Film-Tech

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PANASTEREO

SP23

DIGITAL EXTENDED SURROUND PROCESSOR

OWNER'S MANUAL

TABLE OF CONTENTS

PANASTEREO SP23 DIGITAL EXTENDED SURROUND PROCESSOR

OVERVIEW

The Panastereo SP23 Digital-EX Surround Processor decodes 6.1 channel sound from existing digital 5.1 installations. The SP23 works with any brand of 5.1 digital sound processor is inserted between the left and right surround outputs of the sound processor and the surround amplifiers. The SP23 provides a decoded rear surround channel that can be fed to rear wall surround speakers via a rear surround amplifier.

SYSTEM FEATURES

- High performance matrix decoding of centre (rear) surround information.
- Choice of 10 band octave (SP23-10) or 30 band 1/3 octave (SP23-30) equalisers for all three surround channels.
- Users with Panastereo processors can re-use the surround equaliser card from the cinema processor in the SP23 to save the cost of duplication.
- Provides three channel mono surround for stereo analogue soundtracks.
- Balanced inputs and outputs for hum and buzz free installation.
- Superb noise and distortion performance.
- EX decode and input level LED indicators.
- CSP1200 / CP65 pin compatible 25way D automation connector.
- Input / output connections via plug-in Phoenix connectors.
- Power-off bypass and manual bypass facility.
- Built-in power supply module.
- 1U standard rack mount chassis with front accessible plug in card modules.
- Designed and manufactured in Australia.
- Fully compatible with the Dolby Digital Surround EX format planned for Star Wars and other films to follow.

SYSTEM SPECIFICATIONS

Inputs: Ls and Rs inputs, 10k ohm balanced, Max input sensitivity: 220mV.

Outputs: Ls, Rs, Csl, Csr. 100 ohm balanced, Max output level +20dBu.

Noise: Typically 78 dB (unweighted), 86dB (A weighted)

Distortion (any channel) 1kHz @ Dolby level: 0.03%

Dynamic Range: Typically 106dB

Dimensions: 430mm (W) x 247mm (D) x 44mm (H)

Weight: 4.2kg

SP23 OPERATION

The SP23 does not require any operator intervention for normal operation. The cinema processor automatically controls the unit.

When a digital format is selected on the cinema processor the SP23 will switch to EX decode mode and the red DECODE-ON indicator will be illuminated. In Digital mode the left and right surround channel information is decoded into three channels, left, right and rear surround.

When any other format is selected on the cinema processor, the SP23 will switch to non-EX mode and the yellow DECODE-OFF indicator will be illuminated. In non-EX mode, if the surround channel information is mono (as with optical stereo film soundtracks), the surround signal is equally distributed to all three surround channels. If the surround signal is stereo, the left surround channel contains the left signal, the right surround channel contains the right signal and the rear channel contains both signals.

EMERGENCY BYPASS

In the event of a failure of the unit, it can be bypassed by pressing the red BYPASS button at the right front of the unit. This button is NOT a power switch but simply allows the left and right surround channels from the processor to be sent directly to the left and right surround power amplifiers. There is no rear surround in bypass mode.

SP23-10 (Octave Equalisers) card positions

SP23-30 (1/3 Octave Equalisers) card positions

SP23 INSTALLATION

RACK MOUNTING THE SP23

The SP23 can be mounted anywhere in the sound rack, although it is preferable from a wiring point of view to mount the unit between the sound processor and the amplifiers. Provision should be made for ventilation above the SP23, so avoid mounting the unit directly beneath other equipment that will prevent air circulation at the top of the SP23 chassis.

REAR SURROUND SPEAKER AND AMPLIFIER REQUIREMENTS

The rear wall surround speakers should be ideally of the same type as the side wall speakers to allow the best match in sound quality between the side and rear wall speakers. The rear wall amplifier and speaker system should have sufficient power handling capability to match that of either side wall system. The number of rear wall speakers will be determined by the width of the auditorium – the wider the room the more speakers will be needed. The spacing between each of the rear speakers should be no greater than the spacing between each of the side wall speakers.

INSTALLATION IN A TWO LEVEL CINEMA

The Panastereo SP23 can be easily adapted to dual level cinemas. Such cinemas, which are usually large older style cinemas, typically have an upstairs balcony and a downstairs stalls area beneath the balcony. For such cinemas, rear wall surround speakers will be required both upstairs and downstairs. In such cases the rear left output can be used to drive the upstairs speakers and the rear right output can be used to drive the downstairs speakers. In the SP23-10 there are separate equalisers for rear left and rear right channels so the upstairs and downstairs rear speaker systems can be separately equalised for optimum results.

CONTROL & AUTOMATION CONSIDERATIONS

The automation connector on the SP23 is pin compatible with Panastereo CSP1200, Panastereo CSP4200, Dolby CP65 and Dolby CP500 processors. When a standard pin for pin cable is used with any of the above processors, the rear surround decoding will be turned on for any digital or magnetic format and turned off for all other formats. For use with other processors, or if it is desired to alter which formats turn the decoding on or off, it will be necessary to make a custom cable. In this case, reference should be made to the automation pinout table in this manual.

CONNECTING THE INPUTS TO THE SP23.

SOUND PROCESSOR WITH UNBALANCED OUTPUTS (DOLBY, SMART, ULTRA STEREO)

Disconnect the left surround and right surround connections at the sound processor outputs.

Use two-core shielded audio cable to connect the left and right surround outputs from the sound processor to the left and right inputs of the SP23.

Connect the "+" terminal from each sound processor output to the "+" terminal of each corresponding SP23 input.

Connect the ground terminal of each processor output to the "-" terminal of each corresponding SP23 input.

Connect the cable shield to the "E" terminal of each SP23 inputs only. Do not connect the shields at the sound processor.

SOUND PROCESSOR WITH BALANCED OUTPUTS (PANASTEREO)

Disconnect the left surround and right surround connections at the sound processor outputs.

Use two-core shielded audio cable to connect the left and right surround outputs from the sound processor to the left and right inputs of the SP23.

Connect the "+" terminal from each sound processor output to the "+" terminal of each corresponding SP23 input.

Connect the "-" terminal of each processor output to the "-" terminal of each corresponding SP23 input.

Connect the cable shield to the "E" terminal of each SP23 inputs only. Do not connect the shields at the sound processor.

AUTOMATION CABLE

The SP23 must be connected to the cinema processor or digital processor automation connector.

The SP23 D25 automation connector is pin compatible with Panastereo CSP42000, CSP1200, Dolby CP65 and CP500 processors.

A pre-made 25-way ribbon cable is supplied with the SP23 for the above processors.

CONNECTING THE SP23 OUTPUTS.

AMPLIFIERS WITH UNBALANCED INPUTS

Use two-core shielded audio cable to connect the left, right and rear surround outputs from the SP23 to the inputs of the amplifiers.

Connect the "+" terminal from each SP23 output to the "+" terminal of each corresponding amplifier input.

Connect the ground terminal of each SP23 output to the "-" terminal of each corresponding amplifier input.

Connect the cable shield to the "E" terminal of each amplifier input only. Do not connect the shields at the sound processor.

AMPLIFIERS WITH BALANCED INPUTS

Use two-core shielded audio cable to connect the left, right and rear surround outputs from the SP23 to the inputs of the amplifiers.

Connect the "+" terminal from each SP23 output to the "+" terminal of each corresponding amplifier input.

Connect the "-" terminal of each SP23 output to the "-" terminal of each corresponding amplifier input.

Connect the cable shield to the "E" terminal of each SP23 inputs only. Do not connect the shields at the amplifier.

SP23 Rear Panel

SETTING THE EQUALISER MODE JUMPERS

The SP23 has three EQUALISER MODE jumpers on the CM126 Power Supply/Control Card.

The jumpers are marked LK1 – 3

The jumpers are factory set to match the equaliser configuration as shipped from the factory.

LK1 – Selects the input for the third equaliser (the upper middle slot).

- If the SP23 is fitted with **1/3-octave equalisers** for the left and right surround channels (left eq in upper left slot and right eq in upper middle slot) then this jumper should be in the **left "RS" position**. This ensures that the right surround signal from the matrix is fed to the right surround equaliser
- If the SP23 is fitted with a **stereo octave equaliser** for the left and right surround channels (upper left slot), AND a 1/3 octave equaliser is fitted to the upper middle slot AND you wish to use the future L-R output from the SP23 this jumper must be in the **right "L-R" position**.

