

USER GUIDE

Soundcraft
Europa

Glossary

auxiliary send	an output from the console comprising a mix of signals from channels and groups derived independently of the main stereo group mixes. Typically the feeds to the mix are implemented on rotary level controls.
balance	the relative levels of the left and right channels of a stereo signal.
clipping	the onset of severe distortion in the signal path, usually caused by the peak signal voltage being limited by the circuit's power supply voltage.
CR (control room) monitors	loudspeakers used by the operator (engineer) in the control room to listen to the mix.
dB (decibel)	a ratio of two voltages or signal levels, expressed by the equation $dB=20\text{Log}_{10}(V1/V2)$. Adding the suffix 'u' denotes the ratio is relative to 0.775V RMS.
DI(direct injection)	the practice of connecting an electronic musical instrument directly to the input of the mixing console, rather than to an amplifier and loudspeaker which is covered by a microphone feeding the console.
equaliser	a device that allows the boosting or cutting of selected bands of frequencies in the signal path.
foldback	a feed sent back to the artistes via loudspeakers or headphones to enable them to monitor the sounds they are producing.
frequency response	the variation in gain of a device with frequency.
(sub) group	an output into which a group of signals can be mixed.
headroom	the available signal range above the nominal level before clipping occurs.
highpass filter	a filter that rejects low frequencies.
line level signals signals	at a nominal level of -10dBV to +6dBu, coming from a low impedance source.
noise gate	an electronic switch which only passes signals exceeding a set threshold level.
pan (pot)	abbreviation of 'panorama': controls levels sent to left and right outputs.
peaking	an equaliser response curve affecting only a band of frequencies i.e. based on a bandpass response.
PFL (pre-fade listen)	a function that allows the operator to monitor the pre-fade signal in a channel independently of the main mix.
rolloff	a fall in gain at the extremes of the frequency response.
shelving	an equaliser response affecting all frequencies above or below the break frequency i.e. a highpass or lowpass derived response.
spill	acoustic interference from other sources.
talkback	the operator speaking to the artistes or to tape via the auxiliary or group outputs.
transient	a momentary rise in the signal level.
VCA	(Voltage Controlled Amplifier) a device which acts as a variable audio attenuator controlled by an external d.c. voltage.

Supplement To EUROPA Functional Description



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Part No. Supplement to ZZ2741

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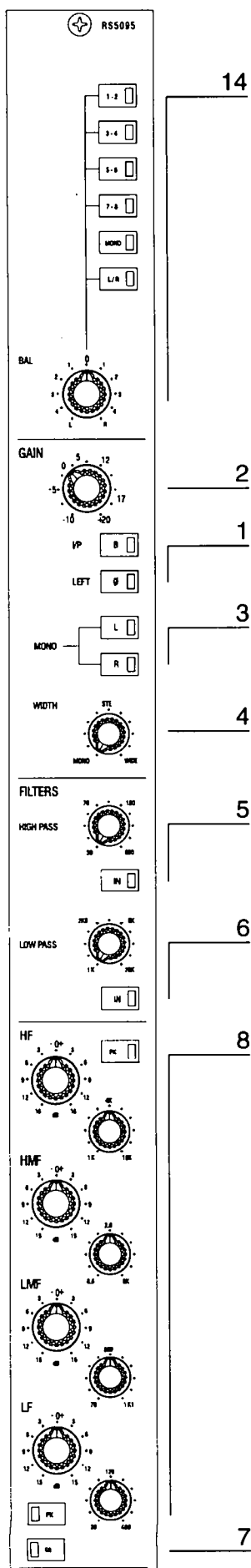


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Stereo Input Module

Stereo Module



Input Section

Input Selection and Phase

1 The module has 2 line inputs, A and B. Input A is connected via XLRs, and Input B is connected via jacks. The default input is A, with B being selected by pressing the (I/P) B switch. The phase of the selected input's left signal can be reversed by the LEFT Ø switch.

Gain

2 The GAIN control has a sensitivity range of +10dBu to -20dBu.

L, R, MONO Switching

3 When L is depressed the left input signal is routed to the left and right channel paths. Similarly, if R is depressed, the right input signal is routed to the left and right channel paths. If both L and R switches are depressed, a mono mix of the left and right input signals is routed to the left and right channel paths.

Width

4 A centre detented WIDTH control varies the width of the stereo image from mono through stereo at the centre detent to phase-enhanced wide stereo. It is located immediately after the L and R switching.

Filters

There are separate second-order highpass and lowpass filters.

5 The HIGHPASS filter has a cut-off frequency which is variable from 30 to 600Hz by the frequency control. The highpass filter is switched into circuit via its IN switch.

6 The LOWPASS filter has a cut-off frequency which is variable from 1kHz to 20kHz by the frequency control. The lowpass filter is switched into circuit via its IN switch.

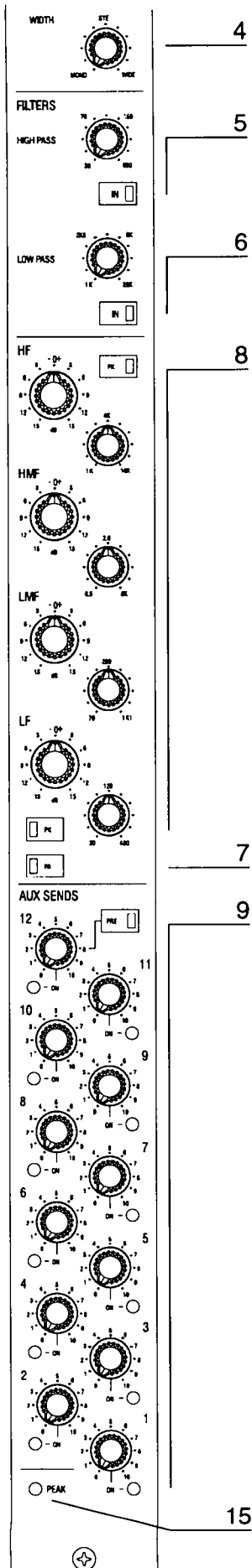
Equaliser.

7 The Equaliser is a 4-band sweep-frequency design, and is placed in the signal path by the EQ switch.

8 The HF and LF sections are second-order shelving or peak/dip, depending upon their respective PEAK switches; the HMF and LMF sections are both peak/dip filters.

All 4 bands have a centre detented cut/boost control giving +/-15dB, and a frequency control with ranges as follows:

- HF 1kHz...16kHz
- HMF 500Hz ... 8kHz
- LMF 70Hz...1.1kHz
- LF 30Hz...480Hz



Auxiliary Sends.

9 12 auxiliary sends are provided. Each has a rotary level control.

All auxes are fed pre- and post-fade mono sums of the L & R signals. The pre-fade is jumper-selectable to be post-mute or pre-mute.

Electronic cut circuitry is operated by pressing the level knob to activate a momentary switch. CUT status is indicated by illumination of the ON LED below each level control.

Pre-fade sourcing is globally selected for each aux bus on its master section.

Aux 12 Pre/Post

AUX 12 has a local PRE switch, and it always follows the master selection, except when PRE has been pressed, in which case it is locally flipped to the opposite source: if the master pre/post selection is changed the channel will flip to be opposite. The PRE LED glows when the state is PRE.

The aux 12 pre-fade is jumper-selectable to be post-mute or pre-mute.

Fader Panel

Channel Status

10 The illuminated, electronically latching SOLO and CUT push-button switches, in conjunction with the 8 mute groups (their status is shown via mute LEDs), the SAFE switch, and the master mutes and SIP switch (in the console master section) control whether the channel is ON or muted. Selection of active mute groups is done from the master section of the console in conjunction with the channel's (MUTE GROUP) SEL switch.

Pressing the CUT switch will always mute the channel via the soft muting circuit. Similarly if a mute group is selected, pressing the corresponding mute master will mute the channel. Likewise, if the channel is part of a VCA group and the CUT on the VCA group master is pressed, the channel will be cut.

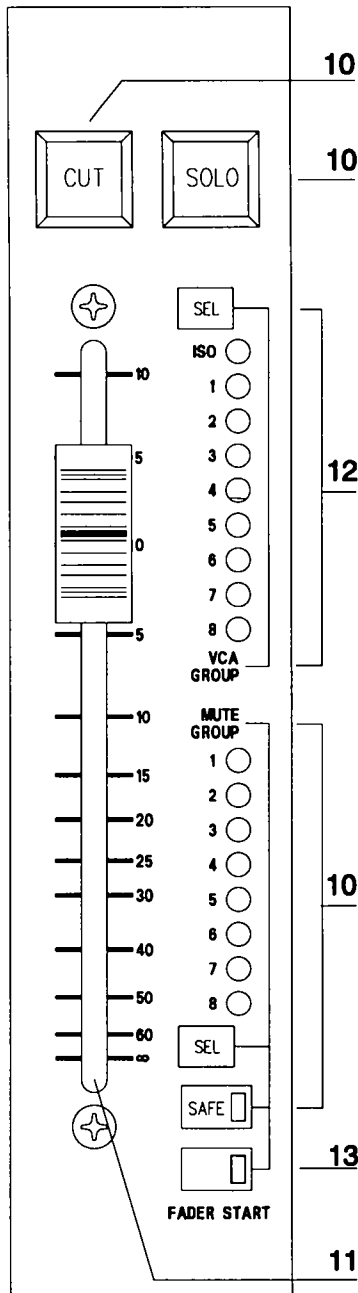
If Solo In Place (SIP) is not selected, pressing the SOLO switch PFL's the channel, i.e. feeds the channel signal to the PFL bus and applies a signal to the PFL enable bus to get the monitoring to change over. If SIP is selected, pressing the SOLO switch does not PFL the channel but cuts all other inputs, unless they have been made safe by selecting ISO on the VCA GROUP. Pressing the SOLO switch on a channel that is isolated whilst SIP is selected will AFL the channel in stereo. AFL changes the monitoring over to the AFL'ed channel without muting any other channels.

Fader

11 The 100mm channel fader has 10dB of gain when fully up.

VCA Grouping

12 The console has a VCA fader system fitted as standard. LEDs 1 to 8 indicate the selection of any VCA groups to which the channel is assigned. The ISO LED indicates that the channel is isolated from Solo-In-Place mutes.



Selection of active VCA groups is done from the master section of the console in conjunction with the channel's VCA SEL switch.

13 The **FADER START** Enable switch allows the fader to activate an external tape/cart/CD machine. Electrically, it is in series with the switch in the fader body and connects to the outside world via a multipin connector on the rear panel (note: the multipin connector is only fitted to special order).

Group Routing.

The routing matrix is at the top of the module, and allows the channel post-fade signal to be fed to the eight group and three mix busses, which are all differential with balanced drive.

14 Routing to the 8 group busses is in pairs by the 4 group switches. Routing to the L & R busses is by the L/R switch. These busses are sourced after the centre detented BAL control. When the MONO switch is pressed, a mono sum of the pre-BAL signal is routed to the mono bus.

Peak LED

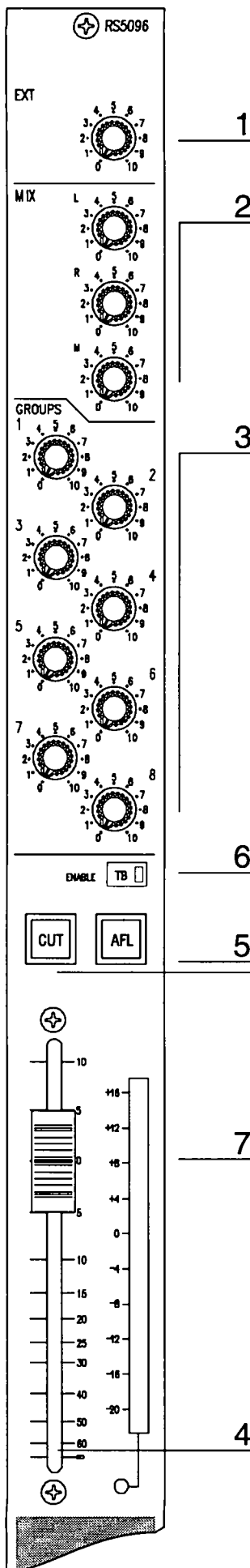
15 A **PEAK** LED illuminates when there is a level of +14dBu on any of the inputs of its driver, which are:

- Output of Line amplifier,
- Output of the EQ,
- Output of fader buffer.

A meter take-off point is provided that can be link-selected to read either the output of the Line amplifier (default) or the wiper of the EQ switch. Channel metering is by means of a 16-segment LED bargraph located in the meter bay. The higher of the L and R signals is displayed on the bargraph.

Matrix Module

Matrix Module



This module allows the creation of composite mixes of an external input, the group, and main mix output signals. Two independent, but functionally identical sections occupy a single width module, which may be fitted in multiples of 4 at the right of the console.

Apart from the fact that the lower section has its fader, CUT and AFL switches on a separate module in the fader bay, both sections are identical, and therefore only one is described.

1 External Receive. There is an **EXTERNAL** receive level control for a balanced, line level external input: this also has internal switching for +4dBu/-10dBV nominal input level.

2 Mix Receive. Three level controls for the main post-fade Mix signals **L**, **R**, and **Mono**.

3 Group Receive. Eight level controls for the post-fade group signals are provided, alternating grey (even groups) and black (odd groups).

4 Matrix Fader. The matrix output fader has +10dB at the top of its travel, and sets the level at the electronically balanced output: nominally this is +4dBu.

5 Matrix Status. The **AFL** switch allows post-fade but pre-mute monitoring of the output signal, whilst the **CUT** switch mutes the post-fade signal.

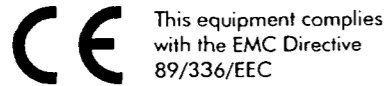
6 Talkback. Talkback to the matrix output is provided. Pressing the latching **ENABLE TB** switch routes the talkback signal into the matrix output when Talkback to Matrix is selected on the centre section master module. Talkback is summed with the matrix immediately before the balanced output. Talkback is not affected by the CUT switch or matrix master fader.

7 The Bargraph Meter provides monitoring of the Matrix Output signal.

SOUNDCRAFT *Europa*

USER GUIDE

Warranty



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Issue 3

Part No. ZZ2741

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1 **Soundcraft** means Soundcraft Electronics Ltd.

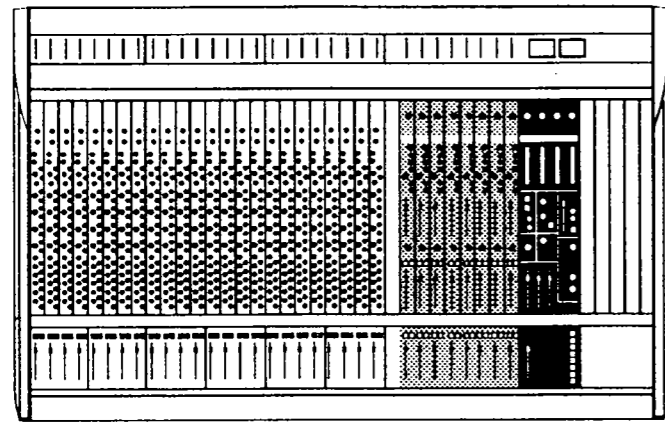
End User means the person who first puts the equipment into regular operation.

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.

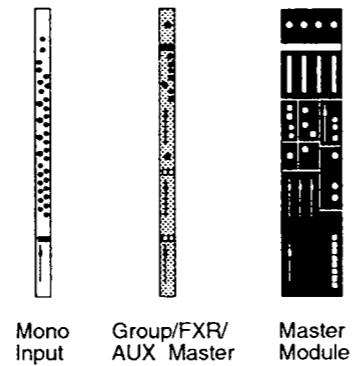
- 2 If within the period of twelve months from the date of delivery of the Equipment to the End User it shall prove defective by reason only of faulty materials and/or workmanship to such an extent that the effectiveness and/or usability thereof is materially affected the Equipment or the defective component 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.

