

PLAYSTATION TECHNICAL NOTE

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Date: November 20, 1996

Ref:

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Subject: New Model Analog Controller (Revised Version: 11/20/96)

ABSTRACT

"PlayStation Expo" was held from November 1st through 4th, 1996, at Makuhari Messe. We, SCEI, exhibited the new model analog controller with vibration device. Following is the release schedule and technical information for this new controller:

CONTROLLER INFORMATION

[1] Overview

The new controller is a standard controller with two 2-axis (horizontal and vertical directions) analog levers and a vibration device to support an even wider range of games than previously possible. All software functions, except those for the vibration device, are equivalent to either the analog joystick mode or the analog controller mode, with additional buttons allocated to the analog levers.

[2] Design Overview

The new controller is the standard controller plus 2 analog levers. One lever is placed between the "SELECT" and downward directional buttons, and the other between the "START" and "X" buttons.

[3] Release

As of today, the detailed schedules for both tool and mass production have not been determined. Please contact SCE Business Affairs if you have a plan to support the new model controller for titles that will be released by the end of this year.

[4] Technical Information

4-A: Controller ID

The three controller IDs below can be selected with a mechanical switch:

- 0x41: Standard Controller
- 0x53: Analog Joystick
- 0x73: Analog Controller

4-B: Vibration Device

The vibration device can be set ON/OFF only through software. From a safety point of view, when there is no data transmission with the controller for more than 140 msec, the vibration device will be turned off.

4-C: Updated Library (LIBAPI)

As stated in Section 4-D, a new LIBAPI function for sending data to the controller is required for the ON/OFF operations. The updated LIBAPI library is planned to be released at the same time

as the controller with the vibration device. Since data can be sent and received in parallel (e.g. status data of controller buttons) at every V-Sync interrupt, it will not affect the CPU time available for an application. Moreover, sending ON/OFF data to a controller which does not have the vibration device will not cause any problem.

4-D: Specification of the New Library Function

SendPAD: Sets controller send buffer

Syntax

```
void      SendPAD(bufA, lenA, bufB, lenB)
char      *bufA, *bufB;
long      lenA, lenB;
```

Arguments

bufA, bufB Buffer for sending data
lenA, lenB Length (in bytes) of the buffer for sending data

Explanation

This function registers sending data buffer for controller. At every V-Sync interruption, the target device ID and data set to the buffer is sent. The buffer becomes invalid once it is sent.

```
=====
Byte      Description
-----
0         Flag to specify validity of the buffer data
          0x00 invalid, 0x01 valid, other values undefined
1         Target Device ID
2         Data to be Sent (Sending data length = Received
          data length)
-----
```

Return Value

None

Remarks

Buffer Setting for New Analog Controller with Vibration device:

```
=====
Target Device ID      0x03: Vibration On, others: Vibration Off
Data to be sent      (First Byte) 0x01: Vibration ON, 0x00: OFF,
other values: undefined
                    (Second byte and after): Always 0x00, other values:
                    undefined
-----
```

Warning:

The vibration device can be set ON only within one V-Sync interval, between two V-Sync interrupts. Thus to keep the vibration device on, the following must be set at every V-Sync interrupt.

- Target device ID
- Vibration: ON
- Buffer data flag: VALID

4-E: Maximum Number of Concurrent Connections

Up to 2 controllers without multi-tap and 8 controllers with two multi-taps can be concurrently connected. This limit is equivalent to a standard controller.

Due to electrical limitations, only two controllers can set the vibration device on at the same time. This number may be changed to a larger value upon release.

4-F How to operate the vibration device with multi-tap

To operate the new analog controller with the vibration device when it is connected to a multi-tap, you need to use the data transmission function SendTAP, in LIBTAP. This function will be released at the same time as the development hardware with the vibration device. SendTAP has the same functional specification as SendPAD. The following shows the details of the send buffer used for the SendTAP function:

```
=====
Byte      Description
-----
0         Flag to specify validity of the buffer data
          0x00: invalid, 0x01: valid, other values: undefined
1         Target device ID of Controller A
2-6      Data to be sent to Controller A
7        Target device ID of Controller B
8-12    Data to be sent to Controller B
13      Target device ID of Controller C
14-18   Data to be sent to Controller C
19      Target device ID of Controller D
20-24   Data to be sent to Controller D
-----
```

To send data in a buffer:

- Write 0x01 into byte 0
- Call SendTAP function

Upon the V-Sync interrupt immediately after the function call, the data in the buffer is sent. The target device ID (0x03 for the vibration device) and the data to be sent (0x01 for ON) are the same as for the SendPAD function.

4-G: Calibration

In Japan, the current acceptance criteria for master titles that support the analog controller require the inclusion of at least the built-in calibration function described below. The same criteria apply to the analog controller with the vibration device as well.

```
=====
0 position calibration
Setting the play (space for movement)
Sensitivity
Detection of maximum stick movement value
-----
```

4-H: Life of the Vibration Device

The life of the vibration device depends on the number of ON/OFF operations it is subjected to. It is highly recommended not to set the vibration device ON and OFF many times, as this can extremely shorten its life.