LK2 – Selects octave or third octave equaliser mode for the left and right equalisers.

- If the SP23 is fitted with a **stereo octave equaliser** for the left and right surround channels (upper left slot), this jumper should be in the **left "OCT" position**.
- If the SP23 is fitted with **1/3 octave equalisers** for the left and right surround channels (left eq in upper left slot, and right eq in upper middle slot) then this jumper should be in **the right "1/3" position**.

LK3 – Selects stereo or mono equaliser mode for the rear surround equaliser.

- If the SP23 is fitted with a **1/3-octave equaliser** for the rear surround channel (bottom middle slot) this jumper should be in the **left "CS" position**. (This will feed the output from the equaliser to both left and right rear outputs).
- If the SP23 is fitted with a **stereo octave equaliser** for the rear surround channel (bottom middle slot) and you wish to use just the left equaliser for both the left rear and right rear channels, this jumper should be in the **left "CS" position**. (This will feed the left equaliser output to both the left and right rear outputs).
- If the SP23 is fitted with a **stereo octave equaliser** for the rear surround channel (bottom middle slot) and you wish to use separate equalisers for the left rear and right rear channels, this jumper should be in the **right "L-R" position**.
- If the future fourth surround channel is used, the right rear output will carry this signal if this jumper is in the **right "L-R" position**.

AUTOMATION INTERFACE - 25-PIN D-CONNECTOR
CONNECTION DATA

Pin No.	SP23 Functions	DECODE	CSP1200 Functions
1	Film Mono Select	OFF	Film Mono Select
2	Film Stereo Select	OFF	Film Stereo Select
3	Film Stereo Sr Select	OFF	Film Stereo Sr Select
4	N/S 1 Select	OFF	N/S 1 Select
5	Film Digital 1 Select	ON	Film Digital 1 Select
6	Film Digital 2 Select	ON	Film Digital 2 Select
7	N/S 2 Select	OFF	N/S 2 Select
8	Film Mag/Aux Select	ON	Film Mag/Aux Select
9			Remote Fader Select
10			Mute Select
11			Remote Fader Ref Voltage
12	Common (Digital Ground)		Common (Digital Ground)
13			Remote Fader Wiper
14			Film Mono Indicator
15			Film Stereo Indicator
16			Film Stereo Sr Indicator
17			N/S 1 Indicator
18			Film Digital 1 Indicator
19			Film Digital 2 Indicator
20			N/S 2 Indicator
21			Film Mag/Aux Indicator
22			Remote Fade Indicator
23			Mute Indicator
24			A/V Input Select
25			Proj Select H = P1, L = P2

SP23 automation connector pins 1-8 should be pulled low (connected to pin 12) to select a format.
Pins 1, 2, 3, 4 & 7 select "decode off".
Pins 5, 6 & 8 select "decode on".

SYSTEM ALIGNMENT

Refer to the appropriate section of the manual for alignment with various sound processors.

1 – Panastereo CSP3200, CSP4200, CSP1200

2 - Dolby CP55

3 – Dolby CP65

4 - Dolby CP500

5 - Smart MOD 6 with DSP Matrix

6 - Smart MOD 6 with Analog Matrix

7 - Smart MOD IIC

8 – Ultra Stereo JSX 1000

1 – ALIGNMENT with PANASTEREO PROCESSORS

Equipment required: CM218 Pink Noise Card, Real Time Analyser (RTA)

1. SET UP REAL TIME ANALYSER	Set up a Real Time Analyser and position the microphones in the auditorium.
2. PRE-SET SP23 OUTPUT LEVELS	Turn all four output trimmers on the SP23 anticlockwise until you feel a slight click.
3. SWITCH SP23 TO BYPASS	Switch the SP23 to bypass mode (Red Bypass button IN).
4. BYPASS SURROUND EQUALISERS	At the rear of the Panastereo processor, switch the Surround Equaliser Bypass switch to the BYPASS position. If necessary remove the surround equaliser card from the processor and place it in the top left slot of the SP23.
5. INSTALL PINK NOISE CARD	Remove the CM224 Matrix Decoder card from the CSP sound processor and install the pink noise generator in it's place.
6. SELECT "OPTICAL STEREO" FORMAT	Select "Optical Stereo" on sound processor to output pink noise to the auditorium.
7. SET PROCESSOR VOLUME TO "7.0"	Set the sound processor volume control to level "7.0" and keep it there for all subsequent adjustments.
8. CHECK SPL LEVELS ON ALL CHANNELS	Check that the SPL levels for all of the channels are correct (85dBC per channel). If not, adjust the output level trimmers on the CM329 or CM349 Audio Output card for a level of 85dBC from each channel.
9. SELECT "DIGITAL" FORMAT	Select the sound processor to DIGITAL format. Check that the red "DECODE-ON" LED is illuminated on the SP23
10. REMOVE AUTOMATION CONNECTION	Disconnect the D25 automation cable from the SP23. (This is to prevent the sound processor from switching the SP23 back to Optical mode)

11. SELECT "OPTICAL STEREO" FORMAT	Select the sound processor to OPTICAL STEREO (to send pink noise to the outputs).
12. TURN OFF SP23 BYPASS	Switch the SP23 out of bypass mode (Red Bypass button OUT).
13. SET PINK NOISE CARD TO LS	Switch on the Left Surround button on the Pink Noise card.
14. ADJUST SP23 LS INPUT LEVEL	Adjust the Left Input trimmer on the SP23 so that the two green LEDs for the left channel are equally illuminated.
15. COARSE SET LS SPL LEVEL TO 85dBC	Adjust the Left Surround Output trimmer on the SP23 for approximately 85dBC in the auditorium.
16. EQUALISE LEFT SURROUND CHANNEL	Remove the Left/Right Equaliser card from the SP23 and connect it via the extender card and cable. Adjust the left equaliser controls for a frequency response in accordance with the standard ISO surround channel response curve.
17. SET LS SPL LEVEL TO 85dBC	Re-adjust the Left Surround Output trimmer on the SP23 for 85dBC in the auditorium.
18. SELECT RIGHT SURROUND ON THE PINK NOISE CARD	Switch off the Left Surround button and press the Right Surround button on the Pink Noise Card.
19. ADJUST SP23 RIGHT SURROUND INPUT LEVEL	Adjust the Right Input trimmer on the SP23 so that the two green LEDs for the right channel are equally illuminated.
20. COARSE SET RIGHT SURROUND SPL LEVEL TO 85dBC	Adjust the Right Surround Output trimmer on the SP23 for approximately 85dBC in the auditorium.
21. EQUALISE RIGHT SURROUND CHANNEL	Adjust the right equaliser controls for a frequency response in accordance with the standard ISO surround channel response curve.

22. SET RIGHT SURROUND SPL LEVEL TO 85dBC	Re-adjust the Right Surround Output trimmer on the SP23 for 85dBC in the auditorium.
23. SELECT BOTH LS AND RS ON PINK NOISE CARD	Switch on both left and right surround on the Pink Noise Card
24. **IF A TWO CHANNEL REAR SURROUND AMPLIFIER IS INSTALLED GOTO 31**	
25. COARSE SET LEFT REAR SURROUND SPL LEVEL to 85dBC	Adjust the Rear Left Surround Output trimmer (CSL) for approximately 85dBC SPL in the auditorium.
26. EQUALISE REAR SURROUND CHANNEL	Remove the Rear Equaliser from the SP23 and connect it via the extender card and cable. Adjust the left equaliser controls for a frequency response in accordance with the standard ISO surround channel response curve.
27. SET REAR SURROUND SPL LEVEL TO 91dBC	Replace the Rear Equaliser card and adjust the Rear Left Surround Output trimmer (CSL) on the SP23 for 91dBC in the auditorium.
28. RE-CONNECT AUTOMATION CABLE	Re-connect the automation cable to the SP23.
29. REMOVE PINK NOISE CARD	Remove the pink noise card from the processor and replace with the CM224 matrix card.
30. **END OF PROCEDURE**	The system is now ready to use.
31. **ALIGNMENT OF TWO CHANNEL REAR SURROUND AMPLIFIER**	
32. TURN OFF REAR RIGHT AMPLIFIER	Switch off or disconnect the rear right-surround amplifier.
33. COARSE SET REAR LEFT SURROUND SPL LEVEL to 85dBC	Adjust the Rear Left Surround Output trimmer (CSL) for approximately 85dBC SPL in the auditorium.