Configurations

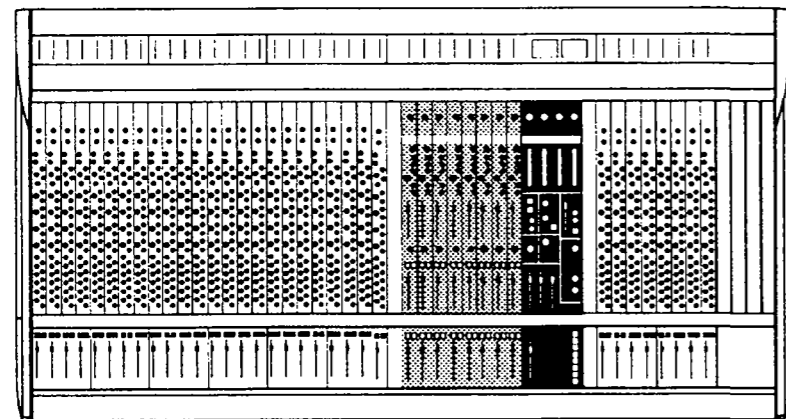


24 Channel Frame

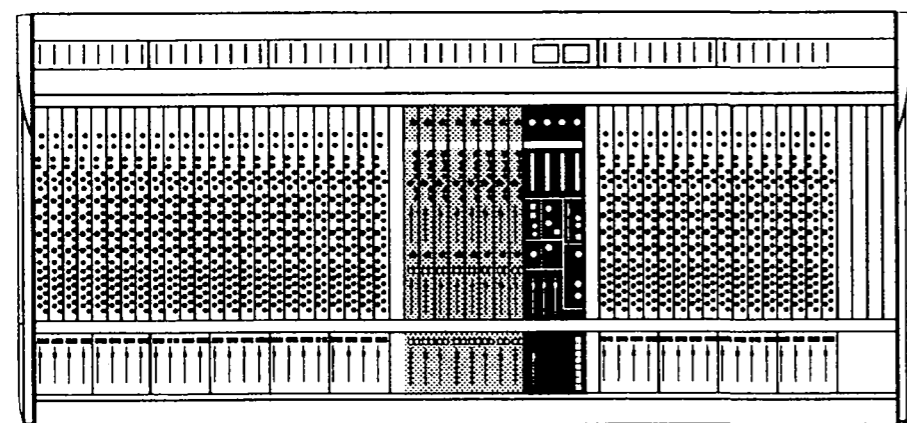
MODULES



Mono Input Group/FXR/AUX Master Master Module



32 Channel Frame



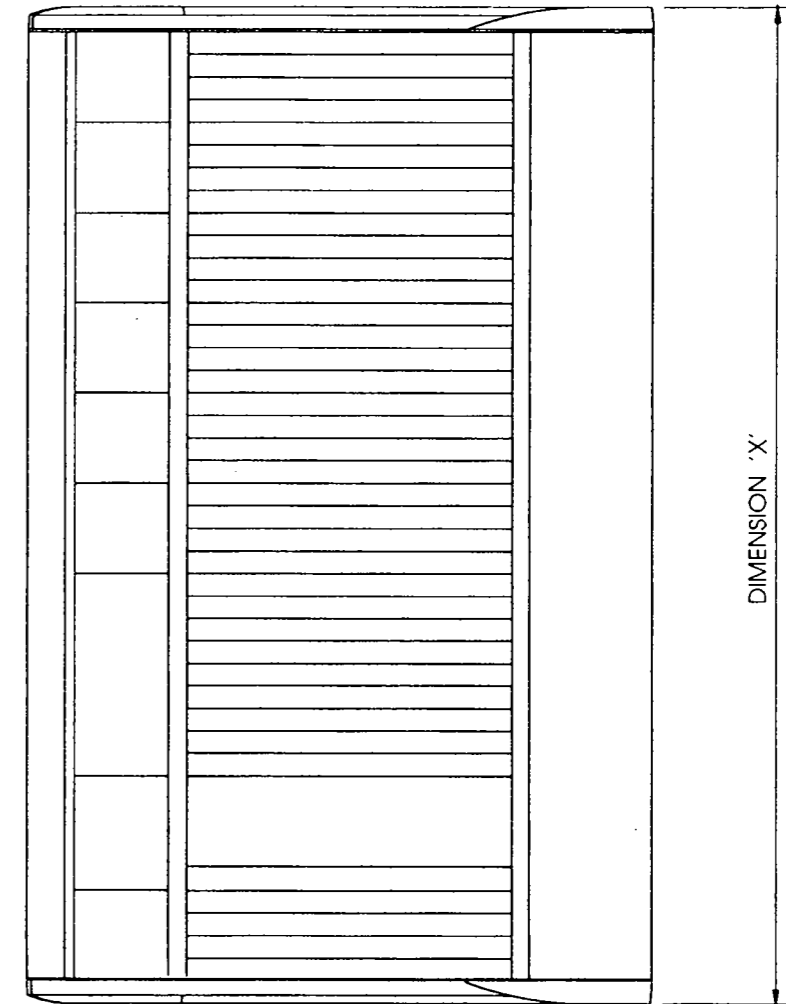
40 Channel Frame

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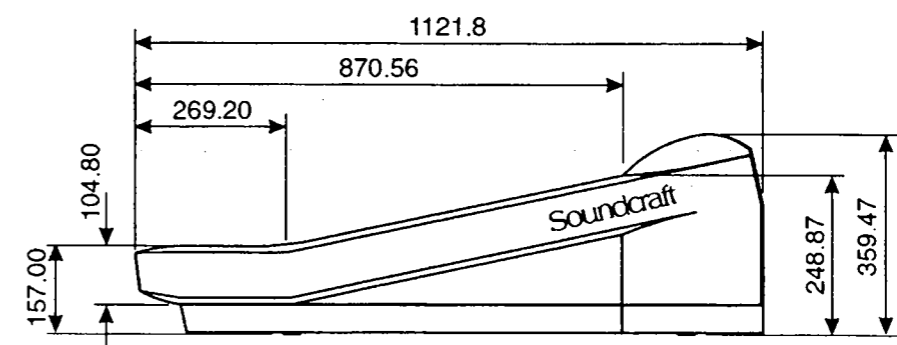
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Dimensions

Europa Outline Dimensions



CONSOLE	DIMENSION 'X'
24 CH	1794.88
32 CH	2120.00
40 CH	2445.12



SPECIFICATION NOTES AND CONDITIONS

A The console has a nominal output level of +4dBu: all input sensitivities are relative to this: i.e. with line input gain set to '0', an input of 0dBu, will give an output of +4dBu at any group or mix output and, a sensitivity of +4dBu gives unity gain from input to output.

B Noise measurements are taken with 22Hz-22kHz bandwidth, average reading response.

C Distortion measurements are made with an input of +20dBu (line inputs at unity gain) giving an output of +20dBu. The analyser reads THD+N with an average response, over a 10Hz-30kHz bandwidth.

D Frequency response and E.Q. measurements are made with an input of 0dBu to line inputs at unity gain, outputs are quoted relative to 0dBu.

E Crosstalk and rejection measurements are made with an input level of +20dBu (line inputs at unity gain) giving an output of +20dBu on the active signal path. The ratio quoted is relative to +20dBu output.

F Gain tolerance +/-1.5dB or 10% of indicated value, whichever is the greater..

G Mix noise figures are stated in two ways:

- Bus residual noise: Noise measured at the output with faders at unity and no channels routed.
- Mix bus noise: Noise measured at the output with 40 channels routed, faders down.

Europa is an outstandingly rugged and versatile Live Sound console, developed from Soundcraft's proven experience in the sound reinforcement industry.

Europa has been designed to provide outstanding sound quality and facilities, a clear and practical control surface and the strength to survive many years 'on the road'.

The console is built of sturdy extrusions with end plates and cross-members specifically designed to avoid twisting. Extrusions form handles which run the entire length of the desk, front and back, making it easier to lift.

A choice of Mono or Stereo Input modules provide access to a full eight groups, stereo and mono busses and twelve aux sends. The input modules incorporate selection to any of eight mute groups, and control via single or multiple VCA groups. Every channel is provided with comprehensive 4-band parametric Equalisation and a Noise Gate plus balanced sends and returns throughout the console. All switches are illuminated for clarity and the rear panels include provision for integral lighting for the control surface.

Europa is designed to allow two consoles to be linked in a master/slave configuration, with opto-isolated control signals and balanced, buffered audio connections for maximum noise immunity. Console linking includes all main outputs plus groups, mutes, solos, auxes, VCAs, the LIVE facility, PFL and AFL. Provision is made for a variety of multiway connectors to be mounted on recessed rear panels for ease of cabling.

Europa is available in 24, 32 or 40 channel frame sizes, all with eight groups as standard and eight stereo effects returns. The optional Matrix output modules provide additional versatility, and include separate external inputs to provide extra submixes.

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 console power supply away from the unit .

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

Handling and Transport

The console is a very rugged unit, designed for touring. However, care in handling and transporting will ensure a long and trouble-free life. If the console is to be regularly moved we recommend that it is installed in a foam lined flight case. At all times avoid applying excessive force to any knobs, switches or connectors.

Power supplies & cables

Always make sure that the power supplies have been set to the same source voltage as the mains supply.

Always use the power supplies and power cables 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 supplies off before connecting or disconnecting the console power cables, 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.

Always ensure that you use the correct power supplies for your console. Each Europa console requires one CPS750 and one CPS550 supply. Different configurations of power connector are used for the two supplies to prevent incorrect connection.

If power supplies are to be mounted in flight case racks, ensure that adequate ventilation or forced cooling is provided before attempting to use the console.

Appendices

Specification Notes

Dimensions

Configurations

Warranty

- The ISO button is cancelled if MUTE WRITE is enabled.
- When neither VCA nor Mute write is enabled, any of the SET-UP switches may be selected. However, when enabling either system, they may be cancelled according to the rules above.
- The MUTE WRITE and VCA WRITE enables are disabled when the console is in LIVE status, to prevent accidental modification of the channel assignment. An optional facility is also provided via a 2-pin Methode connector for connection to a key-switch. When the 2 pins are shorted, the VCA and Mute Write enables are disabled.
- The channel Mute and VCA assignments are retained at power-down by battery-backed storage.
- The VCA, Mute and write enable functions of the master assignment section in the master module are reset at power-down. This presents the user with a clear control surface when the desk is powered-up.

The VCA and Mute systems work together with the local CUT buttons to provide several ways of controlling the electronic mute circuitry in the channels:

- Local control using the CUT switch
- On/Off control using the MUTE MASTER switches
- Proportional control using a VCA GROUP
- Automatic muting by the SOLO-IN-PLACE system

The channel will be turned OFF if any of the above produces a mute signal, and the CUT button illuminates to show that the channel is muted.

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 common mode DC, AC or RF voltages, as these will reduce the available signal range on the inputs. Note that 0dBu = 0.775V RMS.

The microphone input is designed for use with balanced low impedance (150 or 200Ω) microphones.

Caution! DO NOT use unbalanced microphones or battery powered condenser microphones without isolating the +48V phantom power on the front panel switch. - degraded performance or damage to the microphone may result.

The sensitivity of the Microphone input is variable from -2dBu to -70dBu (for +4dBu at the Mix outputs).

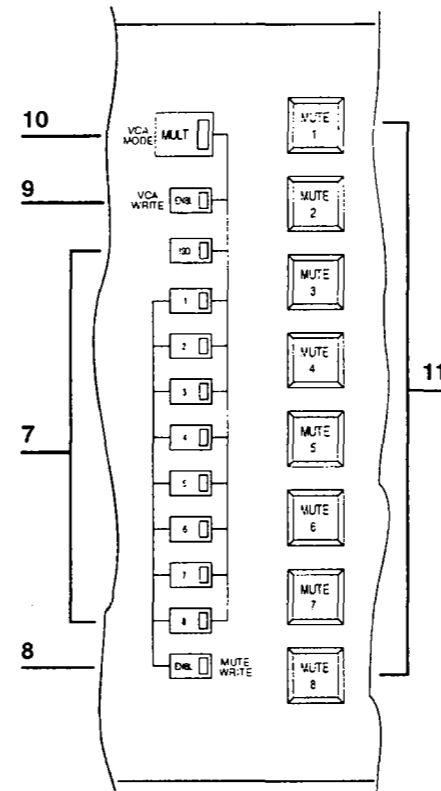
The Line inputs have a sensitivity variable between -20dBu and +10dBu, and can also handle a maximum input level up to 27dBu. Note that the maximum input level for unbalanced inputs is 6dB less than that for balanced signals, so very high level unbalanced signals (e.g. loudspeaker outputs of power amplifiers) may cause distortion. The input impedance is greater than 10kΩ, balanced.

The Direct Inputs are similar to the Line Inputs, with a nominal +4dBu input level, a maximum input level of +27dBu but have an input impedance of 600Ω.

All Insert Returns are balanced, with an input impedance of 20kΩ. Nominal input level is +4dBu, with a maximum of +27dBu.

All outputs are balanced, nominal +4dBu and can drive a maximum of +26dBu into a load greater than 600Ω.

The Headphone output can drive +20dBu into 600Ω (150mW into 8Ω).



The channel may be removed from the Mute Group system by pressing **SAFE**, which illuminates when active.

This is entirely independent of the **MUTE MASTERS**, allowing the mute_set-up to be altered without changing the MUTE MASTERS. If the (VCA WRITE) ENBL switch is already active when (MUTE WRITE) ENBL is pressed, it is cancelled.

Pressing a Mute Master switch will mute any channels selected to the group, and their MUTE switches will flash to indicate that a non-local mute is active.

SINGLE VCA GROUPS are assigned as follows:

- Arm the system by pressing (VCA WRITE) ENBL (9) on the master panel. If the (MUTE WRITE) ENBL switch is already active, it is cancelled.
- Select the required group using the set-up switches (7) on the master panel.
- Assign the required channels to the group by pressing the momentary channel SEL switch. The corresponding VCA Group LED will illuminate to show the current assignment.

The **ISOLATE** function is selected in the same way, except that the **ISO** set-up switch is pressed instead of a group selection. This mode completely isolates the channel from Solo-in-Place mutes, i.e. it is a **SOLO SAFE** status.

When no VCA group is assigned on a channel, the VCA circuit is automatically bypassed.

MULTIPLE VCA GROUPS are assigned as follows:

- Press the (VCA MODE) **MULT** switch (10) on the master panel to disable the intercanceling action of the set-up switches.
- Arm the system by pressing (VCA WRITE) ENBL (9) on the master panel.
- Select the required groups using the set-up switches (7) on the master panel.

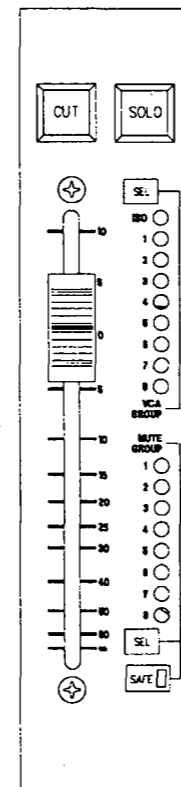
Assign the required channels to the groups by pressing the momentary channel **SEL** switch. The corresponding VCA Group LEDs will illuminate to show the current assignment.

Re-entering single-assignment mode does not affect previously assigned channels, which may still be multiply assigned, thus avoiding the accidental loss of multiple assignments.

Mute and VCA Interactions

To simplify operation of the Mute and VCA systems, the following interactions occur when switching between Mute, VCA single assignment and VCA multiple assignment modes:

- In single-assignment mode, enabling VCA WRITE resets the SET-UP switches.
- In multiple-assignment mode, enabling VCA WRITE does not reset the SET-UP switches.



VCA & Mute Master Modules

VCA Sub-Group System

The VCA grouping system allows several channels (a group) to be placed under the control of one group fader, allowing the operator to change the level of that group of signals in the mix but keeping the relative levels of the channels the same, without having to move each of the channel faders individually. Also it permits the muting and soloing (destructive or non-destructive) of the group. In this way, the VCA group fulfils most of the functions of audio subgrouping, but at the same time greatly simplifying the audio signal path.

