Film-Tech

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MATRIX DECODER

The CM224 card decodes stereo sound-tracks that have been 4 track matrix encoded to produce the left, centre, right and surround channels. The card utilises a sophisticated high speed logic steering controlled matrix to produce a high degree of separation between the decoded channels.

The logic steering circuitry has been designed for maximum compatibility with the Dolby Stereo 35mm optical SVA matrix format.

MATRIX DECODER MODE SWITCHING

The matrix decoder card logic scheme is switchable for use with different speaker configurations and must be correctly set in accordance with the speaker arrangement used. This switching is achieved by means of the four "MATRIX DECODER MODE" dip switches, located on the rear panel of the CSP1200 processor. The first three switches labelled "L/R, C and S" must be set according to which speaker channels you have installed.

For example if your installation has all four channels, all three switches must be set to "ON". However if your system has no centre speaker (ie. left, right and surround only), the "C" switch should be switched to "OFF", or if your system has left, centre and right speakers, but no surround, the "L/R" and "C" switches must be set to "ON" and the "S" switch set to "OFF" etc. Failure to correctly set these switches will result in incorrect reproduction of the sound-track.

SURROUND DELAY ADJUSTMENT

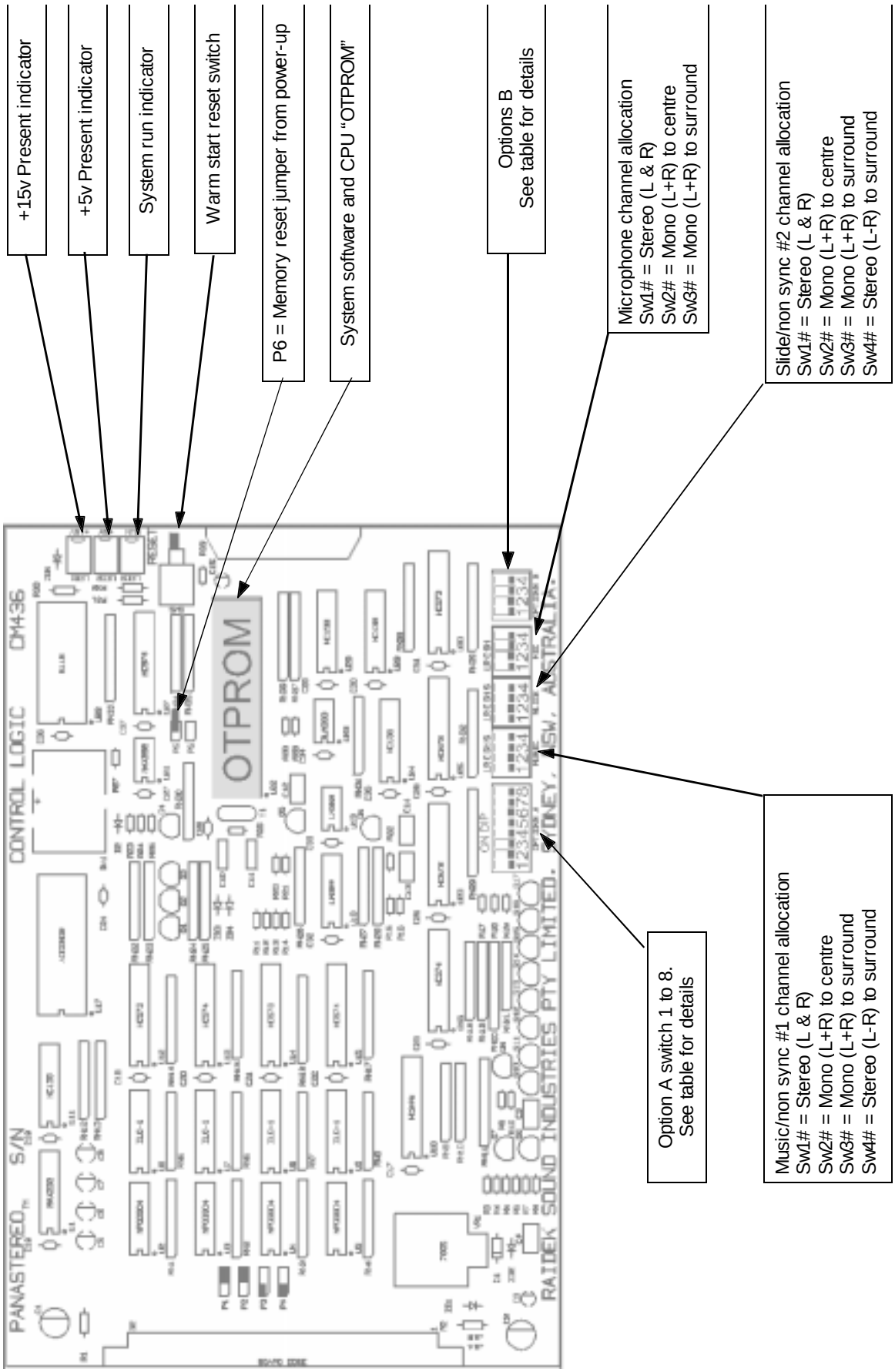
Because the surround speakers are located much closer to the audience than the speakers behind the screen, it is necessary to delay the sound from the surround speakers to ensure that it does not reach the audience before sound from the screen speakers. This is particularly important with matrix encoded stereo optical soundtracks because of the likely presence of dialogue leakage from the centre screen channel into the surround channel due to normal cross-talk in the matrix decoder.

If the surround channel delay is increased by an additional 10-20mS beyond what is required for synchronisation, any surround channel cross-talk is not heard by the audience, so that dialogue appears to come only from the screen. This is due to a phenomenon known as the Has effect. When two identical sounds arrive at a listener about 20mS apart, the brain interprets the direction of the source of the sound as that of the first arriving sound. Therefore by ensuring that the listener hears the surround channel about 20mS later than the front channels, any front to surround cross-talk will not be heard by the listener.

The surround delay is adjustable separately for the left and right surround channels in 10mS steps from 10mS to 160mS to allow for optimum adjustment for auditoriums of differing sizes. This adjustment can be made either by setting two rotary switches located on the CM425 card or using the "Functions" programming on the remote control panel. Both methods are described in the following paragraphs, however the CSP1200 processor is supplied with the delay set using method 2, ie from the remote control panel. This is the recommended method unless you have a specific reason for using method 1.

To determine the correct delay time, find the seat nearest to the rear-most surround speaker and estimate the distance (in feet) from this seat to the front speakers and to the surround speaker. Then subtract the smaller distance from the larger and add 20. This will give the required delay time in milliseconds (sound takes about 1mS to travel a distance of 1 foot). For example if the seat is 70 feet from the front speakers and 10 feet from the surround speaker, subtracting 10 from 70 gives 60, and adding 20 gives 80. Therefore the delay should be set to 80mS.

