

# Installation and Service Manual

## SR-1 +

### Universal SR Card Adapter

# SMART

## Theatre Systems

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American  
Made

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## INTRODUCTION

The SMART SR1*Plus* SR ADAPTOR is an accessory signal processing unit designed to add Dolby type SR noise reduction capability to most of the popular stereo processors currently in use. Supported processors include the SMART MOD II and MOD III, the Dolby CP50, CP55, and CP200, and the ULTRA\*STEREO JS Series.

The unit is a 1 3/4" mainframe designed to hold two Dolby Cat. # 280 or 280T cards. These cards are NOT supplied by SMART, but they can be ordered through your theatre equipment supplier.

The SR cards plug in from the front and are easily removed for relocation to another SR1*Plus* should an SR print need to be moved to another screen. In this way, multiple SR1*Plus* mainframes can be installed at a reasonable cost, and one or two sets of SR cards can be purchased to allow the most efficient use of SR prints in your multiplex.

The unit has its own power supply and therefore will not be a burden on the power supplies of other equipment. The power supply is an external wall type transformer which delivers about 18 Volts AC to the power input terminals. The power pack is UL approved and should have no problems being accepted at any installation.

The unit has left and right preamp inputs, left and right auxiliary inputs, left and right outputs, and an SR Enable input. The SR1*Plus* has built-in signal path switching to accommodate the needs of the various processors. In normal operation, SR selection is just as easy as selecting any other mode of operation, and in many cases, it can be tied in to the booth automation system for completely automatic operation.

Audio specifications are strictly dependent on the SR cards themselves. The SR1*Plus* is a signal routing and control device for the SR cards, and it has virtually no effect on the audio quality of the system. The SR cards themselves provide the increased dynamic range, lower noise, and lower distortion capabilities for the soundtrack. The external power pack also keeps noise-causing electromagnetic fields away from the audio circuitry.

There are some preliminary things which must be done to certain processors in order to prepare them for interfacing to the SR1*Plus*. Please check the chapter on connections to your particular processor for any special requirements and modifications which must be made.

## OPERATION

Once the SR1*Plus* is installed and calibrated, operation becomes virtually automatic. Simply select the proper format on the processor, and the SR1*Plus* logic sets up the proper signal paths for the format you have chosen. The only exception is the Ultra\**Stereo* processor where the SR format must be manually selected by a switch which has been installed by the engineer. There may be special exceptions to this which will be explained by the engineer at the time of installation.

The SR1*Plus* front panel has two LED indicator lights to keep the operator informed of the status of the system. The POWER LED is on whenever the SR1*Plus* is turned on. Please note that there is no power switch on the front panel. The SR1*Plus* is turned on and off by the main sound system

switch or circuit breaker.

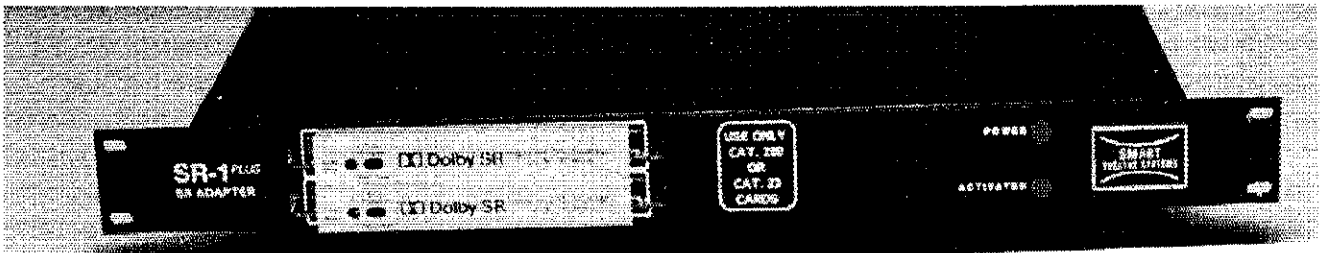
When the *SR1Plus* is used with all processors except the MOD III, the ACTIVATED LED is on whenever SR mode is selected and is off at all other times. Selecting SR mode on the stereo processor will turn on the ACTIVATED LED.