The VCA Grouping system on Europa allows the creation of up to eight **VCA GROUPS** controlling Mono Inputs and Stereo Inputs. In addition, a VCA group itself may be assigned to the **GRAND MASTER**, allowing the overall control of multiple VCA Groups using a single centrally-positioned fader.

1 The **VCA MASTER FADER** controls the level of the pre-fade signals in the assigned channels.

2 Pressing the **CUT** switch on the VCA master will mute all channels assigned to that group. In this case the CUT switch on the VCA master lights continuously, and the CUT switches on the channels flash to show that a non-local mute is active.

3 If the console is in **SOLO-IN-PLACE** mode, pressing the **SOLO** switch on the VCA master will mute all inputs except those in the VCA group, and those made solo-safe by setting them to ISO.

When the console is not in SIP mode pressing SOLO causes all the assigned channels in the group to generate a stereo AFL.

4 Each of the VCA Group Masters may be assigned to the Grand Master by pressing the **GM** on that master.

5 The **GRAND MASTER FADER** proportionately controls all channels assigned to groups on which GM is pressed, with the balance still set by the Channel fader and VCA Master faders.

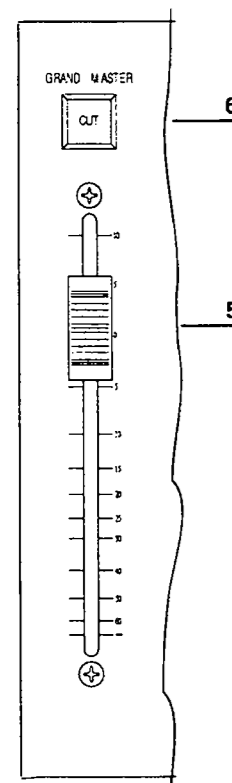
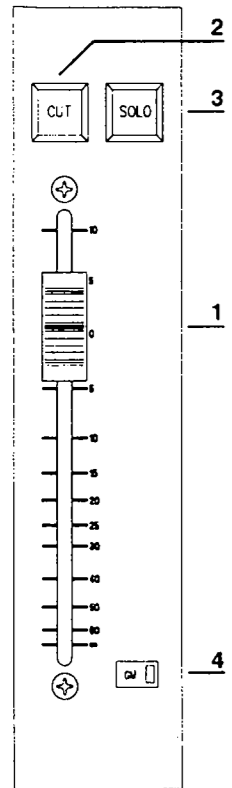
6 When the Grand Master CUT switch is pressed, all channels assigned to a VCA group which in turn is assigned to the Grand Master are muted. The Grand Master CUT switch lights steadily, and both the channel CUT and VCA master CUT switches flash to show that a non-local mute is active.

Mute And VCA Assignment

Channels are assigned to Mute and VCA groups from a central programming panel below the master module.

MUTE GROUPS are assigned as follows:

- Select the required group on the set-up switches (7) on the master panel.
- Arm the system by pressing (MUTE WRITE) ENBL (8).
- Assign the selected channel to the selected Mute Groups by pressing the momentary SEL switch on the channel fader module. The corresponding Mute Group LEDs will illuminate to show the current assignment.



Installation

Connections

Europa is designed for reliability, high performance and built to the highest standards. Whilst great care has been taken to ensure that installations are made as trouble-free as possible, care taken at this stage, followed by correct setting up will be rewarded by a long life and reliable operation.

Warning! Before switching on your Europa console, check that the mains voltage selectors on the power supply units are set to the correct mains voltage for your area, and that the fuses are of the correct rating. This is clearly marked on the case of the power supplies. Do not replace the fuses with any other type, as this could become a safety hazard and will void the warranty.

Always ensure that you use the correct power supplies for your console. Each Europa console requires one CPS750 and one CPS550 supply. Different configurations of power connector are used for the two supplies to prevent incorrect connection.

If power supplies are to be mounted in flight case racks, ensure that adequate ventilation or forced cooling is provided before attempting to use the console.

Wiring Considerations

A 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, and all earths should be 'star-fed' from this point. It is recommended that an individual earth wire be run from each electrical outlet, back to the system star point to provide a safety earth reference for each piece of equipment.

B Install separate mains outlets for the audio equipment, and feed these independently from any other equipment.

C Avoid locating mains distribution boxes near audio equipment, especially tape recorders, which are very sensitive to electro-magnetic fields.

D Where possible ensure that all audio cable screens and other signal earths are connected to ground only at their source.

E Keep audio cabling separate from heavy current mains supplies for lighting or special effects equipment, especially cabling from thyristor dimmers.

VCA and Mute System

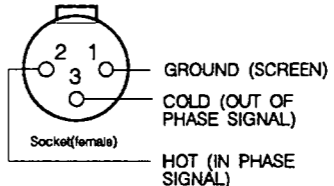
Description and Operation

Connections

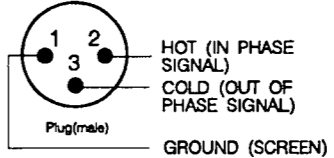
Wiring conventions

The standard Europa console uses two different types of audio connector, 3 pin XLR (top diagram) and 1/4" three pole ('A' gauge or stereo) jacks. The latter are used in several configurations, as shown below. In addition, 4 pin XLR connectors are provided on the rear panel to supply desk lights. For information on power and console linking connectors, refer to the Europa Technical Manual.

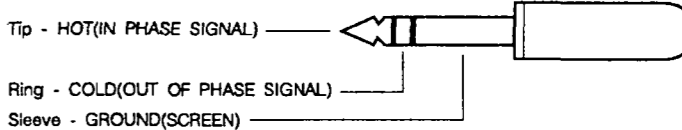
MICROPHONE INPUTS
2 TRACK A INPUT



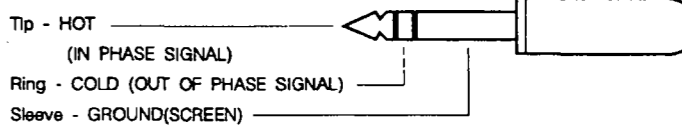
MIX L,R & MONO OUTPUTS
T/B, PFL, AFL & C/ROOM OUTPUTS
GROUP, AUX & ALT OUTPUTS



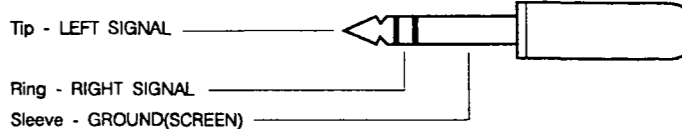
1/4" 'A' Gauge Stereo Jack Plug used as balanced input:
line inputs, 2 Track B Inputs, insert returns, s/chain input & FX return inputs



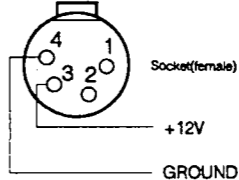
1/4" 'A' Gauge Stereo Jack Plug used as balanced output:
insert sends, direct outputs & oscillator output



1/4" 'A' Gauge Stereo Jack Plug used as a stereo output: headphones



GOOSENECK LAMP SUPPLY



Monitor Section**Control Room Output**

Electronically balanced
Nominal Output Level +4dBu
Maximum Output level +26dBu into >600Ω

Headphones Output

Unbalanced
Maximum Output 150mW into 8Ω
+20dBu into 600Ω
Maximum Gain +16dB ref Mix Output

2-Track Returns

Electronically Balanced
Input Impedance 20kΩ
Sensitivity +4dBu or -10dBV
Maximum Input Level 21dB above nominal
CMRR at +4dBu sensitivity 40dB (1kHz)

EQ Section (2-Track B)

HF Second Order, Shelving
Maximum Boost/Cut 15dB
Shelving Frequency 12kHz
LF Second Order, Shelving
with VLF roll-off
Maximum Boost/Cut 15dB
Shelving Frequency 60Hz
VLF Roll-off 30Hz

**Listen and Talkback
Microphone Inputs****Listen Microphone Input**

Stereo, Electronically Balanced
Sensitivity Range -20dBu to -55dBu
Input Impedance 2kΩ
Phantom Power (link Enabled) +48V

Talkback Microphone Input

Electronically Balanced
Sensitivity Range -20dBu to -55dBu
Input Impedance 2kΩ

Specification

Mix Section

Mix Inserts

Electronically Balanced	
Nominal Output Level	+4dBu
Maximum Output Level	+26dBu into >600Ω
Insert Return Impedance	20kΩ

Mix Outputs

Electronically Balanced	
Nominal Output level	+4dBu
Maximum Output Level	+26dBu into >600Ω
Mix Bus Residual Noise	-90dBu
Mix Noise	-80dBu
(40 Channels Routed)	
THD at +20dBu	1kHz: 0.005%
	10kHz: 0.020%

Mix Direct Inputs

Electronically Balanced	
Nominal Input Level	+4dBu
Maximum Input Level	+27dBu
Input Impedance	600Ω

Alternate PA Output

Electronically balanced	
Nominal Output Level	+4dBu
Maximum Output Level	+26dBu into 600Ω

Module Block Diagrams

Mono Input Module

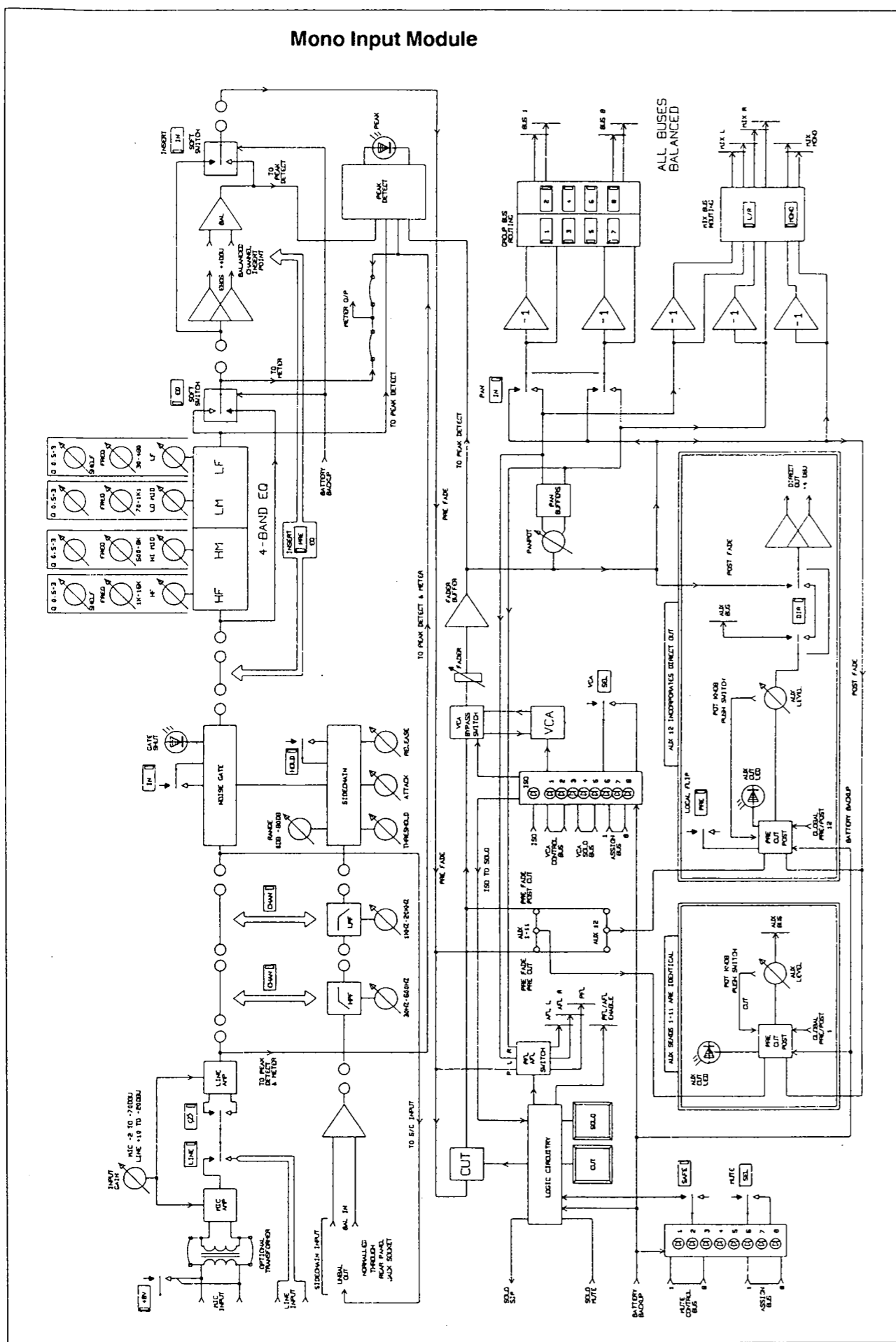
Output Group

Stereo FX Return

Aux Master

Master Module

Mono Input Module



2 Track B Input L & R - 3 Pole Jack

Tip Hot (in phase signal)
 Ring Cold (out of phase signal)
 Sleeve Ground (screen)

Oscillator Output - 3 Pole Jack

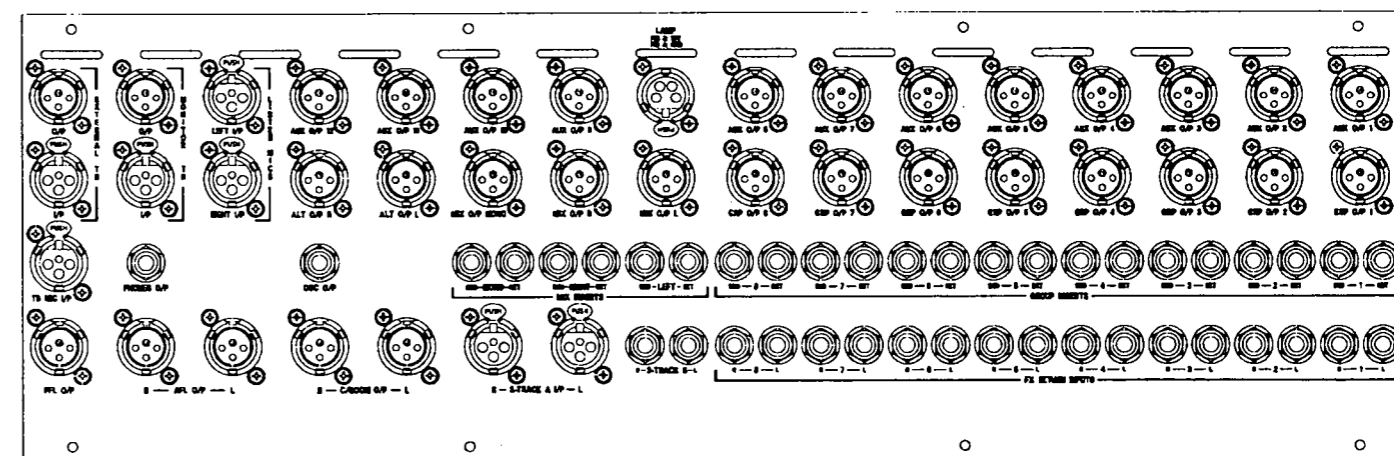
Tip Hot (in phase signal)
 Ring Cold (out of phase signal)
 Sleeve Ground (screen)

Mix L,R & Mono Insert Send/ Return - 3 Pole Jack

Tip Hot (in phase signal)
 Ring Cold (out of phase signal)
 Sleeve Ground (screen)

Phones Output - 3 Pole Jack

Tip Left Phones signal
 Ring Right Phones signal
 Sleeve Ground (screen)



Connector Pinouts

Mix L,R & Mono Outputs - XLR Male

- Pin 1 Ground (screen)
- Pin 2 Hot (in phase signal)
- Pin 3 Cold (out of phase signal)

Alt O/P L & R - XLR Male

- Pin 1 Ground (screen)
- Pin 2 Hot (in phase signal)
- Pin 3 Cold (out of phase signal)

C/Room O/P L & R - XLR Male

- Pin 1 Ground (screen)
- Pin 2 Hot (in phase signal)
- Pin 3 Cold (out of phase signal)

