Film-Tech

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MAINFRAME INSTALLATION

The CSP1200 Mainframe has been designed for installation in a standard 19" equipment rack.

Important Notice:

The CSP1200 processor is fitted with ventilation slots on the top and bottom covers to allow for the free flow of air through the processor. Thus heat which is normally generated by the circuitry is able to quickly dissipate into the surrounding air. It is important to allow a clear space above and below the processor of one rack unit (approx 40mm) so that air can freely circulate through the unit. Failure to provide such free space could result in the unit overheating, or shorten the life of internal components.

To ensure a hum and buzz free installation, care should be taken to correctly interconnect the audio equipment earthing. Furthermore, the length of the leads connecting the solar cells to the CSP1200 should be kept as short as practicable.

EQUIPMENT EARTH

Every piece of audio apparatus has a signal (audio) ground and an electrical (mains) ground. In some equipment these are linked, in others these are held apart by a small resistance (10-27ohms). Some manufacturers also provide facilities to connect or break the signal-electrical ground. The electrical ground should always be connected to the input mains supply earth.

Whatever the system, the best method is to connect every equipment electrical ground to one central star point. This star point should be tied to the mains supply earth. The mains supply earth should be part of the one or three phase supply, being a three wire (live, neutral and earth) or four wire (red phase, yellow phase, blue phase and earth) system. The mains earth must not be a "phantom" earth derived by capacitors. If it does not exist, drive a copper stake into the ground outside and establish the electrical earth!

We will call this mains supply our "clean" mains. We will use it to connect all our audio equipment only, and not the dimmer pack for the lighting or the rectifiers for the projection equipment etc.

Obtain an ohm meter and establish which of your equipment has it's electrical ground tied to signal ground. If an earth lift switch is fitted, use it to connect the electrical ground to the signal ground. Write down a list of which equipment is internally connected. This can be useful later in solving earth loops.

MAINFRAME GROUNDING

At the bottom left hand corner of the CSP1200 mainframe rear panel are located two ground switches. These are labelled "CHASSIS EARTH" and "MAINS EARTH". The chassis earth switch connects the CM410 power supply ground to the mainframe chassis. The mains earth switch connects the CM410 power supply ground to the mains input earth. If both switches are off the mains input earth is automatically connected to the mainframe chassis leaving the CM410 power supply ground floating. Ideally, both switches should be ON, however, following installation, if hum or buzz proves to be a problem, different combinations of these two switches can be tried to reduce or eliminate the problem.

INPUT CONNECTIONS

Some of the input connections to the CSP1200 are balanced (+, - and E) and others are unbalanced (+ and E). When connecting unbalanced sources to the balanced inputs, the signal connection should be connected to the "+" terminal, and the ground connection should be connected to the "-" terminal. If the source equipment does not have a mains earth, the ground connection should also be connected to the "E" terminal.

OUTPUT CONNECTIONS

All outputs are electronically balanced. If your power amplifiers have balanced inputs, use two-core shielded cable to connect "plus" to "plus", "minus" to "minus", and "earth" to "earth". If your power amplifiers have unbalanced inputs, connect "plus" to "plus", and the "minus" terminals of the CSP1200 to the "earth" terminals of the power amplifiers. Connect the shields at the CSP1200 "earth" terminals only.

OPTIONAL REMOTE CONTROL INSTALLATION

The RC420 remote control panel connects to the CSP1200 processor via standard 9 pin D connectors using 6-way cable. Each panel can be installed at any reasonable distance from the processor (such as beside the projector). Several RC420 panels can be installed at convenient locations around the Projection room by looping through each panel to the next. The RC420 panel has a male and a female 9 pin D connector. Where only one control panel is used the male connector is used to connect to the CSP1200 processor. The male connector of each additional panel must be connected to the female connector of the previous panel. All control panels in a multi-remote panel installation can be used simultaneously without need to switch control from one panel to the next.

AUTOMATION INTERFACE

An external automation system can be used to control the CSP1200 processor. Interface between the automation system and the processor can use either the usual parallel connection method or can be achieved via a standard RS232 serial communications interface. Parallel connection can be made via the "Automation" 25-way D-connector on the rear panel of the processor. Momentarily connecting any function-select terminal to the common (ground) terminal will select the relevant function. The exception being the *Mute* and *External Volume* functions, which will toggle on or off each time the appropriate terminal is grounded. There are several variations of the parallel automation protocol available which vary with the firmware version installed in the processor. For details of these options, plus serial communications protocol and the automation pin-outs for your firmware version, see the Automation Interface Reference section at the end of this manual. Connection to the RS232 serial interface is made via the "Automation" 9-way connector at the rear of the processor.

TWO-PROJECTOR CHANGER-OVER SHUTTER INTERFACE FACILITY

In cases where two projectors are installed, it is possible to inter-connect the processor sound change-over with the projector shutter changeover so that both occur simultaneously.

This can be achieved by using one of the following methods:

METHOD 1:
SHUTTER CHANGEOVER RELAY CONTROLS SOUND PROCESSOR CHANGEOVER

With this method a closing contact relay is used to control the Panastereo processor. Connect the relay contacts between pins 12 and 25 of the automation connector, J27. Closing the relay contacts will select projector 2.

METHOD 2:
SOUND PROCESSOR CONTROLS SHUTTER CHANGEOVER

The terminal strip marked "preamplifier change-over" at the bottom right-hand corner of the CSP1200 backplane is for connection of external logic to drive a two projector shutter changeover system. If this facility is to be used to directly drive relays, we recommend using 12V solid state relays with an appropriate contact rating for the shutter solenoid system.

