Film-Tech

The information contained in this Adobe Acrobat pdf file is provided at your own risk and good judgment.

These manuals are designed to facilitate the exchange of information related to cinema projection and film handling, with no warranties nor obligations from the authors, for qualified field service engineers.

If you are not a qualified technician, please make no adjuatments to anything you may read about in these Adobe manual downloads

www.film-tech.com

SONY

Cinema Processor System

DIGITAL FILM SOUND DECODER

DFP-D3000

DIGITAL FILM SOUND READER

DFP-R3000

SDDS Sony Dynamic Digital Sound®

QUICK START GUIDE

1st Edition

Table of Contents

Check list

This is a step by step check list for the experienced installer. Refer to the associated sections of this Guide for additional information and see the Tech Notes for specific details.

1. Introduction

The Sony DFP-3000 Cinema Processor forms the heart of the projection booth sound system in your theatre. It provide a sophisticated system for playing SDDS digital sound tracks, high quality optical soundtrack playback, comprehensive B-Chain control, and many other features. Here are just a few:

- The DFP-3000 system of projector-mounted reader and rack-mounted decoder perform traditional audio processing entirely in the digital domain. Inputs are processed with 20-bit A/D converters and then slit-loss EQ, noise reduction, and matrix decoding are all processed and adjusted digitally. After B-chain processing, fully balanced outputs are driven by 20-bit D/A converters.
- A comprehensive fallback system with two auxiliary inputs permits automatic playback of all three digital sound systems (by connecting the analog outputs of the other digital decoders into the AUX inputs of the DFP-D3000) as well as optical and non-sync inputs. You can select an AUX input to play in the event there is no SDDS digital soundtrack, a second auxiliary input to play if the first has no valid audio, and optical to play automatically if no digital soundtrack of any kind is available.
- The B-Chain system of the DFP-3000 is exceptionally flexible. It provides seven channels of multi-band graphic equalization, surround delays, subwoofer parametric EQ and separate low pass filter for optical and digital play, and many other functions. These are all implemented in powerful DSP's to make setup fast and easy using Windows-based software.
- SDDS Fader Automation lets you set levels reel by reel. Your settings are retained in non-volatile memory and automatically restored whenever that reel is played again.
- A front panel headphone monitor with selection switch lets you perform many tests using headphones or test equipment directly at the decoder front panel.
- The DFP-3000 is designed for professional applications as well as cinemas. It has balanced inputs and outputs for lowest noise and you can select professional operating references if required.

This Quick Start Guide is intended to assist experienced cinema engineers in systematically installing, setting up, and maintaining the Sony DFP-3000 cinema processor system. Instructions are complete, but brief. For more detailed information, Sony offers the following comprehensive manuals:

DFP-R3000 Installation Manual (for installation of the Reader)
DFP-R3000 Maintenance Manual (for component-level service of the Reader)
DFP-D3000 Maintenance Manual (for component-level service of the Decoder)

The information in this Guide is presented in the same order that most cinema engineers follow when setting up a new theatre. If you go through the sections step-by-step you will be sure to touch on the most important points.

Sony Cinema Products would like to hear from you. We hope you will contact us and tell us your experiences in using this Guide so that we may constantly improve its value to you.

2. Equipment and accessories

Your purchase of a DFP-3000 system includes the following items in two boxes:
In the Reader box you will find :

2.1 Digital Film Sound Reader Unit	1	DFP-R3000
Reader-to-Decoder Cable, 10 meter*	1	1-783-382-11
Adapter EA	1	3-194-819-03
Spacers	4	
Bolt, Hex 3/8"	4	3-185-981-01
Washer 10	4	7-688-000-32
Screw, Hex 4 × 12	5	7-683-421-04
Washer 4	5	7-688-004-12
Spring Washer 4	5	7-623-210-22

2.2 In the Decoder box you will find:

Film Sound Decoder Unit	1	DFP-D3000
AC Power Cable	1	Varies by Country
Plug Holder	1	Varies by Country
AC Adapter (backup supply)	1	Varies by Country
Operation Manual	1	3-862-212-02

2.3 Personal equipment you will need:

Personal computer (laptop) running Windows 3.1 or later	486-66 with 32 Mb RAM, Floppy drive, serial port, 20 Mb available disk space. Pentium 120+ MHz recommended
Null modem cable, RS232C	With 9-pin male on D3000 end
Real Time Analyzer	With calibrated microphone (s)
Oscilloscope	2-Ch, 10 MHz minimum
Allen wrench set, ANSI	Up to 3/8-inch
Allen wrench set, Metric	Up to 6 mm
Tweaker	(small straight slot screw driver)

2.4 The following additional equipment is available from Sony:

Connector kit	Free	STK-2202
Setup Software	Free	STK-2233
Test Film Kit		Contact Sony
#1 JIS screwdriver, cross point type		7-700-749-03
Reader-to-Decoder Cable, 50 meter*		1-783-896-11

*Neither the 10 meter nor 50 meter cable can be cut, spliced, or re-pinned.

3. Basic checks of site and installation.

Before you begin making settings and adjustments to your DFP-3000 system, it's best to confirm some basic conditions. Here is a check list.

3.1 Check that the Decoder environment is suitable.

The DFP-D3000 Decoder is intended to be mounted in a rack chassis along with other cinema equipment. However, it should not be mounted in close proximity to power amplifiers or other equipment which may radiate strong magnetic fields or which give off high heat. Observe the ambient temperature limit of 40° C (104° F) and if the interior of the rack is excessively warm, provide more ventilation to lower the temperature.

Note

Do not "hot plug" the Reader! The Reader gets its power through the cable that connects it to the Decoder. Do not remove or install this cable while the Decoder AC power is on. Doing so may cause damage to the Reader and void its warranty.

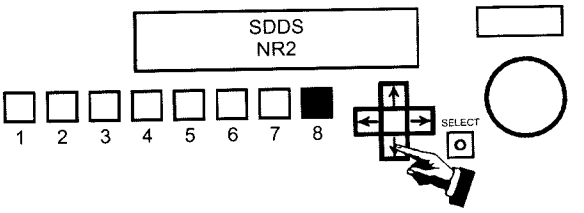
3.2 Confirm basic power up activity.

Connect the Reader to the Decoder using its cable. Note that this special cable cannot be cut or spliced. Connect the line cord to a mains supply of 100-240 VAC 50/60 Hz and connect the backup power supply to a mains supply for which it is rated. The LED in the SELECT switch will be illuminated Red. Switch on the Decoder. The SELECT switch LED will go out, the LCD display will be illuminated, the MASTER LEVEL numerical display will go through a brief count and then display its last +/– dB setting. The illuminated PRESET switch shows the last and current Preset selected and the LCD display shows its name and any fallback Preset that is assigned to it.

3.3 Confirm the proper version of Decoder firmware.

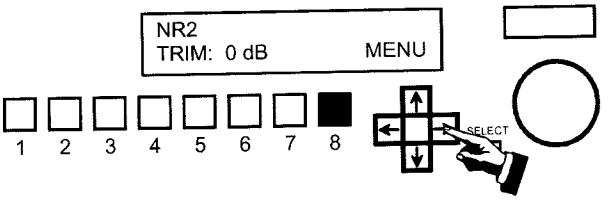
The instructions contained in this Guide relate to functions and features associated with DFP-D3000 firmware versions v2.74 and higher. See TN99121401 for the latest versions of all forms of firmware and software for Sony cinema products. The following steps illustrate how to display the DFP-D3000 firmware version on the front panel LCD screen:

1. Select any Preset by pressing its PRESET button twice. The display should appear as illustrated.

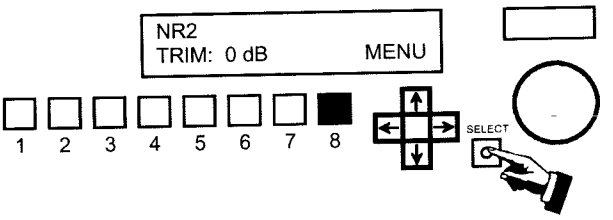


2. Press the ↓ button.

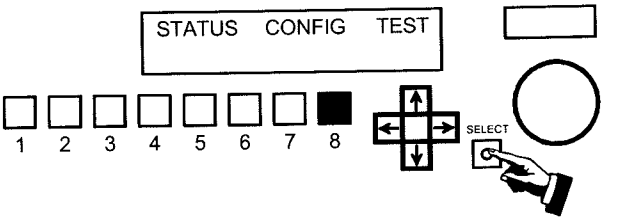
3. The NR2 TRIM value will now be flashing. Press the → button so that the MENU option is flashing.



4. With the MENU option flashing, press the SELECT button.

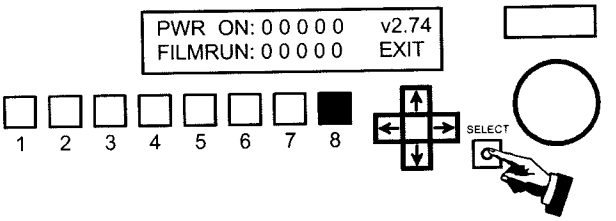


5. The STATUS option will now be flashing. Press the SELECT button again.



6. The firmware version will now be indicated in the upper right corner of the LCD display.

7. Press the SELECT button while the EXIT option is flashing to leave this area of the menu system.



3.4 Check the version of the Setup Software on your computer.

The Setup Software is updated frequently. Be sure you are using the latest version, which will be v2.00, build 2.055 or higher. You can check the SDDS web site or contact Sony Cinema Products to determine the latest version and to request a free copy. You can check the version of Setup Software you are using by launching the program and selecting **Help>About. . .** from the pull down menu at the top of the main screen.

