

XL *logic*

**Multichannel Compressor
Owner's Manual**

Solid State Logic



Super-Analogue™ Outboard

Owner's Manual

82S6XL010D

Solid State Logic

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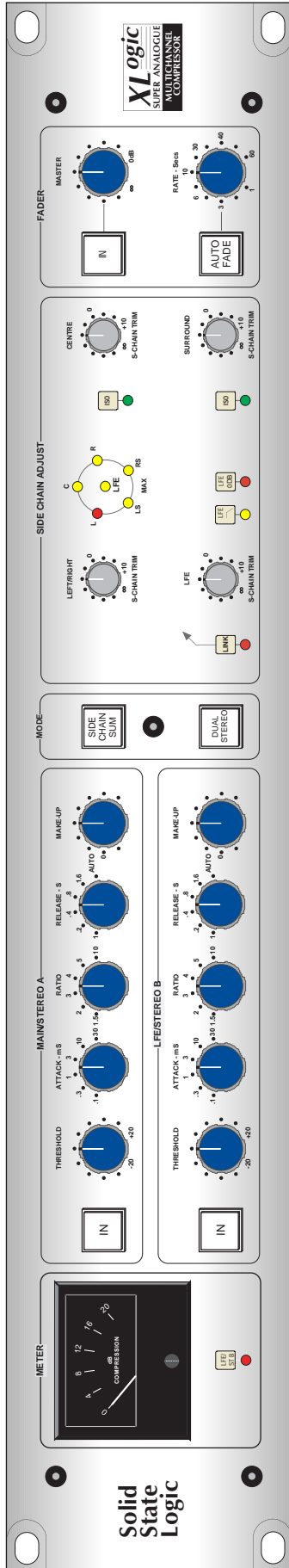
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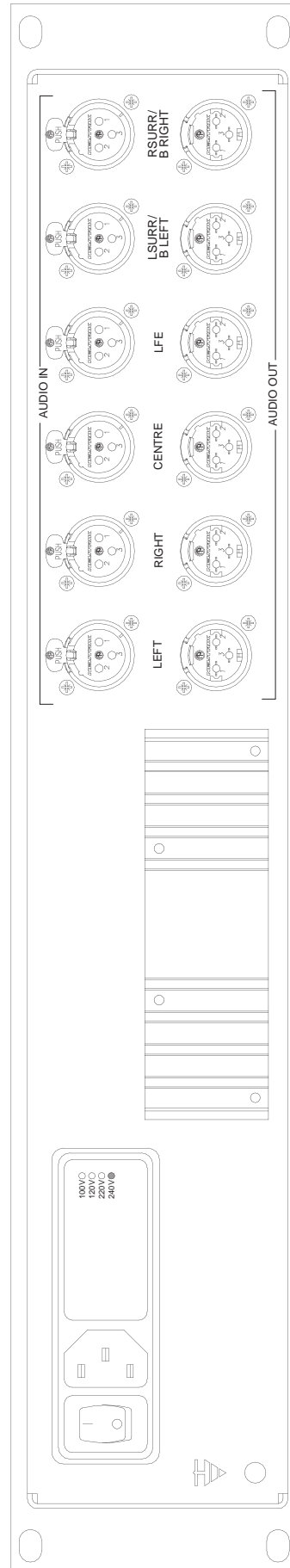
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XLogic Multichannel Compressor (front)



XLogic Multichannel Compressor (rear)



1.0 Introduction

The XLogic Multichannel Compressor is a 2U rack-mounting six-channel compressor. It utilises classic SSL Centre Section compressor design elements within a SuperAnalogue design topology. This brings the dual benefits of spectacular surround audio performance with a universally acclaimed compressor characteristic.

The unit contains two separate compressors. Normally the upper one controls the left, centre, right and surround channels and the lower one the LFE channel, but the DUAL STEREO switch reassigns the controls so that the lower set control the surround channels and the upper set control left, centre, right and LFE channels.

The SIDE CHAIN TRIM controls allow different thresholds to be set for left/right, centre, surround and LFE channels. The centre and surround ISO switches bypass the respective compressor channels completely.