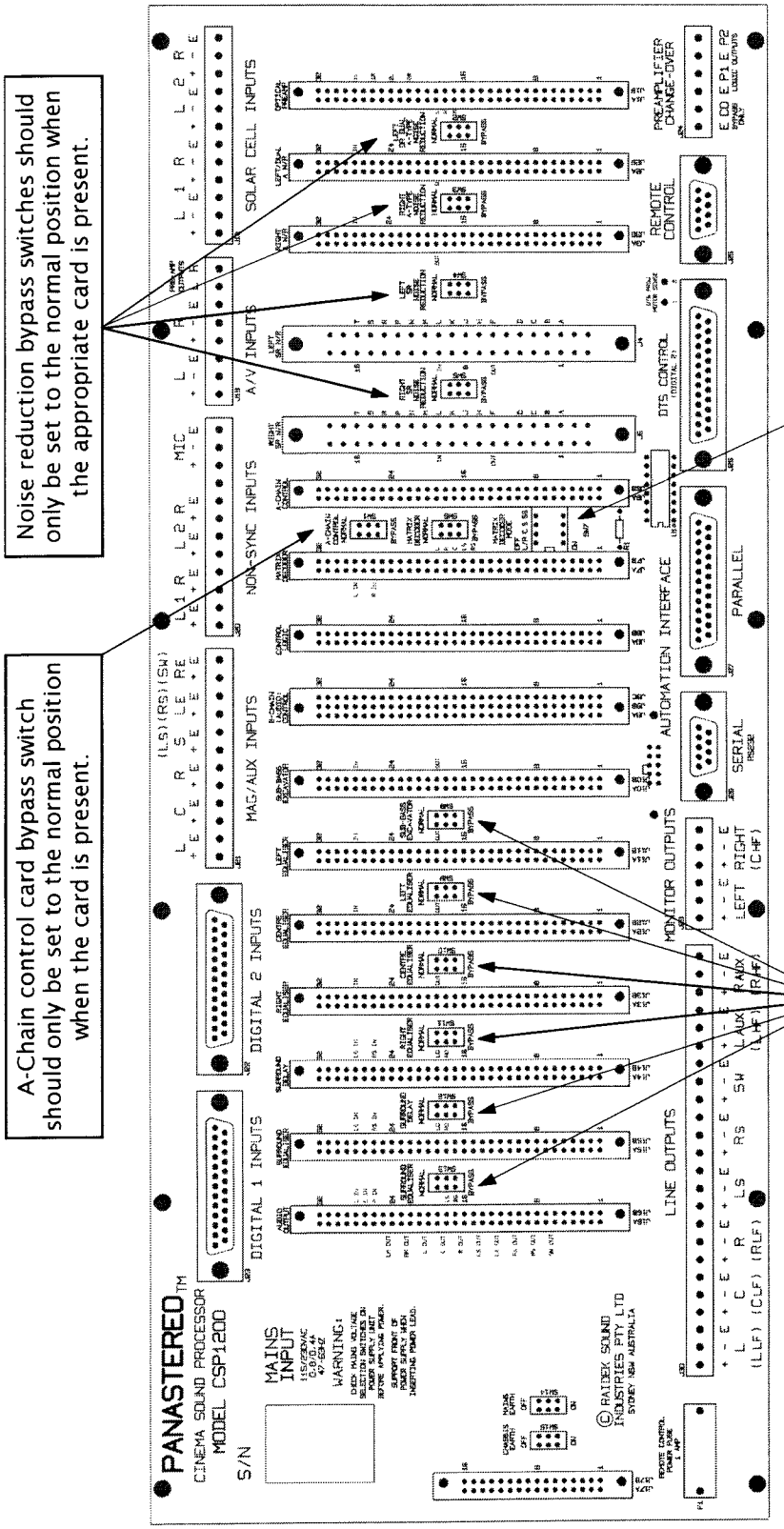
The P1 (projector 1) and P2 (projector 2) logic terminals are "active high" and the output from each terminal when active is 12V. The voltage is fed from the emitters of switching transistors via current limiting resistors. The load current for each output should not exceed 25mA.