In the MOD III, all SR audio switching is done internally. Therefore, when the *SR1Plus* is used with the MOD III, the ACTIVATED LED will remain on at all times indicating the *SR1Plus* SR audio path is active and ready to be switched by the MOD III. Simply select SPECIAL FORMAT on the MOD III to play SR encoded films.

## GENERAL INSTALLATION INFORMATION

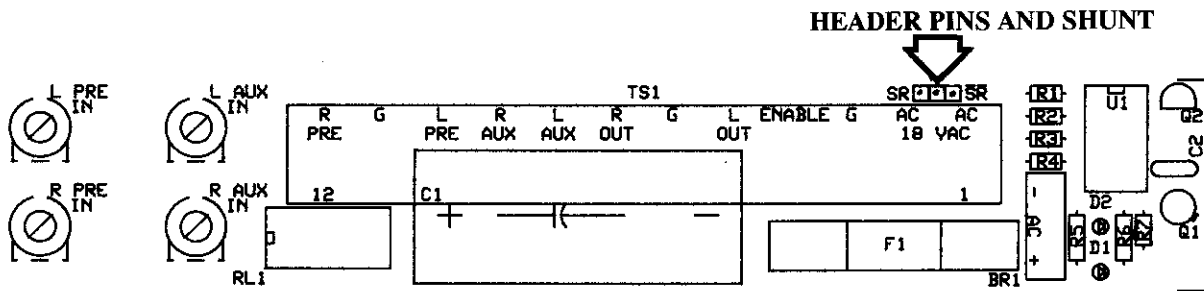
Find an appropriate place in the rack in which to install the *SR1Plus*, preferably close to the stereo processor. Follow normal installation practices when installing the SMART *SR1Plus* such as keeping unit away from high heat areas and strong magnetic fields (such as power amplifiers). Keep audio wiring as short as possible consistent with proper lead dress. Connect audio cable shields at one end only to avoid ground currents flowing in the shield and increasing the likelihood of hum. Make sure all solder connections are good, and be sure to tighten all screw terminals for solid contact. Good practices here will help to avoid trouble later.

The SR cards simply slide into the opening in the front panel of the *SR1Plus* and plug into the motherboard edge connectors. They will protrude out the front about 1/2 inch when fully seated. This allows easy removal by grasping the left and right sides of the card and pulling straight forward.



### SR ADAPTER HAS CARDS THAT PLUG IN FROM FRONT

In order to accommodate the control signals of various stereo processors, an internal shunt is provided which can be moved to one of two positions. This shunt is used to select whether the *SR1Plus* ENABLE terminal requires either a HIGH or LOW logic level to activate the SR mode of operation. The top cover must be removed to gain access to this shunt. It is located at the top edge of the motherboard, about two inches from the right hand end of the board. Note that the shunt slides over two of the three header pins and connects them together.



SR-1 MOTHERBOARD VIEWED FROM FRONT

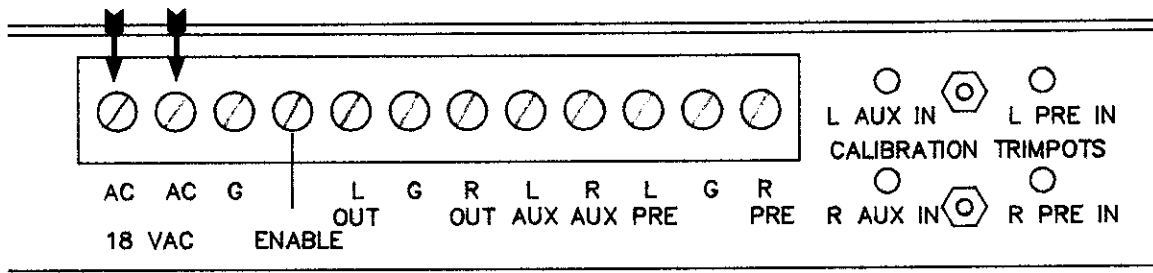
With the shunt on the middle and right pins, the SR1Plus requires a LOW logic control signal on the ENABLE terminal to turn on SR. This is necessary for the SMART MOD III, Dolby CP50 and CP200, and the Ultra\*Stereo JS series.