A six channel Master Fader and Autofade control provide overall level control of the mix

The object of this manual is to provide purchasers of the XLogic Multichannel Compressor unit with information in the following areas:

- Operation of the unit
- Safety considerations
- Installation requirement
- Electrical connections and cabling
- Connector pin-outs
- Specifications and physical dimensions

Warranty

The warranty period for this unit is 12 months from date of purchase.

In Warranty Repairs

In the event of a fault during the warranty period the unit must be returned to your local distributor who will arrange for it to be shipped to Solid State Logic for repair. All units should be shipped to Solid State Logic in their original packaging. Solid State Logic can not be held responsible for any damage caused by shipping units in other packaging. In such cases Solid State Logic will return the unit in a suitable box, which you will be charged for. Please do not send manuals, power leads or any other cables - Solid State Logic can not guarantee to return them to you. Please also note that warranty returns will only be accepted as such if accompanied by a copy of the receipt or other proof of purchase.

Out of Warranty Repairs

In the event of a fault after the warranty period has expired, return the unit in its original packaging to your local distributor for shipment to Solid State Logic. You will be charged for the time spent on the repair (at Solid State Logic's current repair rate) plus the cost of parts and shipping.

2.0 Safety considerations

This section contains definitions and warnings, and practical information to ensure a safe working environment. Please take time to read this section before undertaking any installation work.

2.1 Definitions

'Maintenance'

All maintenance must be carried out by fully trained personnel. *Note: it is advisable to observe suitable ESD precautions when maintenance to any part is undertaken.*

'Non-User Adjustments'

Adjustments or alterations to the equipment may affect the performance such that safety and/or international compliance standards may no longer be met. Any such adjustments must therefore only be carried out by fully trained personnel.

'Users'

This equipment is designed for use solely by engineers and competent operators skilled in the use of professional audio equipment.

'Environment'

This product is a Class A product intended to form an integrated component part of a professional audio recording, mixing, dubbing, film, TV, radio broadcast or similar studio wherein it will perform to specification providing that it is installed according to professional practice.

2.2 Electrical Safety Warning

When installing or servicing any item of Solid State Logic equipment with power applied, when cover panels are removed, HAZARDOUS CONDITIONS CAN EXIST.

These hazards include:

- High voltages
- High energy stored in capacitors
- High currents available from DC power busses
- Hot component surfaces

Any metal jewellery (watches, bracelets, neck-chains and rings) that could inadvertently come into contact with uninsulated parts should always be removed before reaching inside powered equipment.

2.3 Installation

Voltage Selection and Fusing

All XLogic units have selectable voltage inlets. Always confirm that the input mains voltage range is set correctly before applying power. Always isolate the mains supply before changing the input range setting.

If it is ever necessary to replace a blown mains fuse, then always use the correct rating and type of replacement. If a correctly rated fuse continues to blow, then a fault exists and the cause should be investigated or the unit returned to Solid State Logic for repair/replacement as appropriate.

Details of mains settings and correct fuse ratings can be found in Section 3.1 and Appendix A of this manual.

Safety Earth Connection

Any mains powered item of Solid State Logic equipment that is supplied with a 3-core mains lead (whether connectorised or not) should always have the earth wire connected to the mains supply ground. This is the safety earth and grounds the exposed metal parts of the racks and cases and should not be removed for any reason.

Mains Supply and Phases

Solid State Logic equipment is designed for connection to single phase supplies with the Neutral conductor at earth potential – category TN – and is fitted with a protective fuse in the Live conductor only. It is not designed for use with Phase (Live) and Neutral connections reversed or where the Neutral conductor is not at earth potential (TT or IT supplies).

Mains cables will be coded with the following colour scheme:

LIVE:	Brown
NEUTRAL:	Blue
EARTH:	Yellow/Green

Mains Isolation and Over-Current Protection

An external disconnect device is required for this equipment which must be installed according to current wiring regulations. A detachable power cord, as fitted to this equipment, is a suitable disconnect device.

An external over-current protection device is required to protect the wiring to this equipment which must be installed according to the current wiring regulations. The fusing or breaking-current are defined in the product specification. In certain countries this function is supplied by use of a fused plug.

CE Certification

Note that the majority of cables supplied with SSL equipment are fitted with ferrite rings at each end. This is to comply with current European CE regulations and these ferrites should not be removed.

If any of the unit metalwork is modified in any way this may adversely affect the CE certification status of the product.

