

Q II - FOH

Operators Manual

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Q II - FOH Operators Manual
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In line with the company's policy of continual improvement, specifications and function maybe subject to change without notice. This Operator Manual was correct at the time of writing. E&OE.

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Declaration of Conformity

The Manufacturer of the Products covered by this Declaration is



Klark Teknik Building, Walter Nash Road, Kidderminster, Worcestershire, DY11 7HJ.

The Directives Covered by this Declaration.

89/336/EEC Electromagnetic Compatibility Directive, amended by 92/31/EEC & 93/68/EEC

73/23/EEC Low Voltage Equipment Directive, amended by 93/68/EEC.

The Products Covered by this Declaration.

Equipment type	Product Name	Variants
Audio Mixing Console	Q2	Q2 VCA
Audio Mixing Console	Q2 Monitor	Meterbridge
Audio Mixing Console	QMR	Meterbridge
Audio Mixing Console	FMR	
Audio Mixing Console	Forum	PA,Matrix,Mute
Audio Mixing Console	Forum Monitor	Meterbridge
Audio Mixing Console	XL200	
Audio Mixing Console	XL250	

The Basis on which Conformity is being Declared

The products identified above comply with the protection requirements of the EMC Directive and with the principal elements of the safety objectives of the Low Voltage Directive, and the manufacturer has applied the following standards:

EN 55013 : 1990

Limits and methods of measurement of radio disturbance characteristics of Broadcast Receivers and Associated Equipment.

EN 50082-1 : 1992

Electromagnetic Compatibility - Generic Immunity Standard Part 1. Residential, commercial and light industry.

EN 60065 : 1994

Safety requirements for mains operated electronic related apparatus for household and similar general use.

The technical documentation required to demonstrate that the products meet the requirements of the Low Voltage Directive has been compiled by the signatory below and is available for inspection by the relevant enforcement authorities. The CE mark was first applied in 1996.

Signed:

A handwritten signature in black ink, appearing to read 'G.M. Squires', written over a horizontal dotted line.

G.M.Squires

Authority: Product Support Manager.

Date: 1st, January 1997.

Attention

The attention of the specifier, purchaser, installer, or user is drawn to special measures and limitations to use which must be observed when these products are taken into service to maintain compliance with the above directive. Details of these special measures and limitations to use are available on request, and are also contained in product manuals.

GENERAL INFORMATION

Three channel or Left, Centre, Right panning differs from the normal stereo panning arrangement in that where the conventional left/right pan moves the signal across the stereo image, LCR panning moves the mono signal across three distinct positions. Using LCR panning gives a more spatial effect, offers more control over vocal and effects positioning, and brings theatre performances to life in a way that conventional stereo panning cannot.

In the LCR mode, the pan pot acts as follows. When panned hard left, the signal is only fed to the left channel of the main output (or sub-group). As the pan is rotated towards the centre, the signal to the left decreases, and the signal to the centre channel increases until at dead centre the signal only goes to the centre output. At this point, no signal is fed to the right channel at all.

LEFT

CENTRE

RIGHT

Rotating the pan pot further (to the right) decreases the centre feed while the right feed increases until at full clockwise rotation the signal is only on the right channel.

THE Q2 IN USE

Providing a hard centre image in addition to left and right speaker clusters improves localisation, as has already been proven in the cinema industry. Stars and soloists are typically mixed to the centre channel. Back-up vocals and orchestra or band may be wrapped around the vocalist in stereo, or panned across the three channels.

In Theatrical performances, LCR panning may be used to follow an actor around the stage.

Q2's typical use in the theatre maybe as follows.

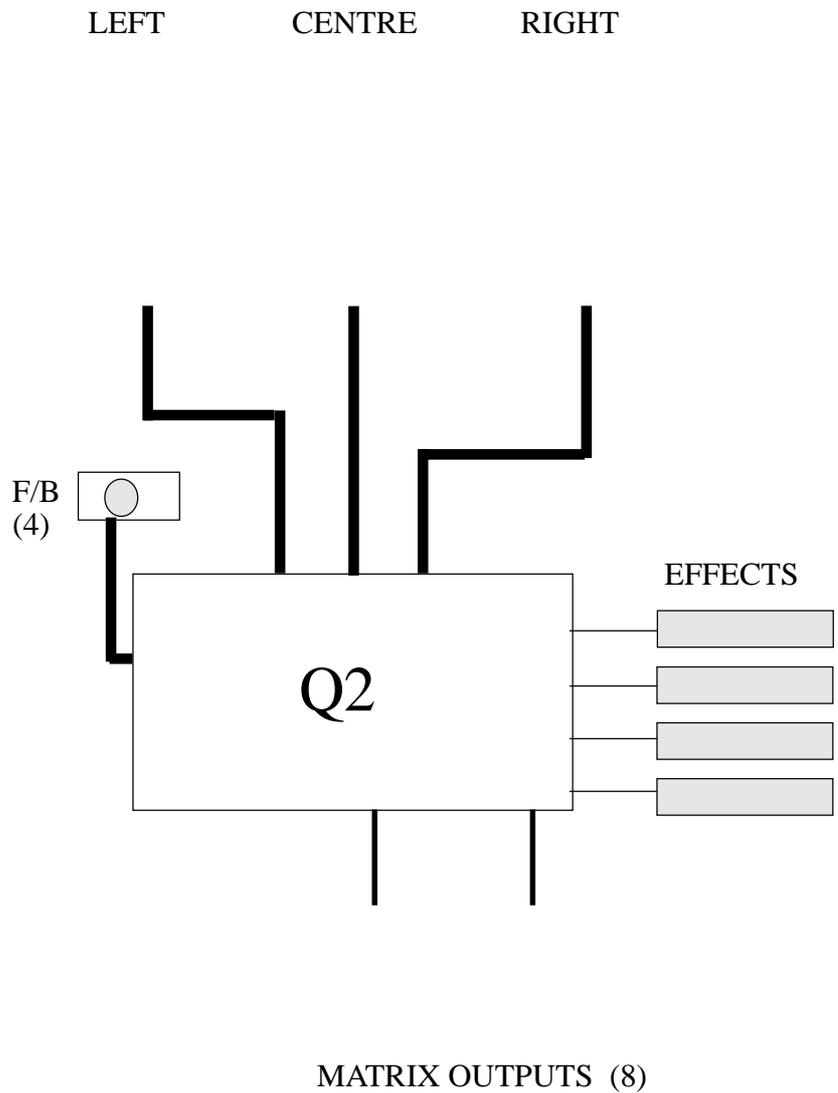
The main LCR output is used to feed the audience clusters. Further flexibility in mixing is provided if the 4 LCR sub-groups are fitted, as groups can be formed with all signals in place, then simply fader-controlled as a group to the main output.

Four of the auxiliary sends, labelled foldback, may be used to provide stage monitoring, as the term foldback suggests. The other four auxiliaries are then free for effects sends, perhaps using the dual concentric controls as stereo pairs.

The matrix section has numerous uses. Apart from creating foyer and backstage feeds, it can be used for distributed loudspeaker arrays for SPL control further back in the house (see the section on the Q2 matrix). If the Q2 stereo sub-groups are fitted, the matrix is fully stereo, so that delayed arrays can be easily set up as distinct and controllable stereo pairs down each side of the auditorium.

Consultants and contractors will be pleased to note that Q2 has balanced inputs and outputs throughout, including inserts. In addition, all inputs and outputs (with the obvious exception of the mic input) operate at a nominal level of +4dBu. This alone means no catering for special levels on inserts, no compensating for unbalanced insert sends which combine with balanced returns.

System connection and signal flow is therefore not console dependant.



WARRANTY

If within a 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 (but no faulty design) to such an extent that the effectiveness and/or the usability thereof is materially affected, the Equipment or the faulty component shall be returned to the Distributor or DDA and subject to the following conditions the Distributor or DDA will repair or at its option replace the defective components. Any components replaced will become the property of DDA.

Any Equipment or component returned will be at the risk of the End User whilst in transit (both to and from the Distributor or DDA) and postage and/or freight charges must be prepaid.

This Warranty shall only be available if:-

- i) The Equipment has been properly installed in accordance with the instructions contained in this manual.
- ii) The End User has notified the Distributor or DDA in writing within 14 days of the defect appearing.
- iii) No persons other than authorised representatives of DDA or the Distributor have effected any replacement of parts, maintenance adjustments or repairs to the Equipment.
- iv) The End User has used the Equipment for such purposes as DDA recommends with only such operating supplies as meet DDA's specifications or approval and otherwise in all respects in accordance with DDA's recommendations.

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.

Benefit of this Warranty may not be assigned by the End User.

End Users who are consumers should note that 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.

DDA shall not be liable for any damage caused to persons or property due to :-

- i) Incorrect usage of the Equipment
- ii) Other equipment attached to the Equipment, which is not approved by DDA
- iii) Modifications made by non-authorized persons, or by using non-recommended parts, or incorrectly made.

In no circumstances shall DDA be liable for any indirect or consequential costs, damages or losses (including loss of business profits, operating time or otherwise) arising out of the use or inability to use the product, whether or not the likelihood of damage was advised to DDA or its distributor.

Fuses and filament lamps are specifically excluded from the warranty

This notice does not affect your statutory rights.

DIMENSIONS

Q2 Dimensions

24 Input Frame

Width : 1255mm / 49.4"
Depth : 810mm / 31.9"
Height : 368mm / 14.5"

32 Input Frame

Width : 1505mm / 59.25"
Depth : 810mm / 31.9"
Height : 368mm / 14.5"

40 Input Frame

Width : 1755mm / 69.1"
Depth : 810mm / 31.9"
Height : 368mm / 14.5"

48 Input Frame

Width : 2005mm / 78.9"
Depth : 810mm / 31.9"
Height : 368mm / 14.5"

Floorstand (optional)

Height to underneath of console : 700mm / 27.5"

Q2 Power Supply Dimensions

Height : 134mm / 5.25" (3U rack mounting)
Depth : 265mm / 10.5"
Width : Front panel 483mm / 19"
Housing 438mm / 17.25"
Nett Weight (unpacked): 7.8 Kg / 17.2 lbs

SPECIFICATIONS

Note : All specifications relate to dBu, ie 0dBu = 0.775V RMS

MAXIMUM GAIN

Mic Input to Mix Output:	86dB
Line Input to Mix Output:	40dB

FREQUENCY RESPONSE

Mic Input to Mix Output: (gain 55dB)	20Hz , -0.50dB 20kHz, -0.20dB
Line Input to Mix Output (gain 0dB)	20Hz , -0.50dB 20kHz, -0.20dB

NOISE, DIN Audio Weighted

Microphone Input Gain 55dB, EIN Ref 200 Ohm	<-127.5dBu
Line Input to Mix Output Gain 0dB, 16 inputs routed	<-83dBu

DISTORTION

Microphone Input to Mix Output -50dBu input, +4dBu output	<0.005%
Line Input to Mix Output +4dBu input, +4dBu output	<0.005%

CROSSTALK

Adjacent Channel,	1kHz	<-100dBu
Group to Mix,	1kHz	<-88dBu
Fader Attenuation	1kHz	<-95dBu
Panpot Isolation,	1kHz	<-72dBu

Q2 Power Supply Specifications

AC Mains Voltage selection :- 110V/120V/220V/240V

Power Consumption (max) : 750VA

AC Mains frequency : 50Hz. - 60Hz

Fuse Ratings:	220/230/240V	- 6.3A
	90/100/120V	- 10A

Cooling Method: Internal fan

DC Power Outputs:	+17 Volts,	7A max
	-17 Volts,	7A max
	+48 Volts,	0.35A max

WIRING CONSIDERATIONS

To take full advantage of the excellent audio performance of DDA mixing consoles, it is essential that the installation is carried out with care and attention. All audio signals are referenced to the system earth, which must be clean and noise-free, and essentially equipotential. In addition, the earth system integrity is absolutely necessary for safety.

Do not disconnect the mains earth wire from each piece of equipment as this could create a hazardous situation.

If in doubt consult a competent engineer and your local electricity supply company to ensure that safety regulations are not infringed or negated.

GROUNDING

The console metalwork **MUST ALWAYS** be connected to the Mains earth via the PSU lead. However, the user has a choice as regards the Audio 0V.

The Audio 0V should be taken from the Studio earthing System which should take the form of a star wired system. Decide on a central point for the main earth system and starfeed to all mains outlets and equipment racks from this point. Common electrical wiring practice is to daisy-chain earth wires from outlet to outlet, but this is not recommended for audio installations. The location of the earth system star point should be in a convenient, easily accessible position, such as the main equipment rack. The star point must then be connected to the incoming mains earth but preferably should be connected to a totally separate technical earth (if local electrical regulations permit).

This should take the form of a large copper plate or stake buried as deeply as practical into the ground (a 1 metre [39"] copper stake hammered fully into the ground would be suitable). This should then be fed to the studio star system via heavy gauge, low impedance cable, with adequate precautions being taken to prevent excessive corrosion of the cable/earth stake.

Do not install other equipment (lighting, vending machines etc) to the technical earth - only use it for Audio Equipment.

If the star point is derived from mains earth, however, and not from a ground stake/plate, install separate clean and dirty mains outlets, wired individually to the mains distribution box. Use the clean supply for all audio equipment, and the dirty supply for all lighting, vending machines etc. Do not mix the two systems. It may be necessary to install an isolating transformer for the clean supply to ensure adequate isolation from mains-borne interference. The isolating transformer must be of adequate current capability and should incorporate a Faraday Shield, connected to the incoming mains earth.

All audio connecting cables should be good quality twin screened cable. Do not use single screened cable.

It is very important that the screen is not used as the signal return. Therefore connect the screen at one end only. Connecting the screen at both ends will cause an earth loop into which external hum fields will be induced.

In areas where high levels of radio frequency interference are present the open end of the screen can be connected to earth through a 0.01 microfarad capacitor. This will appear as a short circuit at high frequencies, and lower the effective shield impedance to earth. However at audio frequencies the reactance of the capacitor will be sufficiently high to not cause an earth loop.

In general, the screen should be connected at the signal source, and not at the signal destination. The exception to this rule of thumb is when connecting to an unbalanced input or to an electronically balanced input. In these cases the wires being screened are referenced to the destination earth.

Electronically balanced outputs which are to be operated in the unbalanced mode should be unbalanced at the output connector, not at the signal destination so that the signal current returns to earth via the shortest, least reactive route.

Rack mounted equipment which has unbalanced inputs and outputs may need to be electrically isolated from the equipment rack and/or other equipment to avoid earth loops.

DO NOT DISCONNECT THE MAINS EARTH.

Connect all equipment in a logical sequence, starting with the monitor systems, followed by the multitrack and then the stereo machines and the peripheral devices and isolate any earth loop problems as they occur. It is very difficult to rectify a problematical installation after everything has been connected due to interaction between the various earth loops.