3.5 Confirm a proper chassis earth ground.

Most audio grounding schemes require that the chassis of the DFP-D3000 have a solid electrical connection to the rack in which it is mounted. The finish on the rack mounting rails may be very durable. Make sure that the mounting screws cut through the finish of the DFP-D3000 and that the mounting ears make electrical connection through the rack rails' finish to the rack itself. Test this with an ohm meter. Additionally, a screw terminal Technical Ground is available on the back panel of the Decoder, to help make a solid ground connection. Do not remove the line cord safety ground pin in an attempt to avoid ground loops. This precaution is already taken care of in the design of the DFP-D3000 and removing the pin will have no benefit, but doing so will compromise electrical safety and may violate electrical codes.

3.6 Check the optical input connector wiring.

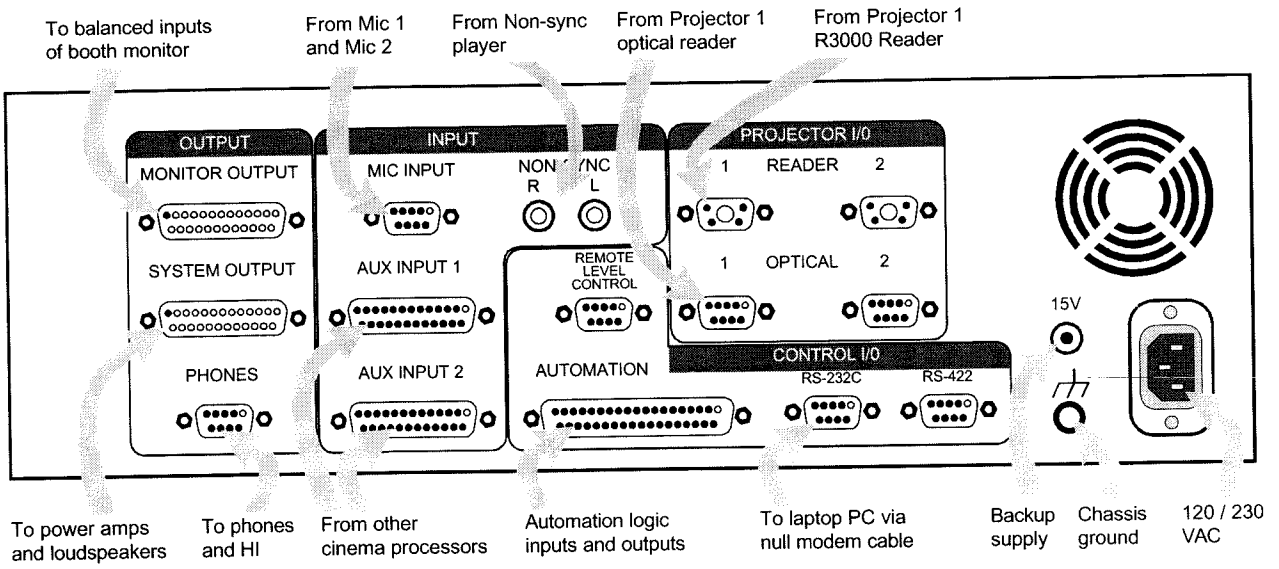
Make sure that the optical input connector is wired according to the pinout diagram in the Appendix. Use individually shielded twisted pair cable. See Chapter 5, A-Chain Alignment, for information regarding the optical pre-amp test points. Note that the wiring of this connector may not correspond to that of other cinema processors.

3.7 Confirm proper audio interface wiring.

The Sony DFP-D3000 Decoder unit uses professionally balanced audio interface connectors, pinned according to the THX convention, for interconnections to amplifiers, crossovers, limiters, booth monitors, and other cinema processors. Unfortunately, many such devices do not employ balanced inputs or outputs. It is essential that proper balanced to unbalanced interface wiring techniques are used when connecting to these devices so as to ensure optimum operating conditions for the DFP-D3000 and connected equipment. Failure to use proper techniques in your sound rack wiring may result in reduced system headroom, improper theatre calibration, and compromised sound performance. For a guide to properly interconnecting balanced and unbalanced audio signals, refer to Tech Note TN99060401.

Wiring of other equipment.

This following is an illustration of the DFP-D3000 rear panel.



Note that these D-Sub connectors have metric (M2.5 × .45) jack screw receptacles and require mating connectors with metric jack screws. A kit of such connectors is provided with each DFP D3000. **Do not use standard D-Sub connectors with 4-40 jack screws.**

Cinema processors.

Refer to the list of available Tech Notes in the Appendix of this Guide for instructions on correct audio and logic interconnections to other cinema processors. Note that Sony connectors use the THX® pinout convention, but other equipment may not. Therefore, pre-fabricated cables or cables made with flat ribbon computer-type cable are generally not acceptable for use with the DFP-D3000. The DFP-3000 cinema processor is capable of exceptional performance; do not degrade this by using inferior cables. Sony strongly recommends that all audio interconnections in your cinema sound rack be made using high quality audio-grade twisted pair shielded cables or individually shielded multipair cable. Contact your dealer for information regarding pre-wired audio cables for the DFP-D3000, available from several cinema accessory distributors.

Non-sync inputs.

The non-sync inputs of the DFP-D3000 are on consumer standard RCA-type connectors. One dedicated non-sync input is available. If additional non-sync inputs are required, the MIC1 input can easily be configured for line level operation, and the two eight-channel AUX inputs can serve as additional line level inputs for electronic projectors, DVD, magnetic film dubbers, and other external analog sound sources.

Microphone inputs.

The MIC1 and MIC2 inputs have built in microphone preamplifiers, so that external mixers or line-matching devices are not required to directly connect a microphone level input. Input connections are balanced on a single D-Sub 9-pin female connector. 48-volt phantom power for condenser microphones is available, and can be switched on using the setup software or the front panel. See the instructions for MIC configuration later in this Guide for more detailed information.

AUX inputs.

If either of the two 8-wide balanced AUX inputs are used for sources other than cinema processors, take note that the sophisticated automatic fallback system of the DFP-3000 requires these inputs to be enabled by a logic command to make them active. To use AUX1 or AUX2 for external sound sources other than digital film sound decoders, short Pin 34 (AUX1 DATA OK) or Pin 35 (AUX2 DATA OK) to GROUND on the Automation connector to enable the AUX1 or AUX2 inputs. See Tech Note TN99042801. Another approach is to chose No Fallback (*) as the fallback option for an AUX Preset, which prevents fallback and so forces the AUX input to play whenever it is selected.

Headphones and HI output.

A single D-Sub 9 pin connector provides a L/R stereo headphone output from the back panel. This is a parallel of the front panel headphone jack and is affected by the MONITOR SELECT switch and HEADPHONES level control. This connector also has two pins providing MONO outputs, which can be used to feed most Hearing Impaired transmission systems. Signal level for the HI outputs can be calibrated by an adjustment control located inside the Decoder. Detailed instructions for Hearing Impaired output level adjustment is discussed in Section 6.15 of this Guide.

Automation inputs and outputs.

All automation logic inputs and outputs are brought to a single 37-pin D-Sub connector on the DFP-D3000. For a complete description of the connections available, see Tech Note TN99042801. Other Tech Notes describe specific means of connecting to other types of cinema equipment; see Tech Note TN99070701.

RS-232C connector.

This 9-pin female D-Sub connector is used to connect an external PC-compatible computer using a null-modem cable.

RS-422 connector.

Contact your Sony service or sales representative for details on the use of this connector.

Remote level control.

Remote control of the Master Volume is possible by connecting a 100k-ohm linear taper potentiometer. The wiring convention of this potentiometer is unique to Sony, so follow the documentation in the Appendix carefully.

Bypass (backup) power supply.

The DFP-D3000 is provided with an external DC power supply which provides emergency power to bypass components within the Decoder. This power supply allows the Decoder to continue playing optical tracks in the event its main power has been turned off. Check that this power supply has the correct AC mains voltage rating for your country and is connected to the AC mains and to the back of the Decoder. A small red LED in the SELECT switch on the front panel of the Decoder indicates when the unit is being powered only by the backup power supply.

4. Checks of correct DFP-R3000 Reader mounting.

Do not "hot plug" the Reader!
The Reader gets its power through the cable that connects it to the Decoder. Do not remove or install this cable while the Decoder power is on. Doing so may cause damage to the Reader and void the warranty.

4.1 Confirm the minimum frame offset.

Specific installation instructions for mounting the Reader to each type of projector are available in the DFP-R3000 Installation Guide provided with the Reader. Following these instructions will ensure at least the minimum frame offset between the Reader's LEDs and the picture gate. The Reader LED offset must be at least 32 frames ahead of the projector gate. Since the loop ahead of the intermittent affects this offset, use a nominal loop when making this determination. The maximum total frame offset possible with the DFP-3000 is 115 frames.

4.2 Check the film path alignment.

Proper alignment of the film path entering and exiting the Reader, as well as adequate tension on the incoming film, is essential to correct operation of the DFP-R3000 Reader. Carefully check that the all rollers on the in-feed mechanism, the Reader, the Adapter plate, and the projector are aligned and that no twisting of the film path occurs. Adjust the positioning of the Reader if necessary.