CM436 CONTROL LOGIC CARD



SETTING THE SURROUND DELAY

1. Remove the CM425 surround delay card and set SW1 to the "REMOTE" position. Replace the card.

2. At the remote control, press the PROG button to enter programming mode.

3. Now press the FUNCTIONS button to access the functions. Turn the middle volume knob to the right until the centre display shows DL, denoting "Delay Left". The right hand display will show the current setting of the left surround delay time.

4. Note that the number shown is the delay time divided by ten, so a display showing 05 represents 50mS delay and a display showing 14 represents 140mS delay.

5. To increase the left delay time rotate the right volume knob clockwise. To decrease the delay time rotate the right volume knob anti-clockwise. The delay time changes in 10mS increments from 10 to 160mS. To set the right delay, turn the middle volume knob clockwise and the centre display will change to DR denoting Delay Right. Follow the same procedure to set the right delay.

ADDITIONAL SURROUND DELAY OPTIONS

The surround delay can be bypassed whenever a digital or magnetic format is selected. This may be desirable if the digital or magnetic processor has a built in surround delay. To activate the digital delay bypass feature, use the DD function to switch off digital surround delay. It is also possible to bypass the B-type noise reduction in the surround channel by using the SN function, however this should only be done if your processor is equipped with a CM424 matrix decoder card. The B-type noise reduction is only used in optical stereo mode and is an essential part of the Dolby Stereo process.

AUDITORIUM EQUALISATION

The CSP1200 processor produces the best noise and distortion performance with the output level trimpots at maximum, and is shipped from the factory in that condition. If your power amplifiers do not have volume controls, all of the output level trimpots on the CM329 audio output card should be turned fully anti-clockwise prior to first switching the system on. If your power amplifiers do have volume controls, do not adjust the output trimpots on the processor. Instead, turn the amplifier's controls to minimum before first switching on.

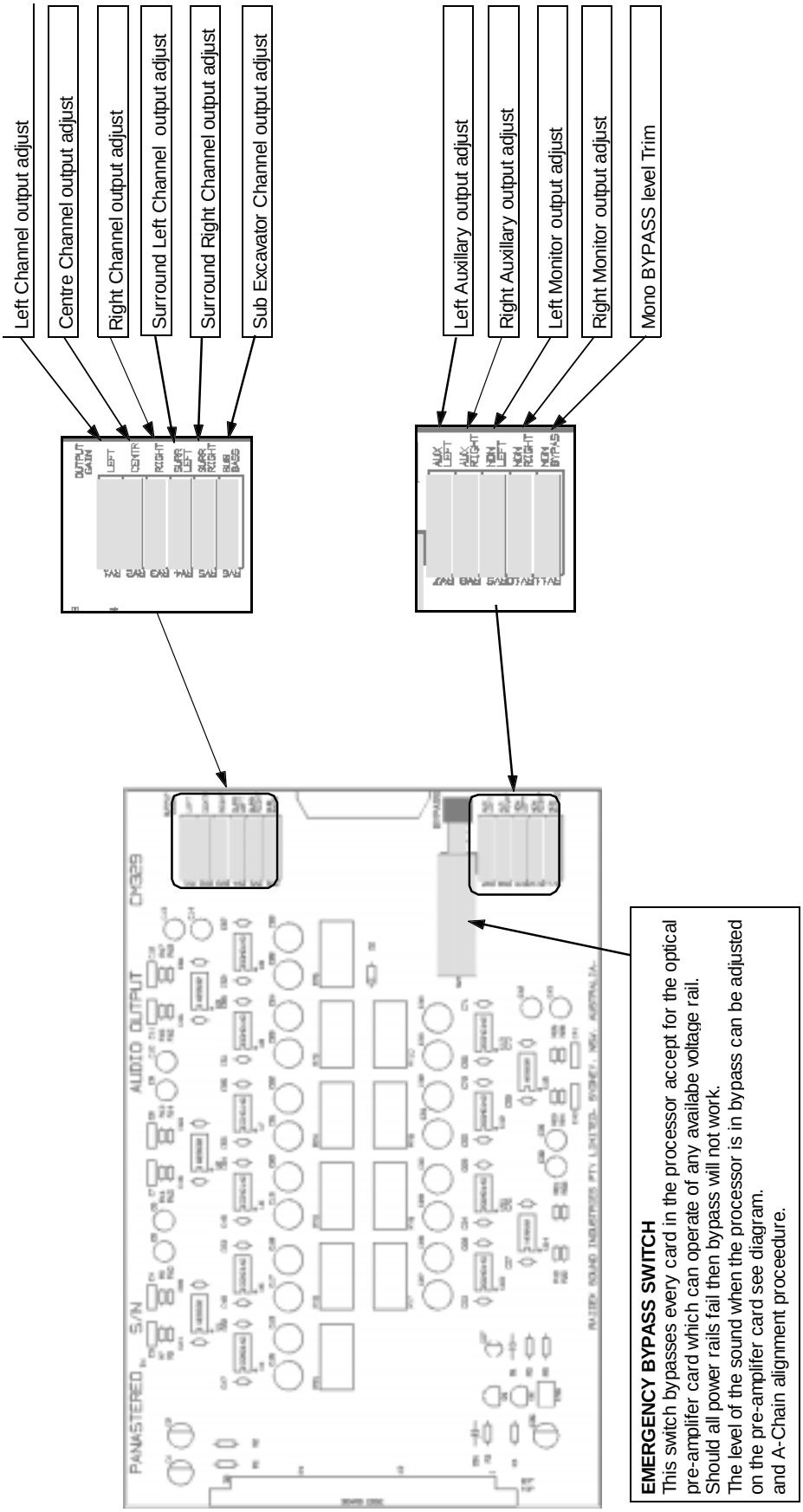
Set up a real time analyser and position the microphone in the auditorium two thirds of the way back from the screen, near the centre of the seating area (but off-axis to the centre speaker), and 1.2 - 1.5 metres above the floor. Remove the CM224 matrix decoder card and insert the CM218 pink noise generator card in it's place. At the remote control panel select "OPTICAL STEREO" and set the film volume to "70". If the installation includes a sub-bass speaker, switch off the sub-bass power amplifier. Select "Centre" on the pink noise card.

For power amplifiers *without* volume controls, increase the setting of the centre output trimpot on the CM329 card to obtain a sound pressure level of 85dBc in the auditorium. For power amplifiers *with* volume controls increase the power amplifier volume control to obtain 85dBc, and then increase the control a little further to a convenient, easily marked position. Then reduce the auditorium level to 85dBc using the centre trimpot on the CM329 card.