AFL O/P L & R - XLR Male

- Pin 1 Ground (screen)
- Pin 2 Hot (in phase signal)
- Pin 3 Cold (out of phase signal)

PFL O/P - XLR Male

- Pin 1 Ground (screen)
- Pin 2 Hot (in phase signal)
- Pin 3 Cold (out of phase signal)

Aux O/P - XLR Male

- Pin 1 Ground (screen)
- Pin 2 Hot (in phase signal)
- Pin 3 Cold (out of phase signal)

Listen Mic Input L & R - XLR Female

- Pin 1 Ground (screen)
- Pin 2 Hot (in phase signal)
- Pin 3 Cold (out of phase signal)

Monitor & External Talkback Input - XLR Female

- Pin 1 Ground (screen)
- Pin 2 Hot (in phase signal)
- Pin 3 Cold (out of phase signal)

Monitor & External Talkback O/P - XLR Male

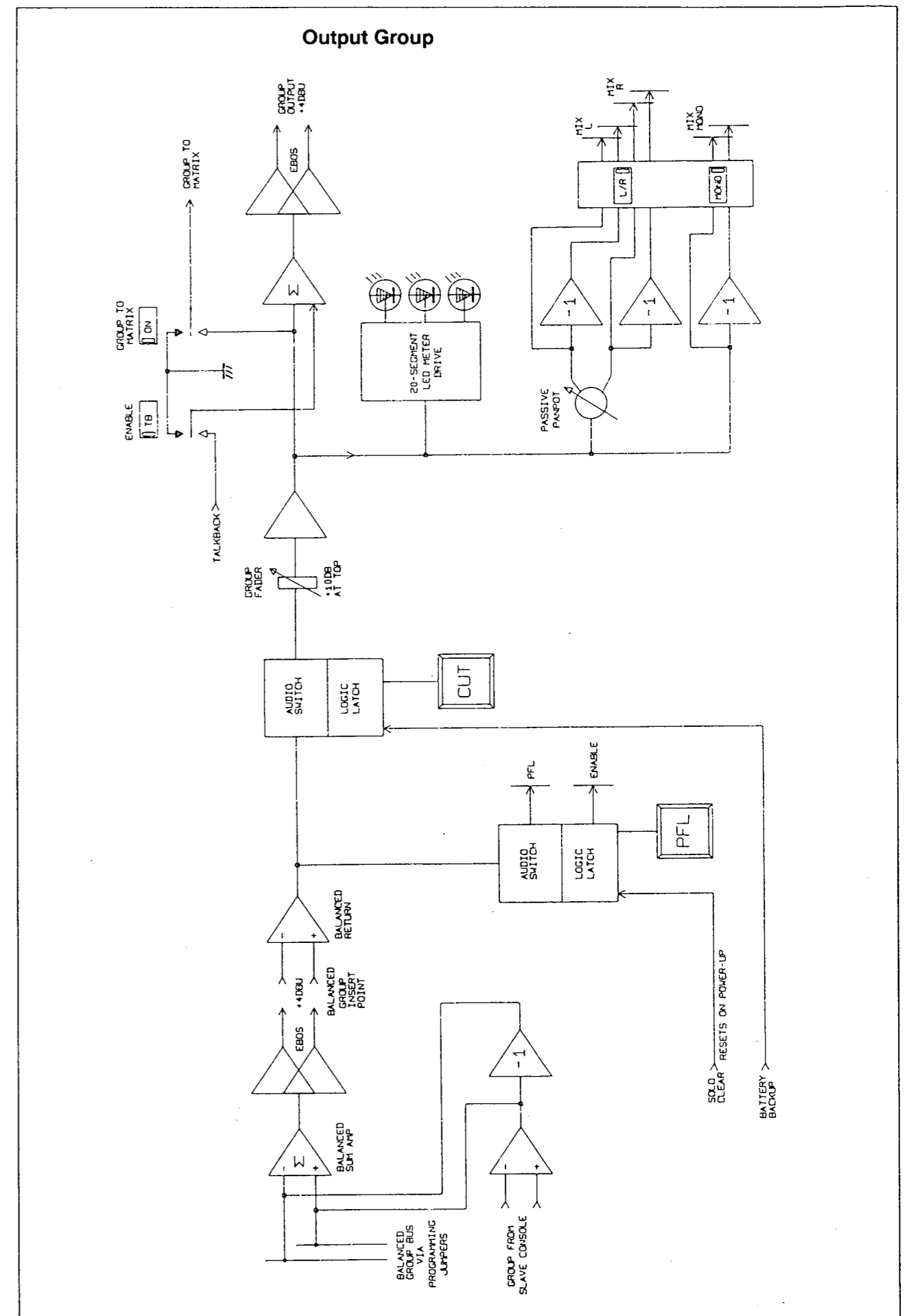
- Pin 1 Ground (screen)
- Pin 2 Hot (in phase signal)
- Pin 3 Cold (out of phase signal)

Talback Mic Input - XLR Female

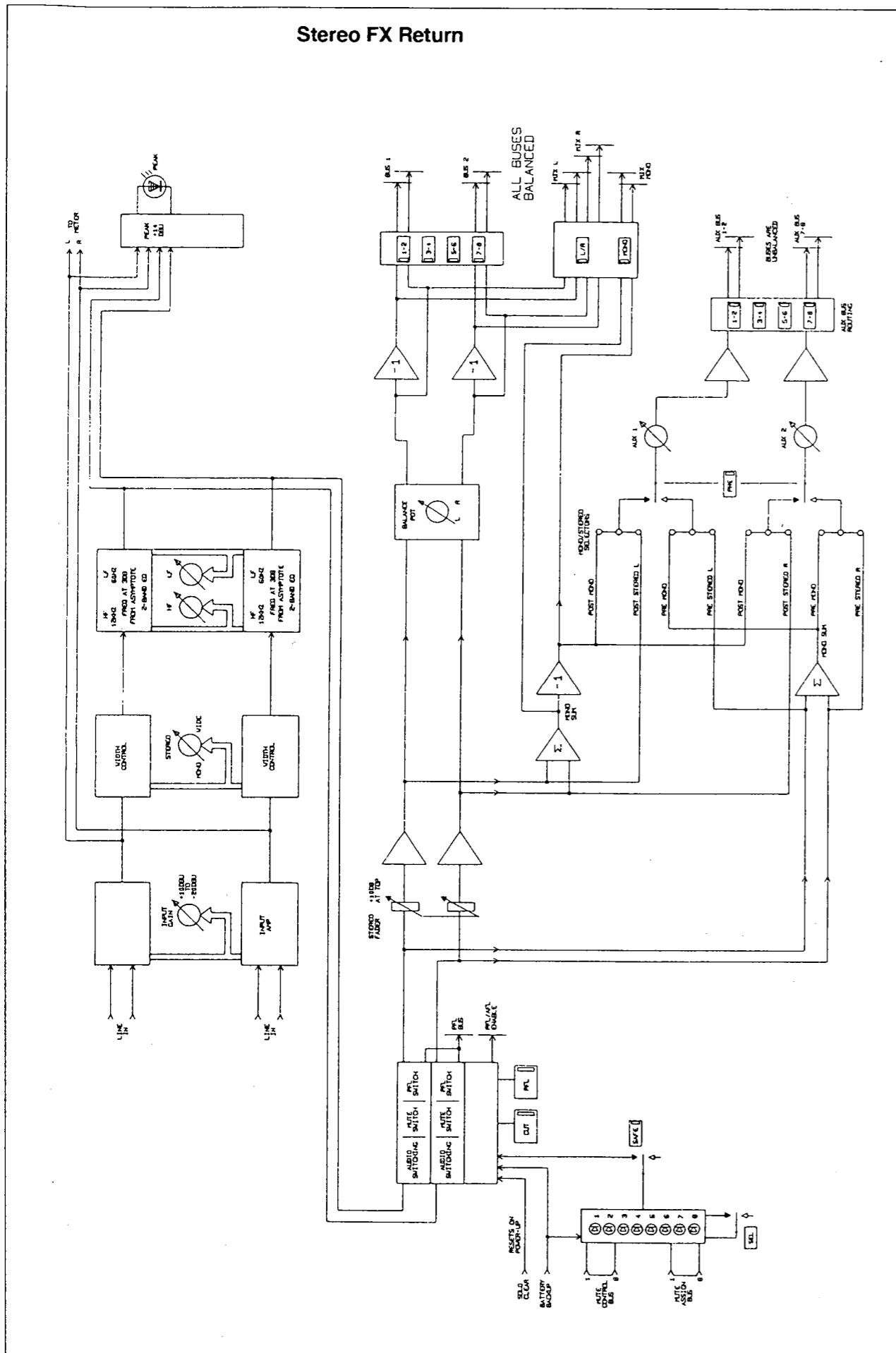
- Pin 1 Ground (screen)
- Pin 2 Hot (in phase signal)
- Pin 3 Cold (out of phase signal)

2 Track A Input L & R - XLR Female

- Pin 1 Ground (screen)
- Pin 2 Hot (in phase signal)
- Pin 3 Cold (out of phase signal)



Stereo FX Return



Module Block Diagrams

23 The monitor and headphone outputs share the source selector, but have independent output level controls: The monitor output level control has a gain of +10dB, the headphone level control has a gain that gives full rated output with the mix bus at nominal.

- Nominal: +4dBu at Mix outputs.
- Output capability: 150mW into 8Ω or +20dBu into 600Ω.

The EXT Talkback feed into the console is summed into the monitor feeds pre the level controls. When active, talkback will dim the existing signal by 20dB.

2-Track B Replay

The 2TKB replay controls allow signal the from 2 track return B to be fed to the mix outputs, typically for use as a source for pre-show music. The signal is fed to the main outputs after the main faders, enabling music to be played to the audience while a soundcheck is being completed, with the main faders down and the main monitoring selected to PRE (17). Any extraneous noises created by the soundcheck are therefore not heard on the main P.A.

24 The 2 TK B TO MIX switch routes the signal to Mix L and R outputs. An internal jumper allows a mono sum to be fed to the Mono bus.

25 The 100mm FADER sets the level of the 2TKB TO MIX signal after the main faders.

26 A two band EQ is provided, typically for sweetening poor quality cassette tapes. The HF and LF shelving controls have turnover frequencies of 12kHz and 60Hz respectively. 15dB cut or boost is available on each control.

ALT PA

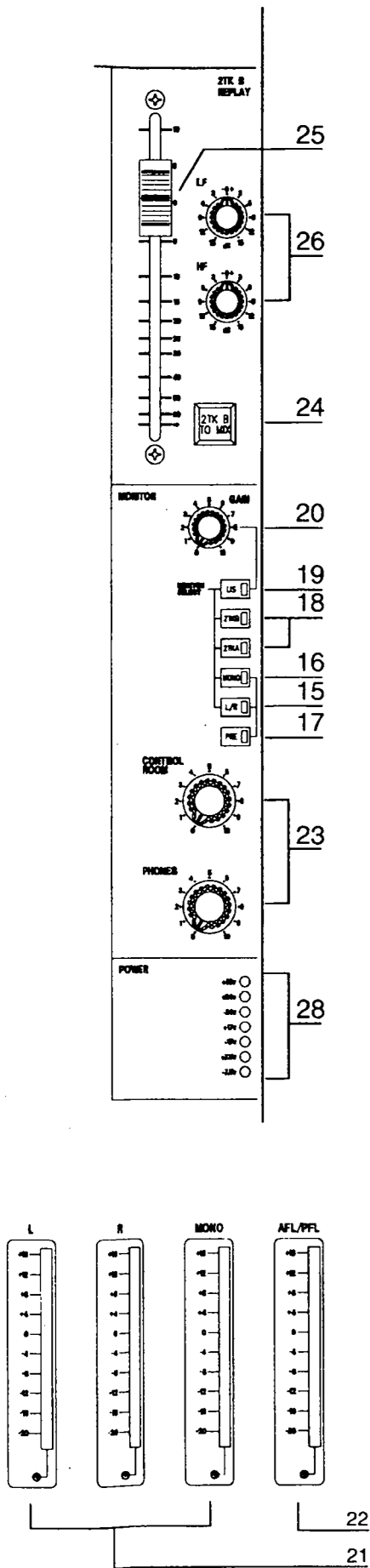
27 Pre-settable jumpers inside the module source the ALT PA from either the L&R MIX outputs, or from the MONO MIX output. The default source is post the Main faders, but can be sourced pre by pressing the PRE switch, and the normally stereo output can be switched to mono by pressing the MONO switch.

The rotary FADER has +10dB gain at full clockwise rotation, and allows level adjustment of the electronically balanced outputs, which give a nominal level of +4dBu at the rear panel XLR connectors.

The AFL switch allows monitoring of the stereo post-fade signal.

Power Supply Monitor

28 Seven LEDs monitor the presence of the various supply rail voltages provided by the power supplies. Any abnormal indication on these LEDs should be investigated immediately to avoid the risk of a failure during live performance.



14 Talkback to **MONITOR DESK** uses a standard Soundcraft interface, and is intended to link to a compatible Soundcraft monitor console. Monitor TB Input and Output XLRs are on the rear connector panel.

A gooseneck Talkback mic can be mounted in a socket in the blank module adjacent to the master module or a handheld or headset mic may be plugged into a rear panel socket. The level of the mic is set by the talkback **GAIN** control, and is variable from +20dB to +55dB.

Monitor

The monitor system allows the engineer to listen to a variety of sources on monitor loudspeakers or headphones. Multiple sources may be selected if required.

15 Mix **L/R** switch routes the mix signal in stereo to the monitors.

16 **MONO** allows monitoring of the Mono signal.

17 The **PRE** switch allows monitoring of the mix signals to be sourced pre the L, R and Mono main mix faders.

18 Selects external monitor returns **2TKA** (2 track return A) or **2TKB** (2 track return B), both of which are balanced inputs. Individual internal switching for +4dBu or -10dBV nominal operating level is provided to suit both professional and semi-professional equipment.

19 **LIS** selects an input for a stereo listen mic.

20 The gain of the listen mic input is controlled by the adjacent **GAIN** pot, and is variable from +20dB to +55dB. +48V phantom power is available by selecting an internal link.

Metering

21 20-segment LED meters follow the Left & Right monitor source switches. The 20-segment LED Mono meter follows the Mono Mix output signal.

