
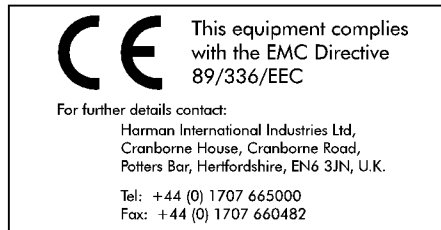

Soundcraft



User Guide





© Harman International Industries Ltd. 1997

All rights reserved

Parts of the design of this product may be protected by worldwide patents.

Part No. ZM0203 Issue 4

Soundcraft is a trading division of Harman International Industries Ltd.

Information in this manual is subject to change without notice and does not represent a commitment on the part of the vendor. Soundcraft shall not be liable for any loss or damage whatsoever arising from the use of information or any error contained in this manual, or through any mis-operation or fault in hardware or software contained in the product.

No part of this manual may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, electrical, mechanical, optical, chemical, including photocopying and recording, for any purpose without the express written permission of Soundcraft.

It is recommended that all maintenance and service on the product should be carried out by Soundcraft or its authorised agents. Soundcraft cannot accept any liability whatsoever for any loss or damage caused by service, maintenance or repair by unauthorised personnel.



Harman International Industries Ltd.
Cranborne House,
Cranborne Road,
Cranborne Industrial Estate,
Potters Bar,
Herts.,
England.
EN6 3JN.

Tel: 01707 665000
Fax: 01707 660482

Table of Contents

Introduction	1.1
<i>Introduction</i>	<i>1.2</i>
<i>Warranty</i>	<i>1.5</i>
Installation	2.1
<i>Dimensions and Configurations</i>	<i>2.2</i>
<i>Precautions and Safety Instructions</i>	<i>2.3</i>
<i>Mains Installation</i>	<i>2.4</i>
<i>Connections</i>	<i>2.6</i>
<i>Console Linking</i>	<i>2.7</i>
Block Diagrams	3.1
<i>Mono Input</i>	<i>3.2</i>
<i>Stereo Input</i>	<i>3.3</i>
<i>Output Module</i>	<i>3.4</i>
<i>Master One</i>	<i>3.5</i>
<i>Master Two</i>	<i>3.6</i>
<i>VCA System</i>	<i>3.7</i>
Functional Description	4.1
<i>Mono Input Module</i>	<i>4.2</i>
<i>Stereo Input Module</i>	<i>4.7</i>
<i>Output Modules</i>	<i>4.11</i>
<i>Master-1 Module</i>	<i>4.17</i>
<i>Master-2 Module</i>	<i>4.21</i>
<i>VCA System</i>	<i>4.25</i>
<i>Metering</i>	<i>4.26</i>

Mute Scenes/Mute Groups & MIDI Module	4.27
<i>Introduction</i>	4.28
<i>MIDI Module</i>	4.30
<i>Saving + loading the memory</i>	4.32
<i>Storing Mute Scenes</i>	4.35
<i>Recalling Mute Scenes</i>	4.36
<i>The 'ALL' Scene</i>	4.37
<i>Introduction to the M1 - M8 Buttons</i>	4.38
<i>Using The M1 - M8 Buttons In Mute Groups Mode</i>	4.39
<i>Using The M1 - M8 Buttons In Mute Scenes Mode</i>	4.40
<i>Storing MIDI Parameters with Mute Scenes</i>	4.41
<i>Editing MIDI Parameters in Mute Scenes</i>	4.43
<i>Setting the Global MIDI Receive/ Note On/Off channel</i>	4.44
<i>MIDI Module - Special Features</i>	4.45
<i>Table of MIDI Note Numbers sent/received by Series 5 mute switches (in note order)</i>	4.46
<i>Table of MIDI Note Numbers sent/received by Series 5 mute switches (in switch order)</i>	4.47
<i>MIDI Implementation Chart</i>	4.48
Specifications	5.1

Introduction

Introduction

Series FIVE features:

- 24-48 ch frame sizes (larger sizes available as Custom order)
- All frames include 4 full stereo input modules as standard
- Additional stereo input modules can be added
- 8 mono subgroups
- 12 Aux sends
- 10 VCA groups
- 4-band fully parametric EQ on both mono and stereo inputs
- Sweepable high and low pass filters on mono inputs, high-pass on stereo inputs
- 16x10 matrix built in as standard
- Input metering on every channel
- VU output meterbridge as standard
- Master facilities include full talkback routing, 2 stereo returns, 3 alternate stereo outputs, monitor outputs and solo control.
- Midi module provides snapshot automation of all input and output mutes, plus Midi program change and continuous controller fader

Mono Input (24, 32, 40, or 48 fitted)

- 2x Mic input XLRs (manually switchable A/B) with separate 48V, phase rev and RANGE switch
- Sweepable high and low pass filters
- Balanced insert point with in/out switch (jumperable pre/post EQ. Default=pre)
- 4-band full parametric EQ, plus bell/shelf on HF, LF bands
- 12 mono Auxes, individual Pre/post and On/Off switches
- Aux 1,2 and 3,4 can be globally switched to work as 2 stereo auxes
- Direct output (controllable from Aux 12)
- Routing to 8 mono subgroups, plus stereo and mono busses
- Switchable LR or true-LCR panning
- 10 VCA groups, individually assignable
- 8 Mute groups, assignable via master store button
- Channel mute controlled by midi scene-set automation (with recessed mute safe switch on each channel)
- 10 segment pre-fade, pre-EQ input meter next to fader (jumperable post-fade)
- Solo with intercancel or additive modes (PFL, stereo AFL or SIP)

Stereo Input (4 fitted to all sizes. Additional possible in blocks of 2 or 4)

- Stereo mic/line input -as mono input but no A/B switching. (Separate gain controls for left, right)
- Sweepable high pass filter
- Balanced insert points with in/out switch
- 4-band fully parametric EQ, plus bell/shelf on HF, LF bands
- 12 mono aux sends (1-8 have switchable feed from mono sum of L+R or stereo)
- Routing to 8 mono groups plus stereo and mono busses
- 10 VCA groups, individually assignable
- 8 mute groups, assignable via master store button
- Channel mute controlled by scene set automation (with recessed mute safe switch)
- 2x 5-segment pre-fade input meters next to fader (jumperable post-fade)
- Solo with intercancel or additive modes (PFL, stereo AFL or SIP)

Group/Aux output module (10 fitted)

- 10x dual output modules to give 8 groups, 12 aux outputs and 10 matrix outputs
- 100mm group and aux output faders
- Routing to stereo and mono outputs for subgrouping
- Matrix outputs are fed by 8 groups, aux 1-4, L/R/M and stereo external inputs
- Balanced insert points for all group, aux and matrix outputs, with insert IN switches
- All outputs have automated mutes (with mute safe switches)
- Aux 1,2 and 3,4 modules have global switches for mono/stereo switching

Master Modules (2 modules 1, 2)

- Stereo and mono main output faders, with automated mutes and recessed mute safe switches
- Talkback and oscillator/pink noise to all output busses, plus external output
- 3x Alternate stereo outputs (one on 100mm faders), source can be pre or post main stereo faders
- 2x Stereo Aux returns with 2-band EQ (routable to LR only)
- Solo mode controls and level trims
- Monitor and high-powered phones outputs
- Balanced XLR buss inputs for all output busses plus 38-way EDAC logic link, for console linking

Scene-set/Midi module

- Resettable Datafader
- 256 mute scenes, including datafader setup and position memory with nulling LEDs
- Scene entry by either up/down or 0-9 keypad
- Receives and transmits midi program change and note on/off data
- External Fx programs can be changed from the console
- Mute groups are available without using the main scene-set module
- CPU reset switch (recessed) on front panel stops CPU and allows all console mutes to operate manually in the event of a CPU failure

Frames

Four frame sizes are offered:

- 24 ch (The number refers to the number of mono inputs fitted as standard)
- 32 ch
- 40 ch
- 48 ch

The frames are all configured as follows: (See 'Frame Configurations' drawing for details).

Inputs 1-24

Stereo Inputs 1-4 (4 single-width modules)

Outputs 1-10 (10 single-width modules)

Master-1 (1 module width)

Master-2 (1 module width)

Midi (1 module width)

Inputs 25-32 (32 channel only)

Inputs 25-40 (40 channel only)

Inputs 41-48 (48 channel only)

Mono inputs can be replaced by additional Stereo inputs in blocks of 2 or 4, together with the appropriate rear-con and fader panel changes. Input Metering is integral to the fader modules, so this is taken care of automatically.

Warranty

- 1 **Soundcraft** is a trading division of Harman International Industries Ltd.

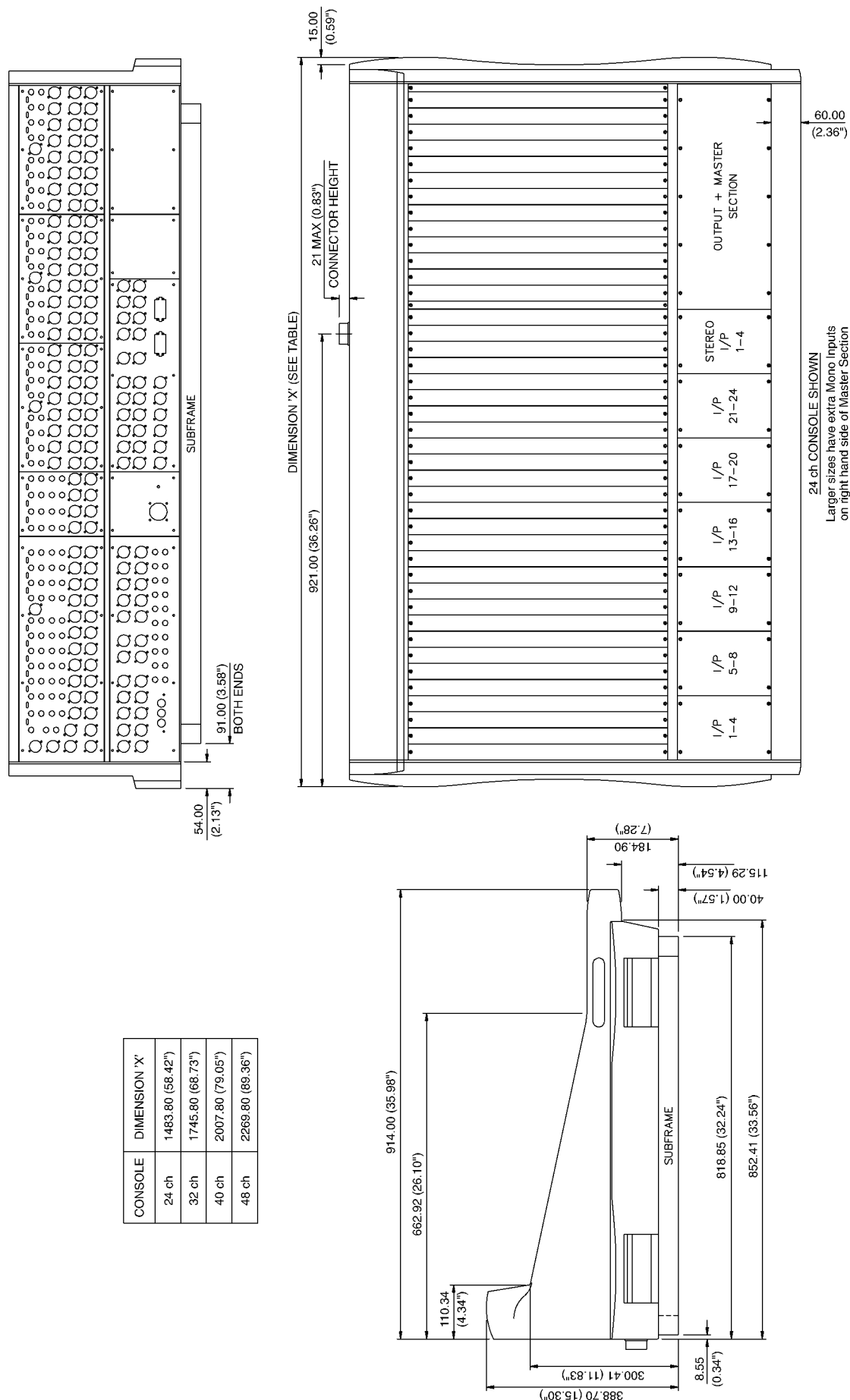
End User means the person who first puts the equipment into regular operation.

Dealer means the person other than Soundcraft (if any) from whom the End User purchased the Equipment, provided such a person is authorised for this purpose by Soundcraft or its accredited Distributor.

Equipment means the equipment supplied with this manual.
- 2 If within the period of twelve months from the date of delivery of the Equipment to the End User it shall prove defective by reason only of faulty materials and/or workmanship to such an extent that the effectiveness and/or usability thereof is materially affected the Equipment or the defective component should be returned to the Dealer or to Soundcraft and subject to the following conditions the Dealer or Soundcraft will repair or replace the defective components. Any components replaced will become the property of Soundcraft.
- 3 Any Equipment or component returned will be at the risk of the End User whilst in transit (both to and from the Dealer or Soundcraft) and postage must be prepaid.
- 4 This warranty shall only be available if:
 - a) the Equipment has been properly installed in accordance with instructions contained in Soundcraft's manual; and
 - b) the End User has notified Soundcraft or the Dealer within 14 days of the defect appearing; and
 - c) no persons other than authorised representatives of Soundcraft or the Dealer have effected any replacement of parts maintenance adjustments or repairs to the Equipment; and
 - d) the End User has used the Equipment only for such purposes as Soundcraft recommends, with only such operating supplies as meet Soundcraft's specifications and otherwise in all respects in accordance Soundcraft's recommendations.
- 5 Defects arising as a result of the following are not covered by this Warranty: faulty or negligent handling, chemical or electro-chemical or electrical influences, accidental damage, Acts of God, neglect, deficiency in electrical power, air-conditioning or humidity control.
- 6 The benefit of this Warranty may not be assigned by the End User.
- 7 End Users who are consumers should note their rights under this Warranty are in addition to and do not affect any other rights to which they may be entitled against the seller of the Equipment.

Installation

Dimensions and Configurations



Precautions and Safety Instructions

General Precautions

Avoid storing or using the mixing console in conditions of excessive heat or cold, or in positions where it is likely to be subject to vibration, dust or moisture. Do not use any liquids to clean the fascia of the unit: a soft dry brush is ideal. Use only water or ethyl alcohol to clean the trim and scribble strips. Other solvents may cause damage to paint or plastic parts.

Avoid using the console close to strong sources of electromagnetic radiation (e.g. video monitors, high-power electric cabling): this may cause degradation of the audio quality due to induced voltages in connecting leads and chassis. For the same reason, always site the power supply away from the unit.

Caution! In all cases, refer servicing to qualified personnel.

Handling and Transport

The console is supplied in a strong carton. If it is necessary to move it any distance after installation it is recommended that this packing is used to protect it. Be sure to disconnect all cabling before moving. If the console is to be regularly moved we recommend that it is installed in a foamlined flightcase. At all times avoid applying excessive force to any knobs, switches or connectors.

Power Supplies & cables

Always use the power supply and cable supplied with the mixer: the use of alternative supplies may cause damage and voids the warranty; the extension of power cables may result in malfunction of the mixing console.

Warning! Always switch the power supply off before connecting or disconnecting the mixer power cable, removing or installing modules, and servicing. In the event of an electrical storm, or large mains voltage fluctuations, immediately switch off the PSU and unplug from the mains.

Warning! Always ensure that you use the correct PSU for your mixer. The Series FIVE is supplied with a CPS2000 power supply unit

Note: The CPS2000 may be linked to a second CPS2000 for backup in the event that one of the PSUs fail.

Signal Levels

It is important to supply the correct input levels to the console, otherwise signal to noise ratio or distortion performance may be degraded; and in extreme cases, damage to the internal circuitry may result. Likewise, on all balanced inputs avoid sources with large commonmode DC, AC or RF voltages, as these will reduce the available signal range on the inputs. Note that 0dBu = 0.775V RMS.

Refer to the Specifications section for details of input and output levels.

Mains Installation

General Wiring Procedures

To take full advantage of the excellent signal to noise ratio and low distortion of Soundcraft consoles care must be taken to ensure that incorrect installation and wiring does not degrade the performance of the desk. Hum, buzz, instability and Radio Frequency interference can usually be traced to earth loops and inferior earthing systems. In some areas, especially heavily industrial areas, the incoming mains earth will not be adequate and a separate technical earth for all the audio equipment must be supplied. However, check with your local electricity supply company to ensure that safety regulations are not infringed or negated.

The successful, hum free, installation of a system requires forethought, and the establishment of a set of ground rules, which must be consistently adhered to at all stages of installation.

Initial Wiring Considerations

- For optimum performance, it is essential for the earthing system to be clean and noise free, as all signals are referenced to this earth. A central point should be decided on for the main earth point system, and all earths should be 'star fed' from this point. It is common electrical practice to 'daisy chain' the earths to all electrical outlets but this method is unsuitable for audio installations. The preferred method is to run an individual earth wire from each outlet, back to the system star point to provide a safety earth screen reference for each piece of equipment.

A separate earth wire should also be run from each equipment rack and area, to the star point. This may or may not be used depending on circumstances, but it is easier to install in the first place, than later when problems arise.

The location of the star point should be a convenient, easily accessible place, preferably at the rear of the console or in the main equipment rack.

- Install separate 'clean' and 'dirty' mains outlets, wired individually back to the incoming mains distribution box. Use the 'clean' supply for all audio equipment and the 'dirty' supply for all lighting, etc. Never mix the two systems.
- If necessary, to provide sufficient isolation from mains borne interference, install an isolating transformer. This should be provided with a Faraday Shield which must be connected with earth.
- Never locate the incoming mains distribution box near audio equipment, especially tape recorders, which are very sensitive to electro-magnetic fields.
- Ensure that all equipment racks are connected to earth, via a separate wire back to the star point.
- Equipment which has unbalanced inputs and outputs may need to be isolated from the rack to prevent earth loops.

Audio Wiring

Having provided all equipment with power and earthing connections, consideration must be given to the method of providing audio interconnection and adequate screening of those interconnections. This must be done in a logical sequence to avoid problems and assist in the localisation of problem equipment.

- Connect the Monitor system to the console and check for any hum, buzz, or RFI. Only when you are satisfied with the quietness of the console and the monitor system should you proceed with the next step.
- Connect stereo tape recorders, echo and foldback sends one at a time, checking and isolating any connection which degrades performance.
- Connect all other peripheral devices.

- Connect all microphone lines.

