

How to Master a PlayStation™ CD

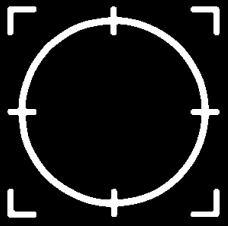


Creating a “Gold Disc” ready
for product submission

Paul Holman, SCEE

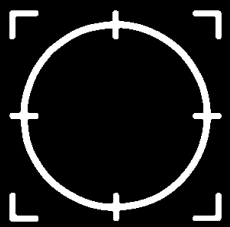


Sony Computer Entertainment Europe



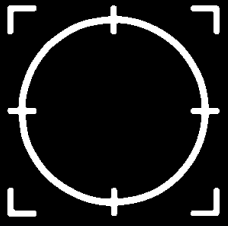
Objectives

- Overview of PlayStation™ CD's
- SYSTEM.CNF
- Introduction to CD-GEN
- How to Create a Master CD
- Tips and Hints
- Summary



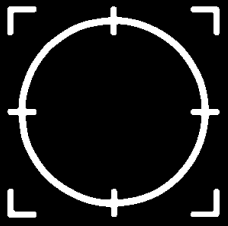
Overview of PlayStation™ CD's

- ▶ Can hold upto 640Mb information
- ▶ Has an ISO-9660 file/directory hierarchy
- ▶ Can contain many forms of data
 - ▶ Executable files
 - ▶ CD-DA
 - ▶ Interleaved Video and/or Audio
 - ▶ Binary data



Key Files on the Disc

- ❖ Track 1:
 - SYSTEM.CNF
 - Your Boot file executable
 - Associated Data Files
- ❖ Track 2 ... N
 - Optional CD-DA tracks



SYSTEM DESIGNATION FILE

Contents

BOOT = cdrom:\SLES_123.45;1

device name:\Product number; version

TCB = 4

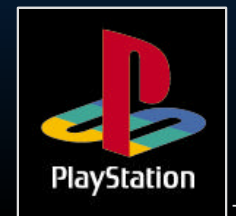
Number of task control blocks / possible threads

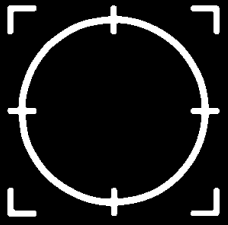
EVENT = 10

Number of possible events (in hex)

STACK = 801ffff0

Stack pointer

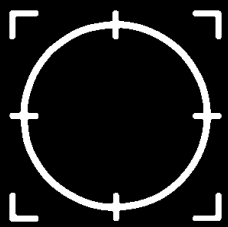




Boot Executable File

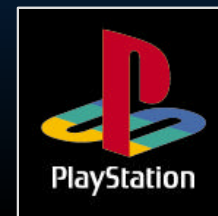
- ▶ Must be named “\XXXX_AAA.AA”, reflecting your titles product code (and the BOOT parameter in SYSTEM.CNF)
e.g. SLES-12345 maps to SLES_123.45
- ▶ Created from a .CPE using CPE2X

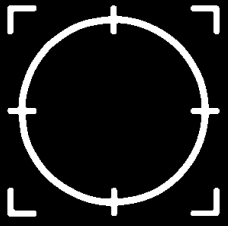
Remember your product code should also map to your memory card filenames and the Disc “Mastering Information”



The Hardware: CD ROM Burners

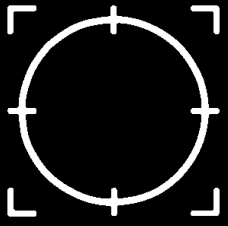
- Types of Burners
 - Sony CDW-900E
 - Sony CDU-921S ***New***
- How do they work ?
 - burner laser melts dye layer of gold CD
 - recording pits (submicron deformations) are formed





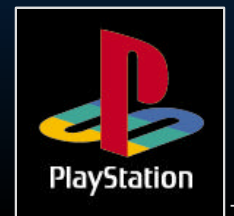
Hardware (continued)

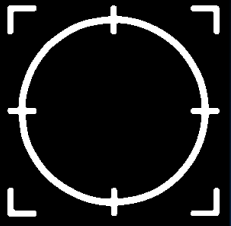
- ▶ Burner Pros
 - ▶ Burns with constant linear velocity
 - ▶ CDU & CDW very high quality - required to produce CD that can be used as Masters
 - ▶ CDW-900E can be daisy chained
- ▶ Burner Cons
 - ▶ Temperature and Vibration Sensitive
 - ▶ Designed for mastering **not** copying.