The Console is supplied with 1 power supply unit 3U high (5.25"), 19" rack mounting. The PSU supplies the console with +18V, -18V, +48V phantom and Audio Ground (0V). Connection between supplies and console is a cable, terminated at both ends by polarised Harting multiway connectors. At the console the connector is located on the rear panel of the console.

The normal length of the PSU-Console cables is 25 feet (8 metres).

The power supply requires the following Mains supplies :-

220-240 Volts AC, 6.3 A (Maximum current ratings)
100-120 Volts AC, 10 A (Maximum current ratings)

and is connected to the AC Mains via standard IEC 3 pin lead.

The PSU has an integral low-noise cooling fan and should be provided with at least 1U (1.75") of rack space above and below it.

WARNING - ENSURE THAT THE CORRECT VOLTAGE HAS BEEN SELECTED ON THE PSU BEFORE SWITCHING ON THE UNIT.

The selection of the mains input voltage is made by removing the fuse holder from the rear panel of the PSU, and replacing it in the correct orientation for the local voltage supply. Ensure that the correct value fuse is fitted to correspond to the supply.

ATTENTION

CABLES

This product should only be used with high quality, screened twisted pair audio cables, terminated with metal bodied 3-pin XLR connectors. The cable shield should be connected to Pin 1. Any other cable type or configuration for the audio signals may result in degraded performance due to electromagnetic interference.

ELECTRIC FIELDS

Should this product be used in an electromagnetic field that is amplitude modulated by an audio frequency signal (20Hz - 20Khz), the signal to noise ratio may be degraded. Degradation of up to 60dB at a frequency corresponding to the modulation signal may be experienced under extreme conditions (3V/m, 90% modulation).

No permanent damage or degradation of performance will be caused by these conditions.

MODULE DESCRIPTIONS	Before describing the module functions, it is worth looking at some of the facilities in some depth which would otherwise be too long to describe within the module texts.
THE CUE SYSTEM	Q2's cue system, smart cue, is as flexible as you want it to be. It can be operated in several modes, the simplest of which is of course a regular PFL solo system.
SOLO MODE	<p>The three modes of cue listening are PFL (pre-fade), AFL (after-fade), and SIP (solo-in-place). The overall level of the cue signal fed to the monitors is adjustable on the stereo master module, so PFL signals will not present high level signals to the monitor outputs.</p> <p>The solo-in-place mode is different from the normal recording SIP or other SIP modes in that cueing a channel or group will not actually mute all the other channels. It would be useless if by soloing a group you cut the inputs to that group. Instead, in SIP mode, any group cue pressed will override and replace whatever signal is present on the main output, until the cue is released when the original signal is returned. No channels are muted, so all active parts of the group remain intact. As this function could be considered as dangerous in a performance situation, the SIP mode switch is located at the top of the module away from all the other cue mode controls.</p>
CUE PRIORITY	Q2's smartcue system incorporates a cue priority function. Two LEDs on the stereo master module indicate whether an INPUT CUE or an OUTPUT CUE is active. If an output cue is active, pressing an input cue will override and replace the output cue until released, when the output cue signal will be returned. This is an important facility in live sound production.
CUE BUTTON ACTION MOMENTARY OR LATCHING	The action of the cue buttons is functional in two ways. If the button is pressed quickly (normally), the channel latches into cue mode, with a flashing LED, and remains in cue mode until the button is pressed again. This is the "latching" mode, and is the normal method of cue operation.

CUE INTERLOCK
MODE

MASTER CUE RESET

If the cue button is held depressed for at least one second, the cue will become momentary, and only active until the cue button is then released. This allows you to listen to a signal for a short period of time and only have to press the button once.

A further method of operation involves a choice of additive or exclusive cues.

In normal mode, the cues are additive. That is, any cue button pressed adds its signal to any cues already pressed, so any number of cues may be active at one time. To clear all the cues completely, press the CUE RESET button on the stereo master module.

In the INTERLOCKED mode, pressing a cue button will clear the previous cue, so only one cue may ever be active at any time. This prevents cue signals adding.

THE MATRIX SECTION

Nowadays, any console destined for theatre or similar live performance use must have a matrix. This matrix takes the group signals, and probably other signals, and allows different sub mixes to be created for many uses.

Traditionally, matrices have been used to provide backstage mixes, dressing room and foyer feeds where some elements of the mix are not required. For example, you may want to send a different mix of an opera or stage show to the dressing rooms to accentuate certain points in the performance.

Now, with demands for sound level control increasing, a matrix is mandatory for distributing sound throughout an auditorium. Using the normal front of house stacks, people at the rear of a hall may need the system power increased for suitable listening levels, while those at the front will no doubt then be deafened. The answer is to provide arrays of loudspeakers, with mixes of suitably delayed signals, stretching from the front of the hall to the back, to provide more comfortable localised levels for better audience reception. Here, the matrix increases the potential of creativity of the performance, as by utilising the mixing facilities of the matrix, a more surround sound effect may be created by perhaps focusing vocals to the front, and mixing effects and music around the hall.

Q2's matrix offers all the flexibility that you need. In addition to a feed from all the group outputs each matrix output may be fed from the main stereo and mono (or LCR) buses, and any 2 of the four foldback mixes. This latter facility is extremely useful when you consider that you can now set up one mix on a foldback bus, and feed portions of that mix to any or all of the matrix outputs.

With fader control, CUE and ON/OFF facilities, Q2's matrix is perhaps one of the most powerful systems available on a console.

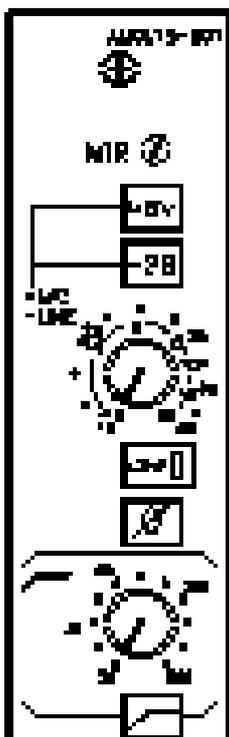
THE 20DB PAD

One trend in modern console design that DDA has chosen not to follow is the removal of the traditional 20dB pad in favour of a wide range gain control system.

The reason for this is mostly due to the use of microphone input transformers. Their position in the circuit is always before the input amplifier. Without a pad, the risk of saturating the transformer with high level microphone outputs is extreme, unless very large transformers are used.

DDA's philosophy places the 20dB pad before the transformer to eliminate the risk of transformer saturation.

INPUT MODULE



The input module is essentially the same for all subgroup versions of Q2, with links selecting whether the buses feed 8 mono, 8 stereo, 4 LCR or 16 mono subgroups. Dedicated LCR input modules have 4 routing buttons marked A, B, C, and D instead of buttons 1-8.

MTR

This sub-panel preset is for calibration of the external meter output of the module.

48V

Provides phantom power for a condenser microphone, or DI box. Optional balancing transformers may be fitted on the Mic input.

-20dB (PAD)

This inserts a 20dB attenuator in circuit with the Mic input. It may be used when high-output microphones are employed, or for the use of the Mic input for Line-level signals.

GAIN

The gain control is a wide range rotary potentiometer, and is active on both Mic and Line Inputs. On Mic, the gain can be adjusted from 12 to 66dB. For Line inputs, the adjustment is from -10 to +20dB.

LINE

The LINE switch selects the signal on the line input socket to feed the channel path when it is down. In this case, the Mic signal is disconnected. The led illuminates when Line is selected.

PHASE

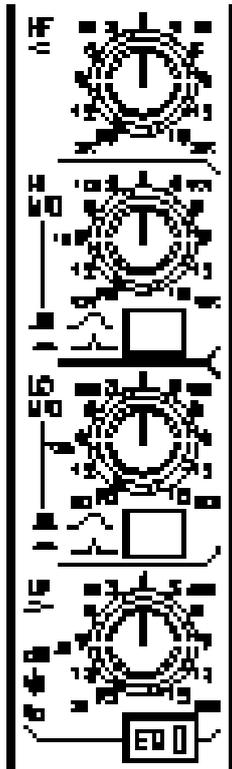
The PHASE REVERSE switch inverts the phase of the selected input, to allow compensation for different wiring standards.

FILTER

The Filter switch inserts a tuneable highpass filter with a roll-off of 12dB per octave into circuit after the input amplifier. This may be used to eliminate unwanted low-frequency noises such as rumble, or camera buzz.

FILTER FREQUENCY CONTROL

The frequency range of the filter is continuously variable between 20Hz to 500Hz.



EQUALISER

The Q2 Equaliser is a four-band design, all bands having sweep frequency adjustment. Each band consists of two dual-concentric pots. The upper pot is the gain adjustment, the lower control being the frequency adjustment. The two mid-range sections each have a switch-selectable Q.

HF

Shelving section, providing +/-15dB of gain with an adjustable frequency range of 2kHz to 20kHz.

HI MID

Peaking section, providing +/-15dB of gain, at frequencies from 525Hz to 15kHz.

Q

Selects the Q to be 0.9 or 1.8. The Q is 0.9 when the switch is in the 'down' position.

LO MID

Peaking section, providing +/-15dB of gain, at frequencies from 80Hz to 2.2kHz.

Q

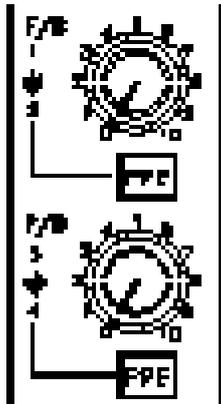
Selects the Q to be 0.9 or 1.8. The Q is 0.9 when the switch is in the 'down' position.

LF

Shelving section, providing +/-15dB of gain with an adjustable frequency range of 20Hz to 500Hz.

EQ IN

The EQ switch inserts the entire equaliser circuit into circuit. When switched out, the equaliser is totally bypassed, keeping the signal path to a minimum. The led in the switch illuminates when the EQ is in circuit. The Insert point is normally located after the EQ section, but a switch located on the module pcb allows the insert to be pre-EQ.



AUXILIARIES

Q2 has eight auxiliary buses, accessed on the Input module from 4 sets of dual-concentric controls. In addition, the channel direct output may be controlled via one pot, to provide extended auxiliary sends. For convenient assignment four of the auxiliary buses are denoted as foldback buses.

F/B 1 (Foldback 1, upper control)

Controls the level of the channel signal fed to the Foldback 1 bus. This signal is normally post-fader, unless the PRE button, just below, is depressed. Internal links on the module pcb allow the pre-fader feed to be pre or post-EQ (paired with F/B 2).

F/B 2 (Foldback 2, lower control)

Controls the level of the channel signal fed to the Foldback 2 bus. This signal is normally post-fader, unless the PRE button, just below, is depressed.

PRE

Selects the signal feed for Foldbacks 1 and 2 to be pre-fader rather than post-fader.

F/B 3 (Foldback 3, upper control)

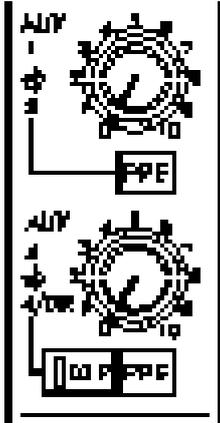
Controls the level of the channel signal fed to the Foldback 3 bus. This signal is normally post-fader, unless the PRE button, just below, is depressed. Internal links on the module pcb allow the pre-fader feed to be pre or post-EQ (paired with F/B 4).

F/B 4 (Foldback 4, lower control)

Controls the level of the channel signal fed to the Foldback 4 bus. This signal is normally post-fader, unless the PRE button, just below, is depressed.

PRE

Selects the signal feed for Foldbacks 3 and 4 to be pre-fader rather than post-fader.



AUX 1 (Upper control)

Controls the level of the channel signal fed to the Aux 1 bus. This signal is normally post-fader, unless the PRE button, just below, is depressed. Internal links on the module pcb allow the pre-fader feed to be pre or post-EQ (paired with Aux 2).

AUX 2 (Lower control)

Controls the level of the channel signal fed to the Aux 2 bus. This signal is normally post-fader, unless the PRE button, just below, is depressed.

PRE

Selects the signal feed for Auxes 1 and 2 to be pre-fader rather than post-fader.

AUX 3 (Upper control)

Controls the level of the channel signal fed to the Aux 3 bus. This signal is normally post-fader, unless the PRE button, just below, is depressed. Internal links on the module pcb allow the pre-fader feed to be pre or post-EQ (paired with Aux 4).

AUX 4 (Lower control)

Controls the level of the channel signal fed to the Aux 4 bus. This signal is normally post-fader, unless the PRE button, just below, is depressed.

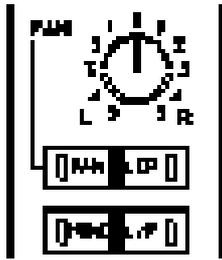
PRE

Selects the signal feed for Auxes 3 and 4 to be pre-fader rather than post-fader.

DIR

Re-routes the signal on the Aux 4 control to feed the Channel Direct output. The signal no longer feeds the Aux 4 bus, and can be used either as an additional single effects send, or as a feed to a multitrack for example.

Note: Dir and Pre are local to the module, they do not affect the signal flow on any other module than the one on which they are located.



ROUTING AND STATUS

PAN

In normal mode and with the PAN set to centre, equal levels are sent to both sides of the stereo mix or to ODD and EVEN groups that are in use, with a 4.5dB drop relative to fully clockwise or anticlockwise. Setting the PAN control fully anticlockwise sends full level to the Left bus, cutting the send to the Right bus; fully clockwise rotation sends full level to the Right bus, cutting the feed to Left.

L/R

Routes the post-fade, post-pan channel signal to the main stereo mix bus, with led indication. The PAN control is automatically inserted into circuit.

MONO

Routes the post-fade, post-pan channel signal to the main mono mix bus, with led indication.

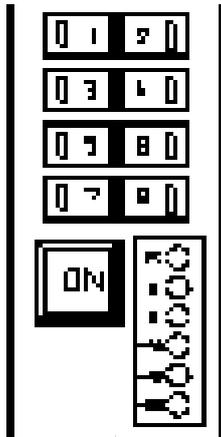
PAN

Switches the PAN control in circuit across odd and even group buses, with led indication.

LCR

Changes the mode of the pan pot from conventional stereo (L/R panning as described above to Left-Centre-Right mode. In this mode, the pan control acts across all three main buses, using the mono bus as a centre bus. When the pan is fully anti-clockwise, signal is sent only to the left bus, with no signal to centre or right buses. In the centre, signal is sent only to the centre (mono) bus, with no signal to left or right buses. When fully clockwise, signal is only sent to the right bus, with no signal sent to left or centre buses.

If a pair of groups (eg 1 and 2) is selected, the pan also acts in LCR mode, but without a centre output from the groups unless the LCR group modules are fitted.



1

Routes the post-fade, post-pan channel signal to output bus 1, with led indication.

