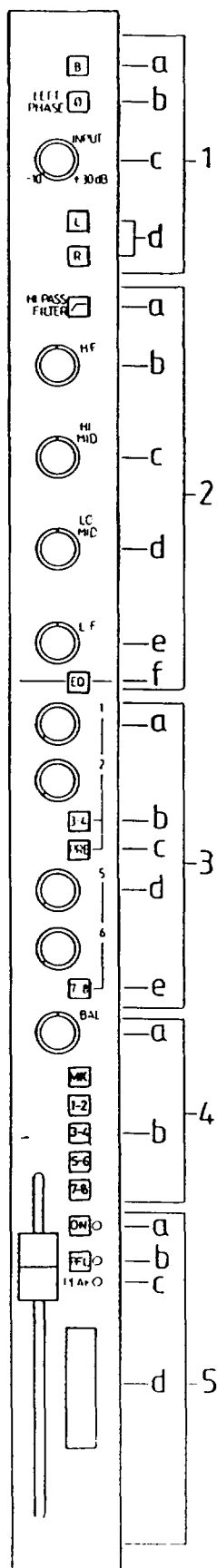


S800B STEREO INPUT MODULE



- b) SENDS 3 and 4
Auxiliary sends 1 and 2 may be routed to auxiliary buses 3 and 4 by pressing the 3-4 button. Auxiliaries 3 and 4 can be selected mono or stereo by push-on links.
- c) PRE
Auxiliary sends 1-4 may be routed Pre-fader by pressing the PRE button.
- d) SENDS 5 and 6
Auxiliary sends 5 and 6 are permanently post-fader.
- e) SENDS 7 and 8
Auxiliary sends 5 and 6 may be routed to auxiliary buses 7 and 8 by pressing the 7-8 button.

4. Routing Section

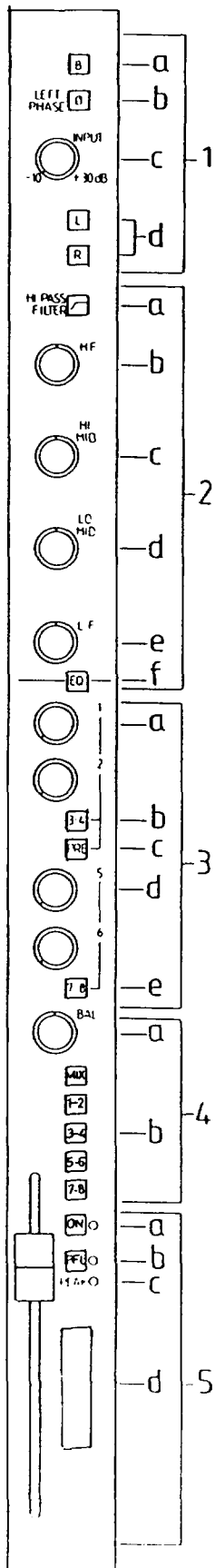
The channel input signal may be routed to any of the pairs of Group Outputs (1-2, 3-4, 5-6, 7-8) and the Stereo Mix, by selecting the relevant routing button.

- a) BALANCE
The balance control corrects or deliberately creates any errors in stereo matching before the fader and the auxiliary sends.
- b) ROUTING
Selection of any routing button assigns the channel signal to a pair of output groups, or the stereo mix, via the balance correction.

5. Channel Status Section

- a) ON
The channel "ON" status is indicated by a green LED. When a channel is switched off, all auxiliary sends are also switched off.
- b) PFL
Pre-fade Listen solos the Pre-fader signal independently of the ON switch. This gives a mono check of signal before the on/off switch. PFL operation is indicated by a red LED on the channel, and a master warning LED on the master module.

S800B STEREO INPUT MODULE



- c) **PEAK**
A red LED indicates the peak signal level. This gives visual warning that the higher signal Right or Left is within 5dB of clipping.
- d) **CHANNEL FADER**
The channel fader is an accurately matched long throw stereo fader. Infinity cut off is greater than 90dB.