5. A-Chain alignment using DFP-D3000 front panel controls

The most direct means of A-Chain alignment is to use with external test equipment and the controls available through the Decoder front panel. There are two approaches. The first, recommended for experienced cinema engineers, is to align the projector's optical playback system so as to produce nominal settings (preset gain = 0.0 dB) in the DFP-D3000. This has the potential benefit of best sound quality as preamplifiers, noise reduction, and matrix decoding circuits will be operating at optimal levels. The second approach is to set the DFP-D3000 to match the existing alignments in the projector's optical playback system. This approach has the benefit of ease of setup, but requires that the optical system is already correctly aligned. Gain trims should end up near 0.0 dB with a properly aligned projector. With either approach, it is important to first ensure a high quality optical system alignment. For detailed instructions on aligning a forward scan optical reader system, see Tech Note TN99111901; to align a specific brand of reverse scan reader, follow its manufacturer's documentation.

5.1 The following instructions require that the projector's optical reader has been properly aligned, the projector is mechanically sound, and its optical playback system is clean. See TN99111901 for instructions on aligning a forward scan optical reader.

The initial steps for A-Chain alignment are common to both alignment approaches.

5.2.1 Prepare a test cable.

This cable connects from a standard 1/4-inch stereo phone plug to the input connectors of your multichannel Real Time Analyzer (RTA) and simultaneously to the inputs of your dual-channel X-Y oscilloscope. The front panel phone jack on the Decoder has line-level output signals wired with Tip = Lt, Ring = Rt, and Sleeve = audio common (ground). The Lt and Rt signals connect to each input of your RTA and to the horizontal and vertical inputs of your oscilloscope. See available Tech Note TN99101201 for details on making up this test cable.

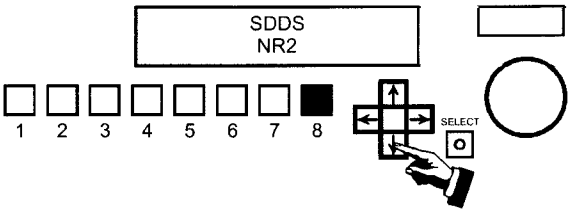
5.2.2 Connect the test cable.

Set up your oscilloscope for X-Y display, i.e., to display phase relationships between two equal signals. Connect the test cable to the X and Y oscilloscope inputs. Connect Lt or Rt to your RTA input. Insert the phone plug end of the test cable into the headphones jack on the front panel of the DFP-D3000.

5.2.3 Set the MONITOR SELECT switch of the Decoder to position 1 (the LCD screen will briefly display L+LC+C+SL/R+RC+SR). Set the adjacent HEADPHONES volume control to the 12:00 (straight up) position.

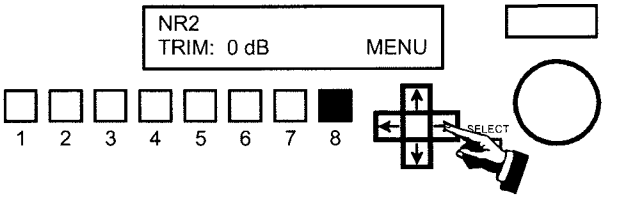
5.3 Enter the A-Chain access password in order to adjust preamplifier gains and set the slit loss equalization frequency. You will need to play customary alignment films at times during this process. The default A-Chain password is "SONY".

5.3.1 Select any Preset other than non-sync by pressing its PRESET button twice. If you have selected Preset 8 for SDDS the LCD display will appear as illustrated.

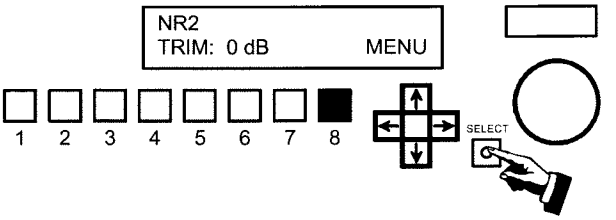


5.3.2 Press the ↓ button.

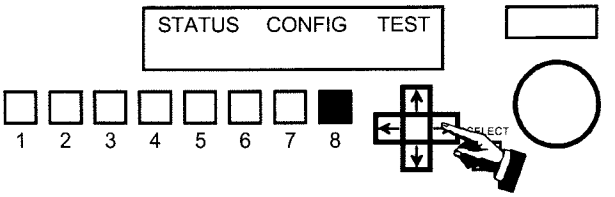
5.3.3 The NR2 TRIM value will now be flashing. Press the → button so that the MENU option is flashing.



5.3.4 With the MENU option flashing, press the SELECT button.

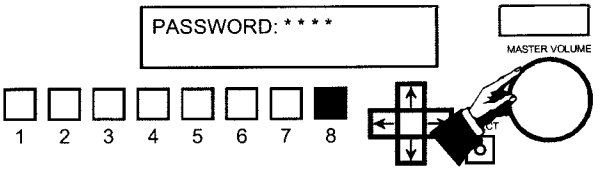


5.3.5 The STATUS option will now be flashing. Press the → button again. This will cause the CONFIG option to flash.

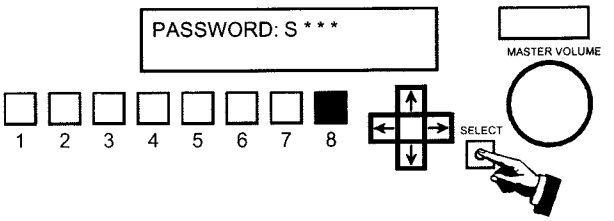


5.3.6 With the CONFIG option flashing, press the SELECT button.

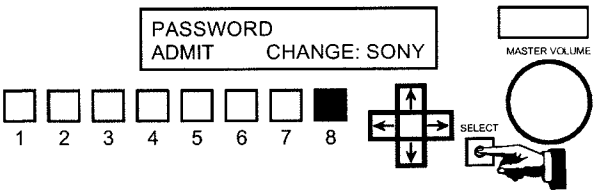
5.3.7 Turn the MASTER VOLUME control clockwise until the first character in the password field is changed to "S". The default A-Chain password is "SONY".



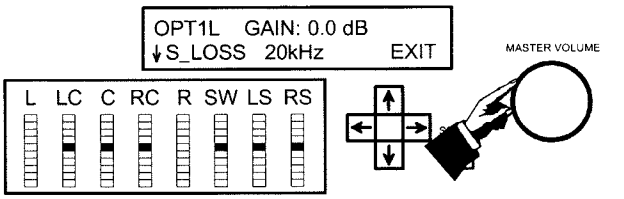
5.3.8 When the first character becomes "S", press the SELECT button to enter it and move to the next character. Continue using the MASTER VOLUME control and SELECT button to enter all characters of SONY.



5.3.9 When you enter the last correct character you will see the ADMIT option flashing. Press the SELECT button to proceed to the A-Chain functions menus.

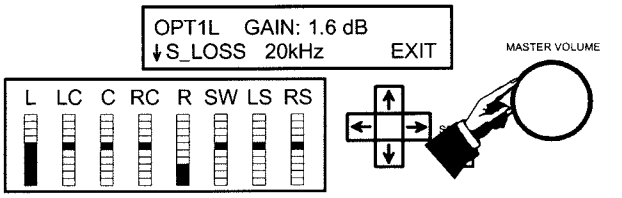


5.3.10 This is the A-Chain Calibration menu for OPT1L (the left optical input from projector 1). Use the ↑ ↓ buttons to select among left and right inputs from two projectors and the ← → buttons to select between Slit Loss and Gain adjustments. The MASTER VOLUME control adjusts the values of GAIN or S_LOSS.

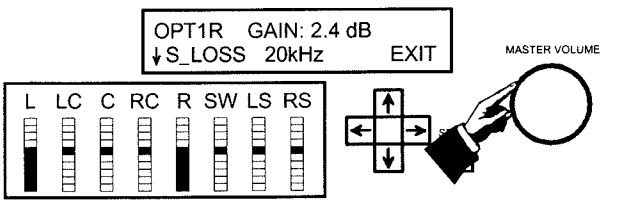


You must now decide whether to align the optical reader to the DFP-D3000 or the DFP-D3000 to the reader. If you decide to adjust the reader to achieve gain settings of 0.0 dB (or as close as possible) you must make adjustments to the exciter lamp voltage or reverse scan preamplifier gain, and possibly other adjustments, according to your experience. Otherwise, use the following steps to adjust the DFP-D3000 to accommodate the correctly aligned reader's output.

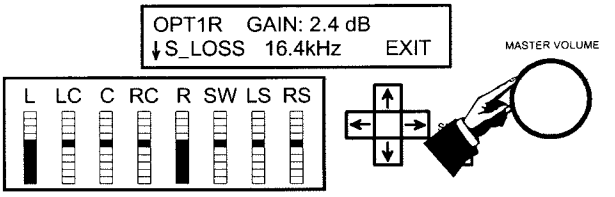
5.4a Play a Calibration Tone loop. The signal amplitude will be indicated on the L and R meters, while the single LED on the remaining meters serves as a reference. Use the Master Volume control to set the gain for the Left optical input from projector 1 (OPT1L) to match the single LED's as shown. Note that the meter sensitivity in this calibration mode is much higher than in normal film playback operation.



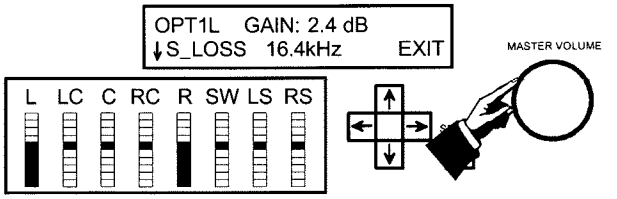
5.4b Use the ↑ ↓ buttons to select the Right optical input (OPT1R) and use the Master Volume control to set the gain so that the signal level is correct. If you chose to align the reader to the DFP-D3000, you would have the L and R bars aligned to match the single LED's and all gain settings would be at 0.0 dB.