2 (and 3, 4, 5, 6, 7, 8)

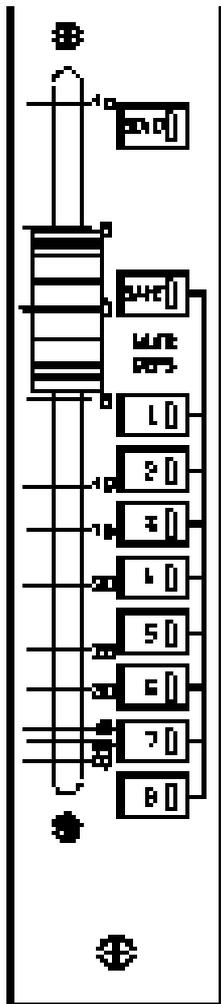
Routes the post-fade, post-pan channel signal to output bus 2 (and 3, 4, 5, 6, 7, and 8 if pressed), with led indication.

ON

The ON switch enables the channel signal path, and is indicated by an led in the switch when the channel is active. When OFF, all post-fade auxiliary sends and routing assignments are muted. Internal links allow the ON switch to be configured as a channel CUT.

METER

The six segment led meter comprises a five segment meter, fed from one of three points in the signal chain, and the PEAK led, which is fed simultaneously from all 3 points, giving a warning of potential overload signals within the signal path.



CUE

The CUE (or SOLO) button feeds a Pre-fader or post-fader signal (as selected on the master module PFL or AFL) to the Monitor section (loudspeakers or headphones), replacing the selected monitor source if one is selected. The main stereo output of the console is not affected unless SIP (Solo-in-place) mode has been selected on the master. The yellow led in the CUE switch will flash when the CUE function is active. CUE signals from different sources that are active simultaneously in the non-interlocked mode will be summed.

To latch the CUE function, press the button quickly and release. To unlatch, repeat. To CUE a signal momentarily, hold down the CUE button for at least 1 second. On release, the CUE will also be released.

See THE CUE/SOLO SYSTEM on page 16 for full functional details.

FADER

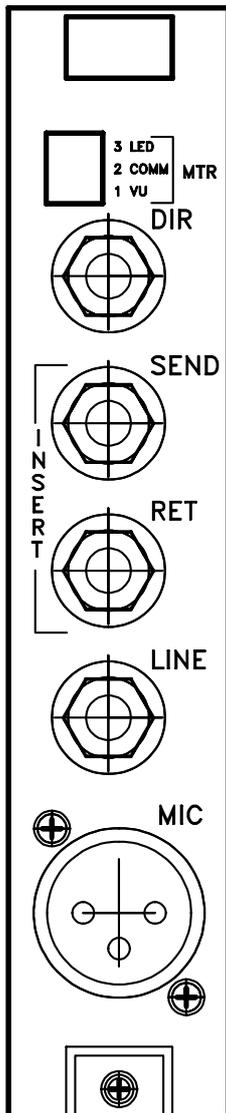
The fader is the main signal level control for the channel, and is a long-throw type which gives smooth control of the channel level.

SAFE

Deselects the return from the VCA/MUTE Group system, without affecting the mute group assignments. Useful to locally protect signals, or manually override grouped MUTE ON conditions.

MUTE GROUP 1

Assigns the channel to MUTE Group 1. Similarly for MUTE Groups 2 through 8.



CONNECTORS AND PIN ASSIGNMENTS

MIC INPUT :XLR type 3 pin connectors, Balanced

Nominal level : -56dBu to -8dBu

Pin 1 - Ground

Pin 2 - Signal +ve (hot)

Pin 3 - Signal -ve (cold)

Input impedance : >2k.

LINE INPUT :1/4" TRS Jack Socket, 'A' Gauge, Balanced

Nominal Input Level : +4dBu

Tip : Signal +ve (Hot)

Ring : Signal -ve (Cold)

Sleeve: Ground

Input Impedance : >10 kOhm

INSERT SEND :

1/4" TRS Jack socket, 'A' Gauge, Balanced

Nominal Output level: +4dBu

Tip : Signal +ve (Hot)

Ring : Signal -ve (Cold)

Sleeve: Ground

Output Impedance: <75 Ohm

INSERT RETURN :

1/4" TRS Jack Socket, 'A' Gauge, Balanced

Nominal Input Level: +4dBu

Tip : Signal +ve (Hot)

Ring : Signal -ve (Cold)

Sleeve: Ground

Input Impedance : >10 kOhm

DIRECT OUTPUT : 1/4" TRS Jack socket, 'A' Gauge, Balanced

Nominal Output level: +4dBu

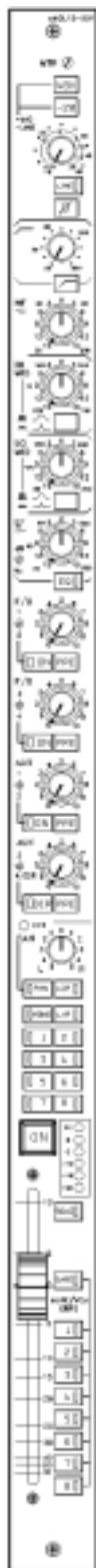
Tip : Signal +ve (Hot)

Ring : Signal -ve (Cold)

Sleeve: Ground

Output Impedance: < 75 Ohm

VCA INPUT MODULE



Q2 may also be supplied with 8 VCA/Mute groups. The input module is essentially the same as the standard mono input, with the addition of the 8 VCA/Mute groups, and mutes on most of the auxiliary sends.

Replacing 4 input modules are the VCA master modules, which are the fader and mute masters to control the 8 VCA/Mute groups. Each module has 2 such masters, and a stereo effects return input.

Only the differences from the standard module are described here, which are in fact all on the lower section of the module.



F/B 1/2 ON

Enables the channel feeds to the foldback buses 1 and 2.

F/B 3/4 ON

Enables the channel feeds to the foldback buses 3 and 4.

AUX 1/2 ON

Enables the channel feeds to the foldback buses 1 and 2.

EXT

This led illuminates when the channel is muted via an external source, for example a noise gate control system using the channel VCA. The remote control input accepts a DC voltage in the range 0 -10V. This facility is not available on current consoles, unless to special order, although the led indicator has not been removed.

The wiring diagram overleaf should be followed to minimise noise on the control lines when using external inputs.

MUTE SAFE (Not active on VCA consoles)

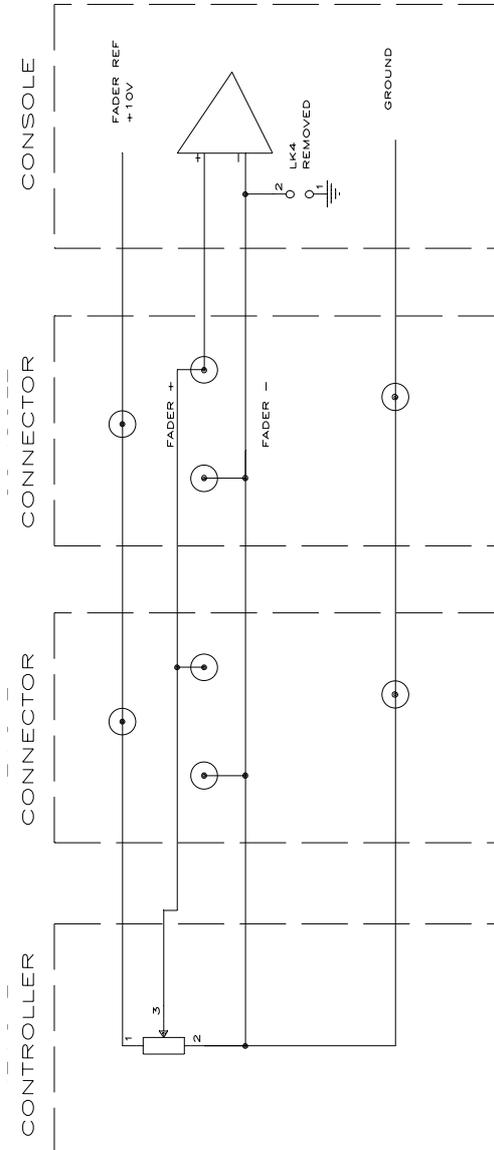
This may not be fitted to future production.

VCA/MUTE GROUP 1 ASSIGN

Assigns the channel mute to VCA/Mute Group 1, with led indication. The channel level is now dependant on both the position of the local fader and the position of the VCA master fader. Similarly for assigns 2, 3, 4, 5, 6, 7 and 8.

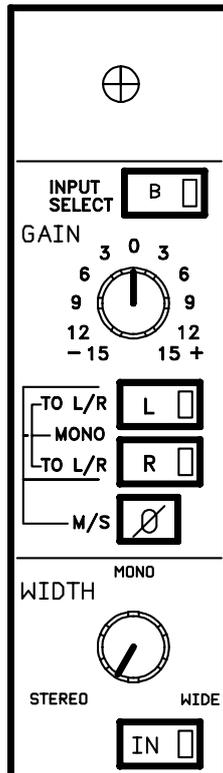
Internal links allow the MUTE GROUPS to become SCENE PRESETS, that is when a MASTER is pressed, all assigned channels are switched ON, not muted.

EXTERNAL VCA FADER CONTROL WIRING



ONE SECTION ONLY SHOWN

STEREO EFFECT RETURN MODULE



As an option, in place of a standard input, a stereo effect return input may be fitted. The effect return section may be controlled by the VCA master, if VCA/Mute subgrouping is fitted to the console.

GAIN

Adjusts the gain of the effect return input section. The gain is adjustable from -15dB to +15dB.

L CUT

Cuts the signal feed to the left channel, with led indication.

R CUT

Cuts the signal feed to the right channel, with led indication.

PHASE REVERSE

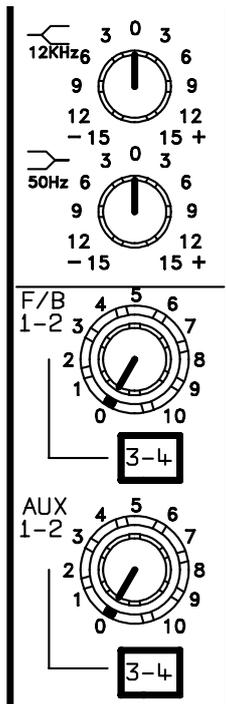
Inverts the phase of the signal on the right channel input.

WIDTH

Varies the width of the stereo image from mono through normal stereo to a wide signal where the left and right signals appear to come from outside their normal image positions.

M/S DECODING

If the width is set fully anticlockwise to MONO and the PHASE REVERSE switch is pressed the module will decode line level M/S (Sum and Difference) signals. This may be the output of a pre-amp, or recorded material.



HF EQ

A shelving equaliser with an adjustable gain of +/-15dB at a frequency of 12kHz.

LF EQ

A shelving equaliser with an adjustable gain of +/-15dB at a frequency of 50Hz.

F/B and AUXILIARY SENDS

F/B 1/2

This dual concentric pair of level controls adjusts the amount of signal fed to foldback buses 1 and 2 (or 3 and 4 if the switch 3-4 is pressed). The upper control adjusts the level for bus 1 (3), the lower for bus 2 (4). Internal links allow these feeds to be selected from a mono sum of the stereo signal, or left to 1, right to 2 (all selectable pre or post fader by links).

3-4

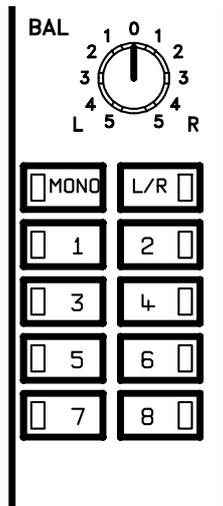
The switch assigns the level controls to feed foldback buses 3/4 instead of 1/2.

AUX 1/2

This dual concentric pair of level controls adjusts the amount of signal fed to auxiliary buses 1 and 2 (or 3 and 4 if the switch 3-4 is pressed). The upper control adjusts the level for bus 1 (3), the lower for bus 2 (4). Internal links allow these feeds to be selected from a mono sum of the stereo signal, or left to 1, right to 2 (all selectable pre or post fader by links).

3-4

The switch assigns the level controls to feed auxiliary buses 3/4 instead of 1/2.



BAL

Balances the stereo signal within the stereo bus, or within pairs of groups if the MONO/STEREO button is set to STEREO.

MONO/STEREO

If set to MONO, a mono sum of the stereo signal is fed to any selected group. If set to stereo, a stereo signal is sent to pairs of groups via the BAL control, left to odd, right to even.

MONO

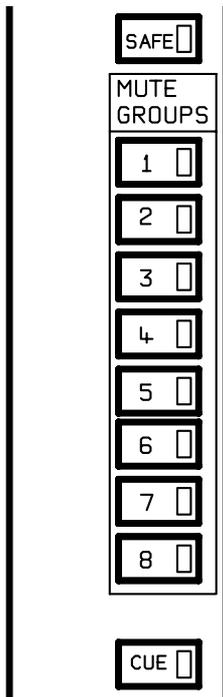
Assigns a MONO sum of the stereo signal to the main MONO (Centre) bus.

L/R

Assigns the stereo signal to the main STEREO L/R bus.

1

Assigns signal to group 1, either as a mono sum, or the left channel, depending on the setting of the mono stereo switch. Similarly for groups 2-8.



SAFE (Not active on VCA modules)

Deselects the return from the MUTE Group system, without affecting the mute group assignments. Useful to locally protect signals, or manually override grouped MUTE ON conditions.

VCA/MUTE GROUP 1

Assigns the channel to VCA/MUTE Group 1. Similarly for VCA/MUTE Groups 2 through 8. If the VCA option is fitted then the post fader level will depend upon the local fader and the VCA group master fader.

CUE

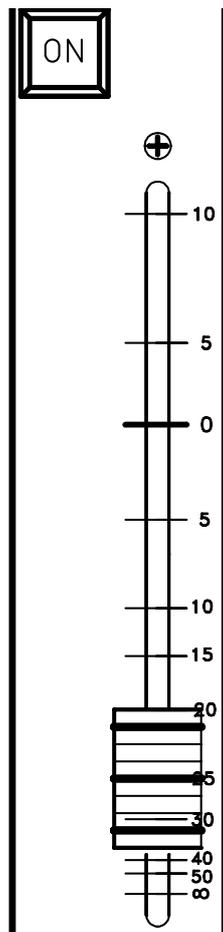
Assigns the stereo signal to the CUE system, with flashing led indication when enabled.