The 8013 PA Output module is designed for "front of house" PA applications. It is divided into 3 sections, and contains a sub-group, an effects return channel which can be routed back into either the stereo mix or the sub-group, and a 3 band equaliser which can be inserted into either the sub-group or the effects return signal paths. The effects return input and the sub-group output are electronically balanced.

a) AUXILIARY SENDS 1-2

b) 3-4

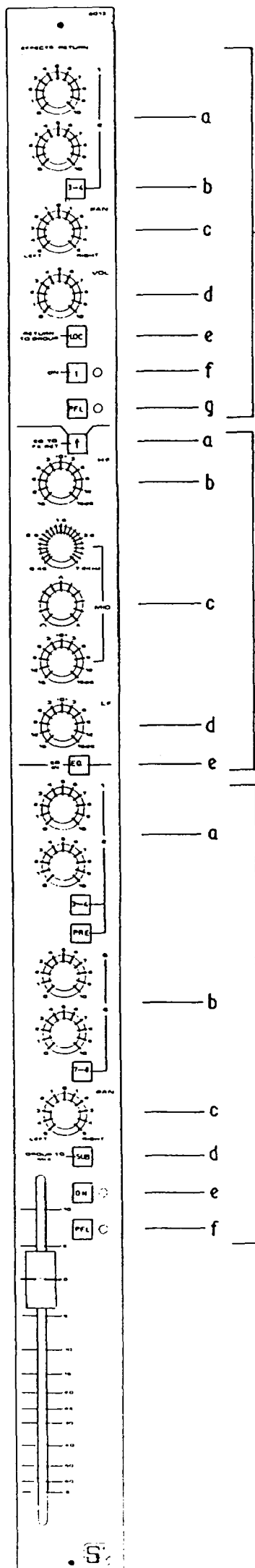
c) PAN

d) VOL

e) LOC (Return to Group)

f) ON

The effects return channel, and auxiliary sends are switched into operation by pressing the ON button. Operation is indicated by an adjacent green LED.



g) PFL (Pre-fade listen)
Pressing the PFL button solos the pre-fader signal and functions independently of the ON switch. A warning LED adjacent to the button, and a master warning LED on the master module indicates a PFL condition.

2. Equaliser Section

The equaliser is a 3 section device comprising of "shelving" type treble and bass controls and a fully parametric mid frequency section.

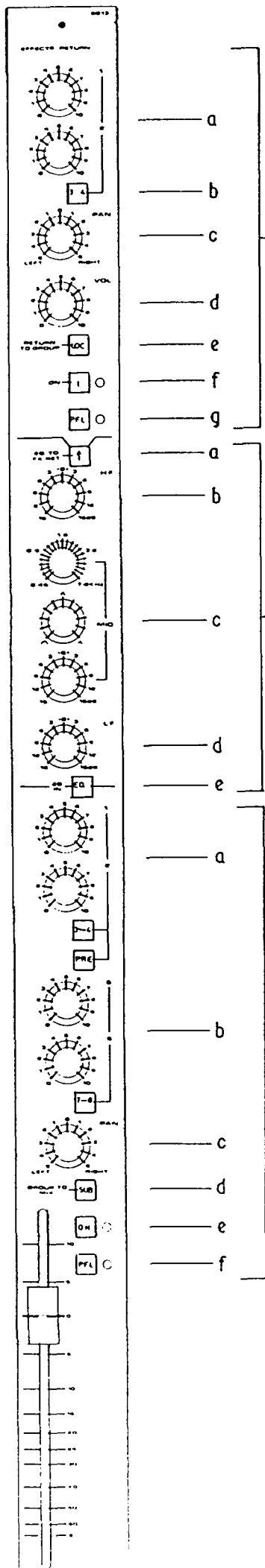
a) (EQ to Effects Return)
The equaliser is normally positioned in the sub-group, but may, alternatively, be inserted into the effects return signal path.