With the shunt on the middle and left pins, the SR1Plus requires a HIGH logic control signal on the ENABLE terminal to turn on SR. This is necessary for the SMART MOD II and Dolby CP55. The SR1Plus is shipped with the shunt set for a LOW logic control signal.

The voltages which will be applied to the SR1Plus ENABLE terminal should be between Ground and +15 volts dc. All processors mentioned in this manual will meet this specification.

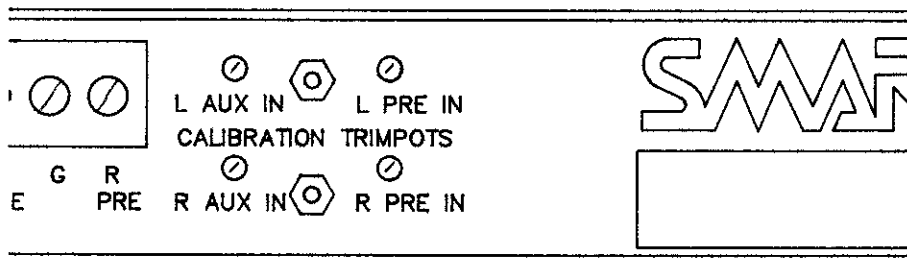
The SR1Plus is powered by an external power pack. The power pack comes with lugs on the low voltage leads. Connect the low voltage leads to the two terminals marked AC on the SR1Plus rear panel terminal strip. Since this is ac voltage, polarity is not important.

CONNECT POWER PACK HERE



REAR OF CHASSIS

The SR1Plus has two sets of trimpots which are accessible through holes in the rear panel. PLEASE NOTE: You must set the stereo processor calibration level (using Dolby Cat. # 69 test film) before you attempt to set these trimpots and check the SR levels.



The L PRE IN and R PRE IN trimpots are used to set the input level to the SR cards. These pots will be fully up (clockwise - viewed from the rear) for the Dolby CP55 and CP200 processors. They will be turned down somewhat for the other processors. When the processor calibration level is correct and the trimpots are set properly, then the voltage at the L OUT and R OUT terminals on the SR1Plus will be 500 mV AC  $\pm$  25 mV.

The L AUX IN and R AUX IN trimpots are used to set the input levels for signals used in non-SR mode. For the Dolby CP50 and CP200, and the Ultra\*Stereo JS Series, these trimpots must be fully up (clockwise - viewed from the rear). This allows the TYPE A NR signal to pass through the SR1Plus unchanged in level. For the CP55, these trimpots are used to set the Non-Sync music level (see the CP55 installation section). These trimpots are not used with the SMART MOD II and MOD III.

## CONNECTION TO A SMART MOD II STEREO PROCESSOR

### INITIAL CONDITIONS

The MOD II must have the following requirements met in order to interface with the SR1Plus:

- 1) For four channel systems, the SMART WIDE-TRAC Matrix on the MOD2x317 carrier card must be installed in the MOD II.

OR,

- 2) For two channel (front-surround) systems, the SMART DYNASPAN Matrix on the MOD2x317 carrier card must be installed in the MOD II.

The proper card must be ordered along with the SR1Plus. The old card must be returned to SMART, and a partial credit will be issued toward the new card.

### INSTALLATION

- 1) Remove the SR1Plus top cover and locate the SHUNT jumper near the top right area of the pc board. Move the SHUNT to the middle and left header pins. This makes the ENABLE terminal active high. Mount the SR1Plus in the rack as close as possible to the MOD II.
- 2) Remove the old matrix carrier card (MOD2x315 or MOD2x316) and install the new matrix carrier card (MOD2x317). Please note that the new matrix carrier card has a connector for

a wiring harness. The wiring harness must be routed through one of the ventilation slots in the top of the MOD II and connected to the SR1*Plus* L OUT, R OUT, and ENABLE terminals.