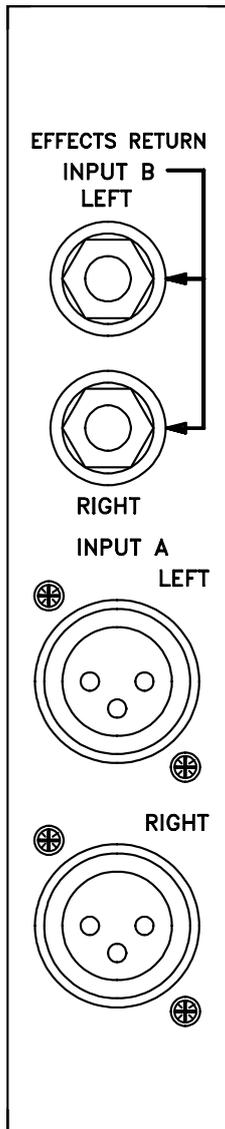
ON

Enables the Effect Return signal path.

FADER

Controls the post fader signal level.





CONNECTORS AND PIN ASSIGNMENTS

LINE A : 3 Pin XLR type, Balanced

Nominal Input Level: +4dBu

Pin 2 : Signal +ve (Hot)

Pin 3 : Signal -ve (Cold)

Pin 1 : Ground

Input Impedance : >10 kOhm

LINE B : 1/4" TRS Jack Socket, 'A' Gauge, Balanced

Nominal Input Level: +4dBu

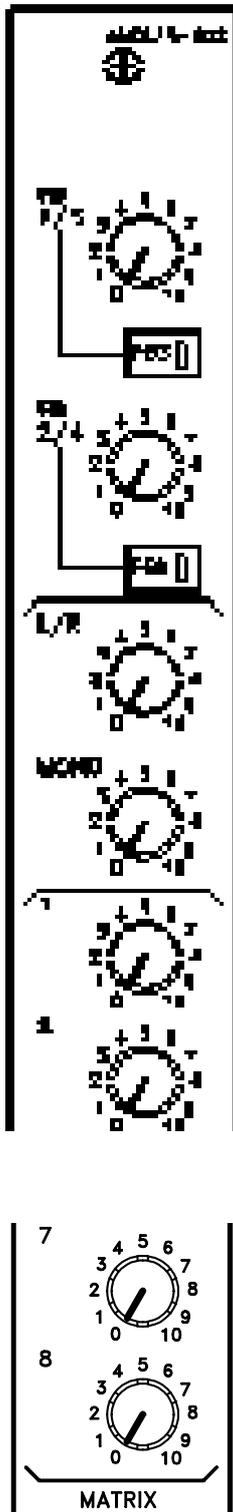
Tip : Signal +ve (Hot)

Ring : Signal -ve (Cold)

Sleeve: Ground

Input Impedance : >10 kOhm

MONO SUBGROUP OUTPUT MODULE



Either 8 or 16 mono subgroup modules may be fitted in Q2. If 16 are fitted, routing is paired, with active pan across the group buses at all times. For 8 modules, routing is individually selected, with pan only switched in across odd and even groups as required.

The module comprises the group control and output (lower part of module) and a matrix mixer section (upper part of module). Each module has controls for inputs to the Matrix mixer, ie they are not feeds from that group to the matrix buses, but feeds from the groups etc to the matrix.

F/B 1/3

Adjusts the level of the Foldback 1 master output (or 3) fed to the Matrix bus on the module. This may be used to feed a global mix set-up on the F/B 1 bus to any of the 8 matrix outputs.

F/B 3 (switch)

Selects the Foldback output 3 to the matrix instead of F/B 1.

F/B 2/4

Adjusts the level of the Foldback 2 master output (or 4) fed to the Matrix bus on the module.

F/B 4 (switch)

Selects the Foldback output 4 to the matrix instead of F/B 2.

L/R

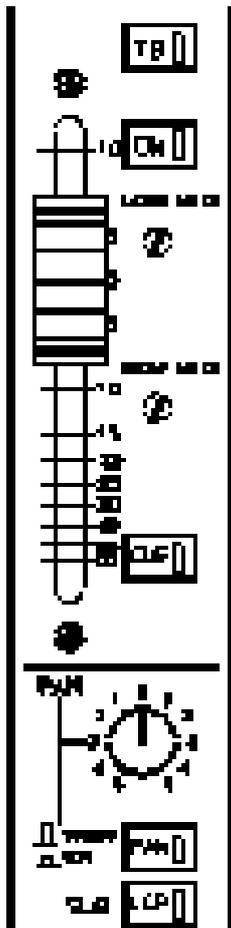
Adjusts the level of the summed (mono) signal from the main stereo left and right outputs fed to the Matrix on the module.

MONO

Adjusts the level of the main Mono (centre) signal from the main mono output fed to the Matrix on the module.

1

Adjusts the level of the post-fader Group 1 signal input to the Matrix. Similarly for Controls 2-8 for Group signals 2 to 8.



T/B

Enables talkback signals to be routed to the Matrix output when the communication system is used, with led indication. This can be used to prevent talkback signals going to unwanted destinations.

ON

Enables the Matrix output, with led indication.

MATRIX METER

Sub-panel preset used to calibrate the Matrix level meter.

GROUP METER

Sub-panel preset used to calibrate the Group level meter.

CUE/SOLO

Solo's the Matrix signal to the main monitors (headphones or loudspeakers), with flashing led indication. See the Input Module for a functional description of the solo button.

FADER

The 60mm fader controls the level of the Matrix output signal.

PAN

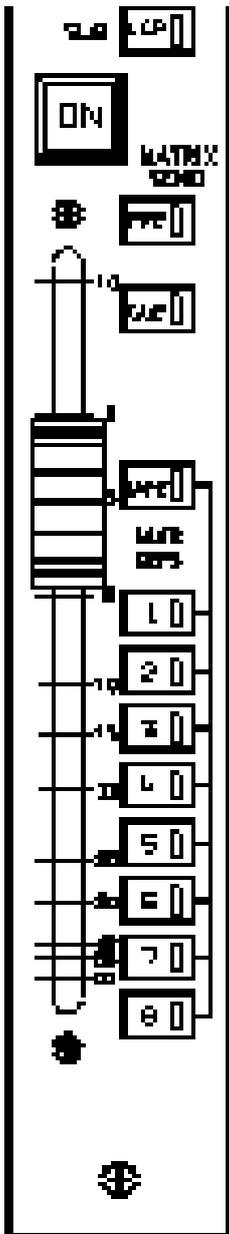
Pans the Group signal across the main Stereo bus, or if in LCR mode across the Left, Right and Centre (mono) buses. In the centre, in L/R mode, the signals are 4.5dB below the signals when hard-panned left or right.

PAN (mode)

In the 'up' position the pan mode is conventional Stereo (L/R) panning. In the 'down' position, the group is panned across the three main outputs in Left-Centre-Right mode.

When the pan is fully anti-clockwise, signal is sent only to the left bus, with no signal to centre or right buses. In the centre, signal is sent only to the centre (mono) bus, with no signal to left or right buses.

When fully clockwise, signal is only sent to the right bus, with no signal sent to left or centre buses.



SUB/LCR

Routes the group signal to the main Stereo (Left/Right) and main Mono (centre) buses, with led indication.

ON

The ON switch enables the group output, and is indicated by an led in the switch when the output is active. Internal links allow the ON switch to be configured as a group CUT.

MATRIX SEND PRE

Allows the Group input to the Matrix to be fed pre-fader, rather than post-fader.

CUE/SOLO

Solo's the Group signal to the main monitors (headphones or loudspeakers), with flashing led indication. See the Input Module for a functional description of the solo button.

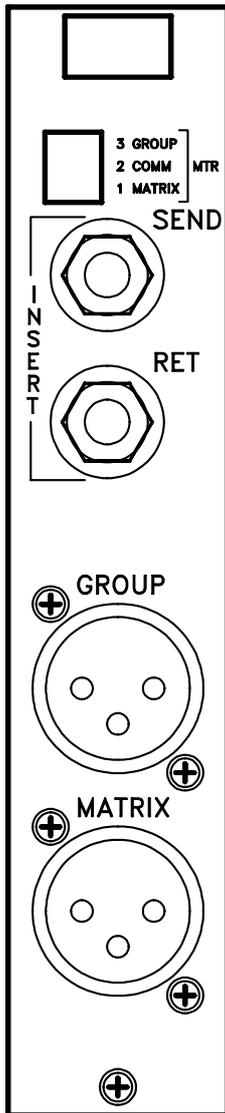
MUTE SAFE (Not active in VCA consoles)

Prevents the Mute Group (or scene preset) master from muting the channel, and may be used to locally override muted channels.

VCA/MUTE GROUP 1 ASSIGN

Assigns the channel mute to VCA/Mute Group 1, with led indication. Similarly for assigns 2, 3, 4, 5, 6, 7 and 8. If the VCA option is fitted then the channel level will depend upon the position of the channel fader and the VCA group master.

Internal links allow the MUTE GROUPS to become SCENE PRESETS, that is when a MASTER is pressed, all assigned channels are switched ON, not muted.



CONNECTORS AND PIN ASSIGNMENTS

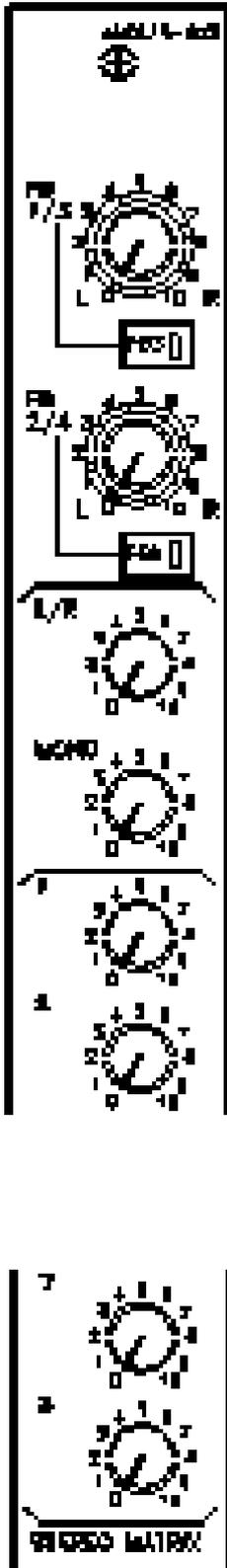
Group Output : 3 Pin XLR type, Balanced
 Nominal Output Level: +4dBu
 Pin 2 : Signal +ve (Hot)
 Pin 3 : Signal -ve (Cold)
 Pin 1 : Ground
 Output Impedance : <75 Ohm

Matrix Output : 3 Pin XLR type, Balanced
 Nominal Output Level: +4dBu
 Pin 2 : Signal +ve (Hot)
 Pin 3 : Signal -ve (Cold)
 Pin 1 : Ground
 Output Impedance : <75 Ohm

Insert Send : 1/4" TRS Jack socket, 'A' Gauge, Balanced
 Nominal Output level: +4dBu
 Tip : Signal +ve (Hot)
 Ring : Signal -ve (Cold)
 Sleeve: Ground
 Output Impedance: <75 Ohm

Insert Return : 1/4" TRS Jack Socket, 'A' Gauge, Balanced
 Nominal Input Level: +4dBu
 Tip : Signal +ve (Hot)
 Ring : Signal -ve (Cold)
 Sleeve: Ground
 Input Impedance : >10 kOhm

STEREO SUBGROUP OUTPUT MODULE



Eight stereo subgroup modules may be fitted in Q2, and routing is individually selected.

The module comprises the Stereo Group control and output (lower part of module) and a Stereo Matrix mixer section (upper part of module). Each module has controls for inputs to the Stereo Matrix mixer ie they are not feeds from that Group to the Matrix buses, but feeds from the Groups etc to the Matrix.

F/B 1/3

Adjusts the level of the Foldback 1 master output (or 3) fed to the Stereo Matrix bus on the module. This may be used to feed a global mix set-up on the F/B 1 bus to any of the 8 Stereo Matrix outputs. The control is a dual-concentric pair with Level and Pan adjust across the Stereo Matrix.

F/B 3 (switch)

Selects the Foldback output 3 to the matrix instead of F/B 1.

F/B 2/4

Adjusts the level of the Foldback 2 master output (or 4) fed to the Matrix bus on the module. The control is a dual-concentric pair with Level and Pan adjust across the Stereo Matrix.

F/B 4 (switch)

Selects the Foldback output 4 to the matrix instead of F/B 2.

L/R

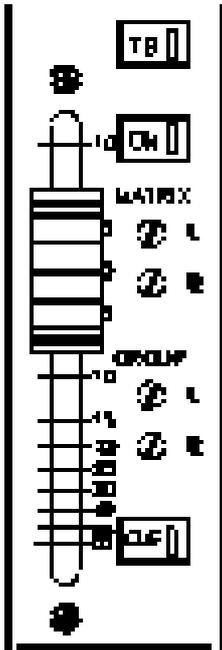
Adjusts the level of the main Stereo Left and Right outputs fed to the Stereo Matrix on the module.

MONO

Adjusts the level of the main Mono (centre) signal from the main Mono output fed to both sides of the Stereo Matrix on the module.

1

Adjusts the level of the post-fader Stereo Group 1 signal input to the Stereo Matrix. Similarly for Controls 2-8 for Group signals 2 to 8.



T/B

Enables talkback signals to be routed to the Matrix output when the communication system is used, with led indication. This can be used to prevent talkback signals going to unwanted destinations.

ON

Enables the Matrix output, with led indication.

MATRIX METER (L and R)

Sub-panel preset used to calibrate the Stereo Matrix level meters.

GROUP METER (L and R)

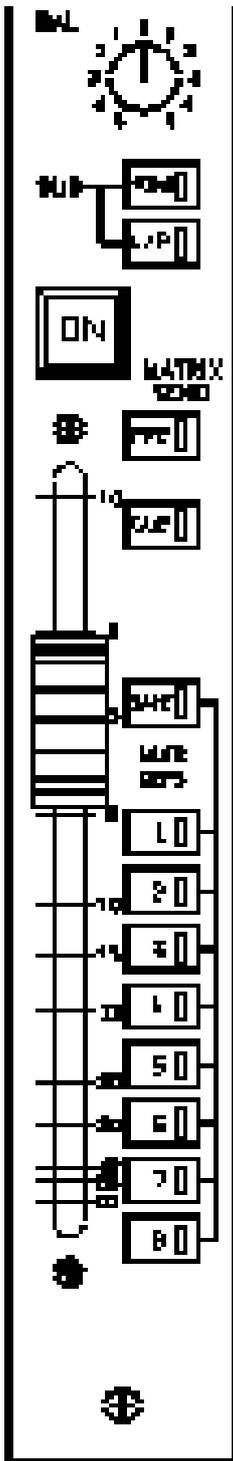
Sub-panel preset used to calibrate the Stereo Group level meters.

CUE/SOLO

Solo's the Stereo Matrix signal to the main monitors (headphones or loudspeakers), with flashing led indication. See the Input Module for a functional description of the solo button.

FADER

The 60mm fader controls the level of the Stereo Matrix output signals.



