the way it is supposed to work; that is, perhaps the parameter documented as "oldNote" really means "initialNote."

So, you don't need to re-trigger the voice with a new note, just keep passing the initial note/fine as the `oldNote/Fine` parameters and update the `newNote/Fine`.

Note: (no pun intended) To get smooth pitch change over a large range, `SsUtChangePitch` works WAY better than `SsUtPitchBend`. This is because `SsUtPitchBend` divides the Total Pitch Bend Note Range into 128 discrete steps, and `SsUtChangePitch` divides the Total Pitch Bend Note Range into (`Total Pitch Bend Note Range * 128`) discrete steps creating a much smoother slope.

---

4/19/95 4:11 PM

Re(2): `SsUtChangePitch`

Buzz Burrowes

Sound

Well, I kind of feel like I'm talking to myself, but here is what I've come up with for those of you interested... (actually, I'd love some feedback from tech support letting me know if I'm creating any long term problems by doing things this way!)

The `libsnd SsUtChangePitch` call doesn't seem to work, so I decided to try the `libspu` calls instead. I use the voice number returned by `SsUtKeyOn` in the `SpuVoiceAttr` structure and call `SpuSetVoiceAttr` with the `SPU_VOICE_NOTE` flag and specify the new pitch (note/fine).

This seems to work fine except that if I do change the pitch this way my looping sound (started with `SsUtKeyOn`) can't be stopped with `SsUtKeyOff`. Weird huh? A call to this function fails.

So, when I try to stop a sound started with `SsUtKeyOn` and the `SsUtKeyOff` call fails, I call `SpuSetKey(SPU_OFF, (0x1L << VoiceInQuestion))` and the sound stops.

So far I've had no problems with this method. Now that I know that I can mix `libspu` and `libsnd` calls I'll be trying it in the few other areas I can't get to work in `libsnd`.

---

4/20/95 2:05 PM

Re(5): SsUtChangePitch  
Buzz Burrowes  
Sound

Well, as I pointed out in a later post, mixing libsnd functions and libspu functions seems to work in some cases.

---

4/20/95 2:15 PM  
Where's that vag?  
Buzz Burrowes  
Sound

As I've been posting these message about SsUtChangePitch etc. it's becoming evident that I will need to use a mixture of libsnd and libspu. Fine, I can deal with that... but...

I'd like to have all of my sound effect data in a .vh + .vb pair. There has to be a way of finding out where in sound RAM a specific vag in a given vab is sitting. I've looked through the documentation on file format and I can't find it.

When the audio data is all in one file (no vabsplit) I can see that the data for the first tone will follow all of the header info. Then you could walk through all of the vags, using their size to move to the next, until you got to the vag data you were looking for. But when the file is split, and header data is in main memory, and vag data is in sound ram, there has to be a link which libsnd uses to associate the two.

I would have to believe that somewhere in main memory there is a map that has pointers to each individual vag in sound RAM so that requests to play a single sound (via SsUtKeyOn for instance) don't require walking through all of sound ram to find the audio data needed.

I NEED THIS! I need to be able to download a .vb to sound ram via SsVabTransBody, and then find a data address for a specific vag with a function like this...

```
unsigned long SsUtFindVag(short vabid,short prog,short tone,short note)
```

Now that would solve nearly all of my problems (I guess I shouldn't hold my breath ;-)

---

4/21/95 6:35 PM  
Re: Where's that vag?  
Buzz Burrowes  
Sound

Here's a method for finding a vag in a vab body (.vb) that has already been downloaded to sound ram (so that you can use the returned address in libspu calls)...

```
unsigned long FindVagInVab(unsigned long haddr, short vabid, short realtonenumber) {  
    unsigned long addr;  
    VabHdr *vabhdr; short *vagtable; unsigned long offset; short count;  
    /* get head of sound data... */ addr = SsUtGetVBaddrInSB(vabid);  
    vabhdr = (VabHdr *)haddr; vagtable = (short *) (haddr + sizeof(VabHdr) + (unsigned  
long)(128 * sizeof(ProgAtr)) + (unsigned long)(sizeof(VagAtr) * 16 * vabhdr->ps)); /* I know, I  
went a little crazy with the casts! */ offset = 0; for(count = 0; count < realtonenumber; count++) {  
    offset += ( ((unsigned long)( (unsigned short)*vagtable )) << 3); vagtable++; } return(addr +  
offset); }
```

where...

haddr = the address of the vab header (.vh) in main memory. vabid = the vab id returned from SsVabOpenHead. realtonenumber = the tone number (1 based! In SoundDelicatessen open the VAG list window, and the vag# shown there for the vag you want is the number to

pass.)

Again... the header must be in main memory and the .vb (body) must have already been downloaded via SsVabTransBody(...)

Goodluck!

---

4/24/95 7:09 PM

Bug in SsUtGetVabHdr( short vabId, VabHdr \*vabhdrptr )????

Ken Chao

Sound

i believe there is an error in the function SsUtGetVabHdr i don't think it gets the element 'fsize' from the original header correctly. the 'fsize' value always returns 0. however, if i look at 'fsize' from the original header i see the proper value. can someone verify this for me?

thanks!

ken

---

4/24/95 11:26 AM

ADPCM format

Mark Beardsley

Sound

Is it possible to get the ADPCM compression algorithm? One of our sound guys wants to look into generating waveforms at runtime. Thanks.

---

5/1/95 2:04 PM

Re: ADPCM format

Jon Burgstrom

Sound

Currently, The ADPCM format that SONY uses for PCM audio compression is being patented. So at this point it would not be possible to release this information. If your sound guy wants to create simple waveforms, he/she can use the "white" noise generator. Otherwise, in the foreseeable future there will be a function called "EncSPU()" which will take a pointer to a buffer containing raw PCM data and compress it for you. This should be what your sound person is looking for.

Hope it helps.... Jon Burgstrom PSX Developer Support

---

5/1/95 5:50 PM

Sound Qs

Bill "Angus" Guschwan

Sound

| | Hi Kaol | | I'm a bit confused about SsSetMarkCallback - What I assume it does, is to  
| allow me to set up a callback function which gets called when a 'mark' | event is detected in  
a SEQ or SEP file. What I don't know is how to put | this mark into my SEQ file. Do I just  
record a certain program change or | controller in my MIDI file, before I run SMF2SEQ ? If

so, please could you describe the MIDI event that I need to use ?

If you use SsSetMarkCallBack, you have to set NRPN(of control change) event in your MIDI file, before you run SMF2SEQ. MIDI description is below:

```
<Control Change>   bnH 99   data1(40)           (NRPN MSB)   bnH 98  
data2(0-127, arbitrary) (NRPN LSB)
```

Also, is there any way of jumping into a sequence at a certain point ? At the moment, it seems that I must always start a sequence from the beginning. We need to write a music system which responds to the player's actions, and so we need to be able to have branching sequences. Would it be possible to add this functionality if it is not already there ?

In current version, libsnd does NOT provide this faculty.

For implementing this faculty, we think that libsnd have to scan all data of specified SEQ file because of interpreting 'running status' in SEQ file, and may have to save each status of data, so it's very hard work for libsnd's realtime processing.

---

5/2/95 11:25 AM

Detect End Of Sample  
Bill "Angus" Guschwan  
Sound

> Could you tell me how to tell when a sample has finished playing ? This is obviously very important to know, as people often need to play one sample immediately after another. Do you have to use SpuSetIRQ and so on, to set a callback to occur at the position at the end of the sample ? If so, how do I know where, in SPU memory, this position is ? SoundDelicatessen does not tell me this information. A lot of people are asking me this at the moment. Thank you for your help Harry

In libspu, by using SpuGetKeyStatus() or SpuGetAllKeysStatus(), you can detect whether specified voices (or all voices) have finished playing. But these functions can only return the value(s) when calls.

If you want to play the one voice immediately after another, as you point out, you must use IRQ mechanism in SPU.

In libsnd, By using SsUtGetVagAddr (VAB\_ID, VAG\_ID), you can get the address of VAG\_ID vag data in VAB\_ID vab data. In vab, vag datas are packed one by one with id's order, so the region of VAG\_ID vag data saved in sound buffer is shown below:

```
start: SsUtGetVagAddr (VAB_ID, VAG_ID) end: SsUtGetVagAddr (VAB_ID, VAG_ID + 1) - 1
```

And, the address of SPU IRQ must be the multiple of 8, so you must set the argument of SpuSetIRQAddr():

```
SpuSetIRQAddr (SsUtGetVagAddr (VAB_ID, VAG_ID + 1) - 8);  
SpuSetIRQCallback ((SpuIRQCallbackProc) eachIRQ); SpuSetIRQ (SPU_ON); /**/  
:
```

```
SpuIRQCallbackProc eachIRQ (void) { SpuSetIRQ (SPU_OFF); SsVoKeyOn (foo.prog,  
foo.pitch, 127, 127); SpuSetIRQ (SPU_ON); /* as you like it */ return; }
```

This pseudo code will work well by replacing pseudo values to real values (really, I tested it).

[Notice: this method can not use for last vag data in vab.]

And in libspu, you do use IRQ mechanism by using IRQ function in libspu, it maybe the same as the method in libsnd.

---

5/2/95 7:32 PM

VAG Header  
Mark Slemko  
Sound

I know the encoding format for VAG files has yet to be patented, but I was wondering if the header of a VAG file could be explained so that I may load my own VAG data into inot sound memory without using VAB files.  
I've been able to decipher the sample rate and data size in the VAG header but don't have a clue how to get the loop points.  
Any info on the format of a VAG header would be very useful!  
Brian Green

---

5/3/95 5:34 PM  
Re: Detect End Of Sample  
Buzz Burrowes  
Sound

>> In libsnd, By using SsUtGetVagAddr (VAB\_ID, VAG\_ID), you can get >> the address of VAG\_ID vag data in VAB\_ID vab data.  
I've been looking for a function like this! (I posted a chunk of code about a week ago that did a similar thing in a rather cludgy way.) Where is this function call documented? What version of the libs did it first appear in?

---

5/3/95 10:18 AM  
Re: VAG Header  
Jon Burgstrom  
Sound

If you use VABSPLIT.EXE you can then load the header and VAG files seperatly. As far as loop points are concerned, when the sample(s) were created, (using Sound Delicatesen) you set the loop point and need to "remember" there position.

You can change the loop point of the waveform data specified above dynamically by using SpuSetVoiceAttr() with specifying the member `loop\_addr' of `SpuVoiceAttr' structure.

If you save the waveform data from 0x2000 to 0x4000 in sound buffer, this waveform data has loop point that you specified `loop' in Hard disk recording tool, for example at 0x800 (so real loop point is set to 0x2800), this waveform data is assgined to voice #0, and you want to specify the loop point at 0x3000, then:

```
SpuVoiceAttr attr;  
attr.voice = SPU_0CH; attr.mask = SPU_VOICE_LSAX; /* LSAX means Loop Start  
Address, */ attr.loop_addr = 0x3000;  
SpuSetVoiceAttr (&attr);
```

Hope it helps.....

Jon Burgstrom SONY PSX Developer Support

---

5/4/95 9:06 PM  
Annoying drone after the SONY logos  
Mark W. Kelly  
Sound

Does anyone out there know how to quick kill the annoying droning sound that occurs after the PSX has displayed the initial 2 logos.

Cheers,

Mark.

---

5/4/95 9:16 PM  
HELP ... Flics and Audio  
Mark W. Kelly  
CD

Can you help...

1. We are trying to find a simple way to detect the end of our stream. Currently we are using a frame count, by as our flics change in size, we have to keep altering the counter value. Any ideas how to detect the end of a flic stream.
2. We have not problems, playing flic at 15fps (version 2) with 37kHz Stereo XA, but that seems to be the only method that we can generate that it stable. Any ideas or comments on getting 30fps with audio.

Cheers,  
Mark.

---

5/4/95 9:10 PM  
Clicks during XA/Flic play  
Mark W. Kelly  
Sound

When we run a flic on the emulator with XA audio, we get several CLICKS in our audio track. The problems seems to disappear when we burn a CD. Is this normal, or are we doing something silly.

Cheers,  
Mark.

---

5/4/95 10:48 AM  
VAG Header  
Mark Slemko  
Sound

Thanks for your reply, John.

So I guess what your saying is that the loop points are not contained in the VAG header? How can this be so if when creating the VAG file with AIFF2VAG you specify the loop points? In the end what I would like to achieve is using AIFF2VAG.EXE to convert aiff files to VAGs and simply using these VAGs on the PSX. Our own composition/music development system will not use VABs.

The loop points must be in the header and it would be very useful for me to know how to get them.

If it is possible please let me know.

Also, since the audio data is compressed, how does the loop point relate to the loop\_start\_address? Why isn't there a loop end address? Does it always loop to the end of the sample from the loop start address?

Any info would be greatly appreciated! I'll be working with this stuff today so I'll let you know how far I get!

Brian 'loopy' Green

---

5/5/95 9:32 AM

Re: Annoying drone after the SONY logos  
Jon Burgstrom  
Sound

>>Does anyone out there know how to quick kill the annoying droning sound that occurs after the PSX has displayed the >>initial 2 logos.

>>Cheers,

>>Mark.

Mark, I'm not sure what you "noise" you are referring to. You may want to try the following sequence of inits.

1. resetcallbacks();
2. CDInit();
3. SSinit();
4. SetserialA(); /\* Adjust your CD volume \*/

Hope it helps.....

Jon Burgstrom PSX Developer Support

---

5/11/95 1:55 PM

How to find out the end of a sound track on a CD?  
Mark D. Hirsch  
CD

Is anyone knows how to find out the end of a sound track on an audio CD? I had used "tuto4.c" sample program in the downloaded "movie30" zipfile. I found that when I play a sound and when it reaches to its end, I can hear several notes of the next sound track. I use "cdRepeat(CdPosToInt(&toc[thistrack]), CdPosToInt(&toc[nexttrack]));" function to play a sound track repeatly. I checked the CdILOC structure. It only tells us the beginning of each track.

-Mark

---

5/16/95 11:17 AM

Priorities  
Administrator  
Sound

>I've STILL got this problem with Libsnd and tone priorities. I've seen the >postings describing how the voice allocation scheme is supposed to work. The >stated spec. looks fine... BUT... >>The attached code demonstrates how this spec. IS NOT WORKING. >>This demo is only slightly different than the demo of the problem I sent to >you >a month or two back. I modified it to better show the problem. >>The only change is that I call SsInit() and then call SsSetReservedVoice(1) so >that we can see exactly what is happening if there is only one voice available >for sound playback with Libsnd calls. >>The LEFTright button will start a looping bass sound. Both the tone & the >program's priority have been set to 50 (more on setting a PROGRAM's priority >in >a moment.) This I call the MID\_PRIORITY sound. >>Now, If you press the LEFTup button you will trigger the playback of the >HIGH\_PRIORITY sound. This tone has a priority==100 and the program has a >priority==127. When you press this button the bass sound stops and the snare >drum can be heard. Now if we assume that bigger priority numbers mean the >sound >is MORE likely to play (is more important to play) than this is working fine.

>But I believe the next test will show that this is just accidental... >>Press the LEFTright button



again to get the bass playing, and then press the >LEFTdown button. This triggers a sound whose tone priority==10 and program >priority = 0 (LOW\_PRIORITY). THIS SOUND SHOULD NOT STOP THE BASS SOUND! (again >assuming that bigger numbers are more important) This clearly does not work as >stated in the spec. The highhat sound plays and the bass sound is stopped. >>Assume now that the looping bass note is my cockpit ambience. It wouldn't be >good if some triangle part in a .seq underscore music file stopped my cockpit >ambience! >>What is going on? What am I doing wrong? How do we get to the bottom of this?

Some problems about the priority has been fixed, and will be released in the next version of library (ver.3.1).

Your sample program is now work FINE!

>PS (Setting a Program's priority): while the Libsnd documentation shows that a >vab header contains information about a PROGRAM's priority as well as >individual tone priorities, there is no obvious way to set this value in >SoundDelicatessen - only ways of setting tone priorities in the "Tone List" >page. I've edited the value for PROGRAM priority with a hex file editor and >then found that the value that I've added shows up in the "attr" column in the >main window of SoundDelicatessen. What does this all mean?

Now, libsnd does not support PROGRAM's priorities and attrs.

Please ignore these values.

---

5/18/95 10:48 AM  
VAB Header Decode  
Bill Long  
Sound

When I dump a VAB and look at the VAG Size Table the first entry is zero. Is this normal?

---

5/19/95 11:32 AM  
SpuSetKey(SpuOff,...)  
Mark Slemko  
Sound

Has anyone else experienced this:

a note or voice not being terminated properly with SpuSetKey.

It seems that sometimes when I turn on multiple notes with SpuSetKey(SpuOn,SPU\_XCH), when I turn off these same notes with(SpuOff,SPU\_XCH) not all of them turn off!

try something like this:

```
SpuSetKey(SpuOn,SPU_0CH); SpuSetKey(SpuOn,SPU_1CH); SpuSetKey(SpuOn,SPU_2CH);  
while(!kbhit()); SpuSetKey(SpuOff,SPU_0CH); SpuSetKey(SpuOff,SPU_1CH);  
SpuSetKey(SpuOff,SPU_2CH);
```

It is easy to notice this if you use looping samples since some notes will continue on for eternity.

\*\* if I delay the SpuSetKey(SpuOff,SPU\_XCH) separately like

```
SpuSetKey(SpuOff,SPU_0CH); while(!kbhit()); SpuSetKey(SpuOff,SPU_1CH); while(!kbhit());  
SpuSetKey(SpuOff,SPU_2CH);
```

.... everything seems to work tickidi boo!

What's up?

Brian Green

---

5/25/95 3:16 PM  
Pausing Sounds

Russell Shanks  
Sound

I have been unable to find a way to pause sounds during a pause menu and start them up where they left off after pause.

I could obviously shut the volume down or just stop all sounds, but there doesn't seem to be any way to tell where in a wave a one-shot sound is when a pause occurs. We have several long sounds such as explosions in our games which should really be stopped during a pause and resumed later. I am using libspu exclusively and it seems that a sound could be started up mid sample, I just don't know how to figure out where in a sample a sound currently is.

I noticed Ridge Racer simply ignored this problem, if you press pause during one of their longer samples, such as the announcer's speeches, they just finish playing the sample during pause. Pretty cheap, I'm hoping for something a little nicer.

---

5/30/95 3:59 PM

Re: using libsnd after aborting xa strm  
Thomas Boyd  
Sound

>Has anyone experienced libsnd no longer works after aborting >an XA streamed movie?

Yes. I have been talking to SCE sound engineers. In order to have your sound work with movie streams, you have to switch the sound to tick mode 60 and use SsStart2. Two examples are provided below. The first example is for any tick mode besides 60. The second example is for tick mode 60.

```
----- EXAMPLE 1: not using SS_TICK60 all the time -----  
----- SsInit(); // only needed once at beginning of prog.  
// if you use sound before movie SsSetTickMode(SS_TICK###); SsStart(); .... before movie  
sounds and other code SsEnd(); // stop sound before movie and reset  
SsSetTickMode(SS_TICK60); // have to set to 60 to match movie streaming // SsStart2() (uses  
VSync callback to not conflict with movie which uses a different timer for tick mode 60  
SsStart2(); ... // run your movie // play sounds ... // after movie: SsEnd();  
SsSetTickMode(SS_TICK###); // whatever tick mode you want SsStart(); // libSND is now  
ready for playback again ... SsEnd(); ... SsQuit(); // only needed once to match SsInit call at  
beginning
```

```
----- EXAMPLE 2: only SS_TICK60 needed -----  
----- SsInit(); // only needed once at beginning of prog. ... SsSetTickMode(SS_TICK60);  
SsStart2(); ... // run your movie // run everything else ... SsEnd(); ... SsQuit(); // only needed  
once to match SsInit call at beginning
```

These examples are untried, but should work, and will be tried in-house soon. Note that you need to match SsInit (which does memory setup) with SsQuit and match SsStart (which starts sound sampling on ticks) with SsEnd. Tom

---

5/30/95 4:08 PM

Re: SpuSetKey(SpuOff,...)  
Thomas Boyd  
Sound

Instead of:

```
SpuSetKey(SpuOn,SPU_0CH); SpuSetKey(SpuOn,SPU_1CH); SpuSetKey(SpuOn,SPU_2CH);  
while(!kbhit()); SpuSetKey(SpuOff,SPU_0CH); SpuSetKey(SpuOff,SPU_1CH);  
SpuSetKey(SpuOff,SPU_2CH);
```

try bitwise or commands:

```
SpuSetKey(SpuOn, ( SPU_0CH | SPU_1CH | SPU_2CH )); while (!kbhit()); SpuSetKey(SpuOff, ( SPU_0CH | SPU_1CH | SPU_2CH ));
```

Tom

---

5/30/95 1:58 PM

using libsnd after aborting xa strm

Jim Rogers

Sound

Has anyone experienced libsnd no longer works after aborting an XA streamed movie. After some trial and error I found the following worked most of the time.

```
StSetMask(1,1,Nframes); // halt streaming _cdrom_stop(); StClearRing(); // flush the ring buffer StUnSetRing(); // release the CdDataCallback+CdReadyCallback
```

```
CdInit(); // reset cd for sound _close_event(); // open up cd events
```

```
DecDCTReset(0); ResetCallback(); // reset audio
```

```
SsSetSerialAttr(SS_SERIAL_A,SS_MIX,SS_SOFF); /* CD mix */
```

```
SsSetSerialVol(SS_SERIAL_A,0,0); /* CD Audio volume set */
```

Unfortunately the introduction of async cd io seems to have broken this again and libsnd never works after xa streaming is aborted. Anyone know whats wrong here? Is there a particular reset sequence to execute after xa play/abort?

Thanks in advance

Jim R.

---

5/30/95 4:02 PM

Re: Pausing Sounds

Thomas Boyd

Sound

Pausing sound and resuming is hard. I have been speaking with two SCE sound engineers and they are going to experiment with it when they return to Japan in the next few weeks. I will pass along what they discover. Tom

---

5/30/95 6:09 PM

Re: VAG Header

Buzz Burrowes

Sound

I know this info has been long in coming, but I just today had a meeting with Sony's Japanese engineers who are responsible for the sound libs and tools. I've seen a number of questions posted here on the BBS regarding a vag's loop start point and how to find it in the vag file.

The answer... you don't need to find it. The start point of the loop in a vag file is buried in the actual sample data. It IS NOT stored in any header. The word from Japan is that you only need to set the loop start point in the voiceatts structure if you want to CHANGE the loop start from that specified when converting the sample with AIFF2VAG!

If you leave this field alone (omitting the appropriate flag), the sample will loop as it was intended to on conversion!

Now, I haven't personally tried it, but it sounds like this will work.

Drop us a note if you find this doesn't work.

---

5/31/95 5:49 PM

Libsnd & Libspu live happily ever after  
Buzz Burrowes  
Sound

Well,

Quite a while ago I posted a message about mixing Libsnd & libspu calls to modify a playing sound STARTED with Libsnd. At the time, the only problem I found was that after changing the sound's pitch (via SpuSetVoiceAttr using the SPU\_VOICE\_NOTE flag) Libsnd could no longer stop the sound with a call to SsUtKeyOff. I had to use SpuSetKey.

Well, the problem here is NOT the libraries but my methodology. You see, Libsnd keeps its own table of playing voices. I would set the pitch to a new note value with libspu and then try to stop the sound specifying that NEW note value in the libsnd SsUtKeyOff call. WRONG. I should have been using the original note value (that specified in the SsUtKeyOn call.) This does the trick!

So, regardless of where I set the pitch with libspu I stop the voice by specifying the original pitch (note.)

It looks like lipsnd and libspu can indeed work together in this way.

---

5/31/95 10:14 AM

Sound and Music Volume  
Mark D. Lyons  
Sound

I am trying to allow the user to independently control the game's sound and CD music volumes, but it seems that the master volume controls both sound and music.

I am using libspu and changing the common sound attributes, I am able to control the CD volume and master volume, but the master volume affects the CD volume as well. The same thing seems to happen if I use CDMix to control the CD volume. Am I missing something or am I going to have to maintain an internal multiplier to control individual sounds myself.

---

6/2/95 11:55 AM

Basic Sound Questions  
Craig Ewert  
Sound

I have some basic questions about PSX sound 1) Can I have a number of VAB's loaded into sound RAM at the same time? LibSPU mentions some memory allocation, but I can't tell if libsnd calls use these. 2) (Assuming the answer to (1) is yes...) I plan on swapping sound data in and out a lot. Do I need to be concerned about sound RAM fragmentation? 3) Can I have two sequences running simultaneously at different tempos? 4) Do the sequences get transferred into sound RAM or do they stay in CPU RAM?

Thanks Colin Lewis (borrowing Craig Ewert's account)

---

6/6/95 10:28 AM

SPUMallocWithStartAddr  
Mark DeSimone  
Sound

If I malloc more than two areas of SPU memory my program locks up while trying to malloc the third area. The first two mallocs return valid addresses but the third never finishes executing.

```
----- Sample: #define BUFF_SIZE 0x6270 #define BUFF0_ADDR
0x1000 #define BUFF1_ADDR BUFF0_ADDR + BUFF_SIZE #define BUFF2_ADDR
BUFF1_ADDR + BUFF_SIZE
Buff0 = SpuMallocWithStartAddress(BUFF0_ADDR, BUFF_SIZE); /* Buff0 = 0x1000 */ Buff1 =
SpuMallocWithStartAddress(BUFF1_ADDR, BUFF_SIZE); /* Buff1 = 0x7270 */ Buff2 =
SpuMallocWithStartAddress(BUFF2_ADDR, BUFF_SIZE); /* program locks up on this line */ --
-----
```

Any help on this would be appreciated.  
Jim Hatfield

---

6/9/95 1:15 PM  
Re(2): VAG Header  
Jim Rogers  
Sound

Anyone know how to play a vag sample created with a loop point as a one shot. Ie: ignore the loop attribute. Would setting the loop address to 0x0 work.  
thanks Jim R

---

6/12/95 11:24 AM  
Re: SPUMallocWithStartAddr  
Buzz Burrowes  
Sound

>> If I malloc more than two areas of SPU memory my program locks up while trying to malloc the third area.  
Is it safe to assume that you are first calling SpuInitMalloc? Check this function out and be sure you are calling it with the proper params.

---

6/12/95 11:21 AM  
Re: Basic Sound Questions  
Buzz Burrowes  
Sound

>>1) Can I have a number of VAB's loaded into sound RAM at the same time? LibSPU mentions some memory allocation, but I can't tell if libsnd calls use these.  
Yes and Yes... Libsnd uses Libspu's memory allocation from what I can see.  
>>2) (Assuming the answer to (1) is yes...) I plan on swapping sound data in and out a lot. Do I need to be concerned about sound RAM fragmentation?  
I would bet that this could easily become a problem. It's just a matter of being careful here. You may find you need to do you own memory allocation.  
>> 3) Can I have two sequences running simultaneously at different tempos?

Yes.

>> 4) Do the sequences get transferred into sound RAM or do they stay in CPU RAM?  
The only data in sound RAM is the vab body. (".vb") the vab head and seq/sep data stay in main memory.

---

7/13/95 10:12 AM

sound after 24 bit movie fix  
Thomas Boyd  
CD

All,

Ever have intermittant problems (changing from compile to compile, seemingly at random) playing sound after running a 24 bit movie? This was caused by a bug in the streaming library which has now been fixed. The new version of libcd (which contains the streaming library) will be released by the administrator soon. I just tested it. It solves the problem.

Tom

---

7/14/95 12:56 PM

Sound of course  
Mark Slemko  
Sound

Hi Buzz,

I have a few concerns on sound:

1. (mentioned before) Turning multiple samples off in sequence with SpuSetKey(SpuOff,..) does not work with the latest libspu.lib or previous ones.

If I call:

```
SpuSetKey(SpuOff,...) SpuSetKey(SpuOff,...)
```

for two separate channels currently playing samples, one of them will most likely continue playing!

Have you seen or heard of this? One suggestion you made before will not work for me, that is using SpuSetKey(SpuOff, SPU\_CH1 | SPU\_CH2) since I call SpuSetKey separately for each channel to terminate sample play.

Is this issue likely to be addressed or should I try and implement work around?

2. Updating volume quickly (such as would be used in real time panning) with SpuSetVoiceAttr() causes a slight glitching for each update. If I increment volume by values <= 127 then there is no glitching. However volume values incremented greater than 127 cause a glitch at every update. Has anyone else commented on this?

3. Will there be a DOS version of AIFF2VAG.exe in the near future? We could really use one since we do not require Sound Delli or a Macintosh for our music composition.

Thanks in advance Brian Green

---

7/14/95 4:03 PM

Some basic questions... (Ralph Thomas)  
Robert w. Calfee  
Sound

Author: Ralph "Cooksey" Thomas, Director of Audio Programming, SSI Email:  
rthomas@mindscape.com OR cooksey@sfnet.com DevKit Rev: 3.0

Hi Guys...

Well I though that I would hack on this for several weeks prior to starting to ask dumb questions...

But... Having paid those dues... Here we go...

As a game developer I need to be able to load sounds as needed. The memory provided is insufficient to load all that is needed for a level.

We load a BANK that loads a number of waveforms then reserve a portion of the audio heap for the loading of ON-CALL waves.

When one of these infrequently called sounds (the ON-CALL sounds) is requested by the app I will purge the disposable area of the heap (if necessary) load the sound and fixup the BANK data structure.

I managed to get the API, File, Heap Management, Bank Loading all up and running with a minimum of trouble... (I won't mention the lack of pointers for SPU memory <g>)

However after reading the sound forum I got the feeling that I was not alone in wanting to do this... I read the docs... not a lot of help... studied the examples... pretty much the same story...

----- Q: Could I get docs on the following...

SsVabOpenHead() SsVabTransBody() SsVabTransCompleted() // I can guess this one...

----- Q: Do the Ss and Spu start up and shut down calls perform the same functions ? Or do they both need to be initialized and closed.

----- Q: It is possible to see an example that does the following... (and as little else as possible)

```
// init the audio system
// allocate main memory transfer area (if necessary)
// allocate bank header in main memory
// allocate SPU memory area
// load the bank header (VH)
// load the audio data required by the bank header (VB's) as individual files, one sample per VB file.
// make the necessary transfers to SPU memory
// play a digital sample from the bank
// load another sound not in the header
// transfer the sound to SPU memory
// fix up the header (VH) to include the new sound
// play the new sound
// close the audio system
```

----- Q: Is this sort of methodology possible with the Sony ?

----- I think this would help the game developers more then the examples that are provided in terms of sound effects... The VH/VB system is based on a sampler archetecture which is directed to the playing of multisampled musical sounds, it is weaker for the presentation of sound effects that cannot be preloaded in a chunk by nature of the interactivity of games and limitations of memory. Because of this problem there should be some sort of documentary indication of how to create this functionality. This would be in the form of code examples and full documentation. A well organized developers API would have this functionality built in with calls that support the loading of individual samples.

---

----- Q: Can I get docs  
on the contents of the members of the VagAttr struct.  
Some documentation on the VabHdr & VagAttr structure past what is on page 364-366 would  
also be helpful... As the whole thing seems to revolve around these two data structures.

---

----- Any help out there  
on this ?  
Thanks  
COOKS!

---

7/18/95 10:10 AM  
Re: Some basic questions... (Ralph Thomas)  
Buzz Burrowes  
Sound

Just a few thoughts about your description of how you want to set up your audio system...  
It sounds like you should be looking at mixing Libsnd and Libspu calls.  
Libsnd, being the higher level library, would probably suit your needs for playing back MIDI  
files... music, complex sound effect scores, etc. In this case you would store your sounds in VAB  
format using SoundDelicatessen, and use Libsnd to manage downloading this data to sound  
ram and playing back the appropriate midi scores.  
You probably want to look into using Libspu to do the sound effect management you proposed.  
In this case you would load your sounds as plain old .vags... you wouldn't need to "fix up" any  
headers, because you would be bypassing Libsnd here. You could set up to do your own sound  
ram management setting aside some for your VAB (music sounds, etc.) and some for VAGs.  
Then use Libspu to trigger playback of the VAG sound effects.  
One last note pertaining to sound ram... early docs indicated that you had to sample at 16bit,  
44.1k resolution. THIS IS NOT TRUE! You must be at 16bit, but you can use lower sample rates  
if you need to. For instance, I've found that in a bank of orchestral type instruments I have a  
beautiful violin sample at 44.1k. My basses are at 22,050... I save the high end for the  
instruments that really count. When I play my score the blend of violin, viola, cello and basses  
totally mask the fact that the basses are at a lower sample rate.(OK, I know... not totally, but it  
still sounds pretty damn amazing for samples stuffed in 512k of sound ram!) In some situations  
this will save you a lot of sound ram.

---

7/18/95 9:06 AM  
Re: Some basic questions... (Ralph Thomas)  
Thomas Boyd  
Sound  
Robert w. Calfee

>Q: Could I get docs on the following... I just pasted these from the 3.0 docs on the BBS. They  
were in acrobat format, now they are in copy-and-pasted format. Let me know if you need to  
know more about these functions. >SsVabOpenHead()  
SsVabOpenHead Recognizes a sound source header list. Syntax short SsVabOpenHead (\*addr,  
vabid) unsigned char \*addr; short vabid Arguments addr VAB data leading address vabid VAB  
ID Explanation Recognizes a sound source header list in the main memory. Sets the table in the  
main memory in the state that is usable by Sound Library. Specify a VAB ID for opening. When



VAB ID is -1, the function searches for an empty VAB ID (0 ~ 16) and allocates. Return value VAB identification number Returns -1 if unsuccessful. Related items SsVabTransBody, SsVabTransBodyPartly  
 >SsVabTransBody()  
 SsVabTransBody Transfers sound source data. Syntax short SsVabTransBody (\*addr, vabid) unsigned char \*addr; short vabid; Arguments addr VAB data leading address vabid VAB ID Explanation SsVabOpenHead is used for recognizing a header list, and starts the transfer of the sound source data (VAB body) in the main memory to the SPU local memory. Return value VAB identifying number Returns -1 if unsuccessful. See also: SsVabOpenHead, SsVabTransBodyPartly  
 >SsVabTransCompleted() // I can guess this one...  
 SsVabTransCompleted VAB data transfer state. Syntax short SsVabTransCompleted ( immediateFlag) short mmediateFlag; Arguments immediateFlag Explanation Returns an indication about whether the data transferred by SsVabOpen () has been successfully transferred. immediateFlag: = SS\_IMMEDIATE ... Immediately returns transfer state. = SS\_WAIT\_COMPLETED ... Loops until the transfer is completed. Return value Returns "1" if the transfer has been completed. Returns "0" if the transfer is ongoing. See also: SsVabOpen

----->Q: Do the Ss and Spu start up and shut down calls perform the same functions ? Or do they both need to be initialized and closed. There are two sets of Ss start up calls. SsInit needs to be paired with SsQuit. Call this pair at the very beginning and end of your program. SsStart (and SsStart2) is paired with SsEnd and can be called multiple times nested within SsInit/SsQuit pairs like this: SsInit(); ... SsStart2(); ... SsEnd(); .... SsStart2(); ... SsEnd(); ... SsQuit(); SsInit calls SsUnit among other things. SsQuit calls SsQuit. -----

----->Q: It is possible to see an example that does the following... (and as little else as possible) >// init the audio system >// allocate main memory transfer area (if necessary) >// allocate bank header in main memory >// allocate SPU memory area >// load the bank header (VH) >// load the audio data required by the bank header (VB's) as individual > files, one sample per VB file. >// make the necessary transfers to SPU memory >// play a digital sample from the bank >// load another sound not in the header >// transfer the sound to SPU memory >// fix up the header (VH) to include the new sound >// play the new sound >// close the audio system >Q: Is this sort of methodology possible with the Sony ? I will see what I can find/do. -----

----->Q: Can I get docs on the contents of the members of the VagAttr struct. I will send it to you.