The Software: CD-GEN

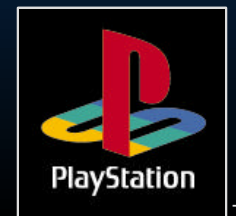
- Version 1.10
 - Windows 3.11/WFW
 - Very demanding in terms of low memory
 - several notable problems
 - Based upon a Sony Music product - some features don't apply to PlayStation™

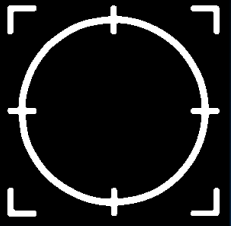




▶ The Software: CD-GEN

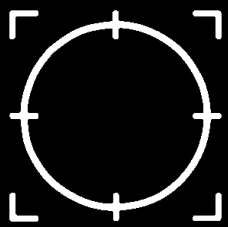
- ▶ Version (1.3) *New*
- ▶ Supports both Win3.11 and Windows95
- ▶ Supports CDW and CDU Burners
- ▶ Supports many forms of Adaptec SCSI Adapters
- ▶ Supports new CDU-921S
- ▶ Removes low (DOS) memory limitations





How to Create a Master CD

- Development Using Emulator
- Preparing to create your CD
 - Output .CCS file from CDBUILD (-g option)
- or
- Handbuild .CCS file using CD-GEN (best)
- Use *defrag*'ed local SCSI discs for source where possible



Using CDGEN - Volume Screen

- ▶ Not all fields are meaningful on a PlayStation™ Disc
- ▶ Set to 74min
- ▶ Remember to specify the license file !

CD-ROM Generator - t:\pholman\fut7.ccs

File Edit Help

Volume Directory Layout 74min 26:38:60 Rec...

Volume: FUTURE_DEMO_7_96 Volume Set:

Publisher: SCEE Data Preparer: VINCE-PAUL

Application: PLAYSTATION Copyright: SCEE

Abstract: Bibliography:

Creation: 96-3-20 9:5:28.0 36 Modification: 96-4-2 8:49:0.0 0

Expiration: Effective:

Comments: Version 3 - Revamped AT

Additional Information...

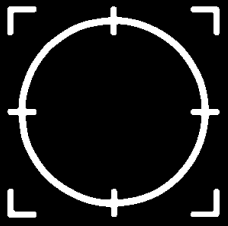
Additional Information

System Identifier: PLAYSTATION

System Area File: \data\licensee.dat

Volume Descriptor File:

OK Cancel



The Directory Screen

Drag & Drop using File Manager

The screenshot shows the CD-ROM Generator interface. The main window is titled "CD-ROM Generator - c:\demodemo\fut7.ccs". It has a menu bar with "File", "Edit", "Tree", "View", and "Help". Below the menu bar are buttons for "Volume", "Directory", and "Layout", along with a progress indicator showing "74min" and a time display "26:38:60".