34. EQUALISE REAR LEFT SURROUND CHANNEL	Remove the Rear Equaliser from the SP23 and connect it via the extender card and cable. Adjust the left equaliser controls for a frequency response in accordance with the standard ISO surround channel response curve.
35. SET REAR LEFT SURROUND SPL LEVEL TO 88dBC	Adjust the Rear Left Surround Output trimmer (CSL) on the SP23 for 88dBC in the auditorium.
36. TURN OFF LEFT REAR AMPLIFIER AND TURN ON RIGHT REAR AMPLIFIER	Switch off or disconnect the rear left-surround amplifier and switch on or connect the rear right surround amplifier.
37. COARSE SET RIGHT REAR SURROUND SPL LEVEL to 85dBC	Adjust the Rear Right Surround Output trimmer (CSR) for approximately 85dBC SPL in the auditorium.
38. EQUALISE REAR RIGHT SURROUND CHANNEL	Adjust the right equaliser controls for a frequency response in accordance with the standard ISO surround channel response curve.
39. SET REAR RIGHT SURROUND SPL LEVEL TO 88dBC	Replace the Rear Equaliser card and adjust the Rear Right Surround Output trimmer (CSR) on the SP23 for 88dBC in the auditorium.
40. TURN ON REAR LEFT AMPLIFIER	Switch on or re-connect the rear left surround amplifier.
41. RE-CONNECT AUTOMATION CABLE	Re-connect the automation cable to the SP23.
42. REMOVE PINK NOISE CARD	Remove the pink noise card from the processor and replace with the CM224 matrix card.
43. END OF PROCEDURE	The system is now ready to use.

2 – ALIGNMENT with DOLBY CP55

Equipment required: Dolby Cat.85C Pink Noise Card, Real Time Analyser (RTA)

1.	SET UP REAL TIME ANALYSER	Set up a Real Time Analyser and position the microphones in the auditorium.
2.	PRE-SET SP23 OUTPUT LEVELS	Turn all four output trimmers on the SP23 anticlockwise until you feel a slight click.
3.	SWITCH SP23 TO BYPASS	Switch the SP23 to bypass mode (Red Bypass button IN).
4.	SET THE CP55 SURROUND EQUALISERS TO FLAT	On the CP55 Cat.441 card, turn the Treble and Bass controls for both the Ls and Rs channels to the middle of their rotation. Turn the midrange cut control for both Ls and Rs channels fully clockwise
5.	INSTALL PINK NOISE CARD	Remove the Cat.150 Decoder card from the CP55 sound processor and install the Cat.85C pink noise generator into the slot provided.
6.	SELECT "OPTICAL STEREO" FORMAT	Select "Optical Stereo" on sound processor to output pink noise to the auditorium.
7.	SET PROCESSOR VOLUME TO "7"	Set the sound processor volume control to level "7" and keep it there for all subsequent adjustments.
8.	CHECK SPL LEVELS ON ALL CHANNELS	Check that the SPL levels for all of the channels are correct (85dBC per channel). If necessary, adjust the L, C and R, output level trimmers on the Cat.242 B-chain card and/or the Ls & Rs trimmers on the Cat.441 card for a level of 85dBC from each channel.
9.	SELECT "DIGITAL" FORMAT	Select the sound processor to DIGITAL format. Check that the red "DECODE-ON" LED is illuminated on the SP23
10.	REMOVE AUTOMATION CONNECTION	Disconnect the D25 automation cable from the SP23. (This is to prevent the sound processor from switching the SP23 back to Optical mode)

11.	SELECT "OPTICAL STEREO" FORMAT	Select the sound processor to OPTICAL STEREO (to send pink noise to the outputs).
12.	TURN OFF SP23 BYPASS	Switch the SP23 out of bypass mode (Red Bypass button OUT).
13.	SELECT "SURROUND" ON THE PINK NOISE CARD	Turn on the Surround switch on the Cat.85C Pink Noise card.
14.	ADJUST SP23 INPUT LEVELS	Adjust the Left Input trimmer on the SP23 so that the two green LEDs for the left channel are equally illuminated. Adjust the Right Input trimmer on the SP23 so that the two green LEDs for the right channel are equally illuminated.
15.	MUTE THE SP23 RIGHT INPUT	On the SP23 press the left channel MUTE button.
16.	COARSE SET LS SPL LEVEL TO 85dBc	Adjust the Left Surround Output trimmer on the SP23 for approximately 85dBC in the auditorium.
17.	EQUALISE LEFT SURROUND CHANNEL	Remove the Left/Right Equaliser card from the SP23 and connect it via the extender card and cable. Adjust the left equaliser controls for a frequency response in accordance with the standard ISO surround channel response curve.
18.	SET LS SPL LEVEL TO 85dBC	Re-adjust the Left Surround Output trimmer on the SP23 for 85dBC in the auditorium.
19.	UNMUTE THE SP23 RIGHT INPUT AND MUTE THE LEFT INPUT.	On the SP23 release the right channel MUTE button and press the left channel MUTE button.
20.	COARSE SET RIGHT SURROUND SPL LEVEL TO 85dBC	Adjust the Right Surround Output trimmer on the SP23 for approximately 85dBC in the auditorium.
21.	EQUALISE RIGHT SURROUND CHANNEL	Adjust the right equaliser controls for a frequency response in accordance with the standard ISO surround channel response curve.

22.	SET RIGHT SURROUND SPL LEVEL TO 85dBC	Re-adjust the Right Surround Output trimmer on the SP23 for 85dBC in the auditorium.
23.	UNMUTE THE LEFT CHANNEL	On the SP23, release the left channel mute button.
24.	**IF A TWO CHANNEL REAR SURROUND AMPLIFIER IS INSTALLED GOTO 31**	
25.	COARSE SET LEFT REAR SURROUND SPL LEVEL to 85dBC	Adjust the Rear Left Surround Output trimmer (CSL) for approximately 85dBC SPL in the auditorium.
26.	EQUALISE REAR SURROUND CHANNEL	Remove the Rear Equaliser from the SP23 and connect it via the extender card and cable. Adjust the left equaliser controls for a frequency response in accordance with the standard ISO surround channel response curve.
27.	SET REAR SURROUND SPL LEVEL TO 91dBC	Replace the Rear Equaliser card and adjust the Rear Left Surround Output trimmer (CSL) on the SP23 for 91dBC in the auditorium.
28.	RE-CONNECT AUTOMATION CABLE	Re-connect the automation cable to the SP23.
29.	REMOVE PINK NOISE CARD	Remove the pink noise card from the processor and replace the CAT.150 decoder card.
30.	**END OF PROCEDURE**	The system is now ready to use.
31.	**ALIGNMENT OF TWO CHANNEL REAR SURROUND AMPLIFIER**	
32.	TURN OFF REAR RIGHT AMPLIFIER	Switch off or disconnect the rear right-surround amplifier.
33.	COARSE SET REAR LEFT SURROUND SPL LEVEL to 85dBC	Adjust the Rear Left Surround Output trimmer (CSL) for approximately 85dBC SPL in the auditorium.

34.	EQUALISE REAR LEFT SURROUND CHANNEL	Remove the Rear Equaliser from the SP23 and connect it via the extender card and cable. Adjust the left equaliser controls for a frequency response in accordance with the standard ISO surround channel response curve.
35.	SET REAR LEFT SURROUND SPL LEVEL TO 88dBC	Adjust the Rear Left Surround Output trimmer (CSL) on the SP23 for 88dBC in the auditorium.
36.	TURN OFF LEFT REAR AMPLIFIER AND TURN ON RIGHT REAR AMPLIFIER	Switch off or disconnect the rear left-surround amplifier and switch on or connect the rear right surround amplifier.
37.	COARSE SET RIGHT REAR SURROUND SPL LEVEL to 85dBC	Adjust the Rear Right Surround Output trimmer (CSR) for approximately 85dBC SPL in the auditorium.
38.	EQUALISE REAR RIGHT SURROUND CHANNEL	Adjust the right equaliser controls for a frequency response in accordance with the standard ISO surround channel response curve.
39.	SET REAR RIGHT SURROUND SPL LEVEL TO 88dBC	Replace the Rear Equaliser card and adjust the Rear Right Surround Output trimmer (CSR) on the SP23 for 88dBC in the auditorium.
40.	TURN ON REAR LEFT AMPLIFIER	Switch on or re-connect the rear left surround amplifier.
41.	RE-CONNECT AUTOMATION CABLE	Re-connect the automation cable to the SP23.
42.	REMOVE PINK NOISE CARD	Remove the pink noise card from the processor and replace the Cat.150 decoder card.
43.	**END OF PROCEDURE**	The system is now ready to use.