7/20/95 12:49 PM

Anyone have a good description of the various SsVAB functions?

Yoram Berkowicz

Sound

The documentation of SsVabFakeHead, SsVabFakeBody, SsVabOpenHeadSticky are quite vague. When is it necessary or beneficial to use these?

Also, I've opened a VAB with SsOpenVab and after transfer to Sound Buffer was complete, I assumed the area in main memory can be used for other stuff. This doesn't seem to be the case. I guess besides the supplied area for VabHdr, additional memory is needed. This is not specified in the docs.

Perhaps if one loads the Vab Header and Vab Body seperatly, then the area for the Body can be reused. It would be nice to have clearcut documentation regarding these considerations... In the

mean time, maybe someone more experienced can shed some light...  
Cheers! Jonathan B. Owen

---

7/20/95 3:34 PM

Re(2): Some basic questions... (Ralph Thomas)

Robert w. Calfee

Sound

<Cooksey>

Hi Buzz...

Re: Playing sound effects...

I have got that going... using vags with the header stripped off... I guess.. I just hit it for the first 0x50 bytes based on a visual inspection of several sample files...

I have to figure out which data type this is as I would much rather be hitting it up for the first sizeof(VagHeaderDataType) kbytes....

Re: the sample rate thang...

Are you then playing the part an octave low or is the SPU smart enough to see that it is a 22k sample ?

Thanks buddy!!!

Ralph "Cooksey" Thomas rthomas@mindscape.com cooksey@sfnet.com

---

7/20/95 3:00 PM

Re: Anyone have a good description of the various SsVABns?

From:

Buzz Burrowes

Sound

>> Perhaps if one loads the Vab Header and Vab Body seperatly

Yes... Splitting the VAB into its header and body allows you to unload the vab body from main memory AFTER it has been downloaded to sound ram.

---

7/20/95 3:26 PM

Re(2): Some basic questions... (Ralph Thomas)

Robert w. Calfee

Thomas Boyd

Sound

<Ralph "Cooksey" Thomas>

Hiya!!!

Thanks for the info... We will get the acrobat docs...

Actually I have since figured out how to do this with out the use of the sony vh/vb-vab data objects...

If am going to upload the example that I made as a test bed for this as it is really uncomfortable to be put into a position where the only examples have comments that are few, far between and unreadable....

I also have a redbook play example...

For someone who has worked with this for a while these examples could be knocked out in a day... any idea why this has not been done ? A lot of developers are wasting programmer time over this and you know what that costs...

What is this business with SsStart2() ? I am unaware of this call...  
What would be the win in shutting down the SPU at any time other than end run ???  
Is it eating on the main CPU's headroom or something ???  
Once Again... Thanks  
Ralph "Cooksey" Thomas rthomas@mindscape.com cooksey@sfnet.com

---

7/20/95 3:51 PM

Re(3): Some basic questions... (Ralph Thomas)

Thomas Boyd

Robert w. Calfee

Sound

>What is this business with SsStart2() ? I am unaware of this call...

SsStart2 has a special case for tick mode 60 that makes it possible to play sounds during movies without nuking the sound later. (It hooks a different callback). See my earlier post about getting sound to play after a movie (I will paste it below) Tom -----

>Has anyone experienced libsnd no longer works after aborting >an XA streamed movie?

Yes. I have been talking to SCE sound engineers. In order to have your sound work with movie streams, you have to switch the sound to tick mode 60 and use SsStart2. Two examples are provided below. The first example is for any tick mode besides 60. The second example is for tick mode 60.

----- EXAMPLE 1: not using SS\_TICK60 all the time -----

----- SsInit(); // only needed once at beginning of prog.

// if you use sound before movie SsSetTickMode(SS\_TICK###); SsStart(); .... before movie sounds and other code SsEnd(); // stop sound before movie and reset

SsSetTickMode(SS\_TICK60); // have to set to 60 to match movie streaming // SsStart2() (uses VSync callback to not conflict with movie which uses a different timer for tick mode 60

SsStart2(); ... // run your movie // play sounds ... // after movie: SsEnd();

SsSetTickMode(SS\_TICK###); // whatever tick mode you want SsStart(); // libSND is now ready for playback again ... SsEnd(); ... SsQuit(); // only needed once to match SsInit call at beginning

----- EXAMPLE 2: only SS\_TICK60 needed -----

----- SsInit(); // only needed once at beginning of prog. ... SsSetTickMode(SS\_TICK60);

SsStart2(); ... // run your movie // run everything else ... SsEnd(); ... SsQuit(); // only needed once to match SsInit call at beginning

These examples are untried, but should work, and will be tried in-house soon. Note that you need to match SsInit (which does memory setup) with SsQuit and match SsStart (which starts sound sampling on ticks) with SsEnd. Tom

---

7/21/95 11:44 AM

Re(3): Some basic questions... (Ralph Thomas)

Buzz Burrowes

Sound

>> Are you then playing the part an octave low or is the SPU smart enough to see that it is a 22k sample ?

No, The SPU isn't that smart. The AIFF2VAG tool is though! when you do AIFF2VAG on a sample with a lower sample rate, it will automatically set the center note appropriately. So when you run SoundDeli and add the vag to a vab, the center note on the tone page will be set correctly.

---

7/27/95 4:06 PM  
SsVabOpenHead() causes hang  
Blake E. Senftner  
Sound

SOUND.C 6K  
Sound Programmers  
I've just begun to get an application hang when I call SsVabOpenHead(). The code is simple test routines that I wrote several months ago, and have not touched since. I've attached the code for your reference in helping me track down the problem.  
As a related issue, the bug began after beginning use of the Cd emulator and moving to lib3.1.  
Thanks, -Blake

---

8/3/95 5:28 PM  
Re: Fidelity of sounds  
Angus  
Sound

You can not play uncompressed sounds on the PSX. Sorry.  
ANgus

---

8/3/95 12:55 PM  
Fidelity of sounds  
Josh I. Pine  
Sound

Is there a way to play raw waveform data that has been CPU generated? I'm afraid that the ADPCM will distort the spectral content of our samples. I don't mind taking a hit on buffer utilization due to the largeness of the uncompressed data. All I want to do is stream raw 16 bit waveform data at 44KHz to the D/A converters.

---

8/7/95 11:52 AM  
Fwd: Sound Help  
Administrator  
Sound

Angus,  
For timeliness reasons, the developer of ZOOP is asking for assistance with the audio programming portion of the game. We have CD quality sound files that need to be incorporated into the game.  
Can you furnish us with a name(s) or company(ies) or documentation that can help us take our produced (CD quality) sound files and combine them with a code or a "black box" that could be taken and "inserted" into the game code.  
I understand that this is a vague question, however the producer approached me this morning and posed this. I am unclear as to why the original developer doesn't have the expertise or resources to handle this. Nonetheless, I thought I would post you a note.  
Thanks, Christopher 212.846.6495

---

8/8/95 10:05 AM

Re: Fwd: Sound Help

Thomas Boyd

Sound

Angus

Christopher,

Check out this file on the PSX distribution disk (it plays CD-DA, which sounds like what you want): \PSX\SAMPLE\MOVIE\CDTUTO\TUTO4.C

Additionally, let me know what format your sound is in. I can tell you what pathway to take to convert it.

This should be your black box. Let me know if it isn't.

Tom

----- Angus,

For timeliness reasons, the developer of ZOOP is asking for assistance with the audio programming portion of the game. We have CD quality sound files that need to be incorporated into the game.

Can you furnish us with a name(s) or company(ies) or documentation that can help us take our produced (CD quality) sound files and combine them with a code or a "black box" that could be taken and "inserted" into the game code.

I understand that this is a vague question, however the producer approached me this morning and posed this. I am unclear as to why the original developer doesn't have the expertise or resources to handle this. Nonetheless, I thought I would post you a note.

Thanks, Christopher 212.846.6495

---

8/8/95 12:06 PM

Follow on to "Fidelity of sounds"

Josh I. Pine

Sound

We need direct control of the waveform. The ADPCM might distort or attenuate the signal we are inserting into regular audio. The sounds cannot come directly off the CD due to the amount of time it takes to seek the sound and then play it. Ideally we want to mix it into songs coming off the CD at near real time rates.

In short, how can we generate a 15KHz waveform of varying amplitude with at least 8 bits of real resolution.

---

8/11/95 4:29 PM

Re: Follow on to "Fidelity of sounds"

Angus

Sound

There is 1 XA ADPCM decoder and 1 VAG ADPCM decoder. You must use ADPCM. Sorry.

ANgus

---

8/15/95 11:17 AM

SPU streaming info

Thomas Boyd

Sound

here is the streaming docs you requested. Tom

=====  
SPSDocId: Document Version 1.0 for Runtime Library Version 3.2beta\$  
PlayStation(R) SPU Streaming Library  
=====

Copyright (C) 1995 by Sony Computer Entertainment Inc. All Rights Reserved.

----- Note:

The functions explained in this documentation are included in the basic sound library (libspu), and distinguished from the streaming library (libcd).

-----  
\* 1 Overview

The "SPU streaming library" provides the playback functionality of large-sized wave forms, which will overflow the sound buffer of PlayStation(R), with SPU.

SPU originally plays back only the wave form data contained in the sound buffer, and that is to say, it cannot play back the wave form data which is larger than the sound buffer. Therefore, by transferring the next play-backed data to a designated area in the sound buffer continuously during the playback by SPU, the wave form data which is larger than the sound buffer can be played back.

\* 2 Basic Operations

With the SPU streaming library, the use of the voice contained by SPU performs its own playback. The playback performed by the voice itself is the same processing as the ordinary sound generation (Key on).

In the main memory the wave form data used by the SPU streaming library is placed. (a part of the data is enough when starting the SPU streaming processing) The wave form data used in the SPU streaming library is: "The VB file which includes only one VAG data." In other words, "The VAG file which doesn't include the header."

In the sound buffer the area is allocated for each voice used by the SPU streaming library. The SPU streaming library allows SPU to play back the wave form data contained in the main memory, transferring it to the allocated area continuously.

The area for each voice used by the SPU streaming library in the sound buffer is called a "stream buffer." This buffer is necessary for each voice used by the SPU streaming library. When the SPU streaming library uses more than one voice, the size of every stream buffer must be the same.

Also, a series of the processing, that the wave form data contained in the main memory is transferred to the stream buffer continuously and is played back by SPU, is called a "stream".

The SPU streaming library can handle 24 streams and 24 stream buffers at the maximum, and all of the 24 voices can be the voices used by SPU streaming library.

\* 3 Wave Form Data Processing

The SPU streaming library can treat the larger wave form data (VB data) than the sound buffer, and all parts of the wave form data don't have to exist on the main memory at the time of starting the stream processing.

With the SPU streaming library, at any points in the processing, the wave form data at least half as large as the stream buffer is necessary for each stream. When the transfer of the processed wave form data is requested, by specifying the head address and the attributes of the necessary part of the wave form data, the SPU streaming library is informed of the continuation of the stream processing.

The wave form data is used being rewritten partly at the time of transferring.

\* 4 Four States in the SPU Streaming Library

There are 4 states in the stream processing by the SPU streaming library.

\* Idle

Streams are not processed in this state. In this state the transfer to the stream buffer is not performed. Thus, the SPU streaming library puts no load on the PlayStation(R) system.

Also, all the processing by the SPU streaming library can be completed in this state.

\* Preparation



The preparation for each stream is always performed for the former part of the stream buffer, and the wave form data is transferred to that part. Therefore, if the preparation for the stream is requested in the "idle state", it is processed promptly. On the other hand, if another preparation is requested in the "transfer state", the preparation must be waited until the processing is transferred to the former part of the stream buffer in the currently processed streams. Consequently, the transfer is carried out with the other stream processing when the former part of the stream buffer is processed. Each stream is always started by the transfer to the latter part of the stream buffer because the transfer to the former part has been completed. Therefore, if the start of the stream is requested in the "preparation state", it is processed promptly. On the other hand, if the start of another stream is requested in the "transfer state", the start must be waited until the processing is transferred to the latter part of the stream buffer in the currently processed streams. Consequently, the transfer is carried out with the other stream processing when the latter part of the stream buffer is processed. \*\* 6.2 Attributes for the Next Transfer

The attributes for the next transfer in each stream are specified in the "transfer finished callback function". The necessary attributes are as follows.

\* The head address of the wave form data area (half as large as the stream buffer) for the next transfer

\* If the stream is completed in the next transfer,

1. specify the "termination" in "status".
2. specify the size of the last-transferred wave form data. (The size must be a half of the stream buffer or less.)

### \*\* 6.3 Stream Termination

The "termination" of each stream is specified by setting the "termination" for the attribute "status" and the size of the last-transferred wave form data (half as large as the stream buffer or less) when setting the next-transferred attributes. The stream is terminated when the playback of the stream specified in this setting is completed.

### \*\* 6.4 Key on/Key off

With the SPU streaming library, only the sound generation (Key on) is carried out automatically. The sound generation (Key on) is performed when the start of the streaming is processed. The sound cancellation (Key off) requires to be processed by the program. However, if the sound cancellation (Key off) is carried out for the voice where the stream is processed, the state of the sound library may be unstable. Be sure to carry out the sound cancellation after the stream termination processing.

## \* 7 Actual Flow of the Stream Processing

The simple flow of the processing by the SPU streaming library is as follows. As for the details on each function, refer to the explanation for each.

### \*\* 7.1 Initialization

The SPU streaming library initialization is performed by SpuStInit().

```
SpuStEnv *stenv; stenv = SpuStInit (0);
```

The SpuStEnv structure returned by SpuStInit() is shown below.

```
=====
typedef struct {   char status;           /* stream status */   char pad1;           /*
padding */   char pad2;           /* padding */   char pad3;           /* padding */
long last_size;   /* the size of last transferring (last_size <= (size /
2)) */   unsigned long buf_addr; /* The start address of stream buffer */
unsigned long data_addr; /* The start address of SPU streaming data in main memory
*/ } SpuStVoiceAttr; typedef struct {   long size;           /* The size of stream
buffer */   SpuStVoiceAttr voice [24]; } SpuStEnv;
=====
```

The stream is processed by specifying the attributes for this structure.

#### \*\*\* 7.1.1 Attribute Initialization

"size" in the SpuStEnv structure is the common attribute in all streams. The size of the stream buffer is specified here.

Example: stenv->size = 0x8000;



The attributes which must be initialized for each stream are:

1. The head address of the stream buffer  
= voice[*n*].buf\_addr in SpuStEnv structure

Example: unsigned long buf\_addr; if ((buf\_addr = SpuMalloc (0x8000)) == -1) { /\*  
ERROR \*/ } stenv->voice [n].buf\_addr = buf\_addr;

2. The head address of the wave form data transferred in the "preparation" on the main memory

= voice[*n*].data\_addr in SpuStEnv structure

Example: stenv->voice [n].data\_addr = 0x80yyyyyy;

The subscript (*n* in the above example) of the array "stenv->voice" corresponds to the voice number.

### \*\*\* 7.1.2 Callback Functions Setting

Each callback function is set as necessary. All the callback functions in the SPU streaming library take the following syntax.

SpuStCallbackProc callback\_proc (unsigned long voice\_bit, long c\_status)

When the callback function is actually called, the value of the voice numbers to be processed in each callback function is given to the argument voice\_bit by the bitOR of SPU\_0CH to SPU\_23CH. The state in which the callback function is called is given to the argument c\_status. The program analyzes the arguments voice\_bit and c\_status, and processes them appropriately. At least the "transfer finished callback function" must be called in order to process the stream. With this callback function, the head address of the next-transferred wave form data is specified, and the argument of the "termination" is specified to terminate the stream.

### \*\*\* 7.1.3 Voice Setting

The attributes for each voice where the stream is processed are set. For the "head address of the wave form data" in the voice attributes, the same value as the head address of the stream buffer is set.

Example: SpuVoiceAttr s\_attr;

: s\_attr.voice = SPU\_3CH; s\_attr.addr = stenv->voice [3].buf\_addr; : SpuSetVoiceAttr (&s\_attr);

### \*\* 7.2 Preparation for the Stream

In order to eliminate the time-lag of the actual sound generation of the stream, as the preparation for starting the stream, the wave form data half as large as the stream buffer is transferred to the stream buffer beforehand. The preparation for the stream is carried out by SpuStTransfer(), and SPU\_ST\_PREPARE is specified as the first argument in the function. The voices used for the stream are set for the second argument of SpuStTransfer() by the bitOR of SPU\_CH to SPU\_23CH. The attribute initialization must be performed for the designated voices.

Example: SpuStTransfer (SPU\_ST\_PREPARE, (SPU\_0CH | SPU\_1CH));

When the transfer in the preparation for the stream corresponding to the requested voices is completed, the "preparation finished callback function" is called.

Prior to starting the stream following the preparation, the attributes for the next transfer must be set. If the start of the stream follows immediately after the preparation, the arguments for the next transfer must be set in the "preparation finished callback function".

As the attributes for the next transfer, the head address of the wave form data area (half as large as the stream buffer) is set.

Example: stenv->voice [n].data\_addr += (0x8000 / 2);

In the main memory, in each setting the area where the wave form data is placed doesn't have to continue from the previously processed area. Any area can be specified.

### \*\* 7.3 Start of the Stream

When the preparation is completed for each stream, the stream can be started.

SPU\_ST\_PLAY is specified as the first argument of SpuStTransfer() as done in the preparation.

The voices used for the stream are set by the bitOR of SPU\_0CH to SPU\_23CH for the second argument of SpuStTransfer(). This value must be the same as the value specified in the preparation.

Example: `SpuStTransfer (SPU_ST_PLAY, (SPU_0CH | SPU_1CH));`

As soon as the stream is started, the sound generation (Key on) is performed.

When one transfer is completed in all the streams, the "transfer finished callback function" is called.

In the "transfer finished callback function" the attributes for the next transfer are set.

As the attribute for the next transfer, the head address of the next-transferred wave form data area (half as large as the stream buffer) is specified.

Example: `stenv->voice [n].data_addr += (0x8000 / 2);`

In the main memory, in each setting the area where the wave form data is placed doesn't have to continue from the previously processed area. Any area can be specified.

When more than one stream is processed, the "transfer finished callback function" is called without fail at the end of the transfer.

#### \*\* 7.4 Stream Termination

To terminate the stream, `SPU_ST_STOP` is set for `voice[].status` in the `SpuStEnv` structure when specifying the attributes for the next transfer in the "transfer finished callback function" processing. At this time, the size of the last-transferred wave form data (half as large as the stream buffer or less) is set for `voice[].last_size`. The stream is terminated after transferring the wave form data area represented by `voice [].data_addr` when `SPU_ST_STOP` is specified.

Example: `stenv->voice [n].data_addr += (0x8000 / 2); stenv->voice [n].status = SPU_ST_STOP; stenv->voice [n].last_size = 0x4000;`

The "stream finished callback function" is called at the completion of the stream playback. (precisely before the start of the next transfer if the other streams are processed at this time.)

#### \*\* 7.5 Completion

The completion of the SPU streaming library is performed by `SpuStQuit()`.

`SpuStQuit ()`;

Prior to calling this function, the termination processing must be completed for all the streams, and the state must be idle, that is to say, the state after the "stream finished callback function" is called.

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////////////////////////////////////  
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### PlayStation(R) SPU Streaming Library Function Explanation

=====

`SpuStInit` -----

Outline:

SPU streaming initialization

Syntax:

`SpuStEnv * SpuStInit (long mode)`

Argument:

mode: Not used under the current specification. Set "0".

Explanation:

It initializes the streaming, and is called only once in the executed program. After the initialization the SPU streaming is available. It returns the pointer towards the structure in which the SPU streaming environment is set. Return value:

The pointer towards the SPU streaming environment structure `SpuStEnv`.

Structure:

```
typedef struct {
    char status;          /* stream status */
    char pad1;
    /* padding */
    char pad2;          /* padding */
    char pad3;          /*
padding */
    long last_size;     /* the size of last transferring
(last_size <= (size / 2)) */
    unsigned long buf_addr; /* The start address of stream
buffer */
    unsigned long data_addr; /* The start address of SPU
streaming data
in main memory */
} SpuStVoiceAttr;

typedef struct {
    long size;
```

/\* The size of stream buffer \*/      SpuStVoiceAttr voice [24];      } SpuStEnv;

Related item:

SpuStQuit

SpuStQuit -----

Outline:

SPU streaming completion

Syntax:

long SpuStQuit (void)

Argument:

None

Explanation:

It completes the SPU streaming. Prior to calling this function, the termination processing must be completed for all the streams. Return values:

SPU\_ST\_ACCEPT ... Normal end

SPU\_ST\_WRONG\_STATUS ... SpuStQuit is not accepted. The cause is:

The current status is not SPU\_ST\_IDLE.

Related items:

SpuStInit, SpuStGetStatus

SpuStGetStatus -----

Outline:

Determining the SPU streaming state

Syntax:

long SpuStGetStatus (void);

Argument:

None

Explanation:

It determines the state of the SPU streaming.

Return values:

SPU\_ST\_NOT\_AVAILABLE ... SPU streaming is not available. SpuStInit() is not called.

SPU\_ST\_IDLE ... The data transfer to the sound buffer is not performed.

SPU\_ST\_PREPARE ... Transferring the first 1 buffer.

SPU\_ST\_TRANSFER ... Transferring the data to the sound buffer. If SpuStTransfer(SPU\_ST\_PREPARE,) is executed in this state, the status doesn't change to SPU\_ST\_PREPARE.

SPU\_ST\_FINAL ... Waiting for the end of the playback after transferring the last 1 buffer. SpuStTransfer() is not accepted in this state.

Related items:

SpuStInit, SpuStTransfer, SpuStGetVoiceStatus

SpuStGetVoiceStatus -----

Outline:

Determining the voices used for SPU streaming

Syntax:

unsigned long SpuStGetVoiceStatus (void);

Argument:

None

Explanation: It determines the voices used for the SPU streaming.

Return value:

The value of the voices represented by the bitOR of SPU\_0CH to SPU\_23CH.

Related items:

SpuStTransfer, SpuStGetStatus

SpuStSetPreparationFinishedCallback -----

Outline:

Setting callback function called at the completion of the data transfer in the preparation for the stream in the SPU streaming.

Syntax:

SpuStCallbackProc SpuStSetPreparationFinishedCallback (SpuStCallbackProc callback\_proc);  
SpuStCallbackProc callback\_proc (unsigned long voice\_bit, long status)

Argument:

callback\_proc: Pointer towards the callback function called at the completion of the data transfer in the preparation for the stream. Explanation:

It sets the callback function called at the completion of the data transfer in the preparation for the stream in the SPU streaming.

When callback\_proc is called, the value of the voices assigned for the stream where the data transfer is completed in the preparation is set for the argument voice\_bit by the bitOR of SPU\_0CH to SPU\_23CH. The following value is set for "status" depending on the state of the streaming library.

State status ----- SPU\_ST\_PREPARE SPU\_ST\_PREPARE  
SPU\_ST\_PLAY SPU\_ST\_PLAY

Return value:

The pointer towards the callback function called at the completion of the data transfer in the stream preparation set before.

NULL is returned if the setting is not performed before. Related item:

SpuStTransfer, SpuStSetTransferFinishedCallback, SpuStSetStreamFinishedCallback

SpuStSetTransferFinishedCallback -----

Outline:

Setting the callback function called at the completion of one transfer to the stream buffer for all the streams in the SPU streaming. Syntax:

SpuStCallbackProc SpuStSetTransferFinishedCallback (SpuStCallbackProc callback\_proc);

SpuStCallbackProc callback\_proc (unsigned long voice\_bit, long status)

Argument:

callback\_proc: Pointer towards the callback function called at the completion of one transfer to the stream buffer for all the streams.

Explanation:

It sets the callback function called at the completion of one transfer to the stream buffer for all the streams in the SPU streaming.

When callback\_proc is called, the value of the voices assigned for the stream where one transfer to the stream buffer is completed is set for the argument voice\_bit by the bitOR of SPU\_0CH to SPU\_23CH. SPU\_ST\_PLAY is always set for "status".

Return value: The pointer towards the callback function called at the completion of one transfer to the stream buffer for all the streams in the SPU streaming set before.

NULL is returned if the setting is not performed before.

Related items:

SpuStTransfer, SpuStSetPreparationFinishedCallback, SpuStSetStreamFinishedCallback

SpuStSetStreamFinishedCallback -----

Outline:

Setting the callback function called at the completion of each stream processing in the SPU streaming. Syntax:

SpuStCallbackProc SpuStSetStreamFinishedCallback (SpuStCallbackProc callback\_proc);

SpuStCallbackProc callback\_proc (unsigned long voice\_bit, long status)

Argument:

callback\_proc: The pointer towards the callback function called at the completion of each stream.

Explanation:

It sets the callback function called at the completion of each stream in the SPU streaming.

When callback\_proc is called, the value of the voices assigned for the stream of which processing is completed is set for the argument voice\_bit by the bitOR of SPU\_0CH to SPU\_23CH. The following value is set for "status" depending on the state of the streaming library.

State status ----- SPU\_ST\_PLAY SPU\_ST\_PLAY  
SPU\_ST\_FINAL SPU\_ST\_FINAL

Return value:

The pointer towards the callback function called at the completion of each stream set before.

NULL is returned if the setting is not performed before.

Related items:

SpuStTransfer, SpuStSetPreparationFinishedCallback, SpuStSetT

---

8/16/95 10:52 AM

DMA OF SOUND

Josh I. Pine

Sound

Can you superimpose a 15Khz sine wave on the output audio by DMA of the output buffer? If so, does the audio output circuitry have the bandwidth to pass the 15Khz to the audio output jacks? Finally, can we get hardware specification description of the ADPCM generator. We are interested in seeing what are the limits of frequencies it can generate.

---

8/25/95 2:57 PM

Re: About aiff2vag

Dave Elton

Dave Elton

Art Tools

I was trying to post this message in sound conference, but somehow it bounced back saying I don't have send access to sound conference. I SURE have posted my message in sound conference before. Anyhow, since it's a question about aiff2vag, so I posted it here.

I have another question related to aiff2vag. I convert several aiff files to vag files and I noticed that the amount of data per second varies in different files. Even I deduct 48 bytes (the vag header size), the data size is still not proportional to the time length of audio files. I understand vag files are compressed ADPCM files. But is anybody clear how the data is organized in it? Or more explicitly, if I want to make sure I will get 2 second of audio, how much vag data should I fetch? We know the compressed ratio is 4:1, but are we damn sure 1/4 of the same size of aiff file is what we need? Thanks for any advice!

Simon ReadySoft Inc.

---

8/30/95 4:54 PM

Imaging distortion?

Mark Slemko

Sound

Has anyone else experienced this:

We sampled speech at 22.5khz, converted these samples to the VAG format, and output them on the PSX using the SPU library so that they played back at the appropriate pitch. We noticed that there was distortion on the samples being played on the PSX which was not on the original samples before conversion to the VAG format. I believe this distortion is 'imaging' distortion caused by playing the samples back at twice their original sampling rate to achieve their relative pitch. Am I right?

I'm not sure of, or have yet to see any specs on the interpolation algorithms used by the PSX hardware to achieve different sample playback rates.

Does anybody have some input?

Thanks.  
Brian 'The COLONEL' Green

---

9/2/95 7:22 PM  
Where can I find libspu docs?  
Mike Benna  
Sound

I've seen the SPU streaming docs and the libsnd (Ss\* functions) docs, but where are the docs for the SPU\* functions?

---

9/5/95 9:52 AM  
Re: Where can I find libspu docs?  
Thomas Boyd  
Sound

They should be in the lib 3.0 ref and the lib 3.0 overview in the documentation conference on this BBS. Let me know if you cannot find them there, or if you need further info than they provide. Tom

---

9/5/95 4:06 PM  
Re: Audio streaming  
Thomas Boyd  
Sound

Montgomery Singman  
\PSX\SAMPLE\MOVIE\CDTUTO\TUTO5.C is the CD-XA example. Use MOVPACK to pack the samples together (The help in this program actually tells everything you need to know to pack audio streams) Use MOVCONV to convert WAV --> XA (this will show you the sample rates)

Let me know if you get stuck Tom

===== How can we do audio streaming on PSX ? Can we use the movie library and just skip the video ? What's the sample rates like ? Is there any sample code I can use ?

---

9/5/95 1:15 PM  
Audio streaming  
Montgomery Singman  
Sound

How can we do audio streaming on PSX ? Can we use the movie library and just skip the video ? What's the sample rates like ?  
Is there any sample code I can use ?  
Thanks, Monte

---

9/6/95 10:03 AM  
Re(2): Audio streaming

Angus  
Sound

Also, in 3.2 there is RAM based streaming. XA is non RAM based streaming. So choose your poison. The example is in the latest sound samples for VAG streaming.  
Angus

---

9/7/95 12:05 PM  
Delay problem  
Chris E. Reese  
Sound

I have just started to get my feet wet with the sound libraries and have noticed after putting in our own SEQs and VABs that we made there is a 20-30 second pause before sound is played on the PSX. I have used both our own code and the demo code that came with the ver 3.0 libs. I have debugged the code and haven't seen any place where time is being spent loading data or setting things up. It seems the delay is only encountered at the beginning when the SEQ is first played. If the SEQ loops there is no delay. The SEQ and VAB files were created by our sound guys so I don't know a lot about how they were created, other than they are SMF and converted using the Sony conversion tools. If this doesn't sound like a code problem let me know and I will check with the sound guys, but currently they are as clueless about this as I am. I am using ver3.2 of the libs and this problem is reproducible in the sound demo code.

---

9/11/95 3:53 PM  
Re: Repeat: Am I using SsUtKeyOnV right?  
Buzz Burrowes  
Sound

>>\_\_\_\_\_ I have a VAB which contains three tones within one program. The tones should 'kick-in' at various points in the scale. I seem to only be able to play the first tone using SsUtKeyOnV(). If I try SsUtKeyOnV(23,vab,0,1,key,0,127,127), where vab is the opened VAB id number, key is the key number (doesn't matter what key I try), it returns -1. Any idea how to turn on specific tones within a program? I thought this would do it.

>>\_\_\_\_\_ OK, I haven't personally used SsUtKeyOnV, but I can tell you about what I've found with SsUtKeyOn. Through experimentation I believe the flow works like this... Let's say the call is a request to play tone 0 note 60. If note 60 is outside of the "note limit" (as set in SoundDeli) the call will fail. If the note is within the tone's note limit an attempt is made to play the sample through code that allocates the sound channel, etc. Now, it sounds like you have two options...

1) Use SoundDeli to set up a "multi-tone" patch using note limits to spread the samples over the keyboard. In this case you could use SsVoKeyOn and the libraries would automatically sound the appropriate tones for the requested note. It looks to me like you are doing your own voice allocation so this method wouldn't work because you can't request which voice channel to use (nor is one returned.)  
2) Use SoundDeli to set up a "multi-tone" patch and let all tones sound over the entire keyboard. Then when you call SsUtKeyOnV you should definitely get only one tone to sound. If you were to both a) set note limits in SoundDeli, and b) call SsUtKeyOnV you could get yourself in trouble with nothing more than an "off by one" error. Trying to sound a specific tone outside of its note limit would result in failure.

...

I've just re-read your original post, and I can see how this might not address your problem. I'm posting anyway to be sure.

---

9/11/95 5:39 PM  
Problems with DA  
Jeff Davies  
Sound

I'm having problems with stereo audio on the PSX with standard redbook audio tracks (44.1 16bit stereo). The tracks play stereo when burnt on a cd and played on a normal stereo. When I play the audio either with the sample code supplied by sony, or my code, I only get audio out the left channel. Mvol and cd volume and cd mix have been set at good levels, is there possibly something else that could need to be set?

---

9/11/95 3:11 PM  
Repeat: Am I using SsUtKeyOnV right?  
Carl Ferreira  
Sound

I will repeat this message, since I never got any reply:

I have a VAB which contains three tones within one program. The tones should 'kick-in' at various points in the scale.

I seem to only be able to play the first tone using SsUtKeyOnV(). If I try SSutKeyOnV(23,vab,0,1,key,0,127,127), where vab is the opened VAB id number, key is the key number (doesn't matter what key I try), it returns -1. Any idea how to turn on specific tones within a program? I thought this would do it.

Carl

---

9/11/95 3:12 PM  
Re: Delay problem  
Buzz Burrowes  
Sound

>> there is a 20-30 second pause before sound is played on the PSX.

I've seen this problem myself. I'm afraid I don't know a REAL fix but I'll describe what I found... I created a SMF (Standard MIDI File) using CakeWalk Pro for Windows. I moved it to my MAC, changed the type code so that SMF2SEQ would recognize it, and then ran it through SMF2SEQ.

When I tried to play the file on the dev system using the libraries I ran in to a very similar problem as what you've described. In my case sound couldn't be heard until the sequence looped. So for a 60 second MIDI file I'd hear nothing for that first minute and then I'd hear playback.

I thought it was a programming problem and wasted a good couple of hours trying to find the problem. I gave up on that idea.

For some reason I decided to open the SMF in Cakewalk for DOS and see if the SMF was good. It opened fine. I then selected SAVE from Cakewalk for DOS's file menu and quit. I converted this new SMF and to my surprise the problem went away!

I DID NOTHING MORE THAN OPEN AND SAVE THE FILE IN A DIFFERENT SEQUENCER!



Well, I sent the files to Japan, and then began using Vision on the MAC and never had the problem again. I haven't heard anything about why the Cakewalk for Windows SMF didn't work.

You might try a similar approach if you have access to another sequencing package.

---

9/14/95 5:54 PM  
Re(2): Problems with DA  
Thomas Boyd  
Sound

Starting to sound lik the case. I will try it myself and see if it works with TUTO4.C. (I assume that is the Sony sample code you are using Jeff?) T

---

9/18/95 2:43 PM  
HELP!  
Mark Slemko  
Sound

Hi,

I have a couple of issues I was hoping someone on this conference could shed some light. To save sound memory we are using lower sample rates on some samples and playing them back accordingly so that they are at their original pitch. This seems to introduce a considerable amount of distortion. Has anyone else experienced this? This is quite a big concern for us since the fidelity of the samples are being seriously compromised.

I cannot seem to get looping to work with VAG files. I understand the loop points are encoded in the VAG wave data and also have aligned my loop points on 28 byte boundaries but their is still noticeable glitching at the loop points. We are using only libspu for our own sound driver and strip the header off the VAG file and move only the waveform data into sound memory. I beleive their is only one place I could be going wrong: That is I don't know for sure where the waveform data starts in the VAG file. Using libspu, to play a sound you have to specify where the waveform data is in sound memory. So this is what I need to know. WHERE DOES THE WAVEFORM DATA START IN A VAG FILE THAT I CAN LOAD IT AND ONLY IT INTO SOUND MEMORY. Has anyone else has problems looping sound using the higher level libraries libsnd.

PLEASE any comments would be greatly appreciated. I would like to resolve these issues as soon a possible!