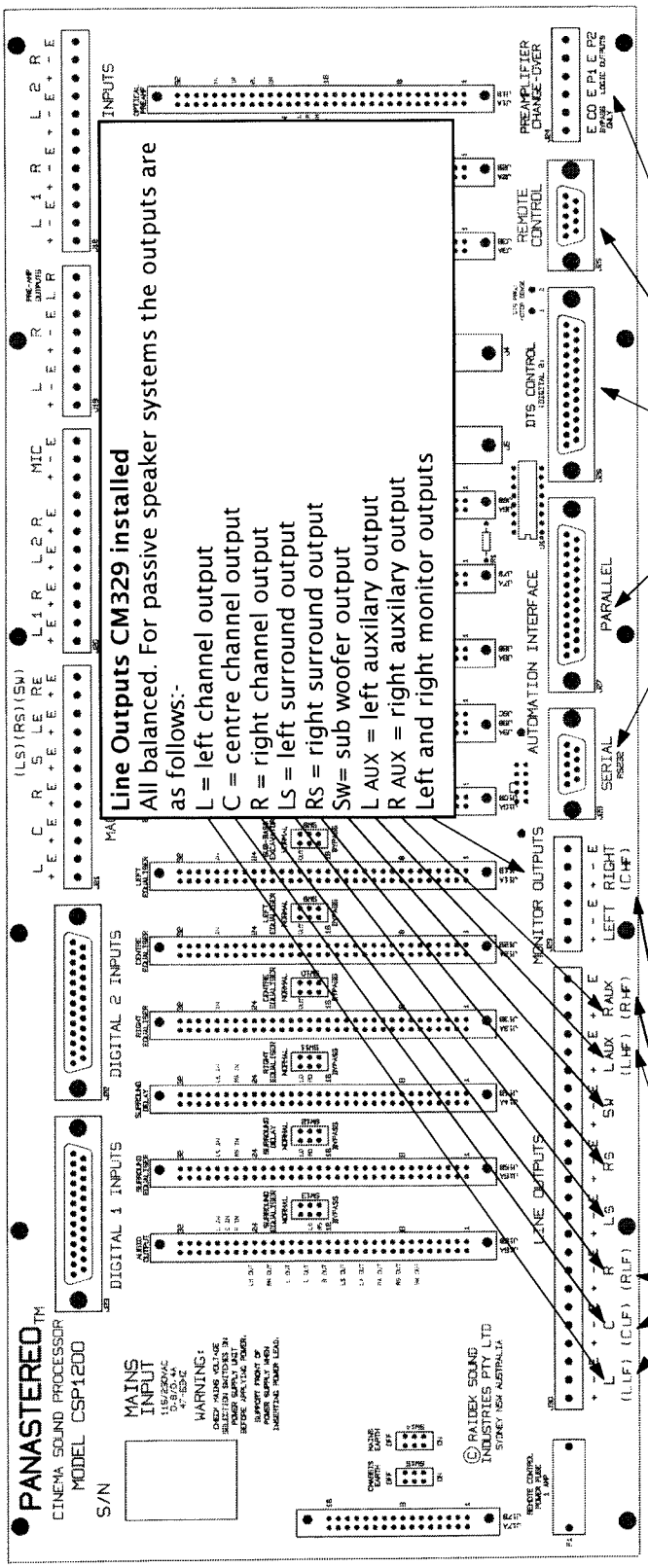
EMERGENCY CHANGE-OVER SWITCH

With two-projector installations is advisable to include an emergency projector change-over switch, as a back-up in case the main processor logic fails. To facilitate this, a terminal marked C/O is included on the "preamplifier change-over" terminal block at the bottom left hand corner of the CSP1200 backplane.

A simple momentary-contact push-button switch should be wired between this terminal and the adjacent "E" terminal and mounted in a conspicuous position.

The switch will toggle the emergency pre-amplifier output between projectors 1 and 2, however it should be noted that this terminal does not effect the main pre-amplifier change-over and should not be used as an automation input.


Noise reduction bypass switches should only be set to the normal position when the appropriate card is present.
A-Chain control card bypass switch should only be set to the normal position when the card is present.
In bypass position input signal to the card is routed directly to the output. (If a card is faulty place card into bypass until replacement card is available.)
Matrix decoder mode switching select. The first three switches labled "L/R, C, S" must be set according to which speaker channels are installed. Switch labeled "SS" not implemented.
PANASTEREO
CINEMA SOUND PROCESSOR
MODEL CSP1200
S/N
DIGITAL 1 INPUTS
DIGITAL 2 INPUTS
MAG/AUX INPUTS
NON-SYNC INPUTS
A/V INPUTS
SOLAR CELL INPUTS
LINE OUTPUTS
MONITOR OUTPUTS
AUTOMATION INTERFACE
SERIAL
PARALLEL
REMOTE CONTROL
DTS CONTROL
PREAMPLIFIER CHANGE-OVER
MAINS INPUT



Line Outputs CM329 installed
All balanced. For passive speaker systems the outputs are as follows:-
L = left channel output
C = centre channel output
R = right channel output
LS = left surround output
RS = right surround output
Sw= sub woofer output
L AUX = left auxilary output
R AUX = right auxilary output
Left and right monitor outputs

- RS232 serial interface as well as parallel interface for automation systems control.
- DTS Digital Theatre Systems control interface.
- Remote control interface for optional RC420 and infra red remote.
- Preamplifier change-over is used to automatically change from projector one to projector two.

(Also note the Bypass only contact for manual control of the preamplifier status when the processor is in emergency BYPASS.)

Line Outputs CM449 installed
LLF = left channel low frequency output
CLF = centre channel low frequency output
RLF = right channel low frequency output
LHF = left channel high frequecny output
RHF = right channel high frequency output
CHF = centre channel high frequency output
Mono monitor output

(NOTE: please contact Raidek Sound Industries if you are installing a CM349 as the outputs are different from that displayed on the backplane.)