3 – ALIGNMENT with DOLBY CP65

Equipment required: Dolby Cat 85C Pink Noise Card, Real Time Analyser (RTA)

1. SET UP REAL TIME ANALYSER	Set up a Real Time Analyser and position the microphones in the auditorium.
2. PRE-SET SP23 OUTPUT LEVELS	Turn all four output trimmers on the SP23 anticlockwise until you feel a slight click.
3. SWITCH SP23 TO BYPASS	Switch the SP23 to bypass mode (Red Bypass button IN).
4. SET THE CP65 SURROUND EQUALISERS TO FLAT	On the CP65 Cat.441 card, turn the Treble and Bass controls for both the Ls and Rs channels to the middle of their rotation. Turn the midrange cut control for both Ls and Rs channels fully clockwise.
5. INSTALL PINK NOISE CARD	Remove the Cat.150 Decoder card from the CP65 sound processor and install the Cat.85C pink noise generator into the slot provided.
6. SELECT "OPTICAL STEREO" FORMAT	Select "Optical Stereo" on sound processor to output pink noise to the auditorium.
7. SET PROCESSOR VOLUME TO "7.0"	Set the sound processor volume control to level "7.0" and keep it there for all subsequent adjustments.
8. CHECK SPL LEVELS ON ALL CHANNELS	Check that the SPL levels for all of the channels are correct (85dBC per channel). If necessary, adjust the L, C and R, output level trimmers on the Cat.242 B-chain card and/or the Ls & Rs trimmers on the Cat.441 card for a level of 85dBC from each channel.
9. SELECT "DIGITAL" FORMAT	Select the sound processor to DIGITAL format. Check that the red "DECODE-ON" LED is illuminated on the SP23
10. REMOVE AUTOMATION CONNECTION	Disconnect the D25 automation cable from the SP23. (This is to prevent the sound processor from switching the SP23 back to Optical mode)

11.	SELECT "OPTICAL STEREO" FORMAT	Select the sound processor to OPTICAL STEREO (to send pink noise to the outputs).
12.	TURN OFF SP23 BYPASS	Switch the SP23 out of bypass mode (Red Bypass button OUT).
13.	SELECT "SURROUND" ON THE PINK NOISE CARD	Turn on the Surround" switch on the Cat.85C Pink Noise card.
14.	ADJUST SP23 INPUT LEVELS	Adjust the Left Input trimmer on the SP23 so that the two green LEDs for the left channel are equally illuminated. Adjust the Right Input trimmer on the SP23 so that the two green LEDs for the right channel are equally illuminated.
15.	MUTE THE SP23 RIGHT INPUT	On the SP23 press the left channel MUTE button.
16.	COARSE SET LS SPL LEVEL TO 85dBC	Adjust the Left Surround Output trimmer on the SP23 for approximately 85dBC in the auditorium.
17.	EQUALISE LEFT SURROUND CHANNEL	Remove the Left/Right Equaliser card from the SP23 and connect it via the extender card and cable. Adjust the left equaliser controls for a frequency response in accordance with the standard ISO surround channel response curve.
18.	SET LS SPL LEVEL TO 85dBC	Re-adjust the Left Surround Output trimmer on the SP23 for 85dBC in the auditorium.
19.	UNMUTE THE SP23 RIGHT INPUT AND MUTE THE LEFT INPUT.	On the SP23 release the right channel MUTE button and press the left channel MUTE button.
20.	COARSE SET RIGHT SURROUND SPL LEVEL TO 85dBC	Adjust the Right Surround Output trimmer on the SP23 for approximately 85dBC in the auditorium.
21.	EQUALISE RIGHT SURROUND CHANNEL	Adjust the right equaliser controls for a frequency response in accordance with the standard ISO surround channel response curve.

22.	SET RIGHT SURROUND SPL LEVEL TO 85dBC	Re-adjust the Right Surround Output trimmer on the SP23 for 85dBC in the auditorium.
23.	UNMUTE THE LEFT CHANNEL	On the SP23, release the left channel MUTE button.
24.	**IF A TWO CHANNEL REAR SURROUND AMPLIFIER IS INSTALLED GOTO 31**	
25.	COARSE SET LEFT REAR SURROUND SPL LEVEL to 85dBC	Adjust the Rear Left Surround Output trimmer (CSL) for approximately 85dBC SPL in the auditorium.
26.	EQUALISE REAR SURROUND CHANNEL	Remove the Rear Equaliser from the SP23 and connect it via the extender card and cable. Adjust the left equaliser controls for a frequency response in accordance with the standard ISO surround channel response curve.
27.	SET REAR SURROUND SPL LEVEL TO 91dBC	Replace the Rear Equaliser card and adjust the Rear Left Surround Output trimmer (CSL) on the SP23 for 91dBC in the auditorium.
28.	RE-CONNECT AUTOMATION CABLE	Re-connect the automation cable to the SP23.
29.	REMOVE PINK NOISE CARD	Remove the pink noise card from the processor and replace the Cat.150 decoder card.
30.	**END OF PROCEDURE**	The system is now ready to use.
31.	**ALIGNMENT OF TWO CHANNEL REAR SURROUND AMPLIFIER**	
32.	TURN OFF REAR RIGHT AMPLIFIER	Switch off or disconnect the rear right-surround amplifier.
33.	COARSE SET REAR LEFT SURROUND SPL LEVEL to 85dBC	Adjust the Rear Left Surround Output trimmer (CSL) for approximately 85dBC SPL in the auditorium.

34.	EQUALISE REAR LEFT SURROUND CHANNEL	Remove the Rear Equaliser from the SP23 and connect it via the extender card and cable. Adjust the left equaliser controls for a frequency response in accordance with the standard ISO surround channel response curve.
35.	SET REAR LEFT SURROUND SPL LEVEL TO 88dBC	Adjust the Rear Left Surround Output trimmer (CSL) on the SP23 for 88dBC in the auditorium.
36.	TURN OFF LEFT REAR AMPLIFIER AND TURN ON RIGHT REAR AMPLIFIER	Switch off or disconnect the rear left-surround amplifier and switch on or connect the rear right surround amplifier.
37.	COARSE SET RIGHT REAR SURROUND SPL LEVEL to 85dBC	Adjust the Rear Right Surround Output trimmer (CSR) for approximately 85dBC SPL in the auditorium.
38.	EQUALISE REAR RIGHT SURROUND CHANNEL	Adjust the right equaliser controls for a frequency response in accordance with the standard ISO surround channel response curve.
39.	SET REAR RIGHT SURROUND SPL LEVEL TO 88dBC	Replace the Rear Equaliser card and adjust the Rear Right Surround Output trimmer (CSR) on the SP23 for 88dBC in the auditorium.
40.	TURN ON REAR LEFT AMPLIFIER	Switch on or re-connect the rear left surround amplifier.
41.	RE-CONNECT AUTOMATION CABLE	Re-connect the automation cable to the SP23.
42.	REMOVE PINK NOISE CARD	Remove the pink noise card from the processor and replace the Cat.150 decoder card.
43.	**END OF PROCEDURE**	The system is now ready to use.