Thanks! Brian 'The COIOneL'

---

9/19/95 7:59 AM  
Re: Problems with DA  
Travis Hilton  
Sound

I have had no problems with stereo. I have an sound initialization routine that makes the following calls:

```
SsInit(); SsSetReservedVoice(24t); SpuSetReverb(SpuOff) SsSetTickMode (SS_TICK60);  
SsStart() SsSetMVol(127,127); SsSetStereo();
```

Then when I am ready to play DA in stereo I make the following call:

```
SsSetSerialVol(SS_SERIAL_A,127,127);
```

That should do it.

---

9/20/95 10:14 AM  
ADPCM encoding  
Joe J. Alemanni  
Sound

Hi,

Does anyone know if the ADPCM encoding algorithm used by the AIFFVAG convertor is available in source form, or as a pc DLL or binary form, so that we can incorporate it in a tool which breaks large audio streams into smaller variable length chunks. Going from a big AIFF file to a group of smaller AIFF files which are then converted to VAG files is too laborious (and prone to mistakes). There are different ADPCM conversion techniques, which one is Sony using?

Thanks, Joe Alemanni

---

9/21/95 11:07 AM  
Re(2): HELP!  
Angus  
Sound

It is 28 sample boundary.  
Angus

---

9/21/95 10:14 AM  
Re: HELP!  
Buzz Burrowes  
Sound

>> To save sound memory we are using lower sample rates on some >> samples and playing them back accordingly so that they are at >> their original pitch. This seems to introduce a considerable >> amount of distortion.

As compared to what?

In other words, If you have a sample at 11kHz and compare it to the 44.1 kHz version you will hear "distortion" no matter what platform you play it on. If, on the other hand, you compare the 11kHz playback from the PlayStation to 11 kHz playback on a sound board or Sound Designer playback there shouldn't really be much of a difference.

A couple of tips... 1) Use a sophisticated tool for doing your sample rate conversion. It's not as simple a process as dropping samples (even if you simply want to 1/2 the sample rate!) The sample rate change changes the Nyquist frequency, and if you don't apply a descent anti-aliasing filter you will hear some weird things in the high end (distortion).

2) The best results will be achieved when re-sampling to an even division of 44.1 kHz. (22050, 11025)

Now, if your sure that your sample (at the lowered sample rate) is clean then you've got a problem that I haven't run into.

>> I understand the loop points are encoded in the VAG wave data >> and also have aligned my loop points on 28 byte boundaries...

I believe it is 28 SAMPLE boundries that you need to look for... perhaps Angus or Tom can confirm that for us.

>> We are using only libspu for our own sound driver and strip >> the header off the VAG file

and move only the waveform data >> into sound memory.  
I've done very little work in this area, but when I did I don't recall stripping anything off the VAG file. I believe I just stuck the whole thing down in sound ram.  
>> Has anyone else has problems looping sound using the higher level libraries libsnd. None.

---

9/25/95 3:02 PM  
Sound level in PSX games  
Montgomery Singman  
Sound

Is there any kind of guideline for sound level for PSX games ? All the US PSX games I have so far all have different volumes.  
Monte

---

9/26/95 9:40 AM  
Re(2): Sound level in PSX games  
Thomas Boyd  
Sound

More info:  
The standard for third party is that sound and music be independantly adjustable from an options screen or from a pause mode menu.  
Slider bars are suggested - but not required (they do not have to have infinite adjustability - just enough settings to provide a range of relative volumes).  
The standards document goes into detail on this, and may be revised soon to add more clarification.

Tom  
===== Not for sound level. Use your judgement. There may be guidelines for making sure that the player can adjust sound levels or turn sound and music off. I am finding out. ===== Is there any kind of guideline for sound level for PSX games ? All the US PSX games I have so far all have different volumes.  
Monte

---

9/26/95 1:27 PM  
Re: Sound level in PSX games  
Buzz Burrowes  
Sound

>> Is there any kind of guideline for sound level for PSX games ? >> All the US PSX games I have so far all have different volumes.  
Louder is ALWAYS better !!!!!!!!!!!!!!!!!!!!!!!!!!!!! !-)  
As we say in the record biz... "He who has the loudest record wins!" (For those of you born ACD (After Compact Disc) a a record is kind of like a CD but is bigger and sounds better when you spend enough money!)

---

9/26/95 8:22 AM

Re: Sound level in PSX games  
Thomas Boyd  
Sound

Not for sound level. Use your judgement. There may be guidelines for making sure that the player can adjust sound levels or turn sound and music off. I am finding out.  
===== Is there any kind of guideline for sound level for PSX games ? All the US PSX games I have so far all have different volumes.  
Monte

---

9/27/95 5:17 PM  
Re: Multiple VAB's  
Buzz Burrowes  
Sound

>> ----- I'm having a problem opening more than 1 VAB file. Are we supposed to be able to have more than one open at a time? I assume so or why give us an ID number. When attempting to open the 2nd file, I get an ID of -1. The files should both fit in the sound memory. I can't even close one VAB and open another without reinitialising the sound driver. Any ideas as to what I could be doing wrong? >> -----  
-----

The only thing that comes to mind immediatly is... are you sure your two VABs are small enough to fit in the 512 minus reverb work area limit?

---

9/27/95 3:56 PM  
Starting to use sound....  
Silas S. Warner  
Sound  
Buzz Burrowes

I am just starting to create sounds based on PC .WAV files. The only examples in my SAMPLES\SOUND directory seem to do entirely with the music synthesizer. Where should I look for examples of sound play code that use PCM sound, and where do I get the PCM to ADPCM converter?  
(I always ask dumb questions when starting a project. I do catch on pretty quickly, though.)  
Silas Warner

---

9/27/95 5:15 PM  
Re: Starting to use sound....  
Buzz Burrowes  
Sound

Hey Silas... How's it going?  
Buzz here (formerly of QSound.)  
I'm now Manager of Audio/Video Services & Chief Audio Engineer for Sony Interactive Studios. While I'm not on the third party support team, I try to help out with some of the questions. Anyway...  
>> am just starting to create sounds based on PC .WAV files. The only examples in my >> SAMPLES\SOUND directory seem to do entirely with the music synthesizer. Where should >> I look for examples of sound play code that use PCM sound, and where do I get the PCM >> to ADPCM converter?  
Well the "music synthesizer" and ADPCM playback are really the same thing. To play back ANY

sound (musical instrument sample or a big, fat explosion) you need to convert that sound into .VAG format. This can ONLY be done on a MAC using the Sound Artist Toolkit which includes a program called AIFF2VAG (sorry... no .wav support... conversion is simple though).

Once in the .vag format you have two choices... 1) put the .vag into a .vab (bank of sounds... again, musical instrument samples and effects can be treated the same) and use LIBSND (high level) calls (e.g. SsUtKeyOn, SsUtKeyOff, etc.) to stick the bank in sound ram and play the sounds.

2) Use LIBSPU (low level) calls to stick the .vag in sound ram and play it.

LIBSND is pretty robust so I would start there. LIBSND and LIBSPU calls can pretty much be mixed and matched, so if you find that LIBSND can't do something you need you can probably build it yourself with LIBSPU.

LIBSND handles all music playback via converted Standard MIDI Files (.seq) and can intelligently handle voice allocation between music and effects when set up correctly (this is all done by the sound guy when he sets up the priority table in each sound bank).

LIBSND can playback up to 16 MIDI sequences at a time allowing for some pretty complex sound effect sequences on top of musical scores.

Bottom line... you need a MAC and a Sound Artist Toolkit to get your content converted.

---

9/27/95 4:58 PM

Multiple VAB's

John Brandwood

Sound

I'm having a problem opening more than 1 VAB file. Are we supposed to be able to have more than one open at a time? I assume so or why give us an ID number. When attempting to open the 2nd file, I get an ID of -1. The files should both fit in the sound memory. I can't even close one VAB and open another without reinitialising the sound driver. Any ideas as to what I could be doing wrong?

---

9/29/95 10:23 AM

Multiple VABs

John Brandwood

Sound

VABBUG.ZIP 375K

Sound Programmers

I don't think the files are too big to fit in the sound memory- the bodies are only 250K in total.

I'm attaching a zipped directory that I am using. The code in main.c is a hacked version of demo\sound\simple\main.c. Rundemo.bat should show the problem. Any comments would be appreciated.

---

10/2/95 1:18 PM

Re(2): ADPCM encoding

Buzz Burrowes

Sound

>----- Dear Joe,

Even though you seem to have a rather simple question, it will get no response. Thanks for asking.

Joe >-----

Yes Joe, I'm afraid Joe is right. Many, including myself, have asked this same question to no avail.

It appears the algorithm is unavailable, and I have heard nothing but deafening silence in regard to a PC based encoder. I've even offered to write the DLL myself if the source for the encoder was made available to me but I've heard nothing in response.

>> There are different ADCPM conversion techniques, which one is Sony using?  
There in lies the rub. Sony ain't talkin'!

---

10/2/95 2:28 PM

Re: ADPCM encoding

Dan Burnash

Sound

Joe J. Alemanni

>Does anyone know if the ADPCM encoding algorithm used by the AIFFVAG convertor is >available in source form, or as a pc DLL or binary form, so that we can incorporate it in a tool >which breaks large audio streams into smaller variable length chunks. No, it is not available, except within the programs already distributed.

>There are different ADCPM conversion techniques, which one is Sony using? I don't know. If I can find out, I will post it.

Dan B.

---

10/6/95 12:24 PM

Re: Multiple VAB's

William Botti

Sound

JohnB. Also make sure your header main ram storage area don't overlap. Also make sure you are waiting for end of sound dma completion. That should be it :)

---

10/9/95 10:24 AM

XA vs DA for music

Heather Barclay

Sound

Is anyone using XA for music? When I tried to use XA instead of DA for music I found that I would have to interleave the XA data with dummy data in order for it to stream at the proper rate off of the CD. If that is true, is there any advantage to using XA if you are not streaming other data off of the CD at the same time?

Also, how can I detect when a DA track is done so that I can loop back to the beginning?

Thanks, Heather Barclay Virgin Interactive Entertainment

---

10/11/95 7:01 AM

Sound - Marker callback.

Christopher C. Rywelski

Sound

Hi,

We are having problems with getting the callback marker to work. Has anyone else had similar problems or succeeded another way? Code follows:

```
SsSetMarkCallback(seq, 0, (SsMarkCallbackProc)Mark); /* Setup midi mark callback function */  
SsMarkCallbackProc Mark(short ac_no, short tr_no, short data) { SsVoKeyOn(0x0003, 0x4600,  
127, 127);
```

OR

```
SsSeqStop(ac_no); }
```

The above code shows the method we are attempting to use to setup and use the midi mark callback function. The sequence contains a CC99 followed by 40 then a CC06 followed by 01.

Viewing the SEQ file you would see the following: b0 99 28 00 06 01

The callback function doesn't seem to be getting called. Any ideas on what could be wrong?

Thanks.

---

10/12/95 1:26 PM

Re: Sound - Marker callback.

Rob Vawter

Sound

```
>----->  
----- SsSetMarkCallback(seq, 0,  
(SsMarkCallbackProc)Mark); /* Setup midi mark callback function */  
SsMarkCallbackProc Mark(short ac_no, short tr_no, short data) { SsVoKeyOn(0x0003, 0x4600,  
127, 127);
```

OR

```
SsSeqStop(ac_no); }
```

The above code shows the method we are attempting to use to setup and use the midi mark callback function. The sequence contains a CC99 followed by 40 then a CC06 followed by 01.

Viewing the SEQ file you would see the following: b0 99 28 00 06 01

The callback function doesn't seem to be getting called. Any ideas on what could be wrong? >--

```
----->  
-----  
It looks like your problem is in setting the mark. Yes, the mark needs to be set with a CC99;  
however, the 99 is a decimal number and thus you need to use 63 as your hex number. Try that,  
I think it will work.
```

- Rob

---

10/16/95 5:37 PM

Re: Multiple VABs

Buzz Burrowes

Sound

I've fixed your problem by adding one line of code...

Add ...

```
SsVabTransCompleted(SS_WAIT_COMPLETED);
```

before...

```
vab2 = SsVabOpenHead((u_char *)VAB_HADDR2, -1); // *** fails here ****
```

(PS: I noticed other responses have pointed to an overlap of the headers in main memory. I did not find this problem in the code you sent me. The one added call above led to a full working

demo.)

---

10/16/95 4:09 PM

Re: Sound - Marker callback.

Buzz Burrowes

Sound

>> The sequence contains a CC99 followed by 40 then a CC06 followed by 01. Viewing the SEQ file you would see the following: b0 99 28 00 06 01

<<

There in lies your problem... You need to send a CC99 - 40 and then a CC 98 - x (where x is the value you want passed to your callback.)

BTW: I see that you are trying to call a KeyOn call in your callback. In the old libraries this did not work. Something to do with the fact that your callback happens at interrupt time I think. Anyway, I brought this to the attention of Japan a while back and I don't know if they've fixed it in the most recent library releases. You CAN do things with sequences though (start,stop, accel., etc.)

I have my own sound servicing routine which gets called 60 times a second, so my fix for not being able to do a KeyOn call was to set a flag that is checked in my own sound servicing routine which in turn triggers the KeyOn (ugly but it works.)

If you get it working they way you have it written in your post let us all know!

---

10/16/95 5:32 PM

Misc Snd/Spu q's

Jim Rogers

Sound

Thomas Boyd

Does anyone know the answers to the following? I am trying to track down a rare problem where the audio system goes south in a seemingly random fashion.

\*Are all LIBSPU/LIBSND functions re-entrant? If not which ones are not?

\*Can I safely set SpuSetIRQAddr() /SpuSetIRQ()/ SpuSetTransferStartAddr()/ SpuWrite()/ SpuSetIRQCallback() / SpuGetKeyStatus() / \*\* SpuFree() \*\* in a CALLBACK regardless of whether I may be modifying pitch/vol/pan/ on off

state through libsnd in the main line code at the time the callback hits? If any of these can cause a problem would I get a status indicating an error or would the sound system crash?

\*I can any harm (to the spu) come from calling SpuSetKey( state, voice ) or SsUtKeyOff( voice, ... ) or SpuSetKey (SpuOff, SPU\_ALLCH) for voices that are NOT on in the firstplace. They don't pend do they? What is the safest check for a sounding voice? I've been using..

if ( (keystate != SPU\_OFF) && (keystate != -1) ) SpuSetKey(SPU\_OFF, kSPU\_VoiceID);

\*Does SpuIsTransferCompleted( SPU\_TRANSFER\_PEEK ) work with the 3.2.1 SPUlib? It didn't work in earlier releases of the spu/snd libs.

\*Are there any know caveats/ warnings to heed when using lib snd and lib spu together?

\*We found that a when an incorrect negative volume was passed to SsUtKeyOn the libsnd code crashed! is range checking done on any libsnd/spu parameters?

Thanks for any help or suggestions anyone may have.

Jim

---

10/16/95 3:22 PM

Re: XA vs DA for music



Thomas Boyd  
Sound

interleave XA with other XA tracks, then index into the file when you are choosing the one you  
wanna play. You can store 8 to 32 times the sound this way over regular DA.  
For DA looping, check out TUTO4.C in the CDTUTO samples (sometimes under MOVIE)

=====

Is anyone using XA for music? When I tried to use XA instead of DA for music I found that I  
would have to interleave the XA data with dummy data in order for it to stream at the proper  
rate off of the CD. If that is true, is there any advantage to using XA if you are not streaming  
other data off of the CD at the same time?

Also, how can I detect when a DA track is done so that I can loop back to the beginning?  
Thanks, Heather Barclay Virgin Interactive Entertainment

---

10/17/95 6:07 PM  
SPU calls  
Montgomery Singman  
Sound

Have the API for SPU low level functions been changed ? I switched from lib 3.0 to 3.2, and  
now all the sounds just went silent. Is there anything obvious I should know about the new  
library ?  
Monte

---

10/17/95 7:21 PM  
Re: SPU calls  
Jim Rogers  
Sound

Hi Monte,  
Are you calling SsSeqCalledTbyT in a vbl callback or using tickmode 60 to flush the request  
queue?  
If so make sure your getting your vblcallback. Lib 3.1 adds an interesting quirk to pad  
initialization (InitPad, StartPad ) that DISABLES vbl callbacks unless you call  
ChangeClearPAD(0); (see ref doc) after initializing the controlers. We had the missing vbl  
callback problem when we went from lib3.0 to lib3.1  
hope it helps Jim

---

10/17/95 5:43 PM  
Misc Snd/Spu q's  
Rob Vawter  
Sound

Jim - I am looking into your questions and will let you know answers as soon as.  
As for your question on SPU\_TRANSFER\_PEEK working - what was the problem? Not  
supported? Not doing what you expected it to do? Seems to return the proper result for me  
now. Let me know.  
- Rob

---

10/17/95 8:38 AM  
Re(2): Sound - Marker callback.  
Rob Vawter  
Sound

Rywelski>> The sequence contains a CC99 followed by 40 then a CC06 followed by 01. Viewing the SEQ file you would see the following: b0 99 28 00 06 01

<<

Burrowes>> There in lies your problem... You need to send a CC99 - 40 and then a CC 98 - x (where x is the value you want passed to your callback.) <<

Actually, as of Library 3.0, the CC99 CC98 combo has been switched to CC99 CC06 for both looping and marking callbacks, with the CC99 CC98 combo still being supported. Why? Dunno.

---

10/17/95 7:14 PM  
Re: Misc Snd/Spu q's  
Jim Rogers  
Sound

Hi Rob,

Thanks for looking into my questions.

I was told that the SPU\_TRANSFER\_PEEK was not reliable back when we were using lib2.5 so

I've been leary of it since and have done dma completion checking via semaphore checking.

From what you've said I assume it works correctly in lib 3.2.1? ( Angus dubbed the libspu and lib cd changes of a few weeks ago lib3.2.1)

Thanks Jim

---

10/17/95 5:30 PM  
Re(2): XA vs DA for music  
Henrik Markarian  
Sound

Could you elaborate on this a little more. A) How many XA tracks can you interleave and B) how do you index into the file to the correct location.

Henrik Mindscape

=====  
interleave XA with other XA tracks, then index into the file when you are choosing the one you wanna play. You can store 8 to 32 times the sound this way over regular DA.

For DA looping, check out TUTO4.C in the CDTUTO samples (sometimes under MOVIE)

=====  
Is anyone using XA for music? When I tried to use XA instead of DA for music I found that I would have to interleave the XA data with dummy data in order for it to stream at the proper rate off of the CD. If that is true, is there any advantage to using XA if you are not streaming other data off of the CD at the same time?

Also, how can I detect when a DA track is done so that I can loop back to the beginning?

Thanks, Heather Barclay Virgin Interactive Entertainment

---

10/18/95 5:16 PM  
Re(2): SPU calls  
Montgomery Singman

Sound

Thanks for the reply.

I am not using Ss calls at all, I am only making Spu calls. In fact, the only doc I can find on Spu calls is really old, is there a new document out yet ?

Thanks, Monte

---

10/18/95 10:36 PM

Re(2): SPU calls

Montgomery Singman

Sound

The address I got from SpuMalloc() is 0x1010, I passed that to SpuSetTransferStartAddr(), the transfers seem to be alright.

The same code worked under lib 3.0, I noticed right after I called SpuSetKey(SpuOn, channel), I made another call to SpuGetKeyStatus(channel), the return value I got was SPU\_ON\_ENV\_OFF.

What does that mean ? What else could turn off a channel other than SpuSetKey() ?

Thanks, Monte

---

10/18/95 9:36 AM

Re: SPU calls

Angus

Sound

Yes. Libspu now reserves up to 0x1010, instead of 0x1000. So, don't put anything at 0x1010, and you'll be ok. They claimed some user area memory for system stuff.

ANgus

---

10/18/95 3:10 PM

Re: Misc Snd/Spu q's

Rob Vawter

Sound

=====  
LIBSPU/LIBSND functions re-entrant? If not which ones are not?\

Q3 can any harm (to the spu) come from calling SpuSetKey( state, voice ) or SsUtKeyOff( voice, ... ) or SpuSetKey (SpuOff, SPU\_ALLCH) for voices that are NOT on in the firstplace.

They don't pend do they? What is the safest check for a sounding voice? I've been using..

if ( (keystate != SPU\_OFF) && (keystate != -1) ) SpuSetKey(SPU\_OFF, kSPU\_VoiceID);

=====  
Q1 I believe

that the functions are all re-entrant. That seems to be the consensus here.

Q3 SsUtKeyOff does nothing at all if the specified voice is not already on. So, you are clear on that one. I am checking SpuSetKey still. Are you checking if a voice is on ONLY to turn it off or for other reasons as well (i.e. volume, pan, pitch)? And I think this would be cleaner:

if (keystate=SPU\_ON) SpuSetKey(SPU\_OFF, kSPU\_VoiceID);

since SPU\_ON is defined as 1 and SPU\_OFF is defined as 0.

- Rob

---

10/20/95 4:12 PM

Misc Snd/Spu q's

Rob Vawter

Sound

Jim Rogers

Jim -

=====  
(to the spu) come from calling SpuSetKey( state, voice ) or SsUtKeyOff( voice, ... ) or  
SpuSetKey (SpuOff, SPU\_ALLCH) for voices that are NOT on in the firstplace. They don't pend  
do they? What is the safest check for a sounding voice? I've been using..

```
if ( (keystate != SPU_OFF) && (keystate != -1) ) SpuSetKey(SPU_OFF, kSPU_VoiceID);
```

=====  
SsUtkeyOff - No problem (as I previously posted) SpuSetKey - Goes through a lot of work to set  
a register to off that is already off. Buzz Burrowes has turned off lots and lots of voices that  
weren't on with no problems. He says that checking to see if the voice is on is unnecessary and  
will merely slow down your code. (And may even give a false positive at times.)

=====  
\*Are there any know caveats/ warnings to heed when using lib snd and lib spu together?

=====  
None known.

=====  
\*We found that a when an incorrect negative volume was passed to SsUtKeyOn the libsnd code  
crashed! is range checking done on any libsnd/spu parameters?

=====  
This has been the least fun of your questions to answer (so I saved it almost to last of course). So  
far, in libsnd (which I am about halfway through), only the following ARE range checked:

In all occurances: voice (0-23) vabId (0-31) prog (0-127)

In specific functions only (as follows): reverbtype in SsUtSetReverbType addr in

SsVabFakeHead

Range checking performed on ALL in: SsUtKeyOff SsVoKeyOff

Thus, things like pitch and volume seem to NEVER be range checked. Reason? Speed. Constant  
range checking can kill performance unfortunately. So, be careful with your values.

Still working on your callback question and libSPU range checking (I expect it will be much the  
same as libSND).

- Rob

---

10/20/95 4:12 PM

Re(2): SPU calls

Jim Rogers

Sound

Lord Angus writes:

>Yes. Libspu now reserves up to 0x1010, instead of 0x1000. So, don't put anything at 0x1010,  
and you'll be ok. >They claimed some user area memory for system stuff.

I assume SpuMalloc knows about this and will never return an address less than 0x1010? Right?

Jim R.

---

10/20/95 10:58 AM

Re(3): SPU calls

Rob Vawter

Sound

STREAM.TXT 32K  
Sound Programmers

=====  
=====  
=====  
===== I am not using Ss calls at all, I am only making Spu calls.  
In fact, the only doc I can find on Spu calls is really old, is there a new document out yet ?  
Thanks, Monte  
=====

=====  
===== Hopefully, you at least have the 3.0 documentation. I  
wasn't here for the changeover from 3.0 to 3.1 so I can't help you with that one, but I know of the  
changes from 3.1 to 3.2. Check out the following file (located in psx\doc\library\eng\spu on  
the CD), which documents the streaming features added to LibSPU. Also, I have a reliable source  
which tells me that hard copies of 3.0 are busy at the printers right now and will be on the way  
VERY soon (Hurrah!).  
=====

---

10/24/95 4:36 PM  
Re(3): SPU calls  
Rob Vawter  
Sound

=====  
===== I assume SpuMalloc knows about this and will never return an address less than  
0x1010? Right?  
Jim R.  
=====

=====  
===== A - Sure looks that way. Tuto6 in the Psx\sample\sound\tuto area does it correctly in  
3.2.  
- Rob  
=====

---

10/26/95 3:53 PM  
libSPU/libSND re-entrant functions  
Rob Vawter  
Sound  
Jim Rogers

I have found functions and groups of functions which are NOT re-entrant. They all set locks  
into place so the particular function (and sometimes others as well) may not be called again until  
the function is completed.

The following functions all use the same lock and cannot be called again while any of the others  
are running: ===== SsSeqCalledTbyT SsUtKeyOffV SsUtKeyOnUtV SsUtFlush  
SsUtkeyOn SsUtKeyOff

I'm checking into the others still - they mostly involve the Streaming Library.

---

11/10/95 8:40 AM  
Deceased functions  
Thomas Boyd  
Sound

> It seems that the header declaration of > SpuGetReverbOffsetAddr (unsigned long addr)  
> SpuGetReverbOffsetAddr (void) > > have been removed. Is it not supported in 3.3?

Yes.

These functions' status were only undocumented, though were available in libspu.lib until 3.2, but are not supported in 3.3.

The mainly reason is that offset address of each reverberation type was opened and written in documents.

With best regards, - -- kaol

---

11/13/95 7:41 PM

Re: Deceased functions

David Schwartz

Thomas Boyd

Sound

Tom,

How can these functions be declared undocumented and unsupported. Up until a week ago there was no documentation past lib 2.0. We need to have these functions back.

David

---

11/15/95 2:53 PM

Non re-entrant Sound Functions

Rob Vawter

Sound

Jim Rogers

Found some other Sound functions which set up locks to ensure that callbacks don't mess you up:

(1) The following two functions block themselves and each other from being called again

SsVabTransBodyPartly SsVabOpenHeadWithMode

(2) SpsStTransfer locks itself to ensure that the Transfer to the stream buffer is not interrupted.

---

11/20/95 4:20 PM

SPU questions

Montgomery Singman

Sound

1. How do you change volume using libspu ? In example tuto6.c, it has 0x1fff for both left and right channel, what's 0x1fff ? How can I change it ? How does it work ?

2. What's the difference between common attribute and voice attribute ? What's the relationship ?

Thanks, Monte

---

11/20/95 11:56 AM

End of Sample Detection for SEQs, SEPs, VAGs, VABs, XA, and DA

Rob Vawter

Sound

Carl Ferreira

SEPs, SEQs 1) Use SsIsEos to check if the song is playing. (Inferior method, because you must keep checking) 2) Have your sound guys build MIDI callbacks into the end of sample. (Superior method)

VABs 1) Use SpuGetKeyStatus to check key on status and envelope status. (Probably the better method) 2) Set an interrupt which checks the address of the next VAG and subtracts one byte (as long as it is not the last VAG in the VAB; for the last VAG, use #1 above).

VAGs 1) See #1 in VABs.

DA 1) Use CdGetToc to check beginning of next track (may need to go back one sector to ensure that the beginning of the next song doesn't play a chunk of the next track). The last DA track is a problem unless you sneak a one second track of silence at the end. 2) If you know the length in minutes of the track, you can convert that to a sector length using the following macros (which are not so cleverly hidden in the libcd.h file). Use btoi to convert the start point of the song to an int. Add the length of the song on, reconvert using itob to get an end point. #define btoi(b) ((b)/16\*10 + (b)%16) /\* BCD to u\_char \*/ #define itob(i) ((i)/10\*16 + (i)%10) /\* u\_char to BCD \*/

XA 1) Similar to DA #2. Take the start point of an XA track and the size of the XA track/2340 (this will give you a sector size) to get the end point of the XA track.

---

11/21/95 2:38 PM

Re(3): SPU questions

Rob Vawter

Sound

>>You can change volum in libspu using SpuSetCommonAttr or SpuSetVoiceAttr. Volume ranges from 0 to 0x8fff. Thus, 0X1fff would be around 30 % volume. Rob Vawter

>>I thought the maximum volume was 0x3fff, not 0x8fff.

Glenn O'Bannon

My mistake. I had meant to put 0x7fff, but somehow screwed that up. And yes, 0x3fff is the maximum for direct mode, (Please see pg. 644 of the Reference Guide, which lists values for volumes per volume mode) so I erred there anyway. Thanks for catching that.

- Rob

---

11/21/95 9:38 AM

Re: End of Sample Detection for SEQs, SEPs, VAGs, VABs, XA,

From:

Rob Vawter

Sound

>>XA 1) Similar to DA #2. Take the start point of an XA track and the size of the XA track/2340 (this will give you a sector size) to get the end point of the XA track.

The above part of my post contained a bit of misinformation - See page 49 of the Overview (Table 4-6-6). Depending on the ModeSize, the size of the XA track will be divided by different numbers (2048, 2340, or 2328). Sorry for the confusion.

---

11/21/95 12:07 PM

Re: End of Sample Detection for SEQs, SEPs, VAGs, VABs, XA,

From:

David W. Marshall

Rob Vawter

Sound

>>>2) If you know the length in minutes of the track, you can convert that to a sector length >>>using the following macros (which are not so cleverly hidden in the libcd.h file). Use btoi to >>>convert the start point of the song to an int. Add the length of the song on, reconvert using

>>>itob to get an end point.

I noticed that when using this method (or the method in tuto4.c for looping CD-DA), the starting time listed in the TOC contains an extra 2 seconds for the 2 second lead-in time.

Therefore, you get 2 seconds of dead time when you start a track.

I add 2 seconds to the start time before passing it to the redbook functions. Any problem with this?

dave

---

11/21/95 9:35 AM

Re: SPU questions

Rob Vawter

Montgomery Singman

Sound

>>1. How do you change volume using libspu ? In example tuto6.c, it has 0x1fff for both left and right channel, what's 0x1fff ? How can I change it ? How does it work ?

You can change volum in libspu using SpuSetCommonAttr or SpuSetVoiceAttr. Volume ranges from 0 to 0x8fff. Thus, 0x1fff would be around 30 % volume.

>>2. What's the difference between common attribute and voice attribute ? What's the relationship ?

The difference is this: common sets the attributes for all 24 voices (channels). If you want different volumes or reverb settingfor each voice, you must use SpuSetVoiceAttr. Also, this function has many more options available (pitch, loop start etc.) than Common does.

---

11/21/95 12:39 PM

Re(2): SPU questions

Mark DeSimone

Sound

I thought the maximum volume was 0x3fff, not 0x8fff.

Glenn O'Bannon Rainbow America

---

11/21/95 11:38 AM

Re: SPU questions

Buzz Burrowes

Sound

>> 2. What's the difference between common attribute and voice attribute ? What's the relationship ?

Just to clarify on Rob's response... Think of this thing as an audio mixer... you have individual volumes, etc. for each channel (voice att.) and then a master volume which can be used to turn the over-all mix up and down. (common att.)

---

11/22/95 3:09 PM

Re(2): SPU questions

Montgomery Singman

Rob Vawter

Sound

I've tried the volume settings, they work pretty well, thanks a lot.

Now I have questions about the pitch control, note and sample\_note, the default values of pitch is 0x1000, note is 60, sample\_note is also 60. Those settings are for 44.1khz samples, what if I want to play back 33 khz and 22 khz, what do I do ? I tried to set the note and sample\_note to 72



or any other numbers, they don't do anything. Do I need to change the pitch value? What should I set it to?

Thanks, Monte

11/27/95 2:59 PM

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Re(2): End of Sample Detection for SEQs, SEPs, VAGs, VABs, XA,

From:

Rob Vawter

Sound

>>>2) If you know the length in minutes of the track, you can convert that to a sector length >>>using the following macros (which are not so cleverly hidden in the libcd.h file). Use btoi to >>>convert the start point of the song to an int. Add the length of the song on, reconvert using >>>itob to get an end point.

>I noticed that when using this method (or the method in tuto4.c for looping CD-DA), the starting time listed in the TOC contains an >extra 2 seconds for the 2 second lead-in time.

Therefore, you get 2 seconds of dead time when you start a track.

>I add 2 seconds to the start time before passing it to the redbook functions. Any problem with this?

Shouldn't be any problems with this.

---

11/27/95 11:25 AM

Re(3): SPU questions

Rob Vawter

Sound

Montgomery Singman

I have questions about the pitch control, note and sample\_note. The default values: pitch is 0x1000, note is 60, sample\_note is also 60. Those settings are for 44.1kHz samples, what if I want to play back 33 kHz and 22 kHz, what do I do? I tried to set the note and sample\_note to 72 or any other numbers, they don't do anything. Do I need to change the pitch value? What should I set it to?

Check out page 645 of the Library Reference. You need to change the pitch - for 22kHz, lower the pitch an octave. For 33kHz, you must lower the pitch part of an octave, near one half - try experimenting a bit, as I am unsure of an exact number. The sample\_note is set at the time of sampling and the note can only be used if the sample\_note feature is set. So, that would be why changing their value had no effect.

---

11/27/95 4:49 PM

Doing loop points with SPU lib

Montgomery Singman

Sound

How do you get loop back to work with SPU lib functions? There is a loop\_addr, but how do you get the loop information from AIFF over to VAG? I could not find any loop info in the VAG file format.

Thanks, Monte

---

11/28/95 2:54 PM

CdControl, CdSetMode, CdModeAP

Rob Vawter

CD

David W. Marshall

CdModeAP (autopause) can be used as a quick and easy way to detect the end of a track.

When Autopause is set on, the DataReady Callback returns the following flag:

```
#define CdDataEnd 0x04 /* End of Data Detected */
```

instead of the dataready flag:

```
#define CdDataReady 0x01 /* Data Ready */
```

Hopefully, Japan will let me know why it is called autopause and whether or not there are any caveats.

---

11/28/95 4:58 PM

Re: CdControl, CdSetMode, CdModeAP

David W. Marshall

Rob Vawter

CD

I tried this CdModeAP bit with the CdReadyCallBack() and it did seem to work for knowing when a Redbook track ended. It even worked when trying to access the last redbook track on the disk.

Since this mode isn't really documented anywhere, I will feel much better when Japan says it is okay to use this and there are no hidden bugs.

dave

---

11/29/95 2:12 PM

Streaming Sound from PC?

Carl Ferreira

Sound

Thomas Boyd

I may have missed this section (or perhaps not?), but...

Is there any way to stream music off of the PC (a WAV file, or something like that)?

Thanks!

Carl Ferreira

---

11/29/95 4:21 PM

Sound effects crash

Heather Barclay

Sound

Occasionally, the sound effects in my game crash. The symptom shown is that the sound effects go quiet for several seconds before resuming again at normal volume (no, the volume setting has not been changed during this time). This happens when several sound effects are requested at the same time (or relatively close together). Do I need to check to see what voices are available before turning on a sound effect? I am currently using SsVoKeyOn/SsVoKeyOff.

Thanks, HB

---

11/30/95 8:13 AM

Re(2): CdControl, CdSetMode, CdModeAP

Rob Vawter  
David W. Marshall  
CD

>>I tried this CdlModeAP bit with the CdReadyCallBack() and it did seem to work for knowing when a Redbook track ended. It even >>worked when trying to access the last redbook track on the disk.

>>Since this mode isn't really documented anywhere, I will feel much better when Japan says it is okay to use this and there are no >>hidden bugs.

Okay, here is the word from Japan:

>>The CdlModeAP means "Auto Pause". >>The end of the track (CdlDataEnd) is reported regardless of the mode. >>But, it is cleared when the next track is played.

>>To detect the end of the track, you must detect the CdlDataEnd by using >>CdReady().

---

11/30/95 11:44 AM  
Re: Streaming Sound from PC?  
Thomas Boyd  
Carl Ferreira  
Sound

The only way to get DA or ADPCM sound into the SPU is through the CDROM subsystem or an emulator. This is a hardware pathway so it cannot be done with just software. I know you do not have a CDROM on the coin-op kit, so you are stuck with MIDI or VAGs (unless you can figure out a hardware solution).