By following this sequence much time and future trouble will be saved, and the result will be a quiet, stable system.

Shielding

Audio equipment is supplied with a variety of input and output configurations, which must be taken into consideration when deciding where the screen connections should be made. There are three sources of unwanted signal being impressed on the screen, which are as follows:

- Extraneous electrostatic or electromagnetic fields.
- Noise and interference on the earth line.
- Capacitive coupling between the screen and signal wires.

To minimise the adverse affects of the unwanted coupling to the signal wires, it is important that the screen is connected at one end only, i.e. the screen must not carry any signal current. Any signal on the wires within the screen will be capacitively coupled to the screen. This current will ultimately be returned to the source of the signal, either directly, if the screen is connected at the signal source end, or indirectly via the earthing system, if the signal is connected at the signal destination end. The indirect connection will cause an increase in high frequency cross-talk, and should be avoided wherever possible.

Therefore, in general, always connect the shield only at the signal source end. In high RF areas, the screen can also be connected to earth via a $0.01\mu\text{F}$ capacitor. This will present a short circuit at RF frequencies, thus lowering the effective shield impedance to ground. However, at low audio frequencies the reactance of the capacitor will be sufficiently high not to cause an earth loop problem.

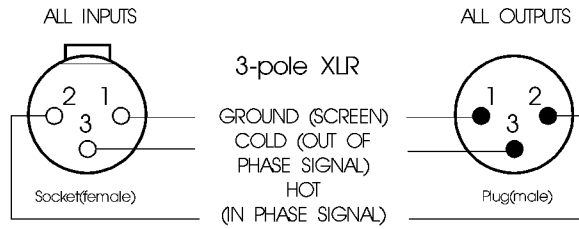
Points to Remember

- In all cases, use good quality twin screened audio cable. Check for instability at the output.
- Always connect both conductors at both ends, and ensure that the screen is only connected at one end.
- Do not disconnect the mains earth from each piece of equipment. This is needed to provide both safety and screen returns to the system star point.
- Equipment which has balanced inputs and outputs may need to be electrically isolated from the equipment rack and/or other equipment, to avoid earth loops.

It is important to remember that all equipment which is connected to the mains is a potential source of hum and interference and may radiate both electrostatic or electromagnetic radiation. In addition, the mains will also act as a carrier for many forms of RF interference generated by electric motors, air-conditioning units, thyristor light dimmers etc. Unless the earth system is clean, all attempts to improve hum noise levels will be futile. In extreme cases there will be no alternative but to provide a completely separate and independant 'technical earth' to replace the incoming 'noisy earth'. However, always consult your local electricity supply authority to ensure that safety regulations are not being infringed.

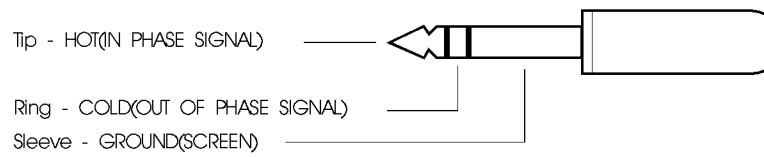
Connections

Audio Connectors

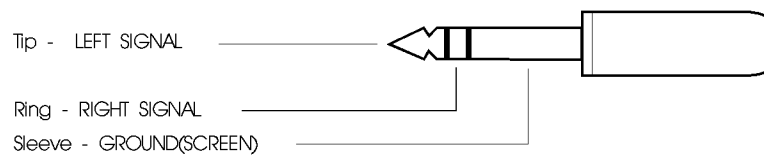


1/4" Stereo Jack Plug used as balanced Input/Output:

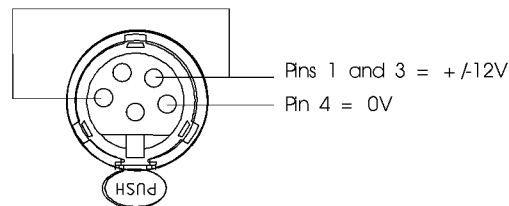
All Jacks Except Headphones



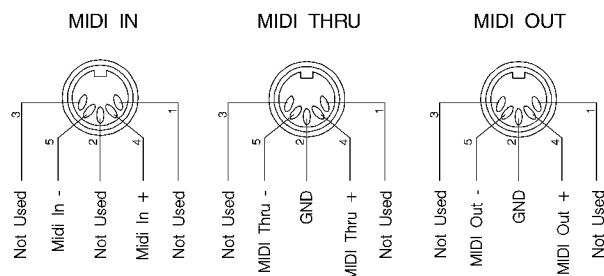
1/4" Stereo Jack Plug used For Headphones



Lamp Connectors



MIDI Connectors



The MIDI IN signal is buffered by an opto-isolator.

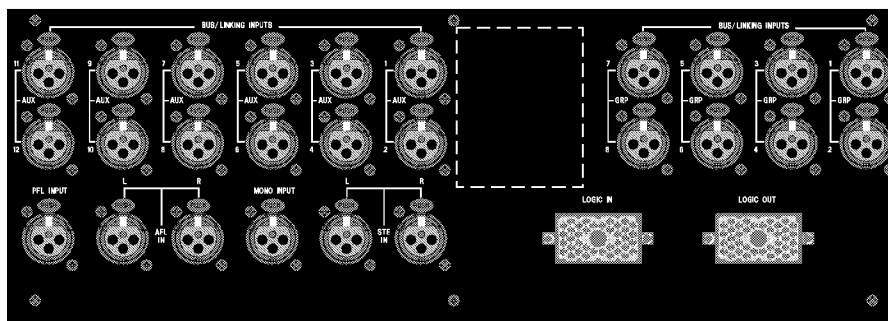
Console Linking

The Series FIVE features a Console Linking System which allows a master Series FIVE to control a slave Series FIVE in order to increase the number of inputs.

The following facilities are included in the linking:

- All audio busses.
- Solo busses (audio and logic).
- VCA level control and mute.
- Solo clear
- Solo intercancel.

To implement console linking, connect the 8 Group Outputs, the 12 Aux Outputs, the Stereo & Mono Outputs, and the AFL & PFL Outputs from the slave Series FIVE to the corresponding **BUS/LINKING INPUTS** on the master Series FIVE. The appropriate rear connector panel is shown below.



The BUS/LINKING INPUTS are on female XLRs. They are all balanced inputs at +4dBu, and are injected directly onto the appropriate bus at unity gain.

You will also need to connect the “LOGIC LINK OUT” connector on the master console to the “LOGIC LINK IN” connector on the slave console. The connectors on the console are 38-way female EDAC connectors. You will need to make a cable of sufficient length with 38-way male EDAC connectors on the ends. Wire the pins 1-to-1.

To avoid overriding the master console settings, the controls on the slave console must be set as follows:

- All 10 VCA Mutes OFF.
- Set all VCA Faders to 0dB.
- Set all Group, Aux and Stereo faders to 0dB.
- Deselect all latching switches on the Output and Master modules.
- Set the STE switches on the Stereo Aux Output modules to be consistent with those on the master console.
- Set the Input Priority switch on the Master2 modules to be consistent with each other.

The input modules in the slave console will function as extensions of the master console. The controls on the Output and Master modules in the slave console should be left alone (advanced users may disagree!).

To minimise shifts in ground potential, the power supplies for the two consoles should be plugged into adjacent mains outlets.

This Logic Linking System is not directly compatible with Vienna or Europa consoles, and must not be used with other manufacturers consoles. It is not designed for linking more than two Series FIVE consoles.

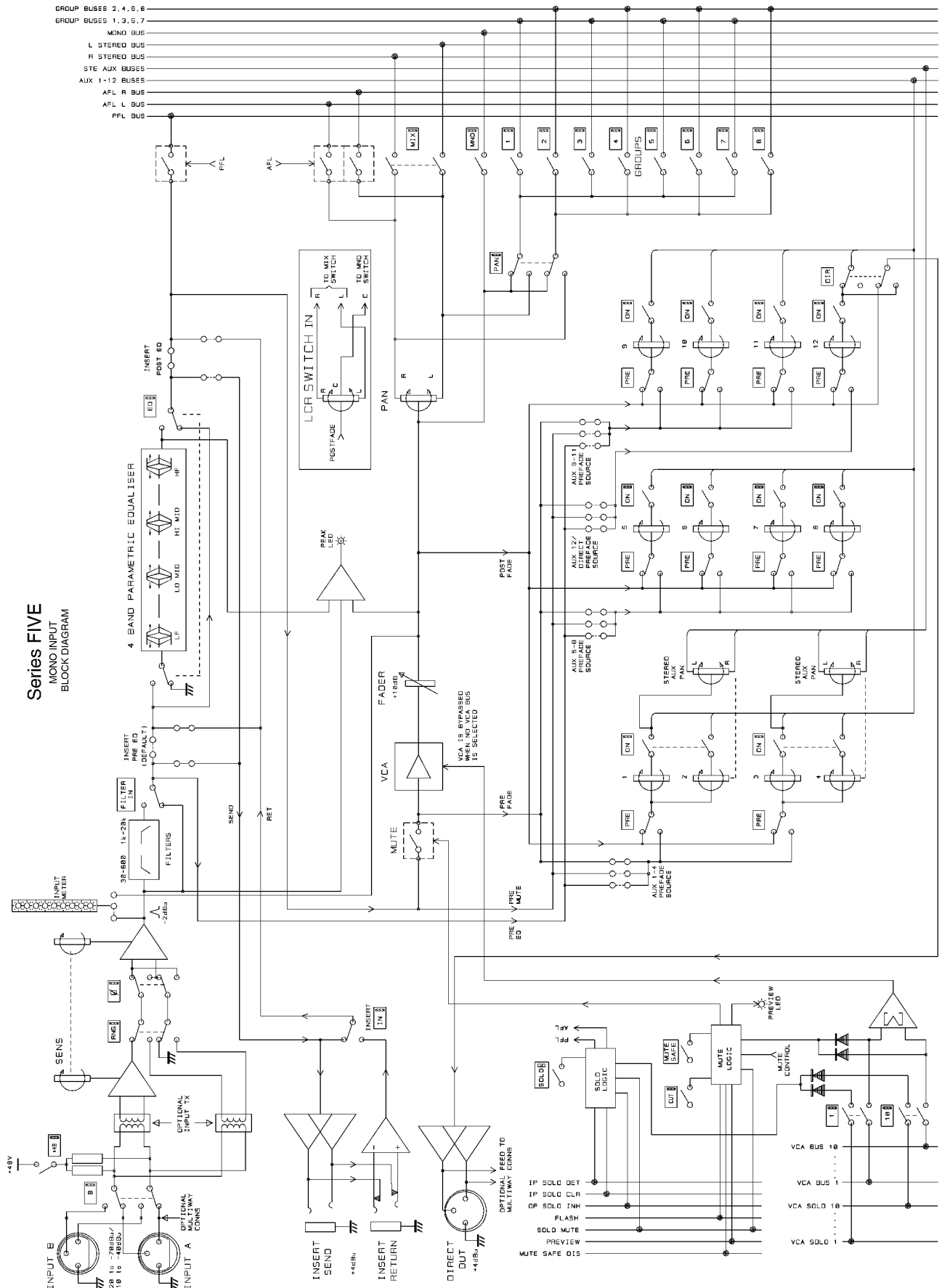
The Audio Linking is, of course, compatible with any other console, simply plug the slave console's audio outputs into the Series FIVE's Bus/Linking inputs.

Mute Group Linking

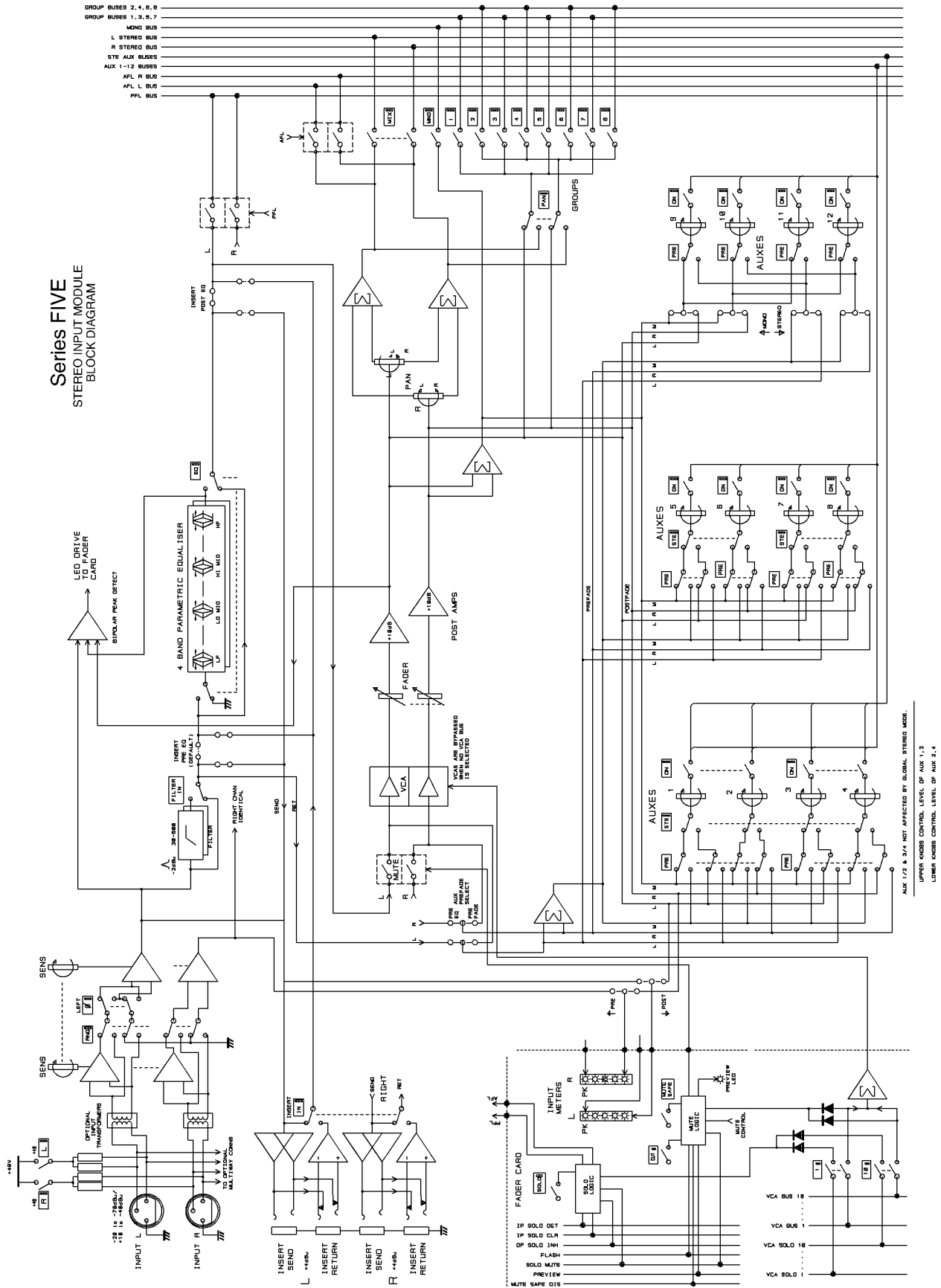
The MIDI-controlled mute group and scene setting are not linked by the EDAC Logic Link System. The scene setting can be linked by connecting the MIDI OUT socket on the master console to the MIDI IN socket on the slave console, and using MIDI program changes to recall scenes on the slave console when scenes on the master are recalled. The scenes must be set up and stored separately on each console.