With the centre equaliser card extended using the extender card, adjust the equaliser controls to achieve a flat response to 2kHz. Above 2kHz adjust the controls for a roll-off of 1dB per frequency division (i.e. -1dB @ 2.5kHz, -2dB @ 3.15kHz, -3dB @ 4kHz, etc. up to -10dB @ 20kHz).

NOTE: Due to the high frequency attenuation of the screen, it may be necessary to turn the 16kHz and 20kHz controls close to maximum to attain a linear roll-off to 20kHz.

CM329 AUDIO OUTPUT CARD



Avoid extreme opposite settings of the controls for adjacent bands as this will introduce severe phase distortion around these frequencies and thus degrade overall phase response.

When equalisation is complete, check that the average setting of the 30 frequency band controls is in the centre, not mostly clockwise or mostly anti-clockwise. Occasionally during, and after equalisation, check that the sound pressure level in the auditorium is still at 85dBc. If not, adjust the centre output trimpot on the CM329 card until it is.

Repeat the above procedure for the left and right channels, selecting the appropriate buttons on the pink noise card.

MONO SURROUND SYSTEM ALIGNMENT

1. If your system is wired for mono surrounds utilising the left surround output only, select the "left surround" position on the pink noise card, and adjust the "left surround" output level trimpot on the CM329 card for a sound pressure level in the auditorium of 88dBc.

2. If the processor has a surround equaliser installed, switch the CM425 surround delay line card to "bypass" using "SW12" on the backplane of the processor. Adjust the frequency response in the same manner as for the screen channels i.e. flat to 2kHz with a 1dB per 1/3 octave band roll-off above 2kHz.

3. After equalisation, switch the surround delay bypass switch back to "normal" and adjust the "left surround" output level trimpot on the CM329 card for a sound pressure level in the auditorium of 88dBc.

STEREO SURROUND SYSTEM ALIGNMENT

1. If your system is wired for stereo surrounds, select the "left surround" position on the pink noise card, and adjust the "left surround" output level trimpot on the CM329 card for a sound pressure level in the auditorium of 85dBC. Next select "right surround" on the pink noise card and adjust the "right surround" output level trim pot for 85dBc.

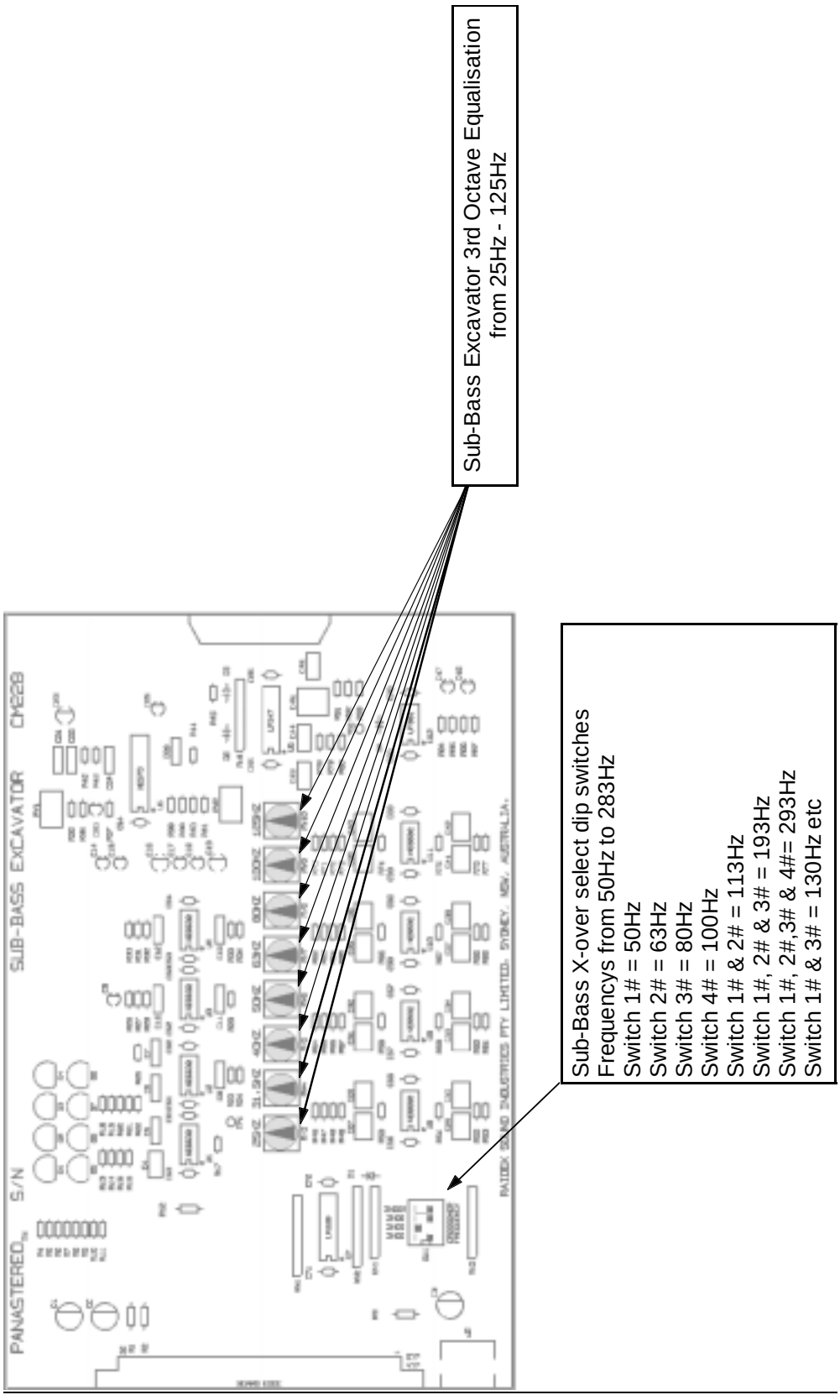
2. If the processor has a surround equaliser installed, switch the CM425 surround delay line card to "bypass" using "SW12" on the backplane of the processor. Adjust the response in the same manner as for the screen channels i.e. flat to 2kHz with a 1dB per 1/3 octave band roll-off above 2kHz.

3. After equalisation, switch the surround delay bypass switch back to "normal" and adjust the left and right surround output level trimpots on the CM329 card for a sound pressure level in the auditorium of 85dBc for each channel.

FINAL ALIGNMENT CHECKS

Finally, use the "sequence" button in conjunction with various combinations of the left, right, centre and surround buttons to aurally double-check the balance between the channels. The sequence speed can be adjusted using the "rate" trimpot situated below the "sequence" button on the pink noise card.

CM228 SUB BASS EXCAVATOR CARD



SUB-BASS SET UP

If the CM228 sub-bass excavator card is installed, remove it from the mainframe. Using the 4-way DIP switches marked "SW1", select a cross-over frequency which suits the speaker system installed. The switches can be used in combination to select additional frequencies other than the four shown.