b) HF (High Frequency)
15dB of boost or cut is available at 12kHz with a "shelving" characteristic, ie. the slope of the EQ curve does not keep rising with frequency, but having reached the desired amount, flattens out, or "shelves" from that frequency on.

c) MID FREQUENCY
15dB of boost or cut is available, the mid frequency is continuously variable between 450Hz and 7.2kHz. The bandwidth may also be varied from broad-band control to very narrow band, almost spot frequency, effects type processing.

d) LF (Low Frequency)
15dB of boost or cut is available at 60Hz, with a "shelving" characteristic.

e) EQ
The equaliser may be switched into the circuit by pressing the EQ button.



3. Sub-group

The sub-group provides a mix of any required number of input channels, either for direct use, via an electronically balanced output, or as a sub-group for re-routing into the stereo mix.

a) AUXILIARY SENDS 1-2

Auxiliary sends 1 and 2 are normally post fader, but can be switched to pre-fader by selecting PRE. Additionally, sends 1 and 2 can be alternatively routed to auxiliary buses 3 and 4.

b) AUXILIARY SENDS 5-6

Auxiliary sends 5-6 are permanently post-fader, aux sends 5 and 6 can, alternatively, be routed to aux buses 7 and 8.

c) PAN

The pan control adjusts the relative balance of the sub-group signal into the stereo mix, if SUB has been selected. The pan pot is a centre detented control, with a loss of 4.5dB at its centre point. This is a compromise between the 3dB loss required for constant power panning, and 6dB loss required for constant voltage panning.

d) SUB (Group to mix)

Selecting SUB routes to sub-group signal directly into the stereo mix, via the pan pot, without affecting the signal to the group output.

e) ON

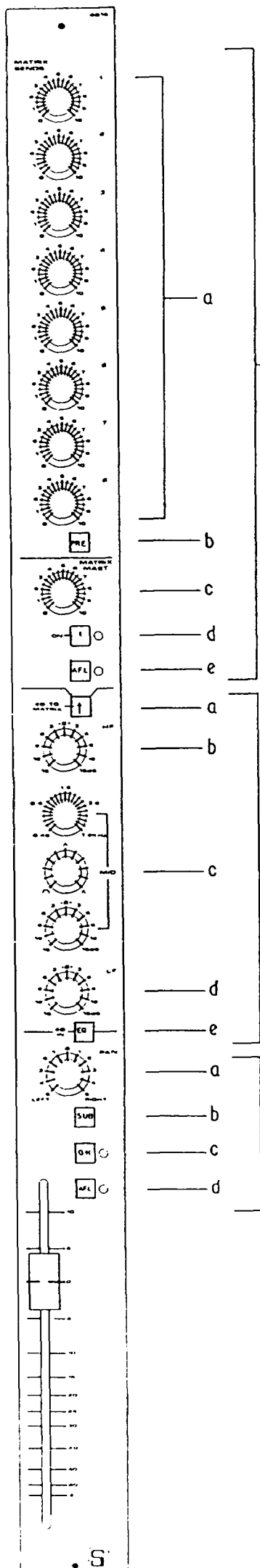
The sub-group and auxiliary sends are switched into operation by selecting the ON switch. A green LED indicates sub-group operation.

f) PFL (Pre-fade Listen)

The pre-fader group signal can be soloed, independently of the ON switch.

NB: 8 TRACK RECORDING APPLICATION

This module may be successfully used for recording with the benefit of balanced tape send (group output) and return (effects return input). Monitoring is accomplished using the effects return section, with auxiliary sends available to give headphone mixes for musicians. Metering on and off tape is provided by using the illuminated alternate meter switch, situated in the meter bridge. Normally tape sends (group outputs) are displayed. Pressing the switch displays the tape return levels (effects return inputs). This switch can remain in alternate mode with any 8 track machines, since signal switching is accomplished inside the tape machine.