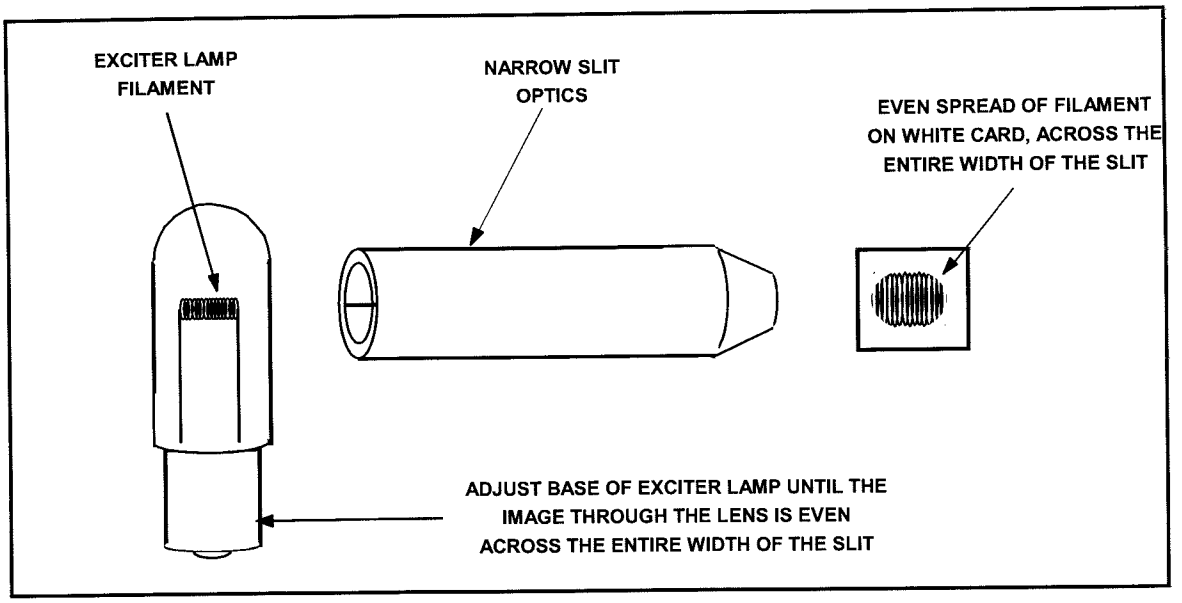


Figure1: Preliminary mechanical alignment of exciter lamp and optics

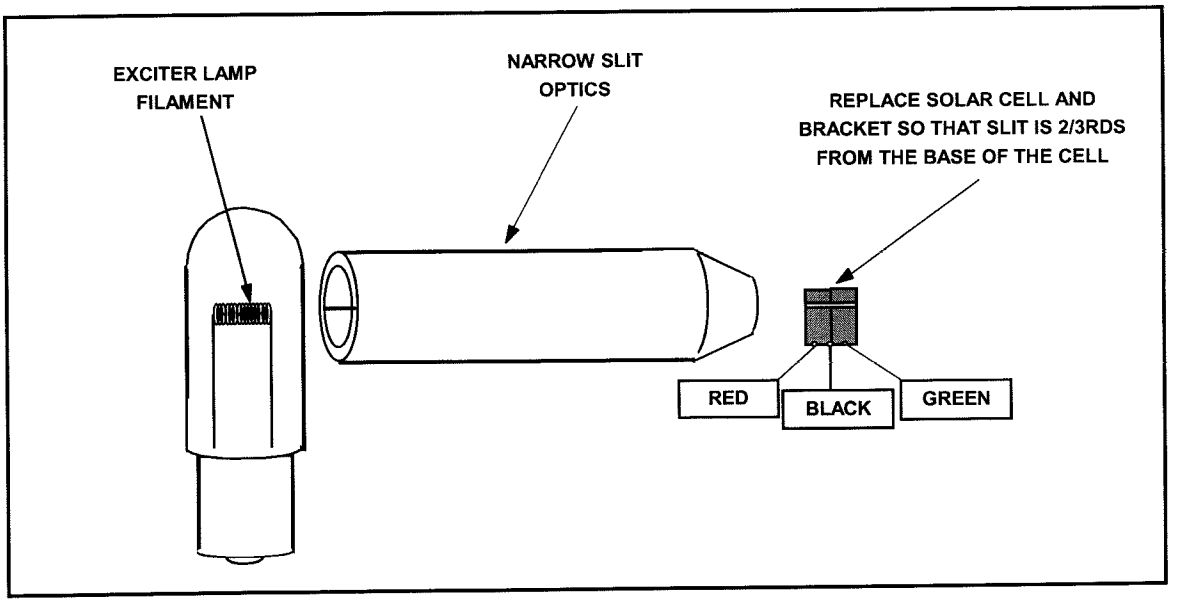


Figure 2: Preliminary mechanical alignment of exciter lamp and optics

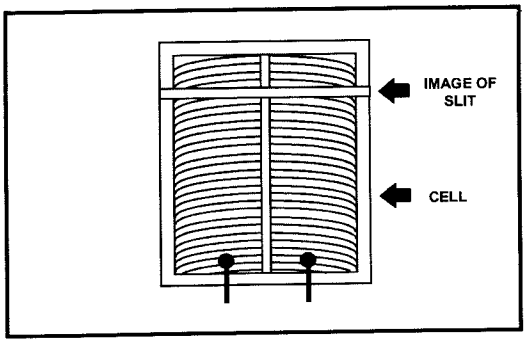


Figure 3: Stereo solar cell

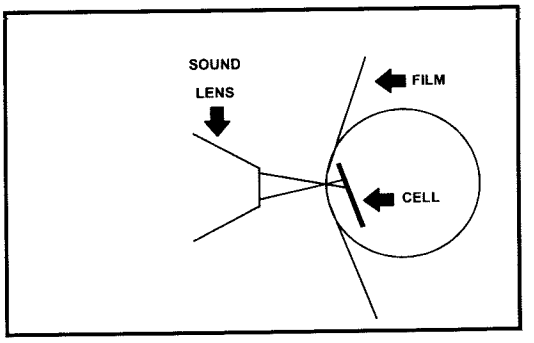


Figure 4: Cell position

PRELIMINARY SOUND HEAD ALIGNMENT

1. Clean the sound head optics thoroughly. If the film guide rollers are worn, replace them. Excessive side to side weave of the film will cause insurmountable problems for the surround decoding circuitry and must be corrected prior to installation.

2. If the exciter lamp is old or blackened inside, replace it. Make sure the lamp is operating at a voltage equal to or greater than 70% of it's rating.

3. Remove the solar cell and place a white card about an inch away from the sound lens. The image of the exciter lamp should look like Figure 1. If necessary, raise or lower the lamp and move it in and out until the filament is centred in the spot of light. This will ensure that the slit is evenly illuminated, thereby producing the least distortion. *(see Figure 1).*

SOLAR CELL INSTALLATION AND ALIGNMENT

1. Mount the stereo solar cell in the projector sound head and position the bracket so that the slit image from the exciter lamp hits the top quarter of the cell. The cell should be located with 1mm clearance from the film so that the slit image just fills the cell width, but does not spill over. *(See Figures 2 & 3).*

2. Install the audio cable from the cell to the optical pre-amp. Use four conductor twin shielded cable (Belden 8404 or equivalent), or a pair of two conductor shielded cables such as Belden 8451. (A single two conductor shielded cable is not recommended.) Connect the lines to the terminal block marked SOLAR CELL INPUTS at the rear of the processor.