Block Diagrams

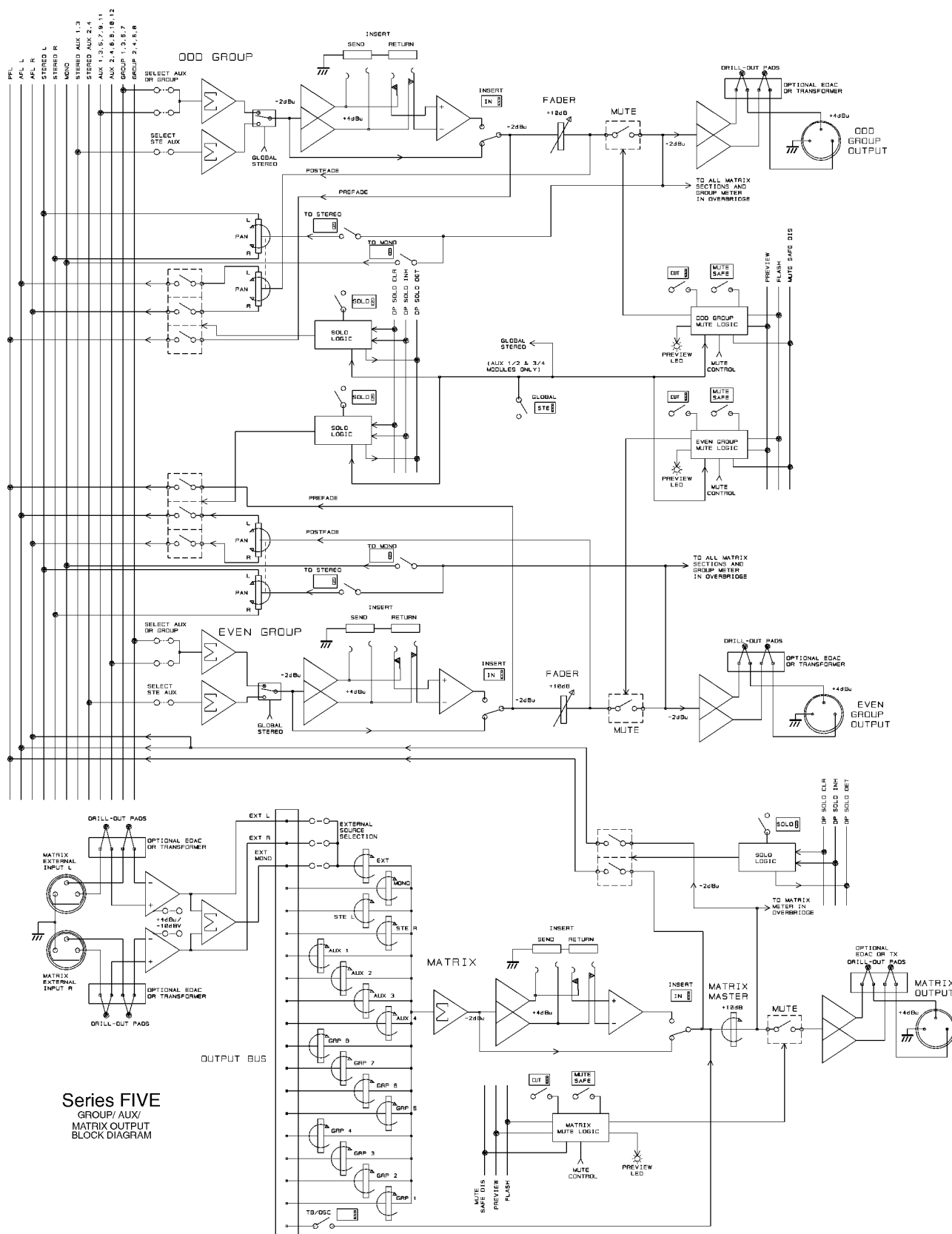
Mono Input



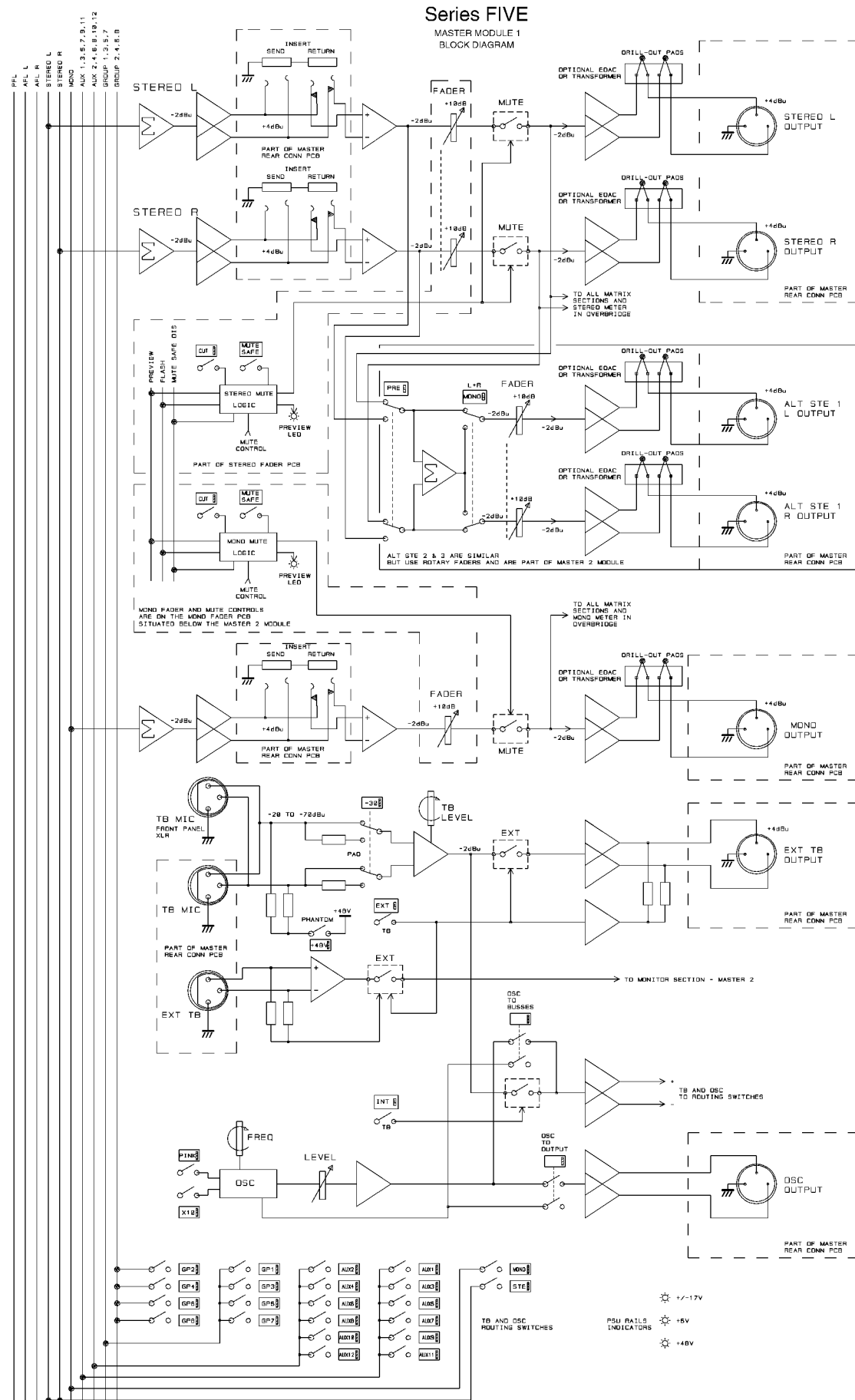
Stereo Input



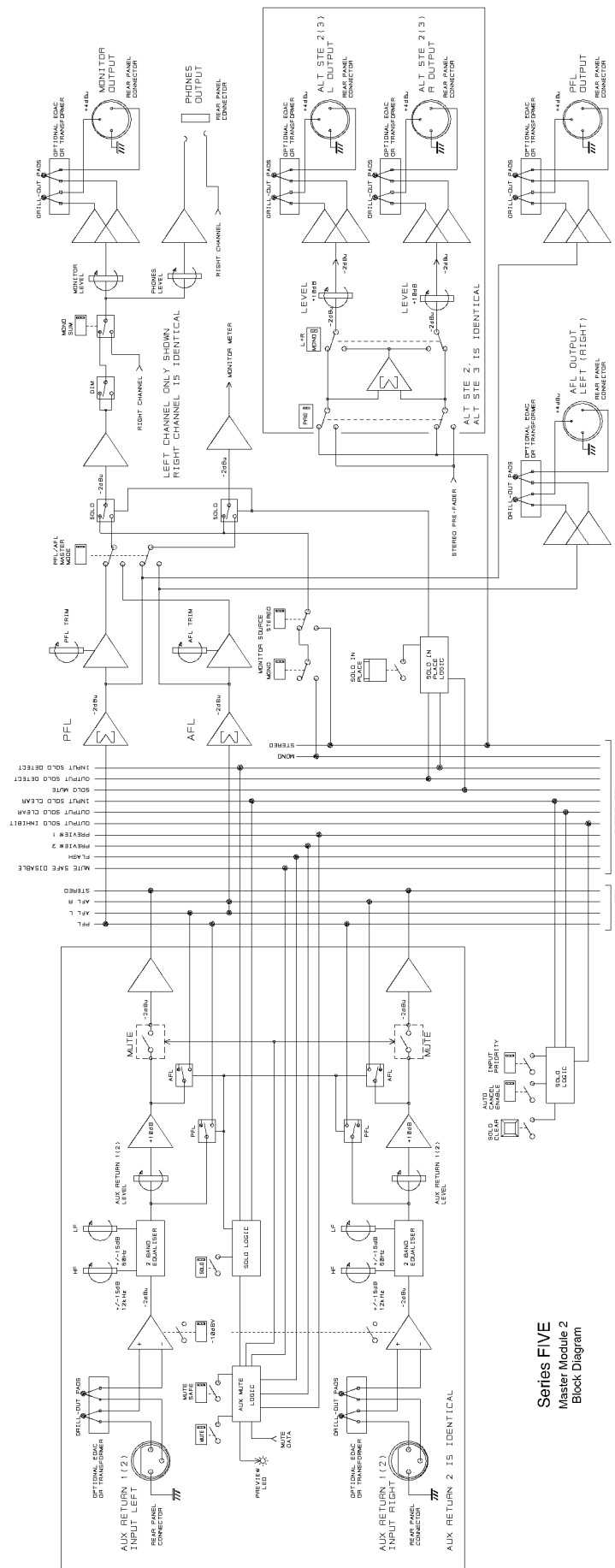
Output Module



Master One

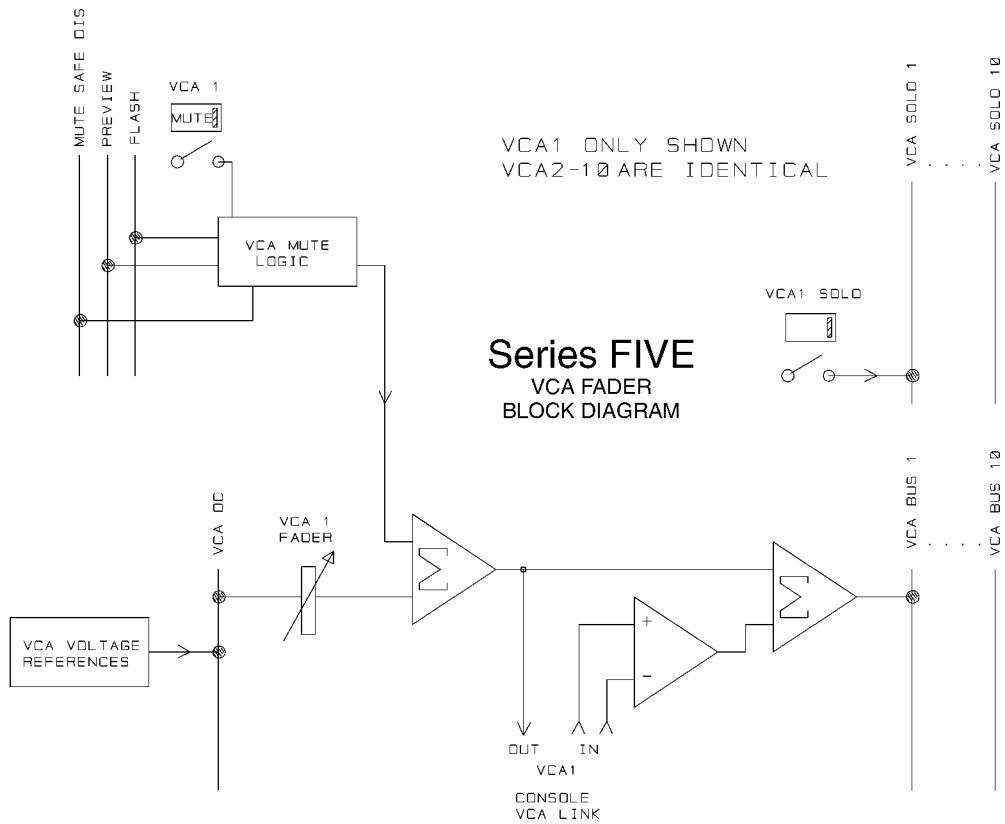


Master Two



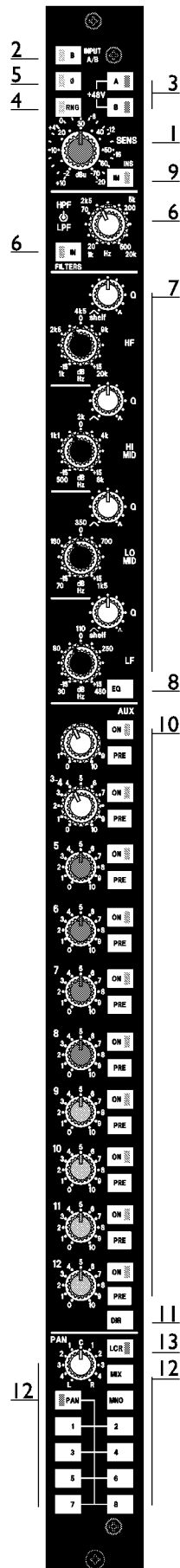
Series FIVE
Master Module 2
Block Diagram

VCA System



Functional Description

Mono Input Module



1 SENS adjusts the sensitivity of both A and B XLR inputs. Both inputs are electronically balanced. Input sensitivity: -2dBu to -70dBu, +10dBu to -20dBu (switched range.).

2 B selects the alternate XLR input connector.

3 Each **48V** switch applies 48V phantom power to the appropriate input XLR.

4 RNG switches the input to the lower sensitivity range to allow line level signals to be used. This gives the same signal handling capability as a traditional passive pad, but without the degradation in noise performance and common-mode rejection that pad circuits cause.

5 PHASE reverses the polarity of the selected input.

6 FILTERS IN switches in the second order variable high and low-pass filters.

- The high-pass filter (top of dual concentric) can be swept from 20-600Hz.
- The low-pass filter (bottom of dual concentric) can be swept from 1KHz-20KHz.

The filters are immediately after the input stage.

7 The EQ section is four band fully parametric, with sweep peak/dip on all four bands using four dual-concentric pots plus separate **Q** pots. In addition, the **HF** and **LF** bands have switchable bell/shelving operation. The **SHLF** switch switches the response to shelving in each case, when the **Q** pot is turned fully anticlockwise. (The switch is built in to the pot).

- The **LF** section gives 15dB of cut or boost from 30-480Hz
- The **LOW MID** section gives 15dB of cut or boost from 70Hz-1.5KHz
- The **HIGH MID** section gives 15dB of cut or boost from 500Hz-8KHz
- The **HF** section gives 15dB of cut or boost from 1-20KHz

The **Q** of each band is adjustable between 0.5 and 3.0 with the **Q** rotary controls.

8 The EQ section is switched in by the **EQ** switch (illuminated, amber LED).

9 The module insert point uses an electronically balanced send and return, at a nominal level of +4dBu. The signal is accessible via separate 1/4" jacks on the rear connector panel. The insert point may be set pre-or post-EQ by push-on jumpers. It is always pre-fader.

The insert return signal from the rear panel jack is enabled by pressing the **INSERT IN** switch. The insert send signal is always available at the rear panel, regardless of this switch setting.

10 Signal is sent to the **Aux 1-12** busses via individual level pots for Aux 5-12, and two dual concentric pots for 1-2 and 3-4. These have unity gain when fully clockwise, and are switched pre-or post-fader by the individual **PRE** buttons. The pre-fade signal may be sourced pre-fade and post mute, pre-mute or pre-EQ and pre-insert, in four blocks of sends, using push-on jumpers (see “jumper options”).

Each send is enabled by pressing the associated **ON** switch.

The dual concentric sends 1-2 and 3-4 work either as four individual mono sends, or as two stereo sends, with level on the top knob and pan on the bottom. The mode is selected by a global mono/stereo switch for each of the two pairs of sends. These switches are located on the corresponding output modules.

11 The **DIR** switch switches Aux 12 away from its bus and connects it to the Direct Output (Electronically balanced, 1/4" Jack). When **DIR** is not pressed, the Direct Output is fed directly with the post-fader signal. The nominal level is +4dBu.

When using **Aux 12** to control the direct output, its **PRE** switch can be used to set a pre-fade feed for multitrack recording etc. This is normally pre-EQ, but can be changed to post-EQ with internal jumpers (see “jumper options”).

12 The signal is sent to the stereo mix bus, mono bus and 8 group busses using the **MIX, MNO, 1, 2, 3, 4, 5, 6, 7** and **8** switches. The **PAN** control, which gives 4.5dB centre drop, always operates on the STE signal, but can be switched to also control the 8 group busses in pairs (odd busses fed from left pan, even busses from right) by pressing the **PAN** switch. If PAN is not pressed, each group bus switch receives the post-fader signal directly.

The Mono bus is always fed directly with the post-fader signal, and is not affected by the pan pot (unless the LCR switch is pressed).

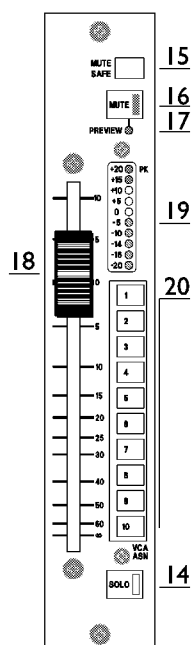
LCR Panning

13 The **LCR** switch changes the mode of the pan pot from normal (i.e. 4.5dB centre drop) to true LCR panning. True LCR panning requires that the signal is routed to both the stereo mix busses and the mono bus: in this case the mono bus is used for the centre output. When the LCR switch is engaged, the mono bus is fed from the centre point of the pan pot, and at this position of the pan pot there will be no outputs from the left or right busses.

Pan Pot Position	Output from Busses		
	L	C	R
Left	0dB	- ∞	- ∞
Centre	- ∞	0dB	- ∞
Right	- ∞	- ∞	0dB

If required, a pair of odd and even subgroups can be selected instead of the stereo mix, and the Pan Pot will pan between odd group, centre and even group in the same way.

Fader Panel



14 The electronically latching **SOLO** switch feeds the PFL and stereo AFL busses with the pre-fade, pre-mute signal and post pan signals respectively.

The master AFL/PFL switch determines which of these two signals is fed to the monitor/phones outputs. If SIP mode is selected on the master, the SOLO switch triggers a solo mute condition on all other inputs. If the module is muted due to another input being soloed, pressing the SOLO switch will unmute the module. The solo latch can be activated remotely from the VCA master Solo switches on any VCA group that the module has been assigned to. The solo mode in this case will be either SIP or stereo AFL, depending on the master solo mode settings. (see “Solo System” for more). If AUTO CANCEL is active, then any previously active SOLOs or AFLs will be cancelled. The SOLO can be remotely cleared either by the SOLO CLEAR button on the master, or by any other SOLO or AFL if AUTO CANCEL is active. If SIP mode is selected on the master module, the SOLO button functions as solo in place, muting all other channels.

15 The **MUTE SAFE** switch allows the module to be made safe from muting if another channel is soloed. It does not disable the channel mute switch itself: this always operates at all times. If the MUTE SAFE switch is enabled, the module cannot be muted by any **remote** method, whether it be from the MIDI module, a mute group, or as a result of soloing another channel in SIP mode. As already stated, the local MUTE switch will still operate when Mute Safe Is selected, and can also be used to write mute data to the MIDI system (in either “active” or “preview” modes).

16 The signal in the module is turned on and off by the **MUTE** switch and the MIDI muting system. The module is assigned to a MIDI mute scene by pressing the MUTE switch while in either ‘ACTIVE’ or ‘PREVIEW’ modes on the MIDI control module. When the module is muted by the MIDI system, the MUTE switch LED is illuminated (steadily).

If the module is muted from a VCA MUTE or Solo in Place (but not from the MIDI system), the MUTE switch LED flashes (this can be disabled by the switch on the MIDI fader panel -see later).

17 The **PREVIEW LED** is flashed by the MIDI control module when PREVIEW mode is selected, to indicate that the channel is programmed into a selected mute scene (see section on the MIDI module for more details).

18 Post-fader signal level is controlled by a 100mm **fader**.

19 A 10-segment **LED bar-graph meter** next to the fader normally meters the signal at the input amplifier, but can be set to meter the post fade signal by changing an internal jumper (see next page). The meter is made up of 9 segments of peak response metering plus a 10th segment configured as a 3-point peak detector. The latter monitors input amp o/p, EQ o/p and post fader o/p.