2.08 8016 PA OUTPUT (Matrix)

The 8016 PA Output (Matrix) has been designed primarily for theatre and stage monitor applications, where an 8-way matrix output provides a large degree of flexibility of operation. Both the sub-group and matrix outputs are electronically balanced. A 3 band equaliser section is switchable to either the sub-group or matrix outputs.

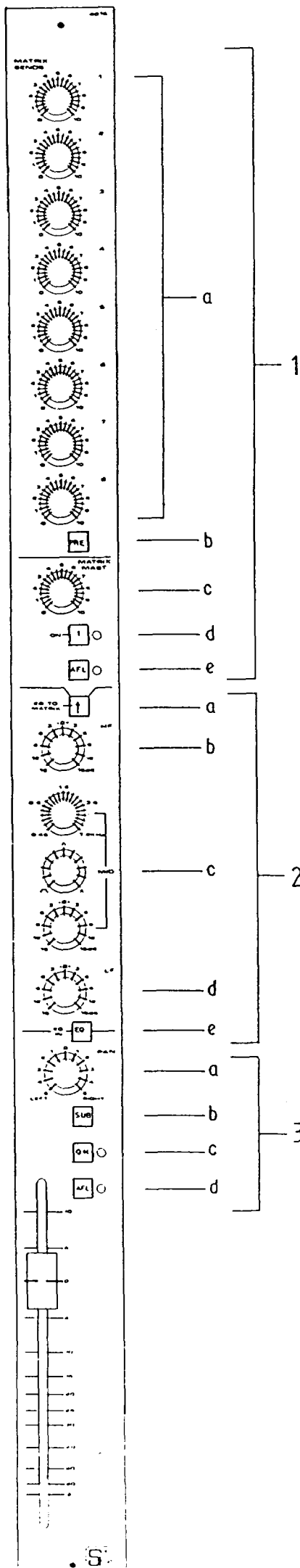
1. Matrix Output

- a) **MATRIX SENDS**
A signal derived either pre or post the sub-group fader can be independently sent to any or all of the 8 matrix outputs.
- b) **PRE**
The matrix sends can be taken from either pre or post the sub-group fader. For pre-fader sends the PRE button should be pressed.
- c) **MATRIX MASTER**
A matrix master level control is provided to adjust the overall level of the sum of all matrix sends to that matrix output.
- d) **ON**
The matrix output is switched into operation by selecting ON. Operation is indicated by a green LED.
- e) **AFL (After-fade Listen)**
The matrix master signal can be soloed.

2. Equaliser

The Equaliser is a 3 section device, comprising of shelving type treble and bass sections and a fully parametric mid frequency section.

- a) **(EQ to Effects Return)**
The equaliser is normally positioned in the sub-group, but may, alternatively, be inserted into the effects return signal path.



b) HF (High Frequency)
15dB of boost or cut is available at 12kHz with a "shelving" characteristic, ie. the slope of the EQ curve does not keep rising with frequency, but having reached the desired amount, flattens out, or "shelves" from that frequency on.

c) MID FREQUENCY
15dB of boost or cut is available, the mid frequency is continuously variable between 450Hz and 7.2kHz. The bandwidth may also be varied from broad-band control to very narrow band, almost spot frequency, effects type processing.

d) LF (Low Frequency)
15dB of boost or cut is available are 60Hz, with a "shelving" characteristic.

e) EQ
The equaliser may be switched into the circuit by pressing the EQ button.

3. Sub-group section

The sub-group provides a mix of any required number of input channels. The sub-group output is electronically balanced. Additionally, the sub-group can be used as a sub-mix, and re-routed back into the stereo mix.

a) PAN
The pan control adjusts the relative balance of the sub-group signal into the stereo mix, if SUB has been selected.

b) SUB (Group to Mix)
Selecting SUB routes the sub-group signal directly into the stereo mix, via the pan pot, without affecting the signal to the sub-group output.

c) ON
The sub-group is switched into operation by pressing the ON button. A green LED indicates sub-group operation.

d) AFL
The group output signal can be soloed.