Tom -----  
----- I may have missed this section (or perhaps not?), but... Is there any way to stream music off of the PC (a WAV file, or something like that)? Thanks! Carl Ferreira

---

12/6/95 10:32 AM  
Re: Real-time monitoring  
Angus  
Sound

Yes you can do analysis. The routine is SpuReadDecodedData I believe. There is also a sample floating around that does this. Maybe Rob can find it for you.  
angus

---

12/6/95 9:08 AM  
Real-time monitoring  
P. (Leake / Scharnberg)  
Sound

Is there any way to monitor, in real-time, the audio being played back from the CD OR being collected at the serial input as through a mic while an application or game is running simultaneously? Essentially I want the game to respond to some real-time audio input.

Thanks.

Martin D. Wilde Viacom New Media (also the poster of msg #5 earlier)

---

12/6/95 8:43 AM

Multi VABs  
Andy Hsiung  
Sound

Buzz - I figured that copying the patch to another slot was going to be the solution- not a big deal really!

My other question regarding multiple VABs is still open - If I use 2 VABS in one section of the game (which I understand is OK) when I put Patch 0 in my SMF how do I set which VAB patch will be selected, VAB1 or VAB2? We have also experienced a problem with patch #40 and above not playing, although the VAGS are listed in the VAG list and the same procedure has been followed for setting up the patch. My understanding is that there may be 128 patch programs in 1 VAB and we can have up to 254 different VAGS. Any suggestions as to what the problem is here?

That'll do it for now. Thanks. --- Greg Turner, Realtime Associates

---

12/6/95 9:01 AM  
Volume, timing and failings  
P. (Leake / Scharnberg)  
Sound

A number of questions here:

1) SsVoKeyOff in NOT working in my current version of the libraries. I'm using the stuff I just got from the CD-ROM Release 1.5, PlayStation Programmer Tools. It as alternately worked and not worked in previous versions of the libraries. Any ideas?

2) I want to control and/or mute the individual track volumes of a multi-track SMF. Is there any way to do this after it's been collapsed into a SEQ? If not, do you have any suggestions on how I WOULD do this? I am currently parsing the SMF myself and issuing SsVoKeyOn and SsVoKeyOff commands myself, but I cannot adjust their volumes since I don't know their voice number. I have tried adjusting the volume fields in the ProgAtr and VagAtr structures, and this works for notes turned on after the adjustments are made. But I also want to adjust the volume of sustained sounds on the fly (ala MIDI controller 7) on individual tracks based on what is happening in our game. Do I have to keep track of all currently playing voices (using SsUtKeyOn, SsUtKeyOff and then SsUtSetVVol) and do all the adjustments myself on a voice-by-voice basis? I'd really rather NOT have to do this.

3) Following on Mark Slemko's experience, I have also found that when two (or more) SFX are triggered in quick succession, one or more or all of the sounds don't get played. What's going on here? I have yet to see an answer about this in the conference or in the archives. SFX do not get played. What's going on? I've seen no answer as yet here.

---

12/6/95 12:37 PM  
Re(4): Volume, timing and fai  
Buzz Burrowes  
Sound

BTW: My last post won't help your problem of trying to change a sound's volume while it is playing. It will only effect future NoteOn messages. I believe you are going to have to keep track of all voices currently referencing a given patch and adjust their volumes individually.

---

12/6/95 10:35 AM

Re: Volume, timing and failings  
Angus  
Sound

I think the way to do it is to use SsUtKeyOn to get the voice and then use the Spu to control the volumes of the voices. You could also look into the volume modes which are described on p 644 of the RunTime Library Overview 3.0  
angus

---

12/6/95 12:34 PM  
Re(3): Volume, timing and fai  
Buzz Burrowes  
Sound

>> Is there any way to affect the volume of sounding voices on a >> program-by-program basis without haveing to keep track of >> which voice numbers are playing and what their current >> volume is?

I would think you could hack the VH data in main memory to alter a program's volume. See page 53 of the "Sound Artist Tool" book. You will find the VH structure.

Now, you will see from the diagram that there is a Program attribute table (16X128 bytes) in the VH. There is no specification given for this table, but it would probably be fairly easy to find an offset to a program's volume and to twiddle that value (create two VABs with a single program, identicle except for the program's volume, and then look for the difference.)

This is only a theory!!!!..... It may not work.

---

12/6/95 11:40 AM  
Re(2): Volume, timing and fai  
P. (Leake / Scharnberg)  
Sound

The method you describe to handle/control voice volumes is done on a voice by voice basis. Is there any way to affect the volume of sounding voices on a program-by-program basis without haveing to keep track of which voice numbers are playing and what their current volume is?  
Martin Wilde Viacom New Media

---

12/6/95 12:29 PM  
Re: Multi VABs  
Buzz Burrowes  
Sound

>> We have also experienced a problem with patch #40 and above not playing...  
I haven't run into this problem, but I must say that I don't believe I've created a VAB with that many programs. I usually have multiple VABs loaded at one time so none have that many patches.

>> My other question regarding multiple VABs is still open - If I use 2 VABS >> in one section of the game (which I understand is OK) when I put Patch 0 >> in my SMF how do I set which VAB patch will be selected, VAB1 or VAB2?

Well, to start with, the programmer will set which VAB an seq files references when he makes

the SsSeqOpen call. I don't know if it is possible to dynamically change that reference via a MIDI message in the SEQ file, but I will investigate that.

---

12/7/95 2:28 PM

Re(2): Real-time monitoring

Rob Vawter

Sound

P. (Leake / Scharnberg)

>>Yes you can do analysis. The routine is SPUReadDecodedData I believe. There is also a sample floating around that does this. >>Maybe Rob can find it for you.

The function is SPUReadDecodeData (pg. 621). The sample is psx\sample\sound\cdvol\main.c.

---

12/7/95 3:57 PM

Re: Sound effects crash

Mark DeSimone

Sound

I have found that if you keep the various simultaneously playing sound volumes down to a reasonable level, the SPU seems to work better. I was having similar side effects. Remember, they can always turn up the volume on their TVs.

Glenn O'Bannon Rainbow America

---

12/7/95 10:17 AM

SEPs

Andy Hsiung

Sound

Buzz -- The problem that we had earlier with not being able to play past patch 39 in the VAB was traced to an empty slot in the VAG list. Once these were deleted, everything worked fine. Here's my new one: The programmer here is not able to play more than 1 sequence (in a SEP) at a time. If he tries to play another it waits until the first one is done playing. What is the procedure to do this??

(NOTE: we are using the SEP to play all of our sfx).

Thanks. -- Greg Turner, Realtime Associates

---

12/7/95 1:10 PM

Re: Volume, timing and failings

Rob Vawter

P. (Leake / Scharnberg)

Sound

>>1) SsVoKeyOff in NOT working in my current version of the libraries. I'm using the stuff I just got from the CD-ROM Release 1.5, >>PlayStation Programmer Tools. It as alternately worked and not worked in previous versions of the libraries. Any ideas?

The only problem I have heard about with both SsVoKeyOff and SsUtKeyOff is that if you change the pitch, you need to KeyOff at the original pitch you set with KeyOn, not with the new pitch. Is that the case here? If not, I will look into it further.

Buzz already got #2 for you.

>>3) Following on Mark Slemko's experience, I have also found that when two (or more) SFX are triggered in quick succession, one or >>more or all of the sounds don't get played. What's

going on here? I have yet to see an answer about this in the conference or in the >>archives. I don't recall seeing Slemko having a problem with it. Maybe Heather Barclay? Can you send me a sample of the code that is causing you problems in this area? I would like to look into this further...

---

12/8/95 1:41 PM

Re: SEPs

Rob Vawter

Andy Hsiung

Sound

>>Here's my new one: The programmer here is not able to play more than 1 sequence (in a SEP) at a time. If he tries to play another it >>waits until the first one is done playing. What is the procedure to do this??

Check out the sample psx\sample\sound\basic\main.c. It can play 2 different SEQs from the same SEP at once. My guess about what your problem might be would be your usage of SsSetTableSize. See pg. 707 of the Library Functions. I'm sure you'll let me know if this isn't the problem.

- Rob

---

12/12/95 1:18 PM

Starting location for CD-DA track

David W. Marshall

Sound

CD

FROM PREVIOUS EMAILS >>>2) If you know the length in minutes of the track, you can convert that to a sector length >>>using the following macros (which are not so cleverly hidden in thelibcd.h file). Use btoi to >>>convert the start point of the song to an int. Add the length of the song on, reconvert using >>>itob to get an end point.

>>I noticed that when using this method (or the method in tuto4.c for looping CD-DA), the >>starting time listed in the TOC contains an >extra 2 seconds for the 2 second lead-in time.

>>Therefore, you get 2 seconds of dead time when you start a track.

>>I add 2 seconds to the start time before passing it to the redbook functions. Any problem >>with this?

>>Shouldn't be any problems with this.

I have been running off the Emulator and have been using the above method of adding 2 seconds to the start of the CD-DA data to get the track to start on the correct time. I just burned a CD and ran it on a Black Cd Box and noticed that my redbook track was starting 2 seconds into the song.

Using the debugger, I found that the Emulator version and the CD version were returning different starting times for the redbook track. Using: CdILOC Toc[10]; CdILOC TrackPos; CdGetToc(Toc); TrackPos = Toc[2];

TrackPos for the emulator would equal 0,18,0. TrackPos for the CD would equal 0,20,0.

Anyone know why the different versions are reporting different start times? Are there layout commands in the CCS file that CDDISK pays attention to but that CDGEN doesn't.

thanks,

dave

---

12/13/95 9:36 AM  
Re(2): Volume, timing and fai  
P. (Leake / Scharnberg)  
Sound

You are correct. It was Heather Barclay who was having a similar crash of SFX when they came too close together.

Anyway, I would be glad to send you some code, but it is really quite straight forward. I issue an SsUtKeyOn command for each SFX I wish to trigger. If I issue two of these commands in quick succession, sometimes I get both sounds while at other times I get one and not the other (the order in which they are sent does not seem to influence which one I get in the case where one sound craps out).

The only funky thing I'm doing is for one-shot SFX, I turn them on with the SsUtKeyOn command, but I don't know when they end. Therefore, I keep the voice number, program number and note number around for each SFX, and issue a SsUtKeyOff command when SpuGetKeyStatus reports the status of that voice to be SPU\_ON\_ENV\_OFF. I obviously have to poll my table of SFX at some interval, and I am currently doing this during an 80-Hz interrupt generated from the system clock.

Any further ideas? What level of detail do you think you need to get at this problem?

Thanks for your help.

--Martin Wilde Viacom New Media

---

12/13/95 5:04 PM  
Re(3): Volume, timing and fai  
Buzz Burrowes  
Sound

Just an idea...

Have you adjusted the envelope for the given one shot sound effects? Are you using VABs or VAGs?

Here is the thing... I had a similar funky problem (not exactly the same symptoms but similar). I was triggering short little oneshot samples which had been added to a VAB without making any adjustments to the default ADSR. By adding a little decay to the envelope of the oneshot samples the problem went away. I can't see why it did, but... it works.

Another thing to try... if you haven't set any priorities do so... even if you just set them all to 1 instead of the default 0. Again, I can't think of a good reason why this would cure the problem, but from what I've seen it just might.

I hope I'm not sending you on teh proverbial "wild goose chase", but these simple things should be easy to try.

---

12/13/95 9:54 AM  
SMF parsing and EOT messages  
P. (Leake / Scharnberg)  
Sound

I'm playing Standard MIDI files (SMFs) in a non-standard way, at least to the PSX. I want to have control over the playback of individual tracks of a SMF (mute on/off, individual volume control/fading). Since my sequence requirements may exceed 16 tracks, I load the multitrack SMF into main RAM and parse the file myself during a regular interrupt generated off the system clock. (I know I could divide my SMF into individual SEQ files, but I have a number of concerns about their synchronization, which I MUST maintain among tracks for track-



swapping and the like, plus my need for more than 16 tracks, an inherent limitation of the seq table size in the box).

My problem comes in when I reach the end of each of these tracks, I obviously have to process each track's EndOfTrack meta-event before I can tell if the SMF is done and decide whether to loop it or go on to something else. These meta-events are only two bytes in length, but it appears I can't get through all the EOT messages before my next interrupt comes along.

Therefore, I never detect the SMF is done and all music stops because of the confusion.

I was initially trying to run my interrupt at 120-Hz, but could not even get through 12 of my tracks' EOT meta-events before the next interrupt. I had to drop my audio frame rate down to 80-Hz, but even then I do not always reliably get through all 12 tracks. I would imagine that your first inclination is to say I'm doing something wacky and highly time consuming (read BAD) in my code. However, this same code is running on a 486 PC and has no trouble running with 16 or more tracks at a 120-Hz frame rate.

What am I missing here? Why can't I keep up? In my test app, this is all that's going on. The only graphical display I have going is a FntPrint for the display of ASCII messages on the screen. But it happens just as randomly in the test app as it does in the full-blown graphically intensive game. I'm baffled. Any insight you folks could give would be greatly appreciated.

Thanks!

--Martin Wilde Viacom New Media

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12/13/95 2:26 PM

Re(3): Volume, timing and fai

Rob Vawter

P. (Leake / Scharnberg)

Sound

>> I issue an SsUtKeyOn command for each SFX I wish to trigger. If I issue two of these commands in quick succession, sometimes I >>get both sounds while at other times I get one and not the other (the order in which they are sent does not seem to influence which >>one I get in the case where one sound craps out).

>>Any further ideas? What level of detail do you think you need to get at this problem?

Two possibilities for lack of sound when 2 sounds are called nearly simultaneously are 1)

Priority levels of the SFX and 2) SsUtKeyOn's non-reentrantcy.

Since you say that the order the SFX are called in doesn't matter, #2 seems unlikely. Otherwise, the order would make a difference. When one call comes into SsUtKeyOff, another call to that function is blocked until the first finishes. Thus, when you call sound effect #1 first, sound effect #2 would not sound and vice-versa.

Perhaps all the available voices are currently being used. Then, if the priorities of the 2 SFX are different, only the higher priority sound might be heard. If the priorities of the SFX are the same, then #1 can be ruled out using the same logic.

These may not be the problems. Could you check the return values from SsUtKeyOn for the 2 sounds? If -1 is being returned, SsUtKeyOn is failing, otherwise the sound is being blocked in another way. That would help me uncover the problem quicker.

- Rob

---

12/13/95 9:37 AM

Re: Starting location for CD-DA track

Thomas Boyd

Sound

CD

Dave,

The emulator and the CD are not exactly the same (as you have discovered). One of our

developers has had success with the following method:  
put a dummy track in track 2 (the first DA track) start actual tracks in track 3  
like this:

```
AUDIO TRACK PAUSE 150 <<DUMMY.DA>> EMPTY 150  
AUDIO TRACK PAUSE 75 <<HVY_MTL.DA>> EMPTY 75  
etc...
```

There may be a better way to reconcile the two devices, but I have not had time to find it yet. So for now, I hope this hack helps you keep coding.

Tom -----

FROM PREVIOUS EMAILS >>>2) If you know the length in minutes of the track, you can convert that to a sector length >>>using the following macros (which are not so cleverly hidden in the libcd.h file). Use btoi to >>>convert the start point of the song to an int. Add the length of the song on, reconvert using >>>itob to get an end point.

>>I noticed that when using this method (or the method in tuto4.c for looping CD-DA), the >>starting time listed in the TOC contains an >extra 2 seconds for the 2 second lead-in time.

>>Therefore, you get 2 seconds of dead time when you start a track.

>>I add 2 seconds to the start time before passing it to the redbook functions. Any problem >>with this?

>>Shouldn't be any problems with this.

I have been running off the Emulator and have been using the above method of adding 2 seconds to the start of the CD-DA data to get the track to start on the correct time. I just burned a CD and ran it on a Black Cd Box and noticed that my redbook track was starting 2 seconds into the song.

Using the debugger, I found that the Emulator version and the CD version were returning different starting times for the redbook track. Using: CdILOC Toc[10]; CdILOC TrackPos; CdGetToc(Toc); TrackPos = Toc[2];

TrackPos for the emulator would equal 0,18,0. TrackPos for the CD would equal 0,20,0.

Anyone know why the different versions are reporting different start times? Are there layout commands in the CCS file that CDDISK pays attention to but that CDGEN doesn't.

thanks,

dave

---

12/14/95 10:09 AM

Re(4): Volume, timing and fai

P. (Leake / Scharnberg)

Sound

Buzz

Thanks, I'll try your suggestions. I have not touched the ADSR settings of the SFX VAGs that are contained within my VAB. I'll also try tweaking the priorities. BTW, what was the nature of the funky behavior you experienced? Were voices dropping out as in my case and in Mike Henry's and Chris Stevens' cases? Could this all be part of the same problem? It's quite disturbing. Could there be an inherent latency in the KeyOn commands which, because they are non-reentrant, cause some notes on to be missed because the box has not finished processing the last one yet? This seems likely, but for now only theoretical.

Should tweaking ADSR and priorities improve the situation, this tells me that my notes are being processed differently than without these "fixes." Can you shed any more light on what is going on internally in the PSX that would help me avoid such peculiarities in the future?

Thanks! --Martin Wilde Viacom New Media

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12/18/95 10:29 AM

Re(5): Volume, timing and fai  
Buzz Burrowes  
Sound

>> BTW, what was the nature of the funky behavior you experienced?

Well, actually, my problem was that notes were getting stuck ON! It was obvious from looking at the problem very closely that it was a voice allocation problem. AS best as I can figure...

- a NoteOn message in a MIDI (SEQ) score caused the sound libraries to set up a voice to play an organ sample (important note: this is a looping sample with ADSR settings.)

- Just before the organ note is heard, by way of player input, I need to play a tiny little sound effect (a one-shot sample... no adjustments made to the ADSR).

... even though there appears to be open/available voices ...

The little sound effect never gets set up, and instead the SsUtKeyOn call intended for that sample triggers a voice to play the ORGAN SAMPLE!@!!@!

Now, since the effect was supposed to be a one-shot I never call a KeyOff command... so the organ sound plays forever (or until reset... which ever comes first.)

The problem disappeared when I went back to the VAB and added just a little decay to the envelope of the one-shot sample.

There is a weird little bug creeping around inside the voice allocation code and it has to do with determining if a voice is free or not. I'm confident of that. The problems you have described, while not the same as mine, point back to voice allocation. Could be another symptom of the same disease.

>> Can you shed any more light on what is going on internally in the PSX

I wish I could. I'm currently trying to bundle up some example code to ship to Japan which demonstrates the bug. The problem is that it happens only very occasionally... it is quite difficult to reproduce. (Except by our internal test department. One guy can get it to happen after about 15 minutes of gameplay. Otherwise, under normal playing conditions it happens about once per 10 hours of test.)

I'm sure once they get the code and see the problem they'll be able to straighten it out.

---

12/19/95 7:17 AM

Volume tracking - Oops!

P. (Leake / Scharnberg)

Sound

Buzz -

I apologize - I don't mean to flame unnecessarily or take up support bandwidth with redundant questions. I just re-discovered one of your replies which read:

>>BTW: My last post won't help your problem of trying to change a sound's volume while it is playing. It will only effect future NoteOn messages. I believe you are going to have to keep track of all voices currently referencing a given patch and adjust their volumes individually.

However, the end of my last posting still goes:

>>This information must already kept internally to the PSX, I just need access to it. The redundancy in voice/volume bookkeeping presents way too much overhead for our game, and NOT having this information at all would seriously compromise what we are trying to deliver in this product.

Any help you could provide in this area would be greatly appreciated.

Thanks.

Martin Wilde Viacom New Media

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12/19/95 7:13 AM  
Re(4): Volume, timing and fai  
P. (Leake / Scharnberg)  
Sound

Buzz -

Previously I asked: >> Is there any way to affect the volume of sounding voices on a >> program-by-program basis without haveing to keep track of >> which voice numbers are playing and what their current >> volume is?

You replied: >>I would think you could hack the VH data in main memory to alter a program's volume. See page 53 of the "Sound Artist Tool" book. You will find the VH structure.

I have done this on both within the context of the ProgAtr and VagAtr structures. Twiddling these volume settings have their effect on any subsequent notes on, but NOT on any notes currently sounding. So my inital question above remains. Again, I

>> want to adjust the volume of sustained sounds on the fly (ala MIDI controller 7)

across all notes currently sounding and yet to sound using a particular program. It is obvious to me that this information is kept around inside the box as one can issue an SsSeqSetVol command and have all programs within that SEQ be adjusted. However, I need to adjust the volume of individual tracks within my multi-track SMF and am therefore parsing it myself and NOT turning it into a SEQ file. Where can I get access to this information? I have not found it within the confines of the current API. I know I could

>>keep track of all currently playing voices (using SsUtKeyOn, SsUtKeyOff and then SsUtSetVVol) and do all the adjustments myself on a voice-by-voice basis? I'd really rather NOT have to do this.

This information must already kept internally to the PSX, I just need access to it. The redundancy in voice/volume bookeeping presents way too much overhead for our game, and NOT having this information at all would seriously compromise what we are trying to deliver in this product.

--Martin Wilde Viacom New Media

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12/19/95 9:39 AM  
Re(5): Volume, timing and fai  
Buzz Burrowes  
Sound

>> It is obvious to me that this information is kept around inside the box as one can issue an SsSeqSetVol command and have all programs within that SEQ be adjusted.

Well, actually, I think that what the internal SEQ playing functions do is keep a master volume multiplier stored which is applied to each velocity value at the time of a NoteOn. I believe that if you do a SsSeqSetVol on an SEQ that is playing it only affects future NoteOn messages. This is kind of a kludge. (At least that is the way it used to work, I haven't played with it lately.) The problem you are encountering was obviously a problem for the developers of the libraries as well.

I believe that if you want to do your own parsing, and need to do sophisticated voice adjustments, you are going to have to dig in an use LIBSPU. You will need to set up voices, and keep a voice table current. It is not impossible, but you'll have to use LIBSPU.

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12/19/95 9:42 AM  
Re: Volume tracking - Oops!  
Buzz Burrowes

Sound

>> I apologize - I don't mean to flame unnecessarily or take up support bandwidth with redundant questions.

Don't worry about it.

Actually I'm NOT a member of the Sony 3rd Party support team. So, if things get too ugly I've got the option of not logging on ;-)

(Just kidding, I learn as much from this section as the rest of you.)

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12/19/95 6:55 AM

Re(6): Volume, timing and fai

P. (Leake / Scharnberg)

Sound

Regarding notes getting stuck on, I have experienced this problem with older versions of the sound libraries. (I am currently using the 3.3 libs, release 1.5.7.) I would play my MIDI files, doing my own SMF parsing and issuing SsVoKeyOn and SsVoKeyOff calls only, and found that the key off commands were NOT working. I.e., notes were getting turned on but never getting shut down and so would play forever resulting in a clamorous cacophony until reset. This problem seems to have gone away with the current library release.

But I still have the problem where I'm losing notes or SFX at random, even when I'm only using 6-12 simultaneous voices. This occurs BOTH on my development system AND on the Sound Artist Tool board on one of our producer's Mac. From what you say of your experience, I agree our problems could also be related to voice allocation as well.

>>The problem disappeared when I went back to the VAB and added just a little decay to the envelope of the one-shot sample.

This last part is what I do not understand. How would changing the envelope influence the selection/allocation of a voice? Do you have any idea on the time frame we're looking at for this problem to be straightened out?

Thanks for your help. --Martin Wilde Viacom New Media

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12/21/95 10:24 AM

resource allocation for sound

clearwater

Sound

- I'm just starting to get into the sound and had a question about the memory usage for streaming music off the CD. In the hardware manual, it states that the CD-ROM buffer is used to buffer the data off the CD, which is reasonable, but that the SPU buffer is also used - I presume this is because the SPU can only access the Sound buffer. Does anyone out there know how much of the sound buffer must be reserved for CD streaming, if any? Do I have control over this allocation?

Thanks in advance to all of you working through christmas

Mick Delaney (clearwater)

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12/28/95 12:11 PM

Problems with SsIsEos call

Dave Feldman  
Sound

When I try to use the SsIsEos call, I always seem to get a return value of 0 even when the specified sequence is playing (I'm using SEQs and specifying the seq number as the access\_num in the first parameter, and 0 as the seq\_num in the second parameter).  
Has anyone had any success with this call? Any known bugs? Or, is there another way to find out if a given sequence is done playing?  
Thanks!

---

12/28/95 3:58 PM  
Re: Problems with SsIsEos call  
Rob Vawter  
Dave Feldman  
Sound

>>When I try to use the SsIsEos call, I always seem to get a return value of 0 even when the specified sequence is playing (I'm using >>SEQs and specifying the seq number as the access\_num in the first parameter, and 0 as the seq\_num in the second parameter).  
Yow. Sorry to let you know that I added an SsIsEos call into the sample\sound\balls sample code and got it to return a value corresponding to whether or not it was playing, using the seq number as the access\_num and 0 as the seq\_num. Perhaps you are using the wrong seq number or something. I haven't heard of any other problems with SsIsEos. What version of the libraries are you using?  
- Rob

---

12/29/95 10:24 AM  
Re(4): CD buffer  
Thomas Boyd  
CD  
Dan Burnash  
OK. This is the story of the CD ROM subsystem sector buffer:  
The CD-ROM subsystem sector buffer is currently 32K. It is located in the CD-ROM subsystem. It uses a sort-of tripple buffering system to read sectors in and make one (and ONLY one) sector available to the user.  
Common questions that spring to mind and their answers:  
Q: 32K - (2352 bytes/sector)\*(3 buffered sectors) = lots of leftover RAM! Can I use it? A: No. It is not accessible by anything but the CD-ROM subsystem.  
Q: How dissappointing. As consolation, can I be told what the extra memory is used for? A: The memory was going to be used for sound mapping, but (1) the system would be too slow, and (2) sound mapping is already done by the SPU. The current implementation of this memory is ... nothing. It is vestigial and will be cut out in future manufacturing cost reduction designs.  
Tom

---

1/3/96 12:04 PM  
Audible Click When Starting A Sound  
Mark DeSimone  
Sound

I am trying (without any success) to get rid of an audible click every time I start a sound. Is there any way to get rid of this annoying artifact?  
I am using VAG files loaded directly to the SPU and started using SpuSetKey(SPU\_ON, mask);  
We have noticed this in at least one currently published game.  
I appreciate any help you can give me.  
Glenn O'Bannon Rainbow America

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1/3/96 5:20 PM  
SsVabOpen function  
Rob Vawter  
Sound

The following is quoted from the changes.txt from Library version 3.4 (soon to be forthcoming):  
Note The following item must be noticed.

SsVabOpen() function This function is not recommended to be used because waveform data (.VAB) header information and waveform data information are left on the main memory, and they consume available area of the main memory.

When developing a title, divide .vab into .vh (header information) and .vb (waveform data information) by the tool, VABSPLIT.EXE, on the DOS, and use SsVabOpenHead() and SsVabTransBody(). The processing flow is as follows:

```
/* Transfer of .vh information to main memory */      /* Transfer of .vb
information to main memory */      SsVabOpenHead(...);      SsVabTransBody(...);
SsVabTransCompleted (SS_WAIT_COMPLETED);      /* Possible to delete .vb data from
main memory here */      SsSeqOpen (...);
```

Note that SsVabOpen() will be deleted in the next version.

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1/4/96 7:39 AM  
Re: SsVabOpen function  
P. (Leake / Scharnberg)  
Sound

By using SsVabOpenHead() and SsVabTransBody(), will BOTH the header and waveform data are transferred into SPU RAM? If I need/want to parse the VAB header myself, can I do this if it's in SPU RAM, or will I have to use the API to get things like VAG and program attributes? Is there any way to access SPU RAM directly?

Upon using SsVabOpen(), the docs state that the VAB data is automatically transferred to SPU RAM and therefore I call SsVabTransCompleted(SS\_WAIT\_COMPLETED) afterward. I assume that I could then delete the VAB data from main RAM. How is this different from the way things will happen now with the two-step loading?

Thanks for the update.

P.S. Any news on when a modified SsVoKeyOn() function, returning a voice list of some description, will be ready?

--Martin Wilde Viacom New Media

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1/4/96 11:21 AM  
Re: Audible Click When Starting A Sound  
Rob Vawter  
Mark DeSimone  
Sound

>>I am trying (without any success) to get rid of an audible click every time I start a sound. Is there any way to get rid of this annoying >>artifact?

Two things you can try: Slowing down the attack rate in the ADSR settings (this may not work for you as the volume may then be too low at the beginning of your sample) Starting the sample at 0. In other words, making sure the beginning of the sound hasn't been clipped. You may be getting the click because the jump from no sound to the level of sound you have may be too great.

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1/5/96 12:36 PM

New SsVoKeyOn-like thing

P. (Leake / Scharnberg)

Sound

Rob Vawter

Rob -

Any luck on getting a new version of SsVoKeyOn to return a voice list of the voices it turned on when called? I REALLY NEED this functionality for our project. Please let me know at your earliest convenience what the status is on this.

Looking forward to your reply.

--Martin Wilde Viacom New Media

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1/7/96 2:14 PM

Spu Streaming library questions

Mike Benna

Sound

I'm having two problems with the SpuSt\* library functions:

1) Is there really no way to terminate a stream faster than waiting for all the current data to be played? The only way I can figure out to terminate a stream is to set the last\_size structure member to 0 and .status to SPU\_ST\_STOP but that still takes several seconds before output ceases and I can begin a new stream of data.

2) I'm having a strange problem which I cannot solve and I'm hoping someone can give me some pointers on where to look next to find the problem. I'm \_sometimes\_ having problems terminating a stream using the above method... in some instances it seems that the SPU\_ST\_STOP status is ignored and I keep getting TransferFinished callbacks, even though I set SPU\_ST\_STOP before the last transfer. In this case, the TransferFinished callbacks begin to come much more quickly than would normally be expected and the StreamFinished callback never gets called.

Any suggestions? Thanks for any info you can provide.

---

1/12/96 2:43 PM

Re: PC Sound Tools

Rob Vawter

Greg G. Gibson

Sound

I am starting our Sony Development Audio department and our entire system is currently PC-Based with many great tools. How much of the mac sound tools are available for the PC. Is there a way to get around adding a mac to our studio..??Which things would I be missing ?

Tools available for the PC: aiff2vag, seq2sep, vabsplit. Look in Sound\Sound Artist Tool\Pc



Sound Utilities. Movie Converter. Tools available for the Mac:aiff2vag, raw2da, raw2xa, Sound Deli, smf2seq, vagplayer.  
Basically, you would be losing the ability to make VABs easily from Vags. I'd add a Mac somehow if I were developing sound.

---

1/14/96 10:11 AM  
Re: Spu Streaming library questions  
Mike Benna  
Sound

I posted two SPU streaming library questions last week but haven't had any response yet. Is there some kind of hold-up I should know about?

---

1/15/96 3:42 PM  
Re(2): Spu Streaming library questions  
Dan Burnash  
Sound  
Mike Benna

Tom and I will get you the answers this week. Sorry for the delay, Rob is busy slacking off in Aruba. We tried to tell him he had to log on daily and answer any questions before he hit the water, but he wouldn't go for it.

---

1/19/96 6:15 PM  
Sound hardware failure?  
Dr. Cat  
Sound

Again, I'm having a problem with something that worked on my development system a few months ago, and has simply stopped working now. I went and tried to run some of the sample sound programs, to decide which to use as a base for my own sound code. They all worked fine before, now if I try to run any of them they lock up.

I used the debugger to trace \psx\sample\sound\balls\main.c and see what was going on. Here's what happens:

When it executes SsInit(), the message window displays "SPU:T/O [wait (reset)]" and then "SPU:T/O [wait (wrdy H -> L)]" The next few lines execute ok, then when it runs SsVabTransCompleted(SS\_WAIT\_COMPLETED) it hangs, and I get the "Target did not respond" dialog box in the debugger.

I tried unplugging the development cards, pushing down on what few chips are socketed, and putting them back in the PC, making sure they were firmly seated. Same problem afterwards. All the graphics demos still run fine, and so does the game I'm developing, which doesn't have any sound code added yet. The only significant changes I have made to my system in the last few months are: removed a sound card, replaced it with a second SCSI adaptor (since the CD-ROM burner requires the 1542), and installed ASPI drivers for the SCSI card. For some reason the new SCSI card makes EMM386 fail with the message "Unable to set page frame base address", so I'm also running with no EMS available now. But I wouldn't think that'd cause problems with the sound on the dev system.

My working theory is that one of the cards has gone bad and needs to be replaced, just as my CD emulator card did. But I'd be happy to try anything else that anyone can suggest. I need to get sound working to get to my next milestone!

-- Dr. Cat

---

1/20/96 8:18 PM

Re: Sound hardware failure?

Dr. Cat

Sound

Well, I managed to solve my own problem. Reading through another section of the BBS, I saw some messages from someone who was getting the same error message. You need to have the external CD drive or the little blue terminating connector plugged into the development card. I don't know when or how I removed that little blue plug without even remembering it, especially considering how difficult it is to get the development card in and out of the PC, but I found it in my desk drawer, plugged it back in, and now everything is fine.

As soon as I figure out how to play a digitized sound file, I'm sure I'll be back with more questions. Folks that designed this product thought it'd be a good idea to use 800k 22khz digitized sound files, hoping I can stream chunks of them to the SPU from main memory or something...

-- Dr. Cat

---

1/21/96 12:30 PM

Re(2): Sound hardware failure?

Sam Black

Dr. Cat

While I haven't actually attempted it yet, the PSX CAN stream ADPCM data from the CD and play it. (Without too much interaction with the main program.)

See p. 56 of Run Time Library Release 3.0/Overview Manual for more info.

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1/23/96 10:42 AM

Re(3): SPU Streaming library questions

Mike Benna

Sound

Hey guys, it's been two weeks since I posted these questions the first time... could you please set aside some time to look into these for me? Thanks.

Here's a repost of the original message:

I'm having two problems with the SpuSt\* library functions:

- 1) Is there really no way to terminate a stream faster than waiting for all the current data to be played? The only way I can figure out to terminate a stream is to set the last\_size structure member to 0 and .status to SPU\_ST\_STOP but that still takes several seconds before output ceases and I can begin a new stream of data.
- 2) I'm having a strange problem which I cannot solve and I'm hoping someone can give me some pointers on where to look next to find the problem. I'm \_sometimes\_ having problems terminating a stream using the above method... in some instances it seems that the SPU\_ST\_STOP status is ignored and I keep getting TransferFinished callbacks, even though I set SPU\_ST\_STOP before the last transfer. In this case, the TransferFinished callbacks begin to come much more quickly than would normally be expected and the StreamFinished callback never gets called.

Any suggestions? Thanks for any info you can provide.