5.5a Use the ← → buttons to change the selected parameter to slit loss (S_LOSS). Play a B&W Pink Noise test film and use the Master Volume control to adjust the slit loss frequency to achieve the flattest response, as indicated by your RTA. The result that is achievable depends on the slit height and other properties of the reader and the actual high frequency flatness of your pink noise test film.



5.5b Use the ↑ ↓ buttons to return to the Left optical input and use the Master Volume control to adjust the slit loss compensation frequency to achieve the flattest response.



This completes the A-Chain alignment procedure. To return to the main LCD menu, use the ← → buttons to select the EXIT option and press the SELECT button. You may also press any PRESET button twice to exit all menus and return the Decoder to normal operation with that Preset selected and its parameters loaded.

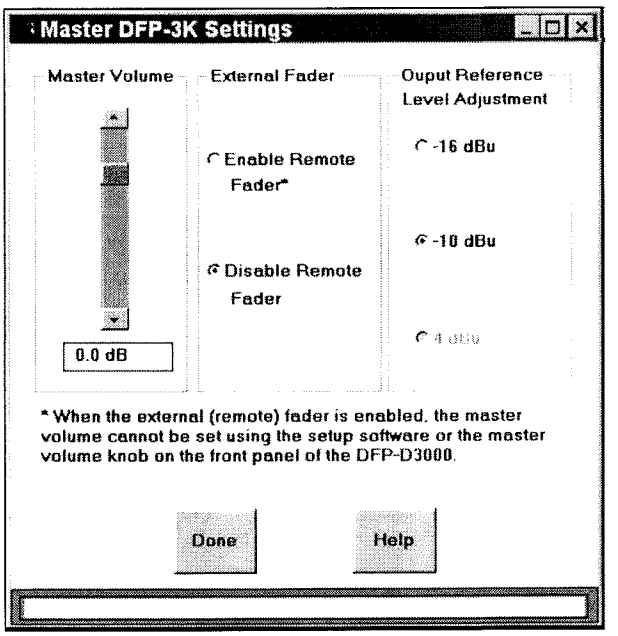
6. B-Chain Alignment

B-Chain alignment is performed using the DFP-D3000, Setup Software, and your own test equipment. To begin, connect your computer to the Decoder using a null modem cable, launch the Setup Software, and "connect" the Setup Software to the DFP-D3000 using the **Config>Connect to DFP...** menus. Set up your microphones and analyzer (THX R2 or other multichannel real time analyzer) in the theatre. Refer to SMPTE Standard 202M, B-Chain Electroacoustic Response, for more detailed information on microphone placement, theatre acoustics, and the "X" curve. Note that the DFP-D3000 must be set up with the Master Fader nominally set to 0.0 (not 7) and that from this position 10 dB of boost and full cut is available, with an audio/dB fader taper.

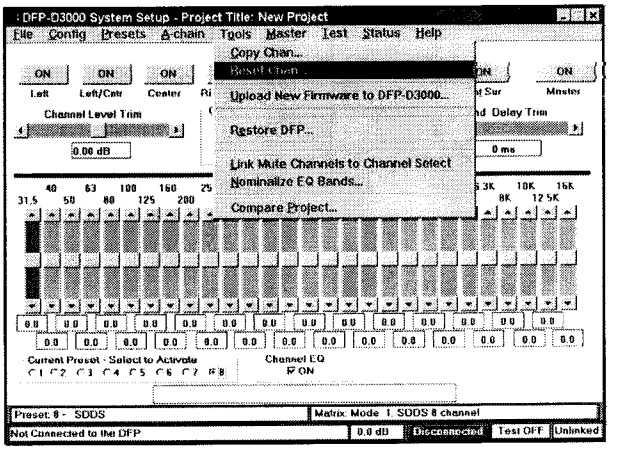
6.1 Open the **Master DFP-3K Settings** screen by selecting **Master DFP-D3000** under the **Master** option in the main screen menu bar.

6.2 Ensure that the **Master Volume** is set to **0.0 dB**. Select the appropriate output level for the DFP-D3000; this is the absolute signal level that corresponds to the −20 dBFS reference point. In most cases you should chose −10 dBu (145 mV).

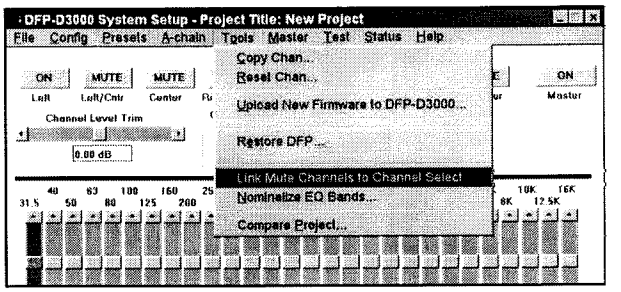
Use your real time analyzer (RTA) to check the SPL in the theatre and ensure that it is in the right range when the Master Volume is 0.0 dB.



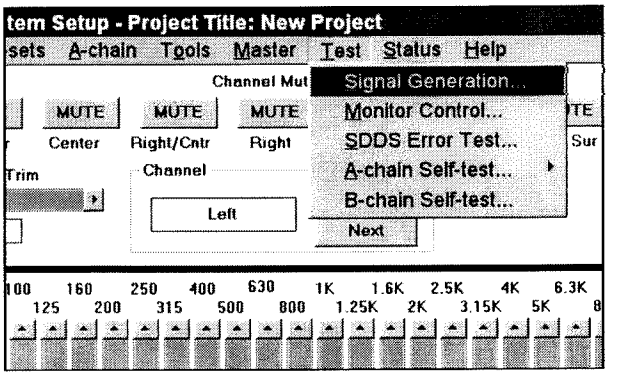
6.3a Move **all** Channel Level Trims to the center setting (0.0 dB). Center all equalizer sliders at 0.0 dB. To quickly set all EQ levels to 0.0 dB, access the **Reset Channel** function in the **Tools** pull-down menu located in the main screen menu bar. The illustration shows the main screen of the Setup Software in this condition, for the Left output channel.



6.3b Link the channel mutes to the channel selects using the **Tools** selection of the main screen and selecting **Link Mute Channels to Channel Select**.



6.3c To bring up the **DFP Test Signal Generator screen**, select the **Signal Generation** option under the **Test** item on the main screen menu bar.



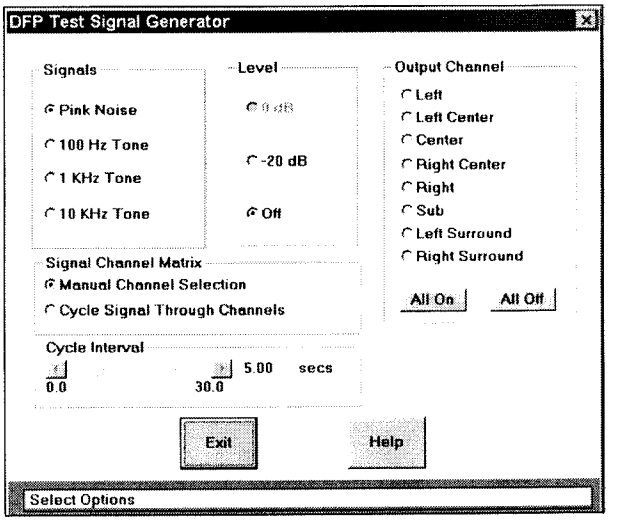
6.4a Select **Pink Noise** in the **Signals** area. Pink noise can be sent to the outputs only at −20 dBFS. This is handled automatically by the software.

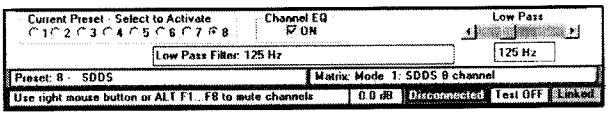
6.4b Enable all outputs by selecting **All On** in the **Output Channel** area. The software automatically mutes all channels to prevent accidentally sending loud sounds into the theatre.

When **All On** is selected, a warning will appear. Read it carefully and select **Yes** if you wish to continue.

When you finish the setup, return to the main screen by pressing **Exit**.

Note that the bottom of the main screen now shows PINK to indicate that pink noise is being generated and Linked to show that channel mutes are linked to channel selects.





6.4c B-Chain alignment is performed on output channels individually. You can use the function keys as an aid in channel selection or use the MUTE/ON buttons illustrated in 6.3a. Because the channels are linked, pressing a function key or button selects and un-mutes (turns on) that channel while muting (turns off) all other output channels.

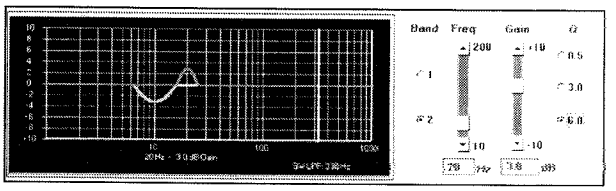
Function Key	Channel
F1	Left
F2	Left Center
F3	Center
F4	Right Center
F5	Right
F6	Subwoofer, (LFE)
F7	Left Surround
F8	Right Surround

6.5 Now select each output channel in succession, confirm that the noise sound is coming from the correct loudspeaker, and adjust the channel's equalization and level. Start by adjusting the equipment between the System Outputs of the DFP-D3000 and the loudspeakers to achieve about 85 dBC SPL in each screen loudspeaker, measured individually (82 dBC for each of the two surround channels). This equipment may include crossovers and power amplifiers from a number of manufacturers so specific instructions cannot be given here. Sony recommends using several measurement microphones and a microphone multiplexer to drive your RTA, but each engineer will have their own preferred measurement techniques.