20 A bank of 10 latching **VCA Assign** switches with internal LEDs is located adjacent to the fader. These switches allow the channel to be assigned to any of the 10 VCA groups. Any combination of assignments is possible. When no VCA is assigned, the VCA element itself is switched out of the signal path, to maximise performance.

Jumper Options

Note: all jumpers are clearly labelled, on the PCB, with their functions, and are easily accessible without dismantling the module.

Function	Options		Default
Insert	pre or post EQ		<u>pre-EQ</u>
Input Meter Source	pre-EQ or post-fader		<u>pre-EQ</u>
* Pre-EQ Aux Feed	pre or post-mute		<u>post mute</u>
	Pre-EQ (pre or post mute)	Post-EQ (pre mute)	Post-EQ (post mute)
Aux 1-4	JMP 7	JMP 8	<u>JMP 9</u>
Aux 5-8	JMP 10	JMP 11	<u>JMP 12</u>
Aux 9-11	JMP 15	JMP 14	<u>JMP 13</u>
Aux 12	JMP 18	JMP 17	<u>JMP 16</u>

* Issue 8 input PCBs onwards

Additional Options

Transformer balancing:

Connectors are provided on the input PCB for wiring input transformers to the Hi-Z and XLR inputs. This is an extra cost option.

Multiway Connectors:

There is space provided on the frame below the XLR and jack connectors to allow customer-specified multipin connectors to be fitted. The largest type of connector catered for is a Harting 144-way. Positions are provided on the input PCB to fit optional method connectors in parallel with XLR inputs, jack input and direct output, for wiring to optional multiway.

In the case of the Hi-Z jack input, drill-out pads are provided on the PCB to break the normalling from the XLR, so that separate mic and line multicore can be catered for.

Rear Connectors

INPUTS (3 pin female XLR)

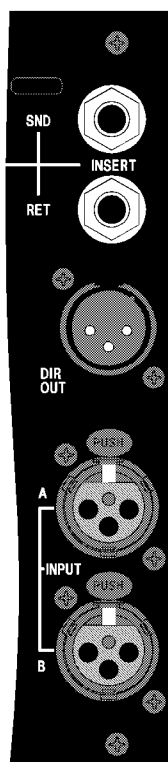
- Pin 1 Ground
- Pin 2 Signal Hot
- Pin 3 Signal Cold

DIRECT OUTPUT (3 pin male XLR)

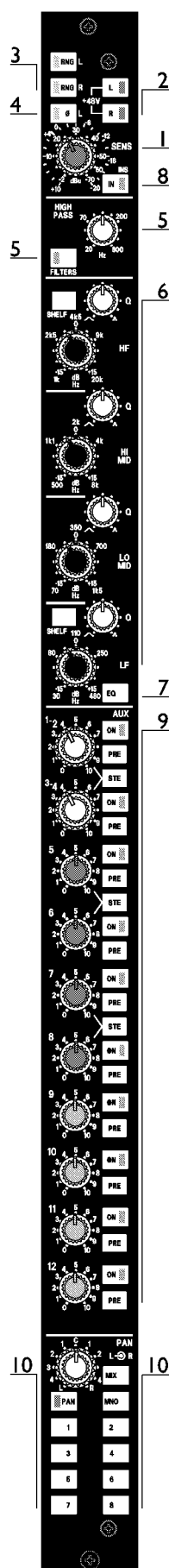
- Pin 1 Ground
- Pin 2 Signal Hot
- Pin 3 Signal Cold

INSERT SEND, INSERT RETURN (1/4" TSR Jack)

- Tip Signal Hot
- Ring Signal Cold
- Sleeve Ground



Stereo Input Module



1 SENS dual concentric adjusts the sensitivity of left and right inputs individually. Both inputs are available on XLRs and are electronically balanced.

XLR input sensitivity: -2dBu to -70dBu and +10dBu to -20dBu (switched range).

2 Each **48V** switch applies 48V phantom power to the appropriate input XLR.

3 Each **RNG** switch switches the appropriate XLR input to the lower sensitivity range to allow line level signals to be used.

4 LEFT PHASE reverses the polarity of the left channel, immediately after the input stage.

5 FILTERS IN switches in the second order variable high-pass filter.

This is a stereo filter, affecting left and right channels simultaneously. The high-pass filter can be swept from 20-600Hz.

The filter is immediately after the input stage.

6 The EQ section is four-band fully parametric, with sweep peak/dip on all four bands using four dual-concentric pots plus separate **Q** pots. In addition, the **HF** and **LF** bands have switchable bell/shelving operation. The **SHLF** switch switches the response to shelving in each case, when pressed. The EQ is ganged in stereo.

- The **LF** section gives 15dB of cut or boost from 30-480Hz
- The **LOW MID** section gives 15dB of cut or boost from 70Hz-1.5KHz
- The **HIGH MID** section gives 15dB of cut or boost from 500Hz-8KHz
- The **HF** section gives 15dB of cut or boost from 1-20KHz

The **Q** of each band is adjustable between 0.5 and 3.0 with the **Q** rotary controls.

7 The EQ section is switched in by the **EQ** switch.

8 The left and right insert points use an electronically balanced send and return, at a nominal level of +4dBu. The signal is accessible via separate 1/4" jacks on the rear connector panel. The insert points may be set pre-or post-EQ by push-on jumpers. They are always pre-fader.

The insert return signals (both left and right) from the rear panel jack are enabled by pressing the **INSERT IN** switch. The insert send signals are always available at the rear panel, regardless of this switch setting.

9 Signal is sent to the **Aux 1-12** busses via individual level pots for Aux 5-12, and two dual concentric pots for Aux 1-2 and 3-4.

The sends to Aux 1 and 2 are configured in one of two ways, depending on the setting of the adjacent **STE** switch (which also affects aux 3 - 4).

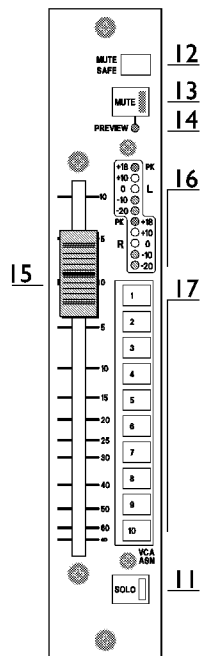
- When STE is not pressed, both the top and bottom of the dual concentric pot (Aux 1 and 2 respectively) are fed with a mono sum of the left and right signals in the module.
- When STE is pressed, Aux 1 (top of pot) feeds the left module signal to the aux 1 bus, and Aux 2 (bottom of pot) feeds the right module signal to the Aux 2 bus. This always happens regardless of the setting of the STE Global Mode switch on the Aux 1 - 2 master module.

To summarise: if you are using the Aux 1 - 2 as a stereo send on the rest of the console (i.e. you have the STE Global Mode switch enabled), then you should also press the STE button on Aux 1 - 2 / 3 - 4 on the stereo module.

The Aux sends 3-4 work in an identical way to 1-2 and share the same STE button. For the Aux sends 5-8, a similar system is used where normally each send pot is fed by a mono sum of the left and right channels. There is then a STE switch for each of the pairs 5,6 and 7,8 which when pressed changes the feed to odd from left, even from right. For the sends 9-12, the feed is a mono sum to each send, but this can be changed by internal jumpers to be left from odd, right from even. The send pots have unity gain when fully clockwise, and are switched pre-or post-fader by the individual **PRE** buttons. The pre-fade signal may be sourced either pre-fade and post mute, or pre-EQ and pre-insert, in four blocks of sends, using push-on jumpers. Each send is enabled by pressing the associated **ON** switch.

10 The signal is sent to the stereo mix bus, mono bus and 8 group busses using the **STE**, **MNO**, **1**, **2**, **3**, **4**, **5**, **6**, **7** and **8** switches. The dual concentric **PAN** controls allow independent panning of the left and right module signals, to the stereo mix bus, or pairs of subgroups. Each pan control gives 4.5dB centre drop, and always operates on the STE signal, but can be switched to also control the 8 group busses in pairs (odd busses fed from left pan, even busses from right) by pressing the **PAN** switch. If PAN is not pressed, each group bus switch receives the post-fader signal directly, (odd grps from left module signal, even from right). The Mono bus is always fed directly with a post-fader mono sum of left and right.

Fader Panel



11 The electronically latching **SOLO** switch feeds a pre-fade, pre-mute mono sum signal to the monitor output and phones output. (Unless SIP mode is selected on the master -see later).

If AUTO CANCEL is active, then any previously active SOLOs or AFLs will be cancelled. The SOLO can be remotely cleared either by the SOLO CLEAR button on the master, or by any other SOLO or AFL if AUTO CANCEL is active. If SIP mode is selected on the master module, the button functions as solo in place, muting all other channels.

12 The **MUTE SAFE** switch allows the module to be made safe from muting if another channel is soloed. If this switch is enabled, the module cannot be muted by any remote method, whether it be from the MIDI module, a mute group or as a result of soloing another channel in SIP mode. If the module is muted from a VCA MUTE or Solo in Place (but not from the MIDI system), the MUTE switch **LED** flashes (this can be disabled by the switch on the MIDI Module- see later).

Note: The local MUTE switch will still operate when Mute Safe is selected, and can also be used to write mute data to the MIDI system (in either "active" or "preview" modes).

13 The left and right signals in the module is turned on and off by the **MUTE** switch and the MIDI muting system. The module is assigned to a MIDI mute scene by pressing the MUTE switch while in either 'ACTIVE' or 'PREVIEW' modes on the MIDI control module. When the module is muted by the MIDI system, the MUTE switch LED is illuminated.

14 The **PREVIEW LED** is flashed by the MIDI control module when PREVIEW mode is selected, to indicate that the channel is programmed into a selected mute scene.

15 Post-fader signal level is controlled by a stereo 100mm **fader**.

16 Two 5-segment LED bar-graph meters next to the fader normally meter the left and right signals at the input amplifier, but they can be set to meter the post-fader signals by changing internal jumpers (see next page). The meters have a peak type response.

17 A bank of 10 latching **VCA ASSIGN** switches with internal amber LEDs is located adjacent to the fader. These switches allow the channel to be assigned to any of the 10 VCA groups. Any combination of assignments is possible. When no VCA is assigned, the left and right VCAs are switched out of the signal path to maximise performance.

Jumper Options

Function	Options						Default
Insert	pre or post EQ						<u>pre-EQ</u>
Left Input Meter Source J18	pre-EQ or post-fader						<u>pre-EQ</u>
Right Input Meter Source J518	pre-EQ or post-fader						<u>pre-EQ</u>
* Pre-EQ Aux Feed Left (J19,20)	pre or post-mute						<u>post-mute</u>
* Pre-EQ Aux Feed Right (J519,520)	pre or post-mute						<u>post-mute</u>
Aux 1-12 Pre Source Left (J7,8)	pre or post EQ						<u>post-EQ</u>
Aux 1-12 Pre Source Right (J507,508)	pre or post EQ						<u>post-EQ</u>
	When Pre-fade			When Post-fade			
	Left	Right	Mono	Left	Right	Mono	
Aux 9,11	JMP 12		JMP 11	JMP 14		JMP 15	<u>mono</u>
Aux 10,12		JMP 10	JMP 13		JMP 16	JMP 17	<u>mono</u>

* Issue 6 input PCBs only

Additional Options

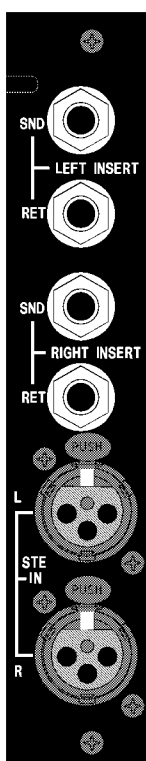
Transformer balancing:

Connectors are provided to allow transformers to be inserted in the left and right inputs. These have to be mounted on the back of the console, and are an extra-cost option.

Multiway Connectors:

There is space provided on the frame below the XLR and jack connectors to allow customer-specified multipin connectors to be fitted. The largest type of connector to be catered for is a Harting 144-way.

Positions are provided on the PCB to fit optional method connector in parallel with XLR input, for wiring to the optional multiway.



Rear Connectors

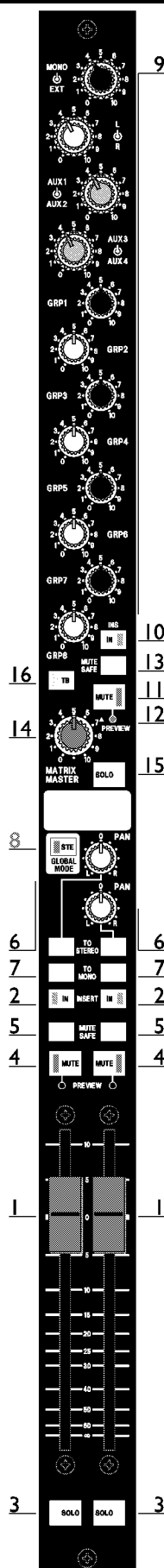
LEFT, RIGHT INPUTS (3 pin female XLR)

- Pin 1 Ground
- Pin 2 Signal Hot
- Pin 3 Signal Cold

INSERT SEND, RETURN (1/4" TSR Jack)

- Tip Signal Hot
- Ring Signal Cold
- Sleeve Ground

Output Modules



Ten dual output modules are fitted to the left of the master modules in each console. Each module contains two Aux/group output sections, with two 100mm faders at the bottom of the module and at the top of the module is a single Matrix output section, with input receive controls.

The two Aux/group sections on each individual module have identical facilities. The module functions either as a Subgroup master, or as an Aux master, depending on its position in the frame.

There are 4 modules used for the 8 Subgroups (Output modules 1-4) and 6 modules used for the 12 Aux masters (modules 5-10). The first two of these are fitted with a Global Mode Stereo switch (Aux 1 - 4).

Module Functions

1 The **output fader** controls the level of the signal fed to the output, with 10dB of gain at the top of the fader.

2 The insert point is pre-fade and uses an electronically balanced send and return, at a nominal level of +4dBu. The insert **SEND** and **RETURN** are accessible via separate 1/4" jacks on the rear connector panel. The insert return signal from the rear panel jack is enabled by pressing the **INSERT IN** switch. The insert send signals are always available at the rear panel, regardless of this switch setting.

The main group or aux output signal is electronically balanced and is available on a male 3-pin XLR connector on the rear panel.

3 The electronically latching **SOLO** switch feeds the pre or post fade output signal (depending on master PFL/AFL mode) to the monitor output and phones output.

The stereo AFL feed is taken from after the group to mix pan pot, which takes care of the stereo positioning. Note that this is the case even if the pan pots are not being used (i.e. the group is not routed to the stereo mix bus).

If solo **AUTO CANCEL** is selected on the master module, then the **SOLO** will cancel any other active **SOLO**s. The **SOLO** may also be cleared with the master **SOLO CLEAR** function. The **SOLO** switch will not activate the **SIP** system -even if **SIP** is selected on the master, it will continue to switch **PFL** or **AFL** to the monitor outputs (i.e. as if **SIP** was not selected).

If the Global Mode **STE** switch is pressed, the odd and even solo switches (and the odd and even **MUTE** switches) are linked so that pressing either switch turns both on (see also next page).

4 The **MUTE** switch mutes the signal to the module output, stereo and mono mix busses (if selected) and any matrix feeds from the group or aux. The **MUTE** switch has an associated **PREVIEW LED**, and is part of the **MIDI** scene automation as with the inputs.

5 The **MUTE SAFE** switch prevents muting by the scene set automation.

6 The **TO STEREO** switch routes the post-fade output signal to the left and right stereo mix busses, via the centre-detented **PAN** control. This allows the group or aux bus to be used as an audio subgroup.

7 The **TO MONO** switch routes the post-fade output signal to the mono buss.

8 The **GLOBAL MODE STE** switch changes the function of the Aux send pots on all the mono inputs to be either two levels (Aux 1 level on top knob, Aux 2 level on bottom knob) in Mono mode, or a stereo level on the top knob, with stereo pan on the bottom knob, in stereo mode. The switch is pressed in for stereo mode. Aux 1 & 2 and 3 & 4 can both be switched as independent pairs.

It also links the SOLO and MUTE switch logic as stereo pairs, as described above.

Matrix Output Section

Each output module contains its own separate matrix output section, providing a mix of 16 sources into a single balanced output, with a master level control.

This gives a matrix configuration of 16x10.

9 The 16 receive signals comprise: (In positional order of controls, starting at the front of the console)

Function	Knob colour
Group outputs 8	Grey
Group outputs 7	Black
Group outputs 6	Grey
Group outputs 5	Black
Group outputs 4	Grey
Group outputs 3	Black
Group outputs 2	Grey
Group outputs 1	Black
Aux 3-4	Blue (Dual concentric)
Aux 1-2	Blue (Dual concentric)
STE L/R	Yellow (Dual concentric)
Mono/Ext input	Black (Dual concentric)

The receive pots feed a mix of the group, mono and stereo mix, Aux 1-4 and an 'external' line level signal (see below) to a summing amplifier. The summed signal from the receive pots is fed to the insert send amplifier.

10 The insert point is pre-fade and uses an electronically balanced send and return, at a nominal level of +4dBu. The insert SEND and RETURN are accessible via separate 1/4" jacks on the rear connector panel. The insert return signal from the rear panel jack is enabled by pressing the **INSERT IN** switch. The insert send signals are always available at the rear panel, regardless of this switch setting.

11 The matrix output is turned on and off by the pre-fader **MUTE** switch and the MIDI muting system. The mute is assigned to a MIDI mute scene by pressing the MUTE switch while in either 'ACTIVE' or 'PREVIEW' modes on the MIDI control module. When the matrix output is muted by the MIDI system, the MUTE switch **LED** is illuminated.

12 The **PREVIEW LED** is flashed by the MIDI control module when PREVIEW mode is selected, to indicate that the matrix mute is programmed into a selected mute scene.

13 The **MUTE SAFE** switch prevents the matrix output from being muted by the scene set automation. It does not prevent local muting by pressing the Mute switch.

14 The matrix master **rotary fader**, controls the level sent to the electronically balanced output stage. It has 10dB of gain at maximum (unity gain is marked by an arrow at the number 7 position).

The balanced signal is fed to the matrix output connector (male XLR) on the rear con.

15 The **SOLO** switch feeds both the pre-fade and post-fade signals to the PFL and AFL busses respectively. The feed to the AFL bus is the same to left and right busses. The solo switch is part of the solo clear/ intercancel system, but not the SIP system. (as for the group/aux solo switch). The solo signal is always pre-mute, in either PFL or AFL modes.

16 The **TB** switch routes the talkback or oscillator signal to the matrix output. This is injected pre the matrix master fader.