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1/23/96 5:57 PM  
Re(2): PC Sound Tools  
Dr. Cat  
Sound

> Tools available for the PC: aiff2vag, seq2sep, vabsplit. >> Basically, you would be losing the ability to make VABs easily from Vags. > I'd add a Mac somehow if I were developing sound. I'm in a similar situation - working entirely on PC, getting a Mac would be somewhat inconvenient. However, I am converting a PC product that makes very simple, limited use of sound. I wouldn't have any problem implementing everything with VAG files. The problem is - all the sound sample programs use VAB files. Is there any sample code anywhere for loading a VAG file and playing it? That is all I need to do, if I could manage that I probably wouldn't need a Mac for anything!  
-- Dr. Cat

---

1/24/96 2:57 PM  
Re(3): PC Sound Tools  
Mark DeSimone  
Sound

For sound effects, we simply strip off 48 bytes from the top of the vag data, load the rest into the SPU, and (after setting up the voice attributes) use SpuSetKey(SPU\_ON, voice #). It plays until it's finished or you turn it off.  
Glenn O'Bannon Rainbow America

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1/24/96 4:21 PM  
Re(3): PC Sound Tools  
Rob Vawter  
Dr. Cat  
Sound

>> Is there any sample code anywhere for loading a VAG file and playing it?  
Yes. It's just well disguised. Check out psx\sample\sound\tuto\tuto1.c. The sample "sin.h" is actually a VAG with the header (first 48 bytes) stripped off.  
It's too bad you will only be using VAGs. Hopefully, even without a Mac, you can somehow find a way to better take advantage of the sound capabilities of the PlayStation.  
Looking forward to more sound questions from you.

---

1/25/96 5:51 PM  
Re(5): PC Sound Tools  
Rob Vawter  
Dr. Cat  
Sound

Actually, the loops are not stored in the header. Strip the header off and play a looping VAG. I'm wondering if I can get away without the header info - I read in some of the earlier info in the sound conference that the information on whether the VAG loops or not is stored in its header, and I do need to loops

these sounds. I also read that information to compensate for different sample rates is stored in the header, but I'm assuming that I'll be able to adjust the pitch manually easily enough to play back at the right speed. Is there some way I can do the looping manually too, if I dump the headers?

---

1/25/96 2:59 PM  
Re(4): PC Sound Tools  
Dr. Cat  
Sound

>> Is there any sample code anywhere for loading a VAG file and playing it?  
> Yes. It's just well disguised. Check out psx\sample\sound\tuto\tuto1.c. > The sample "sin.h" is actually a VAG with the header (first 48 bytes) stripped off.  
I'm wondering if I can get away without the header info - I read in some of the earlier info in the sound conference that the information on whether the VAG loops or not is stored in its header, and I do need to loops these sounds. I also read that information to compensate for different sample rates is stored in the header, but I'm assuming that I'll be able to adjust the pitch manually easily enough to play back at the right speed. Is there some way I can do the looping manually too, if I dump the headers?  
-- Dr. Cat

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1/26/96 11:42 AM  
Re(5): PC Sound Tools  
Rob Vawter  
Mark DeSimone  
Sound

>>What "sound capabilities" would I be taking advantage of if I used other than VAG files?  
Interleaved sound and video data in XA. MIDI scores can make the music more interactive - different instruments in a score can be turned on/off depending on how well the player is doing/where the player is located.  
Perhaps "sound capabilities" was a poor choice of words. I think that sound is often neglected in video games, especially in terms of interactivity.

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1/26/96 9:56 AM  
Re(4): PC Sound Tools  
Mark DeSimone  
Sound

What "sound capabilities" would I be taking advantage of if I used other than VAG files?  
Glenn O'Bannon Rainbow America

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2/6/96 2:17 PM  
Re(4): Spu Streaming library questions  
Rob Vawter  
Mike Benna  
Sound

Q1) Is there really no way to terminate a stream faster than waiting for all the current data to be played? The only way I can figure out to terminate a stream is to set the last\_size structure member to 0 and .status to SPU\_ST\_STOP but that still takes several seconds before output

ceases and I can begin a new stream of data.

A1) I will forward the response I just received from Japan: "In the current specification of SPU streaming, SPU stream can only start after the data of half-size of stream buffer is transferred. As the reasonable way, by transferring the first data for another stream with SpuStTransfer(SPU\_ST\_PREPARE, another\_voice) before switching stream, smooth switching the SPU stream is available." So the answer to your original question would unfortunately be "yes, there is no other way". Can you change the buffer size? This would at least decrease the lag time. Also, the documentation was correct: "However, if the sound cancellation (Key off) is carried out for the voice where the stream is processed, the state of the sound library may be unstable. Be sure to carry out the sound cancellation after the stream termination processing." The sample code for streaming was incorrect in using a SpuSetKey(SPU\_OFF,all\_voices).

Q2) I'm having a strange problem which I cannot solve and I'm hoping someone can give me some pointers on where to look next to find the problem. I'm \_sometimes\_ having problems terminating a stream using the above method... in some instances it seems that the SPU\_ST\_STOP status is ignored and I keep getting TransferFinished callbacks, even though I set SPU\_ST\_STOP before the last transfer. In this case, the TransferFinished callbacks begin to come much more quickly than would normally be expected and the StreamFinished callback never gets called.

A2) Still working on this. Haven't reproduced it yet, sorry.

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2/6/96 1:52 PM

Re(4): Spu Streaming library questions

Mike Benna

Sound

Well, it's been another week and I still haven't heard anything helpful about our Spu streaming problem (it has been over 4 weeks since I first brought the problem up). Is anyone actively looking into this? We're getting very close to finishing our project and we need to get this problem resolved ASAP. This problem has prevented us from putting music into the game so we definitely need to get it fixed soon so the game can be tested thoroughly with music. We've also got the CdGetSector/StoreImage screen glitching problem outstanding but I'll post about that in the CD conference.

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2/7/96 4:22 PM

Re(5): Spu Streaming library questions

Mike Benna

Rob Vawter

Sound

Thanks, I'll see how that information helps me.

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2/8/96 8:36 PM

Re: Streaming XA CD data from a non-CD device

Dennis Harper

Sound

BTW, I don't want to use a CD emulator board to do this. Our final product will need to be able to stream audio off of the hard drive.

Thanks, Eu-Ming Lee Time Warner Interactive

---

2/8/96 8:11 PM

Streaming XA CD data from a non-CD device

Dennis Harper

Sound

I would like to stream XA CD data audio from a hard drive. The only examples I could find require a CD-ROM player. Is there a way to decode XA data into raw data in main memory before sending it into the SPU? Or is there a way to send XA data from main memory into the SPU for the SPU to decode? Will I be able to handle the timing of the streaming process without a CD-ROM attached?

Thanks, Eu-Ming Lee Time Warner Interactive

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2/12/96 10:17 AM

Re: Streaming XA CD data from a non-CD device

Rob Vawter

Dennis Harper

Sound

I would like to stream XA CD data audio from a hard drive. The only examples I could find require a CD-ROM player. Is there a way to decode XA data into raw data in main memory before sending it into the SPU? Or is there a way to send XA data from main memory into the SPU for the SPU to decode? Will I be able to handle the timing of the streaming process without a CD-ROM attached? BTW, I don't want to use a CD emulator board to do this. Our final product will need to be able to stream audio off of the hard drive.

\_\_\_\_\_ Since you are a coin-op guy, I forwarded your question here to R&D who emailed me the following:

I think it is not easy to decode XA data by software in real time. And also, we cannot put XA data directly to SPU. I think it is easier to use audio data for SPU instead of XA data. In that case, he needs to write some programs to achieve SPU streaming. I will ask a Japanese guy about it. It will be next week since it is already week end in JAPAN today.

I will let you know what I hear back.

---

2/13/96 3:03 PM

Dynamic voice stuff

P. (Leake / Scharnberg)

Sound

Rob Vawter

Sound folks -

Allow me to run this by you:

Our game calculates the position of many different objects on the fly. These objects get created dynamically, at which time they are assigned an appropriate looping sound (begun with SsVoKeyOn, which now returns the voice number(s) used for that sound). The game code calls me every so often with updated coordinates and I translate those coordinates into calls to SsUtSetVVol. When that object is killed, the sound is stopped with a call to SsVoKeyOff, returning those voices to the pool of available resources. Everything seems to be working OK with my test code, but when we roll it into the game itself (where there is a LOT of this stuff happening all the time), things are breaking. At times the music/MIDI notes seem to get

adjusted by the SsUtSetVVol calls instead of the intended SFX voices. (This does not appear to be a logic error as I keep a table of which voice(s) were turned on for the SFX and only adjust those voice numbers). Additionally, objects created after the first ones are killed often are silent, although their voice numbers look fine (SsVoKeyOn succeeds). This is very weird stuff. Any ideas what may be causing this to happen?

Thoughts and observations:

I've tried setting the priority levels of the looping SFX VAGs higher than those for the MIDI notes, but that did not solve the problem. I have seen in the documentation something about allocating some number of voices for the SS versus the SPU lib. What is that, and could that be a problem? Is SsUtSetVVol a stable routine? Is anyone else using this?

Any help you could offer would be greatly appreciated.

THANKS! Martin Wilde Viacom New Media

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2/14/96 6:56 AM

Need more info on the "new" SsVoKeyOn

P. (Leake / Scharnberg)

Sound

Rob Vawter

I now suspect that I'm not decoding the return value of SsVoKeyOn correctly. My initial tack was to look to see what bit was set in the return value and translate that bit number directly into a voice number (e.g., bit 24 set = voice 23). But I have run into problems with this logic in that I am seeing two simultaneous sounds report the same voice number. In a previous conversation I had with Dan Burnash, he seemed to think that the voice numbers were being returned via some weird groups of 4 bits.

Would you please explain how to interpret the return value of SsVoKeyOn correctly?

Thanks.

--Martin Wilde Viacom New Media

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2/16/96 10:41 AM

Re: libspu and libsnd usage...

Buzz Burrowes

Sound

>> Now, is there any way to get libspu and libsnd to coexist peacefully?

Yes

>>So far when I try to introduce MIDI playback into the game (using libsnd) which currently uses libspu, my program crashes (sigh).

When does it crash?

Basically, LIBSND inits LIBSPU. So, if you init LIBSND you can use lib spu calls without doing the LIBSPU init calls. You might be crashing because you are initing the SPU library twice.

The other thing you will want to look at is the SsSetReservedVoice function (part of LIBSND) this function will set aside voices for LIBSPU calls. The issue is this... LIBSND uses the priority info in your VAB's header to "intelligently" allocate voices from the pool of 24. On the other hand, LIBSPU requires you to specify the voice you want to twiddle in its functions. Using SsSetReservedVoice limits the number of voices LIBSND will be able to choose from during voice allocation.

There are pros and cons to using LIBSND for ALL sound playback... PROS... 1) you don't have to explicitly set aside voices for SFX and music. By simply setting the priorities appropriately in SoundDeli. you can be sure your sfx will be heard while letting the library deal with voice

allocation. 2) sfx can be logically grouped into patches (programs) and banks (vabs) and downloaded all at once to SPU RAM.

CONS... 1) you will need to keep the vab's header (.vh) in main memory at all times so LIBSND. (using LIBSPU you wouldn't be working with a vab, so no vab header.) ... ah, ... well, ... i'm sure there are alot more points to be made on both sides of the issue.

Actually, I would encourage the rest of you out there to chime in with your feelings on this issue. What are the advantages and/or disadvantages to using LIBSND for simple sample playback (assuming the library needs to be linked in anyway since it will be used for MIDI playback)?

---

2/16/96 9:20 AM

libspu and libsnd usage...

stephen chaplin

Sound

Hello all, We have converted some VOC files from the PC into VAG files for the PSX using a few conversion programs. So far we simply strip the first 48 bytes of the VAG and play them using libspu. Now, is there any way to get libspu and libsnd to coexist peacefully? I would like to use libsnd for playing the MIDI scores that we have (it seems so straightforward), yet use libspu for simple digital sound playback. So far when I try to introduce MIDI playback into the game (using libsnd) which currently uses libspu, my program crashes (sigh). I am not sure I want to use libsnd to do something as simple as playback of raw sampled sounds, so what am I to do?

Thanks, Romesh, Celeris Inc.

---

2/21/96 9:55 AM

Re(2): libspu and libsnd usage...

stephen chaplin

Sound

Buzz Burrowes

Thank you for your info, doing the init twice was crashing the program. I really appreciate your help and thorough reply.

Thanks again, Romesh

---

2/21/96 9:59 AM

SpulsTransferComplete from Event Routine

stephen chaplin

Sound

Due to the way in which Virtual Pool calculates the physics, sound effects are calculated ahead of time and are scheduled in a queue. Now, I have reprogrammed one of the timers to "tick" 240 times a second. In this routine, I send the sound effects to the sound processor and deschedule sound effects. When I try to execute SpulsTransferComplete from this routine, it hangs the system.

So, is there anyway in which I can use the function in an event routine?

Any help would be most appreciated, Romesh

---

2/21/96 5:53 PM

Re: Need more info on the "new" SsVoKeyOn



Rob Vawter  
P. (Leake / Scharnberg)  
Sound

Q:I now suspect that I'm not decoding the return value of SsVoKeyOn correctly. My initial tack was to look to see what bit was set in the return value and translate that bit number directly into a voice number (e.g., bit 24 set = voice 23). But I have run into problems with this logic in that I am seeing two simultaneous sounds report the same voice number. In a previous conversation I had with Dan Burnash, he seemed to think that the voice numbers were being returned via some weird groups of 4 bits.

Would you please explain how to interpret the return value of SsVoKeyOn correctly?

A:You have interpreted the return value of the New SsVoKeyOn correctly. I'm not sure what might be going on with 2 sounds reporting the same voice number. Any chance you have a small example you can send? I can't seem to replicate that here.

---

2/22/96 11:29 AM

Re(2): Need more info on the "new" SsVoKeyOn

P. (Leake / Scharnberg)

Sound

I believe I have determined why I get 2 sounds reporting the same voice number. Since I keep some looping sounds around as well as play back MIDI files, voices got re-used because I wasn't setting the priority of my SFX higher than my music sounds. Additionally, I was using SsVoKeyOn on numerous objects all of which turned on the same note on the same program. This worked fine until I turned one off with SsVoKeyOff. Then ALL of the objects which were using that note got turned off, but I still thought the remaining objects were playing and continued to adjust those voices. This had the effect of adjusting whichever thing might now be using that voice. No real insight or surprises here, just took me awhile to wade through the symptoms.

Thanks for clarifying the return of SsVoKeyOn. BTW, SsVoKeyOff has also been redefined to return a long. What does it return, and how should we interpret that?

--Martin Wilde Viacom New Media

---

2/22/96 11:39 AM

Re(3): libspu and libsnd usage...

P. (Leake / Scharnberg)

Sound

Hey, all -

Am I doing something bad? Since I, too, would like to use calls in both libspu and libsnd, my initialization routine calls the following in the order presented:

```
SpuInit(); SpuSetTransferStartAddr(0x1000); SpuWrite0(512*1024); SsInit(); SsStart();
```

Anything wrong with any of this?

--Martin Wilde Viacom New Media

---

2/22/96 12:48 PM

Re(4): libspu and libsnd usage...

Buzz Burrowes

Sound

>>----- Hey, all -

Am I doing something bad? Since I, too, would like to use calls in both libspu and libsnd, my initialization routine calls the following in the order presented:

```
SpuInit(); SpuSetTransferStartAddr(0x1000); SpuWrite0(512*1024); SsInit(); SsStart();
```

Anything wrong with any of this? >>-----

Well, I'm sure Rob could tell you with more confidence since he can look at the library source code, but the first thing that comes to mind is my previous post regarding initing LIBSND and LIBSPU. Since SsInit() does SpuInit(), I don't see why you couldn't change the above too...

```
SsInit(); SpuSetTransferStartAddr(0x1000); SpuWrite0(512*1024); SsStart();
```

Of course, if the code you've posted isn't crashing I would assume your OK.

---

2/23/96 3:27 PM

Lib 3.4 SpuVmSetVol Bug !

John Brandwood

Sound

Rob Vawter

In changing from lib 3.3 to lib 3.4, I've found a few divide by zero bugs in my code that weren't getting reported under the old lib 3.3, but seem to be getting checked for in the new lib 3.4.

Unfortunately, after stomping on all the bugs in my code, I've found one in the LIBSPU library code.

The function is SpuVmSetVol, and the code goes ...

```
div a3,v0 bne v0,xxxxx nop break $1c00 addiu at,zero,-$1 bne v0,at,yyyyyy
```

Until this gets fixed I've changed back to using the 3.3 sound libraries.

Good hunting,

John.

---

2/23/96 12:49 PM

Re(3): Need more info on the "new" SsVoKeyOn

Rob Vawter

P. (Leake / Scharnberg)

Sound

Q: Thanks for clarifying the return of SsVoKeyOn. BTW, SsVoKeyOff has also been redefined to return a long. What does it return, and how should we interpret that?

A: Short answer: garbage.

Long answer: At this point it returns garbage. A counter is incremented for the number of voices turned off by SsVoKeyOff. No information about which voices have been turned off is returned.

Additionally, the way it is written is buggy.

Say you had four of the same looping sounds playing in voices 1-4 (you'd be doing this if maybe you had 4 moaning ghosts, with each ghost moaning at a different start time - sort of a "Row, row, row your boat" with ghosts). The player walks away from the ghosts so you key the sound off using SsVoKeyOff (all four sounds would key off). A "4" is returned, as 4 voices were keyed off. Now, the player walks in the dungeon toward a ghost again, so a ghost gets keyed back on in voice #1. The player walks away yet again, so 1 ghost voice is turned off this time with SsVoKeyOff, yet a "4" is still returned if no other sounds occupied the voices between the SsVoKeyOffs. This occurs because the info regarding the voices VabId, note, etc is never cleared, just overwritten.

Ignore the value returned - I'll see if we can get it to match up with SsVoKeyOn.

- Rob

---

2/26/96 5:35 PM  
Jumping into a SEQ  
Ted Morris  
Sound

Is there any way to start playing from an arbitrary position of a SEQ? It does not look like the libraries support more than PLAY/STOP/PAUSE. I need to be able to switch from one point in a song to the same point in a different song.

---

2/27/96 3:38 PM  
Re: Jumping into a SEQ  
Buzz Burrowes  
Sound

>> Is there any way to start playing from an arbitrary position of a SEQ? It does not look like the libraries support more than PLAY/STOP/PAUSE. I need to be able to switch from one point in a song to the same point in a different song.

Short answer... No.

Long answer... There is a possible solution... break your sequences up into little pieces (4 bars, 8 bars, 16bars, whatever) and put MIDI messages just before the end of each of these pieces that will cause a MIDI callback message. When your program receives the callback message, check the game state and then use SsSeqSetNext(...) to cue up the next sequence to be played. This way you have a bunch of possible branch points to go off and play a different sequence.

Obviously, you will only be able to branch at these pre-defined points... not instantaneously with gameplay conditions.

It just depends on what exactly you are trying to do.

---

2/28/96 5:23 PM  
Re(3): Jumping into a SEQ  
Buzz Burrowes  
Sound

>> In the scenario you describe, will/can SsSeqSetNext() indeed jump into another sequence at one of those "little piece" breakpoints, or will it simply start the specified sequence at the beginning? I suspect the latter...

You're right.

The idea is this those "little piece" breakpoints are actually separate little SEQs... NOT a big SEQ with marks every 4 or 8 bars. So if you have the following SEQs...

Intro Pieces: 1,2,3,4 MIDI callback value: 1

A Section Pieces: 5,6,7,8 MIDI callback value: 2

B Section Pieces: 9,10,11,12 MIDI callback value 3

Total SEQ = 12 (note: the MIDI callback messages are 1 beat before the end of each SEQ)

And you wanted to play the form... Intro -> A -> B ... (and all sections musically work in this scenario) then your callback function might look like this...

```
/* global... */ static short gGameMusicState = 0;
```

```
/* gGameMusic state is varied from 0 to 3 */
```

```
SsMarkCallbackProc MIDICallback(short acc_num, short seq_num, short data) { /* I will  
assume we are dealing with SEQs NOT SEPs! */ switch(data) { case 1: /* must be an  
intro piece... cue up an A section... */ SsSeqSetNext(seq_num, 5+gGameMusicState);
```

```
break;      case 2: /* must be an A section piece... cue up an B section... */
SsSeqSetNext(seq_num, 9+gGameMusicState);      break;      ... }
```

You get the picture. You'll have to check out the docs on how you setup the callback procedure. (Note... I just ripped that code off the top of my head... it is certainly not going to work first shot... I'm not sure I'm even showing SsSeqSetNext(...) correctly ;-)  
Code in a reply... SCARRY STUFF!

---

2/28/96 6:48 AM  
Re(2): Jumping into a SEQ  
P. (Leake / Scharnberg)  
Sound

Buzz -  
In the scenario you describe, will/can SsSeqSetNext() indeed jump into another sequence at one of those "little piece" breakpoints, or will it simply start the specified sequence at the beginning? I suspect the latter...  
Martin Wilde Viacom New Media

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3/1/96 10:55 AM  
Re(4): Jumping into a SEQ  
Ted Morris  
Sound

I've got another midi question....  
Is it possible to mute individual tracks in a SEQ?

---

3/1/96 12:39 PM  
Re(5): Jumping into a SEQ  
Buzz Burrowes  
Sound

>> Is it possible to mute individual tracks in a SEQ?  
Nope.  
This was another of the many "wish list" items I presented to the Japanese audio engineers about 10 months ago. This particular item though seemed to draw little criticism, and they seemed to think at the time that it wouldn't be too hard to do. Maybe they have just been waiting to see if I'm the only one who could see such a need!  
The function should be something like...  
SsSeqSetMute(short vabid, short mutestate)  
where... vabid = yeah... we know  
mutestate = a bit field where each of the 16 bits corresponds to a MIDI channel. The bit high means play the notes coming down that "pipe" and low means ignore events coming down that pipe.  
so... SsSeqSetMute(1,0xFFFF) -- all channels on SsSeqSetMute(1,0x0000) -- all channels off  
SsSeqSetMute(1,0xFFFE) -- all channels on EXCEPT channel 1 etc. (obviously you'd need a corresponding sep version)  
Note: Looking at the seq structure, you can understand that it would be VERY hard to mute MIDI "tracks" as opposed to MIDI channels.  
In other words, suppose you have 2 tracks shown in your sequencer... "kick" and "snare"... and

both were using MIDI channel 10. Suppose that you send one program change message to set the patch to 0, where patch 0 has the kick.vag on one key (MIDI note number) and snare.vag on another. Now, once the MID sequence is converted to a seq you just have a string of messages for MIDI channel 10. I don't believe there is any way of telling which message were on midi track "kick" and which where on midi track "snare".

So, you would just have to be sure that any tracks that you wanted to mute used their own MIDI channel. It's not as hard as I've made it sound!

Anyway, the described functionality should be easy beacuse all you have to do is one additional test for each MIDI event that you (LIBSND) process. When you check the event's midi channel (which you have to do anyway to determine what tambre to play, also check to see if the mute flag is set (or unset as the case may be). If it is just ignore the message and move on. HEY ROB! How about asking Japan about this ?! ;-)

---

3/1/96 12:04 PM

Re(5): libspu and libsnd usage...

Rob Vawter

Buzz Burrowes

Sound

P. (L/S): SpuInit(); SpuSetTransferStartAddr(0x1000); SpuWrite0(512\*1024); SsInit(); SsStart();

Anything wrong with any of this?

Burrowes: The first thing that comes to mind is my previous post regarding initing LIBSND and LIBSPU. Since SsInit() does SpuInit(), I don't see why you couldn't change the above too...

SsInit(); SpuSetTransferStartAddr(0x1000); SpuWrite0(512\*1024); SsStart();

Buzz is right. SsInit calls SpuInit, so you should be able to change your code above to his posted code with no problems.

---

3/2/96 12:54 AM

Re(6): Jumping into a SEQ

Tim L. Lowery

Sound

>> >> Is it possible to mute individual tracks in a SEQ? >> >> Nope.

Couldn't you just manually send a MIDI program change on a channel to assign to it a voice that has no amplitude?

Dave Howell pablo Media

---

3/4/96 6:13 PM

Re(7): Jumping into a SEQ

Buzz Burrowes

Sound

>> Couldn't you just manually send a MIDI program change on a channel to assign to it a voice that has no amplitude?

Well, no.

There is no way to "manually" send any MIDI messages to the seq playback engine that I know of.

---

3/4/96 7:29 AM

Re(7): Jumping into a SEQ  
P. (Leake / Scharnberg)  
Sound

You have to be careful in your dealings with MIDI channels and tracks in the context of SEQ files. In fact, in many cases MIDI channel info is ignored in deference to programs. Try this: create a track on MIDI channel X with program Y, then create another track also on MIDI channel X but this time use program Z (and, as recommended, be sure program changes happen before any notes on the two tracks). After conversion to a SEQ, you should still get the correct notes from programs Y and Z, even though they were on the SAME MIDI channel in your original SMF. It also appears as though channel-specific messages and controllers are applied locally to the track of your SMF in the process of converting them to SEQs. Has anyone else found this to be the case? This means that you could apply, say, one controller 7 value to MIDI channel X on track 1 and a different controller 7 value to MIDI channel X on track 2 and have the intended results in your SEQ, but this could result in quite different behavior in most conventional MIDI sequencer packages. But however the case, once it's a SEQ, the ideas of channels and tracks are history. It's all been collapsed into one serialized data stream.  
--Martin Wilde Viacom New Media

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3/4/96 6:10 PM  
Re(8): Jumping into a SEQ  
Buzz Burrowes  
Sound

>> You have to be careful in your dealings with MIDI channels and tracks in the context of SEQ files.

YES

>> In fact, in many cases MIDI channel info is ignored in deference to programs.

I don't think so. (I'm scratching my bald head)

>> Try this: create a track on MIDI channel X with program Y, then create another track also on MIDI channel X but this time use program Z (and, as recommended, be sure program changes happen before any notes on the two tracks).

Are you putting program changes between phrases on each track? In other words, if you have two tracks where...

1 - -----AXXXXXX-----AXXXXXX----- 2 - BYYYYY-----BYYYYY-----BYYYYY-- (hopefully your font doesn't screw that up too much!)

key: 1 & 2 = Sequencer Tracks both going to MIDI channel 1 A = Patch change message B =

Patch change message X & Y = MIDI note on & offs - = nothing

This will work... no problem.

It's hard to believe the two tracks could actually be playing at the same time (note ons from both tracks) and not have patch conflicts. I'll have to try it! It doesn't work that way with SoundDeli, so I guess I'll have to convert and then try it on my dev. system.

>> After conversion to a SEQ, you should still get the correct notes from programs Y and Z, even though they were on the SAME MIDI channel in your original SMF. It also appears as though channel-specific messages and controllers are applied locally to the track of your SMF in the process of converting them to SEQs.

Wow, this sounds pretty bizarre!

>> But however the case, once it's a SEQ, the ideas of channels and tracks are history. It's all been collapsed into one serialized data stream.

Again, I'm not sure on this one... the MIDI spec includes the channel info in with the status message (note on, etc.) I think that is still there in the seq. You just no longer have each track

saved as a separate chunk. The tracks are "interleaved". I'll have to double check.  
It sounds like I better dig in and take a closer look at this!

---

3/5/96 7:25 AM  
OOPS - CLARIFICATION  
P. (Leake / Scharnberg)  
Sound

Hey, folks -

Sorry for the confusion about MIDI tracks and program changes. Here's the deal:

CONTRARY to what I stated before, one CANNOT create a SMF, and hence a SEQ, in which two (or more) different tracks use the same MIDI channel but different programs at the same time. This will indeed cause patch conflicts. I sincerely apologize for my error and hope I've not caused too much gnashing of teeth and hair pulling.

THAT SAID, let me clarify why I may have thought this way in the first place. I do not use SEQ files. They are too limiting, especially in their (non)handling of tracks for what I need to do. I therefore read in the SMF directly and parse/play that on the fly. This obviously means I have to issue all noteon/noteoff messages myself. So depending on the track in question, I issue either SsUtKeyOn() or SsVoKeyOn() calls (and their OFF counterparts) to play my SMFs. These calls do NOT take MIDI channel numbers in their parameter lists, only such things as VAB id, program number, note, left and right volume, and in the case of SsUtKeyOn, the tone/vag within the program and a fine pitch parameter. So I ignore MIDI channel info completely, opting instead to keep tabs on the separate/individual tracks and their current program numbers. When a noteon comes along on a track, I issue the noteon call with the correct program number. This means I can essentially have 128 different MIDI channels, or as many channels as I have tracks, whichever way you want to look at it. I suppose this could be considered by the powers that be around here as giving away the farm. BUT, I've not told you the whole story. You can always go write your own sequencer and control it however you like. That's where the distinctions lie, IMHO.

Hope this helps.

--Martin Wilde Viacom New Media

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3/5/96 3:23 AM  
Re(8): Jumping into a SEQ  
Tim L. Lowery  
Sound

>> >> Couldn't you just manually send a MIDI program change on a channel to assign to it a voice that has no amplitude? >> >> Well, no. >> There is no way to "manually" send any MIDI messages to the seq playback engine that I know of.

Okay, I believe that. But couldn't you just replace the voice sample with a silent one in your VAB, thereby silencing all ensuing notes that use that voice?

Dave Howell Pablo Media

---

3/18/96 5:19 PM  
Re: SPU streaming info  
Dennis Harper  
Thomas Boyd  
Sound

I've read through this document many times, now. Can we have a document written by someone who knows SPU streaming and also knows English? The translation from Japanese into English is very confusing. Also, can we have some better code examples for SPU streaming? The one I have doesn't terminate the stream correctly.

I'm trying to start a new stream once the old one is finished using the terminateStream callback function. However, I don't know what I have to set up to start a new stream after stopping the old one. There are many states in the env->status flag such as SPU\_ST\_START, SPU\_ST\_PLAY, SPU\_ST\_STOP which I may set either with certain functions or directly. I don't know if I should set these states via a function or directly, and I don't know the difference between SPU\_ST\_START and SPU\_ST\_PLAY.

Also, I tried setting up an SpuIRQ callback, but the documentation was too sparse for me to do anything. For the function SpuGetIRQAddr, the description reads: "Checks interrupt request address" and the explanation: "Returns interrupt request address value" and the return value: "Currently set address value". SpuSetIRQAddr is similarly brief. What does it do? Does it generate an interrupt once the SPU hits that address? If so, how is this interrupt differentiated from the other sound interrupts? Do I have to handle the other interrupts in the IRQ callback routine?

All I need is some readable documentation on what each of the function does, what the states are, and how to properly enter and exit each state. Is this available somewhere?

Thanks, Eu-Ming Lee  
Time Warner Interactive

---

3/19/96 6:14 PM

Sound out of one channel?

Geoffry R. Meek

Sound

I'm only getting sound out of one channel (L/R) of the development system. If I plug the white RCA connector into the audio input of my TV, I get sound, but not if I plug the Red one in. Any ideas on what is going on? This problem happens even when playing an existing game, such as MotorTown.

Thanx,

Ron Maxwell Virtual Music Entertainment, Inc.

---

3/21/96 9:35 AM

Re: Sound out of one channel?

Rob Vawter

Geoffry R. Meek

Sound

I'm only getting sound out of one channel (L/R) of the development system. If I plug the white RCA connector into the audio input of my TV, I get sound, but not if I plug the Red one in. Any ideas on what is going on? This problem happens even when playing an existing game, such as MotorTown.

I have no idea what might be going on. Try a new output device (TV whatever). Try a different RCA cord. Make sure the plugs are all the way in. Then, if you are absolutely sure that it could be nothing else, call your AE and complain about your dev system.

---

3/21/96 3:57 PM

Re(3): SPU streaming info

Dennis Harper



Rob Vawter

Sound

Thanks for the info.

I'm still having problems streaming audio. Right now, we suspect that the PIO and SPU streaming DMAs share the same bus. What I really need to know soon is if this is true.

We have our own device hooked up the PIO and we're streaming audio data as well as other data off of this device. If the PIO and SPU streaming DMA share the same bus, we need to know about it soon so we can resolve the conflicts. I haven't seen any code which would resolve these device conflicts, nor any documentation about what's in these black boxes. If we know the above to be true, then we can start working on writing our own device contention handlers. If not, then we're going to have to go back to poking our fingers into the black boxes to figure out what's wrong.

Thanks, Eu-Ming Lee Time Warner Interactive

---

3/21/96 9:54 AM

Re(2): SPU streaming info

Rob Vawter

Sound

Dennis Harper

Also, I tried setting up an SpuIRQ callback, but the documentation was too sparse for me to do anything. For the function SpuGetIRQAddr, the description reads: "Checks interrupt request address" and the explanation: "Returns interrupt request address value" and the return value: "Currently set address value". SpuSetIRQAddr is similarly brief. What does it do? Does it generate an interrupt once the SPU hits that address?

SpuSetIRQAddr does generate an interrupt when an address in the sound RAM is hit. This is an excellent method of setting up an end of sample detection for VAGs. When using the tool VABSPLIT, choose the "-v" option to output a VAG address table.

```
#define VAGS_c:\psxsound\vab\robsound 2  
unsigned long c:\psxsound\vab\robsound[] = { 0x0, 0xdb50, 0x15570, }; /* vag table from  
"c:\psxsound\vab\robsound.vab" */
```

Use this table to assign an address for the interrupt to occur. You need to know where in the sound RAM a VAB resides and then add on the offset for whichever VAG you wish to check sample end for.

If so, how is this interrupt differentiated from the other sound interrupts? Do I have to handle the other interrupts in the IRQ callback routine?

Some of them. MIDI callback uses VSyncCallback. SpuStreaming uses the IRQ callback routine. I'll get to your streaming questions in another post a little bit later today.

---

3/22/96 9:22 AM

Re(4): SPU streaming info

Rob Vawter

Dennis Harper

Sound

I'm still having problems streaming audio. Right now, we suspect that the PIO and SPU streaming DMAs share the same bus. What I really need to know soon is if this is true.

We have our own device hooked up the PIO and we're streaming audio data as well as other data off of this device. If the PIO and SPU streaming DMA share the same bus, we need to know about it soon so we can resolve the conflicts.

They share the same bus. Sorry.

---

3/24/96 8:56 PM  
End of song detection  
Chris E. Reese  
Sound

I need to detect when a song has finished playing.

I have tried to use the marker callback function where I have a marker placed at the end of the songs, but the problem is I am playing several sequences at one time. According to the docs and code experiments I can only set 1 callback at a time which won't allow me to have a callback for each sequence I am playing. So that won't work, unless I am missing something here.

I have also tried polling every 1/60th of a second using the SsIsEos() function. The result I get back from that function is 0. I have made sure the values passed to it are valid and it won't return anything but 0. This is my least favorite way of checking for the end of a song so I won't be too upset if you tell me this function doesn't work, but I do need a valid way of checking for the end of a song.

I know I could setup a table of lengths for each song in the game, or I could check for a specific key that is turned on at the end of a song. Is there any better method?

I am using version 3.4 of the libraries.

Chris Reese Eidetic, Inc.

---

3/25/96 11:43 AM  
Re: End of song detection  
Buzz Burrowes  
Sound

>> I have tried to use the marker callback function where I have a marker placed at the end of the songs, but the problem is I am playing several sequences at one time. According to the docs and code experiments I can only set 1 callback at a time which won't allow me to have a callback for each sequence I am playing.