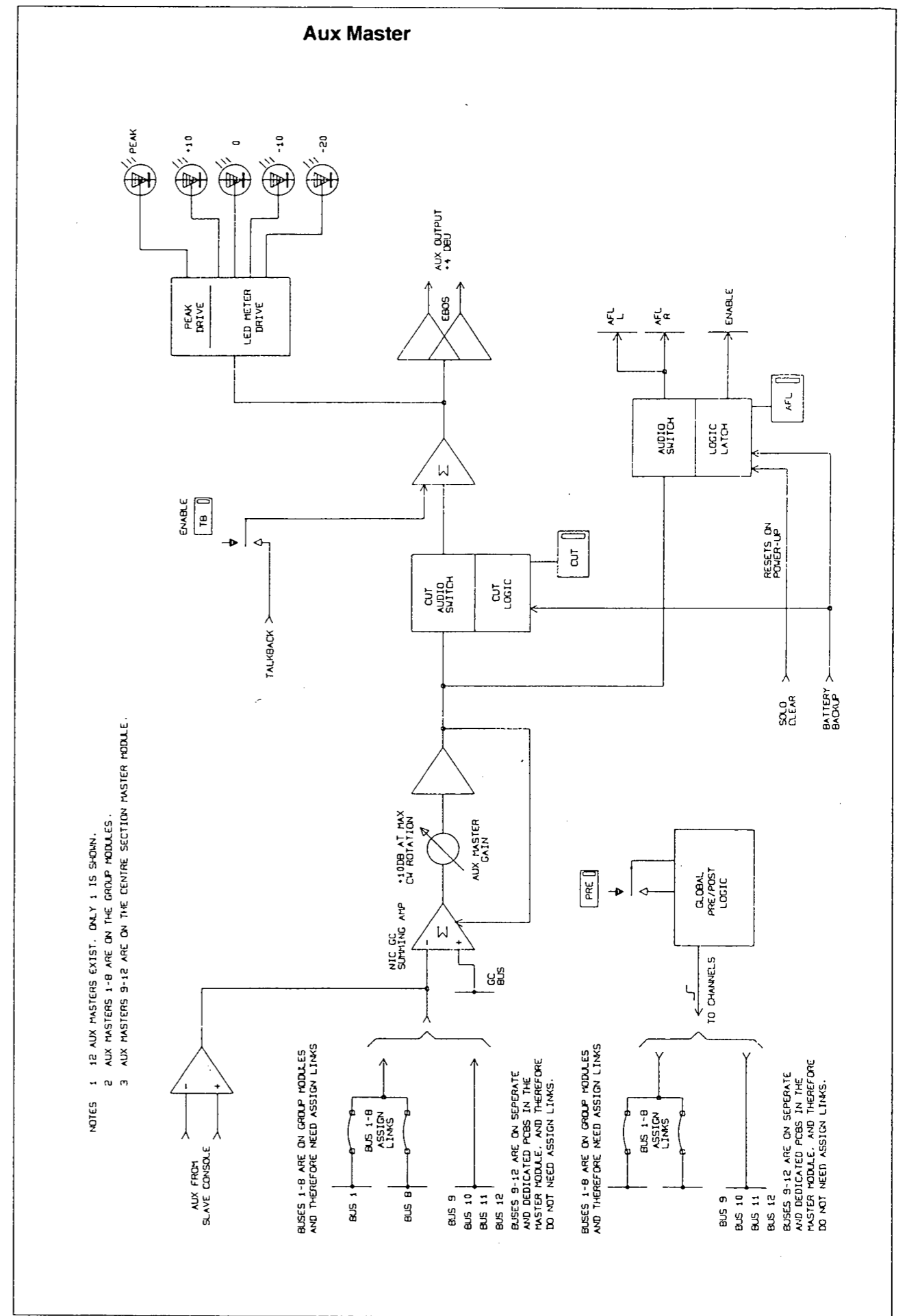
22 20-segment AFL/PFL meter reads the AFL or PFL signal before the trim controls so that a true level is displayed. Where the AFL signal is in stereo, the higher of the Left or Right signals is displayed.

The L & R VU meters in the overbridge follow the Mix L & R.

Output Control

Left & Right monitor outputs are provided to drive control room power amps/loudspeakers. The XLR outputs are fitted on the master connector panel, and are electronically balanced at a nominal level of +4dBu.

Two headphones output jacks are provided: one in the same blank module as the talkback mic, and the other on the master rear panel.



NOTES
 1 12 AUX MASTERS EXIST. ONLY 1 IS SHOWN.
 2 AUX MASTERS 1-8 ARE ON THE GROUP MODULES.
 3 AUX MASTERS 9-12 ARE ON THE CENTRE SECTION MASTER MODULE.

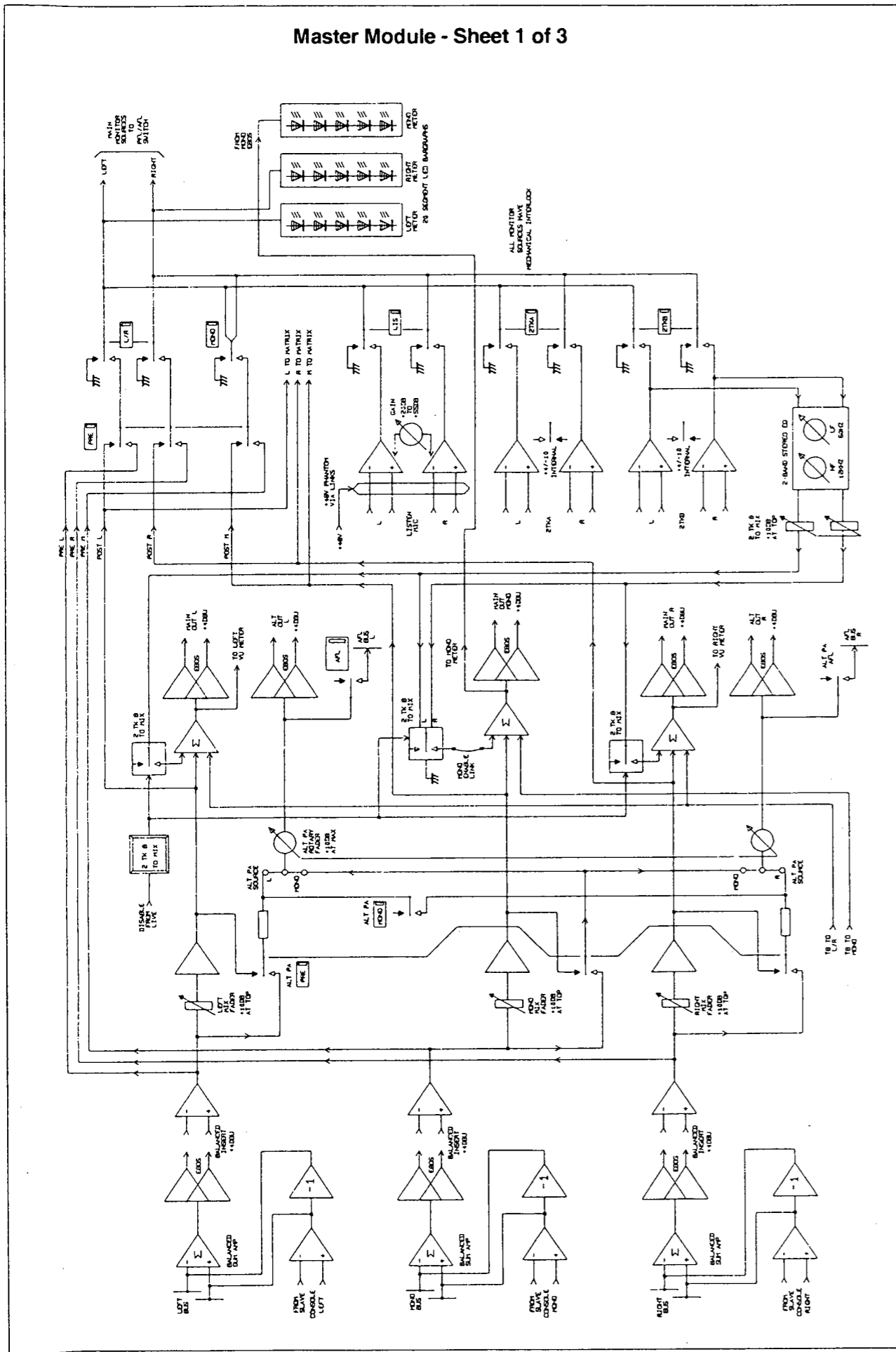
BUSES 1-8 ARE ON GROUP MODULES AND THEREFORE NEED ASSIGN LINKS

BUSES 9-12 ARE ON SEPARATE AND DEDICATED PCBs IN THE MASTER MODULE, AND THEREFORE DO NOT NEED ASSIGN LINKS.

BUSES 1-8 ARE ON GROUP MODULES AND THEREFORE NEED ASSIGN LINKS

BUSES 9-12 ARE ON SEPARATE AND DEDICATED PCBs IN THE MASTER MODULE, AND THEREFORE DO NOT NEED ASSIGN LINKS.

Master Module - Sheet 1 of 3



5 The level of the PFL and AFL signals can be adjusted by their respective TRIM controls.

- PFL TRIM gives -20...0dB range of control.
- AFL TRIM gives 0...+20dB range of control.

The 20-segment AFL/PFL meter (22) reads the AFL or PFL signal before the trim controls so that a true level is displayed. Where the AFL signal is in stereo, the higher of the Left or Right signals is displayed.

Oscillator

The oscillator normally produces pink noise, but can be switched to produce a sinusoidal output, the frequency being variable from 63Hz to 10kHz. The output may be internally routed to auxes, groups and mix, as well as being available on a rear panel connector.

6 The ON switch is electronically latching. It is reset to OFF and held in that status by operating the LIVE switch. When LIVE is de-selected, the oscillator remains OFF.

7 The oscillator normally provides pink noise: to get sine wave tone the TONE switch is pressed which enables the sine wave generator.

8 The LEVEL control sets the oscillator output level and is variable from infinity to +10dBu.

9 The frequency of the sine wave oscillator is variable from 63Hz to 1kHz by the FREQ control: the X10 switch multiplies this up to cover the range 630Hz to 10kHz.

10 Illuminated mechanically latching pushbutton switches route the oscillator to Auxes, Groups, Mix L/R and Mono busses. The LEDs flash only when the oscillator is on.

A dedicated rear panel output is provided and this is active only when the oscillator is switched ON.

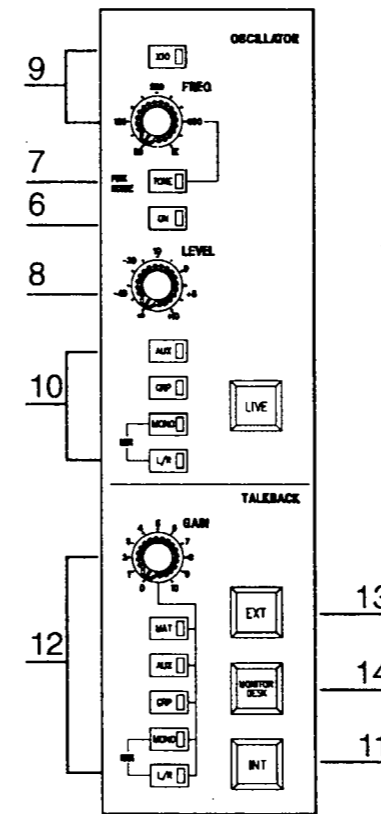
Talkback System

11 Internal talkback is initiated by the INT switch and can be routed to Groups, Matrix outputs, L/R and Mono mix outputs, and Aux sends.

12 Selection of the internal talkback destination is by five switches:

- Talk to Matrix and Aux switches are latching.
- Talk to Groups, Mix L/R and Mix Mono switches momentary.

13 External talkback is bi-directional and enabled by the EXT switch. Balanced line in and line out are provided, at a nominal level of +4dBu. When the external talkback input is active and feeding the monitors, the main monitor signal is dimmed by 20dB.



Solo-in-Place not Selected

Inputs Pressing SOLO on any channel switches the monitoring (control-room output or headphones) to listen to the pre-fade, pre-mute signal in the channel. The SOLO switch on the input lights steadily, and the SOLO CLEAR switch flashes to indicate an active PFL/AFL.

Aux & Matrix Masters Pressing AFL on any Auxiliary Master or Matrix Master switches the monitoring to listen to the post-fade signal on that master. The AFL switch lights steadily, and the SOLO CLEAR switch flashes.

Stereo Returns & Groups Pressing PFL on a stereo return or group switches the monitoring to listen to the pre-fade signal on the return or group. The PFL button lights steadily, and the SOLO CLEAR switch flashes.

VCA Group Modules Pressing SOLO on any VCA master will set all inputs assigned to that VCA group to AFL: the monitoring switches over to listen to the stereo post-fade, post-pan signal. The SOLO switches on the affected inputs flash, the SOLO switch on the VCA master lights steadily, and the SOLO CLEAR switch flashes.

Solo-in-Place Selected

Inputs Pressing SOLO on any input mutes all other inputs unless they are selected to be isolated. On the inputs that are cut and affected VCA groups, the CUT switches flash. On the SOLO'd input, the SOLO switch lights steadily. On the master, the SOLO-IN-PLACE switch flashes to indicate an active SIP, and the SOLO CLEAR switch lights steadily.

Pressing SOLO on an input selected to ISO does not cut the other channels. Monitoring is switched over to listen to the stereo, after-fade signal from the SOLO'd channel. The SOLO switch lights steadily. The SOLO-IN-PLACE switch on the master flashes, and the SOLO CLEAR switch lights steadily.

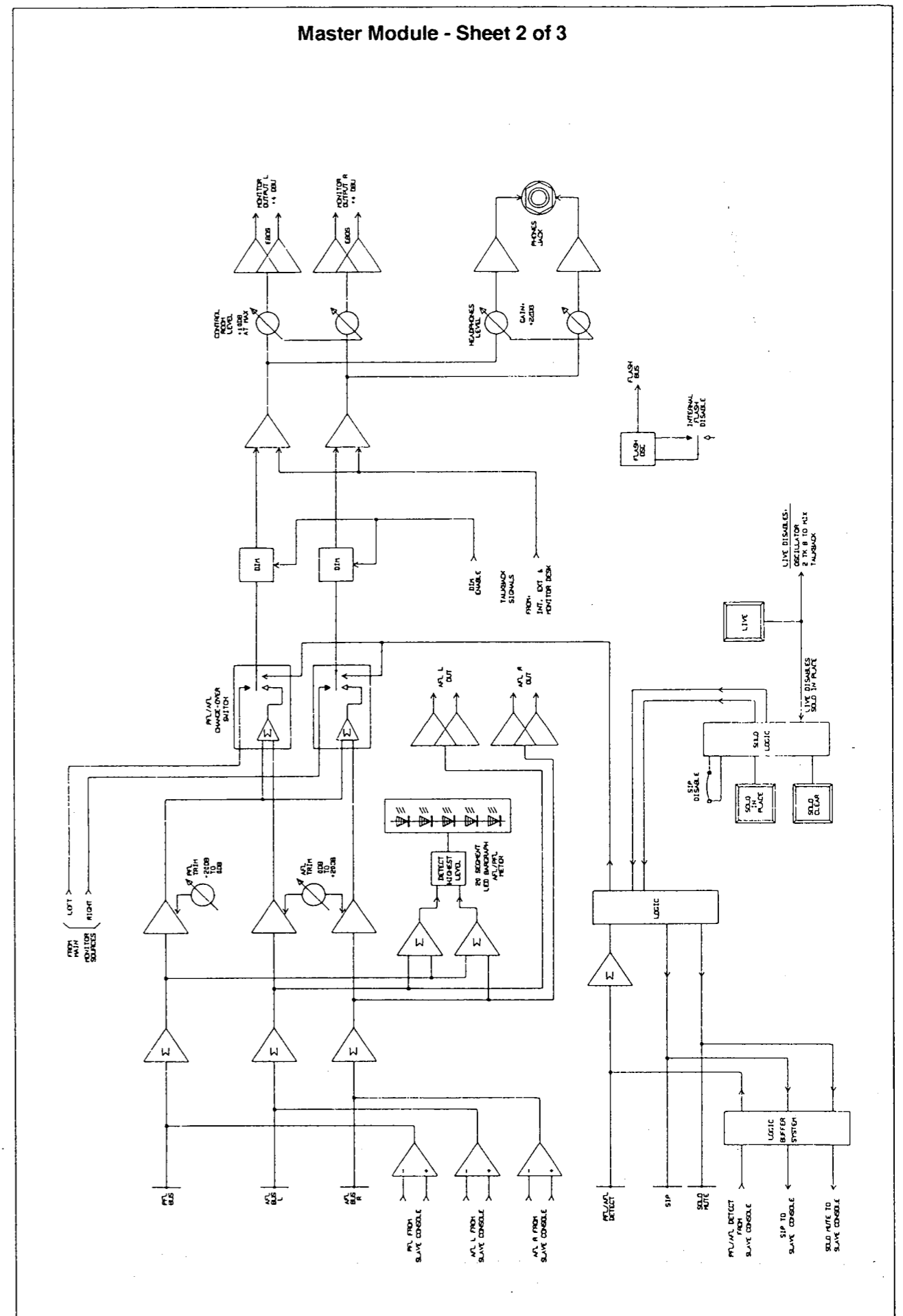
Aux & Matrix Masters, Stereo Returns & Groups Pressing AFL on an Auxiliary or Matrix Master, or PFL on a Stereo Return, operates in the same way as when SIP is not selected. The monitoring is switched over to the PFL or AFL signal, and the PFL or AFL switches lights steadily. The SOLO-IN-PLACE switch on the master module lights steadily, and the SOLO CLEAR switch flashes.