The INT button or OSC TO BUSSES switches must also be enabled for signal to pass.

The external input Left and right signals are shared by all ten matrix sections in the console and is electronically balanced from two female XLRs on the rear-con. The sensitivity is normally +4dBu, but can be changed to -10dBV by moving internal jumpers. The signal from the input amps is fed one of two ways to the 'EXT' receive pots on the ten matrix sections: Either a mono sum of the left and right external inputs is fed to each receive pot, or the left input is fed to matrix 1,3,7 and 9 receive pots, and the right input to matrix 2,4,6,8 and 10 receive pots. The feed to each receive pot is set by internal jumpers.

(The EXT receive pot are ganged with the MONO receive pot as a dual concentric).

Jumper Options

Function	Options	Default
Matrix External Input sensitivity	-10dBV/+4dBu	+4dBu
Matrix Ext I/P source	Ext IP left, right or mono	Left on odd modules, right on even.

Additional Options

Positions on PCB for fitting optional 0.1" methode connectors in parallel with Grp/Aux outputs, matrix output and external input. (For multicore wiring/transformer bal)

Transformer balancing: Grp/Aux outputs, matrix o/p and ext inputs by line output/input TX mounted in base of console. (Above mentioned methode connectors can be used).

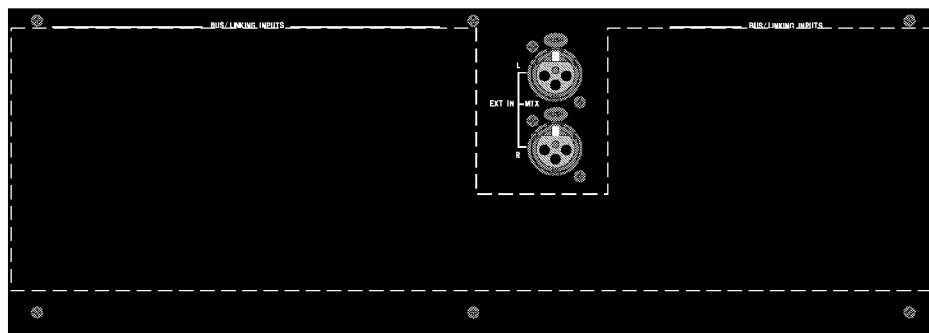
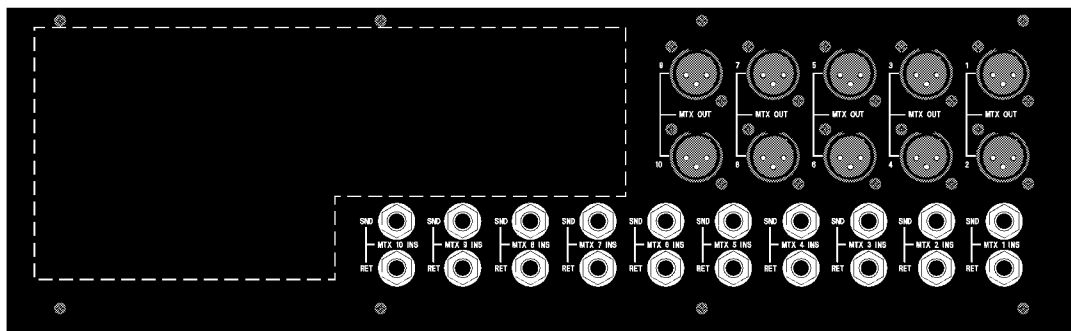
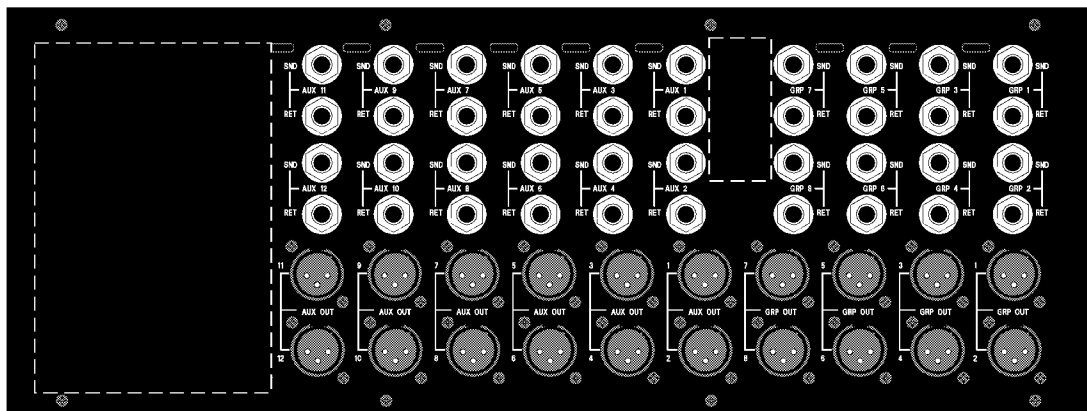
Rear Connectors

Grp/Aux, Matrix Outputs (3 pin male XLR)

Pin 1 Ground

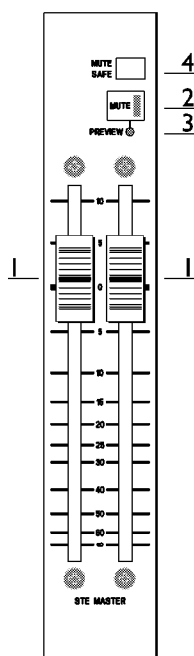
Pin 2 Signal Hot

Pin 3 Signal Cold
 L,R External Inputs (3 pin female XLR)
 Pin 2 Signal Hot
 Pin 3 Signal Cold
 Pin 1 Ground
 Group, Aux & Matrix Insert Send, Return (1/4" TSR Jack)
 Tip Signal Hot
 Ring Signal Cold
 Sleeve Ground



Master-1 Module

The Master-1 module is situated to the immediate right of the last Output module (Aux 11/12), and contains the stereo mix output, alternate stereo mix output 1, mono mix output, a noise or sine wave test oscillator, internal/external talkback functions, and PSU status indicator LEDs.



Main Outputs

1 The Stereo Mix Left and Right signals are controlled by the **STE MASTER L** and **R** Faders on the fader panel. There is 10dB of gain at the top of the faders.

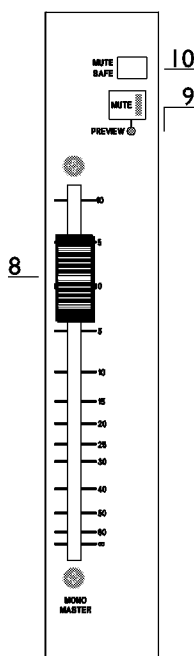
The left and right outputs are electronically balanced and appear on male XLR connectors on the rear panel.

2 The left and right signals to the outputs is turned on and off by the **MUTE** switch and the MIDI muting system. The switch is assigned to a MIDI mute scene by pressing the MUTE switch while in either 'ACTIVE' or 'PREVIEW' modes on the MIDI control module. When the module is muted by the MIDI system, the MUTE switch LED is illuminated.

3 The **PREVIEW LED** is flashed by the MIDI control module when PREVIEW mode is selected, to indicate that the master mutes are programmed into a selected mute scene.

4 The **MUTE SAFE** switch allows the stereo outputs to be made safe from muting by the scene set automation. Note that it doesn't stop the outputs from being muted by pressing the MUTE switch.

The left and right insert points are pre-fade using an electronically balanced send and return, at a nominal level of +4dBu. The send and return appear on separate 1/4" jacks on the rear panel.



5 The ALT STE 1 output is an additional stereo output derived from the main stereo outputs, controlled by the **ALT STE 1** 100mm faders (located above the main left and right output faders). The outputs appear on electronically balanced male XLRs on the rear panel.

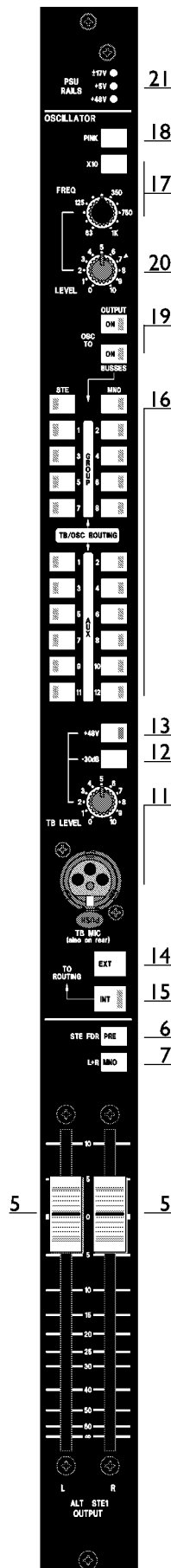
6 The source of the ALT STE 1 outputs is selected by the **PRE** switch either pre or post the main stereo output faders (the pre feed is pre-mute).

7 The **MNO** switch sums the stereo mix to mono and feeds it to both left and right ALT STE outputs.

There are two further alternate stereo outputs (ALT STE 2 and ALT STE 3: the controls for these are located on the Master-2 module.

8 The mono mix bus output is electronically balanced and appears on a male XLR connector on the rear panel. The signal level to the mono output is controlled by the 100mm **Mono fader** which is located on the fader panel below the Master-2 module. The fader has 10dB gain at the top.

The mono insert point is pre-mono fader and uses an electronically balanced send and return. The send and return appear on separate 1/4" jacks on the rear panel.



9 The signal to the mono output is controlled by the **MUTE** switch and its associated **PREVIEW LED**. It is controlled by the scene set automation as per the other MUTE switches.

10 The **MUTE SAFE** switch, prevents the mono output from being muted by the scene set automation. The mono output can still always be muted by pressing the Mute switch.

Talkback

The talkback system allows communication by the operator to the all group, aux, stereo and mono busses, and to and from an external console.

11 The **T/B LEVEL** pot controls the level of the talkback input, from a **3-pin XLR** on the master module front panel (duplicated on rear panel). The sensitivity of the input is variable between -20dBu and -50dBu.

12 The **-30dB** switch introduces a 30dB pad into the mic input: this is for use with line level signals from an external test tone or noise generator, for example.

13 The **+48V** switch applies phantom power to the talkback input sockets.

14 The **EXT** button initiates talkback to the monitor console using the Soundcraft proprietary "Blythphone" system. The talkback mic signal is switched to the EXT OUT XLR, with a +15V DC common-mode voltage to signal the Monitor console (an SM12, 16 or 24) that talkback is occurring. An internal jumper disables the common-mode DC voltage, to allow use with non-Soundcraft desks. The signal present on the TB IN XLR is fed to the phones/ monitor output, dimming the existing signal by 15dB. If a 15V common-mode voltage is detected on the TB IN XLR, indicating talkback from the monitor console, then the TB IN signal is switched to the 'phones output, dimming the existing signal by 15dB.

The EXT button has either a momentary or a latching operation, depending on how the switch is pressed. If the switch is pressed and released very quickly (less than 0.5 sec) it will latch on, allowing permanent communication. If momentary operation is required, the button can be pressed and held in while talking. Upon release of the button it will automatically switch off.

15 The **INT** button, switches on talkback to the internal busses, via the TB+OSC Routing switches. These switches are shared with the oscillator routing, and allow the Talkback and Oscillator internal destination to be preset.

16 The following busses are accessible: **Group 1-8, Aux 1-12, STE(L/R) and MNO**. The INT button has a combined momentary or latching action, like the EXT button.

The talkback (or oscillator) signal is also fed (after the INT button) to the matrix 1-10 outputs, where a local TB switch (located on each matrix output section) injects it into each matrix output, pre the master fader.

Oscillator

17 The oscillator produces a sine wave with frequency variable between 63Hz and 1kHz by the **FREQ** pot. The **X10** button increases the frequency up to 630Hz and 10kHz.

18 The **PINK** button switches the signal from sine wave to pink noise.

19 The oscillator signal is enabled to the TB+Osc routing switches by the **OSC TO BUSSES ON** switch, and to its own rear panel output with the **OSC TO OUTPUT ON** switch. The oscillator output is balanced at a nominal level of +4dBu, on a male XLR connector on the rear connector panel.

20 The **LEVEL** pot adjusts the level of the oscillator from OFF to 10dB above nominal.

PSU Status Indicators

21 The three PSU Status Indicator LEDs show that the PSU rails +48v, +/-17v (both sets of rails) and +5V logic rail are working. Note that the 5V rail on the console is generated from the 8V rail of the CPS2000 power supply.

Additional Options

Positions are provided on the PCB for fitting optional 0.1" methode connectors in parallel with Ste, Mono, Alt Ste outputs (for multicore wiring/transformer bal).

Rear Connectors

Stereo L/R, ALT STE 1 L/R, Mono, Osc, Ext TB Outputs (3 pin male XLR)

Pin 1 Ground

Pin 2 Signal Hot

Pin 3 Signal Cold

TB MIC, EXT TB IN Inputs (3 pin female XLR)

Pin 1 Ground

Pin 2 Signal Hot

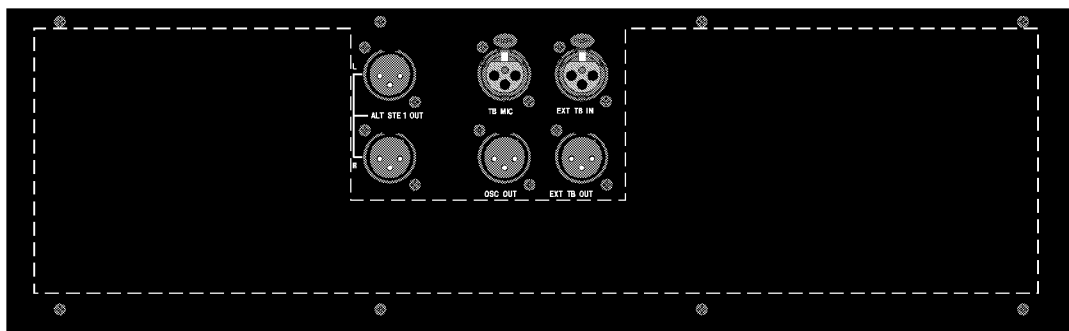
Pin 3 Signal Cold

Stereo L/R and Mono Insert Sends, Insert Returns (1/4" TSR jack)

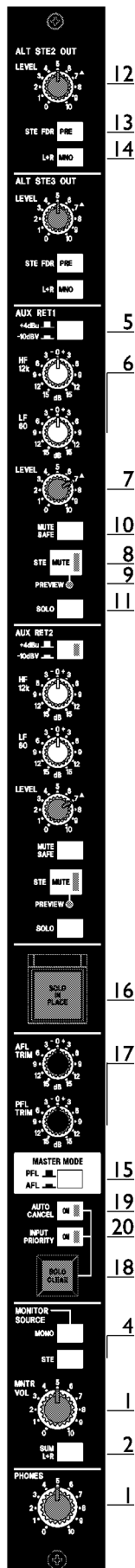
Tip Signal Hot

Ring Signal Cold

Sleeve Ground



Master-2 Module



The Master-2 Module contains the monitor and headphone outputs, solo outputs and controls, stereo aux returns and alternate stereo 2 and 3 outputs.

Note that the fader panel of this module houses the Mono Master fader, MUTE and mute safe switches, the electronics for which are on the Master-1 module.

Monitor and Headphones Outputs

1 The Monitor Outputs and Headphones output share a common signal source and are controlled by the **MNTR VOL** and **PHONES** level controls respectively. The monitor outputs are via Left and Right balanced XLRs on the rear panel.

The monitor outputs are designed to feed an engineers wedge, or pair of wedges, to allow monitoring of the stereo mix and any active solo signals

2 The **SUM L+R** switch sums both left and right channels together and feeds them to both outputs.

3 The phones output sockets are two parallel stereo 1/4" jacks: one is mounted in a recessed hole in the master fader panel area, the second parallel jack is fitted to the rear panel.

NOTE: Please exercise caution when first using a particular set of headphones. Turn the volume down before feeding any signals to the 'phones.

4 The signal source for these outputs is selected using two monitor select switches:

- the **STE** switch routes the post-fade stereo mix signal to the monitor outputs.
- The **MONO** switch routes the post-fade mono mix signal to both left and right monitor outputs.

Normally, any PFL/AFL operation will automatically override the stereo or mono mix signal. If neither STE or MONO are selected, the monitors receive PFL/AFL signals only (i.e. the monitors will be silent unless a solo is active).

Aux Returns

There are two stereo Aux Return inputs, 1 and 2, electronically balanced, from female XLRs on the rear connector pnel. Both have identical facilities, as follows:

5 The **+4/-10** switch allows the sensitivity of the Input to be either +4dBu or -10dBV.

6 The EQ section comprises stereo shelving high and low bands. The **HF** control gives +/-15dB of cut or boost at 12KHz. The **LF** control gives +/-15dB of cut or boost at 60Hz.

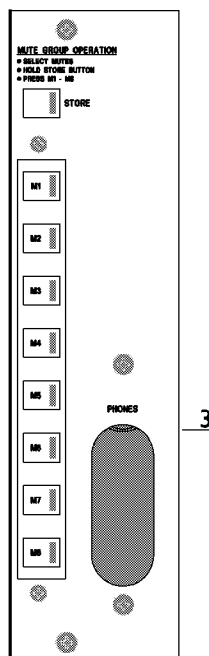
7 The post-EQ signal is sent to the stereo Aux Ret **LEVEL** control, which has 10dB of gain at maximum, and is then routed permanently to the stereo mix buss.

8 The **MUTE** button turns the signal on and off, and can also be controlled from the MIDI module in the same way as the other mutes.

9 The **PREVIEW LED** flashes to indicate that the aux return MUTEs are assigned to a mute scene when the MIDI module is switched to preview mode.

10 The **MUTE SAFE** switch prevents the Aux returns from being cut by either the MIDI system or solo-in-place system.

11 The **SOLO** switch for each aux ret switches the pre-fade, post EQ aux ret signal (sum L+R) onto the PFL bus and the stereo post fade, pre-mute signal onto the AFL busses. The solo is treated as an input solo in terms of priority. Whether the PFL of Stereo AFL signal is heard on the phones/monitors will depend on the setting of the global PFL/AFL mode switch.



Alternate Stereo Outputs 2,3

Two further alternate stereo outputs are provided, for miscellaneous recording or broadcast feeds, etc. (The first one being fader controlled, on the Master-I module). Both have identical facilities, as follows:

12 The **ALT STE 2 (or 3) OUT LEVEL** pot controls stereo signal level fed to the balanced left and right XLR outputs on the rear panel. The pot has 10dB of gain at maximum.