4 – ALIGNMENT with DOLBY CP500

Equipment required: Pink Noise Card, Real Time Analyser (RTA)

1. SET UP REAL TIME ANALYSER	Set up a Real Time Analyser and position the microphones in the auditorium.
2. PRE-SET SP23 OUTPUT LEVELS	Turn all four output trimmers on the SP23 anticlockwise until you feel a slight click.
3. SWITCH SP23 TO BYPASS	Switch the SP23 to bypass mode (Red Bypass button IN).
4. DISABLE CP500 SURROUND EQUALISERS	On the CP500, press the MENU key. Press ALIGNMENT. Press B-CHAIN ALIGNMENT. Press B-CHAIN EQUALISATION. Use the fader knob to select LEFT SURROUND then press OK. After the RTA screen appears, press FLAT. A dialogue box will appear – Set the EQ to flat? Press OK Press Exit then press OK to save the settings. Press B-Chain Equalisation Use the fader knob to select Right Surround Press OK After the RTA screen appears, press FLAT. A dialogue box will appear – Set the EQ to flat? Press OK Press Exit then press OK to save the settings.
5. SET PROCESSOR VOLUME TO "7.0"	Set the sound processor volume control to level "7.0" and keep it there for all subsequent adjustments.
6. CHECK SPL LEVELS ON ALL CHANNELS	On the CP500 select "Adjust Output Levels". Check that the SPL levels for all of the channels are correct (85dBC for each front channel and 82dBC for the surround channels). If necessary, adjust the L, C, R output levels for a level of 85dBC from each channel, and adjust the Ls and Rs output levels for a level of 82dBC from each channel.
7. SELECT "DIGITAL" FORMAT	Select the sound processor to DIGITAL format. Check that the red "DECODE-ON" LED is illuminated on the SP23

8.	REMOVE AUTOMATION CONNECTION	Disconnect the D25 automation cable from the SP23. (This is to prevent the sound processor from switching the SP23 back to Optical mode)
9.	TURN OFF SP23 BYPASS	Switch the SP23 out of bypass mode (Red Bypass button OUT).
10.	SELECT PINK NOISE TO LEFT SURROUND	On the CP500 use the fader knob to select the Ls channel. Do not adjust the output level of the CP500.
11.	ADJUST SP23 LS INPUT LEVEL	Adjust the Left Input trimmer on the SP23 so that the two green LEDs for the left channel are equally illuminated.
12.	COARSE SET LS SPL LEVEL TO 82dBC	Adjust the Left Surround Output trimmer on the SP23 for approximately 82dBC in the auditorium.
13.	EQUALISE LEFT SURROUND CHANNEL	Remove the Left/Right Equaliser card from the SP23 and connect it via the extender card and cable. Adjust the left equaliser controls for a frequency response in accordance with the standard ISO surround channel response curve.
14.	SET LS SPL LEVEL TO 82dBC	Re-adjust the Left Surround Output trimmer on the SP23 for 82dBC in the auditorium.
15.	SELECT PINK NOISE TO RIGHT SURROUND	On the CP500 use the fader knob to select the Rs channel. Do not adjust the output level of the CP500.
16.	ADJUST SP23 RIGHT SURROUND INPUT LEVEL	Adjust the Right Input trimmer on the SP23 so that the two green LEDs for the right channel are equally illuminated.
17.	COARSE SET RIGHT SURROUND SPL LEVEL TO 82dBC	Adjust the Right Surround Output trimmer on the SP23 for approximately 82dBC in the auditorium.
18.	EQUALISE RIGHT SURROUND CHANNEL	Adjust the right equaliser controls for a frequency response in accordance with the standard ISO surround channel response curve.

19.	SET RIGHT SURROUND SPL LEVEL TO 82dBC	Re-adjust the Right Surround Output trimmer on the SP23 for 82dBC in the auditorium.
20.	SELECT PINK NOISE TO Ms CHANNEL	On the CP500 use the fader knob to select the Ms channel. Do not adjust the output level of the CP500.
21.	**IF A TWO CHANNEL REAR SURROUND AMPLIFIER IS INSTALLED GOTO 31**	
22.	COARSE SET LEFT REAR SURROUND SPL LEVEL to 82dBC	Adjust the Rear Left Surround Output trimmer (CSL) for approximately 82dBC SPL in the auditorium.
23.	EQUALISE REAR SURROUND CHANNEL	Remove the Rear Equaliser from the SP23 and connect it via the extender card and cable. Adjust the left equaliser controls for a frequency response in accordance with the standard ISO surround channel response curve.
24.	SET REAR SURROUND SPL LEVEL TO 88dBC	Replace the Rear Equaliser card and adjust the Rear Left Surround Output trimmer (CSL) on the SP23 for 88dBC in the auditorium.
25.	RE-CONNECT AUTOMATION CABLE	Re-connect the automation cable to the SP23.
26.	**END OF PROCEDURE**	The system is now ready to use.
27.	**ALIGNMENT OF TWO CHANNEL REAR SURROUND AMPLIFIER**	
28.	TURN OFF REAR RIGHT AMPLIFIER	Switch off or disconnect the rear right-surround amplifier.
29.	COARSE SET REAR LEFT SURROUND SPL LEVEL to 82dBC	Adjust the Rear Left Surround Output trimmer (CSL) for approximately 82dBC SPL in the auditorium.

30.	EQUALISE REAR LEFT SURROUND CHANNEL	Remove the Rear Equaliser from the SP23 and connect it via the extender card and cable. Adjust the left equaliser controls for a frequency response in accordance with the standard ISO surround channel response curve.
31.	SET REAR LEFT SURROUND SPL LEVEL TO 85dBC	Adjust the Rear Left Surround Output trimmer (CSL) on the SP23 for 85dBC in the auditorium.
32.	TURN OFF LEFT REAR AMPLIFIER AND TURN ON RIGHT REAR AMPLIFIER	Switch off or disconnect the rear left-surround amplifier and switch on or connect the rear right surround amplifier.
33.	COARSE SET RIGHT REAR SURROUND SPL LEVEL to 82dBC	Adjust the Rear Right Surround Output trimmer (CSR) for approximately 82dBC SPL in the auditorium.
34.	EQUALISE REAR RIGHT SURROUND CHANNEL	Adjust the right equaliser controls for a frequency response in accordance with the standard ISO surround channel response curve.
35.	SET REAR RIGHT SURROUND SPL LEVEL TO 85dBC	Replace the Rear Equaliser card and adjust the Rear Right Surround Output trimmer (CSR) on the SP23 for 85dBC in the auditorium.
36.	TURN ON REAR LEFT AMPLIFIER	Switch on or re-connect the rear left surround amplifier.
37.	RE-CONNECT AUTOMATION CABLE	Re-connect the automation cable to the SP23.
38.	**END OF PROCEDURE**	The system is now ready to use.

5 – ALIGNMENT with SMART MOD VI with DSP MATRIX

Equipment required: Real Time Analyser (RTA)

1. SET UP REAL TIME ANALYSER	Set up a Real Time Analyser and position the microphones in the auditorium.
2. PRE-SET SP23 OUTPUT LEVELS	Turn all four output trimmers on the SP23 anticlockwise until you feel a slight click.
3. SWITCH SP23 TO BYPASS	Switch the SP23 to bypass mode (Red Bypass button IN).
4. SET THE MOD VI SURROUND EQUALISERS TO FLAT	Open the front panel of the MOD VI processor and set all of the surround equaliser controls to the mid position. This should be done as accurately as possible.
5. SELECT "OPTICAL STEREO" FORMAT	Select "Optical Stereo" on sound processor to output pink noise to the auditorium. Check that the "DECODE-OFF" LED is illuminated on the SP23
6. SET PROCESSOR VOLUME TO "CAL"	Set the sound processor volume control to the CAL position and keep it there for all subsequent adjustments.
7. CHECK SPL LEVELS ON ALL CHANNELS	Using the pink noise generator in the MOD VI check that the SPL levels for all of the channels are correct (85dBC per channel). If not, adjust the output level trimmers on the MOD VI for a level of 85dBC from each channel. Pink Noise is selected by turning the Time Delay switch on the MOD VI matrix board to positions A through F. This will select Left, Right, Centre, Left Surround, Right Surround, and Sub. Note the delay setting before disturbing this switch.
8. TURN OFF THE REAR SURROUND AMPLIFIER(S)	Switch off the rear amplifier or disconnect both the left and right inputs to the rear amplifier.
9. TURN OFF SP23 BYPASS	Switch the SP23 out of bypass mode (Red Bypass button OUT).
10. SET PINK NOISE TO LS	Select the Pink Noise generator output to Left Surround. (Time Delay switch position "D").