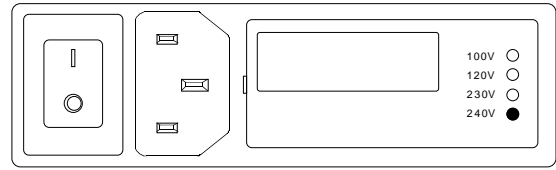
FCC Certification

The XLogic unit has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

3.0 Installation

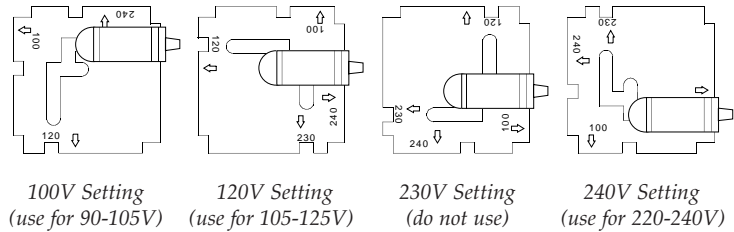
3.1 Voltage Selection

Before connecting the mains supply ensure that the voltage range selector next to the IEC socket on the rear of the unit is correctly set. The input setting must be confirmed before applying power. The input module can be configured to be one of 4 voltage settings. The setting is indicated by a plastic pin protruding through the appropriate hole in the fuse panel - the example shown here is set for 240V operation.



The setting is altered by a small vertical PCB which can be fitted in 4 positions. To change the setting:

- Switch off and remove the IEC lead.
- Using a small flat-bladed screwdriver, lever open the fuse panel to the right of the connector.
- At the right hand side is a vertical PCB with a plastic key which indicates the setting. Using pliers, pull out the PCB.
- The PCB has to be rotated until the desired voltage is shown along the edge which plugs into the module. The plastic key (and this bit is quite fiddly) must also be rotated so that it points out of the module so that the round pin aligns with the appropriate hole in the cover panel; (refer to the adjacent illustrations).



Note. Where the mains voltage is a nominal 230V, the '240V Setting' should be used – not the '230V Setting'!

- Re-insert the PCB and replace the fuse panel. The plastic pin should project through the appropriate hole.

3.2 Mounting

The XLogic unit is designed to be rack mounted. It is 2 RU (89mm/3.5 inches) high. Its depth is:

- 325 mm/12.8 inches not including heatsink
- 365 mm/14.3 inches including heatsink
- 400 mm/15.75 inches including connectors

The unit must be mounted on suitable rack shelves: do not rely on the rack mounting ears alone.

A 1RU space should be left above each unit to ensure adequate ventilation.

3.3 Connection

The unit has six input XLRs (female) and six output XLRs (male). Connect the inputs to the main output insert sends of your console or to your workstation outputs. Connect the outputs to the corresponding insert returns or to your workstation inputs.

When the unit is switched off the input XLRs are linked to the output XLRs by relays, so the unit will pass signal even when switched off. There is a 3 second delay after switching on before the bypass relays are energised to allow the power rails to settle, thus avoiding unpleasant thumps and pops on your monitoring.

Note that when switched off the DC coupled input stage of the XLogic Multichannel Compressor can load the output stages of some devices, causing low level distortion. For this reason it is not advisable to leave the unit connected and switched off.

Once the unit is connected switch it on, then route signal to each channel in turn and check that the correct signal LED lights yellow in the MAX display and that the signal is returned to the correct input on your console or workstation.

4.0 Operation

The XLogic Multichannel Compressor unit is a 2U rack-mounting six-channel compressor designed to provide extremely flexible control over a 5.1 channel mix, or to be used as two separate compressors when working on stereo material. The compressor design is very similar to that found in the XL 9000 console centre section, but with additional controls to provide the flexibility that modern 5.1 productions require. The signal path is balanced and DC coupled through out: this ensures extended bandwidth, low noise and low distortion.