2.09 8014 AUXILIARY MASTER MODULE

The 8014 Auxiliary Master module contains the master level controls for the 8 auxiliary outputs, a sweep frequency oscillator, and a stereo headphone drive amplifier. The auxiliary and oscillator outputs are electronically balanced.

1. Auxiliary master 1-8

Each of the 8 auxiliary buses has an overall master level control. An associated AFL (after fade listen) button allows the signal at the auxiliary to be monitored.

2. Oscillator

a) PAD

The oscillator output can be reduced by a 40dB attenuator. This allows the signal at the oscillator jack to be used for testing microphone channels.

b) FREQUENCY

The oscillator frequency is continuously variable between 45Hz and 15kHz in 2 ranges; 45Hz to 900Hz and 700Hz to 15kHz.

c) ON

Enables the oscillator.

d) LEVEL

Adjusts the level of the oscillator. When used in conjunction with the 40dB Pad, a wide range of output levels can be obtained, suitable for testing microphone and line level inputs.

e) GRP (Group)

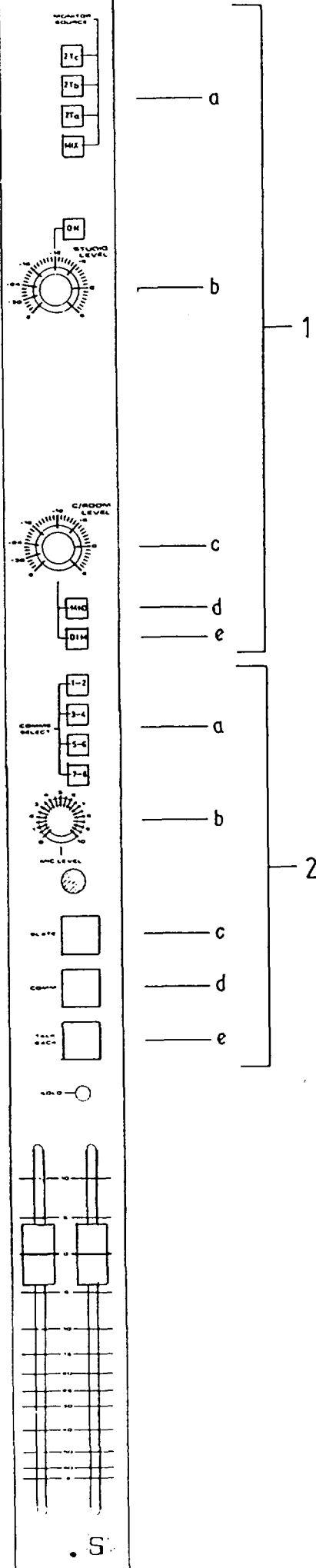
The oscillator can be routed to all output groups for alignment and test purposes.

f) AUX

The oscillator can be routed to all 8 auxiliary buses.

3. Headphone Output

The headphone output allows monitoring of the main stereo mix output, and also of any soloed signal. It will drive headphones of all impedances, though use of 8 Ohm phones at high listening levels may cause slight headphone crosstalk into the stereo mix.



2.10 8015 MASTER MODULE

The 8015 Master Module is common to all versions of the Series 800B and Series 1600 consoles. It contains the main electronically balanced stereo output, monitoring facilities and the talkback system.

1. Monitor Section

a) MONITOR SOURCE

Four interlocking push buttons, 2Ta, 2Tb, 2Tc, and Mix, route the signals from three external stereo sources or the main stereo mix output to the Control Room, Studio and Headphone monitoring systems. The inputs are electronically balanced.

b) STUDIO LEVEL

The signal from the monitor source selection is fed via the Studio On switch to the Studio Level control.