When two or more switches are selected to "ON", the cross-over frequency will be the sum of the selected frequencies. For example, if both the 50Hz and 100Hz switches are switched to "ON", the cross-over frequency will be 50 + 100 = 150Hz.

SUB-BASS ALIGNMENT

With the pink noise card inserted in the matrix decoder slot, and the sub-bass excavator card extended using the extender card, select "centre" on the Pink Noise card. With the centre channel power amplifier turned on and the sub-bass power amplifier turned off, check that the overall sound pressure level is 85dBc, then make a note of the average level of the bands on the analyser between 100Hz and 1kHz (this is usually around 78dBc).

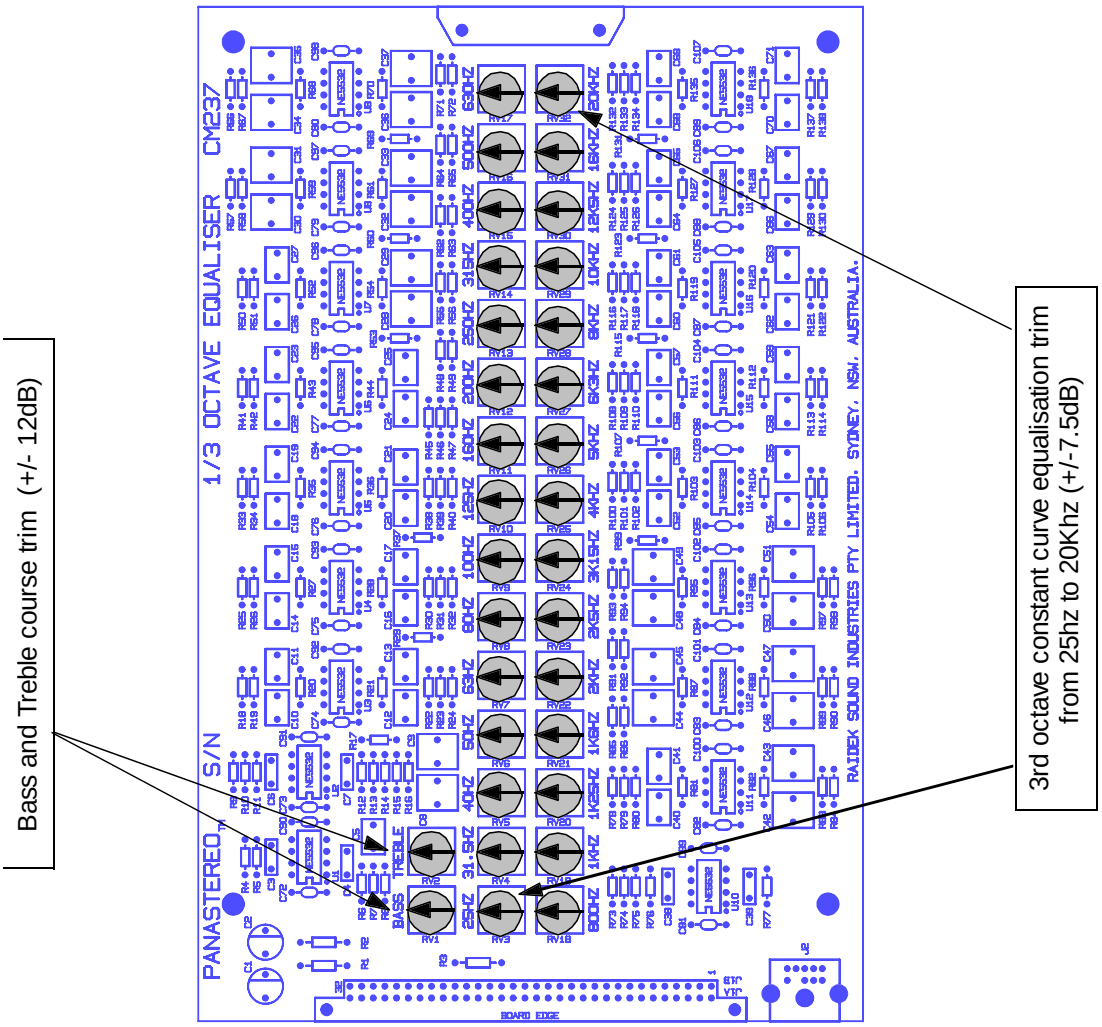
Switch off the centre channel amplifier and switch on the sub-bass amplifier. Adjust the sub-bass output trimpot on the CM329 audio output card so that the average level of the bands between 25Hz and the selected crossover is the same as that noted for the 100Hz to 1kHz region of centre channel (approx 78dBc). Adjust the equaliser controls on the sub-bass card for the flattest response up to the selected cross-over frequency.

IMPORTANT: Do not adjust any equalisers at or above the selected cross-over frequency and avoid extreme opposite settings of the controls for adjacent frequency bands.