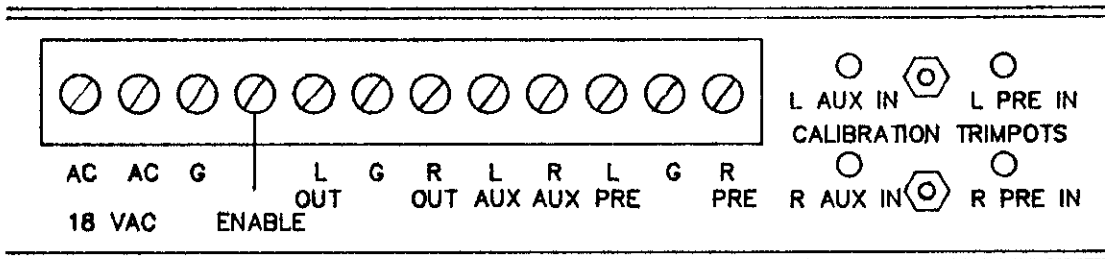
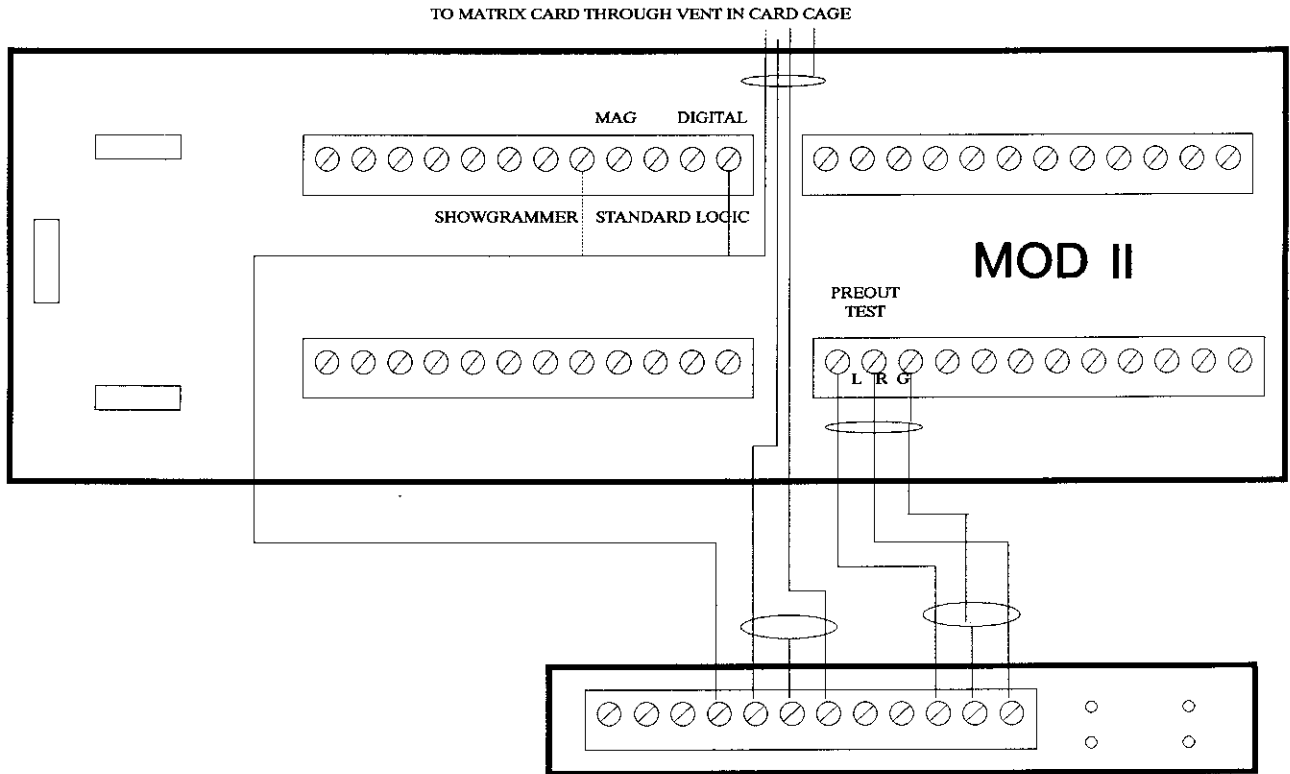
- 3) Refer to the wiring diagram, and connect the SR1*Plus* to the MOD II as shown.
- 4) On MOD II's with the standard Program A/B logic card, connect the SR1*Plus* ENABLE terminal to the MOD II DIGITAL logic terminal. Selecting DIGITAL on the Program A or B switches on the MOD II will turn on the SR mode.
- 5) On MOD II's with the SMART Show-grammer sound format selector, the SR1*Plus* ENABLE terminal should be connected to the MAGNETIC terminal on the MOD II. This terminal should be re-labeled SR with the enclosed sticker.