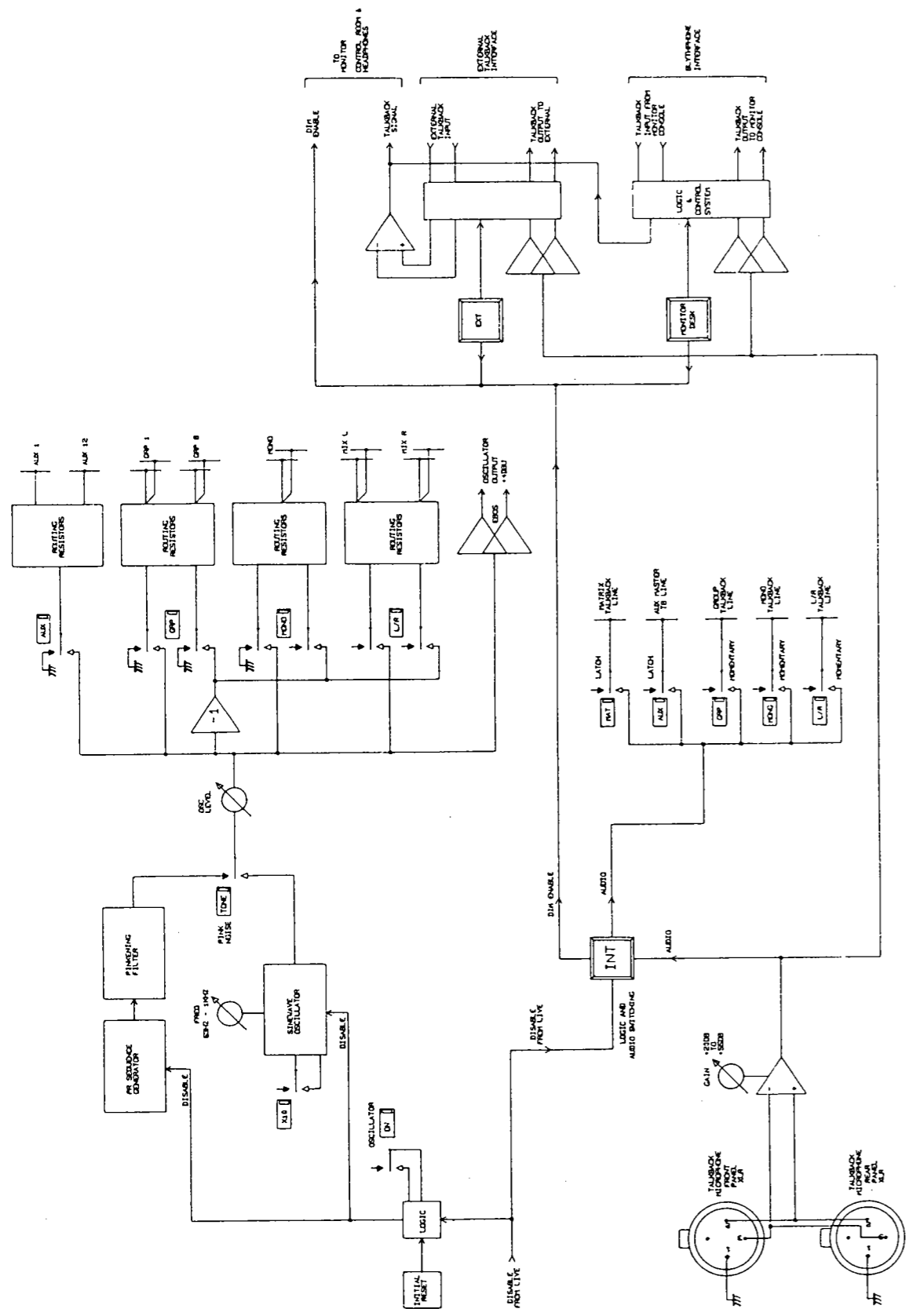
VCA Group Modules Pressing SOLO on a VCA master mutes all inputs except those assigned to that VCA group or that are isolated. On all cut inputs and VCA groups, the CUT switches flash. On all inputs selected to the SOLO'd VCA group, the SOLO switch flashes. On the VCA master, the SOLO switch lights continuously. The SOLO-IN-PLACE switch on the master module flashes, and the SOLO CLEAR switch lights steadily.

PFL / AFL

The PFL, AFL Left and AFL Right buses have balanced external inputs (on a 90-way EDAC) for receiving signals from a slave console. These signals are individually summed into their respective buses, and each bus has an electronically balanced output for interfacing to a Master console (or other external device). The balanced outputs are pre the trim controls.

Master Module - Sheet 2 of 3





Master Module

Aux Masters 9 - 12

These are functionally identical to Aux Masters 1-8 and are described fully in the previous chapter.

L, R and MONO Mix Paths

1 The balanced L, R and Mono mix busses are summed and the outputs feed the electronically balanced insert sends. These are at a nominal level of +4dBu. The insert return amps are also balanced, and feed the top of the main output **FADERS**. These have +10dB gain at the top of their travel.

The post-fade signals feed the 20-segment LED **METERS** and electronically balanced output buffers.

The rear panel XLRs are at a nominal level of +4dBu. Transformer output coupling can be provided, the transformers being located in the bottom of the console frame.

PFL, AFL and SOLO

The PFL/AFL and SOLO systems have two modes of operation:

- PFL or AFL - non-destructive solo
 - SOLO-IN-PLACE (SIP) - destructive solo
- 2 Since SIP is can have a disastrous effect on the mix if caused accidentally, it is disabled when the console is put into LIVE status by the **LIVE** switch.

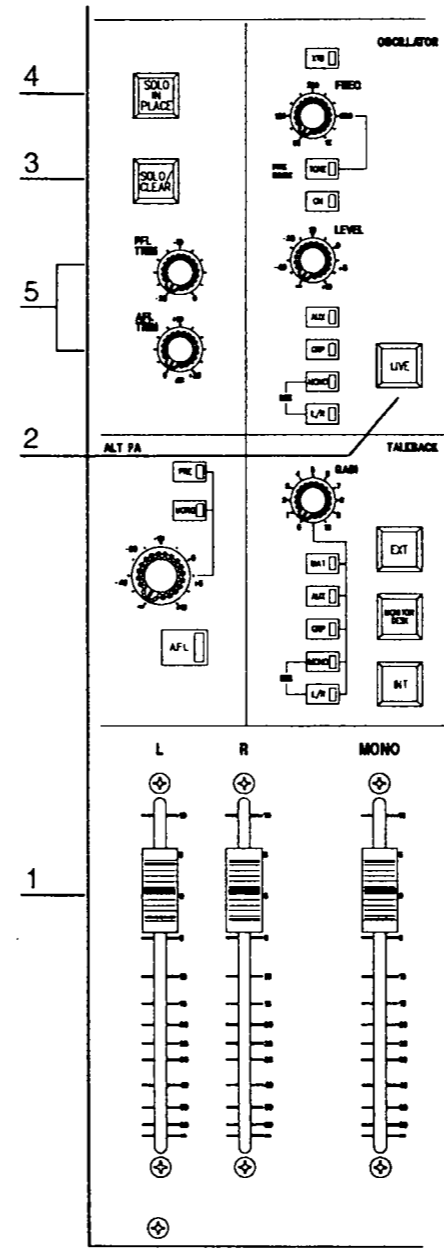
The **LIVE** switch cancels oscillator ON as well as SOLO-IN-PLACE. It cuts the 2TK B REPLAY TO MIX, and inhibits talkback to all destinations except EXT and Monitor Desk Talkback.

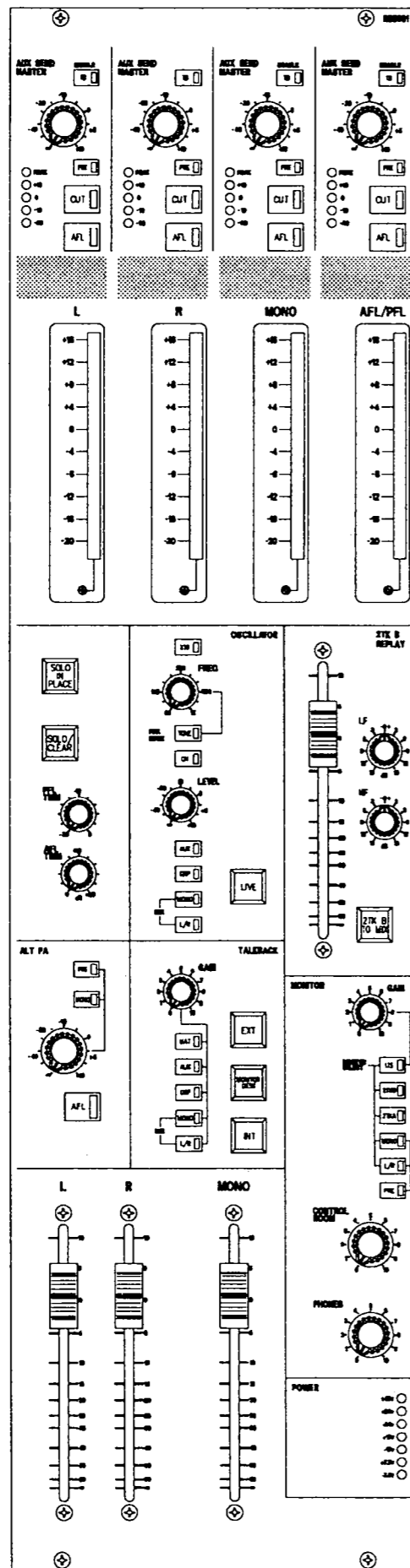
LIVE also disables the MUTE WRITE and VCA WRITE systems to prevent accidental modification of existing assignments.

3 **SOLO CLEAR** cancels all solos, PFLs and AFLs which have been selected on the console.

4 Pressing **SOLO IN PLACE** switches the console from non-destructive AFL/PFL to destructive Solo-in-Place. The flip-up safety cover prevents accidental operation, and an internal link is provide to disable the facility if required. Pressing **LIVE** also disables the SIP facility.

Since the action of the AFL/PFL/SOLO system is determined by a combination of controls, the following sections describe each their effect on each module:





Overview of Modules & Operation

Overview of Modules & Operation

All Europa frames may be fitted with a choice of Mono or Stereo Input modules, both of which incorporate VCA and Mute grouping in the separate fader modules.

All frames comprise a centre section of eight Group Output/Stereo FX Return/ Aux Master modules, below which are fitted eight VCA Group fader modules. The Aux master sections of these modules provide summing for Auxs 1-8, and the remaining Aux Masters 9-12 are adjacent at the top of the larger master module.

The Master module houses the L, R and Mono master faders, plus monitoring, power supply indicators, oscillator and talkback. The VCA Grand Master, VCA and Mute system selection and Mute Masters are fitted below the master module.

The VCA grouping system allows several channels to be placed under the control of a single group fader, allowing the operator to change the level of that group of signals in the mix while maintaining their relative levels the same. The channels may be muted or soloed (AFL or Solo-in-Place) *as a group* from the central VCA Group fader module. A VCA Group therefore provides very similar facilities to an audio subgroup, while greatly simplifying the signal path.

Eight VCA groups are provided as standard, and each of these may be assigned to the Grand Master fader allowing, if required, the entire console to be controlled by a single fader. To increase the flexibility of the system yet further, channels may be assigned to several VCA Groups simultaneously using the VCA MODE (MULT) facility.

While the VCA Group system provides *proportional* control of channels as a group, the complementary Mute system allows the mute status *only* of channels to be controlled in groups from centrally positioned master buttons.

The VCA and Mute systems work together with the local CUT buttons to provide several ways of controlling the electronic mute circuitry in the channels:

- Local control using the CUT switch
- On/Off control using the MUTE MASTER switches
- Proportional control using a VCA GROUP
- Automatic muting by the SOLO-IN-PLACE system

The channel will be turned OFF if any of the above produces a mute signal, and the CUT button illuminates to show that the channel is muted.

The following sections describe the front panel controls, followed by a detailed description of the VCA, Mute and Solo systems.

Master Module

Description

Operation

and Specifications

Stereo Effects Return**Input**

Electronically Balanced	
Input Impedance	20k Ω
Sensitivity	-20dBu to +10dBu
Maximum Input Level	21dB above nominal
CMRR at +4dBu sensitivity	40dB (1kHz)

EQ Section

HF	Second Order, Shelving
Max Boost/Cut	15dB
Shelving Frequency	12kHz
LF	Second Order, Shelving with VLF roll-off
Shelving Frequency	60Hz
VLF Roll-off	30Hz

General

Mute Off Ratio	>90dB (1kHz)
Fader Off Ratio	>80dB (1kHz)
Panpot Crosstalk	<-60dB (1kHz)
Routing Off Ratio	>100dB (1kHz)
THD	<0.005% (1kHz) <0.02% (10kHz)

Mono Input Module

Description

Operation

and Specifications

Mono Input Module

Input Stage

1 The input stage has mic and line inputs, sharing a common **GAIN** control with a sensitivity range of -2dBu to -70dBu on the Mic input, and +10dBu to -20dBu on the Line input. The mic connects via an XLR on the rear panel and the module may be optionally fitted with transformer coupling - refer to your dealer for suitable transformers.

The **+48V** switch feeds 48V phantom power to the mic input.

The **LINE** switch selects the Line input jack socket. The console may be optionally fitted with Line Input transformers - refer to your dealer for more information.

The **Ø** switch reverses the phase of the selected input to compensate for conflicting microphone position or to check for crossed wiring. This switch should normally be released.

Filters

2 There are separate second-order highpass and lowpass filters.

Highpass cut-off frequency is variable from 30 to 600Hz by the frequency control. By default it is in the sidechain of the noise gate but can be switched in to the channel path by the **CHAN** switch. Lowpass cut-off frequency is variable from 1kHz to 20kHz by the frequency control. By default it is in the sidechain of the noise gate, but can be switched in to the channel path by the **CHAN** switch.

Noise Gate

3 A Noise Gate is placed in the signal path by pressing the **IN** switch. Its sidechain is normally fed from the output of the module's input amplifier, but can be sourced externally via the **S/CHAIN** jack socket on the rear panel, and this breaks the normalised connection. The channel's **HIGH PASS** and **LOW PASS** filters are normally resident in the sidechain, except when the **CHAN** switches are pressed as described above. The attenuation range of the gate is variable from 0dB to -80dB by the **RANGE** control.

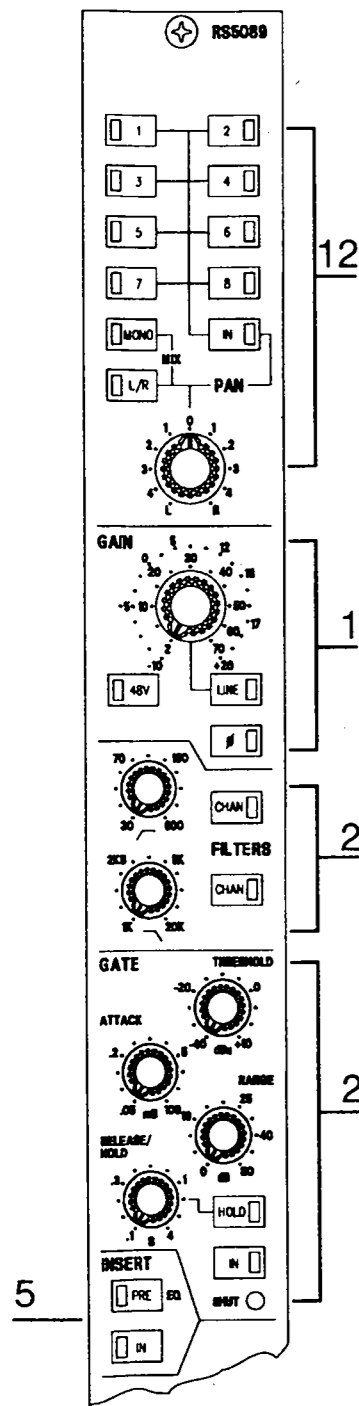
The **THRESHOLD** control allows the gate opening point to be adjusted from -40dB to +10dB referred to sidechain input level.