Actually, you can have only one callback function registered at a time FOR A GIVEN SEQ. In other words...each SEQ can have only one registered callback at a time... so each SEQ could have a different callback function. Now, I think a better way to go (and I actually have this working, although I don't use it to determine the end of SEQ playback.) is to have ONE callback function and register it to multiple SEQs...

```
/* prototype... */ SsMarkCallbackProc SoundSeqCallback(short access_num,short seq_num,
short data);
/* my MIDI setup function... */ void SetUpMIDI() { int count;
/* a bunch of init stuff goes here */
for(count=0;count<NUM_SEQ;count++) SsSetMarkCallback(seq[count],0,
(SsMarkCallbackProc) SoundSeqCallback); }
/* my callback function... */ SsMarkCallbackProc SoundSeqCallback(short access_num,short
seq_num, short data) { /* do stuff here*/ if(data==127) { /* some sequence has ended... check
access_num & seq_num! */ /* BE CAREFUL! If the callback was generated by a stand alone
SEQ then access_num holds the SEQ number... if an SEQ IN an SEP generated the message
than access_num is the SEP and seq_num is the SEQ in that SEP. */ } }
```

NOTE: You can see by looking at my callback function that it is easy to see which SEQ has generated the message. Since you know which SEQ has caused the callback you can pick one callback value (data) to signal the end of ANY sequence... let's say 127.

>> I have also tried polling every 1/60th of a second using the SsIsEos() function. The result I get back from that function is 0. I have made sure the values passed to it are valid and it won't return anything but 0.

This should work. I have definitely used the SsIsEos() to determine the state of a MIDI sequence and have not had a problem. Be sure that when you start the sequence you specified that it is to

be played a FINITE number of times. If you specify SSPLAY\_INFINITY SsIsEOS will never happen.

>> This is my least favorite way of checking for the end of a song so I won't be too upset if you tell me this function doesn't work...

Understandably! Try callbacks again.

---

3/27/96 12:53 PM

Re(5): SPU streaming info

Ron W. Moore

Rob Vawter

Dennis Harper

Howdy, What is the best pathway to get audio ready for SPU streaming? Ideally I would like to send my generated 8 bit PCM directly to SPU, but I would be happy to preprocess all of the audio files. I can get to Sound Designer II format. Do I go to RAW2XA from there?

Ron Moore ron@aimla.com Philips Media LA CA, USA (310) 444-6690

---

3/27/96 1:07 PM

Re(2): ADPCM format

Ron W. Moore

Jon Burgstrom

Sound

Howdy, It's almost been a year. Any sign of the function "EncSPU()" becoming available soon?

Ron Moore Philips Media ron@aimla.com

---

3/28/96 4:56 PM

Re: Problem with the program changes using smf2seq

Rob Vawter

Jason Friedman

Sound

If we convert a smf file to seq we lose the program change info, because the all seq file used the first sample of the vab file.

The default of the smf is 0, or the first program. In the sequencing software, you must explicitly assign a program number for the seq to use.

---

3/28/96 9:41 AM

Re: 8 bit PCM to ADPCM

Rob Vawter

Ron W. Moore

In the Sound BBS Archive is discussion about a runtime routine to convert 8 bit PCM to ADPCM. It was called something like EncSPU(). The mention was about a year ago, and the person who mentioned it no longer has a mail box. Have you heard of such a function? I could really use it.

Yes, I have heard of such a function. It still has not had all the kinks taken out of it yet, and as such, is still not available. I am hoping that it will finally be available soon.

---

4/1/96 2:45 PM

Re(5): SPU streaming info

Dennis Harper

Rob Vawter

Sound

Rob and other SPU gurus:

If the PIO and the SPU share the same DMA bus, I need some way to control the SPU DMA transfers. Right now, I only have SpuStTransfer, but it doesn't let me know anything about the DMA transfer. In order to arbitrate conflicts, I need to be able to start the DMA transfer when I want to, and know when the DMA bus is still busy. The way SpuStTransfer and its callback function works, once I begin the stream with SpuStTransfer(SPU\_ST\_PLAY), the callback function only allows me to specify where to find the next chunk of audio data. This is not enough--- I need to know when the DMA is being used--- and even \*that\* is not enough. I need to be able to begin the DMA when I want to, and know when it ends.

Note that we have attached our hard drive to the PIO and are using it extensively throughout the duration of gameplay. The DMA conflicts happen very often in this environment, and need to be resolved properly.

Ultimately, in order for me to get audio streaming to work, I need some more software support from Sony. We don't quite have enough tools in our arsenal to arbitrate DMA conflicts on our own. In order of preference, here are some solutions which would help solve our problem.

1) Since the PIO and SPU share the same DMA bus, the best case scenario is that we send the data directly over the DMA bus from the PIO into the SPU and skip main memory altogether. For us to do this, we need to know more about how the DMA into the SPU operates. I'd also need some software to accept a DMA transfer that \*wasn't\* from main memory, play it back, complete it, generate callbacks/interrupts etc.--- or know enough about the hardware to let us write our own software. Is this possible?

2) In the second, "black box solution", I need a routine which begins the DMA transfer, and a callback routine for when it finishes. Maybe something hacked onto SpuStTransfer which takes an argument of SPU\_ST\_DMA??? And a callback function for when the transfer is finished... That would be very helpful.

Please get back to me on this as soon as possible.

Your help on this matter is much appreciated, Eu-Ming Lee Time Warner Interactive

---

4/4/96 1:44 PM

Re: resource allocation for sound

Rob Vawter

clearwater

Sound

And now for the least timely response award...

Original completely overlooked question: "I'm just starting to get into the sound and had a question about the memory usage for streaming music off the CD. In the hardware manual, it states that the CD-ROM buffer is used to buffer the data off the CD, which is reasonable, but that the SPU buffer is also used - I presume this is because the SPU can only access the Sound buffer. Does anyone out there know how much of the sound buffer must be reserved for CD streaming, if any? Do I have control over this allocation?"

Answer: Worry not. The SPU area from 0-1010 takes care of CD music.

---

4/8/96 5:32 PM

Re: patchx.bat

Rob Vawter

Gerald T. McCants

Sound Programmers

on read on a sound sample from the latest cd shipped out about a little ditty called "patchx.bat".

But i can't seem to find it anywhere. What is it? (typo?)

also, all my sound sample programs compile, but when i run them nothing happens.

and...yeah..i'm pqbload'ing your sample sounds first.

Don't use patchx. Use snpatch. Patchx baaaad. Snpatch gooooood.

Um, as for the sound problem.....you need something on the end of your dev boards - a blue connector or a black external cd drive.

---

4/8/96 4:57 PM

sound playing

Gerald T. McCants

Sound Programmers

solved sound playing problem (oops). ya don't wanna know.  
but how 'bout patchx.bat?

---

4/8/96 3:50 PM

(last msg)

Gerald T. McCants

Sound Programmers

(the last message might read better now)

I read on a sound sample from the latest cd shipped out about a little ditty called "patchx.bat".

But i can't seem to find it anywhere. What is it? (typo?)

also, all my sound sample programs compile, but when i run them nothing happens.

and...yeah..i'm pqbload'ing your sample sounds first.

any thoughts? hints...?

-brett butler

---

4/8/96 3:48 PM

patchx.bat

Gerald T. McCants

Sound Programmers

on read on a sound sample from the latest cd shipped out about a little ditty called "patchx.bat".

But i can't seem to find it anywhere. What is it? (typo?)

also, all my sound sample programs compile, but when i run them nothing happens.

and...yeah..i'm pqbload'ing your sample sounds first.

any thoughts? hints...?

-brett butler

---

4/9/96 11:03 AM

Set Reverb problem

Chris Stevens

Sound Programmers

Help,

We're still having trouble setting the reverb. Currently, I have given the programmer a SEQ file

that has the following data only:

CC 99 16 CC 98 15 CC 6 2 (for the reverb type)

CC 99 16 CC 98 16 (depth) CC 6 60 (tried a few other numbers too, like 10, 20, 30, 40, etc)

Everything is separated by several clock ticks.

The SEQ file plays briefly before the main tune, which is still dry as the desert. I'd like any feedback from people who have had success getting reverb to work with this method or any other method. Is there a way for the programmer to turn reverb on directly? If so, what is the command?

---

4/10/96 10:31 AM

Re(2): SsVabOpen function

Rob Vawter

P. (Leake / Scharnberg)

Sound Programmers

Time to answer yet another set of questions which withered on the vine...

1) By using SsVabOpenHead() and SsVabTransBody(), will BOTH the header and waveform data be transferred into SPU RAM?

No, only the the body is transferred into SPU RAM. This is one of the advantages of SsVabOpenHead() over SsVabOpen(), since the latter also used SPU RAM for the header.

2) If I need/want to parse the VAB header myself, can I do this if it's in SPU RAM, or will I have to use the API to get things like VAG and program attributes?

Since it will not be in SPU RAM, this shouldn't be a problem.

3) Is there any way to access SPU RAM directly?

No.

4) Upon using SsVabOpen(), the docs state that the VAB data is automatically transferred to SPU RAM and therefore I call SsVabTransCompleted(SS\_WAIT\_COMPLETED) afterward. I assume that I could then delete the VAB data from main RAM. How is this different from the way things will happen now with the two-step loading?

Now, only the body is transferred from main RAM. So, the header must remain in main RAM, and the body will remain in SPU RAM.

---

4/16/96 3:09 PM

SsUtGetVagAddrFromTone

brian l. schmidt

Sound Programmers

Has anyone used this?

It seems to always give program 0 information

i.e.:

SsUtGetVagAddrFromTone(vab, 0, 0); is the same as SsUtGetVagAddrFromTone(vab, 1, 0); even though programs 1 and 0 are different

---

4/16/96 6:56 AM

Re(3): SsVabOpen function

P. (Leake / Scharnberg)

Sound Programmers

I seem to recall some mail, from awhile ago, that stated SsVabOpen was going away or shouldn't be used - in favor of SsVabOpenHead and SsVabTransBody (in conjunction with

SsVabTransCompleted). Yes, here it is:

SsVabOpen() function This function is not recommended to be used because waveform data (.VAB) header information and waveform data information are left on the main memory, and they consume available area of the main memory.

When developing a title, divide .vab into .vh (header information) and .vb (waveform data information) by the tool, VABSPLIT.EXE, on the DOS, and use SsVabOpenHead() and SsVabTransBody(). The processing flow is as follows:

```
/* Transfer of .vh information to main memory */          /* Transfer of .vb
information to main memory */          SsVabOpenHead(...);          SsVabTransBody(...);
SsVabTransCompleted (SS_WAIT_COMPLETED);          /* Possible to delete .vb data from
main memory here */          SsSeqOpen (...);
```

Note that SsVabOpen() will be deleted in the next version.

This last line is what concerns me. Can we still use SsVabOpen? For how long? Is it going away? When, as it still seems to be around in libsnd.h, version 3.4.

--Martin Wilde Viacom New Media

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4/17/96 4:34 PM

.vh file format

Brett Butler

Sound Programmers

I was looking through the sample.vh file sent on the programmer tools CD and I've noticed something that I can't quite make out.

1. 1st there's the VabHdr structure consisting of 8 longs 2nd the ProgramSlot (attributes) consisting of 128 slots of 4 longs. 3th the VagAtr segments consisting of 16 blocks of 8 longs of data. the VagAtr segments continue after each other, until the last segment. note: i believe there are 16 VagAtr segments in this file.

BUT THEN: After the 16th VagAtr there are 16 blocks of 8 longs (which match a standard VagAtr block). The data in this last segment does not look like VagAtr information. Q: What is it? Q: Can someone give me a structure definition for this data? Q: Could I just append this data to my own homemade .vh files and not worry about what it is?

Here is a sample of a standard VagAtr segment -----  
----- 00000820: 00 00 7F 1E 24 00 00 2B - 00 00 00 00 02 02 B1 B2 ..•.S.+..... 00000830: FF 80  
CE 09 00 00 01 00 - C0 00 C1 00 C2 00 C3 00 ..... 00000840: 00 00 7F 2D 30 00 2A 37 - 00  
00 00 00 02 02 B1 B2 ..•-0.\*7..... 00000850: FF 80 CE 09 00 00 02 00 - C0 00 C1 00 C2 00 C3 00  
..... 00000860: 00 00 7F 3C 3C 00 36 43 - 00 00 00 00 02 02 B1 B2 ..•<<.6C..... 00000870:  
FF 80 CE 09 00 00 03 00 - C0 00 C1 00 C2 00 C3 00 ..... 00000880: 00 00 7F 4B 48 00 42 4F -  
00 00 00 00 02 02 B1 B2 ..•KH.BO..... 00000890: FF 80 CE 09 00 00 04 00 - C0 00 C1 00 C2 00  
C3 00 ..... 000008A0: 00 00 7F 5A 54 00 4E 7F - 00 00 00 00 02 02 B1 B2 ..•ZT.N•.....  
000008B0: FF 80 CE 09 00 00 05 00 - C0 00 C1 00 C2 00 C3 00 ..... 000008C0: 00 00 00 00 00  
00 00 00 - 00 00 00 00 02 02 B1 B2 ..... 000008D0: 00 00 00 00 00 00 00 00 - C0 00 C1 00 C2  
00 C3 00 ..... 000008E0: 00 00 00 00 00 00 00 00 - 00 00 00 00 02 02 B1 B2 .....  
000008F0: 00 00 00 00 00 00 00 00 - C0 00 C1 00 C2 00 C3 00 ..... 00000900: 00 00 00 00  
00 00 00 - 00 00 00 00 02 02 B1 B2 ..... 00000910: 00 00 00 00 00 00 00 00 - C0 00 C1 00 C2  
00 C3 00 ..... 00000920: 00 00 00 00 00 00 00 00 - 00 00 00 00 02 02 B1 B2 .....  
00000930: 00 00 00 00 00 00 00 00 - C0 00 C1 00 C2 00 C3 00 ..... 00000940: 00 00 00 00  
00 00 00 - 00 00 00 00 02 02 B1 B2 ..... 00000950: 00 00 00 00 00 00 00 00 - C0 00 C1 00 C2  
00 C3 00 ..... 00000960: 00 00 00 00 00 00 00 00 - 00 00 00 00 02 02 B1 B2 .....  
00000970: 00 00 00 00 00 00 00 00 - C0 00 C1 00 C2 00 C3 00 ..... 00000980: 00 00 00 00  
00 00 00 - 00 00 00 00 02 02 B1 B2 ..... 00000990: 00 00 00 00 00 00 00 00 - C0 00 C1 00 C2  
00 C3 00 ..... 000009A0: 00 00 00 00 00 00 00 00 - 00 00 00 00 02 02 B1 B2 .....  
000009B0: 00 00 00 00 00 00 00 00 - C0 00 C1 00 C2 00 C3 00 ..... 000009C0: 00 00 00 00 00

00 00 00 - 00 00 00 02 02 B1 B2 ..... 000009D0: 00 00 00 00 00 00 00 00 - C0 00 C1 00 C2  
00 C3 00 ..... 000009E0: 00 00 00 00 00 00 00 00 - 00 00 00 00 02 02 B1 B2 .....  
000009F0: 00 00 00 00 00 00 00 00 - C0 00 C1 00 C2 00 C3 00 ..... 00000A00: 00 00 00 00 00  
00 00 00 - 00 00 00 00 02 02 B1 B2 ..... 00000A10: 00 00 00 00 00 00 00 00 - C0 00 C1 00 C2  
00 C3 00 ..... -----

-----  
Here is that biZarre last segment that exists at the end of the sample.vh file. (WHAT IS IT?) -----  
-----

----- 00002820: 00 00 94 2E 02 13 D4 26 - 20 09 9E 07 2A 05 30 02 .....& ...\*.0.  
<what are these longs storing? 00002830: 2E 03 14 01 60 07 D8 02 - 7C 06 54 01 14 00 9E 03  
...`...|.T..... <???? 00002840: BE 03 CE 02 10 03 0A 06 - 84 01 14 13 B8 13 16 05 ..... <????  
00002850: 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00 ..... 00002860: 00 00 00 00 00 00  
00 00 - 00 00 00 00 00 00 00 ..... 00002870: 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00  
00 ..... 00002880: 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 ..... 00002890: 00  
00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 ..... 000028A0: 00 00 00 00 00 00 00 00 - 00 00  
00 00 00 00 00 00 ..... 000028B0: 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00  
..... 000028C0: 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 ..... 000028D0: 00 00  
00 00 00 00 00 00 - 00 00 00 00 00 00 00 ..... 000028E0: 00 00 00 00 00 00 00 00 - 00 00 00  
00 00 00 00 00 ..... 000028F0: 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 .....  
00002900: 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 ..... 00002910: 00 00 00 00 00 00  
00 00 - 00 00 00 00 00 00 00 ..... 00002920: 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00  
00 ..... 00002930: 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 ..... 00002940: 00  
00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 ..... 00002950: 00 00 00 00 00 00 00 00 - 00 00  
00 00 00 00 00 00 ..... 00002960: 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 .....  
00002970: 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 ..... 00002980: 00 00 00 00 00 00  
00 00 - 00 00 00 00 00 00 00 ..... 00002990: 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00  
00 ..... 000029A0: 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 ..... 000029B0: 00  
00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 ..... 000029C0: 00 00 00 00 00 00 00 00 - 00 00  
00 00 00 00 00 ..... 000029D0: 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00  
..... 000029E0: 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 ..... 000029F0: 00 00  
00 00 00 00 00 00 - 00 00 00 00 00 00 00 ..... 00002A00: 00 00 00 00 00 00 00 00 - 00 00 00  
00 00 00 00 ..... 00002A10: 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 .....

-----  
If anyone can help, please fill me in.  
I'm having to build my own .vh files 'cause we're sound-board free.

---

4/17/96 5:21 PM  
Re: SsUtGetVagAddrFromTone  
Buzz Burrowes  
Sound Programmers

>>----- It seems to always give program 0 information  
i.e.:  
SsUtGetVagAddrFromTone(vab, 0, 0); is the same as SsUtGetVagAddrFromTone(vab, 1, 0);  
even though programs 1 and 0 are different  
>>-----  
Yes, I've confirmed that there is a bug in that function. I will bring it to the attention of the  
engineers in Japan. In the mean time you can use a combination of the functions  
SsUtGetVagAtr(...) and SsUtGetVagAddr(...) to accomplish your goal.

---



4/18/96 11:36 AM  
VAB sound tool  
Brett Butler  
Sound Programmers

I'm about to complete a DOS version tool of "VAGS2VAB.exe"  
This would allow you to take your vags and pack them together into a vab FROM DOS. Then from there, just run VABSPLIT.exe to get your .VH and .VB files.  
So, if anyone out there is tired of leasing a Mac just to do sound,...here's your tool.  
Is anyone interested in this VAB tool?  
Send me mail.  
) Bretto

---

4/18/96 3:55 PM  
.vag header  
Brett Butler  
Sound Programmers

I can't seem to find a definition for the .VAG header (which is 48 bytes).  
I understand the bs info and the (file size minus its header), but...  
here is a sample header for beep3.vag. -----  
-----  
----- 00000000: 56 41 47 70 00 00 00 00 - 00 00 00 00 40 13 00 00 VAGp.....@... 00000010:  
00 00 56 22 00 00 00 00 - 00 00 00 00 00 00 00 00 ..V"..... 00000020: 62 65 65 70 33 00 00 00 -  
00 00 00 00 00 00 00 00 beep3..... 00000030: 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00  
-----  
-----

Questions questions questions:  
1. what does the data "00 00 56 22" mean? are these Attack, Decay, Sustain, Release vals?  
2. Also, whats up with the 4 longs of zeros? Reserved space for future versions? Something special for SoundDeli?

-Thanx Bretto :)

---

4/18/96 1:28 PM  
tone pan  
Brett Butler  
Sound Programmers

I noticed that in a VagAtr block, that information is mostly redundant about the vag. I'm curious about tone pan. When one vag is called to play and it is passed several different value of tone pan (in combination with sometimes a tone volume change).  
I think i hear a difference in the vag when these tone pans are altered or removed.  
Q: What is there importance? What are they?  
Q: Could a standard vag just be given 1 tone pan value? which means i could cut back on redundant information and just fill the rest of the VagAtr with the standard "i'm not used" block of 8 longs.  
Q: SoundDeli is the tool that allows these multiple tone pan settings to be assigned, correct?  
ThanxInAdvance Bretto :)

---

4/19/96 7:29 AM  
Sample playing via SPU only  
Dave R. Scheele  
Sound Programmers

Does anyone have an example (or know where one exists) of playing a sound sample (preferably a .VAG, if possible) using only the SPU library? The developers CD (version 1.5 is all I have so far ....) has examples in \PSX\SAMPLE\SOUND that load .vb / .vh's and play them via libsnd, but I'd rather not have to link in that whole thing just to play a sound.  
Thanks,  
Dave

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4/22/96 10:55 AM  
Clearing SPU RAM  
P. (Leake / Scharnberg)  
Sound Programmers

Upon initialization, I'm hearing some stuff from a previous load AND getting a stuck note which I obviously do not want to hear. I try and clear the sound buffer when I first start up using the following code:  
SsInit(); SpuSetTransferStartAddr(0x1000); bytesWritten = SpuWrite0(512\*1024);  
but to no avail. bytesWritten is always 0, no matter what number of zero bytes I tell SpuWrite0 to write, and I always hear the vestigial stuff.  
What am I doing wrong, if anything? I'm using library version 3.4  
Martin Wilde Viacom New Media

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4/23/96 9:50 AM  
XA Data  
Chris E. Reese  
Sound Programmers

I am trying to playback XA data that I have created using the latest MOVCONV tool. I know the code that we have written works as we have been able to successfully playback XA data from commercially released titles, however if we try to playback data created from the MOVCONV tool it does not work. I have also used the MOVPACK tool on the MOVCONV .XA file and that didn't seem to make a difference except for the fact that the file size is about 4 times larger. Is there a step I am missing?  
Chris Reese Eidetic, Inc.

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4/23/96 9:03 AM  
Re(4): SsVabOpen function  
Rob Vawter  
P. (Leake / Scharnberg)  
Sound Programmers

"... Note that SsVabOpen() will be deleted in the next version.  
This last line is what concerns me. Can we still use SsVabOpen? For how long? Is it going away? When, as it still seems to be around in libsnd.h, version 3.4."

I think that SsVabOpen will be disappearing in version 3.5, which will be coming out around June.

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4/26/96 10:54 AM

Re: .vag header

Rob Vawter

Brett Butler

Sound Programmers

I can't seem to find a definition for the .VAG header (which is 48 bytes).

"I understand the bs info and the (file size minus its header), but...

here is a sample header for beep3.vag. -----

----- 00000000: 56 41 47 70 00 00 00 00 - 00 00 00 00 40 13 00 00 VAGp.....@... 00000010:  
00 00 56 22 00 00 00 00 - 00 00 00 00 00 00 00 00 ..V"..... 00000020: 62 65 65 70 33 00 00 00 -  
00 00 00 00 00 00 00 00 beep3..... 00000030: 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00  
.....  
-----"

From page 50 of 3.0 Sound Artist Tool Manual: ID ("VAGp") 4 bytes Version 4 bytes Reserved  
4 bytes Data Size (in bytes) 4 bytes Sampling Frequency 4 bytes Reserved 12 bytes Name 16  
bytes

"Questions questions questions:

Q1 . what does the data "00 00 56 22" mean? are these Attack, Decay, Sustain, Release vals?"

A1: No, that's the sampling frequency.

"2. Also, whats up with the 4 longs of zeros? Reserved space for future versions? Something special for SoundDeli?" A2: For an incredibly long name. Not sure if it happens to be that way because of Kanji Font name possibilities or workstation naming conventions or what.

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4/26/96 3:29 PM

Re: tone pan

Rob Vawter

Brett Butler

Sound Programmers

I noticed that in a VagAtr block, that information is mostly redundant about the vag. I'm curious about tone pan. When one vag is called to play and it is passed several different value of tone pan (in combination with sometimes a tone volume change).

I think i hear a difference in the vag when these tone pans are altered or removed.

Q: What is there (sic) importance? What are they? A: Okay, although you didn't know it, this is a big question. Here's the scoop - A VAB is a bank of up to 255 VAGs, but it is much more than just that. A VAB is made up of up to 128 programs. Each program contains up to 16 tones. Each tone is sort of a control for playing a specific VAG a specific way (such as ADSR, center note, volume, pitch, pan, etc). VagAtr are equivalent to the tones in a program; they contain the same information. So, when you see a VAG with a variety of pan information, these are different tones for that VAG, and these tones are probably within different programs, as well. You are often playing more than just a single VAG within a program of a VAB; that may be part of why you hear a difference in the VAG when those tone pans are altered or removed.

Q: Could a standard vag just be given 1 tone pan value? which means i could cut back on redundant information and just fill the rest of the VagAtr with the standard "i'm not used" block of 8 longs. A:Not in the manner that you mean. See above for a proper answer.

Q: SoundDeli is the tool that allows these multiple tone pan settings to be assigned, correct?

A:Yes, Sound Deli is the tool that allows you to put VAGs into a bank of VABs, including tone

and program info.

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4/26/96 11:10 AM

Re: Set Reverb problem

Rob Vawter

Chris Stevens

Sound Programmers

Chris wrote: "We're still having trouble setting the reverb. Currently, I have given the programmer a SEQ file that has the following data only:

CC 99 16 CC 98 15 CC 6 2 (for the reverb type)

CC 99 16 CC 98 16 (depth) CC 6 60 (tried a few other numbers too, like 10, 20, 30, 40, etc)

Everything is separated by several clock ticks.

The SEQ file plays briefly before the main tune, which is still dry as the desert. I'd like any feedback from people who have had success getting reverb to work with this method or any other method. Is there a way for the programmer to turn reverb on directly? If so, what is the command? "

Okay, here is the problem with what you are trying to do. All that SEQ is doing is setting reverb for itself, not for the PlayStation as a whole or any voices in general. There are three ways to setup reverb, and I'm not sure if one of them even works: 1) Record with reverb. Drawbacks: This method will expand the file size of samples. So, more main RAM and/or SPU RAM (depending on sample type) will be taken up. 2) Use Reverb functions in libspu or libsnd. Check the FAQ for more details or let me know and I can set up a step by step tutorial. Drawbacks: a) You must set aside SPU RAM for reverb effects. b) Only one type of reverb can be set up at any given time for the PlayStation as a whole. 3) Use control changes. Drawbacks: Not sure if this works. It doesn't work within playback within Deli to my knowledge, it locks up the system instead. If it does work, it works on the currently playing tune.

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4/26/96 9:59 AM

Re: .vh file format

Rob Vawter

Brett Butler

Sound Programmers

This message is important for those of you building VABs in a non-standard way, whether it is pre-disk burning on a PC, or during gameplay.

I've copied Brett's huge original message at the bottom for those of you who are interested. The following is a corrected revision of figure 4-7 (VH format) from page 53 of the sound artist tool manual.

ID ("VABp") 4 bytes\* Version 4 bytes VABID 4 bytes\*\* Waveform Size 4 bytes Reserved 2 bytes No. of Programs 2 bytes No. of VAGs 2 bytes Reserved 8 bytes Program Attr. Table 16 x 128 Tone Attr. Table 512 x # of programs VAG Size Table 512

\* Actually shows up as "pBAV" if viewed in hex. \*\* [not sure, but think that this is updated in the .vh file which resides on main RAM when an ID has been assigned after transferring .vb to SPU RAM. SO, it looks like it always starts out 00 00 00 00].

You can get each VAG data size from the "VAG Size Table." 3 bit right-shifted VAG data size is stored in short (16 bit), so you can get the actual VAG size shifting the size in the table.

Example: VAG #1 #2 #3 ... VAG Size Table 0x1000 0x0800 0x0200... actual size 0x8000 0x4000 0x1000... offset 0x8000 0xc000 0xd000...

So, on to Brett's questions: After the 16th VagAtr there are 16 blocks of 8 longs (which match a standard VagAtr block). The data in this last segment does not look like VagAtr information. Q: What is it? A: It's the VAG Size Table. In this case there are 23 VAGs. So the info reads: VAGs 1-7 size: line # 00002820: 00 00 94 2E 02 13 D4 26 - 20 09 9E 07 2A 05 30 02 VAGs 8-15 size: line #

00002830: 2E 03 14 01 60 07 D8 02 - 7C 06 54 01 14 00 9E 03 VAGs 16-23 size: line # 00002840:  
BE 03 CE 02 10 03 0A 06 - 84 01 14 13 B8 13 16 05 Also, we know there are 23 VAGs total  
because the first 32 bytes of sample.vh read: 70424156 ID ("pBAV") 05000000 Version 00000000  
VABID 70E60600 Waveform Size EEEE1000 Reserved ("EEEE"), # of Programs ("1000")  
5F001700 # of tones ("5F00"), # of VAGs ("1700" or 23) 7F400000 FFFFFFFF Reserved Q: Can  
someone give me a structure definition for this data? A: Done. (The first 2 bytes are 00 00 as a  
starting point) Q: Could I just append this data to my own homemade .vh files and not worry  
about what it is? A: No. That would be bad.

Brett's original message: I was looking through the sample.vh file sent on the programmer tools  
CD and I've noticed something that I can't quite make out.

1. 1st there's the VabHdr structure consisting of 8 longs 2nd the ProgramSlot (attributes)  
consisting of 128 slots of 4 longs. 3th the VagAtr segments consisting of 16 blocks of 8 longs of  
data. the VagAtr segments continue after each other, until the last segment. note: i believe  
there are 16 VagAtr segments in this file.

BUT THEN: After the 16th VagAtr there are 16 blocks of 8 longs (which match a standard  
VagAtr block). The data in this last segment does not look like VagAtr information. Q: What is  
it? Q: Can someone give me a structure definition for this data? Q: Could I just append this data  
to my own homemade .vh files and not worry about what it is?

Here is a sample of a standard VagAtr segment -----  
----- 00000820: 00 00 7F 1E 24 00 00 2B - 00 00 00 00 02 02 B1 B2 ..•.S.+..... 00000830: FF 80  
CE 09 00 00 01 00 - C0 00 C1 00 C2 00 C3 00 ..... 00000840: 00 00 7F 2D 30 00 2A 37 - 00  
00 00 00 02 02 B1 B2 ..•-0.\*7..... 00000850: FF 80 CE 09 00 00 02 00 - C0 00 C1 00 C2 00 C3 00  
..... 00000860: 00 00 7F 3C 3C 00 36 43 - 00 00 00 00 02 02 B1 B2 ..•<<.6C..... 00000870:  
FF 80 CE 09 00 00 03 00 - C0 00 C1 00 C2 00 C3 00 ..... 00000880: 00 00 7F 4B 48 00 42 4F -  
00 00 00 00 02 02 B1 B2 ..•KH.BO..... 00000890: FF 80 CE 09 00 00 04 00 - C0 00 C1 00 C2 00  
C3 00 ..... 000008A0: 00 00 7F 5A 54 00 4E 7F - 00 00 00 00 02 02 B1 B2 ..•ZT.N• .....  
000008B0: FF 80 CE 09 00 00 05 00 - C0 00 C1 00 C2 00 C3 00 ..... 000008C0: 00 00 00 00 00  
00 00 00 - 00 00 00 00 02 02 B1 B2 ..... 000008D0: 00 00 00 00 00 00 00 00 - C0 00 C1 00 C2  
00 C3 00 ..... 000008E0: 00 00 00 00 00 00 00 00 - 00 00 00 00 02 02 B1 B2 .....  
000008F0: 00 00 00 00 00 00 00 00 - C0 00 C1 00 C2 00 C3 00 ..... 00000900: 00 00 00 00 00  
00 00 00 - 00 00 00 00 02 02 B1 B2 ..... 00000910: 00 00 00 00 00 00 00 00 - C0 00 C1 00 C2  
00 C3 00 ..... 00000920: 00 00 00 00 00 00 00 00 - 00 00 00 00 02 02 B1 B2 .....  
00000930: 00 00 00 00 00 00 00 00 - C0 00 C1 00 C2 00 C3 00 ..... 00000940: 00 00 00 00 00  
00 00 00 - 00 00 00 00 02 02 B1 B2 ..... 00000950: 00 00 00 00 00 00 00 00 - C0 00 C1 00 C2  
00 C3 00 ..... 00000960: 00 00 00 00 00 00 00 00 - 00 00 00 00 02 02 B1 B2 .....  
00000970: 00 00 00 00 00 00 00 00 - C0 00 C1 00 C2 00 C3 00 ..... 00000980: 00 00 00 00 00  
00 00 00 - 00 00 00 00 02 02 B1 B2 ..... 00000990: 00 00 00 00 00 00 00 00 - C0 00 C1 00 C2  
00 C3 00 ..... 000009A0: 00 00 00 00 00 00 00 00 - 00 00 00 00 02 02 B1 B2 .....  
000009B0: 00 00 00 00 00 00 00 00 - C0 00 C1 00 C2 00 C3 00 ..... 000009C0: 00 00 00 00 00  
00 00 00 - 00 00 00 00 02 02 B1 B2 ..... 000009D0: 00 00 00 00 00 00 00 00 - C0 00 C1 00 C2  
00 C3 00 ..... 000009E0: 00 00 00 00 00 00 00 00 - 00 00 00 00 02 02 B1 B2 .....  
000009F0: 00 00 00 00 00 00 00 00 - C0 00 C1 00 C2 00 C3 00 ..... 00000A00: 00 00 00 00 00  
00 00 00 - 00 00 00 00 02 02 B1 B2 ..... 00000A10: 00 00 00 00 00 00 00 00 - C0 00 C1 00 C2  
00 C3 00 ..... -----

Here is that biZarre last segment that exists at the end of the sample.vh file. (WHAT IS IT?) -----

----- 00002820: 00 00 94 2E 02 13 D4 26 - 20 09 9E 07 2A 05 30 02 .....& ...\*0.  
<what are these longs storing? 00002830: 2E 03 14 01 60 07 D8 02 - 7C 06 54 01 14 00 9E 03  
...`...|.T.... <???? 00002840: BE 03 CE 02 10 03 0A 06 - 84 01 14 13 B8 13 16 05 ..... <????  
00002850: 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00 ..... 00002860: 00 00 00 00 00 00  
00 00 - 00 00 00 00 00 00 00 00 ..... 00002870: 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00  
00 ..... 00002880: 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00 ..... 00002890: 00  
00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00 ..... 000028A0: 00 00 00 00 00 00 00 00 - 00 00

00 00 00 00 00 00 ..... 000028B0: 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00  
..... 000028C0: 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00 ..... 000028D0: 00 00  
00 00 00 00 00 00 - 00 00 00 00 00 00 00 00 ..... 000028E0: 00 00 00 00 00 00 00 00 - 00 00 00  
00 00 00 00 00 ..... 000028F0: 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00 .....  
00002900: 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00 ..... 00002910: 00 00 00 00 00 00  
00 00 - 00 00 00 00 00 00 00 ..... 00002920: 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00  
00 ..... 00002930: 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00 ..... 00002940: 00  
00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00 ..... 00002950: 00 00 00 00 00 00 00 00 - 00 00  
00 00 00 00 00 00 ..... 00002960: 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00 .....  
00002970: 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00 ..... 00002980: 00 00 00 00 00 00  
00 00 - 00 00 00 00 00 00 00 ..... 00002990: 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00  
00 ..... 000029A0: 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00 ..... 000029B0: 00  
00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00 ..... 000029C0: 00 00 00 00 00 00 00 00 - 00 00  
00 00 00 00 00 00 ..... 000029D0: 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00  
..... 000029E0: 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00 ..... 000029F0: 00 00  
00 00 00 00 00 00 - 00 00 00 00 00 00 00 00 ..... 00002A00: 00 00 00 00 00 00 00 00 - 00 00 00  
00 00 00 00 00 ..... 00002A10: 00 00 00 00 00 00 00 00 - 00 00 00 00 00 00 00 00 .....  
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If anyone can help, please fill me in.  
I'm having to build my own .vh files 'cause we're sound-board free.