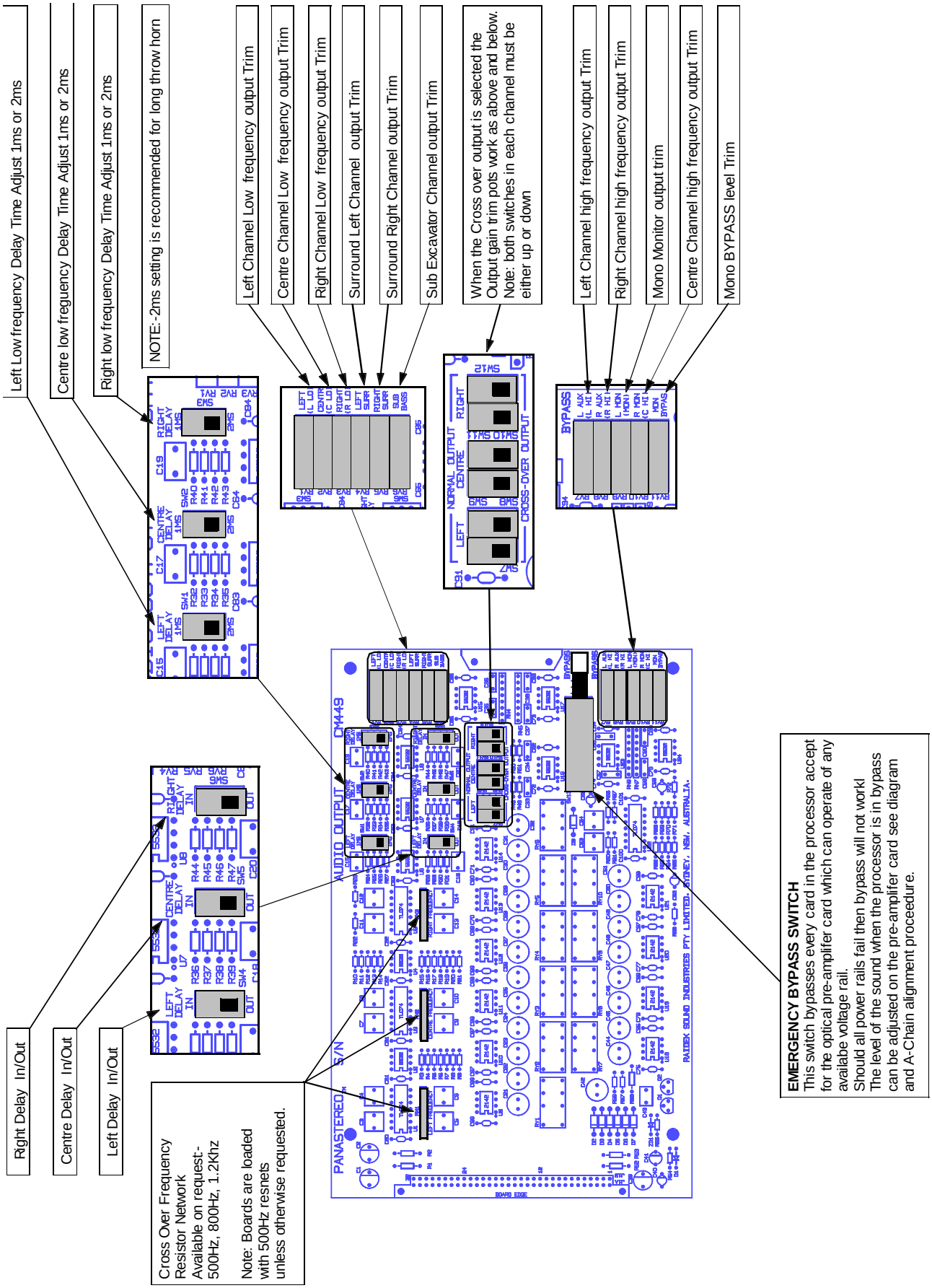
After equalisation, re-adjust the setting of the sub-bass output trimpot to ensure that the average level of the bands between 25Hz and the selected crossover frequency is the same as that noted for the centre channel.

Finally, switch the centre channel amplifier back on and check that the level of the bands below the sub-bass cross-over frequency is approx 3dB higher than the bands above the crossover frequency. If the average level of the bands below the crossover frequency is lower than the those above, the sub-bass speaker is wired out of phase and this must be corrected.

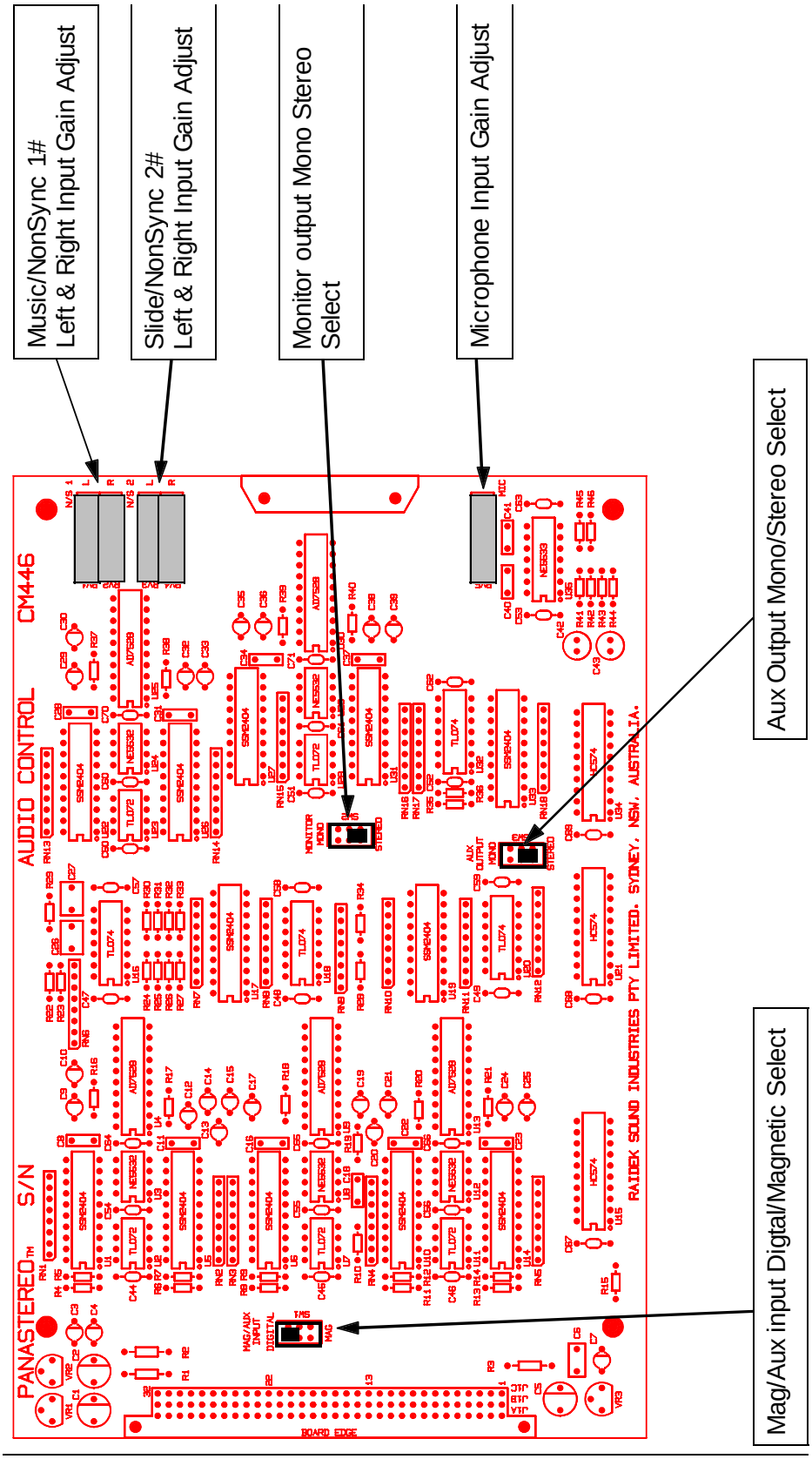
CM237 1/3 OCTAVE EQUALISER CARD



CM449 AUDIO OUTPUT CARD



CM446 B-CHAIN CONTROL CARD



EMERGENCY BYPASS LEVEL

When equalisation is complete and all output levels on the CM329 Audio Output card have been finally set, run a stereo film print and switch from "NORMAL" to "EMERGENCY BY-PASS" by pressing the red "EMERGENCY BY-PASS" button on the CM329 card.