6.6 Adjust the graphic equalizer to achieve the "X" curve of SMPTE 202M, or other frequency response that has been established for your theatre. Do this for each loudspeaker attached to an output channel, except the subwoofer. Setting the graphic equalizer for best results requires skill and experience, but a few general points can be made. Make small adjustments and let the RTA display settle down after each adjustment. Cutting EQ is always better than boosting EQ. Adjacent bands with boost and cut differences of more than 3dB indicates problems that aren't appropriate for EQ to correct; try to end up with a smooth equalizer setting using as little EQ as possible and no more than a few dB difference between adjacent bands. Use even less EQ on the surround loudspeakers. The screen speakers should all have the same EQ settings (if they are the same cabinet type); if they aren't very close, there may be problems that EQ should not be used to address. Don't boost low bands in an attempt to extend the low frequency response; that is mainly determined by the cabinet design. Remember that you can only adjust for the sound that comes directly from the loudspeakers to the measurement microphone; you cannot do much about the sound that is influenced by the auditorium acoustics or resonances and you should avoid the temptation to try to do so. If you see wide variations when you move your microphones around in the auditorium, position them closer to the front so as to measure more sound direct from the loudspeakers and have less influence from the sound that has bounced around the auditorium (which you can't affect with EQ).

6.7 When all loudspeakers except the subwoofer have been EQ'd, make a wideband adjustment in the equipment between the DFP-D3000 and each of the loudspeakers (such as with a power amplifier gain control) to achieve 85 dBC SPL from each screen loudspeaker. This is a wideband sound pressure measurement; at this point, the individual bands of your RTA will each be at about 70 dB SPL. The left and right surround cabinet groups should each be set for 82 dBC wideband. It is better to achieve this result with an adjustment of amplifier gain than by using a Channel Level Trim, and when using a Channel Level Trim, it is better to preserve full headroom by using attenuation (cut, or −dB) instead of gain (boost, or +dB).

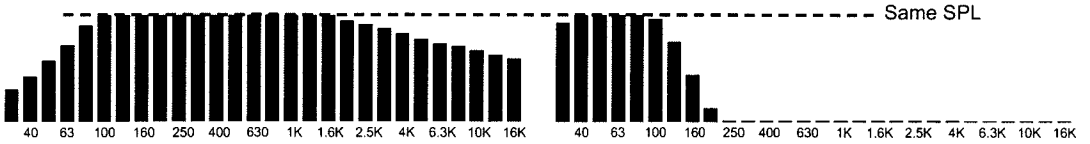
6.8 To set the equalization for the subwoofer loudspeaker, press F6 to select the Subwoofer output channel and bring up the 2-band parametric equalizer. Verify that sound is coming from the subwoofer loudspeaker cabinet.



Adjusting the subwoofer equalizer is especially difficult and benefits from experience with the particular cabinet model used. Use as little EQ as possible and allow your RTA display extra time to settle between adjustments. Aim for a smooth, rather than extended, response. Note that the higher frequencies are rolled off by the subwoofer low pass filter, whose frequency is shown below the graphic display and is indicated by the vertical yellow line. Use 330 Hz for this step and reduce the setting later, using separate settings for optical, digital, and other presets.

The analog subwoofer channel level trim affects the subwoofer output level of all eight presets. The SDDS subwoofer level is an offset trim from this value. The AUX subwoofer offset settings are also offset from the analog subwoofer channel level trim.

6.9 The recommended method of setting the analog subwoofer level is to use the internal pink noise generator as you have previously done for the screen speakers and adjust the subwoofer power amplifier input gain control and the subwoofer level trim (which is essentially in series with the subwoofer power amplifier's input gain control) to make the subwoofer's RTA bands match the level of the Center channel's RTA bands where they are flat. Use attenuation in preference to gain at the subwoofer level trim and achieve gain with the subwoofer power amplifier's input control. When you make a change to the Analog Channel Level Trim slider while the Subwoofer output channel is selected, the software will automatically select a non-SDDS Preset.



Center channel loudspeaker response

Analog subwoofer channel response

Purists may want to set the optical subwoofer level by playing a pink noise loop and adjusting to make the overall response of the screen speakers as flat and extended as possible as a result of the subwoofer's supplementation. This technique is beyond the scope of this Guide.

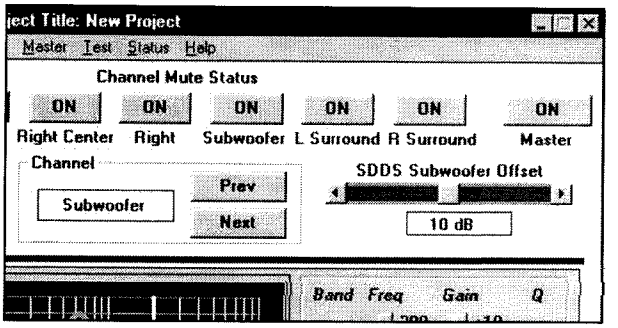
Recognize that the **SDDS** (and other digital formats') **subwoofer** is an effects channel that delivers low frequency sounds that are designed to enhance certain elements of a particular film. The **analog subwoofer** is derived from the optical L,C,R channels and is intended to compensate for limitations of the screen speakers being used; modern, full-range screen loudspeakers may need little or no analog subwoofer supplementation. For a longer discussion, see Tech Note TN99051701.

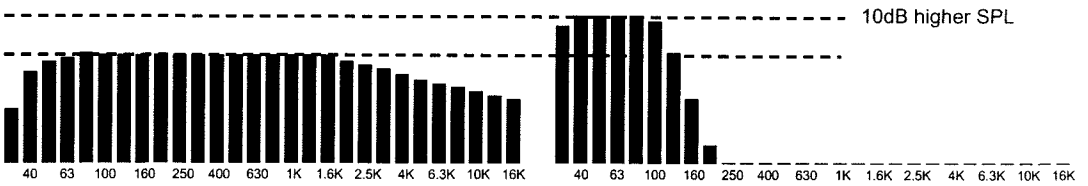
The low pass filter frequency for the optical preset must first be set to match the response of the subwoofer to the response of the screen speakers. Wide range screen speakers can have the optical subwoofer low pass filter set to the lowest value of 80 Hz; 100 Hz is a good starting point for most modern screen loudspeakers.

What ever method is used, a final listening test, using film having a high quality optical track with familiar, wide range content should be auditioned to ensure that the subwoofer level is set for best sound and optimal low frequency balance. If you use a non-sync audio source, such as a music CD, for this test, be sure to select Mode 6, 7, 8, or 9 for your non-sync Preset in the Preset Configuration screen (see Step 6.11), so that the analog subwoofer output is active.

6.10 When adjusting the SDDS subwoofer (LFE) level offset, the SDDS Preset must be made the active Preset. Select the preset manually with the **Active Preset** option under the **Presets** item in the main screen menu bar and then selecting the SDDS Preset, or by clicking the appropriate radio button at the lower left of the main screen.
8 is the default preset for SDDS. Press F6 to manually the subwoofer output channel. Alternatively, the software will automatically select the SDDS Preset when you have selected the Subwoofer output channel and click the SDDS Subwoofer Offset slider.

Use the **SDDS Subwoofer Offset** slider control and your real time analyzer (RTA) to set 10 dB of in-band gain of the subwoofer's bands as compared to the previously calibrated Center speaker's bands in the region of its flat frequency response. Be sure to allow extra time for the low frequency bands to settle to their final values.





Center channel loudspeaker response

Digital subwoofer (LFE) channel response

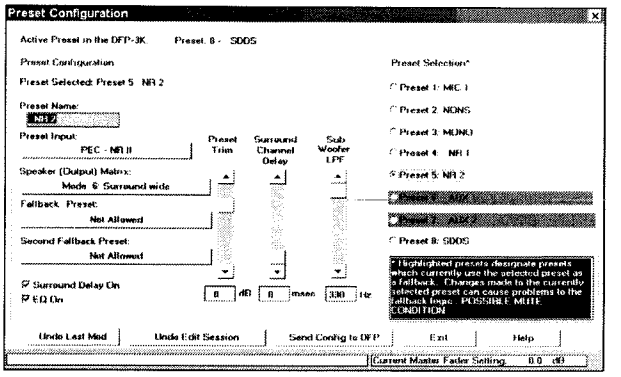
This procedure, which requires an RTA, matches the playback gain of the SDDS Preset's subwoofer loudspeaker in the cinema to the playback response of the digital subwoofer (LFE loudspeaker) on the stage where the film's sound track was mixed.

When evaluating the SDDS digital subwoofer (LFE) level, no listening test is entirely definitive, because the amount of energy in the LFE channel is a creative decision made when the soundtrack of each film was mixed. For the same reason, the digital subwoofer (LFE) low pass filter setting has no relationship to the screen loudspeakers' performance. It merely serves to exclude undesirable sound from the subwoofer (LFE) cabinet. The actual sounds reproduced on the digital subwoofer (LFE) channel are determined by what was put there by the film's sound mixer, as long as the filter frequency is not set so low as to remove sounds the mixer intended to be included. Setting the digital subwoofer low pass filter frequency to 100 to 200 Hz should be acceptable and either setting should sound the same when actual film is exhibited; start with 160 Hz. Subwoofer manufacturers may have specific recommendations for their cabinets.