5.1 mixing presents a number of challenges to the engineer that are not present when working in stereo. This is essentially because the signal content can vary hugely between speakers - both in level and frequency content – unlike stereo material where the two channels are normally similar in both level and content. This presents a number of potential problems including:

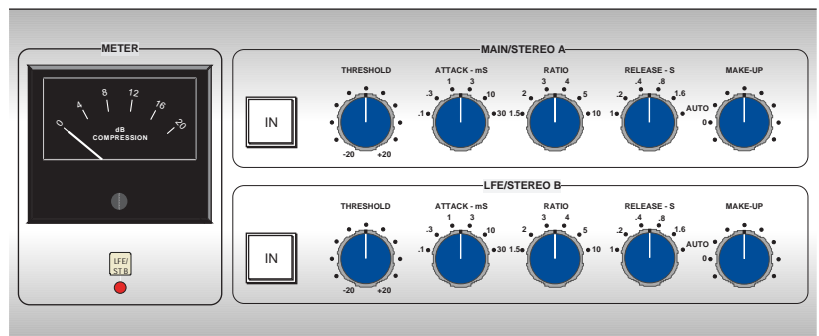
- The LFE channel will almost certainly require different attack and release times and different thresholds from the other channels.
- Depending on the material you may or may not want some channels to be compressed.
- Conversely you may want some channels to be compressed but not to contribute to the overall compression.
- You may want channels to have different thresholds.
- With five speakers it is possible have signals panned so that they are the loudest signal in the room but not the loudest signal in any one speaker.

The XLogic Multichannel Compressor is designed to give the engineer a flexible but easy to use set of tools to deal with all these potential problems – and hopefully those we haven't thought of yet.

4.1 Compressor Controls

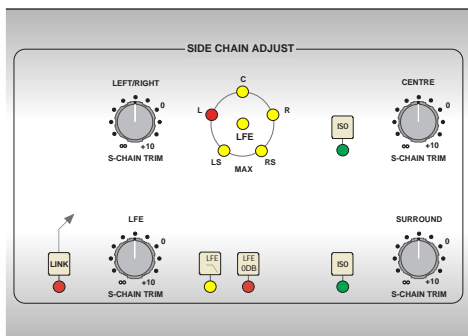
The compressor sidechain controls are straight forward and hopefully require little explanation. The ATTACK, RELEASE and RATIO controls are six position switches: the THRESHOLD and MAKEUP GAIN controls are continuously variable.

The compression meter at the left of the unit normally displays gain reduction for the Main (upper) compressor. Pressing the **LFE/STB** switch shows the gain reduction for the LFE (lower) compressor.



4.2 Side Chain Adjust Section

The side chain adjust section is the key to the operation of the XLogic Multichannel Compressor. It provides very flexible control of the compressor side chain.



S-CHAIN TRIM controls – These allow the contribution of their respective channels to the side chain to be adjusted - effectively allowing different thresholds to be set for each input. They are indented at the '2 o'clock' position (which is marked '0') to allow the trims to be easily set to the same level. When fully clockwise they increase the side chain level by 10dB – effectively reducing the threshold on that channel by 10dB. Turning a trim control fully anti-clockwise removes that input from the side chain completely.

An example may help: imagine the mix you are working on has a number of loud sound effects in the surround channels. You want the surround channels to follow the same compression as the front channels, but don't want the sound effects to compress the front channels. To achieve this simply turn the side chain trim control on the Surround channels anti-clockwise.

The **ISO** switches isolate their respective channels from the compressor. When pressed that channel will not contribute to the side chain and will not be affected by the compressor. It is still controlled by the Master Fader and AutoFade controls.

Another example may help: your mix has low level stereo reverb placed in the surround channels. You don't want this to be affected by the front channels so you press the Surround ISO switch in.

The **LFE LINK** switch links the LFE channel to the main compressor - effectively turning the unit into a single six channel compressor. This is useful if you want the LFE channel to be compressed with the main mix. Turning down the LFE S-CHAIN TRIM control will stop the LFE signal compressing the rest of the mix.

Alternatively (provided the LO PASS FILTER switch is released and the LFE 0DB switch is pressed) the LFE channel can be used as a sixth full bandwidth channel for compressing the 6 main channels of a 6.1 mix.

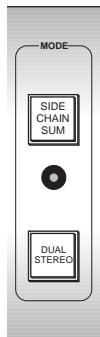
The **LFE LO PASS** filter switch inserts a 120Hz low pass filter in the LFE side chain. This is useful if the LFE channel is full bandwidth (if it is derived from the LCR channels for example) and prevents the low frequency content being over compressed by higher frequency material.