c) CONTROL ROOM LEVEL

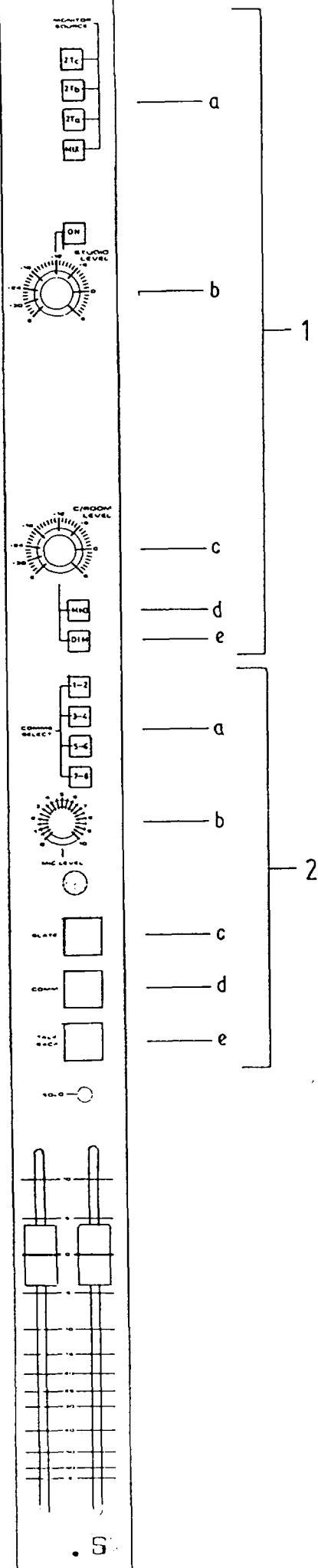
The Control Room monitoring signal can be adjusted in level. The source signal is either the output of the monitor source selection or the solo signal from any soloed PFL/AFL source. Because the stereo meter drive is derived from the signal to the Control Room monitor pot, any signal that is monitored will also be metered. This allows any auxiliary, or channel pre-fader signal level to be metered.

d) MNO (mono)

To provide a mono compatability check of the stereo signal, the left and right monitor channels can be summed together by the MNO switch. This is operative on both the Control Room and Headphone monitoring systems, and does not affect the main stereo output.

e) DIM

The Control Room and Headphone monitoring sytems can be attenuated by a set amount, (20dB).



2. Talkback Section

- a) COMMS SELECT
The Talkback signal can be routed into any or all pairs of auxiliary outputs, to allow free use of the auxiliaries for either foldback or effects sends purposes.
- b) MIC LEVEL
Adjusts the level of the talkback signal.
- c) SLATE
Pressing SLATE routes the talkback signal to all group outputs, with the addition of a 30Hz tone. This is useful for identifying sections of the multitrack tape recording, as the low frequency tone can be heard during rewinding of the tape even though the tape is not in contact with the replay head.
- d) COMM (Communicate)
The talkback signal can be routed to any or all of the auxiliary buses, (selected by the Comms Select switches), to enable communication to the foldback systems.
- e) TALKBACK
This is similar to "Comm" but with the signal also being routed to the studio monitoring system, independently of the level or ON status.

2.11 INPUT CONNECTOR PANEL

1. Line Inputs

These stereo standard jacks carry the unbalanced Line Inputs, and are normalised to the tape returns. They are wired as follows:-

Tip: HOT
Ring: Signal common
Sleeve: Signal common

2. Line Outputs

These stereo standard jacks carry the unbalanced Line outputs and are wired as follows:-

Tip: HOT
Ring: Signal common
Sleeve: Signal common

3. Channel insert sends

These stereo standard jacks carry the Channel insert sends are normalised to the channel insert returns and are unbalanced, they are wired as above.

4. Channel Insert Returns

These stereo standard jacks carry the Channel insert returns and are unbalanced. Inserting a jack into the insert return breaks the signal flow from the insert send and replaces it with the signal on the jack plug. They are wired the same as the Line Outputs.