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4/29/96 10:38 PM  
SsUtSetVVol  
tim m. edwards  
Sound Programmers

Hey, Guys.  
In a few posts to this conference, buzz and a few others refer to the function SsUtSetVVol as if it works. My experience as of 2 minutes ago is that it doesn't.  
If I count down left and right volumes from 127 to 0 by one using SsSetMVol(), the volume of my looping sample decreases. If I instead use SsUtSetVVol on all voices (0-24), I get no decrease in volume.  
Is there some #define MAKE\_IT\_WORK that I'm missing? I've written a set of functions a lot like the AutoPan/AutoVol functions, which depend on this feature, and which are presently broken.  
Thanks in advance for any suggestions about where I may have gone wrong.  
-Erik Strickland LifeLike productions.  
If this function does not work after all, what can I do to modify sample playback in realtime (as the samples are playing)?

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4/29/96 4:44 PM  
Re(2): Set Reverb problem  
Buzz Burrowes  
Sound Programmers

Chris wrote: "We're still having trouble setting the reverb. Currently, I have given the programmer a SEQ file that has the following data only:  
CC 99 16 CC 98 15 CC 6 2 (for the reverb type)  
CC 99 16 CC 98 16 (depth) CC 6 60 (tried a few other numbers too, like 10, 20 ,30, 40, etc)  
Everything is separated by several clock ticks.

The SEQ file plays briefly before the main tune, which is still dry as the desert. I'd like any feedback from people who have had success getting reverb to work with this method or any other method. Is there a way for the programmer to turn reverb on directly? If so, what is the command? "

Rob Wrote: Okay, here is the problem with what you are trying to do. All that SEQ is doing is setting reverb for itself, not for the PlayStation as a whole or any voices in general.

Buzz Writes: You want to check out (or have the programmer check out) the following functions... SsUtSetReverbType(...) SsUtSetReverbDepth(...) SsUtReverbOn(...)

SsUtSetReverbOff(...)

and maybe even... SsUtSetReverbFeedback(...) SsUtSetReverbDelay(...)

and don't forget... SpuClearReverbWorkArea(...)

There is a whole issue around turning the reverb on and off without getting noises. Check the archives or FAQ.

Just tell the programmer what reverb type to turn on (based on your findings using SoundDeli for example), and what percentage to set the depth to. I say percentage because the "depth" menu you are used to using in SoundDeli has no relevance to the depth setting the programmer has (a value from 0 - 127). So do a little simple math to turn your SoundDeli depth setting into a percentage and let the programmer set up the call to SsUtSetReverbDepth.

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4/30/96 12:05 PM

Re: SsUtSetVVol

Buzz Burrowes

Sound Programmers

>> In a few posts to this conference, buzz and a few others refer to the function SsUtSetVVol as if it works. My experience as of 2 minutes ago is that it doesn't.

Yes, it did... and I just confirmed that it still does.

>> If I use SsUtSetVVol on all voices (0-24), I get no decrease in volume.

I do the following...

Start the looping sample with the SsUtKeyOn(...) call... Save the returned voice number somewhere (e.g. LoopingVoice)... Call SsUtSetVVol(...) passing LoopingVoice and the new volume.

It works.

>> Thanks in advance for any suggestions about where I may have gone wrong.

From your post, I'm not sure there is enough information to determine what you are doing wrong. It maybe the fact that you aren't using the returned value from your KeyOn call in your call to SsUtSetVVol(...).

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5/2/96 8:53 AM

Streaming Sound Oddity

Carl Ferreira

Sound Programmers

I have an odd problem with the streaming sound library.

I have modified the example program (with the bouncing balls) to play out of two RAM buffers and two audio RAM buffers a mono sound file (specifically TR1L\_PAD.VB). The program seems to run OK -- when the end of file is reached, it seeks to the start of the file and continues reading as though it were a huge data stream.

Here's the problem:

The file length is 0x7a000 bytes long.

When I use a buffer size of 0x4000 (same as the example program), there is no problem. At end of file, the program seeks to the beginning and keeps on going -- over and over and over and

over....

When I use a buffer size of 0x5000 (NOT an even divisor of the file length), then the file plays once and then stops. The SpuStGetStatus() and SpuStGetVoiceStatus() values have not changed, but there is no longer any sound, and I can neither end the stream nor restart it without exiting the program. This occurs even if, rather than seek to the start of the file, I concatenate two copies of the .VB file into a file twice as long. When I use a buffer size of 0x4000 everything works fine; when I use any buffer not an even divisor of the original file, it stops playing after the first iteration (halfway through the concatenated .VB file).

This is VERY strange. Any ideas?

Carl Ferreira Atari Games

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5/6/96 1:53 PM

Re: Streaming Sound Oddity

Dennis Harper

Sound Programmers

I think the streaming sample code does not end the stream properly. It uses KeyOff or something, which it specifically says in the docs not to use.

Eu-Ming Lee Atari Games Corporation

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5/6/96 1:55 PM

Re: Clearing SPU RAM

Dennis Harper

Sound Programmers

Well, if you're starting your write at 0x1000 and trying to write 512\*1024, you're going to find yourself writing 0x1000 too many bytes. Try 512\*1024-0x1000 in your SpuWrite routine.

Eu-Ming Lee Atari Games Corporation

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5/6/96 2:40 PM

Re(2): Clearing SPU RAM

Carl Ferreira

Sound Programmers

Alas, I fear that I have not described the situation well enough. Let me try again.

I have modified the streaming sound example so that it uses a single buffer for a single voice. The buffer size (in system RAM and audio RAM) is 16k -- I get a callback after each 8k (1/2 buffer) is through.

I can successfully stream megabytes of data this way.

The problem is that for some strange reason, the streaming audio stops at the end-point of the sample ONLY if the buffer size is not evenly divisible into the streaming file size. Since I reset the file to continue loading the file from the beginning, I don't understand how the buffer size can possibly affect this hanging problem -- but a 16k buffer works and a 20k buffer does not.

Sony -- please respond.

Carl Ferreira Atari Games

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5/7/96 10:16 AM

Re: Sample playing via SPU only



Rob Vawter  
Dave R. Scheele  
Sound Programmers

Does anyone have an example (or know where one exists) of playing a sound sample (preferably a .VAG, if possible) using only the SPU library? The developers CD (version 1.5 is all I have so far ...) has examples in \PSX\SAMPLE\SOUND that load .vb / .vh's and play them via libsnd, but I'd rather not have to link in that whole thing just to play a sound.

Check out tuto3, under PSX\SAMPLE\SOUND\TUTO. pf\_wave.h is a VAG with the header (first 48 bytes) stripped off.

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5/7/96 10:56 PM  
Pitch and Sample Freq  
Lobotomy Software  
Sound Programmers

When using VAG sounds, what is the relation between the sample frequency in the header and the pitch value of the attr for playing the VAG?

What is a the "formula" for converting between the two (sample rate to pitch)?

Jeff Blazier Lobotomy

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5/7/96 3:31 PM  
Re: Clearing SPU RAM  
Rob Vawter  
P. (Leake / Scharnberg)  
Sound Programmers

Q: Upon initialization, I'm hearing some stuff from a previous load AND getting a stuck note which I obviously do not want to hear. I try and clear the sound buffer when I first start up using the following code:

```
SsInit(); SpuSetTransferStartAddr(0x1000); bytesWritten = SpuWrite0(512*1024);
```

but to no avail. bytesWritten is always 0, no matter what number of zero bytes I tell SpuWrite0 to write, and I always hear the vestigial stuff.

What am I doing wrong, if anything? I'm using library version 3.4

A: The return value of SpuWrite0() listed in the docs is wrong. The SPU clearing is done in chunks of 1024 or less, and then 1024 is subtracted from the value which you send to SpuWrite0. So, you will always get a return value which ranges from 0 to -1023. SpuWrite0() also has no error checking. I'm not really sure what happens when you write past the end of SPU RAM. I'm not going to look into that unless you REALLY need me to, as I am swamped here. I still have no idea why you are hearing sounds from a previous load. Let me know if writing the proper amount of 0s works for you.

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5/10/96 12:20 PM  
Re(2): Pitch and Sample Freq  
Lobotomy Software  
Sound Programmers

I am using the DOS util "aiff2vag" for converting my sounds. I then load them into the sound ram by stripping off the header and sending only the raw data. I use methods for playing the sounds similar to those in the sample on the developer CD.. (the one with the sin wave vag with its header missing)  
In the demo, the code just sets the pitch with an attr structure.

What do I use for this pitch value given only the value found in the vag header?  
Jeff Blazier

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5/12/96 4:16 PM  
Re(3): Pitch and Sample Freq  
Jay Stelly  
Sound Programmers

>I am using the DOS util "aiff2vag" for converting my sounds. >I then load them into the sound ram by stripping off the header and sending only the raw >data.  
>I use methods for playing the sounds similar to those in the sample on the developer CD..  
>(the one with the sin wave vag with its header missing)  
>In the demo, the code just sets the pitch with an attr structure. >What do I use for this pitch value given only the value found in the vag header?  
> Jeff Blazier  
I believe what you are looking for is this:  
pitch = (headerFreq<<12)/44100L;  
Since the SPU pitch is a fixed point fraction of 44.1KHz.  
Jay Stelly Tetragon

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5/13/96 6:50 AM  
Stereo / Mono via SPU  
Dave Scheele  
Sound Programmers

In LibSnd there are two functions, SsSetStereo and SsSetMono, which perform the obvious functions :) How does one go about achieving that functionality using only LibSpu? I am streaming stereo XA music off of the CD, but when played on a mono TV, I lose one side ... using SPU only, how can I stop this from occurring?  
Dave

---

5/20/96 6:39 PM  
CD-XA: Buffering?  
Mick Killianey  
Sound Programmers

Hi,  
Is it possible to allocate a piece of SPU RAM as a buffer for streaming XA data, in order to avoid interrupting playback while sending the CD head off to a random location for a snippet of data? Has anyone tried this, especially when the additional data is destined for the SPU?  
Thanks, Tom Hays Rocket Science Games

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5/21/96 9:39 AM  
Re: CD-XA: Buffering?  
Rob Vawter  
Mick Killianey  
Sound Programmers

Q: Is it possible to allocate a piece of SPU RAM as a buffer for streaming XA data, in order to avoid interrupting playback while sending the CD head off to a random location for a snippet of data?

A: No. XA data heads straight to the SPU from the CD ROM decoder. It never really hits SPU RAM. You could accomplish something similar to this by using VAG streaming, which uses a buffering system.

Q: Has anyone tried this, especially when the additional data is destined for the SPU?

A: Try SPU streaming (VAG streaming).

---

5/22/96 8:07 AM

Re: sound playing

Pat Quinn

Gerald T. McCants

Sound Programmers

solved sound playing problem (oops). ya don't wanna know.

Gerald,

We're having a problem with getting sample sound programs to run. Any ideas on how to get them to run would be appreciated.

Gordon Read NuFX, Inc.

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6/3/96 2:17 PM

SPU streaming

P. (Leake / Scharnberg)

Rob Vawter

Rob -

Continuing along in this vein, here is a more formal list of my other outstanding streaming questions:

1) Can I stream files at sampling rates other than 44.1kHz? You indicated this should be possible, something about changing a pitch field? 2) What voice attributes MUST be set for a voice that will be used for streaming? 3) You indicated that SpuInitMalloc() gets called by SsInit() with the "num" parameter set to 32 and the "top" char record set to a size of (SPU\_MALLOCS\_RECSIZ\*18). The manual states this latter parameter should be sized as: (SPU\_MALLOCS\_RECSIZ\*(num+1)) bytes. And I'm also confused as to what these memory management blocks do for me. Is the SPU RAM divided up into 32 (or 18) equally sized regions? How much RAM does each memory management block consume in overhead? Do I need to call anything to undo any previous management setup before I call SpuInitMalloc() on my own? What memory management does the SPU do? Help...

Thanks for your attention.

-Martin Wilde Viacom New Media

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6/6/96 9:35 AM

Re(2): CD-XA: Buffering?

Robert w. Calfee

Sound Programmers

So is it possible to use the CD streaming functions to load music data from disc, buffer the sound data in a ring cache, then while music is streaming (different library) into the SPU, move the CD's read head and load data.

Gee- reading data while music is playing off the CD rom sure would be nice....

Any examples?  
rwc-Abalone

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6/10/96 9:48 AM  
Re(3): CD-XA: Buffering?  
Rob Vawter  
Sound Programmers

Q: So is it possible to use the CD streaming functions to load music data from disc, buffer the sound data in a ring cache, then while music is streaming (different library) into the SPU, move the CD's read head and load data.

A: No. XA and DA data travel straight from the CD-ROM to the SPU. There is no way to buffer these types of sound data. You can only use VAG streaming to try to accomplish the above scenario.

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6/11/96 12:32 PM  
VAB Header (.VH) File Format  
Rob Vawter  
Sound Programmers  
Brett Butler

This is a corrected update of the VAB Header (.VH) file format. I left out a whole 2 bytes earlier and didn't put quite enough info in before either. Sorry! Changes are in red.

This message is important for those of you building VABs in a non-standard way, whether it is pre-disk burning on a PC, or during gameplay.

ID ("VABp") 4 bytes\* Version 4 bytes VABID 4 bytes\*\* Waveform Size 4 bytes Reserved 2 bytes No. of Programs 2 bytes No. of Tones 2 bytes No. of VAGs 2 bytes Master Volume 1 byte Master Pan 1 byte Reserved 6 bytes Program Attr. Table 16 bytes x 128 (Max # of programs) Tone Attr. Table 512 bytes (32 bytes \* 16 (maximum tones per program)) # of programs VAG Size Table 512 bytes

\* Actually shows up as "pBAV" if viewed in hex. \*\* [not sure, but think that this is updated in the .vh file which resides on main RAM when an ID has been assigned after transferring .vb to SPU RAM. SO, it looks like it always starts out 00 00 00 00].

You can get each VAG data size from the "VAG Size Table." 3 bit right-shifted VAG data size is stored in short (16 bit), so you can get the actual VAG size shifting the size in the table.

Example: VAG #1 #2 #3 ... VAG Size Table 0x1000 0x0800 0x0200... actual size 0x8000 0x4000 0x1000... offset 0x8000 0xc000 0xd000...

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6/13/96 4:07 PM  
DMAing data to SPU during Stream  
Sean P. Igo  
Sound Programmers

Hello,

Is there some graceful way to DMA a relatively large (say, 64K) lump of sound data to the SPU RAM while there are sounds being streamed out of system RAM? I've thought of a kludge for handling it, but would rather find a more elegant way.

..sean igo Sculptured Software

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6/24/96 9:05 AM  
Fwd: SPU streaming  
P. (Leake / Scharnberg)  
Sound Programmers

Rob -  
Re-posting, here. Please give me an update. -Martin

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Continuing along in this vein, here is a more formal list of my other outstanding streaming questions:

[High priority] 1) Can I stream files at sampling rates other than 44.1kHz? You indicated this should be possible, something about changing a pitch field? Addendum: If this is so, would this also be the preferred method for intended pitch shifting of a stream? 2) What voice attributes MUST be set for a voice that will be used for streaming?

[Lower priority] 3) You indicated that `SpuInitMalloc()` gets called by `SsInit()` with the "num" parameter set to 32 and the "top" char record set to a size of  $(\text{SPU\_MALLOC\_RECSIZ} * 18)$ . The manual states this latter parameter should be sized as:  $(\text{SPU\_MALLOC\_RECSIZ} * (\text{num} + 1))$  bytes. And I'm also confused as to what these memory management blocks do for me. Is the SPU RAM divided up into 32 (or 18) equally sized regions? How much RAM does each memory management block consume in overhead? Do I need to call anything to undo any previous management setup before I call `SpuInitMalloc()` on my own? What memory management does the SPU do? Help...

Thanks for your attention.  
-Martin Wilde Viacom New Media

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6/27/96 10:06 AM  
Re: Fwd: SPU streaming  
Rob Vawter  
P. (Leake / Scharnberg)  
Sound Programmers

[High priority] 1) Can I stream files at sampling rates other than 44.1kHz? You indicated this should be possible, something about changing a pitch field? Addendum: If this is so, would this also be the preferred method for intended pitch shifting of a stream?

Yes. The `attr.pitch` must be set at a lower value for lower sampling rates. I'm not sure in your addendum if you mean pitch shifting mid stream or what.

2) What voice attributes MUST be set for a voice that will be used for streaming?

Answer: a) `attr.voice.left` MUST be set (`SpuInit` initializes this to 0 for all voices). b) `attr.voice.right` MUST be set (`SpuInit` initializes this to 0 for all voices). c) `attr.voice` MUST be set d) `attr.addr` MUST be set e) `attr.pitch` probably should be set or pitch will be too high (`SpuInit` initializes this to 3FFF for all voices).

I successfully streamed sound using only a-d.

[Lower priority] 3) You indicated that `SpuInitMalloc()` gets called by `SsInit()` with the "num" parameter set to 32 and the "top" char record set to a size of  $(\text{SPU\_MALLOC\_RECSIZ} * 18)$ . The manual states this latter parameter should be sized as:  $(\text{SPU\_MALLOC\_RECSIZ} * (\text{num} + 1))$  bytes.

Sorry, I did mispeak slightly on this issue. The array of char (`rec`) is  $\text{SPU\_MALLOC\_RECSIZ} * 18$ . The start address of the area storing SPU management table (`top`) is set to  $\text{rec} + \text{SPU\_MALLOC\_RECSIZ}$ . I have no idea why this formula does not follow the guidelines. And I'm also confused as to what these memory management blocks do for me. Is the SPU RAM divided up into 32 (or 18) equally sized regions?

Sort of. Let's say you went crazy and set `num` to 100 and for the sake of argument let's pretend all 512k of sound RAM is usable. Then, each block would be about 5k in size. When you need to

transfer a 7k .vb over, 2 blocks would be eaten up and 3k would be wasted. If you transferred over a 100k .vb, 20 blocks would be used and 0k would be wasted. It's a tradeoff; less wasted SPU RAM for higher values of num, but more main RAM used because of the increase in the size of rec. You can choose to manage the blocks yourself in the libsnd, by using SsOpenHeadWithMode with mallocmode set to 1 (don't use SpuMalloc) and setting an address you wish to transfer you .vb to.

How much RAM does each memory management block consume in overhead?

I believe that it depends purely on the size of rec. Do I need to call anything to undo any previous management setup before I call SpuInitMalloc() on my own?

No. SpuInitMalloc will do a complete reset of the management setup.

What memory management does the SPU do? Help...

The management blocks are used by SpuMalloc to find a workable area for your next transfer to SPU RAM.

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6/28/96 9:20 AM

Re(2): Fwd: SPU streaming

P. (Leake / Scharnberg)

Sound Programmers

>>> [High priority] 1) Can I stream files at sampling rates other than 44.1kHz? You indicated this should be possible, something about changing a pitch field? Addendum: If this is so, would this also be the preferred method for intended pitch shifting of a stream?

Yes. The attr.pitch must be set at a lower value for lower sampling rates. I'm not sure in your addendum if you mean pitch shifting mid stream or what. >>>

What specifically should these pitch values be for specific sampling rates? The sample code sets it to 0x1000, but you say SpuInit() sets it to 0x3FFF. Is that pitch attribute field used as a fixed-point value? And yes, is it possible to shift the pitch of a stream while playing?

>>> You can choose to manage the blocks yourself in the libsnd, by using SsOpenHeadWithMode with mallocmode set to 1 (don't use SpuMalloc) and setting an address you wish to transfer you .vb to. >>>

Never heard of the SsOpenHeadWithMode() call. Don't see any mode parameters with any of the SsVabOpenHead...() calls. What is this thing and how is it used/what are its parameters? And along these lines of memory management, three things: 1) How can I calculate where and how much SPU RAM is taken up by the reverb, especially if I bypass SpuMalloc()? I have numbers for the various rooms from SoundDeli, but this gives me no information for the various depths I can set. Is this total reverb work area always butted up against the 0x7FFFF top?, 2) Do any of the calls become garbage if I manage where I put things? Calls like SpuIsTransferCompleted(), any of the SpuSetReverb...() calls., and 3) Do the existing SsVabOpenHead() and SsVabTransBody() calls rely on an initialized SPU malloc table?  
Martin Wilde Viacom New Media

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6/28/96 9:31 AM

CD audio

P. (Leake / Scharnberg)

Sound Programmers

How do I play back an audio track from the CD? Does this data have to be CD-DA or can it be ADPCM? I ask because there's a confusing explanation in the run-time library 3.0 reference for the CdMix() call, where it states it sets the "audio volume for CD audio (CD-DA, ADPCM)"? Can I do other sound playback, as from a VAB, while CD audio is happening? Does this CD audio use the same part of SPU RAM as my VABs use, or the initial 0x1000 bytes (the SPU

Decode Data Region)?  
Thanks for your help. Martin Wilde Viacom New Media

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6/28/96 11:38 AM

Re: CD audio

Rob Vawter

P. (Leake / Scharnberg)

Sound Programmers

How do I play back an audio track from the CD? Check out psx\sample\cd\tuto\  
(various tutorials).

Does this data have to be CD-DA or can it be ADPCM? I ask because there's a confusing explanation in the run-time library 3.0 reference for the CdMix() call, where it states it sets the "audio volume for CD audio (CD-DA, ADPCM)"? That confusing entry exists because XA is an ADPCM format. SO, DA and XA can be played from the CD.

Can I do other sound playback, as from a VAB, while CD audio is happening? Yes.

Does this CD audio use the same part of SPU RAM as my VABs use, or the initial 0x1000 bytes (the SPU Decode Data Region)? None of the VAB area gets used up by CD audio. The only place CD audio ever resides is in the Decode Data Region.

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7/2/96 1:55 PM

Pitch and SPU Malloc

Rob Vawter

P. (Leake / Scharnberg)

Sound Programmers

Question#1

Rob's old answer: The attr.pitch must be set at a lower value for lower sampling rates. I'm not sure in your addendum if you mean pitch shifting mid stream or what.

Martin: 1a) What specifically should these pitch values be for specific sampling rates? 1b) The sample code sets it to 0x1000, but you say SpuInit() sets it to 0x3FFF. Is that pitch attribute field used as a fixed-point value? 1c) And yes, is it possible to shift the pitch of a stream while playing?

Rob's Answers 1a-1c (answers a and b stolen directly from Jay Stelly): #1a: pitch = (headerFreq << 12) / 44100L; 44.1 = 0x1000 22.05 = 0x800 etc #1b: SPU pitch is a fixed point fraction of 44.1KHz. #1c: You could use SpuSetVoiceAttr() to change the pitch by small increments over time, or change the pitch, slam-bang-right-now. However, you will run across problems regarding SPU streaming and pitch value, specifically when more than one voice is streaming. Only one IRQ is set for all streams; this is why they must be all the same size. They should also be the same pitch; otherwise, you will suffer from data drought or data cut-off.

Question #2 Rob's old answer really wrong answer: You can choose to manage the blocks yourself in the libsnd, by using SsOpenHeadWithMode with mallocmode set to 1 (don't use SpuMalloc) and setting an address you wish to transfer you .vb to. >>>

Martin: 2) Never heard of the SsOpenHeadWithMode() call. Don't see any mode parameters with any of the SsVabOpenHead...() calls. What is this thing and how is it used/what are its parameters?

Rob's answer #2: Gee, I know the reason you haven't heard of it! It's an internal call! Sorry. The function I really meant to point out while my brain was on vacation is SsVabOpenHeadsticky() which allows you to manage where the .vb gets transferred to. (In my defense, OpenHead and OpenHeadSticky both call OpenHeadWithMode.) Question #3

Martin: And along these lines of memory management, three things: 3a) How can I calculate where and how much SPU RAM is taken up by the reverb, especially if I bypass SpuMalloc()? I

have numbers for the various rooms from SoundDeli, but this gives me no information for the various depths I can set. Is this total reverb work area always butted up against the 0x7FFF top? 3b) Do any of the calls become garbage if I manage where I put things? Calls like SpuIsTransferCompleted(), any of the SpuSetReverb...() calls. 3c) Do the existing SsVabOpenHead() and SsVabTransBody() calls rely on an initialized SPU malloc table?

Rob's answers #3a-3c #3a: Yes, the reverb work area is ALWAYS butted up against the 0x7FFF. Here are the reverb work sizes (taken from pg. 638 of the 3.0 Reference Guide:  
Mode Bytes OFF 0/128\* ROOM 9920 STUDIO\_A 8000 STUDIO\_B 18496 STUDIO\_C  
28640 HALL 44512 SPACE 63168 ECHO 98368 DELAY 98368 PIPE 15360

\* Even if the Mode is OFF, if SpuReserveReverbWorkArea(SPU\_ON) is called, 128 bytes will be taken up for reverb.

#3b: Some of the reverb calls check an SPU malloc management table to ensure an open work area. All functions except SsVabOpenHead() should be fine without SpuMalloc calls. Use SsVabOpenHeadSticky() instead and manage your SPU RAM carefully.

#3c: SsVabOpenHead() - Yes. SsVabTransBody() - No. OpenHead() internally sets up an SPU address based on reverb work area, SPU mallocs etc, for the transfer of the .vb.

OpenHeadSticky() sets that address based on YOUR management system. TransBody() doesn't care where it's going, it just does what it is told.

---

7/8/96 11:02 AM

SpuVoiceAttr volume settings

John Harris

Developer Support

I'm trying to create a function to adjust the music volume by using SpuSetVoiceAttr(). The range for volume values in the SpuVoiceAttr structure does not seem to match the 0-127 range as specified in the KeyOn() functions. The voice was originally keyed on with a volume of \$40, and yet the value returned in the structure using SpuGetVoiceAttr() shows \$1040. I have temporarily coded the routine by taking the 0-127 volume figures and shift left 6 places before storing them in SpuVoiceAttr.volume, and it seems to work okay, but it doesn't really make sense. Plus, I'm going to get \$1000 instead of \$1040 with that calculation, which doesn't match what SpuGetVoiceAttr() returned after a KeyOn(). (but sounds the same)

Here's the code, and I'd like someone to verify, or correct it. Thanks!

```
SetVol(int voice, int vol) { SpuVoiceAttr attr; attr.voice = 1<<voice; attr.volume.right =  
attr.volume.left = vol<<6; // vol would be 0-127 attr.mask = SPU_VOICE_VOLL |  
SPU_VOICE_VOLR; SpuSetVoiceAttr(&attr); }
```

John Harris Tachyon Studios, Inc

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7/11/96 11:01 AM

Direct MIDI volume for .SEQ's

Chris Stevens

Sound Programmers

Our programmer is having trouble sending realtime distance-based volume commands to .SEQ files. We have a collection of one-track single note MIDI sequences (not using direct MIDI triggering at this time). The first time the sfx is played there is no volume response, the second time it is played, there is. Any thoughts?

p.s. there is a single volume command at the front of the .SEQ file, but since the programmer is sending a steady stream of volume commands, I would suspect this would be okay.



Chris Stevens

---

7/22/96 10:23 AM

EncSPU  
Rob Vawter  
Sound Programmers

I know you have all heard this before, but I'm going to tease you yet again. EncSPU() has been slated for release in libpress for the next release version ("maybe 3.6" was the exact quote). Apparently there was an issue involving possible patent infringement that has now been cleared.

---

7/23/96 11:37 PM

SsVabOpenHead and samples  
Tom Sloper  
Sound Programmers

I hope this is not an RTFM question, but... I just downloaded the 3.5 samples/lib and such and tried to compile and run the XSE sound sample. The sample fails with a '-1' in SsVabOpenHead. I'm sure that I called 'make load' for the vb/vh files, but since this is the first time I've messed with psx sound, perhaps I'm doing something stupid. I've tried to compile other samples that also use SsVabOpenHead, like some of the tuto(x) files, and the error is occurring in the same place, SsVabOpenHead returns '-1'. Any suggestions would be greatly appreciated...

---

7/24/96 4:38 PM

Re: Direct MIDI volume for .SEQ's  
Rob Vawter  
Chris Stevens  
Sound Programmers

Our programmer is having trouble sending realtime distance-based volume commands to .SEQ files. We have a collection of one-track single note MIDI sequences (not using direct MIDI triggering at this time). The first time the sfx is played there is no volume response, the second time it is played, there is. Any thoughts? p.s. there is a single volume command at the front of the .SEQ file, but since the programmer is sending a steady stream of volume commands, I would suspect this would be okay.

This sounds like a NoteOn volume response MIDI problem. Changes to the volume which occur after a NoteOn do not affect the currently sounding note. For example, a decrescendo will leave the currently playing notes at their current volume, while future NoteOn commands will decrescendo

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7/24/96 4:33 PM

Re: SsVabOpenHead and samples  
Rob Vawter  
Tom Sloper  
Sound Programmers

I just downloaded the 3.5 samples/lib and such and tried to compile and run the XSE sound sample. The sample fails with a '-1' in SsVabOpenHead. I'm sure that I called 'make load' for the vb/vh files, but since this is the first time I've messed with psx sound, perhaps I'm doing

something stupid. I've tried to compile other samples that also use SsVabOpenHead, like some of the tuto(x) files, and the error is occurring in the same place, SsVabOpenHead returns '-1'. I have no problems running this sample. I think you must be performing the load incorrectly, perhaps loading the data to a different address than expected. Check your load message and report it back to me.

-Rob

---

7/25/96 2:34 PM

Re(2): SsVabOpenHead and samples

Tom Sloper

Sound Programmers

Rob Vawter writes: I just downloaded the 3.5 samples/lib and such and tried to compile and run the XSE sound sample. The sample fails with a '-1' in SsVabOpenHead. I'm sure that I called 'make load' for the vb/vh files, but since this is the first time I've messed with psx sound, perhaps I'm doing something stupid. I've tried to compile other samples that also use SsVabOpenHead, like some of the tuto(x) files, and the error is occurring in the same place, SsVabOpenHead returns '-1'.

I have no problems running this sample. I think you must be performing the load incorrectly, perhaps loading the data to a different address than expected. Check your load message and report it back to me.

-Rob

I could be doing the load wrong, but I've since decided that the wholeVAB/VB/VH thing is lame. Unless I'm missing something, I get a lot more control over my samples by taking individual VAG files and stripping off the first 48 bytes and using that. Thank-you though for the reply!

---

7/25/96 4:21 PM

Current Voice Position

Tom Sloper

Sound Programmers

Save for actually setting up an IRQ callback, is there any way of knowing where in a particular channel the SPU is currently playing from, even to the nearest few samples?

If I was just playing one voice out of one channel, the IRQ mechanism would be sufficient, but, if I'm playing 24 voices, using the IRQ method would be difficult to code at best, and I'm not sure it could be done with 100% reliability. I could use a root counter, but if I'm streaming a VAG file, the root drift could account for thousands of samples' worth of error.

Any suggestions/comment would be appreciated!

---

7/25/96 3:07 PM

Complex VAG streaming

Tom Sloper

Sound Programmers

Because I find direct XA transfer of sound too far removed from my control, I would like to perform VAG data streaming for movie playback. One reason is for variable sized sound

interleaving to account for playback data spikes.

Anyway, the actual streaming of VAG is not that hard. The real problem is error recovery/frame skipping. In either case, I would like to be able to start a movie in an arbitrary place. The problem is that the VAG format, and hence the ADPCM format is opaque. I can find no way of capturing the ADPCM 'state' for a restart. Having coded ADPCM sound before, I know that \*someone\*(libspu, the spu itself maybe) has to have this running state to decode the next sample. The actual question is this:

Is there any way an interface could be made to give this state, in whatever back-box format is deemed necessary, to the application for mid-vag restarting?

One other possible solution for the in-movie jumping is the notion of sound 'key frames' just as delta movie compressors use key frames. I would not mind so much using this idea, but the cost of keeping a VAG key frames around seems quite high! Every compressed VAG file has the 4:1 data PLUS some amount of overhead(Custom Step size tables? Custom index tables? loop points? who knows?). This overhead will seriously degrade my movie playback quality. Unlike movie 'key frames', I don't have enough state information on a VAG file(read: none!) to make small enough VAG key frames because of the overhead.

Any comments or suggestions? Please forgive me if I'm being obtuse and missing something obvious.

verbose mode off

---

7/29/96 1:06 PM

DMA transfers

Tom Sloper

Sound Programmers

What kind of bus arbitration goes on during a DMA transfer? Can I have multiple DMA transfers going on, one to SRAM and one to VRAM, and if I can, is there some percentage of cycles that the R3000 loses, or will the R3000 block until one/both transfers are done?

Is there some documentation on this somewhere, or is this a profiling experiment?

Thanks for any and all responses!

---

7/30/96 10:18 AM

Re: Current Voice Position

Rob Vawter

Tom Sloper

Sound Programmers

Save for actually setting up an IRQ callback, is there any way of knowing where in a particular channel the SPU is currently playing from, even to the nearest few samples?

I think that a root counter is currently your best possible of timing the sample and estimating where in the sample you are.

---

7/30/96 8:47 PM

Re(2): Complex VAG streaming

Tom Sloper

Sound Programmers

Rob Vawter writes: Is there any way an interface could be made to give this state, in whatever back-box format is deemed necessary, to the application for mid-vag restarting?

Currently there is no way to mid-VAG restart. I'm looking into the possibilities.

Thanks! I just implemented the streaming of VAGs using the streaming libs and I can now

definitely say that it's a somewhat cumbersome way of doing things... I took a quick peek at the (ST)ream obj(I know, shame on me...) and it's not a huge amount of code. Is this a proprietary issue? :(

---

7/30/96 10:38 AM

Re: DMA transfers

Rob Vawter

Tom Sloper

Sound Programmers

What kind of bus arbitration goes on during a DMA transfer? Can I have multiple DMA transfers going on, one to SRAM and one to VRAM, and if I can, is there some percentage of cycles that the R3000 loses, or will the R3000 block until one/both transfers are done?

Is there some documentation on this somewhere, or is this a profiling experiment?

No, you can't have multiple transfers going. R3000 access to the bus will be limited according to which DMA transfer mode you are in (slice, source chain, burst etc)

---

7/30/96 10:16 AM

Re: Complex VAG streaming

Rob Vawter

Tom Sloper

Sound Programmers

Is there any way an interface could be made to give this state, in whatever back-box format is deemed necessary, to the application for mid-vag restarting?

Currently there is no way to mid-VAG restart. I'm looking into the possibilities.

---

7/30/96 8:43 PM

Re(2): Current Voice Position

Tom Sloper

Sound Programmers

Rob Vawter writes: Save for actually setting up an IRQ callback, is there any way of knowing where in a particular channel the SPU is currently playing from, even to the nearest few samples?

I think that a root counter is currently your best possible of timing the sample and estimating where in the sample you are.

Thanks for the reply! I suppose the same can be said for a loop count?

---

7/31/96 11:07 AM

Re(3): Complex VAG streaming

Rob Vawter

Tom Sloper

Sound Programmers

I just implemented the streaming of VAGs using the streaming libs and I can now definitely say that it's a somewhat cumbersome way of doing things... I took a quick peek at the (ST)ream obj(I know, shame on me...) and it's not a huge amount of code. Is this a proprietary issue?

Partially, yes, since it deals with the format of the VAG files, which Sony has yet to release.

What would you like to see improved or added?

---

7/31/96 2:44 PM

Re(4): Complex VAG streaming

Tom Sloper

Sound Programmers

Rob Vawter writes: Partially, yes, since it deals with the format of the VAG files, which Sony has yet to release. What would you like to see improved or added?