On the left side, there is a directory tree showing the following structure:

- AT
 - SFX
 - SECT21
 - SECT11
 - NME
 - LANGUAGE
 - GFX
- WEB_DAT
 - SFX
 - MATRIX
 - VIDEO
 - FONTs

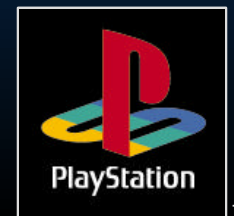
On the right side, there is a "File Manager" window titled "File Manager" with a menu bar "File", "Disk", "Tree", "View", "Options", "Tools", "Window", "Help". The address bar shows "D:". The main pane shows a directory tree for "D:\DD\ALIEN*.*" with the following contents:

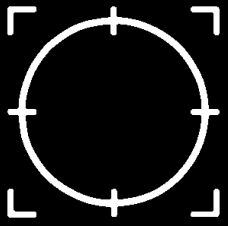
- d:\
 - dave
 - dd
 - act...
 - alien
 - basket
 - cdda
 - dddemo
 - descent
 - output
 - mania
 - mk3

The "alien" folder is selected. The right pane shows a list of files and folders with their properties:

File Name	Size	Modified	Created	Attributes
at		21/03/96	15:39:02	
cdda		21/03/96	15:39:22	
jap_demo		21/03/96	15:40:10	
...		21/03/96	15:40:12	
readme.txt	362	01/04/96	13:35:50	a
trilengl.ccs	14332	29/03/96	13:28:32	a

A black arrow points from the "alien" folder in the File Manager to the "alien" folder in the CD-ROM Generator directory tree. The status bar at the bottom shows "Selected 6 file(s) (14.3KB)" and "Total 6 file(s) (14.3KB)".





Disc Information (Layout)

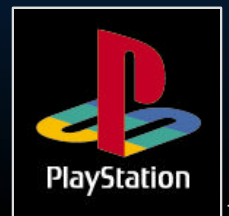
- ▶ Drag and drop CD-DA tracks to re-arrange

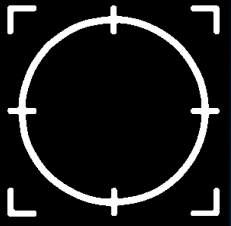
CD-ROM Generator - t:\pholman\fut7.ccs

File Edit Help

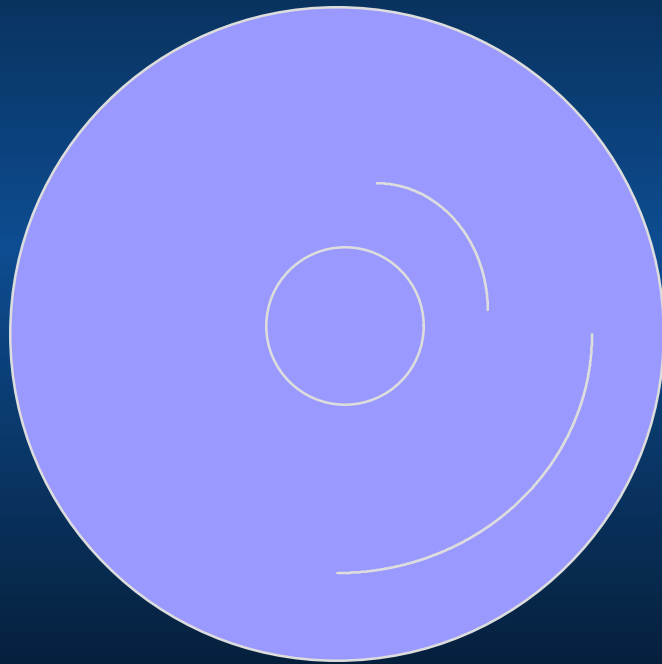
Volume Directory Layout 74min 26:38:60 Rec...

Track	Index	Time	Form	Control	Track Name	ISRC
00	00	00:20:00	CDROM2_0	DATA		
01	00	00:00:00	CDROM2_0	DATA		
01	01	00:02:00	CDROM2_3	DATA		
02	00	25:25:04	CDDA_0	2CHAN		
02	01	25:27:04	CDDA_1	2CHAN		
03	00	27:37:34	CDDA_0	2CHAN		