With the Show-grammer, the MOD II motherboard must be modified with one cut and one jumper to allow the SR logic signal to appear at the re-labeled MAGNETIC terminal on the MOD II. Please call the factory for details.

## CHECKOUT

- 1) Turn on the SR1*Plus* and the MOD II.
- 2) Select DIGITAL format (or SR if using a Show-grammer on the MOD II). The ACTIVATED LED on the SR1*Plus* should light. Select any other format. The ACTIVATED LED should go out.
- 3) Select OPTICAL STEREO on the MOD II. Play a Cat.# 69 test loop, Dolby tone side. Calibrate the MOD II preamps for proper Dolby tone level. Also adjust for best possible surround null (refer to the MOD II manual for details).
- 4) Select DIGITAL format (or SR) on the MOD II. Adjust the SR1*Plus* L PRE IN and R PRE IN calibration trimpots for 500 mV AC  $\pm$  25 mV at the SR1*Plus* L OUT and R OUT terminals. Adjust the SR1*Plus* L PRE IN trimpot very slightly to obtain the best possible surround null.
- 5) Do not adjust the SR1*Plus* L AUX IN and R AUX IN trimpots as they are not used with the MOD II.
- 6) Play a Cat.# 69 test loop, pink noise side. Listen in the auditorium as you switch from DIGITAL format (or SR) to OPTICAL STEREO. In SR mode the pink noise should be slightly louder and brighter than in SVA mode.

# INSTALLATION OF SR1 PLUS TO SMART MOD II



## CONNECTION TO A SMART MOD III STEREO PROCESSOR

### INITIAL CONDITIONS

There are no special conditions when using the *SR1Plus* with the MOD III.

### INSTALLATION

- 1) Remove the *SR1Plus* top cover and locate the SHUNT jumper near the top right area of the pc board. Move the SHUNT to the middle and right header pins. This makes the ENABLE terminal active low.
- 2) Mount the *SR1Plus* as close as possible to the MOD III.
- 3) Connect the MOD III "TO SF L and R" terminals to the *SR1Plus* "L PRE and R PRE" terminals.
- 4) Connect the MOD III "FROM SF L and R" terminals to the *SR1Plus* "L OUT and R OUT" terminals.

In steps 3 and 4, connect the shields of the cables at the *SR1Plus* end only, but connect the ground leads at both ends.

- 5) Connect the power pack leads to the *SR1Plus* "AC" terminals. Polarity is not important since this is an AC power pack.
- 6) Connect a jumper wire between the *SR1Plus* ENABLE terminal and any *SR1Plus* GROUND terminal.

This completes the installation.