3. Be sure that the RED lead of the cell is connected to the left input terminal marked "+" and the GREEN lead of the cell is connected to the right input terminal marked "+". The BLACK cell lead(s) connects to the low "-" input terminals of both left and right channels respectively. Do not connect the shields to anything at the projector end, but ensure that the shield of each pair is connected to the corresponding "E" terminal on the input terminal block.

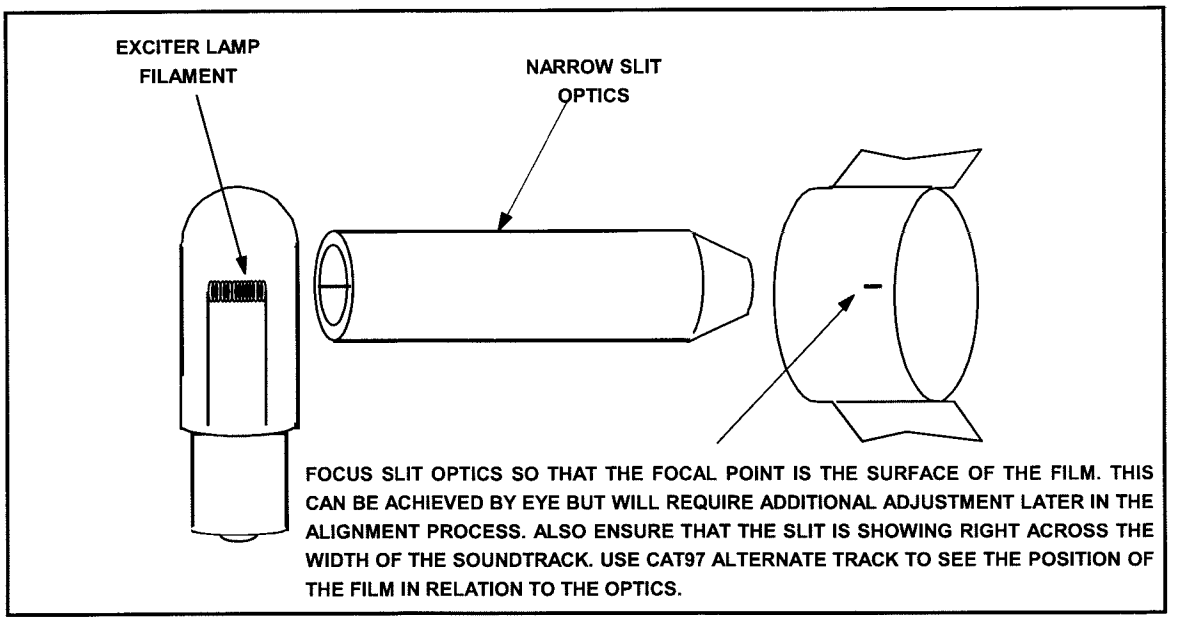


Figure 5: Preliminary mechanical alignment of exciter lamp and optics

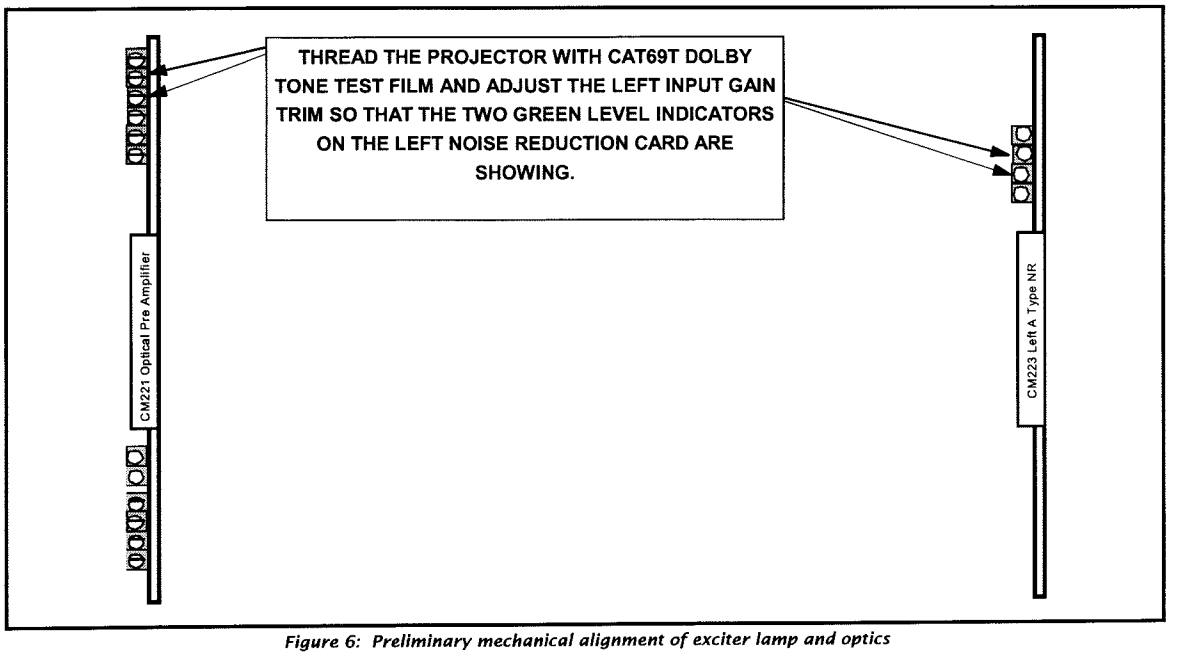


Figure 6: Preliminary mechanical alignment of exciter lamp and optics

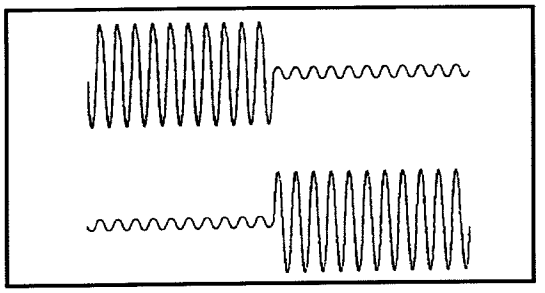


Figure 6: Minimum cross-talk results when this display is obtained on a dual-trace scope using a left-right test film