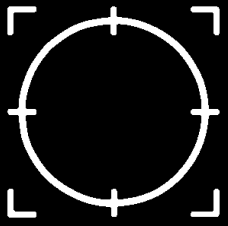
Optimising your CD Layout



- Merge related data files into one file (best)

or

- Use “Layout” section to make files contiguous

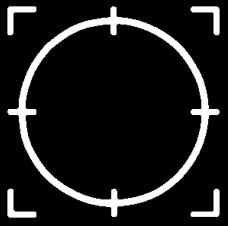


Disc Information (Layout)

- Drag and drop files, to re-arrange position of files on disc

	Start	End	Mode	Fno	Intlv	Path
	22	22	2.1	0	[0: 0]	--> \
	23	23	2.1	0	[0: 0]	--> \DD
	24	69	2.1	0	[0: 0]	--> \DD\PIRATE.EXE;1
	70	184	2.1	0	[0: 0]	--> \DD\DD.EXE;1
	185	196	2.1	0	[0: 0]	--> \DD\CREDITS.VLC;1
	197	432	2.1	0	[0: 0]	--> \DD\DD.VB;1
	433	463	2.1	0	[0: 0]	--> \DD\TICONS.TIM;1
	464	494	2.1	0	[0: 0]	--> \DD\DSICONS.TIM;1
	495	525	2.1	0	[0: 0]	--> \DD\GSTICONS.TIM;1

Track Index Location File No. ISRC Catalog Master



Disc Information (Mastering)

Screen must match description on disc

Master information [X]

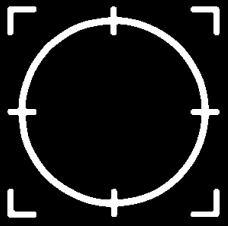
Disc Name:

Producer Name:

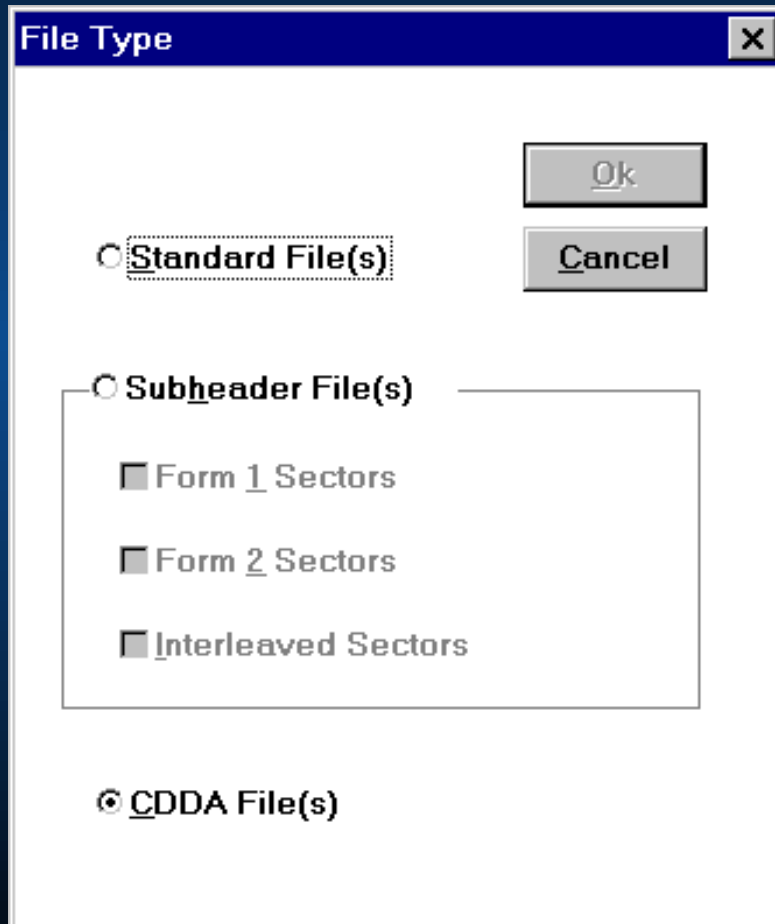
Copyright Holder:

Licence Area:

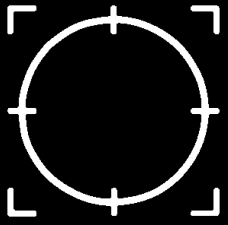
Creation Date: Year Month Date



File Types



- Standard file
- Subheader
 - XA Form 1
 - XA Form 2
- CD-DA

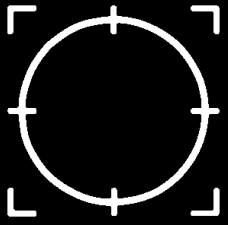


Note on XA Frames

- XA Form 1
 - Includes CRC and error correction
- XA Form 2
 - No error correction.

XA-ADPCM is form 2, and should be interleaved with other Audio files, or video to make the best use of disc.

See CD-II

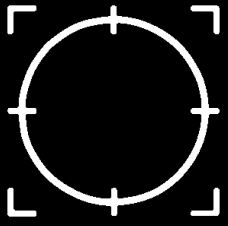


CD-DA Tracks

- Promote to CD-DA type with “File Type”
- In “*Layout*”
 - By default CD-DA track appear in Track 2
 - Use *Track/Append New Track* to create new track
 - Re-order with drag/drop into position

or

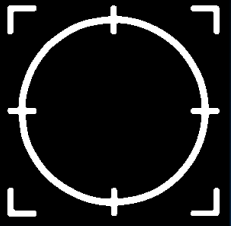
- Drag directly from the file manager



Caveats

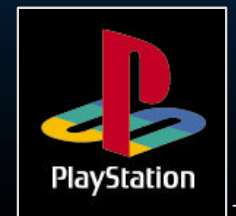
Issues when moving from Emulator to Gold Disc:

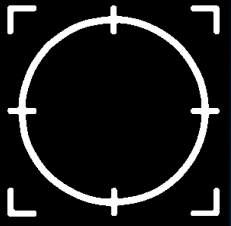
- CdSearchFile limitations
 - limits on number of files per directory
 - CD-DA files are counted as files
- 2Mb Ram Limitation
- Rules on track lay out (3 minute rule for last track)



Tips

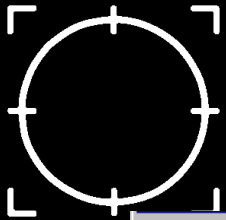
- Use *Windows Properties* to specify default directory for `..CCS` files
- Use *Update/Date & Time* (with subdirs) to ensure that time stamps on disc matches those of source files
- Use **Mcheck** to verify Mastering Infor
- Use **BUILD**CD with -1 (ISO) during design