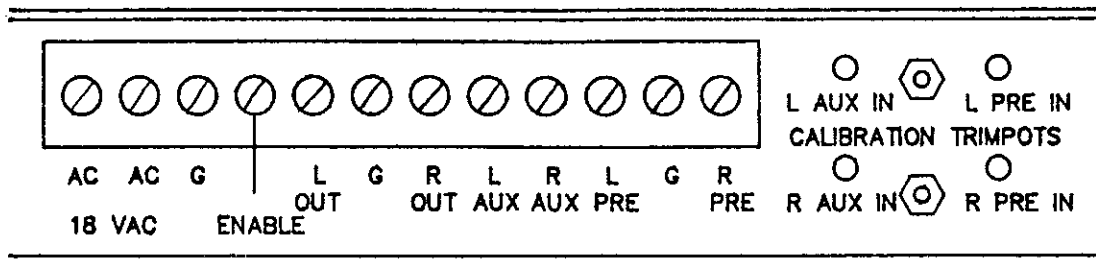
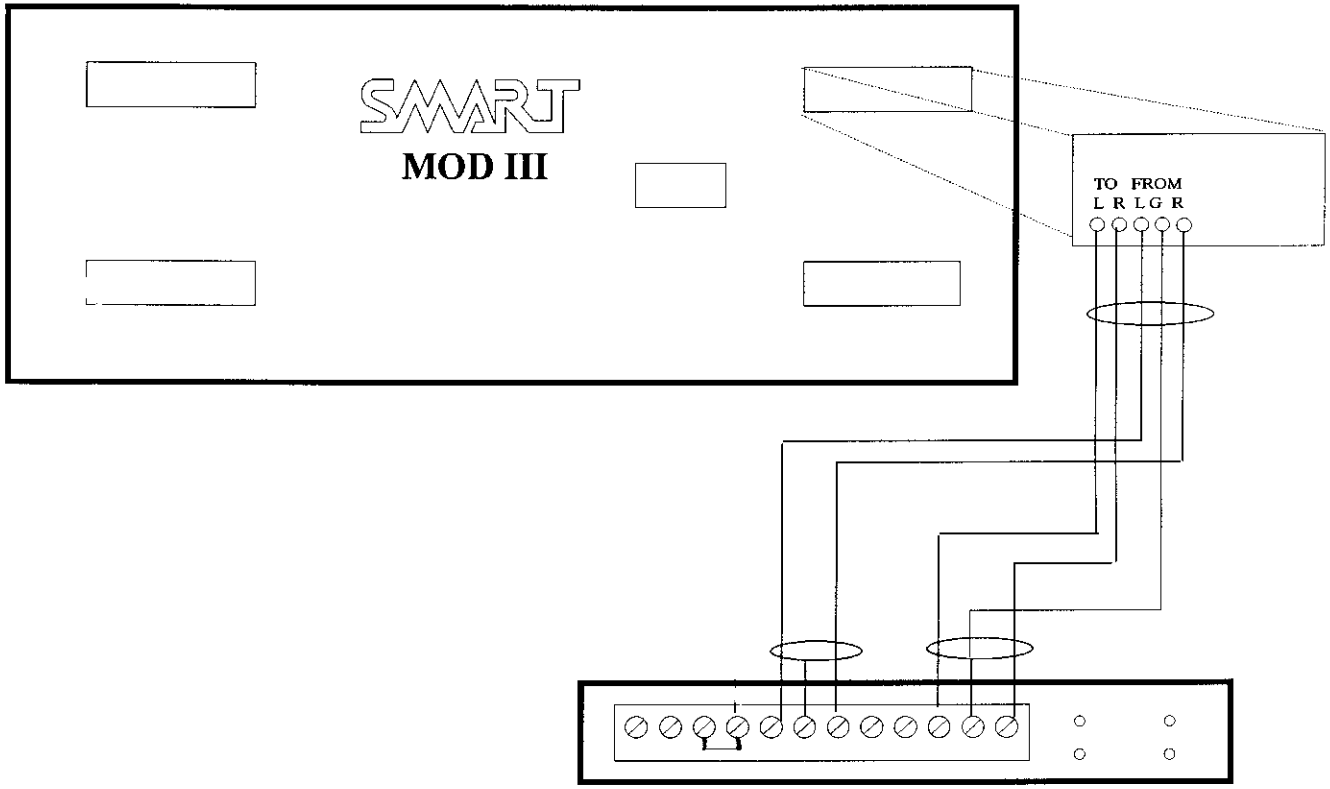
### CHECKOUT