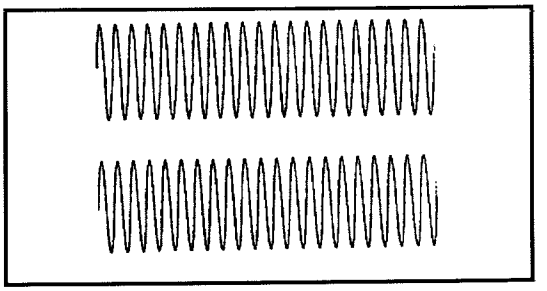


Figure 7: Double check of alignment as shown on a dual-trace scope

SOLAR CELL CROSS-TALK ADJUSTMENT

1. Connect the probes of a dual trace oscilloscope to the test points at the lower front edge of the left and right noise reduction cards. There is no need to establish an earth connection for the oscilloscope provided the oscilloscope is powered from the same power outlet as the processor. Run a 100% alternating left/right stereo alignment film, such as the Dolby Cat97 test film.

2. Adjust the triggering and timebase of the oscilloscope to give traces similar to Figure. 4. Move the cell in and out laterally across the film plane until the cross-talk is at a minimum on both channels as shown in Figure. 4. It may be necessary to roughly set the gain of the pre-amp at this time. When satisfactory results are attained lock-off the cell adjustment, taking care not to disturb the setting in the process.

3. Run a 50% level test film such as the Dolby tone side of the Dolby Cat69 test film. Adjust the left and right gain controls for projector one (RV1 & RV2) on the optical pre-amplifier card until the two green LED's on each of the noise reduction cards are illuminated with equal intensity. Repeat the procedure for projector two (if applicable) using RV3 & RV4.

4. Check that the left and right channels are connected the right way around by slowly inserting a business card into the light path from the outside edge of the film. The right channel is located nearest the edge of the film so the LED meter on the right noise reduction card should change from green to amber (indicating a drop in level) before the LED meter on the left noise reduction card.

5. Double check the cell alignment by running a 100% stereo alignment film, or the Dolby Cat 97 left/right stereo alignment film. The *amplitude* of the two 100% modulated wave forms should be identical. *(See Figure 5).* If one is greater than the other, whilst the modulated wave forms of the 50% level film are identical, there is a problem with the scanning beam. Either the slit is not uniformly illuminated along it's length, or the scanning beam is not in perfect alignment with the film guide roller and solar cell. Since most sound head optics cannot be moved in or out, it will be necessary to adjust the position of the film guide roller and realign the solar cell so that both the 50% and 100% modulated tones match from channel to channel. When this fine alignment is not done, loud sounds (above 50% modulation) will be distorted and will leak into the surround speakers.

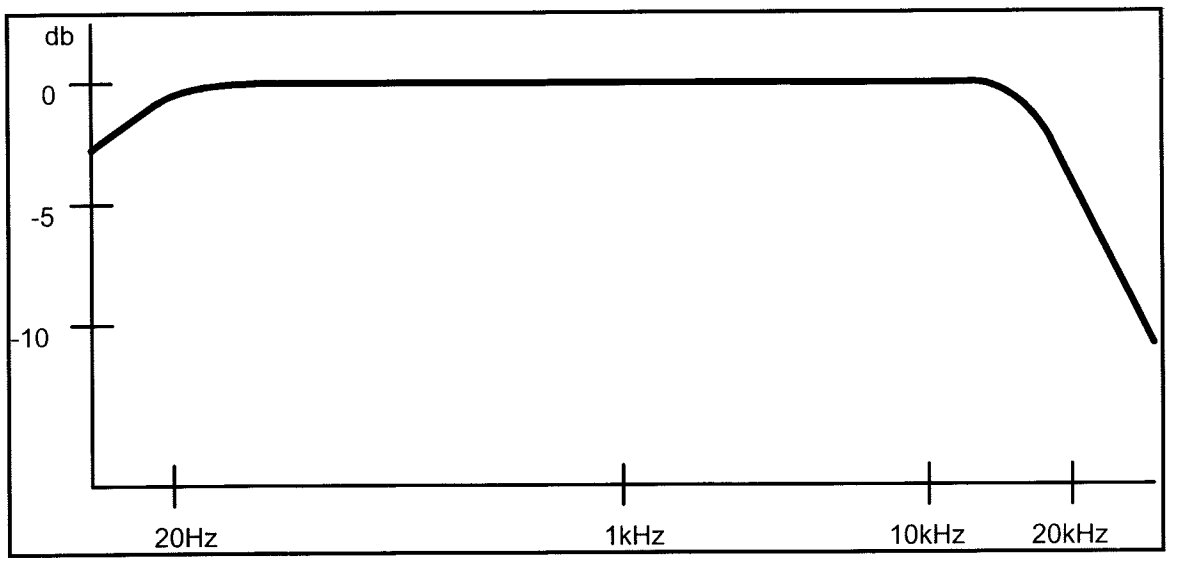


Fig.8 Checking optimum high frequency response on a real time analyser with a Pink Noise film.

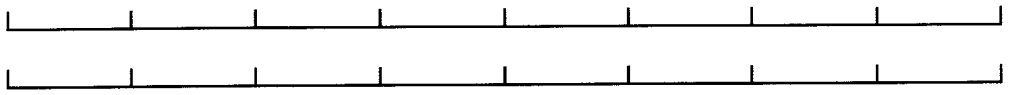


Fig.8 Left-right phase response with dual-trace scope in X/Y mode.