BAL

Adjusts the Stereo Group signal within the main Stereo Left and Right buses. The range of adjustment is +/-3dB.

SUB/LCR

Routes the Stereo Group signal to the main Stereo (Left/Right) bus, and/or the main Mono (centre) buses, with led indication.

ON

The ON switch enables the group output, and is indicated by an led in the switch when the output is active. Internal links allow the ON switch to be configured as a group CUT.

MATRIX SEND PRE

Allows the Stereo Group input to the Stereo Matrix to be fed pre-fader, rather than post-fader.

CUE/SOLO

Solo's the Group signal to the main monitors (headphones or loudspeakers), with flashing led indication. See the Input Module for a functional description of the solo button.

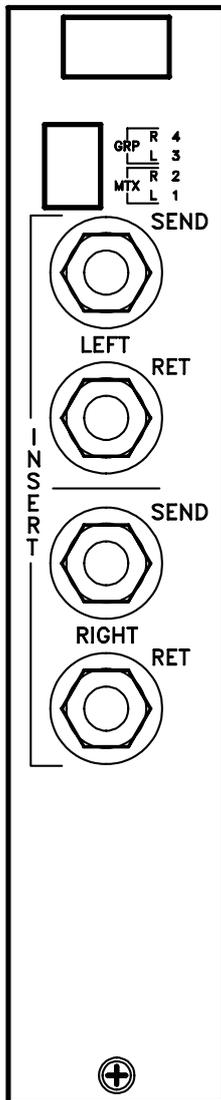
MUTE SAFE (Not active on VCA consoles)

Prevents the Mute Group (or scene preset) master from muting the channel, and may be used to locally override muted channels.

VCA/MUTE GROUP 1 ASSIGN

Assigns the channel mute to VCA/Mute Group 1, with led indication. Similarly for assigns 2, 3, 4, 5, 6, 7 and 8. If the VCA option is fitted then the channel level will depend upon the position of the channel fader and the VCA group master.

Internal links allow the MUTE GROUPS to become SCENE PRESETS, that is when a MASTER is pressed, all assigned channels are switched ON, not muted.



CONNECTORS AND PIN ASSIGNMENTS

Group Output : 3 Pin XLR type, Balanced

Nominal Output Level: +4dBu

Pin 2 : Signal +ve (Hot)

Pin 3 : Signal -ve (Cold)

Pin 1 : Ground

Output Impedance : <75 Ohm

Matrix Output : 3 Pin XLR type, Balanced

Nominal Output Level: +4dBu

Pin 2 : Signal +ve (Hot)

Pin 3 : Signal -ve (Cold)

Pin 1 : Ground

Output Impedance : <75 Ohm

Insert Send : 1/4" TRS Jack socket, 'A' Gauge, Balanced

Nominal Output level: +4dBu

Tip : Signal +ve (Hot)

Ring : Signal -ve (Cold)

Sleeve : Ground

Output Impedance: <75 Ohm

Insert Return : 1/4" TRS Jack Socket, 'A' Gauge, Balanced

Nominal Input Level: +4dBu

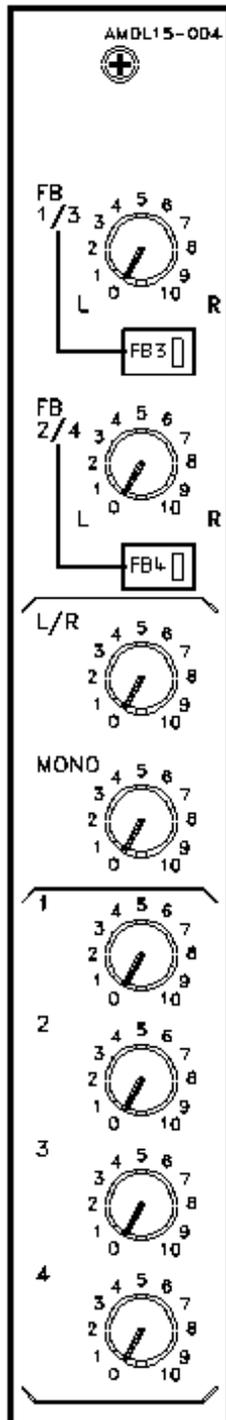
Tip : Signal +ve (Hot)

Ring : Signal -ve (Cold)

Sleeve: Ground

Input Impedance : >10 kOhm

LCR SUBGROUP OUTPUT MODULE



The LCR Subgroup Output module has three outputs (for the left, centre and right outputs from each group). It may be used with either the normal input module or the dedicated LCR input module.

The module comprises the LCR Group control and output (lower part of module) and a mono Matrix mixer section (upper part of module). Each module has controls for inputs to the Matrix mixer ie they are not feeds from that group to the matrix buses, but feeds from the groups etc to the matrix.

F/B 1/3

Adjusts the level of the Foldback 1 master output (or 3) fed to the Matrix bus on the module. This may be used to feed a global mix set-up on the F/B 1 bus to any of the 8 matrix outputs.

F/B 3 (switch)

Selects the Foldback output 3 to the matrix instead of F/B 1.

F/B 2/4

Adjusts the level of the Foldback 2 master output (or 4) fed to the Matrix bus on the module.

F/B 4 (switch)

Selects the Foldback output 4 to the matrix instead of F/B 2.

L/R

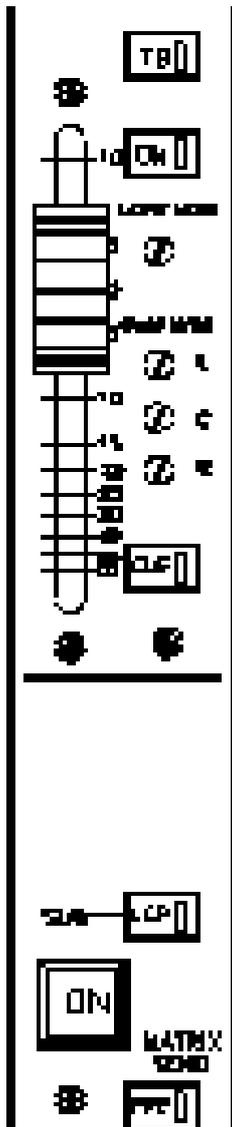
Adjusts the level of the summed (mono) signal from the main stereo left and right outputs fed to the Matrix on the module.

MONO

Adjusts the level of the main Mono (centre) signal from the main mono output fed to the Matrix on the module.

1

Adjusts the level a summed mono signal of the post-fader LCR Group A (1) signal input to the Matrix. Similarly for Controls 2-4 for LCR Group signals B, C and D (2 to 4).



T/B

Enables talkback signals to be routed to the Matrix output when the communication system is used, with led indication. This can be used to prevent talkback signals going to unwanted destinations.

ON

Enables the Matrix output, with led indication.

MATRIX METER

Sub-panel preset used to calibrate the Matrix level meter.

GROUP METERS (L, C, R)

Sub-panel presets used to calibrate the LCR Group level meters.

CUE/SOLO

Solo's the Matrix signal to the main monitors (headphones or loudspeakers), with flashing led indication. See the Input Module for a functional description of the solo button.

FADER

The 60mm fader controls the level of the Matrix output signal.

SUB/LCR

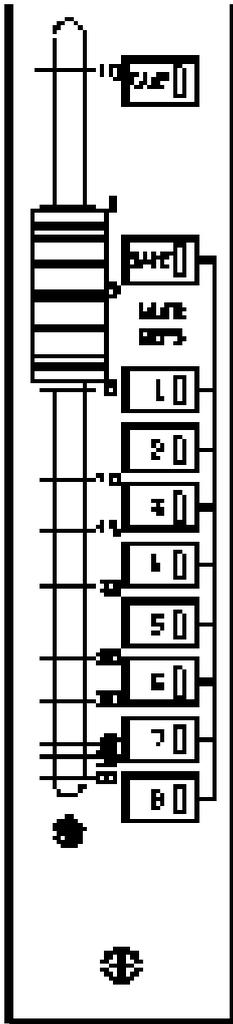
Routes the group signal to the main LCR Stereo (Left/Right) and Centre (mono) buses, with led indication.

ON

The ON switch enables the group output, and is indicated by an led in the switch when the output is active. Internal links allow the ON switch to be configured as a group CUT.

MATRIX SEND PRE

Allows the Group input to the Matrix to be fed pre-fader, rather than post-fader.



CUE/SOLO

Solo's the Group signal to the main monitors (headphones or loudspeakers), with flashing led indication. See the Input Module for a functional description of the solo button.

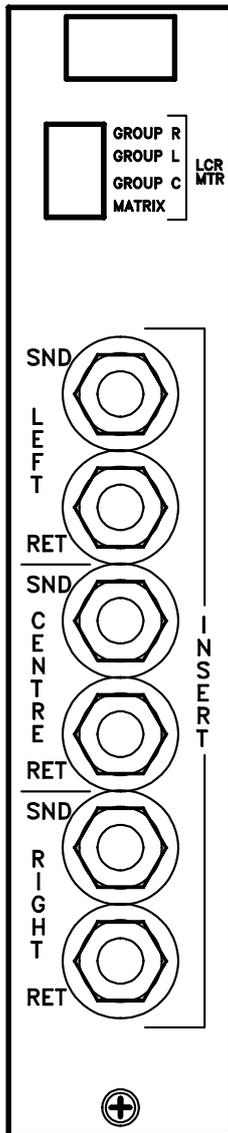
MUTE SAFE (Not active in VCA consoles)

Prevents the Mute Group (or scene preset) master from muting the channel, and may be used to locally override muted channels.

VCA/MUTE GROUP 1 ASSIGN

Assigns the channel mute to VCA/Mute Group 1, with led indication. Similarly for assigns 2, 3, 4, 5, 6, 7 and 8. If the VCA option is fitted then the channel level will depend upon the position of the channel fader and the VCA group master.

Internal links allow the MUTE GROUPS to become SCENE PRESETS, that is when a MASTER is pressed, all assigned channels are switched ON, not muted.



CONNECTORS AND PIN ASSIGNMENTS

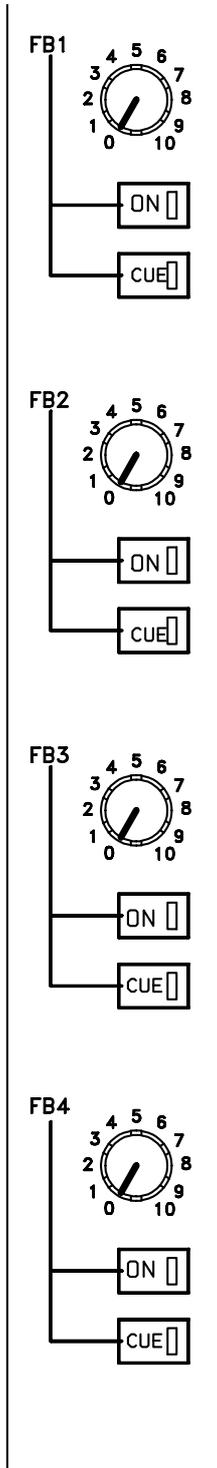
Group Output : 3 Pin XLR type, Balanced
 Nominal Output Level: +4dBu
 Pin 2 : Signal +ve (Hot)
 Pin 3 : Signal -ve (Cold)
 Pin 1 : Ground
 Output Impedance : <75 Ohm

Matrix Output : 3 Pin XLR type, Balanced
 Nominal Output Level: +4dBu
 Pin 2 : Signal +ve (Hot)
 Pin 3 : Signal -ve (Cold)
 Pin 1 : Ground
 Output Impedance : <75 Ohm

Insert Send : 1/4" TRS Jack socket, 'A' Gauge, Balanced
 Nominal Output level: +4dBu
 Tip : Signal +ve (Hot)
 Ring : Signal -ve (Cold)
 Sleeve: Ground
 Output Impedance: <75 Ohm

Insert Return : 1/4" TRS Jack Socket, 'A' Gauge, Balanced
 Nominal Input Level: +4dBu
 Tip : Signal +ve (Hot)
 Ring : Signal -ve (Cold)
 Sleeve: Ground
 Input Impedance : >10 kOhm

FOLDBACK MASTER MODULE



F/B 1 LEVEL

Adjusts the level of the Foldback 1 Master output signal.

ON

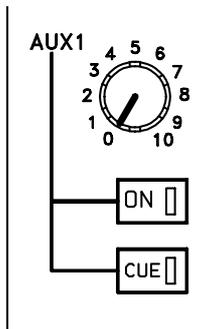
Enables the Foldback 1 Master output signal, with led indication.

CUE/SOLO

Solo's the Foldback signal to the main monitors (headphones or loudspeakers), with flashing led indication. See the Input Module for a functional description of the solo button.

Foldbacks 2-4 are identical to Foldback 1 above.

AUXILIARY MASTER MODULE



AUX 1 LEVEL

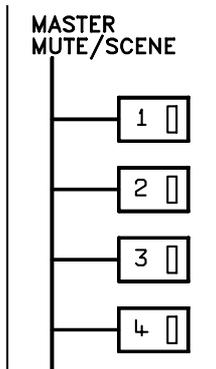
Adjusts the level of the Auxiliary 1 Master output signal.

ON

Enables the Auxiliary 1 Master output signal, with led indication.

CUE/SOLO

Solo's the Auxiliary signal to the main monitors (headphones or loudspeakers), with flashing led indication. See the Input Module for a functional description of the solo button.



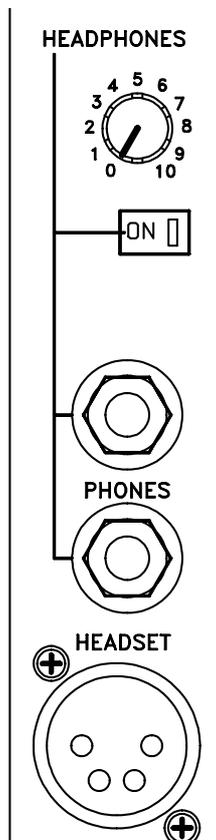
Auxiliaries 2-4 are identical to Auxiliary 1 above.

MUTE GROUP MASTER 1

When pressed, mutes all channels and outputs assigned to MUTE GROUP 1. MASTER MUTES 2-8 operate in a similar fashion for MUTE GROUPS 2-8.

HEADPHONES/HEADSET OUTPUTS

Two pairs of headphones (impedance 200-600 Ohms) may be plugged in to the module. A Clearcom-type headset may also be connected, complete with boom microphone, on a 4-pin XLR connector.