Ensure that the Film volume is still at reference level ("70" on the film volume display) by pressing the "RESET VOLUME" button on the remote control.

With the aid of an assistant listening in the centre of the auditorium, adjust the "Emergency Mono" level trim-pot on the Optical Pre-amp card ("1M" for projector 1, "2M" for projector 2) so that *dialogue* is the same volume with the "BY-PASS" switch either in or out. If, at any subsequent time the setting of the centre output level trim-pot on the CM329 card is altered, it will be necessary to re-set the Emergency By-pass level to ensure that the volume of dialogue remains the same when "Emergency By-pass" is selected.

NON-SYNC CHANNEL ALLOCATION

Traditionally, the Non-sync inputs to cinema sound processors have all been sent to a fixed configuration of the auditorium loudspeakers - usually the front left and right speakers. Because of the probable differing nature of the three possible Non-Sync sources, the CM436 Control Logic card provides the facility to program the speaker configuration for each of the three Non-sync inputs separately. Thus it is possible to have the background music fed to say the front left and right speakers in stereo, the theatre ad v/o tape fed to the centre speaker and the microphone fed to the surround speakers. Any combination is possible including generating centre and/or surround information from stereo sources.

Programming is achieved by setting the DIP switches at the bottom of the CM436 Control Logic card. They can be accessed by removing the card from the mainframe. There are four banks of four switches, the banks are labelled N/S 1, N/S 2 and N/S 3 (Mic) corresponding to the three Non-sync inputs. The fourth bank is used for other control function options. The labelling of the switches and their function is as follows:

SWITCH	FUNCTION
LR	STEREO TO LEFT & RIGHT
C	MONO (L+R) TO CENTRE
SM	MONO (L+R) TO SURROUND
S	SURROUND (L-R) TO SURROUND

These switches can be used in combination to select any possible speaker arrangement for each of the three Non-sync inputs.

NOTE: DO NOT SET BOTH THE "S" AND "SM" SWITCHES TO "ON" AT THE SAME TIME ON ANY ONE SWITCH-BLOCK, AS THIS WILL RESULT IN ONLY THE LEFT CHANNEL OF THAT INPUT BEING SENT TO THE SURROUND SPEAKERS.

NON-SYNC PRE-SET LEVEL ADJUSTMENT

Each of the various Non-Sync inputs should be adjusted for a good average listening level with the Non-Sync volume control on the remote control set to level "70". The adjustments are performed using the Non-Sync trimpots on the front edge of the CM446 Audio Control card *only after all optical film levels have been set and after the DIP switches mentioned in the preceding section have been set.* (Do not make any adjustment to the output level trimpots on the CM329 Audio Output card after the film levels have been set).

Press the RESET VOLUME button on the remote control before making any adjustment to Non-Sync levels. For both stereo and mono sources adjust both the left and right Non-Sync level trimpots for a suitable average listening level in the auditorium.

If the signal is being fed to the left and right speaker channels, check the input balance by switching the monitor between the left and right channels, adjusting the trimpots for equal level. If a source is being fed to just the centre and/or surround speaker channels, check the input balance by switching the monitor to the centre (or surround channel) and alternately disconnect the left and right inputs, adjusting for equal level from either input.

The microphone input is mono only. Adjust the pre-set level using the trimpot at the bottom front edge of the Audio Control card.

MONITOR SET UP

NOTE: The built-in monitor feature is only available if an RC420 remote control unit is fitted to the CSP1200 processor.

The processor caters for both mono and stereo monitoring arrangements. To select which mode you wish to use, remove the CM446 Audio Control card and set "SW1" to either MONO or STEREO. In MONO mode, all channels selected using the Monitor section of the remote control, can be monitored through the Monitor Left(mono) output.

In STEREO mode, if "mix" is selected on the remote control, the monitor output is a full stereo mix available from the Monitor Left(mono) and Monitor Right outputs. If just the left channel is selected for monitoring, it is fed to the Monitor Left output. Likewise if the Right channel is selected it is fed to the Monitor Right output. Centre and Surround channels are fed to both Monitor Left and Monitor Right outputs. The Monitor Left(mono) and Monitor Right output level trimpots on the CM329 Audio Output card can be adjusted to provide a suitable level for the monitor amplifier.

AUXILIARY OUTPUTS

A stereo (or mono) auxiliary output is provided for connection to systems for the hearing impaired, or for use with foyer sound systems, etc. To select either stereo or mono operation, remove the CM446 Audio Control card, and set "SW3" to the "STEREO" or "MONO" position. The Aux Left(mono) and Aux Right output level trimpots on the CM329 Audio Output card can be adjusted to provide a suitable level for external amplifiers.

OPTIONS DIP SWITCHES ON CM436 CONTROL LOGIC CARD

There are two Options dip switch banks on the CM436 card which allow for modifications to some of the processor's operating modes. As the availability of these options may vary with the firmware release included with the processor, it is necessary to consult the Automation Interface Reference at the end of this manual for details.

DIGITAL PROCESSOR INSTALLATION

The CM446 Audio Control Card has three six-track inputs which can be used for digital processors. The DIGITAL 1 & DIGITAL 2 inputs are configured specifically for the Dolby and DTS systems. The MAG/AUX input can be used for digital, magnetic or any other multi-channel source.

DOLBY SR/D PROCESSOR

Connect the audio outputs from the Dolby DA10/20 processor (J8 25-way 'D' connector) directly to the Panastereo Digital 1 input (J23 25-way 'D' connector) using 25-way ribbon cable.

Connect the control lines from the DA10/20 (J6 25-way 'D' connector) directly to the Panastereo Parallel Automation connector (J26 25-way 'D' connector) using 25-way ribbon cable.

Provided the analogue system alignment has been correctly performed, no adjustment of audio levels for the DA10/20 is required.

DTS-6D PROCESSOR

Connect the audio outputs from the DTS-6D processor ("Analog Out" 25-way 'D' connector) directly to the Panastereo Digital 2 input (J22 25-way 'D' connector) using 25-way ribbon cable.

Connect the control lines from the DTS-6D ("Automation" 25-way 'D' connector) directly to the Panastereo DTS control input (J26 25-way 'D' connector) using 25-way ribbon cable.

Ensure that the analogue system has been correctly aligned. Adjust the audio level trimpots on the DTS unit in accordance with the manufacturer's instructions.

CONNECTING A DIGITAL PROCESSOR TO THE MAG/AUX INPUTS

To connect a 6-track digital processor to the Mag/Aux input, the "MAG/AUX INPUT" switch on the CM446 card must first be set to the "DIGITAL" position.

Connect the digital input channels to the "Mag/Aux" Input screw terminal connector according to the labels above the connector. Use the bracketed labels for the Left and Right Surround and Sub-Bass inputs. If the processor is a Dolby SR/D or a DTS unit, follow the instructions in the Dolby or DTS sections above, regarding alignment of audio levels.