13 The **PRE** switch changes the ALT STE output source to be either pre- or post-the stereo master faders. (pre feed is pre-MUTE)

14 The **MONO** switch sums the stereo mix left and right signals to mono and routes them to both left and right ALT STE outputs.

Solo System

The solo system works in one of three modes: PFL, stereo AFL and SIP (solo-in-place). The selected mode applies to the whole console.

PFL and AFL are non-destructive modes, where the soloed signal is switched onto separate PFL or stereo AFL busses, and the monitor/phones and master meters are automatically switched over to receive the signal on these busses when a logic signal is detected from the soloed module. (The normal monitor source -stereo or mono mix - is overridden).

Either AFL or PFL can be selected by the user for these non-destructive modes, by means of a global mode switch.

Solo-in-place is a destructive mode, where the soloed channel sends a logic signal to the solo mute bus which then **mutes** all other channels, thus leaving only the soloed channel in the main outputs. Soloing another channel or switching on its mute safe switch, will unmute that channel. SIP mode selection takes priority over AFL or PFL modes.

SIP is only applicable from inputs -any output channel soloed while the console is in SIP mode will appear as a PFL or AFL on the monitors.

SIP mode is known as a “destructive” solo because it works by actually muting channels, so it cannot be used during a performance. The SOLO IN PLACE mode switch is therefore protected by a “rocket launcher” style switch to minimise the chance of accidental operation.

The VCA group masters have a solo facility which acts as a remote trigger for the local solo switches on the inputs assigned to that group. This works in both AFL and SIP modes as described above for the individual channels. See “VCA System” for more details.

15 The **MASTER MODE PFL/AFL** switch switches the whole console between mono PFL and stereo AFL.

16 The SIP mode is selected by pressing the protected “rocket launcher” **SOLO IN PLACE** switch.

Note: The Group/Aux and matrix output AFLs will not trigger the solo in place system, but will continue to be audible on the monitor/phones outputs, even if SIP mode is selected.

17 The **PFL TRIM** and **AFL TRIM** controls give +/-15dB of gain adjustment to the mono PFL and stereo AFL signals fed to the Monitor/phones outputs. The trims do not affect the meter readings of the solo signals, only the volume heard at the monitor/phones outputs.

18 The **SOLO CLEAR** button lights when any solo switch on the console is active -pressing it will clear a PFL or AFL or SIP.

19 When **AUTO CANCEL** is activated by the **ON** button, any solo switch will cancel any currently active solo, so only one channel can be active at once.

The current solo signal (pre-trim for PFL/AFL) is metered by the L/R VU meters -see “metering”, on page 4.26.

20 The **INPUT PRIORITY** button activates a mode where any currently active output solo will be remembered so that if an input solo is temporarily engaged (for example, to quickly listen to a problem on an input channel) it will override the output solo until it is released, whereupon the original output solo will be heard again.

SOLO SYSTEM -Summary of operation

Mode	Autocancel Button	Input Priority Button	Description
Normal	OFF	OFF	All outputs and input solos are additive
Autocancel	ON	OFF	All solos autocancel, no distinction between output and input.
Input Priority	OFF	ON	If an output is left solo, soloing an input will temporarily override the output but will return to it when input is unsoloed.
Input/Output Intercancel with Input Priority	ON	ON	Combination of previous two: works as input priority, but also with auto-cancelling between groups of outputs and groups of inputs.

Rear Connectors

MNTR L/R, ALT STE 2/3 L/R, AFL L/R, PFL outputs (3 pin male XLR)

Pin 1 Ground

Pin 2 Signal Hot

Pin 3 Signal Cold

AUX RET 1 & 2. L,R inputs (3 pin female XLR)

Pin 1 Signal Hot

Pin 2 Signal Cold

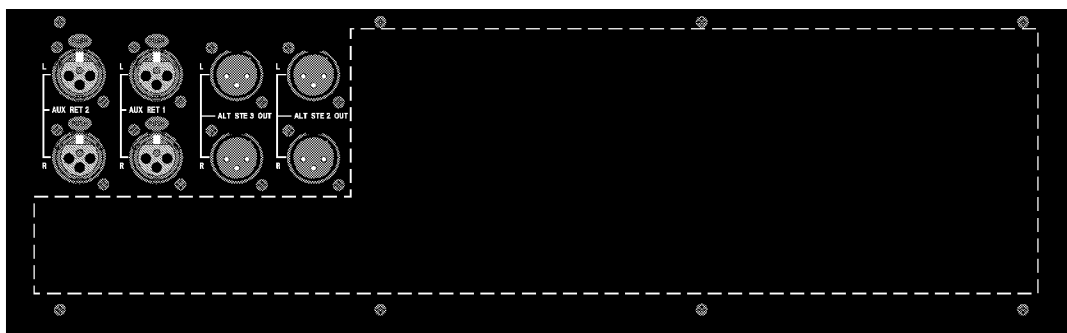
Pin 3 Ground

Phones Output (parallel connected to 1/4" TSR jack on front panel)

Tip Left

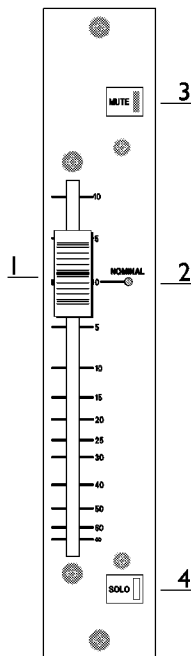
Ring Right

Sleeve Ground



VCA System

The VCA system on the Series FIVE comprises 10 VCA Master Faders, to which any input can be assigned using the VCA Assign switches on the input fader panels. Each VCA Master Fader has associated **MUTE** and **SOLO** buttons.



1 The **VCA Master Fader** Controls the fader gain of any channels which are assigned to it, from $-\infty$ to $+10\text{dB}$. If multiple VCAs are assigned from a given channel, the resultant gain at the channel will be the arithmetic sum of the gain settings (in dB) of all the assigned master faders and the channel's own fader setting. For example, if a channel is assigned to VCA Groups 1,2 and 3, the following will happen:

Fader Setting	Channel Fader	0	0	0	0	+5	+10
VCA 1 Fader	0	0	-10	-10	-10	+10	
VCA 2 Fader	0	0	0	0	0	+10	
VCA 3 Fader	0	$-\infty$	0	-10	-10	+10	
Resulting Gain (dB)	0	$-\infty$	-10	-20	-15	+10	*

0= unity gain

$-\infty$ = bottom of fader

* Note: the input module is limited to $+10\text{dB}$ gain.

2 The **NOMINAL** LED gives accurate confirmation that the VCA master fader is set to 0dB (unity) gain, so that a channel may be assigned to a VCA group during a performance without causing any level change.

3 The latching **MUTE** button operates as a global mute for all channels assigned to the VCA group in question. The channel mute buttons will flash under VCA mute conditions, unless this facility is disabled by operating the MUTE FLASH DISABLE switch which is located at the top of the MIDI Module.

Note that the VCA mute is not the same as just pulling down the VCA Master Fader: it is a proper mute which will mute the pre-fade sends in the input module(s).

4 The VCA **SOLO** button operates as a global solo button for all channels assigned to the VCA group. Pressing this button will have the same effect as pressing all the individual solo buttons on the channels in question. This means that what you hear when you solo a VCA group will depend on the settings of the global AFL/PFL Master Mode and SIP switches.

Metering

Master Meters

Two moving-coil VU meters (LEFT and RIGHT) in the overbridge read the output of the monitor switching (pre-monitor level pot), which may be stereo mix, mono mix or PFL/AFL signals.

A third meter (MONO) continuously monitors the post-fade mono bus output level. These are accurately calibrated so that the meters effectively read the true output level from the stereo and mono outputs.

All metering on the console is calibrated to 0VU = +4dBu output.

Peak LED's are fitted to each VU meter; they illuminate when the output signal reaches 3dB below clipping.

Group, Aux and Matrix Meters

A bank of 12 moving-coil VU meter (1 - 12) in the overbridge can be switched, via the 3 source select buttons, to read either the 8 Group outputs, the 12 Aux outputs or the 10 Matrix outputs. The console powers-up set to read the 8 Group outputs. The meters are switched in banks, i.e. you can only meter all of the groups, all of the Auxes or all of the Matrix outputs. Where there are less than 12 outputs the remaining meters are unused.

Peak LED's are fitted to each VU meter; they illuminate when the output signal reaches 3dB below clipping.

L/R Phase Bargraph Meter

This LED bargraph meter monitors the phase difference between left and right signals which appear on the master left and right VU meters.

Normally this will be the stereo mix, but any soloed stereo source can be monitored if the console is in stereo AFL or SIP mode.

The meter is scaled from 0 to 180, representing degrees of phase difference. Normally the meter should remain in the green or amber sections (0 -90) which indicates a normal predominantly phase coherent stereo signal. If the meter goes into the red zone (90 - 180) this would indicate a phase problem, possibly due to phase reversal of one channel.

Note that a mono signal appearing on the left and right meters will have a phase difference of zero degrees. Also note that if a signal is only applied to one of the left or right meters (e.g. by panning a signal hard left or hard right) the phase meter may appear to show a 180 degree phase difference. This is normal, it is because the phase meter has only been presented with one signal and has no other signal to compare it with; it does not mean that the mono signal itself is out of phase with other signals.

Mute Scenes/Mute Groups & MIDI Module

<i>Introduction</i>	<i>4.28</i>
<i>MIDI Module</i>	<i>4.30</i>
<i>Saving + loading the memory</i>	<i>4.32</i>
<i>Storing Mute Scenes</i>	<i>4.35</i>
<i>Recalling Mute Scenes</i>	<i>4.36</i>
<i>The 'ALL' Scene</i>	<i>4.37</i>
<i>Introduction to the M1 - M8 Buttons</i>	<i>4.38</i>
<i>Using The M1 - M8 Buttons In Mute Groups Mode</i>	<i>4.39</i>
<i>Using The M1 - M8 Buttons In Mute Scenes Mode</i>	<i>4.40</i>
<i>Storing MIDI Parameters with Mute Scenes</i>	<i>4.41</i>
<i>Editing MIDI Parameters in Mute Scenes</i>	<i>4.43</i>
<i>Setting the Global MIDI Receive/ Note On/Off channel</i>	<i>4.44</i>
<i>MIDI Module - Special Features</i>	<i>4.45</i>
<i>Table of MIDI Note Numbers sent/received by Series 5 mute switches (in note order)</i>	<i>4.46</i>
<i>Table of MIDI Note Numbers sent/received by Series 5 mute switches (in switch order)</i>	<i>4.47</i>
<i>MIDI Implementation Chart</i>	<i>4.48</i>

Introduction

The MIDI module provides two main functions: the **Mute Scenes Controller**, and the **Mute Grouping System**

Mute Scenes Controller

This allows the status of all the input and output mute switches to be memorised, and stored, in battery-backed memory within the console, as one or more 'snapshots' or Mute Scenes. Up to 256 scenes are possible internally, more are possible if a MIDI SysEx data file device is used to off-load the console's internal memory.

Mute Grouping System

The Mute Grouping System works independently of the Mute Scenes Controller. It allows up to 8 Mute Groups to be set up and used in the same way that conventional mute groups would be.

MIDI Control

The integration of **MIDI** within the system further extends the power of the 'Scene Set' automation, because MIDI program changes can be sent out automatically as a Mute Scene is selected (or 'Recalled') and these can be used to select relevant patches on outboard FX devices, etc. Alternatively, by only storing program change messages and leaving the console mutes the same in each scene, the system can be used simply to change FX programs from the console.

The system will also respond to incoming program change messages, so the console can be stepped through its mute scenes by remote control, or automatically by a MIDI sequencer if necessary.

The MIDI capabilities also include the sending and receiving of MIDI Note-On and Note-Off messages from each mute switch on the console, so that muting a channel will send out a Note-Off command and un-muting will send a Note-On. (Or, working in reverse, channels can be turned on and off by sending Note messages into the console). A useful application of this facility would be to trigger an outboard sampler by un-muting the input channel to which it is connected. Pressing the mute switch on the console would then have the dual function of turning on the audio input from the sampler, and playing the actual sound effect.

The possibilities are almost endless with MIDI control, as more and more equipment includes a MIDI interface.

The DataFader is a further extension of the Series FIVE's MIDI capabilities, giving even more control of outboard equipment from the console's control surface. The DataFader is a real time control which generates MIDI Continuous Controller data as it is moved, and sends it out via the console's MIDI output. Continuous Controller data can be used to adjust volume levels, delay times, dry/fx mixes etc. of many outboard fx units, as well as almost any MIDI controlled device. Even lighting consoles, for example, can be remotely controlled with Continuous Controller data. This opens up a whole range of possibilities for integrated show control, and is a facility not available on any other console of this type.

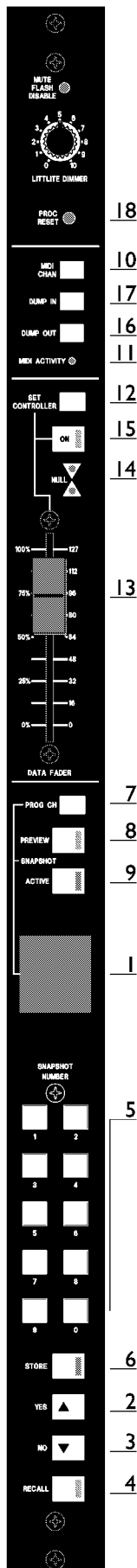
When the DataFader is used in conjunction with the Mute Scenes controller, it becomes even more powerful:

The particular parameter being controlled (the MIDI Controller `number'), as well as the MIDI channel on which the data is sent and the actual position of the Datafader itself, can be saved with each mute scene, so for example, in one scene the DataFader could be used to crossfade a lighting scene, and in the next it might be controlling the decay time of a reverb. All this can be preprogrammed so that the engineer only has to recall each scene and move the DataFader; the actual information about what the fader is doing when it is moved is automatically recalled with each scene. In fact the Datafader doesn't necessarily have to be moved because its positional value is also sent out automatically as the mute scene is recalled, allowing parameters to be changed automatically once the required value has been stored in each scene.

Using The Mute Groups

If you only want to know about using the mute groups on the console, go straight to page 4.39!

MIDI Module



Mute Scenes Controller

The Mute Scenes controller is able to store the Mutes for up to 256 different scenes (1 to 256). There is a further, non-standard, scene called ALL which appears on the display between 256 and 1. This allows you to store the same Mutes in all of the scenes 1 to 256 (see page 4.32). In addition, MIDI Program Change with channel, MIDI Controller Number with channel, and Datafader position may be stored for each scene.

1 The 3-digit 7-segment display. This primarily displays the current scene number, information relating to the scene number, and information relating to the MIDI controls. It is also used to indicate when changes to the cuts have been made (by flashing the decimal points), and is used to prompt the user for confirmation that changes are to be stored.

2 The **Up** key is used to increment the scene number as shown in the 7-segment display. It is also used as a “**Yes**” button to confirm that you wish to store changes. Holding the key down for longer than one second will cause the display to increment at high speed.

3 The **Down** key is used to decrement the scene number as shown in the 7-segment display. It is also used as a “**No**” button to allow you not to store changes. Holding the key down for longer than one second will cause the display to increment at high speed.

4 Whenever the Up or Down key is pressed the scene number will change. However the Mutes for that scene number will not be activated until you press **RECALL**. Note that until you press RECALL, the numbers in the display will flash to remind you that the Scene number which is displayed is not active on the desk.

5 The **0-9** keypad is used as an alternative to the Up and Down buttons to enter a scene number.

6 The **STORE** button is used to store changes made to scenes. For each scene number it also stores the MIDI Global Channel Number, The MIDI program-change value and channel, and the MIDI controller number and channel. (Note: STORE and RECALL are illuminated if any parameter (cuts or MIDI) is different from the recalled scene)

7 The **PROG CHANGE** button allows you to view and change the MIDI program change number and the MIDI channel used for sending and receiving program changes for the currently recalled scene. After you have pressed the PROG CHANGE button, which latches electronically, the change number is displayed. The program change message value (off, 1 to 128) may be changed using the Up/Down buttons (note: the actual MIDI number which is sent is in the range 0 - 127, i.e. one less than the displayed value). Due to the variations in how various equipment manufacturers interpret program change numbers, the Series FIVE's displayed program change number may or may not correspond to the displayed program number of the external equipment being controlled. As changes are made, the appropriate program change is sent, so you can see the effect of the program change on your out-board gear. The MIDI channel number may be viewed by pressing and holding the MIDI CHANNEL button. The channel number may be changed by using the Up/Down buttons. Note that the console is supplied from the factory with program changes 1-127 stored in scenes 1-127. Scenes 128-256 are set to Prog Ch=off.

8 The **PREVIEW** button allows you to preview and change any values in a scene without affecting the current status of the console. This is a useful function during live performances.

9 The **ACTIVE** button returns the console to Active mode. In this mode, pressing any CUT button will affect the audio in the normal way.

10 Pressing the **MIDI CHANNEL** button causes the Global MIDI Channel Number to be displayed. This is the channel on which Note ON and Note Off events are transmitted and received, and on which Program Change messages are **received**. This may be set to one of 1 to 16 or ANY. This is done by using the Up and/or Down buttons. Note that if the MIDI CHANNEL is set to ANY no Note On or Note Off data will be sent, but Program Changes will be received regardless of their channel.

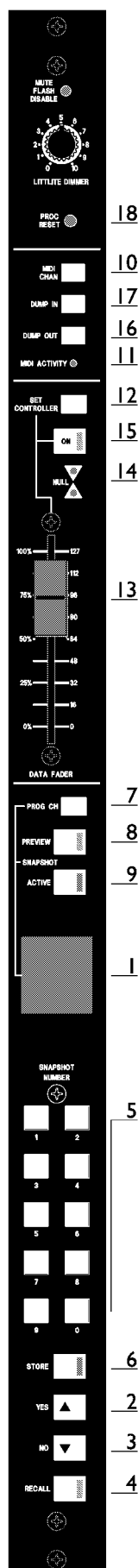
11 The **MIDI ACTIVITY** LED illuminates whenever MIDI information is transmitted or received by the console. This is useful when setting-up MIDI systems, e.g. to confirm that connections are good etc.

MIDI Controller

The MIDI Controller section is completely separate from the Mute Scenes controller, although it shares the controls and display of the latter for the purpose of adjusting its various parameters. These parameters are also stored along with the mute information in each scene.

The purpose of the MIDI Controller section is to send continuous controller data from the DataFader directly to the MIDI Out socket on the rear of the module. This may be used to control parameters on remote devices, e.g. FX units, samplers etc.