Note that the result of a wideband SPL measurement of pink noise from the SDDS subwoofer (LFE) will depend on both the level Trim setting and the low pass filter Frequency setting. For a LPF frequency setting of 100 Hz, a wideband measurement made with an SPL meter will show approximately 91 dB. Such a measurement should only be made to confirm that a correctly calibrated theatre has not drifted, and cannot be used as a primary calibration measurement in place of an RTA. Also remember that the analog subwoofer channel trim is effectively in series with the subwoofer amplifier's input gain control. This means that **an adjustment to the analog subwoofer channel trim also affects the playback level of all digital subwoofer signals**.

Note that the graphic and parametric equalizer settings adjust for the frequency response of each of the loudspeaker cabinets in the theatre. This means they affect the output from all Preset inputs. The output channel level trims, including the analog subwoofer channel level trim, also affect all Presets. These settings are retained in the DFP-D3000's non-volatile memory as a single set of overall adjustments to the playback system. Other settings, such as subwoofer low pass filter frequency and surround speaker delay, may be unique to each format or signal source. These values are stored as individual settings for and within each of the eight Presets.

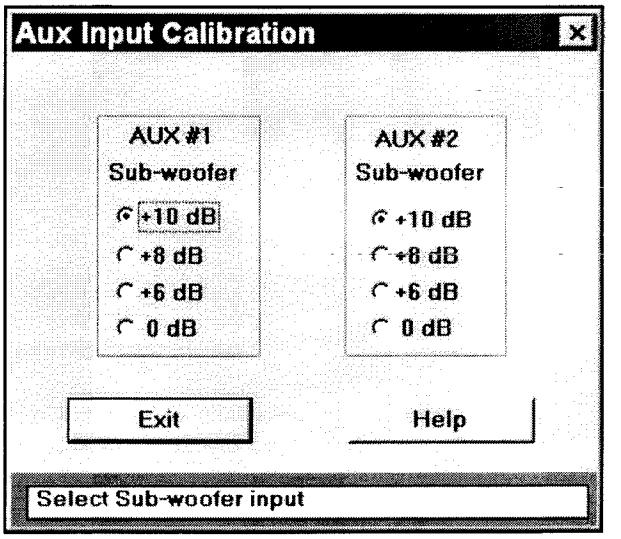
6.11 To set the surround channel delay and enable it for each Preset, bring up the **Preset Configuration** screen by selecting the **Preset Configuration** option under the **Presets** item in the main screen menu bar. This screen allows you to select each Preset, make a level trim (to balance the relative level of each Preset), set a surround delay, and set the subwoofer low pass filter (LPF) frequency for that Preset.



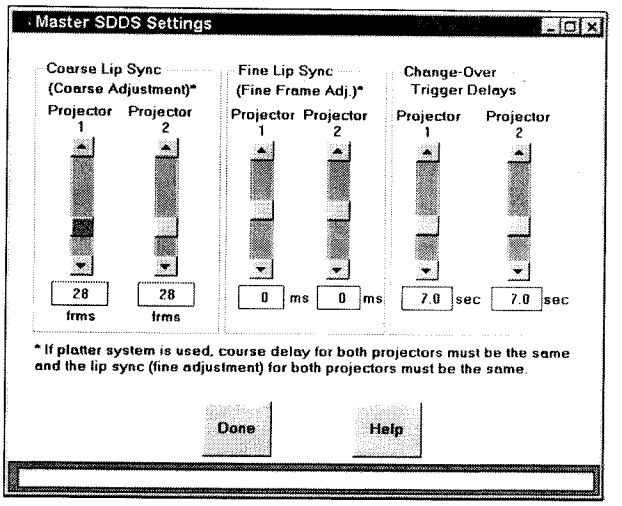
In the latest versions of software you can also set surround delay and subwoofer LPF frequency at the main screen, according to the output channel selected.

The surround channel delay can be set with elaborate science based on SMPTE 202M. However, an easy rule-of-thumb approach is to set the milliseconds of delay for optical sources (NR2) to equal the length of the theatre (in feet) +10. For digital sources (SDDS) it should be set to 60 % of the optical surround delay.

6.12 If a cinema digital audio system is connected to one of the AUX inputs, you must set its corresponding subwoofer input level offset. The playback level of the subwoofer in today's cinema digital audio systems is offset by 10 dB. To access the **AUX Input Calibration** screen, select the **AUX Inputs** option from the **A-chain** item in the main screen menu bar. Click to select the correct offset.



6.13 To adjust the synchronization between optical and SDDS playback, access the **Master SDDS Settings** screen by selecting **Master SDDS** from the **Master** item on the main screen menu bar.



First set the coarse adjustment of frame offset by counting the actual frames of film between the projector's film gate and the LEDs of the DFP-R3000 Reader. You must have at least 32 frames. This adjustment cannot be changed while film is running.

Now adjust the Fine Lip Sync by playing the SDDS Installation reel or a quality, dialog-heavy feature print (not a trailer, which may have loose sync) and comparing optical and digital dialog. Set the fine lip sync to make the two coincident. Do this by plugging headphones into the front panel of the DFP-D3000 and turning the Monitor switch to position 5 (the LCD display will briefly indicate "Lt+Rt/SOURCE_Cch"). The left output will contain the optical center channel and the right output will contain the digital center channel audio. Verify your setting by watching the film from a mid-audience position and check that the dialog synchronization appears to be correct; don't use the projection booth monitor while looking through the booth's port hole or you will retard the sound by about two frames.

The DFP-D3000 allows you to use this same feature to check synchronization of the AUX input signals. This means that if you also have DTS or SRD sources you can check their synchronization against the optical tracks, even though their manufacturers do not offer this capability.

6.14 Setting up Preset configurations. A Preset is a set of retained DFP-D3000 Decoder settings that apply to a particular input signal. These settings are associated with eight numbered switch buttons on the front panel of the Decoder which are used to select inputs. Pressing any of these buttons once will cause the LCD screen to display its current assignments; this is only a display function. Pressing a button twice will select its associated input as the signal source for the Decoder and will also load the corresponding Preset's retained parameters.

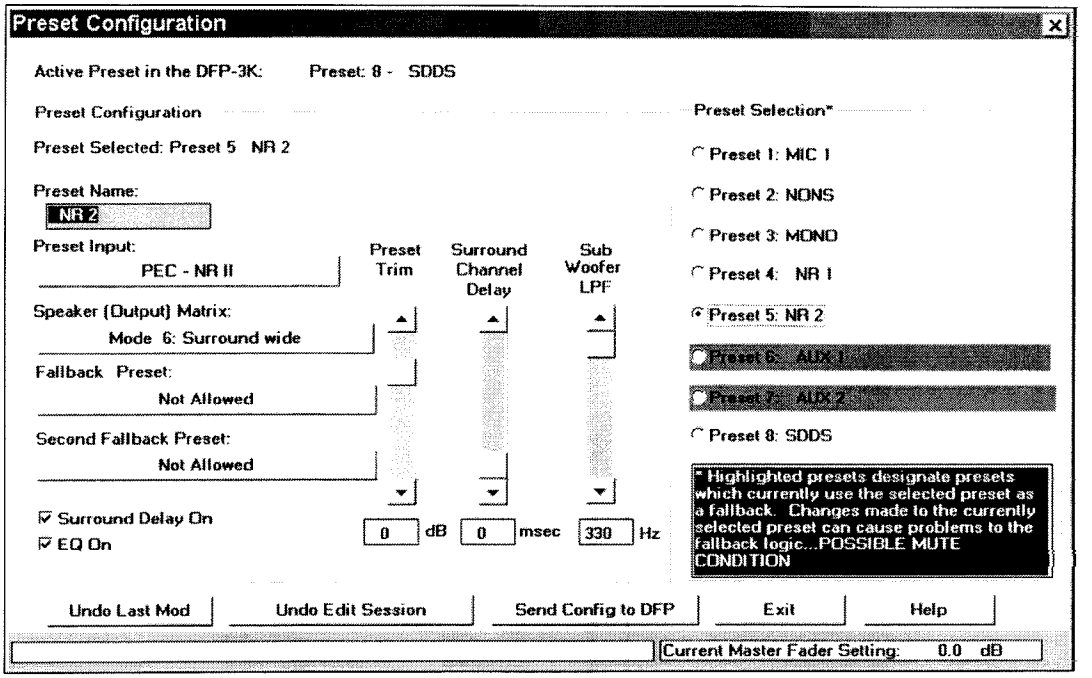
Sony recommends that these default Preset assignments be Maintained, but the signal type can be renamed for convenience. For Example, AUX1 could be renamed to DTS, but keep it as Preset 6 unless you have good reason to do otherwise.

Button	Input Signal Type
1	Microphone
2	Non-sync
3	PEC - Academy mono
4	PEC - NR1
5	PEC - NR2
6	AUX1
7	AUX2
8	SDDS

The following parameters are stored in the DFP-D3000 for each Preset:

- Preset name (up to 12 user-entered characters)
- Input signal type (microphone, non-sync, PEC, AUX, or SDDS)
- Speaker output matrix (1 of 16 available matrix options)
- Fallback presets (for presets with AUX or SDDS input formats)
- Preset trim (fader offset for each Preset)
- EQ On/Off switch
- Surround delay On/Off switch
- Surround delay
- Sub-woofer low pass filter frequency
- Fade in time (same for all non-sync presets)

To change these parameters, access the Preset Configuration screen from the Preset Configuration option under the Presets item in the main screen menu bar.