OPTIC LENS ALIGNMENT

1. With the oscilloscope still connected as above, connect a real time analyser to the left channel noise reduction card test point and run a pink noise test film such as the Dolby Cat69 test film.

2. Switch the scope to X/Y mode and adjust the gain and timebase to obtain the display shown in Figure 6.

3. Adjust the RTA to obtain a reading similar to Figure 7.

4. Adjust the focus of the sound lens by moving it closer to, or further away from the film, to obtain a maximum reading for high frequencies on the RTA. At the same time, adjust the azimuth by rotating the lens for the thinnest display on the oscilloscope. *(see Figure 6).*

FREQUENCY RESPONSE CORRECTION

Once the focus and azimuth settings have been optimised, adjust the left channel high frequency control at the lower front edge of the optical pre-amplifier card to achieve a flat response on the analyser. It should be possible to attain a flat frequency response up to a limit that is governed by the vertical size of the slit in the sound lens. Above this limit the response will have a rapid roll-off. Adjust the left HF control to extend the response until a high frequency peak appears, then back off the control slightly to minimise the peak. Next adjust the right channel high frequency control for the thinnest display on the oscilloscope. *(see Figure 6).* Double check the right channel response by connecting the input of the RTA to the right channel test point.

An extended response with a significant high frequency peak may cause audible phase response degradation. Unless there is some problem with the optics, it should be possible to achieve a response which is flat to 12-16kHz.