The type of data sent (e.g. volume, pitch bend, etc) may be selected, and a MIDI channel, which may be different to that used for program changes, may also be selected.



12 The MIDI controller number and channel is viewed and changed by pressing the **SET CONTROLLER** button which latches electronically. At this point the continuous controller number is displayed, and you may change it using the Up/Down buttons (see table 1 showing standard controller numbers and their functions).

You may then view the controller MIDI channel number by pressing and holding the MIDI CHANNEL button. The MIDI controller channel number is displayed, and you may change it using the Up/Down buttons. Release the MIDI channel button when the desired channel is selected.

13 The **DataFader** allows you to send data values between 0 and 127 on the designated controller number and channel. Note that data values are only sent when the fader moves, whatever the current position of the fader is, the stored value will always be sent. The Datafader's value is stored whenever a mute scene is stored, as long as the ON switch is active.

The DataFader is marked with two scales: 0 - 127, which indicates the MIDI Controller value being sent; and 0 - 100%, which gives an indication of volume or depth of the parameter in question.

14 The NULL LED shows which direction the fader has to be moved in order to reach its stored value in the currently active scene. Whilst the fader is being moved, no controller data is sent out, but when the fader reaches its stored position the NULL LED extinguishes, and the fader begins to send out controller information.

15 The DataFader is only active when the **ON** switch is active, as indicated by the switch's internal LED. The ON switch allows you to 'punch in' a preselected controller value to create a sudden control change, and enables the Datafader for either scene storage or recall.

Saving and Loading The Memory

The module's internal battery-backed RAM holds all the data for up to 256 scenes. This memory data may be 'dumped' in to an external storage device, so that another set of scenes may be programmed in whilst retaining a backup of the original set of scenes. This is done by using the MIDI System universal bulk dump method. Various devices are available on which to store the dumped data; these include stand-alone MIDI bulk-dump recorders, and some sequencer packages or keyboards.

Note: We recommend only using dedicated MIDI data filers as we have had some data corruption when using sequencers.

16 Pressing the **DUMP OUT + MIDI CHAN** buttons together triggers a system universal bulk dump of the console's Random Access Memory (RAM) via the MIDI output. The MIDI activity LED will light to show the duration of the outgoing MIDI data.

17 Pressing the **DUMP IN + MIDI CHAN** buttons together primes the console to accept a system universal bulk dump of the RAM into the MIDI input. When the console has not been primed in this way, the RAM is protected, and cannot be overwritten by an incoming bulk dump. When you do press the DUMP IN + MIDI CHAN button the 7-segment display shows three flashing bars, which stop flashing while incoming MIDI data is being received. At the end of the dump, press DUMP IN to finish the process and return to the scene number display. To abort the DUMP IN procedure (e.g. if no data is received), the DUMP IN button may be pressed while the flashing bar is displayed. The 7-segment display returns to the scene number display.

The DUMP IN button should not be pressed while data is being received, otherwise the data will not be properly restored.

I8 The **PROC RESET** button is available via a screwdriver hole. It may be latched in to disable the MIDI Module in the highly unlikely event of a CPU failure (all console mutes can be operated manually if the CPU is disabled). It can also be used to re-boot the CPU without having to power down the entire console.

Rear Connectors

See installation section for pinouts.

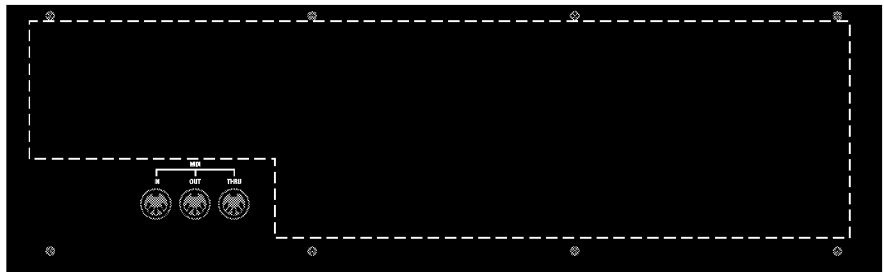


Table I - Controller Numbers

CONTROL NUMBER	CONTROL FUNCTION
0	Undefined
1	Modulation wheel or lever
2	Breath Controller
3	Undefined
4	Foot Controller
5	Portamento Time
6	Data Entry MSB
7	Main Volume
8	Balance
9	Undefined
10	Pan
11	Expression Controller
12 - 15	Undefined
16 - 19	General Purpose Controllers (#s 1 - 4)
20 - 31	Undefined
32 - 63	LSB for values 0 -31
64	Damper Pedal (sustain)
65	Portamento
66	Sostenuto
67	Soft Pedal
68	Undefined
69	Hold 2
70 - 79	Undefined
80 - 83	General Purpose Controllers (#s 5 - 8)
84 - 90	Undefined
91	External Effects Depth
92	Tremolo Depth
93	Chorus Depth
94	Celeste (Detune) Depth
95	Phaser Depth

Storing Mute Scenes

Mute Scenes may be stored using two alternative methods:

Active Mode

This is the default mode, but it is also a 'live' mode, that is, any mutes which you select will affect their channels immediately. We do not recommend using this mode during a performance.

So assuming that you are not in a live performance, you may set mute scenes in this mode as follows:

Press the required mute buttons on any of the input channels, group EQ or group/stereo modules. At this point the 7-segment display will show 3 flashing dots (this indicates that a change to the cuts has taken place), and the STORE and RECALL buttons will also illuminate. Next, select a Scene number by pressing the Up or Down buttons, or typing the scene number on the 0-9 keypad. There are 256 scenes(+ ALL);note that the UP and DOWN buttons will wrap around, i.e. if scene 256 is displayed and you press UP, the display will show scene ALL, when you press UP again the display will show scene 1, likewise the keypad will not allow entry of numbers above 256. When the scene number is correct press the Store Button. The display will cycle through 'YES', 'no' and the scene number which is about to be overwritten. Press YES to confirm that you wish to store this Scene. If you press NO the scene number will revert to the number which was shown prior to the changes, and the changes will not be stored.

Preview Mode

Preview Mode is selected by pressing PREVIEW. This mode is not 'live', that is, any mutes which you select will not cut the audio signal, but they will be shown on the Preview LEDs adjacent to the mute switches in question. We recommend using this mode when editing scenes during a live performance. The procedure for storing the mutes is the same as for the Active Mode described above.

Recalling Mute Scenes

There are two ways of recalling scenes:

Active Mode

This is the default mode, it is also the 'live' mode and is therefore the one which is used during a live performance.

Suppose that you wish to recall scene 1. You change the display to scene 1 by use of the Up/Down switches or 0-9 keypad. Note that the Scene number is flashing. This is to alert you to the fact that the mutes which are active are not the ones for the displayed scene, in this case scene 1. As soon as you press RECALL the mutes stored for that scene will be activated. The Program Change Number will also be transmitted on the stored channel number via the MIDI Output.

At this stage, during scene 1, you may wish to get ready to activate scene 2. To do this select scene 2 using the UP button or the keypad (0-0-2). Once again the scene number will flash to warn you that the mutes have not yet been activated. At the appropriate time in the performance you will press RECALL again and the mutes for scene 2 will be activated and, of course, the stored MIDI Program change number will be transmitted on the stored channel number.

The Scene number display acts as a pre-select for the mute scenes. This allows you to select scenes which are not in numerical order without having to activate every scene in between them. Alternatively you may choose to hold down the RECALL button as you step through the scenes with the Up/Down buttons. In this case the cuts are activated each time you change to the next scene number.

Preview Mode

Preview mode is entered by pressing the PREVIEW button. If a scene number is selected and the RECALL button is pressed the selected mute scene will be illustrated by illumination of the Preview LEDs on the inputs in question. The actual cuts on the inputs will not be affected, and will still be set to the scene number which was displayed prior to pressing the PREVIEW button. In this way any scene may have its mute status inspected without disturbing the active scene's mutes.

To exit Preview mode you have to press PREVIEW again. The display will return to the currently-active scene.

Auto Increment or Next mode

A special mode enables the RECALL button to function as a NEXT button, where it will recall the displayed scene number and then automatically select the next number, with one press. Therefore the UP/DOWN buttons or keypad do not need to be used, and the scenes can be recalled in numerical order by repeated pressing of the RECALL button

This mode has to be selected by holding down M2 during the boot-up routine. The best way to do this is using the PROC RESET button: hold down M2, then press and release the PROC RESET button at the top of the MIDI Module, using a suitable implement to access the switch via the front panel hole. Note that the switch is latching, so it must be latched and then unlatched to re-boot the module. Keep holding M2 until the scene number reappears in the display. The console will now be in NEXT mode, and will remain in this mode even when the power is turned off. To change back to RECALL mode, the above procedure must be repeated.

The 'ALL' Scene

The ALL scene allows selected data to be copied uniformly across all 256 scenes, to facilitate 'global' setting of the console (eg changing the DataFader to Controller #7 on all scenes). The currently displayed mute status or parameter value will be copied to all scenes when store is pressed.

Example 1

To copy a setup of mutes to all scenes, for use as a starting point when programming:

1. Select either Active or Preview mode, using the Preview button.
2. Set up the required combination of input or output mutes by pressing the console's mute buttons.
3. Use the Up/Down and Recall buttons to select the 'ALL' scene.
4. Press STORE. The display scrolls the message 'COPY TO ALL -YES-NO'.
5. Confirm the Store by pressing the 'Yes' button. The display scrolls the message YES-NO-ALL. Press the Yes button again to double confirm the Store. The mute setup will be copied into all scenes, overriding any previously stored mute scenes.

Example 2

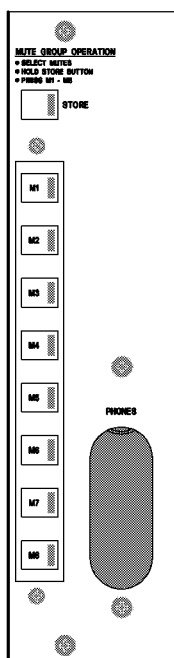
To change the DataFader to Controller #7 on all scenes:

1. Select either Active or Preview mode, using the Preview button.
2. Use the Up/Down and Recall buttons to select the 'ALL' scene.
3. Press the Set Controller button -the 7-segment display changes to show the currently stored MIDI Controller number.
4. Use the Up/Down buttons to select Controller number 7 on the display.
5. Press STORE. The display scrolls the message 'COPY TO ALL -YES-NO'.
6. Confirm the Store by pressing the 'Yes' button. The display scrolls the message YES-NO-ALL. Press the Yes button again to double confirm the Store. The Controller 7 will be copied into all scenes, overriding the previous setting.

Note that care is needed when using ALL due to the effect it has on scenes which are not currently selected. (This is the reason for the double-confirm). Once the 'Copy to All' message has been double confirmed, it cannot be reversed. The only way to restore the previous setup is to either go through each scene and manually change the parameters, storing each change, or reload the console's RAM memory, if this has been backed up using the bulk dump facility.

Introduction to the M1 - M8 Buttons

The M1 - M8 buttons can be used in two ways, depending on the application.



Mute Groups

This mode may be thought of as the software version of the traditional 'mute groups'.

This mode provides the facility to use the M1 - M8 buttons on the fader panel below the MIDI module as conventional Mute Groups. This facility simplifies the creation of mute groups, and is well suited to live music applications where the engineer does not wish to get involved with programming mute scenes using the 7-segment display. This facility also allows mute groups to be toggled on and off and to be 'layered' in the same way as with a conventional mute group system.

The Mute Groups mode separates the M1 - M8 buttons from the 256 scenes, giving in effect an extra 8 'special' scenes which are used for mute grouping. Thus the M1 - M8 buttons can now be used independently of the rest of the midi module, simplifying operation.

Mute Scenes

In this mode the M1 - M8 buttons simply act as instant recall buttons for any of the 256 scenes which have already been stored using the 7-segment display and STORE button. This is useful in a theatre environment where a certain number of scenes need to be recalled often: finding the number on the 7-segment display could be laborious.

Only one scene at a time can be recalled with this mode.

Switching between Mute Scenes mode and Mute Groups mode

The user only has to decide once which mode is preferred: the console remembers which mode is in use every time it is powered up, unless you want to change mode for any reason.

Swapping between Mute Group mode and Mute Scenes mode is done at power up. To change from one mode to the other you must hold down the M1 button during the power-up sequence. The new mode will then remain active during each mixing session thereafter, until the M1/power-up operation is performed again to swap to the other mode.

The default mode when leaving the factory is Mute Group Mode, and the instructions printed on the fader panel above the M1-8 buttons refer to this mode only.

Using The M1 - M8 Buttons In Mute Groups Mode

The following instructions only apply to 'Mute Group' mode.

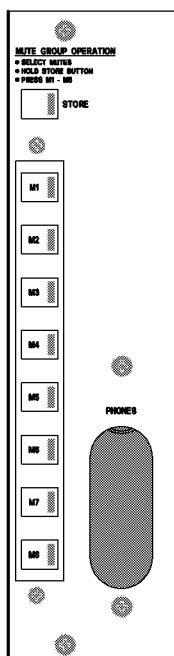
How To Set Up A Mute Group

Make sure that the console is in 'Mute Group' mode (see 'Switching between Mute Scenes Mode and Mute Groups Mode' on page 4.38). The console should be in this mode when it leaves the factory.

To set up a Mute Group you can be in either PREVIEW or ACTIVE mode. Select the mutes required in the Mute Group by pressing the appropriate MUTE switches. (If in preview mode this will cause the Preview LED to start flashing as an indication of selection. The channel audio will not be affected.)

To store these mutes as Mute Group 1 you should hold down the STORE button (the one on the fader panel, not the MIDI module) and press the M1 button. The Store operation does not need to be confirmed. Similarly if you want to assign the active mutes as Mute Group 8 you should hold down the STORE button and press the M8 button. This principal applies to assigning mutes to any of the buttons M1-M8.

N.B. Each individual mute may belong to one or more Mute Groups. Alternatively you may choose not to assign a particular mute to any groups at all.



Using The Mute Groups

Once mute groups have been assigned as described above, they can be checked if required by selecting PREVIEW mode and then pressing the M1 - M8 buttons. The Preview LEDs will flash to confirm which channels are assigned to the selected mute group. To use the mute groups during the performance, select ACTIVE mode again.

Operating the M1 - M8 buttons now will cause the selected channels to MUTE. (Preview mode can be re-entered at any time during the performance, for checking purposes).

How Mute Groups Behave In Practice

Each of the buttons M1-M8 will be illuminated when that group is active. Pressing one of the buttons M1-M8 to select a Mute Group will mute all channels assigned to that group. Pressing M1-M8 to deactivate the group will un-mute the assigned channels. If more than one mute Group is selected at a time, the result will be a 'layering' or 'additive' effect. In addition, channel mutess can still be unmuted locally after they have been muted by a Mute Group.

Mute Groups & Scene Recall

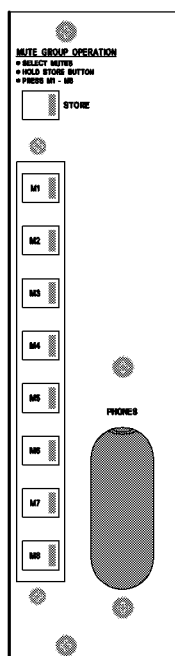
On software versions below 1.20 (June '99) the Scene-set system (if used) took priority over the Mute Group system. When a Mute Scene was recalled by selecting one of the 256 scenes and pressing the RECALL button, any Mute Groups which were active at the time are deactivated.

On V1.20, the priority is reversed, so that mute groups are not cancelled by scene recall. This can be changed if required, see "Special Features", page 4.45.

Mute Groups and Program Change Messages

Note that program changes cannot be stored or recalled from the M1 - M8 buttons when in Mute Group Mode. If program changes are required, a scene must be recalled using the 7-segment display, or the M1 - M8 buttons must be switched to Mute Scenes mode.

Using The M1 - M8 Buttons In Mute Scenes Mode



When the console is in Mute Scenes mode (see 'Switching between Mute Scenes Mode and Mute Groups Mode' on page 4.38), the M1 - M8 buttons are designed to allow 'instant' recall of any mute scene, without having to use the Up/Down buttons and 7-segment display to find the scene and then recall it with the 'Recall' button.

When Mute Scenes mode is first selected, the M1 - M8 buttons are pre-programmed to select and recall scenes 1-8, so all that is necessary to use them is to store required mute settings into each scene of 1-8. (See 'Storing Mute Scenes' on page 4.35). The various combinations of mutes can then be recalled at will by simply pressing the M1 - M8 buttons. The buttons have an 'interlocking' action, i.e. you can only select one at a time, any selection cancels the previous one. (Note: if overlapping Mute Scenes are required use Mute Group mode - see page 4.38)

Once scenes have been stored, the effect of pressing the M1 - M8 buttons is then to instantly select and recall the corresponding scene, in one operation. Any program changes or controllers stored with the scene will also be recalled exactly as if the scene had been recalled using Up/Down and Recall.

For more advanced use, the M1 - M8 buttons can be reassigned from their factory set defaults of scenes 1-8, to any other scene numbers. The only restriction is that you cannot assign a given M1 - M8 button to more than one scene at the same time, and you cannot assign more than one M1 - M8 button to a given scene number.

This would be useful in a theatre production to provide fast access to given scenes which need to be recalled frequently, for example during rehearsals.

To reassign the M1 - M8 buttons to any scene number:

- 1 Select and recall the required scene using the Up/Down and Recall buttons.
- 2 Press and hold down the Store button (the one on the MIDI module), and then momentarily press the required M1 - M8 button.
- 3 Release the Store button. The M1 - M8 button has now been assigned to the current scene.

Note that if the above operation is repeated with the same M1 - M8 button, the button will be deassigned and will not be assigned to any scene. The M1 - M8 buttons can all be set to 'no scene' in this way if required.

Storing MIDI Parameters with Mute Scenes



At the same time as creating a mute scene, a number of other parameters can be stored.

These are:

- Program change number for the scene.
- MIDI channel number for transmission of program change messages.
- Controller number for DataFader.
- Position (value) for DataFader.
- MIDI channel for Controller messages.
- Global receive channel for incoming MIDI Note on/off messages and reception of program changes.

All these parameters can be stored at the same time, or edited individually without changing the others. Storing/editing of these parameters can be carried out in either Active Mode or Preview mode, as for the mutes.