Material that has been mastered for Dolby Digital™ or Dolby AC3™ release has the LFE level reduced by 10dB, as Dolby specify a gain of 10dB in the LFE speaker channel relative to the other channels. The LFE side chain has 10dB more gain than the other channels to compensate for this. Other release formats (SACD for example) run the LFE channel at the same level as the other channels. The **LFE 0DB** switch sets the LFE side chain to the same gain as the other channels.

The **MAX** display consists of 6 bi-colour LEDs. These light yellow to show signal present (at approximately -36dBu). When the compressor is active the LED corresponding to the channel that is applying the most gain reduction will turn red.

4.3 Mode Section

This section contains two switches that radically change the operation of the compressor.



The **DUAL STEREO** switch reassigns the controls so that the lower set control the surround channels and the upper set control left, centre, right and LFE channels. This can be used either to provide separate compression of the surround channels or to allow the unit to be used as two separate compressors (one 4-channel, one stereo) when working on stereo material.

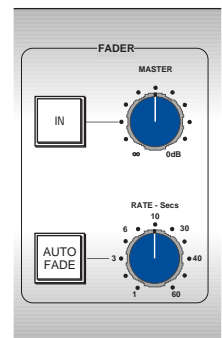
In normal operation the loudest signal will drive the compressor. With some material this may not give the desired effect – if the lead guitar is panned to all five speakers it may well be the loudest thing in the mix but not be the loudest thing on any one speaker channel. The **SIDE CHAIN SUM** switch changes the operation of the compressor so that the side chain is derived from a sum of the input signals. These are summed after being rectified to avoid phase cancellation effects. In this mode the **SIDE CHAIN TRIM** trim controls control the contribution of each input to side chain.

Note that if the LFE LINK switch is selected in this mode the LFE channel will be controlled by the upper compressor but will *not* contribute to its side chain.

4.4 Fader Section

The final part of the compressor is the output fader section which provides overall level control of the mix. This has two parts:

- The **MASTER** fader and its associated **IN** switch provide overall level control of the mix. When the **IN** switch is off the fader control has no effect.
- The **AUTOFADE** switch and associated rotary control provides a timed fade down or up with a fade time of 1 to 60 seconds. Pressing the switch will fade out the audio in the time set on the associated control and releasing the switch will fade the audio back up in the same time - the fade time can be adjusted at any time. The **AUTOFADE** switch will be illuminated whilst the signal is fading down and will remain illuminated until the signal has returned to normal gain.



Appendix A – Internal links and fuses

Fuses (Mains Inlet)

The mains inlet contains a single 1 amp 1.25" time delay fuse (SSL Part No. 35FJJ310). To change it disconnect the mains inlet, then using a small screwdriver prise open the mains selector cover. This contains the fuse. Test and replace with the same type and value if necessary.

Internal Fuses

The internal power rails are also individually fused. These fuses should only be changed by suitably experienced staff. They are listed below

Fuses (629610X1 Power Regulator Card)

+48V FS-1 - 500mA wire ended (SSL part No. 35F5E250)

Fuses (629601X1 Main Card)

-18V FS1 - 3 amp wire ended (SSL part No. 35F5E330)

-15V FS2 - 3 amp wire ended (SSL part No. 35F5E330)

+15V FS3 - 3 amp wire ended (SSL part No. 35F5E330)

+18V FS4 - 3 amp wire ended (SSL part No. 35F5E330)

+5V FS5 - 3 amp wire ended (SSL part No. 35F5E330)

Links

LK3 Solder link. Links chassis and analogue 0V. Do not remove.

LK4 Links 0V of input and output XLRs to chassis. Normally fitted. Remove to capacitively couple.

LK5 Solder link. Links 0VA planes. Do not remove.

LK6 Solder link. Links digital and analogue 0V. Do not remove.

LK8 Not used

LK9 Not used

LK10 Normally audio passes through VCAs at all times. Removing LK10 will switch in the bypass relays when all compressor IN and Master Fader IN switches are off. Normally fitted.

Appendix B – Connector Details

Audio Input	
Location:	Rear Panel
Conn' Type:	XLR Female
<i>Pin</i>	<i>Description</i>
1	Chassis
2	Audio +ve
3	Audio -ve

Audio Output	
Location:	Rear Panel
Conn' Type:	XLR Male
<i>Pin</i>	<i>Description</i>
1	Chassis
2	Audio +ve
3	Audio -ve

Appendix C – Performance Specification

Conditions

Source impedance 50Ω unless otherwise stated.