- 1) Turn the sound system on. The ACTIVATED LED on the *SR1Plus* should be on.
- 2) Play a Cat.# 69 test loop, Dolby tone side. Refer to the MOD III manual, and adjust the preamp calibration level if needed. Also, adjust for best possible surround null in STEREO mode (refer to the manual for details).
- 3) Select SPECIAL FORMAT (SR) mode on the MOD III. Adjust the *SR1Plus* L PRE IN and R PRE IN trimpots for 500 mV AC  $\pm$  25 mV measured at the *SR1Plus* L OUT and R OUT terminals. Monitor the surround channel, and adjust either one (NOT both) of the *SR1Plus* PRE IN trimpots SLIGHTLY for the best signal null.
- 4) The *SR1Plus* L AUX IN and R AUX IN trimpots are not used with the MOD III.
- 5) Play a Cat.# 69 test loop, pink noise side and listen in the auditorium while switching from

STEREO to SPECIAL FORMAT on the MOD III. You may want to use an assistant to do the switching. In SPECIAL FORMAT (SR) mode, the pink noise should be slightly lower and brighter than in STEREO mode.

This completes the checkout.

## CONNECTING THE SR-1 TO A SMART MOD III STEREO PROCESSOR



## CONNECTION TO A DOLBY CP50 STEREO PROCESSOR

### INITIAL CONDITIONS

The CP50 stereo processor must have the following requirements met in order to interface with the SR1Plus:

- 1) A Cat.# 150 module must be installed;
- 2) A Cat.# 113C module must be installed.

If your CP50 does not meet these requirements, it must be upgraded to work with the SR1Plus. These requirements are the same as Dolby requires for their SR adaptor.

### INSTALLATION

- 1) Remove the SR1Plus top cover and locate the SHUNT jumper near the top right area of the pc board. Move the SHUNT to the middle and right header pins. This makes the ENABLE terminal active low. Mount the SR1Plus in the rack as close as possible to the CP50.
- 2) Refer to the wiring diagram and connect the SR1Plus to the CP50 as shown. Connect the shields of the cables at the SR1Plus end only, but connect the ground leads at both the SR1Plus and the CP50. Please note from the diagram that the SR1Plus L PRE and L AUX terminals are jumpered together as are the R PRE and R AUX terminals.

The wire to the ENABLE terminal can be unshielded. It must be soldered to the SK21 connector Pin #22 on the CP50 motherboard. Pin #22 is the second terminal from the top of the left column of terminals on SK21. BE CAREFUL NOT TO SPLASH SOLDER ON TO ANY OTHER PART OF THE CIRCUIT.

- 3) Remove the CAT.# 110L Link Card from the CP50 and insert the dummy card (SMART Part # SR1+A550) into the CAT.# 110L/160 slot. SAVE the CAT.# 110L card for future use. If the SR1Plus is ever removed for any reason, the CAT.# 110L card MUST be re-installed to restore the normal signal path.

*STEPS 4 AND 5 APPLY ONLY IF A Cat.# 160 OBE CARD IS INSTALLED IN THE CP50.*

- 4) If a CAT.# 160 OBE card is used with the CP50, then modifications must be made on the inner side of the motherboard. These modifications PERMANENTLY affect the signal path and if the SR1Plus is ever removed for any reason, these connections must be restored by jumpering certain terminals together on SK7 on the back of the CP50 (SK7-1 to SK7-9 and SK7-5 to SK7-11).
- 5) Remove the cards around the Cat.# 109 and Cat.# 110L/160 edge connectors. Pull out enough cards to allow access to the circuit board traces which run between the Cat.# 109 and Cat.# 110L edge connectors. With a sharp blade (such as an X-acto knife), cut the two traces shown on the "CP50 FOIL CUTS" diagram. Make two cuts about 1/8" apart on each trace,

and remove the cut section to ensure that the cut is complete. Take care not to cut other traces.

This completes the installation.

## INSTALLATION OF SR-1 with Dolby CP50