11. ADJUST SP23 LS INPUT LEVEL	Adjust the Left Input trimmer on the SP23 so that the two green LEDs for the left channel are equally illuminated.
12. COARSE SET LS SPL LEVEL TO 82dBC	Adjust the Left Surround Output trimmer on the SP23 for approximately 82dBC in the auditorium.
13. EQUALISE LEFT SURROUND CHANNEL	Remove the Left/Right Equaliser card from the SP23 and connect it via the extender card and cable. Adjust the left equaliser controls for a frequency response in accordance with the standard ISO surround channel response curve.
14. SET LS SPL LEVEL TO 82dBC	Re-adjust the Left Surround Output trimmer on the SP23 for 82dBC in the auditorium.
15. SET PINK NOISE TO RIGHT SURROUND	Select the Pink Noise generator output to Right Surround. (Time Delay switch position "E").
16. ADJUST SP23 RIGHT SURROUND INPUT LEVEL	Adjust the Right Input trimmer on the SP23 so that the two green LEDs for the right channel are equally illuminated.
17. COARSE SET RIGHT SURROUND SPL LEVEL TO 82dBC	Adjust the Right Surround Output trimmer on the SP23 for approximately 82dBC in the auditorium.
18. EQUALISE RIGHT SURROUND CHANNEL	Adjust the right equaliser controls for a frequency response in accordance with the standard ISO surround channel response curve.
19. SET RIGHT SURROUND SPL LEVEL TO 82dBC	Re-adjust the Right Surround Output trimmer on the SP23 for 82dBC in the auditorium.
20. SET PINK NOISE TO LEFT SURROUND	Select the Pink Noise generator output to Left Surround. (Time Delay switch position "D").
21. TURN OFF THE LEFT AND RIGHT SURROUND AMPLIFIER(S)	Switch off or disconnect the inputs to the left surround and right surround amplifier(s).

22. **IF A TWO CHANNEL REAR SURROUND AMPLIFIER IS INSTALLED GOTO 31**	
23. TURN ON THE REAR SURROUND AMPLIFIER.	Switch on, or re-connect the input to the rear surround amplifier.
24. COARSE SET REAR SURROUND SPL LEVEL to 82dBC	Adjust the Rear Left Surround Output trimmer (CSL) for approximately 82dBC SPL in the auditorium.
25. EQUALISE REAR SURROUND CHANNEL	Remove the Rear Equaliser from the SP23 and connect it via the extender card and cable. Adjust the left equaliser controls for a frequency response in accordance with the standard ISO surround channel response curve.
26. SET REAR SURROUND SPL LEVEL TO 82dBC	Replace the Rear Equaliser card and adjust the Rear Left Surround Output trimmer (CSL) on the SP23 for 82dBC in the auditorium.
27. RE-CONNECT AUTOMATION CABLE	Re-connect the automation cable to the SP23.
28. TURN OFF PINK NOISE	Select the appropriate time delay setting on the MOD VI Matrix board which will turn off the pink noise source.
29. TURN ON THE LEFT AND RIGHT SURROUND AMPLIFIER(S)	Switch on, or re-connect the inputs to the left surround and right surround amplifier(s).
30. **END OF PROCEDURE**	The system is now ready to use.
31. **ALIGNMENT OF TWO CHANNEL REAR SURROUND AMPLIFIER**	
32. TURN ON THE REAR LEFT AMPLIFIER	Switch on or re-connect the rear left surround amplifier.
33. COARSE SET REAR LEFT SURROUND SPL LEVEL to 82dBC	Adjust the Rear Left Surround Output trimmer (CSL) for approximately 82dBC SPL in the auditorium.

34.	EQUALISE REAR LEFT SURROUND CHANNEL	Remove the Rear Equaliser from the SP23 and connect it via the extender card and cable. Adjust the left equaliser controls for a frequency response in accordance with the standard ISO surround channel response curve.
35.	SET REAR LEFT SURROUND SPL LEVEL TO 79dBC	Adjust the Rear Left Surround Output trimmer (CSL) on the SP23 for 79dBC in the auditorium.
36.	TURN OFF LEFT REAR AMPLIFIER AND TURN ON RIGHT REAR AMPLIFIER	Switch off or disconnect the rear left surround amplifier and switch on or re-connect the rear right surround amplifier.
37.	SET PINK NOISE TO RIGHT SURROUND	Select the Pink Noise generator output to Right Surround. (Time Delay switch position "E").
38.	COARSE SET RIGHT REAR SURROUND SPL LEVEL to 82dBC	Adjust the Rear Right Surround Output trimmer (CSR) for approximately 82dBC SPL in the auditorium.
39.	EQUALISE REAR RIGHT SURROUND CHANNEL	Adjust the right equaliser controls for a frequency response in accordance with the standard ISO surround channel response curve.
40.	SET REAR RIGHT SURROUND SPL LEVEL TO 79dBC	Replace the Rear Equaliser card and adjust the Rear Right Surround Output trimmer (CSR) on the SP23 for 79dBC in the auditorium.
41.	TURN OFF PINK NOISE	Select the appropriate time delay setting on the MOD VI Matrix board which will turn off the pink noise source.
42.	TURN ON REAR LEFT AMPLIFIER	Switch on or re-connect the rear left surround amplifier.
43.	TURN ON LEFT AND RIGHT SURROUND AMPLIFIERS	Switch on, or re-connect the inputs to the left and right surround amplifier(s).
44.	**END OF PROCEDURE**	The system is now ready to use.

6 – ALIGNMENT with SMART MOD VI with Analog Matrix

Equipment required: Real Time Analyser (RTA)

1. SET UP REAL TIME ANALYSER	Set up a Real Time Analyser and position the microphones in the auditorium.
2. PRE-SET SP23 OUTPUT LEVELS	Turn all four output trimmers on the SP23 anticlockwise until you feel a slight click.
3. SWITCH SP23 TO BYPASS	Switch the SP23 to bypass mode (Red Bypass button IN).
4. SET THE MOD VI SURROUND EQUALISERS TO FLAT	Open the front panel of the MOD VI processor and set all of the surround equaliser controls to the mid position. This should be done as accurately as possible.
5. SELECT "OPTICAL STEREO" FORMAT	Select "Optical Stereo" on sound processor to output pink noise to the auditorium. Select Pink Noise by setting (on the matrix card) SW1-8 down and selecting SW2-1 through 6 down for each channel. 1=Left, 2=Center, 3=Right, 4=LS, 5=RS, and 6=Sub
6. SET PROCESSOR VOLUME TO "CAL"	Set the sound processor volume control to the CAL position and keep it there for all subsequent adjustments.
7. CHECK SPL LEVELS ON ALL CHANNELS	Check that the SPL levels for all of the channels are correct (85dBC per channel). If not, adjust the output level trimmers on the MOD VI for a level of 85dBC from each channel.
8. SELECT "DIGITAL" FORMAT	Select the sound processor to DIGITAL format. Check that the red "DECODE-ON" LED is illuminated on the SP23
9. REMOVE AUTOMATION CONNECTION	Disconnect the D25 automation cable from the SP23. (This is to prevent the sound processor from switching the SP23 back to Optical mode)
10. SELECT "OPTICAL STEREO" FORMAT	Select the sound processor to OPTICAL STEREO (to send pink noise to the outputs).

11. TURN OFF SP23 BYPASS	Switch the SP23 out of bypass mode (Red Bypass button OUT).
12. SET PINK NOISE TO LS	Switch on the Pink Noise generator to Left Surround.
13. ADJUST SP23 LS INPUT LEVEL	Adjust the Left Input trimmer on the SP23 so that the two green LEDs for the left channel are equally illuminated.
14. COARSE SET LS SPL LEVEL TO 85dBC	Adjust the Left Surround Output trimmer on the SP23 for approximately 85dBC in the auditorium.
15. EQUALISE LEFT SURROUND CHANNEL	Remove the Left/Right Equaliser card from the SP23 and connect it via the extender card and cable. Adjust the left equaliser controls for a frequency response in accordance with the standard ISO surround channel response curve.
16. SET LS SPL LEVEL TO 85dBC	Re-adjust the Left Surround Output trimmer on the SP23 for 85dBC in the auditorium.
17. SET PINK NOISE TO RIGHT SURROUND	Set the Pink Noise generator to Right Surround.
18. ADJUST SP23 RIGHT SURROUND INPUT LEVEL	Adjust the Right Input trimmer on the SP23 so that the two green LEDs for the right channel are equally illuminated.
19. COARSE SET RIGHT SURROUND SPL LEVEL TO 85dBC	Adjust the Right Surround Output trimmer on the SP23 for approximately 85dBC in the auditorium.
20. EQUALISE RIGHT SURROUND CHANNEL	Adjust the right equaliser controls for a frequency response in accordance with the standard ISO surround channel response curve.
21. SET RIGHT SURROUND SPL LEVEL TO 85dBC	Re-adjust the Right Surround Output trimmer on the SP23 for 85dBC in the auditorium.
22. SELECT BOTH LS AND RS PINK NOISE	Set SW2-4 and 5 down.