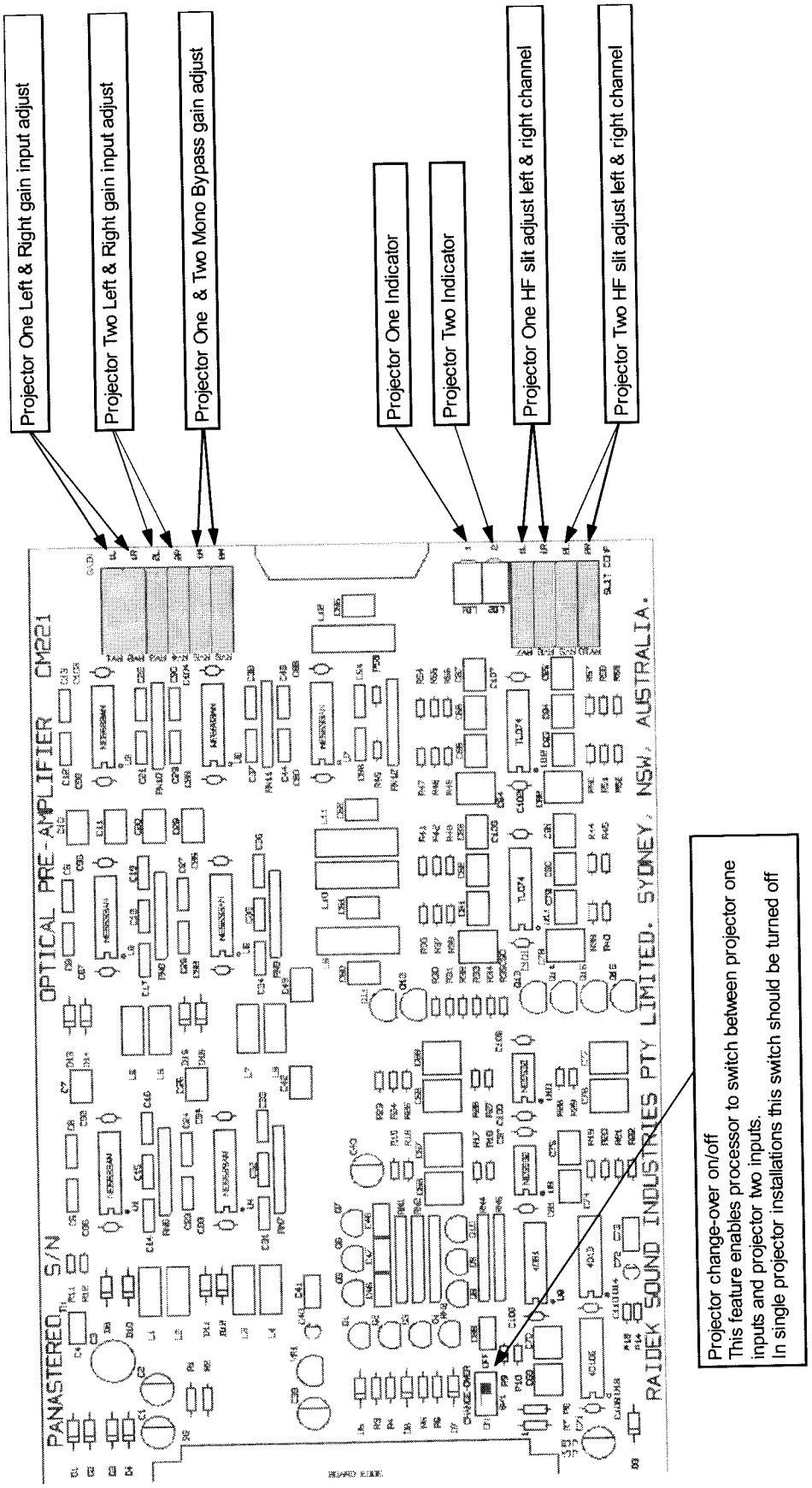
DOLBY LEVEL METERS

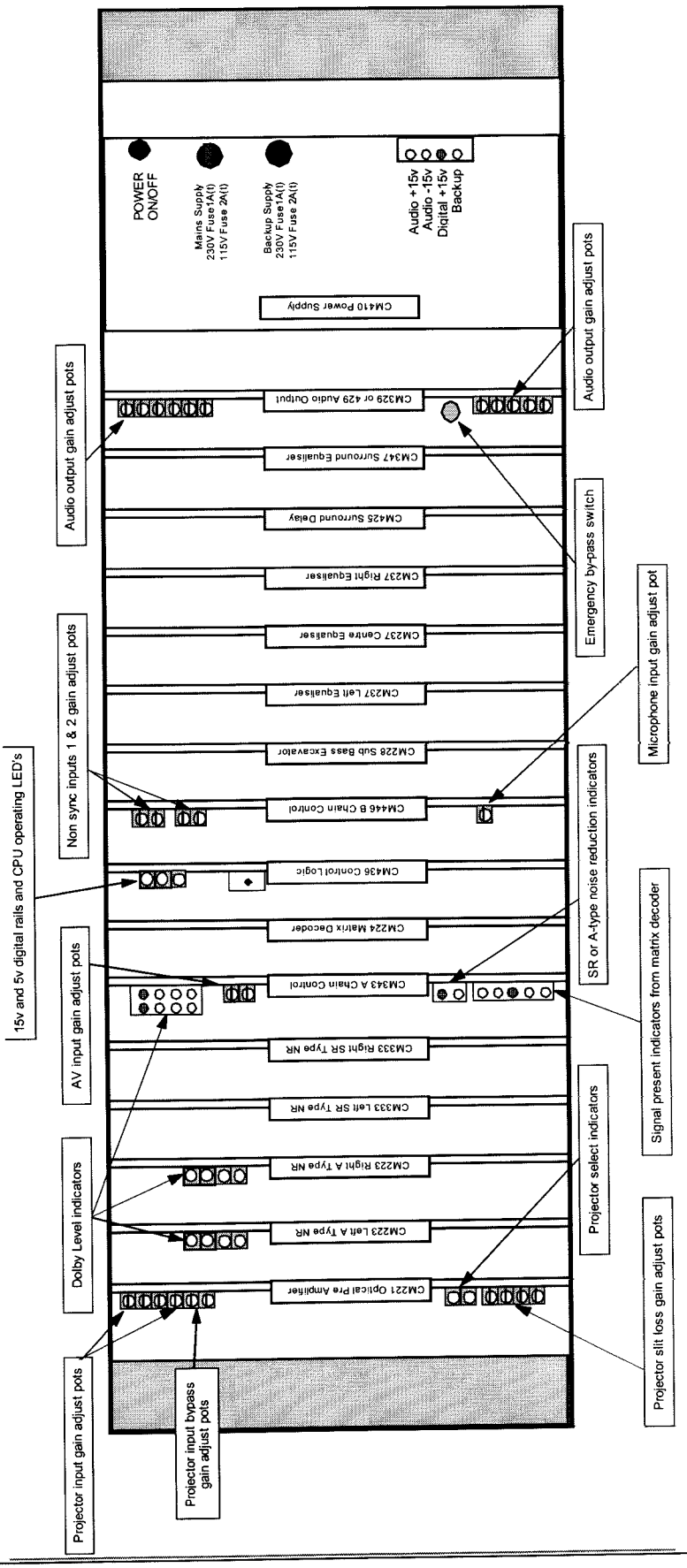
The meters on the CM223 Noise Reduction cards consist of four LED's. An orange LED illuminates at a signal level some 16dB below operating level (-12dBu) and indicates that the signal is below reference. Two green LED's provide a window +/-0.6dB wide around reference level. Correct alignment to 50% level test films (Dolby tone) is indicated by equal intensity of both green LED's. A red LED illuminates 0.6dB above operating level to indicate that the signal is above reference. Note that the red LED does not indicate maximum level or clipping.

DOLBY LEVEL ALIGNMENT

Run the Dolby tone side of the Dolby Cat69 test film and fine tune the pre-amplifier gain controls so that the two green LED's on each noise reduction card are of equal intensity. Ignore any brief fluctuations in level caused by splices in the test film loop.

If the level of the Dolby tone varies slowly over a period of time, it is probably due to voltage fluctuation in the exciter lamp power supply. In such cases it will be necessary to replace the supply with a regulated type.


Projector One Left & Right gain input adjust
Projector Two Left & Right gain input adjust
Projector One & Two Mono Bypass gain adjust
Projector One Indicator
Projector Two Indicator
Projector One HF slit adjust left & right channel
Projector Two HF slit adjust left & right channel
OPTICAL PRE-AMPLIFIER CM221
PANASTEREO S/N
RAIDEK SOUND INDUSTRIES PTY LIMITED. SYDNEY, NSW, AUSTRALIA.
Projector change-over on/off
This feature enables processor to switch between projector one inputs and projector two inputs.
In single projector installations this switch should be turned off


POWER ON/OFF
Mains Supply 230V Fuse 1A(t) 115V Fuse 2A(t)
Backup Supply 230V Fuse 1A(t) 115V Fuse 2A(t)
Audio +15v
Audio -15v
Digital +15v
Backup
CM410 Power Supply
CM329 or 429 Audio Output
CM347 Surround Equaliser
CM425 Surround Delay
CM237 Right Equaliser
CM237 Centre Equaliser
CM237 Left Equaliser
CM228 Sub Bass Excavator
CM446 B Chain Control
CM436 Control Logic
CM224 Matrix Decoder
CM343 A Chain Control
CM333 Right SR Type NR
CM333 Left SR Type NR
CM223 Right A Type NR
CM223 Left A Type NR
CM221 Optical Pre Amplifier
Audio output gain adjust pots
Audio output gain adjust pots
Emergency by-pass switch
Microphone input gain adjust pot
Non sync inputs 1 & 2 gain adjust pots
SR or A-type noise reduction indicators
15v and 5v digital rails and CPU operating LED's
Signal present indicators from matrix decoder
AV input gain adjust pots
Projector select indicators
Dolby Level indicators
Projector slit loss gain adjust pots
Projector input gain adjust pots
Projector input bypass gain adjust pots