All measurements are RMS and are made using a 22Hz to 22kHz filter unless otherwise stated.

Noise

Input terminated with 50Ω. Compressor switched in and set for 0dB gain.

Noise < 99dBu

Headroom

Headroom is defined at the output level at which THD exceeds 1%.

Headroom > +26dBu output level, 20Hz to 20kHz at 0dB gain

Dynamic Range > 125dB

Frequency Response

Measured reference level at 1kHz. Any gain setting. Source impedance 50Ω.

20Hz to 20kHz ±0.05dB

10Hz to 96kHz +0.2/-0.5dB

10Hz to 200kHz +0.2/-2dB

Common Mode Rejection Ratio (CMRR)

Input level +20dBu, ground referenced.

20Hz to 10kHz > 50dB

THD + Noise

Gain +0dB, input level +4dBu. Master Fader switched in. Compressor switched out.

10Hz to 20kHz (80kHz filter) < 0.006%, typically 0.003%

Gain +0dB, input level +20dBu. Master Fader switched in. Compressor switched out.

10Hz to 20kHz (80kHz filter) < 0.01%, typically <0.006%

THD with the compressor switched in is dependent on attack and release times and signal content.

Crosstalk

Channel to channel crosstalk, measured with one input terminated with 50Ω. All channels at 0dB gain. Apply +20dBu test tone to any channel input except the one under test. Crosstalk is the ratio of level at the output of the test channel and the output of the channel to which the signal is applied.

Crosstalk @ 50Hz < -105dB

Crosstalk @ 1kHz < -90dB

Impedance

Input Impedance > 10kΩ

Output Impedance < 40Ω

Appendix D - Calibration Information

The XLogic Multi Channel compressor is factory calibrated and should only need calibration if a potentiometer or other component has been replaced or if it is suspected that there is a problem with calibration.

In all of the following instructions it is assumed that the lid has been removed and that power has been applied. It is also assumed that unless otherwise specified, all switches are released and all potentiometers are at unity, minimum or indent position as appropriate. The required accuracy for each adjustment will be specified along with the target value.

All level and distortion measurements should be made with audio-band 20Hz to 20kHz filters unless otherwise specified.

DC Calibration

Side Chain Trim Calibration

Equipment Required: Digital Volt Meter

Unit Setup:

1. Ensure that all front panel switches are off and all controls are set fully anti-clockwise, except for the Side Chain Trim pots which should be set to indent.
2. Reference the DVM to 0VA at TP42 on the lower card (629606).

Adjustment:

1. Measuring TP44 on the lower card (629606) – remove PL2 connector to access the test point – adjust VR8 (AutoFade offset) for $0\text{mV} \pm 0.5\text{mV}$. Reconnect PL2 between the upper and lower cards.
2. Set the Left/Right S-Chain Trim on the front panel to indent. Measuring TP3 on the upper card (629607), adjust VR6 on the upper card for $-0.45\text{V} \pm 10\text{mV}$.
3. Set the Centre S-Chain Trim on the front panel to indent. Measuring TP4 on the upper card (629607), adjust VR7 on the upper card for $-0.45\text{V} \pm 10\text{mV}$.
4. Set front panel pot, Surround S-Chain Trim, to indent. Measuring TP43 on the lower card (629606), adjust VR7 on the lower card for $-0.45\text{V} \pm 10\text{mV}$.
5. Set front panel pot, LFE S-Chain Trim, to indent. Measuring TP39 on the lower card (629606), adjust VR6 on the lower card for $-0.45\text{V} \pm 10\text{mV}$.

Side Chain Gain Adjustment

Unit Setup: Switch the Master Fader IN. Measure TP5 on the upper card (629607) and adjust the Master Fader on the front panel for $-2.00\text{V} \pm 1\text{mV}$ (which equates to 40dB of attenuation).

Adjustment:

1. Measuring TP47 on the lower card (629606), adjust VR10 for $+2.00\text{V} \pm 1\text{mV}$.
2. Measuring TP45 on the lower card (629606), adjust VR9 for $+2.00\text{V} \pm 1\text{mV}$.
3. Release the Master Fader IN switch.