23.	**IF A TWO CHANNEL REAR SURROUND AMPLIFIER IS INSTALLED GOTO 31**	
24.	COARSE SET LEFT REAR SURROUND SPL LEVEL to 85dBC	Adjust the Rear Left Surround Output trimmer (CSL) for approximately 85dBC SPL in the auditorium.
25.	EQUALISE REAR SURROUND CHANNEL	Remove the Rear Equaliser from the SP23 and connect it via the extender card and cable. Adjust the left equaliser controls for a frequency response in accordance with the standard ISO surround channel response curve.
26.	SET REAR SURROUND SPL LEVEL TO 91dBC	Replace the Rear Equaliser card and adjust the Rear Left Surround Output trimmer (CSL) on the SP23 for 91dBC in the auditorium.
27.	RE-CONNECT AUTOMATION CABLE	Re-connect the automation cable to the SP23.
28.	TURN OFF PINK NOISE	Set SW1-8 up and all SW2 switches up
29.	**END OF PROCEDURE**	The system is now ready to use.
30.	**ALIGNMENT OF TWO CHANNEL REAR SURROUND AMPLIFIER**	
31.	TURN OFF REAR RIGHT AMPLIFIER	Switch off or disconnect the rear right-surround amplifier.
32.	COARSE SET REAR LEFT SURROUND SPL LEVEL to 85dBC	Adjust the Rear Left Surround Output trimmer (CSL) for approximately 85dBC SPL in the auditorium.
33.	EQUALISE REAR LEFT SURROUND CHANNEL	Remove the Rear Equaliser from the SP23 and connect it via the extender card and cable. Adjust the left equaliser controls for a frequency response in accordance with the standard ISO surround channel response curve.

34. SET REAR LEFT SURROUND SPL LEVEL TO 88dBC	Adjust the Rear Left Surround Output trimmer (CSL) on the SP23 for 88dBC in the auditorium.
35. TURN OFF LEFT REAR AMPLIFIER AND TURN ON RIGHT REAR AMPLIFIER	Switch off or disconnect the rear left-surround amplifier and switch on or connect the rear right surround amplifier.
36. COARSE SET RIGHT REAR SURROUND SPL LEVEL to 85dBC	Adjust the Rear Right Surround Output trimmer (CSR) for approximately 85dBC SPL in the auditorium.
37. EQUALISE REAR RIGHT SURROUND CHANNEL	Adjust the right equaliser controls for a frequency response in accordance with the standard ISO surround channel response curve.
38. SET REAR RIGHT SURROUND SPL LEVEL TO 88dBC	Replace the Rear Equaliser card and adjust the Rear Right Surround Output trimmer (CSR) on the SP23 for 88dBC in the auditorium.
39. TURN ON REAR LEFT AMPLIFIER	Switch on or re-connect the rear left surround amplifier.
40. RE-CONNECT AUTOMATION CABLE	Re-connect the automation cable to the SP23.
41. TURN OFF PINK NOISE	Set SW1-8 up and all SW2 switches up
42. END OF PROCEDURE	The system is now ready to use.

7 – ALIGNMENT with SMART MOD IIC

Equipment required: SMART Pink Noise Card, Real Time Analyser (RTA)

1.	SET UP REAL TIME ANALYSER	Set up a Real Time Analyser and position the microphones in the auditorium.
2.	PRE-SET SP23 OUTPUT LEVELS	Turn all four output trimmers on the SP23 anticlockwise until you feel a slight click.
3.	SWITCH SP23 TO BYPASS	Switch the SP23 to bypass mode (Red Bypass button IN).
4.	SET THE MOD IIC SURROUND EQUALISERS TO FLAT	On the MOD IIC SURROUND EQ card turn the EQ trimpots to their mid positions. This should be done as accurately as possible.
5.	INSTALL PINK NOISE CARD	Remove the matrix card from the MOD IIC sound processor and install the SMART pink noise generator into the matrix slot.
6.	SELECT "OPTICAL STEREO" FORMAT	Select "Optical Stereo" on sound processor to output pink noise to the auditorium.
7.	SET PROCESSOR VOLUME TO "CAL"	Set the sound processor volume control to the CAL position and keep it there for all subsequent adjustments.
8.	CHECK SPL LEVELS ON ALL CHANNELS	Check that the SPL levels for all of the channels are correct (85dBC per channel). If necessary, adjust the L, C, R, Ls and Rs output level trimmers on the output card for a level of 85dBC from each channel.
9.	SELECT "DIGITAL" FORMAT	Select the sound processor to DIGITAL format. Check that the red "DECODE-ON" LED is illuminated on the SP23
10.	REMOVE AUTOMATION CONNECTION	Disconnect the D25 automation cable from the SP23. (This is to prevent the sound processor from switching the SP23 back to Optical mode)
11.	SELECT "OPTICAL STEREO" FORMAT	Select the sound processor to OPTICAL STEREO (to send pink noise to the outputs).

12.	TURN OFF SP23 BYPASS	Switch the SP23 out of bypass mode (Red Bypass button OUT).
13.	SELECT "SURROUND" ON THE PINK NOISE CARD	Turn on the Surround switch on the SMART Pink Noise card.
14.	ADJUST SP23 INPUT LEVELS	Adjust the Left Input trimmer on the SP23 so that the two green LEDs for the left channel are equally illuminated. Adjust the Right Input trimmer on the SP23 so that the two green LEDs for the right channel are equally illuminated.
15.	MUTE THE SP23 RIGHT INPUT	On the SP23 press the left channel MUTE button.
16.	COARSE SET LS SPL LEVEL TO 85dBc	Adjust the Left Surround Output trimmer on the SP23 for approximately 85dBC in the auditorium.
17.	EQUALISE LEFT SURROUND CHANNEL	Remove the Left/Right Equaliser card from the SP23 and connect it via the extender card and cable. Adjust the left equaliser controls for a frequency response in accordance with the standard ISO surround channel response curve.
18.	SET LS SPL LEVEL TO 85dBC	Re-adjust the Left Surround Output trimmer on the SP23 for 85dBC in the auditorium.
19.	UNMUTE THE SP23 RIGHT INPUT AND MUTE THE LEFT INPUT.	On the SP23 release the right channel MUTE button and press the left channel MUTE button.
20.	COARSE SET RIGHT SURROUND SPL LEVEL TO 85dBC	Adjust the Right Surround Output trimmer on the SP23 for approximately 85dBC in the auditorium.
21.	EQUALISE RIGHT SURROUND CHANNEL	Adjust the right equaliser controls for a frequency response in accordance with the standard ISO surround channel response curve.
22.	SET RIGHT SURROUND SPL LEVEL TO 85dBC	Re-adjust the Right Surround Output trimmer on the SP23 for 85dBC in the auditorium.

23.	UNMUTE THE LEFT CHANNEL	On the SP23, release the left channel mute button.
24.	**IF A TWO CHANNEL REAR SURROUND AMPLIFIER IS INSTALLED GOTO 31**	
25.	COARSE SET LEFT REAR SURROUND SPL LEVEL to 85dBC	Adjust the Rear Left Surround Output trimmer (CSL) for approximately 85dBC SPL in the auditorium.
26.	EQUALISE REAR SURROUND CHANNEL	Remove the Rear Equaliser from the SP23 and connect it via the extender card and cable. Adjust the left equaliser controls for a frequency response in accordance with the standard ISO surround channel response curve.
27.	SET REAR SURROUND SPL LEVEL TO 91dBC	Replace the Rear Equaliser card and adjust the Rear Left Surround Output trimmer (CSL) on the SP23 for 91dBC in the auditorium.
28.	RE-CONNECT AUTOMATION CABLE	Re-connect the automation cable to the SP23.
29.	REMOVE PINK NOISE CARD	Remove the pink noise card from the processor and replace the matrix card.
30.	**END OF PROCEDURE**	The system is now ready to use.
31.	**ALIGNMENT OF TWO CHANNEL REAR SURROUND AMPLIFIER**	
32.	TURN OFF REAR RIGHT AMPLIFIER	Switch off or disconnect the rear right-surround amplifier.
33.	COARSE SET REAR LEFT SURROUND SPL LEVEL to 85dBC	Adjust the Rear Left Surround Output trimmer (CSL) for approximately 85dBC SPL in the auditorium.