Well, what it really boils down to is the inability to control the data rate to the SPU. I understand that the data rate needs to keep up with the playback rate, but during a movie, I may have data that comes in a few hundred bytes at a time. Rather than take that hundred bytes from the CD subsystem's sector buffer, waste cycles copying it to a temp ram buffer until I have enough data to match half the SPU stream buffer, I would like to be able to issue an SPUWrite call to transfer the data to the right location.

In other words, I don't want the stream libs to automatically transfer the data from the dram buffer specified in the stream structure. I may not have the data available at the right time because of movie data spikes. I want it to tell me, via some GetStreamInfo call, how much data it thinks it has left to play before it loops with stale data. This will tell me where to write the VAG data as soon as I get it. Does this make sense? And, as an extra added bonus, this same call lets me know exactly where, time wise, in the stream I am, allowing me to do really accurate syncing to movie data!

Thanks!

---

7/31/96 11:09 AM

Re(3): Current Voice Position

Rob Vawter

Tom Sloper

Sound Programmers

I suppose the same can be said for a loop count?

As in how many times the sound has looped? Yeah, for now using a root counter is perhaps your best method. I am checking the possibility of using the area in Sound RAM 0x1000 - 0x1010 which has been set aside for some sort of internal VAG place markers.

---

8/2/96 2:32 PM

Pitch with SSVoKeyOn()?

Eric Yiskis

Sound Programmers

The 2nd parameter indicates an ability to specify a finer pitch in the lower 8 bits, however, I have not been able to actually accomplish this. Is there some initialization I am missing? Without knowing which voices are being used by SsVoKeyOn(), I can't do it manually. I have also tried using SsUtGet/SetVagAttr() to set the values of attr.pbmin and attr.pbmax, again to no avail. Any suggestions would be appreciated...

---

8/2/96 5:56 PM

Re: Pitch with SS....

Eric Yiskis

Sound Programmers

I've found a different direction which may offer a solution, but has it's own problem. I'm now using calls to SsUtKeyOn() which requires: vabID, prog, tone, note, fine... I understand vabid, prog, and note, but where did "tone" come from? I've been able to pitch shift sounds, but I can't seem to pick which sound is being played. Needless to say my team-members are hoping I find a solution soon...

---

8/5/96 10:56 AM  
Dos sound Tools 2.0  
Administrator  
Sound Programmers

The Dos Sound Tools Version 2.0 are now found in: Conferences/Tools Docs and Info/  
Tools/Sound Artist Tools.  
Download at your leisure.  
-Peter

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8/7/96 12:11 PM  
Re(2): Pitch with SS....  
Rob Vawter  
Eric Yiskis  
Sound Programmers

I'm now using calls to SsUtKeyOn() which requires: vabID, prog, tone, note, fine... I understand vabid, prog, and note, but where did "tone" come from? I've been able to pitch shift sounds, but I can't seem to pick which sound is being played. Needless to say my team-members are hoping I find a solution soon...

VABs consist of the following: 1) Master VAB info (master volume etc) 2) Program info (program pan, program volume etc.). Each program consists of 1-16 tones. 3) Tone info (tone pan, tone volume etc.). Each tone is made up of 1 VAG. A tone can be thought of as a set of attributes with which to play a particular VAG. Example: GUNSHOT.VAG could be used by 2 completely different tones. One tone may have a low magnum firing sound, and the other may have a rapid fire automatic weapon sound. 4) VAG data  
Either ask your VAB creator which tone you intend to be changing OR use a Mac to check out each tone individually or use the new DOS tools to parse out the VAB and try to make educated guesses about what each VAG inside the VAB sounds like.  
Question: are you trying to pitch shift a currently sounding note?

---

8/7/96 12:04 PM  
Re: Pitch with SSVoKeyOn()?  
Rob Vawter  
Eric Yiskis  
Sound Programmers

The 2nd parametre indicates an ability to specify a finer pitch in the lower 8 bits, however, I have not been able to actually accomplish this. Is there some initialization I am missing? Without knowing which voices are being used by SsVoKeyOn(), I can't do it manually. I have also tried using SsUtGet/SetVagAttr() to set the values of attr.pbmin and attr.pbmax, again to no avail. Any suggestions would be appreciated...  
The lower eight bits aren't currently supported. SsVoKeyOn() should return voice values keyed on in version 3.5.

---

8/8/96 12:05 PM  
Re(3): Pitch with SS....  
Eric Yiskis  
Rob Vawter  
Sound Programmers

Hi Rob,

Thanx for your reply. I'm still missing one piece - what you described to me was what I thought a "note" was. I guess what I still don't see is what's the difference between a "tone" and a "note"? SsUtKeyOn() requires me to specify both.

You asked: >>Question: are you trying to pitch shift a currently sounding note? Not particularly. The result I want to achieve is playing a note from start to finish at a specified but constant pitch bend. If SsVoKeyOn() now returns the voices which were just activated, I seem to remember a PitchBend routine somewhere which I'll try to use to see if that works. My VAB creator is a third party in San Francisco, which makes it a bit difficult to work through the initial development.

Thanx again

--tinman Oddworld Inhabitants

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8/8/96 2:33 PM  
Re(4): Pitch with SS....  
Rob Vawter  
Eric Yiskis  
Sound Programmers

I'm still missing one piece - what you described to me was what I thought a "note" was. I guess what I still don't see is what's the difference between a "tone" and a "note"?

The tone was created with a center note specification. So, you can decide at what note you want to play the tone; do you want the same tone or a tone with a different pitch? It's up to you.

---

8/9/96 9:36 AM  
Re(2): Pitch with SS....  
Buzz Burrowes  
Sound Programmers

Eric Yiskis writes: I'm now using calls to SsUtKeyOn() which requires: vabID, prog, tone, note, fine... I understand vabid, prog, and note, but where did "tone" come from?

Ok, here's the deal...

A program can be made up of up to 16 tones. Each tone has it's own envelope, volume, pan, center note, pitch bend range, etc. Tones are timbres (sounds) that make up the program. Each program can be made up of up to 16 tones.

Now, as to your question...

SsVoKeyOn(...) starts an ENTIRE program playing at the specified note. That is to say that all tones in the program are started. If the program is made up of 4 tones then 4 voices are used (hence the difficulty in returning the voices used.) (Note: actually it is a little more complicated than that because the number of tones that actually sound depends on the note being played and the key range set up for each tone.)

SsUtKeyOn(...) allows you to start a specific tone in the specified program... hence the tone parameter which can be set from 0 -15. This call will allocate only one voice (assuming that the specified tone's key range includes the specified note), and will return that voice number.

A few things to think about... We had a sound guy build a nice stereo crowd sound for use in one of our games. The test department complained that the crowd sound was left heavy. Can you guess what the problem was?

The crowd program was made up of 3 tones (one panned left, one right and one center.) The programmer was using the SsUtKeyOn(...) call and specifying 0 as the tone parameter. Only the tone panned left was being played!  
I hope that helps.

---

8/10/96 3:03 PM  
ssVabTransComplete failure  
Craig Galley  
Sound Programmers

We're having a problem which has us all completely stumped. Randomly, the ssVabTransComplete(SS\_WAIT\_COMPLETED) is hanging forever. We've tried tracking the memory allocation for sound ram and that all seems ok. We have no clue what to check next. ANY help would be greatly appreciated as we are ready to submit once this problem is sorted. As you can understand, we want to submit ASAP! This is the last of our crash bugs that we need to deal with.  
I have seen mention of problems with ssVabTransComplete but apparently no official resolution. Oh and another point, the calls prior (ssVabTransBody) do not fail when they are set up, checks are done.  
Bisc.

---

8/12/96 10:46 AM  
Re(2): ssVabTransComplete failure  
Craig Galley  
Sound Programmers

Rob Vawter writes:  
What sort of transfer mode are you in, IO or DMA? Any other DMA stuff going on at the same time, like spu streaming or cd streaming? Since you are sure that the transbody and openhead are working successfully, I'm not sure what the problem could be.  
We're using the DMA transfer mode. At that point, the only other possible DMA transfer that could be going on is from the CD subsystem where we'd be in the process of loading more data while the transfer to sound RAM is occurring. It is occurring mainly when we are setting up a CD stream. As I said before, we've decided to remove the streaming and contain as much of the sample snippets in the resident sound package. This does, unfortunately, mean that we have less than 1/3 of the sfx that we were using previously but it does work.  
We have decided to go for submission with the more limited sound library but I am still working on this problem. If we can solve it, we would be interested in replacing the effects and possibly submitting again. Unfortunately, we don't have the luxury of time right now.  
As regards the DMA sub-system. What could cause conflicts with this? What would possibly make SsVabTransCompleted to hang? The only other time I came across anything like this was within some Genesis code which was waiting for a flag to be set that was being set and cleared within an ISR.  
Bisc.

---

8/12/96 10:28 AM  
Re: ssVabTransComplete failure  
Rob Vawter  
Craig Galley  
Sound Programmers



We're having a problem which has us all completely stumped. Randomly, the `ssVabTransComplete(SS_WAIT_COMPLETED)` is hanging forever. We've tried tracking the memory allocation for sound ram and that all seems ok. We have no clue what to check next. ANY help would be greatly appreciated as we are ready to submit once this problem is sorted. As you can understand, we want to submit ASAP! This is the last of our crash bugs that we need to deal with.

I have seen mention of problems with `ssVabTransComplete` but apparently no official resolution. Oh and another point, the calls prior (`ssVabTransBody`) do not fail when they are set up, checks are done.

What sort of transfer mode are you in, IO or DMA? Any other DMA stuff going on at the same time, like spu streaming or cd streaming? Since you are sure that the transbody and openhead are working successfully, I'm not sure what the problem could be.

---

8/14/96 7:42 AM

Re(3): `ssVabTransComplete` failure  
P. (Leake / Scharnberg)  
Sound Programmers

I seem to recall a problem with this as well, but my mind is foggy on it now. Try using: `SsVabTransCompleted(SS_IMMEDIATE)` and sit in a while loop until the result code goes high.  
Martin Wilde Viacom New Media

---

8/14/96 12:35 PM

Re(4): `ssVabTransComplete` failure  
Craig Galley  
Sound Programmers

We did that and ended up placing a 2 second time out within the loop. Of course, it timed out but then none of the sound sub-system worked properly again. It's almost as if we killed the sound driver completely by doing \*something\*. It's the something we're trying to find!

---

8/20/96 1:34 AM

`SsVabOpenHeadSticky` returns -1  
Dennis Harper  
Sound Programmers  
Dennis Harper

I'm having trouble with `SsVabOpenHeadSticky`. I think that it's failing because I'm running out of SPU memory, even though I know I haven't filled it up yet. I'm trying to manage my own SPU memory, but the Sony routines are getting in my way. I know that when I call `SpuMallocWithStartAddr`, it sometimes returns an address which is not the same as the one I gave it! I just want routines which put the data where I TELL it to put the data in SPU memory. That way, if it gets screwed up, I know it's because I'm not allocating my SPU memory correctly, not because some Sony routine arbitrarily decided that it didn't want to load my data where my function parameters specified it to.

Meanwhile, I have no idea why `SsVabOpenHeadSticky` is returning -1. The same file loads up just fine in other situations where the VABs loaded before it are smaller, so I assume it's got to be an out of SPU memory problem. But I'm keeping track of SPU memory, and I know that I have >200Kb left for a 50Kb VAB file! I'd like to pack that 512Kb of SPU memory full of sounds, but the darn thing just won't let me! Why not? I start at the top of SPU memory at 0x1000 and increment it by the size of the \*.VB file each time I load a VAB. Should I increment it

by the size of \*.VB + \*.VH? I know that \*.VH resides in main memory, so I thought it would be redundant to have a copy in SPU memory. I don't know. You guys always have me grasping at straws here... I'm not using reverb, and I've reserved some memory at the bottom of SPU memory from 0x69000 thru 0x7ffff for my SPU streaming buffers using `SpuMallocWithStartAddr`. But I know that sometimes that routine misbehaves... argh. Is there some way for me to check out the internal SPU memory management table to see what's taking up my SPU memory? Your help in this matter is greatly appreciated, Eu-Ming Lee Atari Games Corporation

---

8/21/96 9:27 PM

Detecting end of CDDA track  
Adrenalin Entertainment  
Sound Programmers

I've tried the following:

```
short CDDAIsAudioPlaying( void ) {  u_char result[8];
  if(0 == CdControlB(CdlNop, 0, result)) {  CD_PRINT_ERROR("CDDAIsAudioPlaying",
(gErrorString, "CdControl CdlNop failed")); }
  if((result[0] & CdlStatPlay) == 0) return 0; else return 1; } /* End of Function:
CDDAIsAudioPlaying() */
```

It does not seem to return the value I expect it to. Can anyone suggest what is wrong? Many thanks, --oFeR

---

8/21/96 2:29 PM

Re: SsVabOpenHeadSticky returns -1  
Rob Vawter  
Dennis Harper  
Sound Programmers

I'm having trouble with `SsVabOpenHeadSticky`. I think that it's failing because I'm running out of SPU memory, even though I know I haven't filled it up yet. I'm trying to manage my own SPU memory, but the Sony routines are getting in my way. I know that when I call `SpuMallocWithStartAddr`, it sometimes returns an address which is not the same as the one I gave it! I just want routines which put the data where I TELL it to put the data in SPU memory. That way, if it gets screwed up, I know it's because I'm not allocating my SPU memory correctly, not because some Sony routine arbitrarily decided that it didn't want to load my data where my function parameters specified it to.

Meanwhile, I have no idea why `SsVabOpenHeadSticky` is returning -1. The same file loads up just fine in other situations where the VABs loaded before it are smaller, so I assume it's got to be an out of SPU memory problem. But I'm keeping track of SPU memory, and I know that I have >200Kb left for a 50Kb VAB file! I'd like to pack that 512Kb of SPU memory full of sounds, but the darn thing just won't let me! Why not? I start at the top of SPU memory at 0x1000 and increment it by the size of the \*.VB file each time I load a VAB. Should I increment it by the size of \*.VB + \*.VH? I know that \*.VH resides in main memory, so I thought it would be redundant to have a copy in SPU memory. I don't know. You guys always have me grasping at straws here... I'm not using reverb, and I've reserved some memory at the bottom of SPU memory from 0x69000 thru 0x7ffff for my SPU streaming buffers using `SpuMallocWithStartAddr`. But I know that sometimes that routine misbehaves... argh. Is there some way for me to check out the internal SPU memory management table to see what's taking up my SPU memory?

A few things here

- 1) If `SpuMallocWithStartAddr` is changing your desired address, it should only be incrementing it to a value divisible by 8. Is this the case?
  - 2) The top of SPU RAM is 0x1010, not 0x1000. 0x1000-0x100f is used for loop markers. Writing to 0x1000 can cause `SpuMallocWithStartAddr` to return failure.
  - 3) Here are the possible reasons `SsVabOpenHeadSticky` can return failure (-1). These are listed in order as they occur in the function: a) An SPU transfer is already in progress b) Invalid VABID argument passed (>15) c) No open VAB slots available (16 VABs already being used) d) VABID argument already being used by another VAB e) Invalid VAB header format ("VAB" not found") f) Too many programs contained in the VAB - caused by parse error of the VAB header. Most likely to be caused by tampering with the header info or by very old VAB formats g) Not enough sound RAM left (sounds like your problem)
  - 4) Don't increment by the .VH file size. You don't need to transfer the .VH file into Sound RAM.
  - 5) No way for you to check out the internal tables right now. Sorry.
- Let me know if none of this is helpful.
- 

8/22/96 7:30 PM

Overlapping calls to `SsSeqPlay()`...

Eric Yiskis

Sound Programmers

My experience suggests that when using a particular sequence, a second call to `SsSeqPlay()` does not generate another "sound", but restarts the first "sound" over again. Can someone confirm or deny this? If this is the case, is there another function call I should be using? I could, of course, just make duplicate copies of the .SEQ file, but I thought I'd look for a more direct approach before going through the hassle.

Thanks

--tinman Oddworld Inhabitants

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8/26/96 11:00 PM

Re: Overlapping calls to `SsSeqPlay()`...

Rob Vawter

Eric Yiskis

Sound Programmers

My experience suggests that when using a particular sequence, a second call to `SsSeqPlay()` does not generate another "sound", but restarts the first "sound" over again. Can someone confirm or deny this? If this is the case, is there another function call I should be using? I could, of course, just make duplicate copies of the .SEQ file, but I thought I'd look for a more direct approach before going through the hassle.

Currently, the only way to play the SEQ a second (and overlapping) time is to copy the entire SEQ. I'm working on finding out the possibility of copying some smaller portion of the SEQ, such as a header.

I'll let you know if and when I can come up with anything.

---

9/3/96 8:42 PM

setting loop points dynamically?

Tom Sloper

Sound Programmers

I know the answer is probably 'NO', but:

Can VAG's be looped dynamically, i.e. can I somehow mess with the vb in such a way during runtime to sometimes loop and sometimes not?

Is there any sort of loop counter?

Thanks.

---

9/4/96 2:46 PM

Re: setting loop points dynamically?

Rob Vawter

Tom Sloper

Sound Programmers

Can VAG's be looped dynamically, i.e. can I somehow mess with the vb in such a way during runtime to sometimes loop and sometimes not?

Without knowing the VAG format (which happens to be proprietary at this point), the answer is no.

Is there any sort of loop counter?

No, not unless you set the SpuIRQ at the end address of the waveform and count (or turn off the VAG) inside a callback. I realize that this would only work for one waveform at a time.

Sorry. I'll see what I can do.

---

9/6/96 10:34 AM

Re: setting loop points dynamically?

Buzz Burrowes

Sound Programmers

Tom Sloper writes: Can VAG's be looped dynamically, i.e. can I somehow mess with the vb in such a way during runtime to sometimes loop and sometimes not?

Well, kind of... I think.

If you use the low level SPU calls there is a documented mask - SPU\_VOICE\_LSAX for the SpuSetVoiceAttr(...) function which should let you change the loop start address.

Note: 1) You can't change the loop end (the end of the VAG)... and... 2) The original AIFF needs to have loop points set and AIFF2VAG must be told (via the loop check box) that the sample will be looped.

If you don't follow step 2 you can play with SPU\_VOICE\_LSAX all day and never get the sound to loop!

(see page 643 & 646 in the big blue Library 3.0 reference)

As for determining how many times a sample has looped... see Rob's message.

---

9/7/96 9:40 PM

Re(2): setting loop points dynamically?

Dave Scheele

Sound Programmers

Buzz Burrowes

Buzz Burrowes writes:

Note: 1) You can't change the loop end (the end of the VAG)... and...

hmm ... wait a sec ... you mean to say a looping VAG always loops to the end of the VAG?? (i.e. the end loop point must be the end of the VAG?)

Maybe this is why I've been having trouble looping a sound without a huge click/pop/spppt!! sound always happening ...

Dave

---

9/10/96 10:37 AM

Re(3): setting loop points dynamically?

Buzz Burrowes

Sound Programmers

Dave Scheele writes: hmm ... wait a sec ... you mean to say a looping VAG always loops to the end of the VAG?? (i.e. the end loop point must be the end of the VAG?)

Yes, this appears to be the case. You will note that when using AIFF2VAG on the MAC the settings dialog box shows the number of frames it will encode. On looping samples this is the loop end point.

High end samplers: Key On: sample playback starts and loops loop end -> loop start.

(attack, decay and sustain portion of ADSR applied) Key Off: sample continues playback but passes loop end and plays release portion of waveform. (release section of ADSR is applied)

PlayStation: Key On: sample playback starts and loops sample end -> loop start. (attack, decay and sustain portion of ADSR applied) Key Off: sample continues to loop while release section of ADSR is applied.

This seems to be confirmed by the lack of a mask for changing the loop end point in the libraries and the functionality of AIFF2VAG.

---

9/13/96 2:23 PM

DMA vs IO xfer

Tom Sloper

Sound Programmers

Has anyone has problems getting the DMA transfer to work? It seems to work fine with the samples, but when I modified the samples, the DMA transfer seems to fail and only the IO transfer(slow!) works. Besides programmer error, could there be library conflicts with the PCRead stuff or the cd emulation?

Thanks!

---

9/17/96 1:27 PM

Re: DMA vs IO xfer

Thomas Rolfs

Sound Programmers

Tom Sloper writes: Has anyone has problems getting the DMA transfer to work? It seems to work fine with the samples, but when I modified the samples, the DMA transfer seems to fail and only the IO transfer(slow!) works. Besides programmer error, could there be library conflicts with the PCRead stuff or the cd emulation?

Thanks!

This is not what you want to hear ;-) We have DMA working with everything: CD, GFX, PCRead and even SpuSt, so there are no known problems why it should not work. Make sure you follow all the alignment rules and that you are not using SpuSt while you try to DMA.

I find it best to pretty much write your own sample code from scratch and use the Sony stuff just for reference. More time consuming but less surprises later on.

Tommy. VIE

---

9/19/96 11:26 AM  
Fwd: SpuVoiceAttr  
Rob Vawter  
Sound Programmers

I'm trying to create a function to adjust the music volume by using SpuSetVoiceAttr(). The range for volume values in the SpuVoiceAttr structure does not seem to match the 0-127 range as specified in the KeyOn() functions. The voice was originally keyed on with a volume of \$40, and yet the value returned in the structure using SpuGetVoiceAttr() shows \$1040. I have temporarily coded the routine by taking the 0-127 volume figures and shift left 6 places before storing them in SpuVoiceAttr.volume, and it seems to work okay, but it doesn't really make sense. Plus, I'm going to get \$1000 instead of \$1040 with that calculation, which doesn't match what SpuGetVoiceAttr() returned after a KeyOn(). (but sounds the same)

Here's the code, and I'd like someone to verify, or correct it. Thanks!

```
SetVol(int voice, int vol) { SpuVoiceAttr attr; attr.voice = 1<<voice; attr.volume.right =  
attr.volume.left = vol<<6; // vol would be 0-127 attr.mask = SPU_VOICE_VOLL |  
SPU_VOICE_VOLR; SpuSetVoiceAttr(&attr); }
```

I'm assuming that you're using VABs and SsUtKeyOn or SsVokeyOn

I'm guessing that the master volume of the bank is \$40 and the master volume of the program and tone are \$7f. For VoiceAttr has a range of 0 - 3fff. This range depends is calculated depending on a lot of things. Since all your pans seem to be centered, that takes care of many of the variants. Basically, the volume is being calculated as a percent of 3fff. If your requested volume, VAB master volume, tone volume, and program volume are all \$7f, and you have no pan effects, then the volume returned by SpuGetVoiceAttr would be 3fff.

Volume = 3fff \* (requested vol as a %) \* (master vol as a %) \* (tone vol as a %) \* (program vol as a %).

The pan will leave volume the same for whichever side has a higher pan value (whether or not the pan is left or right of center). The volume of the left or right side of the channel will be reduced according to a pan percentage value. This pan percentage value calculation takes place for tone pan, program pan, and requested pan. The calculation looks like this

Volume = volume \* (pan percentage) where pan percentage is calculated as x/63 where x is either the difference (x-0) or (127-x) depending on whether the pan is left or right.

In other words, don't use your current left shift 6 bits trick.

---

9/20/96 12:31 AM  
Re(2): DMA vs IO xfer  
Tom Sloper  
Sound Programmers

Thanks for the reply....I'll check data alignment...

---

10/2/96 9:37 PM  
Re: Detecting end of CDDA track  
Adrenalin Entertainment  
Sound Programmers

Nevermind. Figured it out on my own.

---

10/10/96 6:00 PM

XA file format  
Rob Vawter  
Sound Programmers

Our technical writer still has not finished the graphical layouts yet, so I'm going to give you a non-graphic overview in the meantime. Look for the .PDF soon.

Two cases of XA file format:

Case 1) XA file containing data (and audio sometimes) Case 2) XA file containing audio only

Case 1: Mode 2 / Form 1

File Area (byte count)

Sync (12) [a repeating pattern to allow the laser to align the start of the sector]

Header (4) Mode (1) [would be "2" in this case] [the next 3 fields explicitly identify the sector by its position. 60 sec \ minute, 75 sectors per sec. Represent time taken to travers the disk during normal playback Sec (1) Sector (1) Min (1)

Subheader (8) File Number (1) [can be set to any value. should be unique within any given track] Channel Number (1) [can be set to any value from 1-32. distinguishes data within an interleaved file. Ex: in a movie the images and audio can be given different channel #s]

Submode (1) EOF (bit 7) 1 in last sector of file 0 in all other sectors RT (bit 6) 1 in real

time sector 0 in all other sectors Form (bit 5) 0: Form 1 1: Form 2 Unused (bit 4) [Of the

following three values, only 1 is set to "1". If all are "0", this sector is handled as a null sector]

Data (bit 3) Audio (bit 2) Video (bit 1) Unused (bit 0) Coding Info (1) Audio (bit 7) 0:

Audio 1: Not audio Emphasis (bit 6) 0: Emphasis on 1: Emphasis off ADPCM level (bits

5- 2) 0000: level B (37.8KHz sampling rate) 0001: level C (18.9KHz sampling rate) Mode

(bits 1-0) 00: Mono 01: Stereo

Repeat above 4 bytes again to complete subheader user data (2048) 32 byte header in here

which I will break down sometime soon. <Sigh> EDC (4) [Error Detetction Code] ECC (276)

[Error Detetction Code]

Two cases of Mode 2 / Form 1 XA format: a) No audio, also known as no subheader from a

CDGen standpoint. CDGen adds all bytes except user data area. b) Audio already interleaved.

Subheader already exists, and user data size has been padded out to 2328. Check subheader box

in CDGen. Sync and Header added by CDGen. EDC and ECC also added by CDGen, by

overwriting the previously padded out area.

Case 2: Mode 2 / Form 2

Same as above except:

1) User data size is 2328 2) No EDC or ECC 3) Subheader created by RAW2XA 4) Sync and

Header created by CDGen

Any questions?? Ow.

---

10/16/96 11:53 PM

How to pause a VAG (or .VB)

Rob Vawter

Sound Programmers

John Hamilton

Q: How do you pause a VAG?

A: Set the pitch to 0 (using, say SpuSetVoiceAttr). Then restart it with the previous pitch (which you could save with a SpuGetVoiceAttr before you pause it).

- Special thanks to a nameless developer for passing this idea on to me.

---

10/17/96 8:39 AM

how to detect the end of AG playing in multiple channels

Dave Elton

Sound Programmers

I am trying to streaming my VAG file through 2 channels (actually 4 channels for stereo) and use a seperate channel to play sound effect. But since I am setting my interrupt address for streaming, I do not know I I can detect the end of my sound effect has finshed playing and this usually cause beep noise in game. Does anybody there know how to solve this problem? Also since SpuSetKey never returns a value, how do we know whether a SPU chanel has been properly turned on or off?

Thanks for any advices!

Simon ReadySoft Inc.

---

10/17/96 12:06 AM

Re: Stereo / Mono via SPU

Rob Vawter

Sound Programmers

In LibSnd there are two functions, SsSetStereo and SsSetMono, which perform the obvious functions :) How does one go about achieving that functionality using only LibSpu? I am streaming stereo XA music off of the CD, but when played on a mono TV, I lose one side ... using SPU only, how can I stop this from occurring?

This problem has nothing to do with which library you are using. In order to make XA or DA mono you must use the libcd function CdMix().

---

10/18/96 2:08 PM

Re: how to detect the end of AG playing in multiple channels

Rob Vawter

Dave Elton

Sound Programmers

I am trying to stream my VAG file through 2 channels (actually 4 channels for stereo) and use a seperate channel to play sound effects. But since I am setting my interrupt address for streaming, I do not know if I can detect the end of my sound effect and this usually causes a beep noise in the game. Does anybody there know how to solve this problem? Are you using the Spu Streaming provided by the Sony libspu library? If so, you currently may be unable to detect the end of your sample. The Spu Streaming library sets up its own IRQ during playback and then returns to your previous callback setup. However, your set address may be missed while the SpuStreaming library has control of the IRQ. There would be no other way to detect the end of the sample. Sorry. What I don't understand is why you would hear a beep noise. The VAG sound effect should key itself off when the end is reached. What were you trying to do with your callback routine?

Also, since SpuSetKey never returns a value, how do we know whether a SPU chanel has been properly turned on or off?

The KeyOn\KeyOff requests should always work. You can use SpuGetKeyStatus to check to see if your voices are currently sounding.

---

10/18/96 2:35 PM

Re(2): how to detect the end of AG playing in multiples

From:

Dave Elton

Rob Vawter

Sound Programmers



I am stream my VAG file thru SPU myself and my SPU callback routines just reset the IRQ address and swap the channels playing. What you are saying is if I DMA all data for a sound effect in SPU and keyon the channel, the channel will keyoff itself at the end of VAG data? In that case, I should never care when the SFX played has reached its end then. But how does SPU know its already the end of a VAG file instead of just a buch of 0 value in VAG data?  
Simon Readysoft Inc.

---

10/20/96 6:20 PM  
Rob Vawter MIA  
Mike Fulton  
Sound Programmers

To those people asking sound-related questions, please be aware that Rob Vawter, our resident sound library expert, got married this weekend and will be out of the office for the next two weeks.

Because Rob is just so gosh darn good at it, most of the rest of us haven't spent much time with the sound library. So we won't be able to provide the answers to your questions as fast as Rob would have. But if you'll be patient and give us time to research your questions, we'll try to get them answered.

Mike Fulton

---

10/21/96 12:21 PM  
SsSetTableSize question  
Adrenalin Entertainment  
Sound Programmers

In the function SsSetTableSize it is unclear what s\_max and t\_max are. I have a SEP with 8 SEQs and 10 SEQs that could be made into a SEP.

What values should s\_max and t\_max be set at to create the smallest table possible. Should the 10 SEQs be included in a SEP or used separately?

For the s\_max parameter is it the number of SEQs that will be open or do SEQs as part of an SEP count extra because of the SEP table entry. For example in the above would I set s\_max to 3 (2 SEQs plus 1 SEP) or 2 (just 2 SEQs).

Also should t\_max 10 (greater of 10 and 8) or 18 (10 + 8).

10/21/96 2:38 PM  
Re: SsSetTableSize question  
Mike Fulton  
Sound Programmers

Keep in mind that the sound libraries are ROB VAWTER's AREA, but we'll do the best we can until he gets back. Until then, please copy any messages to "devtech\_support@interactive.sony.com" via Internet EMAIL so that our engineers here and at Sony Europe all get a crack at them.

I think I have the answers you're looking for, but again, this isn't my area, so let me know if you have any doubts or additional questions about anything.

In the function SsSetTableSize it is unclear what s\_max and t\_max are. I have a SEP with 8 SEQs and 10 SEQs that could be made into a SEP.

The 's\_max' value is the maximum number of times that your SEQ/SEP data will be opened.

The maximum is 32. The 't\_max' value specifies how many SEQ's you have in your SEP data.

The maximum value is 16.

What values should s\_max and t\_max be set at to create the smallest table possible. Should the 10 SEQs be included in a SEP or used separately?

Your table size will be equal to: (SS\_SEQ\_TABSIZ \* s\_max \* t\_max), where SS\_SEQ\_TABSIZ is defined in LIBSND.H as 172.

For the s\_max parameter, is it the number of SEQs that will be open? Or do SEQs as part of an SEP count extra, because of the SEP table entry? For example, in the above, would I set s\_max to 3 (2 SEQs plus 1 SEP) or 2 (just 2 SEQs).

I believe it's 1 per SEQ or SEP. So if you have 8 SEQ's in 1 SEP, the total would be 9. If you have another 10 SEQ's not in a SEP, then the total would be 19.

Also should t\_max be 10 (greater of 10 and 8) or be 18 (10 + 8).

You have 8 SEQ's within your SEP data. The other SEQ's don't matter if they aren't in the SEP data.

Mike

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10/23/96 9:17 AM

Re: SsSetTableSize question

Administrator

Sound Programmers

Adrenalin Entertainment writes: In the function SsSetTableSize it is unclear what s\_max and t\_max are. I have a SEP with 8 SEQs and 10 SEQs that could be made into a SEP.

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Answer from Europe (Who is standing in while Rob is out)

t\_max is the maximum amount of SEQ's held in any of the SEP files. If for example, you had two SEP files, one with 4 SEQ's and the other with 7, you would set this value to 7 (the higher of the two)

s\_max is the maximum amount of SEP files that you can open at any one time. If you are want to play, say, 8 tunes at once then this value should be set to 8.

For your purposes, you will need two SEP files (as you have over 16 SEQ's). If you had one SEP with 10 SEQ's and the other with 8:

t\_max = 10 (maximum amount of SEQ's) s\_max = maximum amount of SEQ's ever opened at once.

Hope this helps.

Jason Page (sound engineer, Dev support SCEE)

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10/25/96 7:30 AM

CD/XA Sector Formats

Jason G. Andersen

Sound Programmers

>\_\_\_\_\_ > >Two cases of XA file format: > >Case 1) XA file containing data (and audio sometimes) > >Case 2) XA file containing audio only > > >Case 1: Mode 2 / Form 1 > >File Area (byte count) > >sync (12) [a repeating pattern to allow the laser to align the start of > the

sector] > >header (4) > mode (1) [would be "2" in this case] > [the next 3 fields explicitly identify the sector by its position. 60 sec > \ minute, 75 sectors per sec. Represent time taken to travers the disk > during normal playback > sec (1) > sector (1) > min (1) > >subheader (8) > file number (1) [can be set to any value. should be unique within any > given track] > channel number (1) [can be set to any value from 1-32. distinguishes > data within an interleaved file. Ex: in a movie the images and audio can > be given different channel #s] > submode (1) > EOF (bit 7) > 1 in last sector of file > 0 in all other sectors > RT (bit 6) > 1 in real time sector > 0 in all other sectors > Form (bit 5) > 0: Form 1 > 1: Form 2 > Unused (bit 4) > [Of the following three values, only 1 is set to "1". If all are > "0", this sector is handled as a null sector] > Data (bit 3) > Audio (bit 2) > Video (bit 1) > Unused (bit 0) > coding info (1) > Audio (bit 7) > 0: Audio > 1: Not audio > Emphasis (bit 6) > 0: Emphasis on > 1: Emphasis off > ADPCM level (bits 5- 2) > 0000: level B (37.8KHz sampling rate) > 0001: level C (18.9KHz sampling rate) > Mode (bits 1-0) > 00: Mono > 01: Stereo > > Repeat above 4 bytes again to complete subheader >user data (2048) > 32 byte header in here which I will break down sometime soon. <Sigh> >EDC (4) [Error Detetction Code] >ECC (276)[Error Detetction Code] > >Two cases of Mode 2 / Form 1 XA format: >a) No audio, also known as no subheader from a CDGen standpoint. >CDGen adds all bytes except user data area. >b) Audio already interleaved. Subheader already exists, and user data size >has been padded out to 2328. Check subheader box in CDGen. Sync and Header >added by CDGen. EDC and ECC also added by CDGen, by overwriting the >previously padded out area. > >Case 2: Mode 2 / Form 2 > >Same as above except: >User data (2328) >No EDC or ECC > >Sync and Header created by CDGen. > >Any questions??

I appreciate it if anyone out there would answer a couple of questions for me.

Just for clarification, the channel number in the subheader, is it 1-32, or is it 0-31?

The big question is, if I have user data in (2048) byte increments, how do I generate the EDC (4), and the ECC (276) fields, so that I may create my own data. For example lets say I have my own tool that will weave XA data with important data (like code). Lets take it one step farther, and say when I compile the code, I want the makefile to invoke my tool, interleave the audio, and leave me with the result. This idea of automating the process is currently impossible with the currently supplied tool (MovPack).

Many thanks in advance,

Jason Andersen Tiburon Entertainment

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