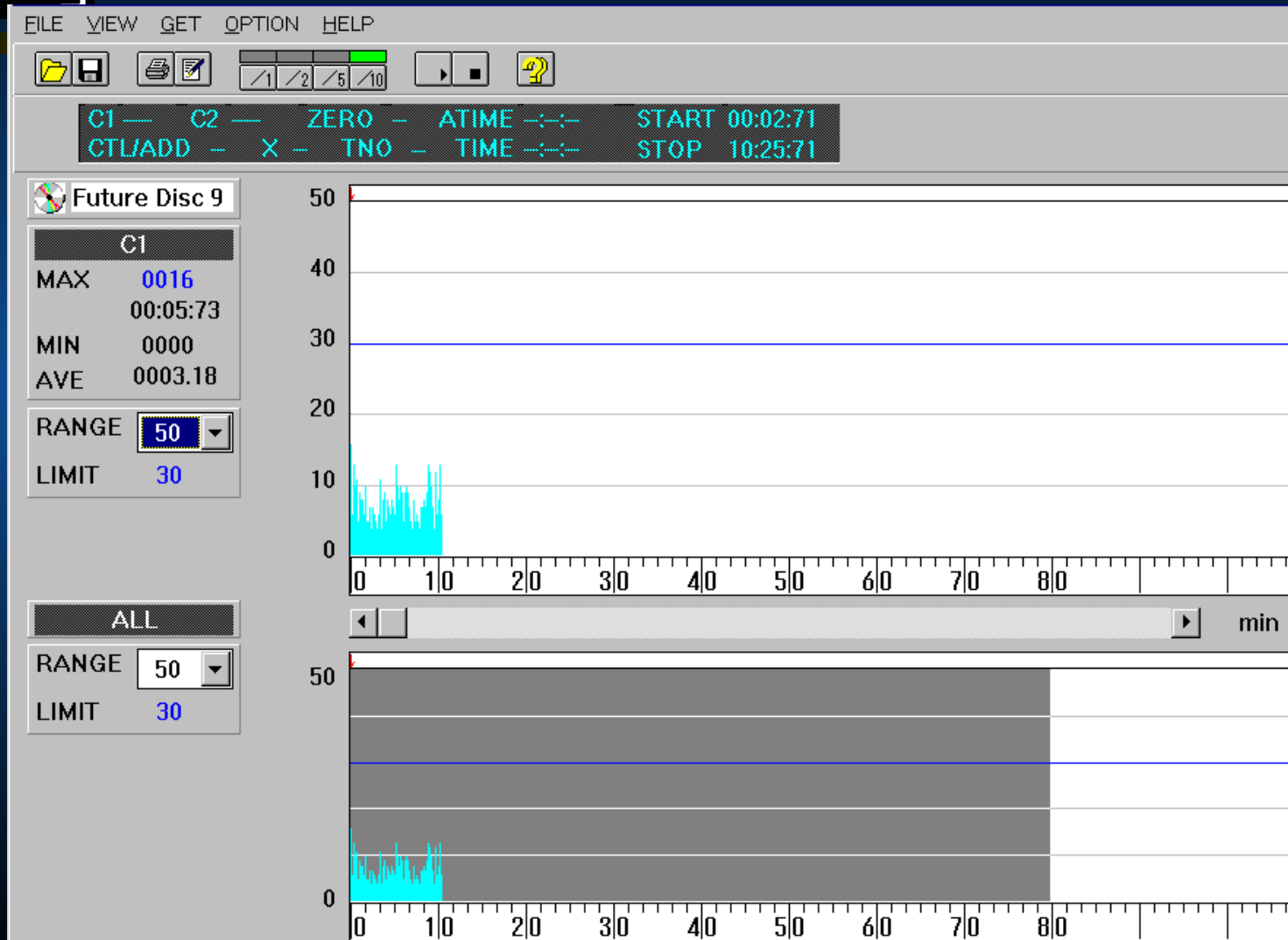


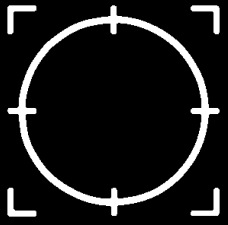
Associated Tools

- **mcheck**
- **ccs2cti**
 - V1.02a needs comments fields
 - V1.02a has problems with complicated ..CCS files
- **buildcd** “-g” option (to output a ..CCS file)



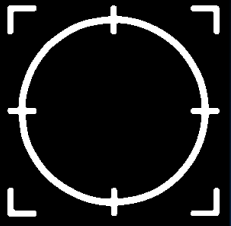
Tools - Error Checkers





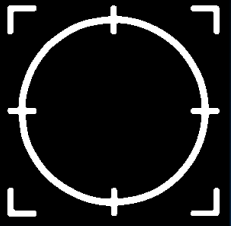
Problems (Hardware related)

- Use Probe SCSI (and Adaptec utility) to verify unit can be “seen”
- Try powering everything off and on
- Keep it (and You!) cool



Problems (Software related)

- Doesn't start up ?
Often memory related (<640K DOS barrier) - tidy up CONFIG.SYS, or use QEMM etc...
- Won't restart ?
Try cleaning up temporary files, and reviewing the log file.



Summary

- ▶ Creating a PlayStation™ CD
- ▶ The Tools
- ▶ Next Step ... submitting for approval