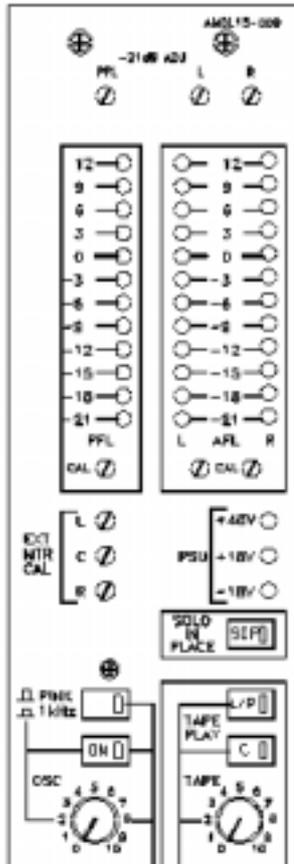
HEADPHONES LEVEL

Adjusts the level of the monitor signal in the headphone or headset, independently of the main monitor level control.

ON

Switches on the headphone/headset outputs.

STEREO MASTER MODULE



SOLO METER

Indicates the level of the Solo signal in stereo.

PFL METER

Indicates the level of the PFL signal.

METER CALIBRATIONS

Sub-panel presets to calibrate all module and meterbridge master meters.

PSU INDICATOR LEDs

Three led's which indicate all DC voltages are present.

CUE MODE SIP

Selects the CUE mode to be SIP (Solo-in-Place). This mode does not mute inputs when a channel or output is solo'ed. The main output signal is replaced by the solo'ed signal, until the cue/solo is cleared when the original signal is returned to the main outputs.

EXTERNAL TAPE INPUT

An external input is provided, for use as interval playback, or effects input.

L/R

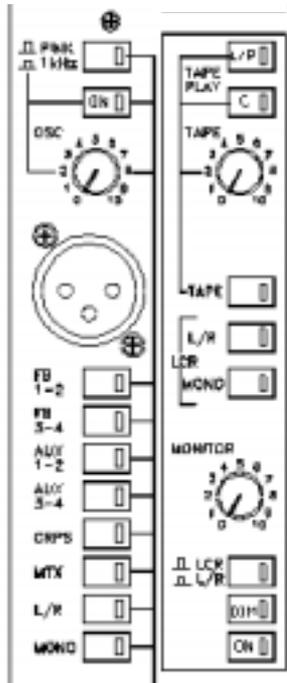
Assigns the Tape input to the main Stereo Left and Right Outputs.

MONO

Assigns the Tape input to the main Mono (Centre) Output.

TAPE PLAY LEVEL

Adjusts the level of the Tape Input.



INTERNAL SINEWAVE/NOISE GENERATOR

Q2 features an integral generator capable of producing a 1kHz sinewave or pink noise for system testing and alignment.

PINK/1kHz

Selects the type of output from the generator. In the 'up' position, the generator produces PINK noise, in the 'down' position a 1kHz sinewave tone.

ON

Enables the generator, with led indication

OSC

Adjusts the level of the generator output.

GENERATOR/TALKBACK ASSIGN MATRIX

Both the internal generator and talkback system share a matrix of assign switches to all outputs.

F/B 1-2, 3-4

Assigns the generator and/or talkback to Foldback buses 1 and 2 and 3 and 4 respectively.

AUX 1-2, 3-4

Assigns the generator and/or talkback to Auxiliary buses 1 and 2 and 3 and 4 respectively.

GROUPS

Assigns the generator and/or talkback to all the Group buses.

MTX

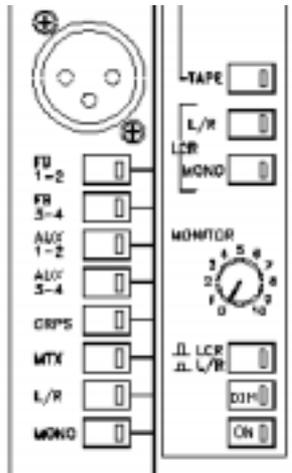
Assigns the generator and/or talkback to all the Matrix buses which have their T/B assign buttons pressed.

L/R

Assigns the generator and/or talkback to the main Left and Right outputs.

MONO

Assigns the generator and/or talkback to the main Mono (centre) output.



MONITOR SECTION

Any of three sources may be fed to the monitoring section, in addition to the CUE/SOLO signal. If no source is selected, nothing is heard on monitors until a CUE/SOLO is pressed.

TAPE

Selects the Tape input as the monitor source.

L/R

Selects the main Stereo Left/Right output as the monitor source.

MONO

Selects the main Mono output as the monitor source.

If both L/R and MONO are pressed, monitoring is in true LCR mode, ie three channel outputs for simulation of the main speaker system. This facility is very useful when the console is located in a screened booth in a Theatre.

MONITOR LEVEL

Adjusts the level of the monitor outputs.

MONO

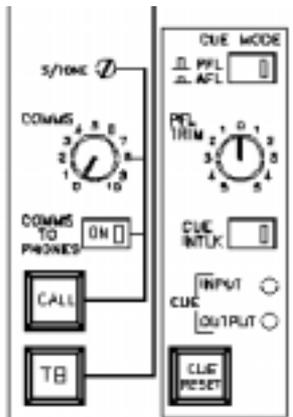
Assigns the monitor outputs to the mono (centre) monitor output.

DIM

Reduces the level of the monitoring system by 20dB.

ON

Enables the monitoring system.



CUE/SOLO MASTER SECTION

PFL/AFL

Selects the Cue/Solo mode to be PFL, or AFL when the switch is depressed.

TRIM

Adjusts the level of the Cue/Solo signal, most useful in the PFL mode.

CUE INTLK

Interlock mode selection. In normal mode, Cues are additive. That is any number of Cue buttons may be pressed and the signals will be added. In INTERLOCK mode, only one Cue may be active at any time, so pressing a Cue will automatically cancel the previously selected Cue.

CUE I/P

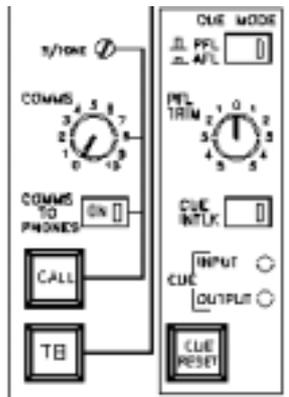
Indicates that an input CUE is pressed. Inputs take priority over outputs in normal mode, so pressing an input CUE will suspend an output CUE until the input is released.

CUE O/P

Indicates that an output CUE is pressed. This led will extinguish if an input CUE is pressed while an output CUE is already active.

CUE RESET

Clears all pressed CUE buttons.



TALKBACK SYSTEM

In addition to the normal talkback microphone input, Q2 includes a Clearcom-type communications interface.

S/TONE

Sub-panel preset for adjusting the sidetone of the Clearcom compatible interface. Sidetone is the level of your own voice that you will hear in the headphones when speaking into the communications microphone. Some sidetone is usually preferred as it gives confidence that the system is working.

T/B LEVEL

Adjusts the level of the talkback microphone system.

COMMS ON

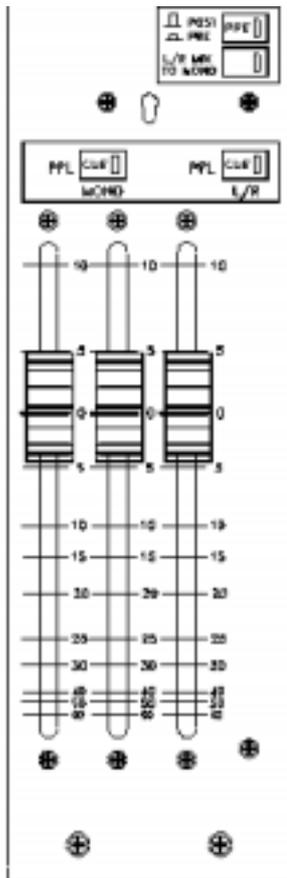
Enables the communication system.

CALL

The led in the switch illuminates when the console is being called. Alternatively, pressing CALL sends out a call signal to the Master.

TB

Pressing TB (Talkback) routes the talkback signal to all assigned outputs.



MASTER OUTPUT CONTROL

PRE

Allows the signal feed from the main Left/Right outputs to the Mono (Centre) output to be pre-fader rather than post-fader.

L/R TO MONO

Assigns the post-fader Left/Right Output to the main Mono (Centre) output.

L/R CUE/SOLO

Solo's the main Left/Right output to the main monitors (headphones or loudspeakers), with flashing led indication.

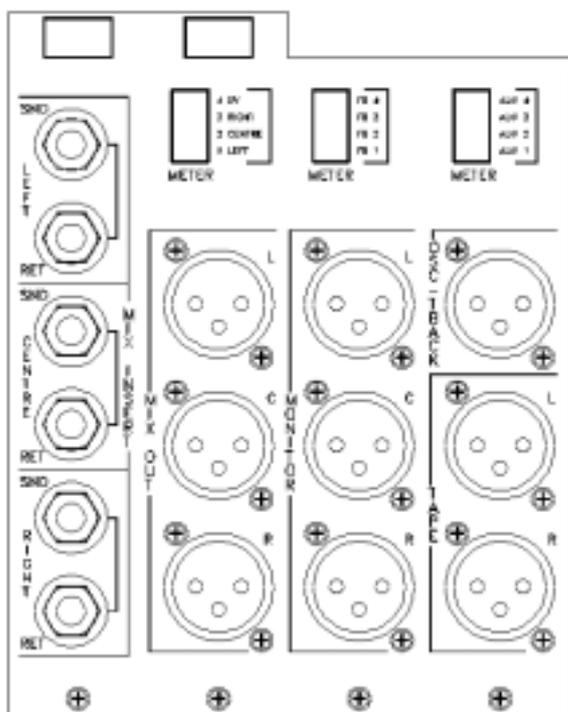
MONO CUE/SOLO

Solo's the main Mono (Centre) output to the main monitors (headphones or loudspeakers), with flashing led indication.

FADERS

Three faders control the output level of the main Left, Right and Centre (mono) signals. The user may determine the configuration of the faders to be L, C, R or L, R, C.

MASTER CONNECTOR PANEL



CONNECTORS AND PIN ASSIGNMENTS

Main Left, Right and Mono Outputs,
Monitor Outputs, Auxiliary Outputs,
and generator output :

3 Pin XLR type, Balanced
Nominal Output Level: +4dBu
Pin 2 : Signal +ve (Hot)
Pin 3 : Signal -ve (Cold)
Pin 1 : Ground
Output Impedance : <75 Ohm

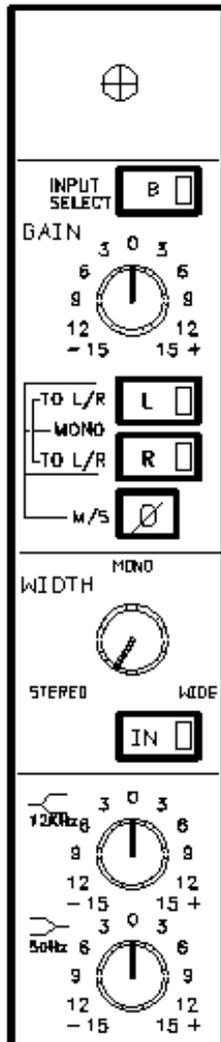
Mix Insert Send :
1/4" TRS Jack socket, 'A' Gauge, Balanced
Nominal Output level: +4dBu
Tip : Signal +ve (Hot)
Ring : Signal -ve (Cold)
Sleeve: Ground
Output Impedance: <75 Ohm

Talkback Microphone Input :
3 pin XLR type, Balanced
Nominal Input Level: -62dBu to -8dBu
Pin 2 : Signal +ve (Hot)
Pin 3 : Signal -ve (Cold)
Pin 1 : Ground
Input Impedance : >2 kOhm
+48V Phantom power optional

Mix Insert Return :
1/4" TRS Jack Socket, 'A' Gauge, Balanced
Nominal Input Level: +4dBu
Tip : Signal +ve (Hot)
Ring : Signal -ve (Cold)
Sleeve: Ground
Input Impedance : >10 kOhm

Tape Play Input :
3 Pin XLR type, Balanced
Nominal Input Level: +4dBu
Pin 2 : Signal +ve (Hot)
Pin 3 : Signal -ve (Cold)
Pin 1 : Ground
Input Impedance : >10 kOhm

VCA MASTER MODULE



The effect return VCA master is only fitted to consoles with the optional VCA Grouping inputs. The effects return section may be controlled by the VCA masters.

GAIN

Adjusts the gain of the effect return input section. The gain is adjustable from -15dB to +15dB.

L CUT

Cuts the signal feed to the left channel, with led indication.

R CUT

Cuts the signal feed to the right channel, with led indication.

PHASE REVERSE

Inverts the phase of the signal on the right channel input.

WIDTH

Varies the width of the stereo image from mono through normal stereo to a wide signal where the left and right signals appear to come from outside their normal image positions.

M/S DECODING

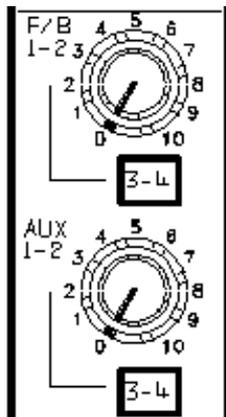
If the width is set fully anticlockwise to MONO and the PHASE REVERSE switch is pressed the module will decode line level M/S (Sum and Difference) signals. This may be the output of a pre-amp, or recorded material.

HF EQ

A shelving equaliser with an adjustable gain of +/-15dB at a frequency of 12kHz.

LF EQ

A shelving equaliser with an adjustable gain of +/-15dB at a frequency of 50Hz.



F/B and AUXILIARY SENDS

F/B 1/2

This dual concentric pair of level controls adjusts the amount of signal fed to foldback buses 1 and 2 (or 3 and 4 if the switch 3-4 is pressed). The upper control adjusts the level for bus 1 (3), the lower for bus 2 (4). Internal links allow these feeds to be selected from a mono sum of the stereo signal, or left to 1, right to 2 (all selectable pre or post fader by links).

3-4

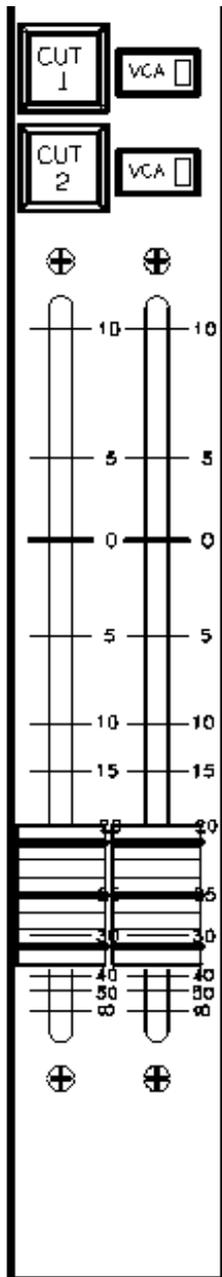
The switch assigns the level controls to feed foldback buses 3/4 instead of 1/2.