MAGNETIC PROCESSOR INSTALLATION

A 4 or 6 track MPU can be connected to any of the processor's three 6-track inputs. If the MPU is a six track unit with Le/Re outputs, you must use the Mag/Aux input.

CONNECTING A 6-TRACK MPU WITH LE/RE OUTPUTS

The "MAG/AUX INPUT" switch located on the CM446 card must be set to the "MAG" position.

Connect the output channels from the MPU to the "Mag/Aux Input" screw terminal connector according to the labels above the connector. Note that the bracketed labels for the Left and Right Surround and Sub-Bass inputs do not apply in this case. The signals from the Le and Re Inputs are combined in the processor to generate the Sub-Bass channel. As the CSP1200 processor has no audio level adjustment for the digital or magnetic inputs, any channel balance and/or level adjustments that may be required must be made on the magnetic processor.

CONNECTING A 4-TRACK MPU

The "MAG/AUX INPUT" switch located on the CM446 card must be set to the "MAG" position.

Connect the output channels from the MPU to the "Mag/Aux Input" screw terminal connector according to the labels above the connector. Note that the bracketed labels for the Left and Right Surround and Sub-Bass inputs do not apply in this case. As the CSP1200 processor has no audio level adjustment for the digital or magnetic inputs, any channel balance and/or level adjustments that may be required must be made on the magnetic processor.

STEREO A/V INPUT

If an RC420 remote control unit is used with the CSP1200 processor, the stereo A/V input is not normally available on the remote panel. If access is required to the A/V input from the remote control unit the function of the MAG/AUX select button can be changed to A/V select. To change the function of the MAG/AUX button it is necessary to set Options B Switch 3 on the CM436 Logic Control Card to the ON position. The Stereo A/V input is routed through the Matrix Decoder in the same way as the optical inputs to decode centre and surround channels. It is also possible to route the A/V input through the A-type or SR noise reduction decoding by setting Options B Switch 4 to the ON position. To select which noise reduction format is used, first select Optical Stereo or Optical Stereo SR before selecting the A/V input.

WARNING: USER ADJUSTMENTS

Some cards have a number of adjustable trim-pots. With the exception of the CM237 Equaliser card, user adjustable trim-pots are located at the front edge of each card and are therefore accessible from the front of the processor with the card plugged in. Those trim-pots which are not accessible from the front are factory set using sophisticated test equipment and on no account should any attempt be made to alter the settings. To do so will severely compromise the performance of the unit.

AUTOMATION INTERFACE

OVERVIEW

The CM436 Control Logic card performs all of the function switching and volume control operations of the CSP1200 cinema sound processor, and can be controlled via the supplied remote control, an opto-isolated parallel automation interface, and an RS232 serial interface.

All three control systems act independently and in parallel, which means there is no need to switch between the various methods of control, with the exception of the parallel remote volume interfaces which must be selected using the external volume remote control button or parallel interface line. (It is not necessary to select External Volume when using the serial interface to control volume).

There are sixteen external parallel interface connection lines which can be configured in software as either opto-isolated input lines, output lines or both. Four of the lines can also be used by changing PCB jumpers, for two analogue remote fader/ external volume interfaces. There are also eight dedicated external LED indicator lines.

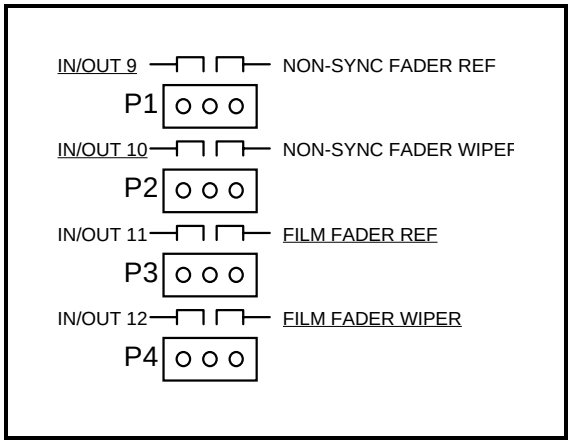


Fig. 8 Jumper Blocks on CM436 card Standard jumper positions are shown underlined.

PARALLEL INTERFACE

The CM436 Control Logic card can accommodate a wide variety of parallel interface arrangements.

All In/Out lines are pulled up to +15V via a 1k resistor in series with an opto-isolator LED. The standard parallel input protocol requires a pulse to ground with a minimum duration of 120mS. This can typically be provided by a set of closing relay contacts or an open collector transistor. In/Out lines which are configured as output lines use an open collector transistor to pull the line low when not active. Output lines can be used to drive a standard LED without the need for a series resistor.

PARALLEL REMOTE FADER INTERFACE

There is provision for two analogue remote fader interfaces on the CM436 card so that the Film and Non-Sync volumes can be separately controlled. In the standard software only the Film volume interface is enabled and it is used to control both Film and Non-Sync volumes. However if the CM436 card 'Options A' DIP switch 3 is set to the 'ON' position, the two interfaces are enabled and the Non-Sync volume can be separately controlled. The remote fader interface/s can be used with a 100kohm linear pot as a simple additional remote volume control or as an input for volume control from an external automation system. The interface provides a 5V reference voltage output and a constant current sink input.

SERIAL INTERFACE

A standard RS232 serial communications interface is provided for connection to automation systems that use serial data transfer. The serial data is available at the 9 pin serial automation D-Sub connector as follows:

Tx data from master
(CSP1200 data receive): pin 3

Rx data to master
(CSP1200 data transmit): pin 2

Common (if required): pin 5

SERIAL PROTOCOL DESCRIPTION

The RS232 serial port communicates at 9600 baud, 8 data bits, no parity and 1 stop bit. The protocol has been designed so that a dumb terminal may monitor the interface for debugging purposes.

The protocol provides both a poll response format with the attached equipment initiating the exchange with a seven character poll command, and an unsolicited response, occurring whenever there is a change of system status which has been initiated either by an automation controller or by a local command from the remote control panel. All commands start with a colon followed by a four character command code, terminated with a carriage return, and a line feed character which are also valid if they occur in the reverse order. (This is to allow compatibility with languages that do not provide easy control of the order of these characters.) The CM436 may respond with a twelve character string starting with a zero and ending with a carriage return. When the CM436 detects the command start character (a colon) a timer is started and if the rest of the command including the end characters (<CR/LF>) is not received within 500mS then the serial port is ignored until another valid start character is seen. If the command is not known then it is ignored.

When the CM436 sees the :STAT command, it will reply with a poll response. When the CM436 starts transmitting there will be a typical inter-character time of 10mS. The poll response will give the controller's status.