To re-configure a Preset, select the candidate Preset from the list of preset configurations in the **Preset Selection** area of the screen. After selecting the Preset, the various fields in the **Preset Configuration** area will change to reflect its current configuration. If the selected Preset is a fallback assignment for other Presets (in the event their digital data becomes unavailable), such Presets will be highlighted in red in the **Preset Selection** area. If a change is made to the selected Preset which renders it invalid as a fallback for one of its highlighted Presets, the setup software will display a warning and attempt to select another valid Preset to replace the one you have modified. A list of changes will be displayed when the modified Preset's new configuration is sent to the DFP-D3000 Decoder. If you are using firmware v3.0 or later, check with Sony to see if changes have been made to functions available from the Preset Configuration screen.

The **Preset Name** edit box is used to change the name of a preset configuration. Alternate Preset names are entirely up to the user, but cannot exceed 12 characters in length. The Setup Software automatically formats the name to center it in the DFP-D3000 front panel LCD display. To change the input signal type, click on the **Preset Input** edit box and select the signal type from a list that pops up. Sony suggests that you maintain the default selections.

To change the output format for the selected Preset, click on the **Speaker (Output) Matrix** edit box and select from the list that pops up. This list automatically contains only those matrix formats that are allowed for the type of input signal that you have chosen. Here are all the matrix modes and their meanings:

Mode	Name	Meaning
1	SDDS	Eight inputs sent directly to eight outputs
2	SDDS 7.1CH	#1 except LC and RC mixed into L, C, R; SW to SW, LC, and RC outs
3	SDDS 6CH	#1 except LC and RC mixed into L, C, R; SL +SR to SL out; SW to LC and RC
4	SDDS 5.1CH	#1 except LC and RC mixed into L, C, R; SW in to SW out only
5	SDDS 4CH	#1 except LC and RC mixed into L, C, R; SL +SR to SL out; SW to SW only
6	Surround wide	L, R matrix decoded as Lt, Rt, bass extended; to L, C, R, SL = SR, SW
7	Surround narrow	L, R matrix decoded as Lt, Rt, bass extended; to LC, C, RC, SL = SR, SW
8	Stereo wide	L, R in to L, R out; bass extension synthesized and sent to SW
9	Stereo narrow	L, R in to LC, RC out; bass extension synthesized and sent to SW
10	Mono	C in to C out with Academy Filter; SW output off
11	Normal	L, R in to L, R out; SW output off
12	Normal narrow	L, R in to LC, RC out; SW output off
13	Matrix decode W	L, R matrix decoded as Lt, Rt and sent to L, C, R, SL = SR; SW off
14	Matrix decode N	L, R matrix decoded as Lt, Rt and sent to LC, C, RC, SL = SR; SW off
15	Surround	L, R in to SL, SR out; SW output off
16	LRS	L, R matrix decoded as Lt, Rt and sent to L, R with SL = SR; SW off

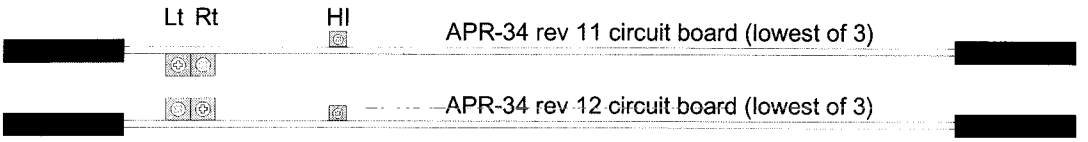
For the AUX1, AUX2, and SDDS Presets, fallback Presets can be selected. To select a fallback Preset, use the edit button just below the **Fallback Preset** label. If no fallback is permitted for the type of input you have selected, this button will indicate **Not Allowed**. Otherwise, when you click on it, a selection list will pop up which shows all Presets including No Preset, with prohibited Presets grayed out to indicate they are unavailable. The SDDS Preset allows selection of a second fallback preset making it possible for all digital formats to be played automatically with optical as an overall fallback if no digital formats are available on a particular reel. For example, the fallback sequence SDDS → AUX1 → AUX2 → NR2 indicates that if SDDS data becomes unavailable, the DFP-3000 will fall back to its AUX1 input. If neither formats are available, the DFP-3000 will fall back to its AUX2 input. Finally, if no digital formats of any kind are available, the DFP-3000 will fall back to its optical (NR2) input. All this assumes, of course, that the other digital systems are installed and that their logic interfaces are properly wired to the DFP-D3000.

For each Preset, graphic and parametric equalization can be switched on or off, surround delay processing can be switched on or off, the number of seconds of surround delay can be set if surround delay processing is switch on, a volume offset for the preset can be specified, and the sub-woofer low pass filter frequency can be set. To select and set these parameters, use the appropriate control in the **Preset Configuration** area of the screen. If the test signal generator is running, only the preset offset, surround channel delay and EQ on/off switch controls, surround delay setting, and the sub-woofer low pass filter frequency controls are active.

After making modifications to a Preset Configuration, use the **Send Config to DFP** button to send the changes to the DFP-3000 decoder from your connected laptop. Even if the **Send Config to DFP** button is not used, the Setup Software will automatically send the new parameters to the DFP-3000 decoder when the **Exit** button for the **Preset Configuration** screen is clicked. Save these settings as a theatre file when prompted in case they need to be restored to recover from unintended changes, transferred to another processor, or reloaded to the DSP-82 board if it is ever replaced.

6.15 At this point the DFP-3000 system needs only a few final adjustments. The **Preset level trims** can be set according to the preferred methods of each cinema engineer. To access the trim of a Preset from the front panel, select the Preset by pressing its button twice and then press the Down arrow. Adjust the Master Volume control to change the preset trim in order to match the Preset to the SDDS loudness level; when satisfied with the level, press the Up arrow to store the setting and return to normal operation. Some may chose to adjust external non-sync distribution amplifiers to achieve the desired level and leave the DFP-D3000 non-sync trim at 0.0 dB. If the screen has additional digital formats, play a quad format feature and block the LEDs of the various readers and use the DFP-D3000's fallback system to automatically switch between formats, comparing loudness by listening to the booth monitor. This allows checking the fallback wiring as well as the preset level matching. Normally, it is best to use output trims on the other digital players to achieve 85 dB SPL at each speaker in the same manner as was done for the SDDS format with the DFP-D3000 (using pink noise and an SPL meter), but the Preset trims can also be used if convenient. When making this test, blocking the DFP-R3000 reader's LEDs will allow you to confirm operation of the SDDS ACM (Analog Concealment Mode) fallback to optical or other preset.

The **bypass level** setting is made by adjusting two trimmer potentiometers (for Lt and Rt) located at the left of the lower circuit board inside the DFP-D3000. These are adjusted to produce the same output level to L and R when the unit is powered Off while playing a pink noise loop through the optical inputs. Remove two silver screws at the right of the front panel and swing it aside to reach these two trim controls.



The single **HI** (hearing impaired) output level trim potentiometer is located to the right of the bypass level trim controls and is marked HI on the circuit board. It adjusts the HI output from .7 to 7 V at its rear panel PHONES connector.

7. Overall systems check and listening test.

The basic installation, alignment, and test of the DFP-3000 Cinema Processor System is now complete. Before signing off on the job, the installer will want to play familiar reference films and listen in the house to confirm that all is well. It might also be a good idea to repeat the synchronization test of 6.13 with actual film. Adjust the fine lipsync if necessary; using the front panel for this will require the "SDDS" password.

8. Troubleshooting

Experienced cinema engineers will have their own methods and styles of troubleshooting. Here are some tips that relate to the SDDS format and the DFP-3000 system. Check with Sony Cinema Products for a Tech Note with more details.

Problems with playing SDDS.

First, ensure that the film actually has SDDS tracks on it. These tracks are the light blue or cyan areas at the outside of both rows of sprocket holes. The dark blue spots are very small, but you should be able to see a fine granularity in this area-not just a smooth blue area.

The first indication of problems playing SDDS titles due to poor print quality or dirty optics may be flickering of the film title displayed on the Decoder's LCD display (SDDS Fader Automation must be enabled to display the film title). Clean the Reader optics.

The SYSTEM OK LED on the DFP-D3000 front panel indicates that battery power is OK and that the unit is properly communicating with its Reader. The DATA PRESENT LED will flash if film is running through the Reader at 24 frames/second (+/- 5%) and comes on solidly when SDDS data is being received from the Reader.

Next to the MASTER VOLUME fader is a switch labeled MUTING. If this switch is illuminated, sound does not appear at the outputs. Press it to restore sound output.

The REMOTE LED indicates that the Decoder is being controlled through its serial port, at which time the front panel controls and most of the AUTOMATION connector's inputs are locked out. Be sure your laptop software is "disconnected".

The Reader will turn on its bright red LEDs when the black sprocket roller is turning and it is receiving power through its cable. If the DFP-D3000 is powered and you don't see LEDs on the Reader, check that the Reader cable is plugged in and is not damaged.

The matrix modes described in section 6.14 can be complicated. If you have channels missing, particularly the subwoofer, on a certain Preset, check that you have selected the desired matrix mode for that Preset.

The EXT FADER button on the front panel of the DFP-D3000 enables a remote fader. If this function is active (as indicated by its illuminated switch), the MASTER VOLUME control becomes inoperative and the external fader takes over. Don't use this switch unless an external fader is actually connected or your sound may be muted.