Control Voltage Breakthrough Null

Unit Setup: Select SIDE CHAIN SUM and press both compressor IN switches. Turn both front panel THRESHOLD pots fully anti-clockwise.

Adjustment:

1. Measuring TP4 on the lower card (629606), adjust VR11 for $0\text{V} \pm 10\text{mV}$. Turn the front panel Main/Stereo A Threshold pot fully clockwise – check that the measurement remains within 10mV of 0V and re-adjust if necessary.
2. Turn the front panel Main/Stereo A Threshold pot fully anti-clockwise. Measuring TP6 on the lower card (629606), adjust VR12 for $0\text{V} \pm 10\text{mV}$.
3. Turn the front panel LFE/Stereo B Threshold pot fully clockwise – check that the measurement remains within 10mV of 0V and re-adjust if necessary.
4. Turn the front panel LFE/Stereo B Threshold pot fully anti-clockwise. De-select the compressor IN switches and the SIDE CHAIN SUM switch.

Distortion Null

Equipment Required: Calibrated audio oscillator, audio distortion analyser and oscilloscope
 Test Signal: 1kHz sinewave at +24dBu
 Input and Output: Oscillator to the Input of the channel being tested, Output to the distortion analyser. Use the oscilloscope to monitor the measured signal.

Adjustment: 1. Connect the +ve input of the analyser to the test point as shown below and connect the -ve input of the analyser to a 0VA test point. Note that the circuitry at this point is balanced and so there are two measurements and two adjustments per channel. Adjust for minimum THD (< 0.007%).

Input	Measure	Adjust
Left (+ve)	TP31	VR24
Left (-ve)	TP32	VR23
Right (+ve)	TP29	VR22
Right (-ve)	TP30	VR21
Centre (+ve)	TP27	VR20
Centre (-ve)	TP28	VR19
LFE (+ve)	TP21	VR14
LFE (-ve)	TP22	VR13
Left Sur (+ve)	TP23	VR16
Left Surr (-ve)	TP24	VR15
Right Surr (+ve)	TP25	VR18
Right Surr (-ve)	TP26	VR17

2. Finally, re-connect the analyser to each output in turn and adjust the +ve distortion null to see if any reduction in THD can be achieved.

VCA Gain Adjust

Equipment Required: Calibrated audio oscillator, audio level meter, oscilloscope and a (digital) DC voltmeter
 Test Signal: 1kHz sinewave at +20dBu
 Input and Output: Oscillator to the Input of the channel being tested, Output to the level meter. Use the oscilloscope to monitor the measured signal.

Unit Setup: 1. Switch the Master Fader IN.
 2. Using the DVM, measure TP5 on the upper card (629607) and adjust the front panel Master Fader for -2.00V ±1mV (which equates to 40dB attenuation).

Adjustment: 1. Connect the audio level meter to each output in turn. Measure each channel, adjusting the appropriate preset for -20dBu ±0.1dB (which equates to 40dB of attenuation).

Input	Adjust
Left	VR30
Right	VR29
Centre	VR34
LFE	VR36
Left Surround	VR27
Right Surround	VR28

Appendix E – Physical specification *

Depth:	325mm/12.8 inches not including heatsink 365mm/14.3 inches including heatsink 400mm/15.75 inches including connectors
Height:	89mm/3.5 inches (2 RU)
Width:	480mm/19 inches
Weight:	5kg/11 pounds
Power:	55 Watts/67 VA
Boxed size:	520mm x 520mm x 182mm (20.5" x 20.5" x 7.2")
Boxed weight:	7.3kg (16 pounds)

* All weights and dimensions are approximate

Appendix F – Environmental Specification

Temperature	Operating:	5 to 30 Deg. C
	Non-operating:	-20 to 50 Deg. C
	Max. Gradient:	15 Deg. C/Hour
Relative Humidity	Operating:	20 to 80 %
	Non-operating:	5 to 90 %
	Max. wet bulb:	29 Deg. C (non-condensing)
Vibration	Operating:	< 0.2 G (3 - 100Hz.)
	Non-operating, power off:	< 0.4 G (3 - 100Hz.)
Shock	Operating:	< 2 G (10mSec. Max.)
	Non-operating:	< 10 G (10mSec. Max.)
Altitude	Operating:	0 to 3000m (above sea level)
	Non-operating:	0 to 12000m

Notes

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