Example

Suppose for scene number 12 you want to store the following configuration:

Program change **40**, on MIDI channel **3**

DataFader controller number **7**, on MIDI channel **8**

1. Select either Active or Preview mode .

2. Select and recall the Scene 12, using the up/down buttons and RECALL button.

3. Press the PROG CHANGE button, which will illuminate. The 7-segment display now shows the currently stored program change number for scene 12. (If the console is new, the program change numbers will be factory-set to be the same as scene numbers, until altered)

4. Use the up/down buttons to change the program number to **40**. Note that if you are in Active mode, Program Change messages will be sent out as you increment the display, enabling you to observe the change happening on the outboard equipment. This does not happen if you are in Preview mode.

5. Press and hold the MIDI CHANNEL button at the top of the module. The 7-segment display now shows the currently stored Program Change transmit MIDI channel for scene 12.

6. Use the Up/Down buttons to set the MIDI channel to channel **3**. When 3 is shown in the display, release the MIDI Channel button.

7. Press the SET CONTROLLER button. (The Prog Change button will turn off, and the Set Controller button will illuminate). The 7-segment display now shows the currently stored Controller Number for scene 12.

8. Use the Up/down buttons to change the Controller Number to **7**.

9. Press and hold the MIDI CHANNEL button at the top of the module. The 7-segment display now shows the currently stored DataFader MIDI channel for scene 12. Use the Up/Down buttons to set the MIDI channel to channel **8**. When 8 is shown in the display, release the MIDI Channel button. Press the Set Controller button again to turn it off. The 7-segment display now returns to showing the current scene number (12).

10. Press the STORE button to save the changes you have made into scene 12's memory location. You are prompted by the display to confirm or abort the store operation, by pressing the Yes or No buttons.

Note 1: The order in which program change and controller numbers are set is not important - in the above example the program change was done first, but this is not essential.

Note 2: If the controller ON button was illuminated when the Store button was pressed, then the position of the Datafader will also be stored along with the other parameters.

Editing MIDI Parameters in Mute Scenes

If you want to change any of the MIDI parameters individually within a scene, follow the instructions in the example on the previous page, but omit the steps which refer to parameters you do not wish to change. You can change the value of just one parameter if you wish, and then press STORE. The scene will then be updated with just the changed information. (The other parameters will be updated as well, but as you haven't changed them, this won't make any difference).

You can also make changes to the console mutes while editing MIDI parameters, and these will be stored along with the MIDI parameters when the STORE button is pressed.

If editing is required during a performance for any reason, Preview mode should be selected, so that the required scene can be recalled for editing without disturbing the existing status of the console.

Setting the Global MIDI Receive/Note On/Off channel

As described above, the MIDI channels for Program change *transmit* and DataFader transmit are set and stored for each scene.

The MIDI channel for the *receiving* of Program Changes and both the *transmitting* and *receiving* of Note On and Note Off messages can also be set and stored in the same way.

To set the Global Receive/Note On/Off channel:

1. Make sure that neither Program Change nor Set Controller switches are illuminated.
2. Press and hold the MIDI channel switch at the top of the module.
3. Use the Up/Down buttons to select a channel between 1 and 16, or select 'ANY', which means that the console will 'listen' on all MIDI channels, but will not transmit on any channel.
4. Release the MIDI Channel button, and press the STORE button. The display scrolls the message "YES-NO-Scene Number". Press the Yes button to confirm the Store.

The channel is factory set to channel 1 on all scenes.

MIDI Module - Special Features (V1. 20 software)

In response to customer feedback, we have added a number of special modes which allow the operation of the MIDI module to be customised to the user's requirements. These are activated by rebooting the module, by pressing and releasing the CPU Reset button, (or powering the console on) **whilst holding down one of the mute group master buttons (M1-8 buttons)**. Once the chosen mode has been enabled, it will remain in effect on all subsequent power-up operations. The mode can be disabled by repeating the sequence of rebooting whilst holding the same M1-8 button .

The available modes with V1.20 software (July '99) are as follows:

The currently selected modes are displayed by illumination of the M1-4 buttons during the boot-up sequence.

Note: Modes M-M4 below were first added with V1.13 software.

Hold down this M1 - 8 button during boot-up to enable or disable:	Description of special operating mode:	Factory Default setting:
M1	Changes M1 - 8 buttons from Mute Groups to mute scenes "instant access" buttons. Already described on pages 4.38 - 4.40 (M1 is lit on startup if mute scenes are selected).	Mute Groups mode
M2	Changes the RECALL button into a "NEXT" button. In NEXT mode, each press of the RECALL button will recall the indicated mute snapshot and automatically increment the snapshot number ready for the next snapshot to be recalled (M2 is lit on startup if auto increment is ON).	Recall button does not automatically increment
M3	Disables the recall of console mutes when a snapshot is recalled by pressing the RECALL button. This allows the snapshot system to be used purely as an FX controller, sending MIDI program changes or controller data, but without affecting the mutes on the console. The Mute Groups can still be used in this mode, as long as the M1 - 8 buttons are set to the Mute Groups mode (see M1 mode, above). (M3 is lit on startup if snapshot recall is MIDI only).	Mute Recall enabled.
M4	Changes priority of mute groups vs. Snapshots. When snapshots have priority, recall of snapshots will override any active mute groups. When mute groups have priority, snapshot recall will not cancel mute groups. Mute groups will not cancel snapshots, but can be layered on top of them. (M4 is lit on startup for snapshot priority).	Mute groups have priority

**Table Of MIDI Note Numbers sent/received
by Series FIVE mute switches (in note order)**

MIDI Note Number	Mute Switch	MIDI Note Number	Mute Switch	MIDI Note Number	Mute Switch
0	Aux 3	32	Group 7	64	Input 27
1	Aux 4	33	Group 8	65	Input 28
2	Matrix 6	34	Matrix 4	66	Input 29
3	Aux 5	35	Aux 1	67	Input 30
4	Aux 6	36	Aux 2	68	Input 31
5	Matrix 7	37	Matrix 5	69	Input 32
6	Aux 7	38	Input 1	70	Input 33
7	Aux 8	39	Input 2	71	Input 34
8	Matrix 8	40	Input 3	72	Input 35
9	Aux 9	41	Input 4	73	Input 36
10	Aux 10	42	Input 5	74	Input 37
11	Matrix 9	43	Input 6	75	Input 38
12	Aux 11	44	Input 7	76	Input 39
13	Aux 12	45	Input 8	77	Input 40
14	Matrix 10	46	Input 9	78	Input 41
15	Stereo Master	47	Input 10	79	Input 42
16	Mono Master	48	Input 11	80	Input 43
17	Aux Return 1	49	Input 12	81	Input 44
18	Aux Return 2	50	Input 13	82	Input 45
19	Stereo 1	51	Input 14	83	Input 46
20	Stereo 2	52	Input 15	84	Input 47
21	Stereo 3	53	Input 16	85	Input 48
22	Stereo 4	54	Input 17	102	Input 49
23	Group 1	55	Input 18	103	Input 50
24	Group 2	56	Input 19	104	Input 51
25	Matrix 1	57	Input 20	105	Input 52
26	Group 3	58	Input 21	106	Input 53
27	Group 4	59	Input 22	107	Input 54
28	Matrix 2	60	Input 23	108	Input 55
29	Group 5	61	Input 24	109	Input 56
30	Group 6	62	Input 25		
31	Matrix 3	63	Input 26		

**Table Of MIDI Note Numbers sent/received
by Series FIVE mute switches (in switch order)**

MIDI Note Number	Mute Switch	MIDI Note Number	Mute Switch	MIDI Note Number	Mute Switch
38	Input 1	70	Input 33	9	Aux 9
39	Input 2	71	Input 34	10	Aux 10
40	Input 3	72	Input 35	12	Aux 11
41	Input 4	73	Input 36	13	Aux 12
42	Input 5	74	Input 37	23	Group 1
43	Input 6	75	Input 38	24	Group 2
44	Input 7	76	Input 39	26	Group 3
45	Input 8	77	Input 40	27	Group 4
46	Input 9	78	Input 41	29	Group 5
47	Input 10	79	Input 42	30	Group 6
48	Input 11	80	Input 43	32	Group 7
49	Input 12	81	Input 44	33	Group 8
50	Input 13	82	Input 45	25	Matrix 1
51	Input 14	83	Input 46	28	Matrix 2
52	Input 15	84	Input 47	31	Matrix 3
53	Input 16	85	Input 48	34	Matrix 4
54	Input 17	102	Input 49	37	Matrix 5
55	Input 18	103	Input 50	2	Matrix 6
56	Input 19	104	Input 51	5	Matrix 7
57	Input 20	105	Input 52	8	Matrix 8
58	Input 21	106	Input 53	11	Matrix 9
59	Input 22	107	Input 54	14	Matrix 10
60	Input 23	108	Input 55	19	Stereo 1
61	Input 24	109	Input 56	20	Stereo 2
62	Input 25	35	Aux 1	21	Stereo 3
63	Input 26	36	Aux 2	22	Stereo 4
64	Input 27	0	Aux 3	17	Aux Return 1
65	Input 28	1	Aux 4	18	Aux Return 2
66	Input 29	3	Aux 5	15	Stereo Master
67	Input 30	4	Aux 6	16	Mono Master
68	Input 31	6	Aux 7		
69	Input 32	7	Aux 8		



MIDI Implementation Chart

Function		Transmitted	Recognised	Remarks
Basic Channel	Default	1	1	
	Changed	1-16	1-16	
Mode	Default	MODE3	MODE3	
	Messages	X	X	
	Altered	X	X	
Note Number:		0-85	0-85	See Note 1
	True Voice	X	X	
Velocity	Note On	X	X	Note ON. Velocity 1-27 = Channel not muted Note ON. Velocity 0 = Channel muted Note Off. Velocity 1-27 = Channel muted
	Note Off	X	X	
After Touch	Keys	X	X	
	Chs	X	X	
Pitch Bend		X	X	
Control Change		O	X	As programmed when the data fader is moved
Program Change		0 - 127	0 - 127	See Note 2
	True#	X	X	
System Exclusive		O	O	See Note 3
System Common	Song Position	X	X	
	Song Select	X	X	
	Tune	X	X	
System Real Time	Clock	X	X	
	Command	X	X	
Aux Messages	Local On/Off	X	X	
	All Notes Off	X	X	
	Active Sense	X	X	
	Reset	X	X	

Notes Note 1. Note Numbers
See the accompanying charts

Note 2. Program Change
Program Change Numbers 0 - 127 are transmitted when scenes 1 - 128 are recalled.
When Program change Numbers 0 - 127 are received, scenes 1 - 128 are recalled.

Note 3. System Exclusive. The system exclusive file format used to dump the scenes to an external computer for backup purposes is as follows:
Header: f0 39 7f 07 01 39 'MIDI' 00 00 03 04 f7
Start Packet: f0 39 7f 07 02 00 17 'Soundcraft Series5' <Version no> f7
Data packets containing scenes: f0 39 7f 07 02 <Packet count> <data size> <data> <checksum> f7
End of file: f0 39 7f 7b 00 f7
(Where '...' indicates ASCII code for text, & <...> indicates hexadecimal data)

Mode 1: OMNI ON, POLY
Mode 3: OMNI OFF, POLY

Mode 2: OMNI ON, MONO
Mode 4: OMNI OFF, MONO

O: Yes
X: No

Specifications

Series FIVE Specification							
	Module	Signal	Conn.	Pin	Nom Level	Max Level	Impedance
Inputs	Mono Input	Input (A & B)	Female XLR	Pin 1 - Ground Pin 2 - Signal Hot Pin 3 - Signal Cold	-70 to -2dBu -20 to +10dBu (switched range)	+30dBu	2kΩ
	Stereo Input	STE IN (Left & Right)	Female XLR	Pin 1 - Ground Pin 2 - Signal Hot Pin 3 - Signal Cold	-70 to -2dBu -20 to +10dBu (switched range)	+30dBu	>2k2Ω
	Matrix	Ext. In (Left & Right)	Female XLR	Pin 1 - Ground Pin 2 - Signal Hot Pin 3 - Signal Cold	+4dBu	+26dBu	>10k Ω
	Master	TB Mic I/P	Female XLR	Pin 1 - Ground Pin 2 - Signal Hot Pin 3 - Signal Cold	-20 to -70dBu	0dBu	2k Ω
		EXT TB I/P	Female XLR	Pin 1 - Ground Pin 2 - Signal Hot Pin 3 - Signal Cold	+4dBu	+26dBu	>10kΩ
		Aux Returns (L & R for 1 & 2)	Female XLR	Pin 1 - Ground Pin 2 - Signal Hot Pin 3 - Signal Cold	+4dBu/ -10dBV	+26dBu/ +12dBV	>10kΩ
Insert points	Mono Input	Channel Snd & Ret	TRS (1/4" Jack)	Tip - Signal Hot Ring - Signal Cold Sleeve - Ground	Send +4dBu Return +4dBu	+26dBu ^(into 1kΩ) +21dBu	Send <75Ω Return >15k Ω
	Stereo Input (L&R)	Channel Snd & Ret	TRS (1/4" Jack)		Send +4dBu Return +4dBu	+26dBu ^(into 1kΩ) +21dBu	Send <75Ω Return >15k Ω
	Matrix	Matrix Snd & Ret	TRS (1/4" Jack)		Send +4dBu Return +4dBu	+26dBu +21dBu	Send <75 Return >15k
	Group/Aux Master	Group/Aux Snd & Ret	TRS (1/4" Jack)		Send +4dBu Return +4dBu	+26dBu ^(into 1kΩ) +21dBu	Send <75Ω Return >15k Ω
	Output Master	Main Mono, L & R Snd & Ret	TRS (1/4" Jack)		Send +4dBu Return +4dBu	+26dBu ^(into 1kΩ) +21dBu	Send <75Ω Return >15k Ω
Outputs	Mono Input	Direct Output	Male XLR	Pin 1 - Ground Pin 2 - Signal Hot Pin 3 - Signal Cold	+4dBu	+26dBu (into 1k Ω)	<75Ω
	Matrix	Matrix Output	Male XLR	Pin 1 - Ground Pin 2 - Signal Hot Pin 3 - Signal Cold	+4dBu	+26dBu (into 1k Ω)	<75Ω
	Group Master	Group Output	Male XLR	Pin 1 - Ground Pin 2 - Signal Hot Pin 3 - Signal Cold	+4dBu	+26dBu (into 1k Ω)	<75Ω
	Aux Master	Aux Output	Male XLR	Pin 1 - Ground Pin 2 - Signal Hot Pin 3 - Signal Cold	+4dBu	+26dBu (into 1k Ω)	<75Ω
	Output Master	L/R/Mono/Alt 2&3 L&R Outputs	Male XLR	Pin 1 - Ground Pin 2 - Signal Hot Pin 3 - Signal Cold	+4dBu	+26dBu (into 1k Ω)	<75Ω
		Ext TB Output	Male XLR	Pin 1 - Ground Pin 2 - Signal Hot Pin 3 - Signal Cold	+4dBu	+26dBu (into 1k)	<75Ω
		Oscillator Output	Male XLR	Pin 1 - Ground Pin 2 - Signal Hot Pin 3 - Signal Cold	+4dBu	+14dBu (into 1k Ω)	<75Ω
		Headphones Output	TRS (1/4" Jack)	Tip - Left Ring - Right Sleeve - Ground	+4dBu	+20dBu (into 600Ω) 0dBu (into 8 Ω)	50Ω
Console Linking Inputs		All Inputs	Female XLR	Pin 1 - Ground Pin 2 - Signal Hot Pin 3 - Signal Cold	+4dBu	+26dBu	>15kΩ

Series FIVE Specification

Frequency Response	XLR input to any output: +0/-0.5dB, 20Hz - 20kHz
T.H.D. and Noise	<p>All measurements at +20dBu.</p> <p>XLR In to Direct Out (VCA Out) <0.004% @ 1kHz <0.02% @ 10kHz</p> <p>XLR In to Direct Out (VCA In) <0.015% @ 1kHz <0.04% @ 10kHz</p> <p>XLR In to Mix Out (VCA Out) <0.005% @ 1kHz <0.02% @ 10kHz</p>
Mic Input E.I.N.	22Hz - 22kHz bandwidth, unweighted: < -127.5dBu (200Ω source)
Residual Noise	Mix Output; no inputs routed, Mix fader @ 0dB: -90dBu
Bus Noise	<p>Mix Output; 32 channels routed, input faders @ -∞, Mix fader 0dB: < -78dBu</p> <p>Grp Output; 32 channels routed, input faders @ -∞, Grp fader 0dB: < -78dBu</p>
Crosstalk	<p>1kHz, +20dBu input signals</p> <p>Input Channel muting: >100dB</p> <p>Input fader cutoff: >90dB</p> <p>Input pan pot isolation: >85dB</p> <p>Input A to B isolation: >80 dB</p> <p>Stereo L/R isolation: >80 dB</p> <p>Mix routing isolation: >100dB</p> <p>Group routing isolation: >100dB</p> <p>Group-group crosstalk: <-90dB</p> <p>Group-Mix crosstalk: <-90 dB</p> <p>Mix-group crosstalk: <-90 dB</p>
CMRR	Mono Input, A or B Inputs -60 dB @ 1kHz
Oscillator	63Hz to 10kHz/Pink Noise, variable level.
HP Filter (Mono Input) LP Filter (Mono Input)	<p>20-600Hz, 12dB/octave.</p> <p>1k-20kHz, 12dB/octave.</p>
EQ (Mono Input)	<p>HF: 1k-20kHz, +/-15dB, Q = 0.5 - 3.0, or shelf</p> <p>Hi-Mid: 500 - 8kHz, +/-15dB, Q = 0.5 - 3.0</p> <p>Lo-Mid: 70 - 1.5kHz, +/-15dB, Q = 0.5 - 3.0</p> <p>LF: 30 - 480Hz, +/-15dB, Q = 0.5 - 3.0, or shelf</p>
Metering	<p>Overbridge: 12 VU Meters monitoring Group/Aux/Matrix + 3 VU Meters monitoring Left Mix/AFL/PFL, Right Mix/AFL/PFL & Mono (centre) Mix Each meter has a peak LED set to 3db below clipping.</p> <p>Mono Input: 9-LED bargraph + Peak LED</p> <p>Stereo Input: 2 x 4-LED bargraph + Peak LED</p>
Power Consumption	48 Ch Console: each 17V rail takes 12.98A (nominal)(measured without Littlites connected) the 8V rail takes 0.8 A (nominal).
Weight	24 Ch - 95kg (209lbs), 32 Ch - 120kg (264lbs), 40 Ch - 145kg (320lbs), 48Ch - 170kg (375lbs).
Operating Conditions	<p>Temperature Range -10°C to +30°C</p> <p>Relative Humidity 0% to 80%</p>