SERIAL VOLUME CONTROL

The Film and Non-Sync volumes can be controlled via the serial interface. Various commands are included to increase or decrease the volume or set the volume to a specific value. If the CM436 card 'Options A' DIP switch 3 is set to 'ON', the Film and Non-Sync volumes can be separately controlled.

NOTE: Whenever a volume change command is sent, the system volume will ramp (rather than jump) to the new level. The ramp speed is always at the FAST rate. When switching between a Film format and a Non-Sync format (or vice versa) the volume will automatically crossfade as it does with normal remote control operation. Likewise, selecting and deselecting MUTE will cause an auto fade to occur. See the OPERATION section of this manual for full details of the crossfade and dipfade facilities.

SYSTEM COMMANDS

:STEA<CR/LF>	Select Film Stereo Format
:STES<CR/LF>	Select Film Stereo SR Format
:MONO<CR/LF>	Select Film Mono Format
:DIG1<CR/LF>	Select Film Digital 1 Format
:DIG2<CR/LF>	Select Film Digital 2 Format
:MAGA<CR/LF>	Select Film Mag/Aux Format
:A/V1<CR/LF>	Select Film A/V Format
:NSY1<CR/LF>	Select Non-Sync 1 (Music)
:NSY2<CR/LF>	Select Non-Sync 2 (Slide)
:NMIC<CR/LF>	Select Non-Sync 3 (Mic)
:MUTE<CR/LF>	Select/de-select Mute
:PRO1<CR/LF>	Select Projector 1
:PRO2<CR/LF>	Select Projector 2
:VOUP<CR/LF>	Increase volume by one
:VODN<CR/LF>	Decrease volume by one
:VU10<CR/LF>	Increase volume by ten
:VD10<CR/LF>	Decrease volume by ten
:VSxx<CR/LF>	Set volume to level 'xx' where 'xx' is a value between 00 and 99
:VNxx<CR/LF>	Set Non-Sync volume to level 'xx' where 'xx' is a value between 00 and 99. (Used only if Options Switch 3 is set to 'on')
:STAT<CR/LF>	Poll the processor for the current system status

RESPONSE FORMAT:

0 1 2 3 4 5 S M D O A R V V_1 V_2 B <CR>

0 =	Response Start character
1 =	Non-Sync 1 (music) is selected
2 =	Non-Sync 2 (slide) is selected
3 =	Non-Sync 3 (mic) is selected
4 =	Projector 1 is selected
5 =	Projector 2 is selected
S =	Film Stereo format is selected
M =	Film Mono format is selected
D =	Digital format is selected
0 =	Mute is active
A =	A type Noise Reduction is on
R =	SR type Noise Reduction is on
V =	Character V is used to mark that the following two characters are volume digits
V_1 =	First decimal digit of volume
V_2 =	Second decimal digit of volume
B =	Busy indicator used to indicate that the controller is in the middle of changing the settings
<CR> =	Carriage return (Response End character)

If a selection is not true then the character is replaced by an "X". All characters are capitals.

AUTOMATION INTERFACE - 25-PIN D-CONNECTOR
CONNECTION DATA - FIRMWARE VERSION SP456 V1.0

Pin No.	Standard Function	Function with Option B SW 1 On *
1	Film Mono Select	Stereo/Mono H = S, L = M
2	Film Stereo Select	N/R H = In, L = Out
3	Film Stereo Sr Select	Stereo/Sr H = St, L = Sr
4	N/S 1 Select	Film/Tape H = Film, L = N/S
5	Film Digital 1 Select	Opt/Dig H = Opt, L = Dig 1
6	Film Digital 2 Select	Not Used
7	N/S 2 Select	Non-Sync H = N/S 1, L = N/S 2
8	Film Mag/Aux Select	Not Used
9	Remote Fader Select	Remote Fader Select
10	Mute Select	Mute Select
11	Remote Fader Ref Voltage	Remote Fader Ref Voltage
12	Common (Digital Ground)	Common (Digital Ground)
13	Remote Fader Wiper	Remote Fader Wiper
14	Film Mono Indicator	Film Mono Indicator
15	Film Stereo Indicator	Film Stereo Indicator
16	Film Stereo Sr Indicator	Film Stereo Sr Indicator
17	N/S 1 Indicator	N/S 1 Indicator
18	Film Digital 1 Indicator	Film Digital 1 Indicator
19	Film Digital 2 Indicator	Film Digital 2/Mag Indicator
20	N/S 2 Indicator	N/S 2 Indicator
21	Film Mag/Aux Indicator	Film Mag/Aux Indicator
22	Remote Fade Indicator	Remote Fader Indicator
23	Mute Indicator	Mute Indicator
24	A/V Input Select	A/V Input Select
25	Proj Select H = P1, L = P2	Proj Select H = P1, L = P2

NOTE 1: The Options B Switches are located on the CM436 logic control card.
With Switch 1 in the 'ON' position, the CSP1200 automation interface emulates a simple EPRAD-style automation interface.

CONTROL LOGIC CARD 'OPTIONS A' SWITCHES

Sw1 - DOLBY DA10/20 CONTROL PULSE DEFEAT - Normally each of the parallel automation input lines also acts as an output, producing a pulse to ground whenever a particular format is selected either from the remote control panel or the serial automation interface. This is to allow Dolby DA10 and DA20 Digital processors to operate correctly. Options Switch 1 will defeat this feature in the ON position.

Sw2 - DTS NON-SYNC DELAY DEFEAT - This feature prevents Optical Stereo or Optical SR format from being re-selected at the end of a feature by the DTS processor, after music (Non Sync 1) has been selected by the operator or by the automation. Switch 2 will defeat this feature in the ON position. The delay lasts for 30 seconds, however the formats can still be selected manually at the remote control panel.

Sw3 - SEPARATE NON-SYNC REMOTE FADER SELECT - It is possible to operate two separate Dolby-style remote faders with the processor, one for film volume and the other for non-sync volume. Selecting Switch 3 will enable this feature. Please note it is also necessary to move the jumpers on P1 and P2 on the CM436 card to the non-default positions - see Fig 8 for details.

Sw4 - SUB-BASS ON IN OPTICAL MONO SELECT - Switch 4 selects Sub Bass ON in Optical Mono mode.

SW5 - NOT CURRENTLY IMPLEMENTED

SW6 - NOT CURRENTLY IMPLEMENTED

Sw7 - PROGRAMMING/SHOW BUTTONS DISABLE - Setting switch 7 to the ON position will disable the lower section of the remote control panel. This option is to prevent unauthorised persons from changing the internal functions of the processor.

Sw8 - BACKUP RAM MEMORY DEFEAT - Normally the status of the processor is stored in backup memory so that if the processor is switched off , or if there is a power failure, the current status of the control panel will be restored on power-up. If it is desired that the processor wakes up in it's default mode (Optical Stereo, volume level 70), switch 8 must be selected to ON.