GATE ATTACK varies the time it takes the gate to start operating from 0.05mS to 100mS.

RELEASE/HOLD allows the recovery time from gating to be varied from 0.1 to 4 seconds.

The **HOLD** switch puts it into Hold mode: the release time is fixed at 0.1 seconds, and the **RELEASE/HOLD** control varies the hold time i.e. delay before the onset of gain reduction.

A red **SHUT** LED gives visual indication of the status of the gate: it illuminates when the gate is shut. When the gate is switched out of circuit, the LED is held off.



Specification

Group Section

Group Insert

Electronically Balanced	
Nominal Output Level	+4dBu
Maximum Output Level	+26dBu into 600Ω
Insert Return Impedance	20kΩ

Group Output

Electronically Balanced	
Nominal Output Level	+4dBu
Maximum Output Level	+26dBu into 600Ω
Group Bus Residual Noise	-90dBu
Group Noise	-80dBu
(40 Channels Routed)	
THD at +20dBu	1kHz: 0.005%
	10kHz: 0.020%

Group Direct Input

Electronically Balanced	
Nominal Output Level	+4dBu
Maximum Output Level	+27dBu
Input Impedance	600Ω

Auxiliary Master

Auxiliary Output

Electronically Balanced	
Nominal Output Level	+4dBu
Maximum Output Level	+26dBu into 600Ω
Output Noise	-80dBu
(40 Channel Console)	
THD at +20dBu	1kHz: 0.005%
	10kHz: 0.020%

Auxiliary Direct Input

Electronically Balanced	
Nominal Input Level	+4dBu
Maximum Input Level	+27dBu
Input Impedance	600Ω

(located on Master Panel) Connector Pinouts

Aux Output - 3 pin XLR Male

Pin 1	Ground (screen)
Pin 2	Hot (in phase signal)
Pin 3	Cold (out of phase signal)

Group Output - 3 pin XLR Male

Pin 1	Ground (Screen)
Pin 2	Hot (in phase signal)
Pin 3	Cold (out of phase signal)

FX Return Input - 3 Pole Jack

Tip	Hot (in phase signal)
Ring	Cold (out of phase signal)
Sleeve	Ground (screen)

Equaliser

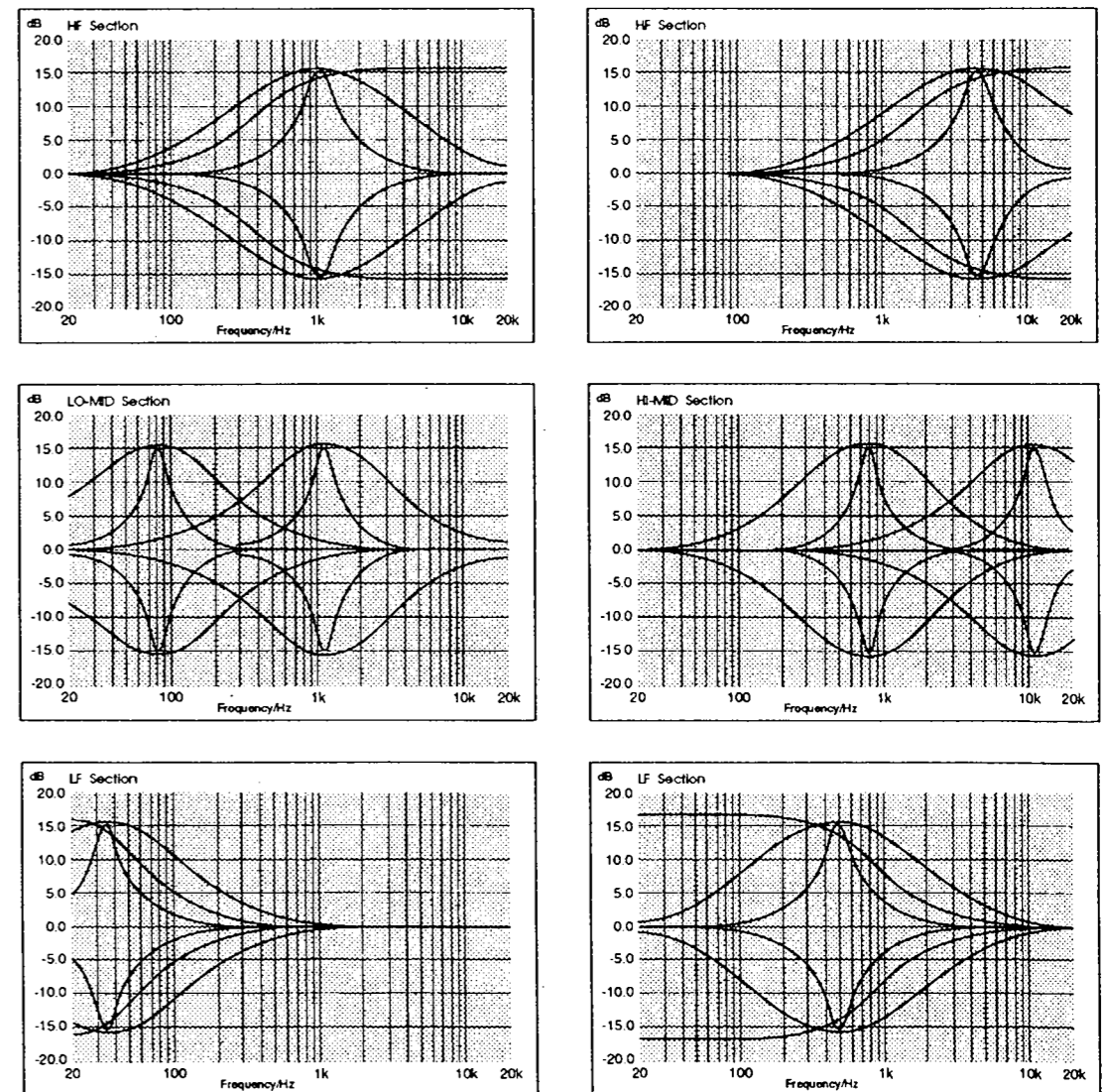
4 The Equaliser is a four band fully parametric design, and is placed in the signal path by the EQ switch. When the EQ is switched out of circuit, its input is grounded.

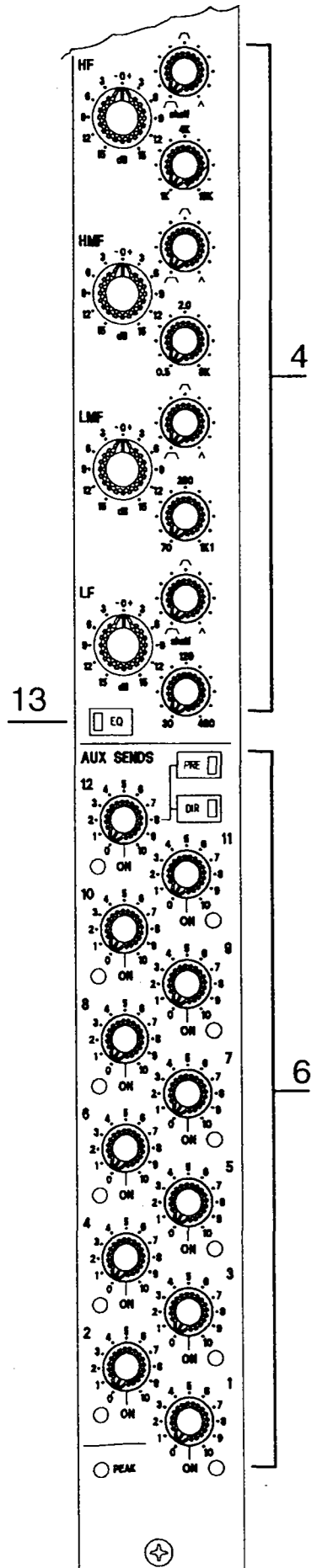
All four bands have:

- A centre detented **CUT/BOOST** control giving +/-15dB of control.
- A **FREQUENCY** control with 16:1 ranges:
 - HF 1kHz...16kHz
 - HMF 500Hz...8kHz
 - LMF 70Hz...1k1Hz
 - LF 30Hz...480Hz
- A variable **Q** control with a range of approx 0.5 to 3.

The **HF** and **LF** **Q** controls each have a switch at their anti-clockwise end that puts the section into **SHELF** mode.

Frequency Response Curves of the Equaliser





Insert Point

5 The default settings for the channel insert is post-EQ and bypassed, but can be switched pre-EQ by the **PRE (EQ)** switch, and into circuit by the **IN** switch. Only the return is switched, the send always has signal present. Both send and return jacks are electronically balanced at a nominal level of +4dBu.

Auxiliary Sends

6 Twelve auxiliary sends are provided. Each has a rotary **LEVEL** control.

Electronic cut circuitry is operated by pressing the level knob to activate a momentary switch. **ON** status is indicated by illumination of the green LED below each level control.

PRE/POST sourcing is globally selected for each aux bus by the **PRE** switch on its corresponding Aux Master module. The source is PRE when the LED is illuminated.

However, to allow for the occasional need for a particular aux bus to be fed from mixed PRE and POST sources, AUX 12 has a local **PRE** switch, which locally reverses the master selection. The PRE LED illuminates when the state is PRE.

Direct Output

A post fade (nominal +4dBu) electronically balanced direct output is provided. Pressing the **DIR** switch allows the direct out to be controlled by the AUX 12 pot. When in DIR mode, the **PRE** switch determines the source of the direct output. The LED glows when the selection is PRE fade. When DIR is active, PRE is not affected by Aux Master 12 global pre/post selection.

Channel Status

7 The illuminated, electronically latching **SOLO** switch, in conjunction with the Solo-in-Place status switch on the Master module allows the monitoring of individual channels. If Solo-in-Place is NOT selected pressing the SOLO switch on the channel feeds the channel signal to the **PFL** bus and automatically switches the monitoring to PFL mode. If Solo-in-Place is selected, pressing the SOLO switch does not PFL the channel, but cuts all other inputs, unless they have been made safe by selecting **ISO** (see below), leaving only the selected channel in the mix.

If the channel is selected to **ISO**, and Solo-in-Place is selected, pressing the SOLO switch **AFL**'s the channel in stereo and automatically switches the monitoring to AFL mode, without cutting any other channels. This is the significant difference between the *non-destructive* AFL mode of soloing and the *destructive* Solo-in-Place. For safety during performance, pressing the **LIVE** button on the Master module inhibits the Solo-in-Place system.

8 Pressing the **CUT** switch will always mute the channel via the soft muting circuit. Note that the CUT status of the channel is also affected by the Mute group, VCA group and SOLO systems as described below.

9 The channel **FADER** sets the level of the channel signal sent to the mix or group outputs via the PAN control (if selected) and any Aux sends selected to POST FADE. The fader has 10dB of gain at the top of its travel.

Aux Master

The console has 12 identical Aux Send Masters. One is located on each of the 8 Group/FXR/Aux modules, the remaining 4 are located on the Master module. The output signal is electronically balanced at a nominal level of +4dBu. Transformer coupling can be provided, the transformers being located in the bottom of the console frame.

Each Aux Send Master comprises:

19 A ground-compensated summing amplifier with an integral **LEVEL** control giving a maximum gain of +10dB referred to the +4dBu output.

20 The illuminated **CUT** switch mutes the output of the Aux Master.

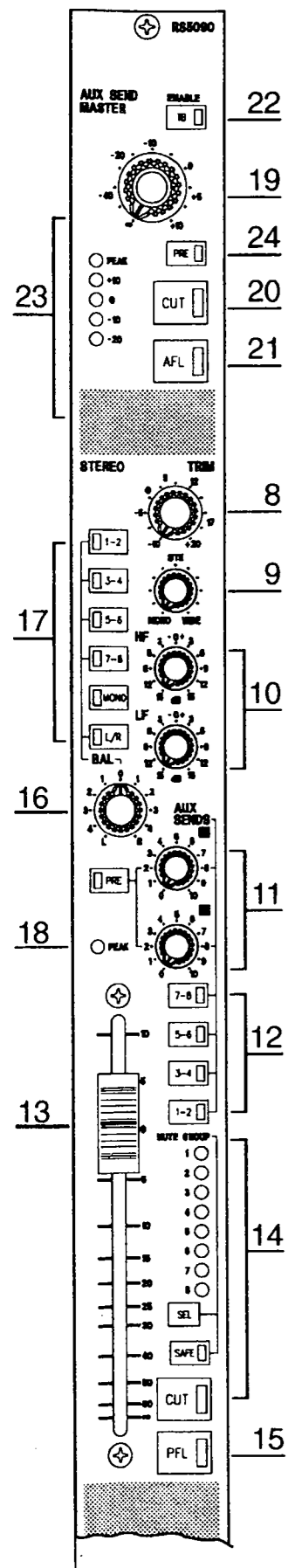
21 Pressing the pre-cut **AFL** switch allows monitoring of the Aux output, and automatically switches the monitoring to AFL/PFL mode. This function is not affected by the setting of the Solo-in-Place switch on the Master module.

22 Pressing the latching (ENABLE) **TB** switch routes the talkback signal into the Aux master when Talkback to Aux is selected on the master module. Talkback is summed with the Aux signal immediately before the balanced output and is not therefore affected by the CUT switch or Aux Send Master.

23 A 5 segment LED **METER** is provided, driven from before the balanced output circuit.

24 Global pre/post switching of the mono and stereo input Aux sends is controlled by the **PRE** switch. Note that on Aux Bus 12 this selection may be reversed by pressing the channel Aux 12 PRE switch, allowing mixed PRE/POST sources to be mixed to a single Aux send.

A VCA Group fader is located on a separate module below the Group/FXR/Aux Master module. This is described in detail in the VCA & Mute Group section later in this manual.



Auxiliary sends

11 There are two **AUX SEND** controls, normally sourced from a post-fade mono sum, though linkable for stereo sourcing, and switchable to pre-fade by the **PRE** switch.

12 The outputs of these level controls can be routed to aux busses 1-8 in pairs by the **AUX ROUTING** switches. More than one pair may be selected if required. If selected for mono sourcing, the upper control feeds the odd-numbered busses and the lower control feeds the even-numbered busses. When the source is selected to stereo the upper knob controls the left signal to odd busses, and the lower knob feeds the right signal to even busses.

FXR Status

13 The effects return **FADER** is a 100mm stereo unit, with 10dB of gain at the top.

14 The illuminated **CUT** switch, together with the 8 mute groups, control whether the FX Return is ON or muted. Pressing the **CUT** switch will always mute the signal. Assigning the Return to one or more Mute Groups allows the signal to be muted by the corresponding Mute Masters.

Mute groups are assigned as follows:

- Select the required group on the set-up switches on the master panel.
- Arm the system by pressing (MUTE WRITE) **ENBL**.
- Assign the required Returns to the selected Mute Group by pressing the momentary **SEL** switch beside the Return fader. The corresponding Mute Group LEDs will illuminate to show the current assignment.

The Return may be removed from the Mute Group system by pressing **SAFE**, which illuminates when active.

15 Pressing the **PFL** switch allows direct monitoring of the signal at the top of the fader and automatically switches the monitoring to **AFL/PFL** mode.

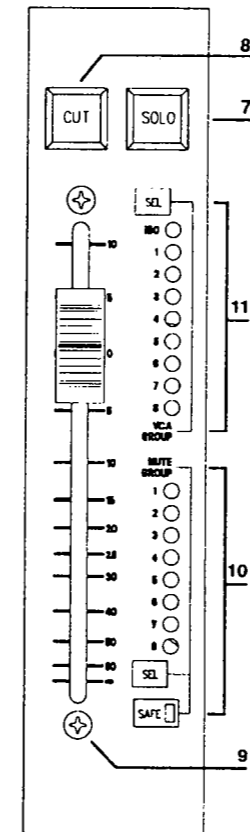
16 The post-fade signal feeds the centre detented active **BAL** (balance) control which has unity gain for both paths of the stereo signal in the centre position.