AUX 1/2

This dual concentric pair of level controls adjusts the amount of signal fed to auxiliary buses 1 and 2 (or 3 and 4 if the switch 3-4 is pressed). The upper control adjusts the level for bus 1 (3), the lower for bus 2 (4). Internal links allow these feeds to be selected from a mono sum of the stereo signal, or left to 1, right to 2 (all selectable pre or post fader by links).

3-4

The switch assigns the level controls to feed auxiliary buses 3/4 instead of 1/2.



VCA MASTER SECTION

CUT 1

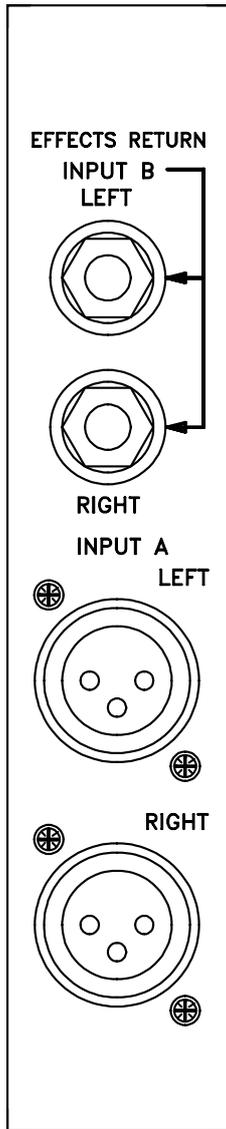
Mutes all channels assigned to VCA/MUTE Group 1. Similarly for CUT 2 through 8.

VCA 1

Switches in the VCA master fader to control VCA/Mute Group 1. If the VCA is not switched in, the VCA control reverts to a fixed unity gain setting. This is useful for quickly resetting all inputs to their nominal gains (as set on their individual faders).

VCA MASTER FADER (100mm)

Controls the overall level of all the channels assigned to that group.



CONNECTORS AND PIN ASSIGNMENTS

LINE A : 3 Pin XLR type, Balanced

Nominal Input Level: +4dBu

Pin 2 : Signal +ve (Hot)

Pin 3 : Signal -ve (Cold)

Pin 1 : Ground

Input Impedance : >10 kOhm

LINE B : 1/4" TRS Jack Socket, 'A' Gauge, Balanced

Nominal Input Level: +4dBu

Tip : Signal +ve (Hot)

Ring : Signal -ve (Cold)

Sleeve: Ground

Input Impedance : >10 kOhm

Q2 TECHNICAL DESCRIPTION

THE AUDIO MASTER MODULE

This consists of two main boards and one sub board. The sub board carries the balanced tape inputs, balanced mix outputs, balanced Left, Centre and Right monitor outputs and the Left AFL Meter. The tape signals are fed down to the audio master board while the mix and monitor outputs are fed in to the sub board from the master board.

The main audio board carries the Right AFL meter and the main circuitry for the Left, Centre and Right outputs of the console in addition to the monitoring functions.

Typically the signal path from the left mix bus to the mix output is as follows. The signal from the LEFT bus is mixed in a virtual earth amplifier and immediately after this the LMIXPRE signal is taken to other parts of the circuit. The signal then passes through an SSM2404 switch which operates as a changeover to allow SIP signals onto the signal path in place of the mix signal. Following this an SSM2142 is used to send a balanced insert send signal to the send jack which is normalled to the return jack. From here the signal passes through an SSM2143 balanced to unbalanced stage to the main fader (one each for Left Centre and Right). A fader buffer stage follows after which the signal is fed up to the sub board to the main mix outputs of the console. The signal is known as LMIX at this point. A further buffer stage follows and the signal is then known as LEFTMIX which goes to the matrix link connector. The MIXL signal, in addition to going to the sub board connects to the PRE switch which allows either a mix pre or post fade signal to be selected as the source for the centre mix when mix left and right are assigned to it. The combined signal is fed onto the CMIX bus.

The Left Right and Centre PRE signal derived immediately after the mix amplifiers is used for SOLO and PFL and is fed via SSM2404s onto the solo buses. A switch selects PFL or AFL operation while a further switch located towards the top of the module is used to select SIP operation. The output of the PFL/AFL switch feeds the AFL meters which are mounted on the module before entering the monitoring system via an SSM2404. A SOLO TRIM pot can be used to alter the PFL solo level although it will not of course change the level shown on the meter. The external feeds to the meterbridge are permanently tied to the mix outputs of the console.

A rotary pot is used to control the monitor outputs although not directly. A control voltage is derived from the pot which is fed to three VCAs on the sub board which control the monitor levels for Left, Centre and Right. The monitor has associated MONO, DIM and ON buttons and can be selected to carry CUE, TAPE, L/R and Centre signals. If both the L/R and CENTRE buttons are depressed then L C R monitoring will result. If no buttons are depressed then CUE will be selected. Headphone monitoring is also available and the left and right headphone feeds have the centre channel mixed in with them. The headphones receive the same feed as the monitor outputs of the console.

SIP monitoring uses the main mix outputs of the console in order that an output solo does not cut the inputs assigned to that group and the SIP signals enter the signal chain immediately before the insert send points for the Left, Centre and Right mixes.

A RESET button disables any active cues on the console without having to locate the soloed channel. The solo function is also available for the L/R and Mono outputs of the console. A further section of logic is associated with the solo function and the operation is as follows.

First of all it is necessary to understand that input priority is the normal condition in which any input solo will cancel an output solo for its duration. Multiple input and output solos can be active in this mode. Interlock mode means that only one solo in the console can be active at any time. The reset button can be used to clear the last required solo.

Consider first of all an input solo in the input priority condition. The solo makes the output of IC44 pin 1 go low causing TR1 to switch on which in turn causes TR2 to switch on giving INPUT SOLO indication. Pin 7 of IC44 will go high as it will invert the low from pin 1 causing TR4 to switch on which in turn switches TR8 on. This causes the RESET line to stay in a high condition which disables the solos on the output modules.

Further input solos can be added and the reset button can be used to cancel them. If a solo is to be cancelled from the master reset button then a positive voltage is fed to the base of TR9 to switch it on causing the reset line to go low. Some means must be used to turn off TR8 as otherwise the Vdd and Vss rails would be shorted together and TR3 is turned on to prevent this from occurring.

In the INTERLOCK position of the switch pin 1 of IC44 is also fed to IC45 which is configured as a virtual earth mixer. Pin 7 of IC45 will thus go high and be applied to the voltage comparator IC46. With only one solo active this comparator will not operate and the output will remain low. When a second solo is received then pin 1 of IC44 will rise higher in voltage causing pin 7 of IC45 to rise which in turn will cause the voltage comparator to operate giving a reset via TR9. Of course solos can still be cancelled on the modules on which they are active. The same is true for output solos which enter via IC45 and are mixed with the input solos before reaching the voltage comparator. A reset can thus be generated by requesting another solo or by operating the master reset.

The solo circuits on the input and output modules are a little complex and will be explained in the relevant sections.

The second main board is the COMMS board and as the name suggests this board handles talkback and related functions. The Q2 is fitted with a CLEARCOM communication interface which is a three wire system carrying DC signalling and two way audio. The PFL meter is located on this board along with the external meter drives and their associated trimmers.

The oscillator can generate either 1kHz or pink noise whose level can be controlled by a pot. The talkback and oscillator can be routed to foldback, auxiliaries, groups, matrix, L/R mix and Mono outputs. To talk to the matrix a further switch must be pressed on the required output module.

The talkback microphone amplifier is adjustable in level from a front panel control and can be routed to the same destinations as the oscillator in addition to the CLEARCOM interface. Incoming communication from the CLEARCOM interface can be routed to the monitor system by use of the COMMS ON key.

A SIDETONE trimmer allows the level of sidetone to be adjusted. This is the amount of your voice that you will then hear in the headphones when using the CLEARCOM system. IC6A is used to amplify incoming communications and to reject outgoing talkback which travels on the same wire as the incoming talkback. PR6 alters the rejection and hence the sidetone can be increased or decreased. When talkback is used a DIM command is sent to the main board. Talkback audio is also incoming from the headset and this is fed to the CLEARCOM interface together with any audio from the console talkback microphone.

The COMMS ON switch has several functions as follows: _

To allow incoming talkback onto the monitor system by operating an electronic switch and passing audio over to the main board.

Allowing either the talkback microphone or the output of the CLEARCOM system to go to talkback routing.

Routing the talkback microphone to the CLEARCOM system.

Putting a call out on the CLEARCOM system.

Also located on the COMMS board are the FLASH oscillator for flashing lamps and the MONO solo switch circuit.

THE AUXILIARY MASTER MODULE

This board contains the master sections for the auxiliary outputs of the console in addition to headphone amplifiers and a talkback microphone amplifier for the headset microphone.

The 4 auxiliaries are identical and therefore it is only necessary to describe one. The signal from the bus is mixed by IC1 and is then passed through the fader followed by the ON switch to an SSM2142 balanced line driver which connects to the rear panel on the console. A feed for the meters and the solo system is taken immediately after the ON switch. There are headphone amplifiers for the front panel headphone sockets and another amplifier to feed the headset. A separate talkback amplifier exists for the headset microphone and this is fed to the COMMS board.

THE FOLDBACK MASTER MODULE

This contains the four master foldback sections which are identical to the auxiliary master sections. A matrix link connector takes the foldback outputs across to the output modules for use on the matrices.

THE INPUT MODULE

THE SIGNAL PATH

The Q2 is equipped with a microphone and a line input selected by a switch and controlled by the same pot. The microphone input may have a 20dB pad switched in and a phantom supply can be fed to the microphone from each module. From here the signal enters or by-passes a phase reverse circuit which is simply a unity gain inverting stage. The signal then enters or by-passes the sweepable high pass filter. At this point the equaliser can be selected pre or post the insert point and from here the signal enters the cut SSM followed by the fader, the fader buffer stage and the pan circuit before going to the routing switches. A VCA version of the module will allow for VCA level control and VCA muting.

THE RESET CIRCUIT.

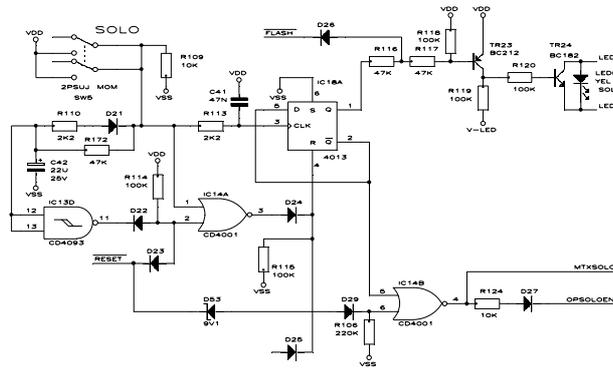
A reset for the module logic is given by the RC network formed by C41 and R142. On power up C41 will charge through R142 causing TR1 to switch on. This applies a low to the SET input of the flip flop and a high to the reset input causing Q bar to go high giving a channel ON condition. The RESET line is also fed to the SOLO enable circuit.

THE SOLO SYSTEM

The Q2 solo system is a little more comprehensive than in other consoles and there are some novel features about the way in which it operates.

The SOLO button can be pressed fleetingly and the solo will latch until the button is pressed for a second time. If the button is depressed for a longer period then the solo will not latch but will release as the solo button is released. There is also a facility for all solos to be cleared by the operation of a master button on the console.

The heart of the system is IC11 a dual D-Type flip flop. Normally the reset pin will be held low and under this condition the state of the Q output will toggle with each operation of the solo switch.



If the solo switch is held down then C43 will charge through D13 and R155 causing pin 1 of IC12 to go high. Pin 2 is already high as the flip flop has operated to give a solo and thus pin 3 of IC12 will go low. This low is applied to pin 2 of IC13 and when the solo button is released pin 1 will also go low. Pin 3 of IC13 then goes high causing the flip flop to be reset thus cancelling the solo. TR6 is also switched on to discharge C43. The output of IC12 will then revert to a high state causing the reset to go low and allow normal operation of the flip flop. A RESET signal from the master module will be received by pin 2 of IC13 and will cause pin 3 to go high (since pin 1 will already be low) again giving a reset and cancelling any solo.

Another version of the above circuit exists based around 4001 OR gates although the principle behind it is exactly the same. The example shown is an output solo and in order for the input priority system to work then an extra gate is used - IC47D. When a solo is requested audio is allowed onto all four solo buses with selection being made on the master module depending upon the selected solo mode.

The RESET line from the master module is in fact tri-state and in the high condition it is used to pull pin 11 of IC47D low cancelling the solo. This only occurs when input priority mode is selected and when an input solo is called for. The RESET does not reset the output solo latch so that when cancelled the previous output solo can again take effect. When the RESET line goes high it will go to almost the audio positive rail. This excess voltage is removed by zener diode D50 which is used to block the output of IC47B which will be at 5V. When the RESET line goes low then IC48A will be reset cancelling any solo.

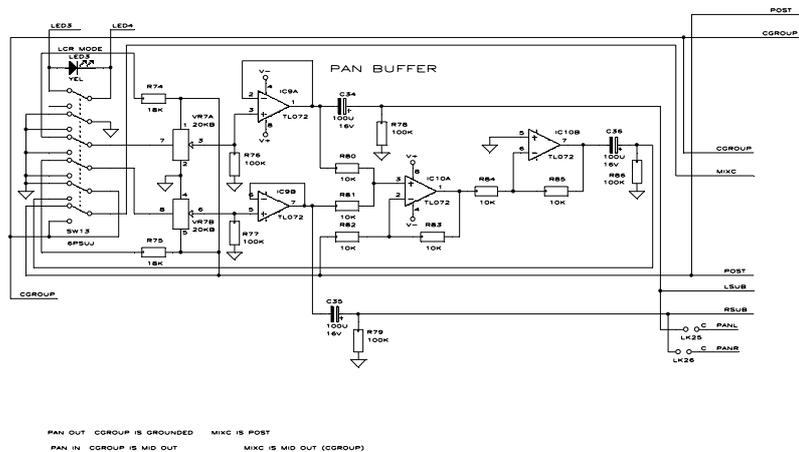
Q2 PANNING

The Q2 console can exploit either L-R panning or L-C-R panning selected by a switch. In either case the same components are employed as follows.

The pan pot VR7 is centre tapped and under normal operation the input signal is fed to the top of the pot (the hot end). This is connected to the centre tap by a 10k resistor to give the appropriate law and the wiper signals are fed to the pan buffer IC9. These signals leave the module as LSUB or RSUB to give normal stereo panning. The MIXC output is directly connected to the (mono) input of the pan pot. The CGROUP output is grounded.

If the switch is depressed to give L-C-R panning then the centre taps of the pots are grounded meaning that the pots will only work across half of their range which is the required condition. The signal can now leave as LSUB or RSUB or indeed PANL and PANR if link 22 is installed in an LCR console. The output of the pan buffers are combined by IC10A along with an out of phase feed of the input signal to give a centre signal which is fed out as CGROUP or MIXC.