34.	EQUALISE REAR LEFT SURROUND CHANNEL	Remove the Rear Equaliser from the SP23 and connect it via the extender card and cable. Adjust the left equaliser controls for a frequency response in accordance with the standard ISO surround channel response curve.
35.	SET REAR LEFT SURROUND SPL LEVEL TO 88dBC	Adjust the Rear Left Surround Output trimmer (CSL) on the SP23 for 88dBC in the auditorium.
36.	TURN OFF LEFT REAR AMPLIFIER AND TURN ON RIGHT REAR AMPLIFIER	Switch off or disconnect the rear left-surround amplifier and switch on or connect the rear right surround amplifier.
37.	COARSE SET RIGHT REAR SURROUND SPL LEVEL to 85dBC	Adjust the Rear Right Surround Output trimmer (CSR) for approximately 85dBC SPL in the auditorium.
38.	EQUALISE REAR RIGHT SURROUND CHANNEL	Adjust the right equaliser controls for a frequency response in accordance with the standard ISO surround channel response curve.
39.	SET REAR RIGHT SURROUND SPL LEVEL TO 88dBC	Replace the Rear Equaliser card and adjust the Rear Right Surround Output trimmer (CSR) on the SP23 for 88dBC in the auditorium.
40.	TURN ON REAR LEFT AMPLIFIER	Switch on or re-connect the rear left surround amplifier.
41.	RE-CONNECT AUTOMATION CABLE	Re-connect the automation cable to the SP23.
42.	REMOVE PINK NOISE CARD	Remove the pink noise card from the processor and replace the matrix card.
43.	**END OF PROCEDURE**	The system is now ready to use.

8 – ALIGNMENT with ULTRA STEREO JSX1000

Equipment required: Pink Noise Card, Real Time Analyser (RTA)

1. SET UP REAL TIME ANALYSER	Set up a Real Time Analyser and position the microphones in the auditorium.
2. PRE-SET SP23 OUTPUT LEVELS	Turn all four output trimmers on the SP23 anticlockwise until you feel a slight click.
3. SWITCH SP23 TO BYPASS	Switch the SP23 to bypass mode (Red Bypass button IN).
4. SET THE JSX-1000 SURROUND EQUALISERS TO FLAT	Remove the surround equaliser card (if fitted) and set all controls to the mid position. This should be done as accurately as possible.
5. INSTALL PINK NOISE CARD	Remove the Synthesiser card (if fitted) from the sound processor and install the pink noise generator in it's place.
6. SELECT "SYN/AUX" FORMAT	Select "Syn/Aux" format on sound processor to output pink noise to the auditorium.
7. SET PROCESSOR VOLUME TO "7"	Set the sound processor volume control to level "7" and keep it there for all subsequent adjustments.
8. CHECK SPL LEVELS ON ALL `CHANNELS	Check that the SPL levels for all of the channels are correct (85dBC per channel). If not, adjust the output level trimmers on the equaliser modules for a level of 85dBC from each channel.
9. SELECT "DIGITAL/EXT" FORMAT	Select the sound processor to DIGITAL/EXT format. Check that the red "DECODE-ON" LED is illuminated on the SP23
10. REMOVE AUTOMATION CONNECTION	Disconnect the D25 automation cable from the SP23. (This is to prevent the sound processor from switching the SP23 back to Optical mode)
11. SELECT "SYN/AUX" FORMAT	Select the sound processor to Syn/Aux format (to send pink noise to the outputs).

12.	TURN OFF SP23 BYPASS	Switch the SP23 out of bypass mode (Red Bypass button OUT).
13.	SELECT "SURROUND" ON THE PINK NOISE CARD	Switch on the Surround button on the Pink Noise card.
14.	ADJUST SP23 INPUT LEVELS	Adjust the Left Input trimmer on the SP23 so that the two green LEDs for the left channel are equally illuminated. Adjust the right Input trimmer on the SP23 so that the two green LEDs for the right channel are equally illuminated.
15.	MUTE THE SP23 RIGHT INPUT	On the SP23, press the left channel MUTE button.
16.	COARSE SET LS SPL LEVEL TO 85dBC	Adjust the Left Surround Output trimmer on the SP23 for approximately 85dBC in the auditorium.
17.	EQUALISE LEFT SURROUND CHANNEL	Remove the Left/Right Equaliser card from the SP23 and connect it via the extender card and cable. Adjust the left equaliser controls for a frequency response in accordance with the standard ISO surround channel response curve.
18.	SET LS SPL LEVEL TO 85dBC	Re-adjust the Left Surround Output trimmer on the SP23 for 85dBC in the auditorium.
19.	UNMUTE THE SP23 RIGHT INPUT AND MUTE THE LEFT INPUT	On the SP23, release the right channel MUTE button and press the left channel MUTE button.
20.	COARSE SET RIGHT SURROUND SPL LEVEL TO 85dBC	Adjust the Right Surround Output trimmer on the SP23 for approximately 85dBC in the auditorium.
21.	EQUALISE RIGHT SURROUND CHANNEL	Adjust the right equaliser controls for a frequency response in accordance with the standard ISO surround channel response curve.
22.	SET RIGHT SURROUND SPL LEVEL TO 85dBC	Re-adjust the Right Surround Output trimmer on the SP23 for 85dBC in the auditorium.

23.	UNMUTE THE LEFT CHANNEL	On the SP23, release the left channel MUTE button.
24.	**IF A TWO CHANNEL REAR SURROUND AMPLIFIER IS INSTALLED GOTO 31**	
25.	COARSE SET LEFT REAR SURROUND SPL LEVEL to 85dBC	Adjust the Rear Left Surround Output trimmer (CSL) for approximately 85dBC SPL in the auditorium.
26.	EQUALISE REAR SURROUND CHANNEL	Remove the Rear Equaliser from the SP23 and connect it via the extender card and cable. Adjust the left equaliser controls for a frequency response in accordance with the standard ISO surround channel response curve.
27.	SET REAR SURROUND SPL LEVEL TO 91dBC	Replace the Rear Equaliser card and adjust the Rear Left Surround Output trimmer (CSL) on the SP23 for 91dBC in the auditorium.
28.	RE-CONNECT AUTOMATION CABLE	Re-connect the automation cable to the SP23.
29.	REMOVE PINK NOISE CARD	Remove the pink noise card from the processor and replace with the Synthesiser card (if fitted).
30.	**END OF PROCEDURE**	The system is now ready to use.
31.	**ALIGNMENT OF TWO CHANNEL REAR SURROUND AMPLIFIER**	
32.	TURN OFF REAR RIGHT AMPLIFIER	Switch off or disconnect the rear right-surround amplifier.
33.	COARSE SET REAR LEFT SURROUND SPL LEVEL to 85dBC	Adjust the Rear Left Surround Output trimmer (CSL) for approximately 85dBC SPL in the auditorium.

34.	EQUALISE REAR LEFT SURROUND CHANNEL	Remove the Rear Equaliser from the SP23 and connect it via the extender card and cable. Adjust the left equaliser controls for a frequency response in accordance with the standard ISO surround channel response curve.
35.	SET REAR LEFT SURROUND SPL LEVEL TO 88dBC	Adjust the Rear Left Surround Output trimmer (CSL) on the SP23 for 88dBC in the auditorium.
36.	TURN OFF LEFT REAR AMPLIFIER AND TURN ON RIGHT REAR AMPLIFIER	Switch off or disconnect the rear left-surround amplifier and switch on or connect the rear right surround amplifier.
37.	COARSE SET RIGHT REAR SURROUND SPL LEVEL to 85dBC	Adjust the Rear Right Surround Output trimmer (CSR) for approximately 85dBC SPL in the auditorium.
38.	EQUALISE REAR RIGHT SURROUND CHANNEL	Adjust the right equaliser controls for a frequency response in accordance with the standard ISO surround channel response curve.
39.	SET REAR RIGHT SURROUND SPL LEVEL TO 88dBC	Replace the Rear Equaliser card and adjust the Rear Right Surround Output trimmer (CSR) on the SP23 for 88dBC in the auditorium.
40.	TURN ON REAR LEFT AMPLIFIER	Switch on or re-connect the rear left surround amplifier.
41.	RE-CONNECT AUTOMATION CABLE	Re-connect the automation cable to the SP23.
42.	REMOVE PINK NOISE CARD	Remove the pink noise card from the processor and replace with the Synthesiser card (if fitted).
43.	**END OF PROCEDURE**	The system is now ready to use.