17 The outputs of the **BAL** control feed the **ROUTING SWITCHES** which route in pairs to groups 1-2, 3-4, 5-6, 7-8, and via the **L/R** switch to the stereo mix bus. Pressing the **MONO** switch feeds a post-fade, pre-balance mono sum to the mono bus.

18 The red **PEAK** LED senses at 2 points:

- The output of the input amplifier.
- The post-EQ, pre-fade signal.

It illuminates when the internal level of either the left or right channel exceeds +14dBu.



Mute Grouping

10 The **CUT** status of a single channel or group of channels may be controlled by eight **MUTE MASTER** switches on the master fader panel each providing master control of a **MUTE GROUP**.

Mute groups are assigned as follows:

- Select the required group on the set-up switches (A) on the master panel.
- Arm the system by pressing (MUTE WRITE) **ENBL** (B).
- Assign the selected channel to the selected Mute Groups by pressing the momentary **SEL** switch on the channel fader module. The corresponding Mute Group LEDs will illuminate to show the current assignment.

The channel may be removed from the Mute Group system by pressing **SAFE**, which illuminates when active.

Pressing a Mute Master switch will mute any channels selected to the group, and their **MUTE** switches will flash to indicate that a non-local mute is active.

VCA Grouping

11 The console has **VCA** channel faders fitted as standard and these may be assigned to the control of single or multiple **VCA GROUP** faders. The VCA Group faders may similarly be placed under the overall control of the **GRAND MASTER** fader.

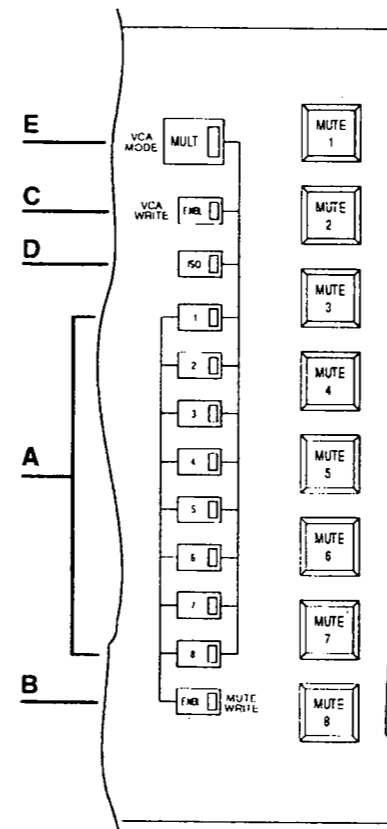
Single VCA Groups are assigned as follows:

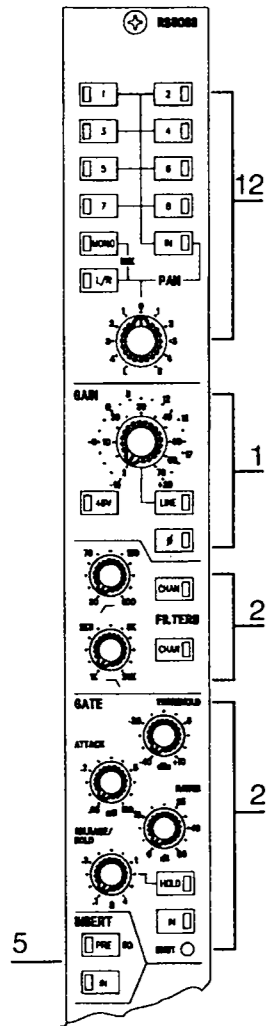
- Arm the system by pressing (VCA WRITE) **ENBL** (C) on the master panel.
- Select the required group using the set-up switches (A) on the master panel.
- Assign the required channels to the group by pressing the momentary channel **SEL** switch. The corresponding VCA Group LED will illuminate to show the current assignment.

The **ISOLATE** function is selected in the same way, except that the **ISO** set-up switch is pressed instead of a group selection. This mode completely isolates the channel from Solo-in-Place mutes, i.e. it is a **SOLO SAFE** status.

Multiple VCA Groups are assigned as follows:

- Press the (VCA MODE) **MULT** switch on the master panel to disable the intercanceling action of the set-up switches.
- Arm the system by pressing (VCA WRITE) **ENBL** (C) on the master panel.
- Select the required groups using the set-up switches (A) on the master panel.
- Assign the required channels to the groups by pressing the momentary channel **SEL** switch. The corresponding VCA Group LEDs will illuminate to show the current assignment.





Moving a VCA group fader varies the level of all channels in the group proportionately. Pressing the VCA Group CUT will mute all channels selected to the group, and while the VCA Group CUT will be lit constantly, the channel CUT switches flash to indicate that a non-local mute is action.

Pressing the VCA Group SOLO with Solo-in-Place NOT selected will produce a stereo AFL of all channels selected to the group. If Solo-in-Place is active, pressing the VCA Group SOLO will cut all channels *not selected* to the group or *isolated* by setting them to ISO.

Group Routing

12 The routing matrix is at the top of the module, and allows the channel post-fade signal to be fed to the eight group and three mix busses (Left, Right and Mono).

All busses are differential with balanced drive. Routing to the L & R busses is by the L/R switch. These busses are sourced after the centre detented PAN control, but before the (PAN) IN switch, and are therefore always affected by the panpot.

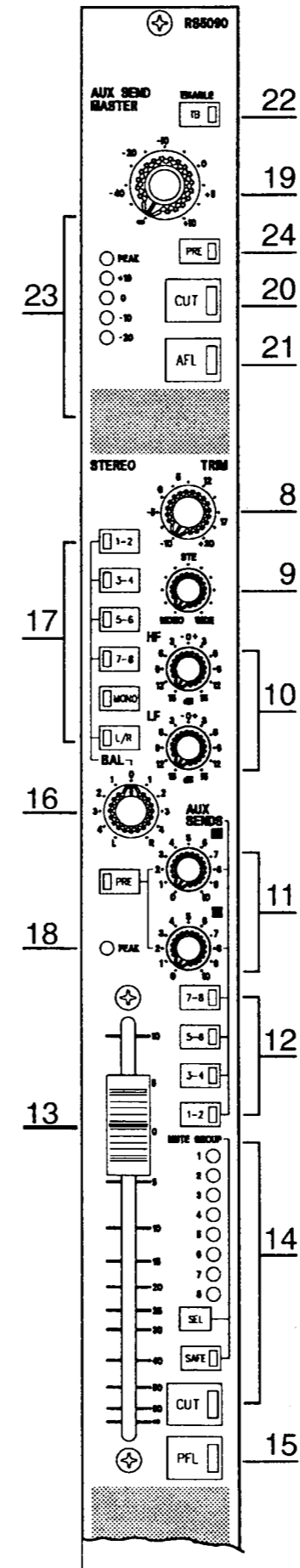
When the MONO switch is pressed, the pre-pan signal is routed to the mono bus. Pressing (PAN) IN switches the pan pot into circuit and allows left/right panning between odd/even groups. Rotation fully anticlockwise pans to odd groups, rotation clockwise pans to even groups.

13 A red PEAK LED illuminates when there is a level of +14dBu on any of the inputs of its driver, which are:

- Output of Mic/Line amplifier
- Output of the EQ
- Insert Return
- Output of fader buffer

Metering

A meter take-off point is provided that can be link-selected to read either the output of the Mic/Line amplifier (default) or the output of the EQ. Channel metering is by means of a 16 segment LED bargraph located above the channel in the meter bay.



Stereo Effects Return (FXR)

Although referred to as an Effects Return, this is a versatile stereo input equally suited to stereo machine or submix inputs as to effects. Eight stereo Effects Returns are fitted as standard.

Input stage

The inputs are via a pair of jack sockets on the rear connector panel. Transformer coupling can be provided, the transformers being located in the bottom of the console frame.

8 The input TRIM control allows the sensitivity of the balanced line level inputs to be adjusted over a range +10dBu to -20dBu.

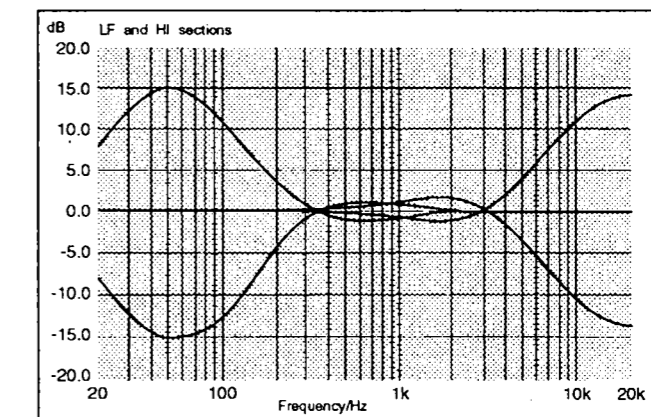
A 16 segment meter located in the meter bay above the Group module reads the output of the TRIM circuit. The meter reads both Left and Right signals and displays the highest level.

9 A pre-EQ, centre detented WIDTH control varies the width of the stereo image from mono (anticlockwise) through stereo at the centre detent to phase-enhanced wide stereo (clockwise).

Equalisation

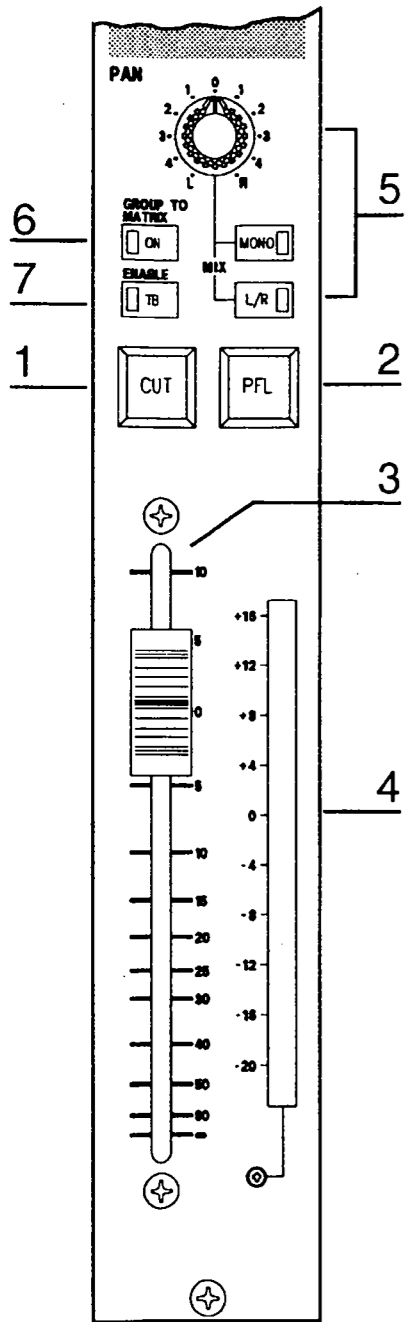
10 Two band equalisation is provided. The centre detented HF and LF shelving controls give 15dB cut and boost at fixed turnover frequencies of 12kHz and 60Hz respectively.

Frequency Response Curves of the Equaliser



Output Group

This comprises a group summing amplifier, group insert, the group fader with associated PFL and CUT switches, Talkback, and a PAN control with routing to Mix L/R, MONO and Matrix.



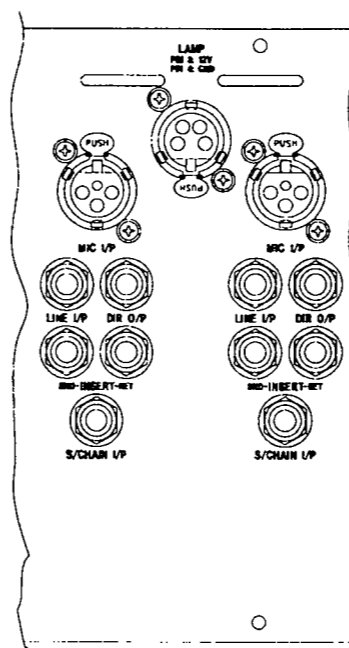
Group Path

The summing amplifier is of the low noise, balanced virtual earth type: it's output feeds the insert send (balanced, nominal level +4dBu).

- 1 The balanced insert return feeds the CUT switch, which is electronically latching.
- 2 The PFL switch allows the post-CUT, pre-fade signal to be monitored.
- 3 The fader sets the group output level and has 10dB of gain at the top of its travel.
- 4 The post-fade, post-CUT signal feeds the 20-segment LED METER adjacent to the group fader. An alignment pot is accessible through a small hole below the LED column.
- 5 The post-fade signal feeds the passive PAN pot. The panned outputs are fed to the main Mix bus through the (MIX) L/R switch. The feed to the MONO bus is enabled by the (MIX) MONO switch, and is sourced pre the PAN pot.
- 6 The post-fade feed from the group to the optional matrix output modules is enabled by the (GROUP TO MATRIX) ON switch.
- 7 Pressing the latching (ENABLE) TB switch routes the talkback signal into the group immediately before the balanced output. It sums with the group signal and is not affected by the CUT switch or fader. Group Talkback does not route to the matrix.

The electronically balanced group output appears on the rear panel on a male XLR connector at a nominal level of +4dBu. Transformer coupling can be provided, the transformers being located in the bottom of the console frame.

Rear Connector Panel



Connector Pinouts

Microphone Input - Female XLR

- Pin 1 Screen
- Pin 2 Hot (in phase signal)
- Pin 3 Cold (out of phase signal)

Line Input - 3 Pole Jack

- Tip Hot (in phase signal)
- Ring Cold (out of phase signal)
- Sleeve Ground (screen)

Direct Output - 3 Pole Jack

- Tip Hot (in phase signal)
- Ring Cold (out of phase signal)
- Sleeve Ground (screen)

Insert Send - 3 Pole Jack

- Tip Hot (in phase signal)
- Ring Cold (out of phase signal)
- Sleeve Ground (screen)

Insert Return - 3 Pole Jack

- Tip Hot (in phase signal)
- Ring Cold (out of phase signal)
- Sleeve Ground (screen)

Sidechain Input - 3 Pole Jack

- Tip Hot (in phase signal)
- Ring Cold (out of phase signal)
- Sleeve Ground (screen)

Specification

Microphone Input

Electronically Balanced (Transformer Optional)

Input Impedance	>2k Ω
Maximum Input Level	+18dBu
Sensitivity Range	-2 to -70dBu
CMRR	>80dB at maximum gain, 1kHz
EIN 150 Ω source	<-128dBu at max. gain

Line Input

Electronically Balanced

Input Impedance	>10k Ω
Maximum Input Level	+27dBu
Sensitivity Range	-20 to +10dBu
CMRR	>40dB at +4dBu sensitivity, 1kHz
EIN 150 Ω source	-90dBu at +4dBu sensitivity

Insert

Electronically Balanced

Nominal Output Level	+4dBu
Maximum Output Level	+26dBu into 600 Ω
Insert Return Impedance	20k Ω

Equaliser

4-Band, Fully Parametric

Boost/Cut Range	+/-15dB
Q (peak)	0.5 - 3
HF (Switchable Peak/Shelving)	
Frequency Range	1kHz - 16kHz
HIGH MID	
Frequency Range	500Hz - 8kHz
LOW MID	
Frequency Range	70Hz - 1.1kHz
LF (Switchable Peak/Shelving)	
Frequency Range	30Hz - 480Hz
High Pass Filter	2nd Order, 30Hz - 600Hz
Low Pass Filter	2nd Order, 1kHz - 20kHz

Line Out

Electronically Balanced

Nominal Output level	+4dBu
Maximum Output Level	+26dBu into 600 Ω

General

Mute Off Ratio	>100dB (1kHz)
Fader Off Ratio	>80dB (1kHz)
Panpot Crosstalk	>80dB (1kHz)
Routing Off Ratio	>100dB (1kHz)
Aux Send Off Ratio	>80dB (1kHz)
Aux Cut Off Ratio	>95dB (1kHz)
THD	<0.025% (1kHz) <0.05% (10kHz)
THD (VCA bypassed)	<0.005% (1kHz) <0.025% (10kHz)

Group Output

Stereo FX Return

Aux Master

Description

Operation

and Specifications