The PROJECTOR LEDs indicate which projector's DFP-R3000 Reader is selected in a changeover environment, using the rear Automation connector pins. Be sure the correct Reader is selected. Optical soundtrack reader selection is also selected at the Automation connector, but has no bearing on these LED indicators.

Problems playing other digital formats.

For other digital systems to play automatically according to fallback settings or when their Preset is selected, their analog audio outputs must be correctly wired to an AUX input and their logic outputs must be correctly wired to the AUTOMATION connector of the DFP-D3000. Basically Pin 34 must be grounded for AUX1 to play and Pin 35 must be grounded to play AUX2, otherwise selecting these Presets will play only their specified fallback sources. The same effect can be achieved in software by selecting "No Fallback" (indicated by *) as the fallback for AUX 1 or 2. This will prevent them from ever going to their fallback presets, but will also preempt selecting optical (NR2) as a fallback in the event their data fails.

If you **lose sound during a show** you can place the DFP-3000 into bypass by turning off its mains power at the front panel; an orange LED in the SELECT switch will come on unless the bypass power supply is not connected. When running off the bypass supply, the Decoder will play in stereo from its optical input, but without noise reduction or matrix decoding. If you lose digital sound for brief periods or if you are unable to play optical soundtracks, the first thing to ensure is that the exciter lamp is working. See Tech Note TN99111901 for help with a forward scan optical reader system.

Use the front panel HEADPHONE output and its MONITOR SELECT switch as a quick troubleshooting aid. The signal source that is selected will be displayed on the LCD screen for five seconds after you move the selector switch to a new position.

In the event you have difficulty.

Sony Cinema Products operates service offices around the world. Contact us for assistance any the following locations:

Sony Cinema Products Corporation
Engineering Services Division
West Coast (USA)
10950 W. Washington Boulevard
Culver City CA 90232, USA
Phone: +1 310 244-3484
Fax: +1 310 244-0484
Hours: 8:30am to 5:00pm PST
With 24-hour telephone response
e-mail: sddstech@scpc.sony.com

Sony Cinema Products Corporation
Engineering Services Division
East Coast (USA)
123 West Tyron Avenue
Teaneck NJ 07666, USA
Phone: +1 201 833-5778
Fax: +1 201 833-5860
Hours: 8:30am to 5:00pm EST

Sony Cinema Products Europe
Engineering Services Division
Europe, Middle East, Africa
25 Golden Square
London W1R 6LU, England
Phone: +44 171 533 1475
Fax: +44 171 533 1590
Hours: 9:00am to 6:00pm GMT

Sony System Service, Tokyo
Tokki Service Center
Japan
7-22-17 TOC Building 8F
Nishi Gotanda, Shinagawa-ku
Tokyo, 141-0031, Japan
Phone: +81 3 5436 7510
Fax: +81 3 5436 7519
Hours: 9:00am to 6:00pm JST

9. Appendix

This appendix contains reference material of interest to installers. Sony Cinema Products issues both Technical Bulletins and Tech Notes frequently. Contact us to be sure you have the latest versions and to inquire if a Tech Note is available that addresses a particular issue you may have. These documents are free upon request. The following are some of the Tech Notes that relate to installation and setup of the DFP-3000 Cinema Processor system:

TN99070701, Complete list of all Tech Notes
TN99020101, Connections to the Dolby® DA20
TN99020103, Connections to the DTS® 6 and 6D
TN99042601, Connections to the Dolby Surround EX processor
TN99061401, Connecting to the Dolby CP500 with the DFP-3000 as master
TN99061402, Connecting to the Dolby CP500 with the DFP-3000 as slave
TN99042802, Uploading new firmware to the DFP-D3000 Decoder
TN99090901, Uploading new firmware to the DFP-R3000 Reader
TN99043001, Special screwdrivers required for Sony electronic equipment
TN99051701, Setting the subwoofer level; overview, not instructions
TN99052301, Metric D-Sub mating connector kit
TN99060401, Connecting balanced and unbalanced circuits
TN99091501, Cautions on using Theatre Diagnostics with firmware v2.74
TN99101201, Making an A-Chain test cable
TN99111901, Setting up the projector's optical reader
TN99121401, A list of current firmware and software for all products

9.1 DFP-D3000 Rear Panel Connectors, Pinout Lists

SYSTEM (25-pin D-Sub Male)
MONITOR (25-pin D-Sub Male)
AUX1, AUX 2 (25-pin D-Sub Female)
(all according to the THX® convention)

Pin	Signal
1	Left GND (ground)
2	Left HOT (+, or in-phase of balanced signal)
3	Left Center COLD (–, or out-of-phase of balanced signal)
4	Center GND (ground)
5	Center HOT (+, or in-phase of balanced signal)
6	Right Center COLD (–, or out-of-phase of balanced signal)
7	Right GND (ground)
8	Right HOT (+, or in-phase of balanced signal)
9	Surround Left GND (ground)
10	Surround Left COLD (–, or out-of-phase of balanced signal)
11	Surround Right COLD (–, or out-of-phase of balanced signal)
12	Subwoofer, LFE, COLD (–, or out-of-phase of balanced signal)
13	Subwoofer, LFE, GND (ground)
14	Left COLD (–, or out-of-phase of balanced signal)
15	Left Center GND (ground)
16	Left Center HOT (+, or in-phase of balanced signal)
17	Center COLD (–, or out-of-phase of balanced signal)
18	Right Center GND (ground)
19	Right Center HOT (+, or in-phase of balanced signal)
20	Right COLD (–, or out-of-phase of balanced signal)
21	No connection
22	Surround Right GND (ground)
23	Surround Left HOT (+, or in-phase of balanced signal)
24	Surround Right HOT (+, or in-phase of balanced signal)
25	Subwoofer, LFE, HOT (+, or in-phase of balanced signal)

MIC INPUT (9-pin D-Sub Female)

Pin	Signal
1	Mic 1 GND (ground)
2	Mic 1 HOT (+, or in-phase of balanced signal)
3	No connection
4	Mic 2 GND (ground)
5	Mic 2 HOT (+, or in-phase of balanced signal)
6	Mic 1 COLD (−, or out-of-phase of balanced signal)
7	No connection
8	No connection
9	Mic 2 COLD (−, or out-of-phase of balanced signal)

OPTICAL 1, OPTICAL 2 (9-pin D-Sub Female)

Pin	Signal
1	Left GND (ground)
2	Left HOT (+, or in-phase of balanced signal)
3	No connection
4	Right GND (ground)
5	Right HOT (+, or in-phase of balanced signal)
6	Left COLD (−, or out-of-phase of balanced signal)
7	No connection
8	No connection
9	Right COLD (−, or out-of-phase of balanced signal)

PHONES (9-pin D-Sub Female)

Pin	Signal
1	GND (ground)
2	GND (ground)
3	No connection
4	Headphone Left
5	Headphone Right
6	Mono Hearing Impaired
7	Mono Hearing Impaired
8	No connection
9	Headphone GND (ground)

REMOTE LEVEL CONTROL (Remote Fader) (9-pin D-sub Female)

Pin	Signal
1	Remote potentiometer ground (min gain end)
2	MAIN FADE (input)
3	No connection
4	No connection
5	No connection
6	Remote potentiometer wiper
7	Remote potentiometer DC drive (max gain end)
8	Remote Tally output for LED
9	GND (ground)

AUTOMATION (37-pin D-Sub Female)
Pins in bold type changed after v2.63 firmware.

Pin	Function	Signal
1	Chassis Ground	GND
2	Projector 1 Motor Start	Input: Low = MOTOR 1 RUNNING
3	Master Mute command	Input pulse: Low = MUTE or UNMUTE
4	Preset 1 Select (and tally pulldown)	Input pulse: Low = SELECT
5	Preset 2 Select (and tally pulldown)	Input pulse: Low = SELECT
6	Preset 3 Select (and tally pulldown)	Input pulse: Low = SELECT
7	Preset 4 Select (and tally pulldown)	Input pulse: Low = SELECT
8	Preset 5 Select (and tally pulldown)	Input pulse: Low = SELECT
9	Preset 6 Select (and tally pulldown)	Input pulse: Low = SELECT
10	Preset 7 Select (and tally pulldown)	Input pulse: Low = SELECT
11	Preset 8 Select (and tally pulldown)	Input pulse: Low = SELECT
12	Motor 1	Output tally: Low = MOTOR 1 RUNNING
13	Motor 2	Output tally: Low = MOTOR 2 RUNNING
14, 15	Logic Common	0 V
16, 17	Tally Common	0 V
18	Optical Change Over Command	Input: Low = PEC 2, High = PEC 1
19	Optical Change Over Tally	Output tally: Low = PEC 2 selected
20	Projector 1 Tally	Output tally: Low = SDDS Reader 1 selected
21	Projector 2 Tally	Output tally: Low = SDDS Reader 2 selected
22	Master Mute Tally	Output tally: Low = Master muted
23	Pink Noise	Input: Low = ON
24-29	Reserved	No Connections
30	+5 V	Power
31	+5 V	Power
32	**SDDS Data OK (any preset active)**	**Output pulse: Low = SDDS OK**
33	Projector 2 Motor Start	Input: Low = MOTOR 2 RUNNING
34	**AUX1 Digital Data OK**	**Input: Low = Data OK**
35	**AUX2 Digital Data OK**	**Input: Low = Data OK**
36	**SDDS Data not OK**	**Output pulse: Low = SDDS NG**
37	Reserved	No Connection

DFP-D3000 (SY)
DFP-R3000 (SY) E
9-976-890-01

Sony Corporation
Communication System Solutions Network Company

Printed in Japan
2000. 3 08