A signal panned fully left will appear at the LEFT output only, a CENTRE panned signal will appear on the centre output only and of course a RIGHT panned signal will appear on the right output only. A signal panned for example between left and centre will have no output on the right output whereas it would if normal stereo panning was employed.



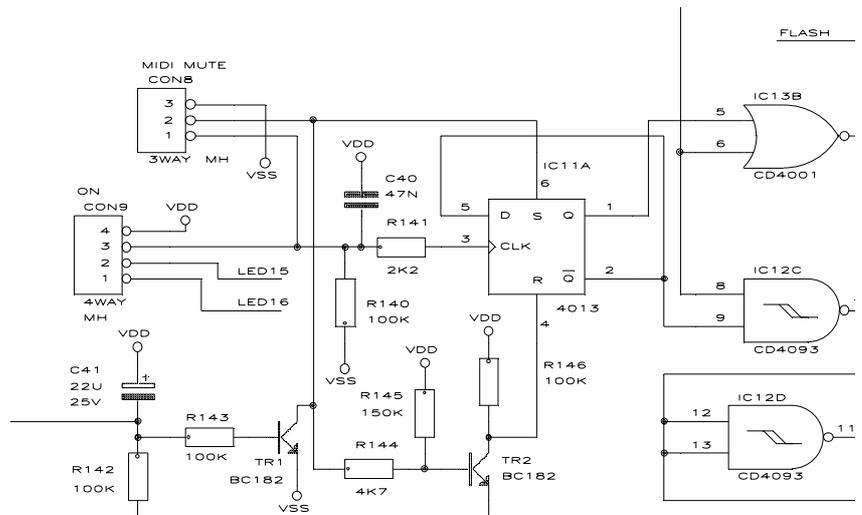
ON/CUT CIRCUIT

The ON circuit of an input module is based around IC11 a dual, positive edge triggered S/R Flip Flop. Under static conditions C40 will charge through R140 holding the clock input low. Pressing the ON switch applies Vdd to the clock input causing pin 2 to be clocked through to pin 1 reversing the states of Q and Q bar. For the channel to be on Q bar should be high. Assuming that the channel is SAFE at the moment then pin 10 of IC12 will go low causing pin 11 to go high. Following this through the ON LAMP link TR3 will be switched off by this high causing TR5 to be off which means that the LED will be ON. An anti phase feed is taken to the series and shunt FETs such that in the ON condition the series FET receives a high while the shunt FET receives a low.

An alternative is for the lamp to indicate the CUT condition. A local channel CUT will set Q bar low and thus pin 10 of IC12 will be high. This will cross the cut lamp link and switch TR3 off causing the LED to come on indicating a mute. At this time Q is high causing pin 4 of IC13 to be low and therefore pin 6 of IC12 to be low. If the channel is not locally cut but an external cut is received from one of the master cut switches Q will be low and the external cut signal will put a low on to pin 6 of IC13. Pin 4 will thus go high and allow the FLASH signal to blink the CUT lamp if LK9 is installed. The external cut is also applied to pin 8 of IC12 causing pin 10 to go high to operate the FETs and the lamp. Thus a flashing cut lamp is an indication that a remote cut has been received.

THE MIDI INTERFACE.

A cut is also possible from a midi muting system and this operates on the flip flop by setting Q high and Q bar low from the same signal which is inverted at TR2. The cut is a high on pin 2 of CON8. The local cut switch is connected to pin 1 of CON8 to feed a cut to the midi system.



Q2 ROUTING

There are 20 buses available in the Q2 console giving rise to several possibilities. An input module can be configured to route to 8 mono groups, 16 mono groups with paired routing, 8 stereo sub groups or 4 LCR groups. The following tables can be used to check which links and resistors should be installed for the different configurations.

INPUT MODULE RESISTORS

Resistor	Standard/LCR	Stereo/Mono 16
94	*	
98	*	
102	*	
189	*	
227		*
91		*
228		*
95		*
229		*
99		*
230		*
186		*

INPUT MODULE ROUTING LINKS

LK	Mono	Stereo	LCR
6			*
20			*
21			*
22			*
23			*
24			*
25			*
26			*
27		*	
28	*		
31	*		
32		*	*
33	*		
34		*	*
35	*		
36		*	*
37	*		
38		*	*

THE LEVEL METER

The peak LED operates independently from the remainder of the meter and is wired to three points as follows:-

Pre EQ
Post EQ
Post fader

Thus a high level on any of the three points may bring the peak LED on. The main meter can be wired to any one of the three points to indicate the desired level and is normally linked to the pre equaliser signal.

FOLDBACK and AUXILIARIES

The Foldbacks and Auxiliaries can be switched pre or post fader. In the pre fade position the signal can be sourced pre or post the equaliser or post cut switch. Auxiliary 4 can be switched to control the direct output which is normally post fader. The VCA version of the console incorporates on/off switches for the auxiliary and foldback sends which are mounted on the sub board. The sub board connector is removed and replaced by links in a non VCA console.

INPUT MODULE LINKS

Link	Function
1, 2	Transformer Bypass
3, 4, (5)	External Meter Pre EQ, Post EQ, Dir
7	Cut Lamp
(8)	On Lamp
9	Cut Lamp Flash
(10)	Link for non VCA version
(11), 12, 13	Internal Meter Pre EQ, Post EQ, Post
(14), 15, 16	Foldback Pre Pre EQ, Post EQ, Post Cut
(17), 18, 19	Auxiliary Pre Pre EQ, Post EQ, Post Cut
(29), 30	Mute, Scene

() Factory Position

THE MONO GROUP OUTPUT MODULE

This module contains the circuit for one group output and one matrix output. The signal path for the group signal is from the bus through the appropriate link depending upon which group the module is programmed to receive into the bus mixing amplifier. The signal then is fed to the balanced insert send output by an SSM2142 and returned by an SSM2143 before entering the SSM2402 used for the cut function. From here the signal passes through the fader which has 10dB of gain in hand followed by the fader buffer to make up the 10dB of gain. The signal is then balanced in an SSM2142 to become the group output signal. The group signal can be sub mixed to the main LCR bus and this can be done in stereo or full LCR if selected.

The matrix send can be taken pre or post fade and in the pre fade position it can be link programmed to be either pre or post mute. The signal is then buffered and sent onto the matrix buses. The matrix operates differently to previous DDA matrices and a full level signal is sent to all buses. Thus the matrix pots are controlling signal coming into their module as opposed to the previous situation where the pots would control the level going to another matrix output. The matrix signals are picked up, level controlled and mixed together before going to the matrix ON switch. In addition to the eight send signals the foldback, mix left/right and mix centre signals are available on the matrix. Immediately after the ON switch talkback is injected although the enable switch must be operated for this to happen. The signal is then balanced in an SSM2142 to become the matrix out signal.

Both the matrix and the group signals can be soloed and the solo enable circuits are as previously described. If LCR mode is selected then the group AFL solo will be across the three buses, otherwise it will be in stereo. The matrix solo is across the L/R buses. The group cut is electronically operated through an identical circuit to that of the input module and again there is provision for the group to be muted by any of eight master mute groups.

MONO GROUP OUTPUT LINKS

Link	Function	
1, 2	Group Bus Programming	**
3, 4	Matrix Send Programming	**
(5), (6)	Group Transformer Balancing	
(7), 8	Post/Pre Mute Matrix Send	
(9), (10)	Matrix Transformer Balancing	
(11)	Link for non VCA version	
12, 13, (14)	Cut/On Lamp	

** Installed link depends upon module position

() Factory Position

THE STEREO GROUP OUTPUT MODULE

The stereo module is very similar to the mono group output but of course the signal paths must be duplicated. There are two group output signal paths and two matrix sends which can be selected pre or post fader. The matrix returns are fed to ganged pots and the matrix output is again duplicated to give a stereo output.

Sub grouping to the L/R and Mono buses is done independently and there is a balance facility for the stereo sub signal. Soloing of the group and matrix signals is possible using identical circuitry to that described previously.

STEREO GROUP OUTPUT LINKS

Link	Function
1, 2	Group Bus Programming **
3, 4	Matrix Send Programming **
(7), 8	Post/Pre Mute Matrix Send
(207), 208	Post/Pre Mute Matrix Send R
11	Link for non VCA version
12, 13, (14)	Cut/On Lamp
(15), 16	Mute/Scene

** Installed link depends upon module position
() Factory Position

THE LCR GROUP OUTPUT MODULE

Three group outputs are required on this module to give the required Left, Centre and Right outputs. The signal path for each of these outputs is as for the mono group output. The matrix output is mono and is fed from a mix of the LCR signals.

The matrix returns are stereo capable and again foldback and the mix can be merged onto the matrix send.

LCR GROUP OUTPUT LINKS

Link	Function
1, 2, 17	Group Bus Programming **
3, 4	Matrix Send Programming **
(7), 8,	Post/Pre Mute Matrix Send L
(207), 208	Post/Pre Mute Matrix Send R
(307), 308	Post/Pre Mute Matrix Send C
11	Link for non VCA version
12, 13, (14)	Cut/On Lamp
(15), 16	Mute/Scene

** Installed link depends upon module position
() Factory Position

Q2 VCA

The modules are similar to the normal Input and Output modules but with different sub boards. The VCA sub board carries the VCA and its associated control voltage circuits along with a mute switch interface for the auxiliaries and foldbacks.

INPUT MODULE

An SSM2018 VCA is used and audio is connected to this from the main board via CON4. The control voltage is fed from IC3B and this voltage can be a sum of the channel fader, the VCA group master fader and an external fader input. The channel fader is an audio fader and consequently it must be processed via a log-amp before it can be used to control the VCA. IC1A buffers the fader voltage while TR1 and IC2 form the log-amp.

The output of the log-amp is linked via LK2 to IC3B the control voltage buffer. If a VCA taper fader is used then LK2 should be removed and LK1 installed. This takes the buffered fader voltage straight to the control voltage buffer IC3B. The external fader voltage is received at CON2 and buffered by IC1B which feeds a virtual earth summing point.

The VCA group control voltage comes from CON12 and is summed with the external fader voltage at this point before going to the control voltage buffer IC3B. LK5 should be normally be installed to allow the VCA group control voltage to operate. The output of the summing amplifier IC3A is also fed to IC5 which is used as a comparator. If LK6 is installed then when the comparator detects that the control voltage is such that the channel is closed a mute signal will be sent to the mute circuit on the main circuit board.

ICs 7 and 8 form a noise gate interface using the audio sent to the VCA which if used would be sent to a noise gate processor via a ground sensing output. LED4 would indicate the gate functioning by looking at the return signal from the noise gate processor and the return signal would close the VCA.

The odd numbered group routing switches are mounted on the sub board along with the direct switch. Switches for enabling Foldbacks 1,2,3,4 and Auxiliaries 1,2 are also mounted on the sub board.

LK3 is normally installed but if removed and LK4 installed then auxiliary 3 is routed through the direct switch. This gives the option of having no direct switch but an auxiliary 3,4 enable switch is created.

INPUT SUB BOARD LINKS

LK	Function	* if factory installed
1	VCA fader	
2	Audio fader	*
3	Aux 3 normal	*
4	Aux 3 depends on DIR switch	
5	CV Input	*
6	VCA Mute	*
7	Ground Link	*
27	Stereo module	
28	Mono module	

Note that if an external fader is used then LK7 should be removed and the fader wired as shown in the drawing AS1358-1.

OUTPUT MODULE

The output module sub board varies according to the output module that it is fitted to. It may require 1,2 or 3 VCAs to be fitted and there is no auxiliary enable switching.

The control voltage circuits are identical to those found on the input VCA sub board as are the VCA circuits. A mono module requires 1 VCA, a stereo module requires 2 VCAs and of course an LCR output module requires 3 VCAs to be fitted.

OUTPUT SUB BOARD LINKS

LK	Function	* if factory installed
1	VCA fader	
2	Audio fader	*
3	CV Input	*

ADJUSTMENTS

The only adjustments that may be required are to trim the distortion of the VCAs.

Input module PR2
Output Module PR2, PR4, PR6

Sending a signal of 0VU 1kHz through the VCA with the gain at unity the distortion should be trimmed for a null.

VCA MASTER MODULES

The VCA master module contains two VCA group master faders and their associated cut switches. A reference voltage of -5V is fed to the faders and applied to ICs 12A and B where it is offset by a fraction of the original reference voltage. The output of the ICs is fed via an enable switch to the VCA group buses from where it will be received by modules assigned to that VCA bus. The VCA group cut switch is a two pole switch. One pole is used to illuminate the switch LED and the other switches the -5V reference to the VCA buses to give a mute. The mute switch feeds the buses after the VCA enable switch so that it can be used even if VCA fader control is not selected.

The remainder of the module is taken up by a stereo effect return. It is possible to select between input A and input B by a switch, the output of which goes to IC1A and 2A, the balanced input stages. Following the left side only the signal then goes to a gain trim stage formed by IC1B and then through the LEFT CUT switch. A width control is next formed by ICs 4A and 5A. This stage may be bypassed when not in use. The left and right signals are combined in this stage to give an image which can be reduced from full stereo to mono and expanded again into stereo but with the left and right channels reversed.

A phase reverse circuit formed by IC3A operates on the right signal only and again is bypassed when not in use. IC4B forms a simple 2 band equaliser for the left signal which is then sent to the fader and buffered by IC6B on its return. A feed of the pre-fade signal is sent to IC18, an SSM2402. The left and right pre fader signals both use this chip as a mute IC. The left and right signals are also combined to give a mono pre fader signal.

From the fader buffers the left and right signals both go through IC17, again an SSM2402, which cuts the post fader effect return signals. A pan stage follows and from here the signals can be routed to the various buses.

Auxiliaries 1,2 and Foldbacks 1,2 can be accessed by the effect return and links 1 - 8 determine the signal that will be the source for these feeds.

The mute control circuits and solo circuits are as previously described for other modules in the Q2 console.

VCA Master Links

LK	Function	* if factory installed
1	FB1,2 Pre	*
2	FB1,2 Post	
3	FB1,2 Left Pre	
4	FB1,2 Left Post	
5	Aux1,2 Pre	
6	Aux1,2 Post	*
7	Aux1,2 Right Pre	
8	Aux1,2 Right Post	
9	Non VCA Link	*
10	Group Scene	
11	Group Mute	*
12	Cut Lamp	
13	On Lamp	*
14	Cut Lamp Flash	
23	VCA to bus 1	
24	VCA to bus 3	
25	VCA to bus 5	
26	VCA to bus 7	
29	VCA to bus 2	
30	VCA to bus 4	
31	VCA to bus 6	
32	VCA to bus 8	

Links 15 - 22 are used for bus routing and are installed as follows.

Link	Standard Input	Stereo/Mono 16
15	*	
16		*
17	*	
18		*
19	*	
20		*
21	*	
22		*

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