5. Mic Inputs

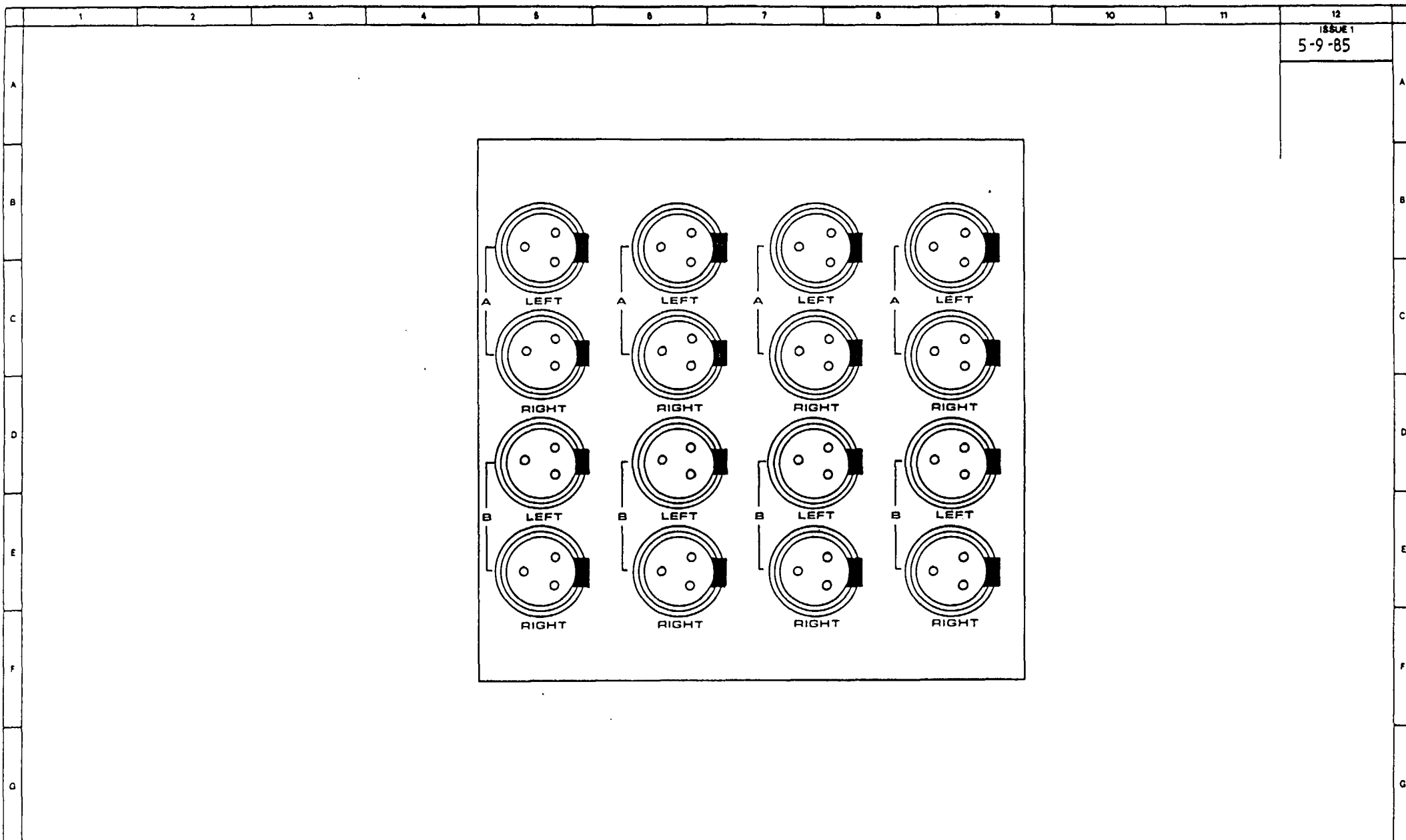
These carry the electronically balanced Microphone Inputs and are wired as follows:-


Pin 1: Ground
Pin 2: COLD (Out of phase signal)
Pin 3: HOT (In phase signal)

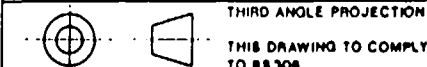
STEREO INPUT CONNECTOR PANEL

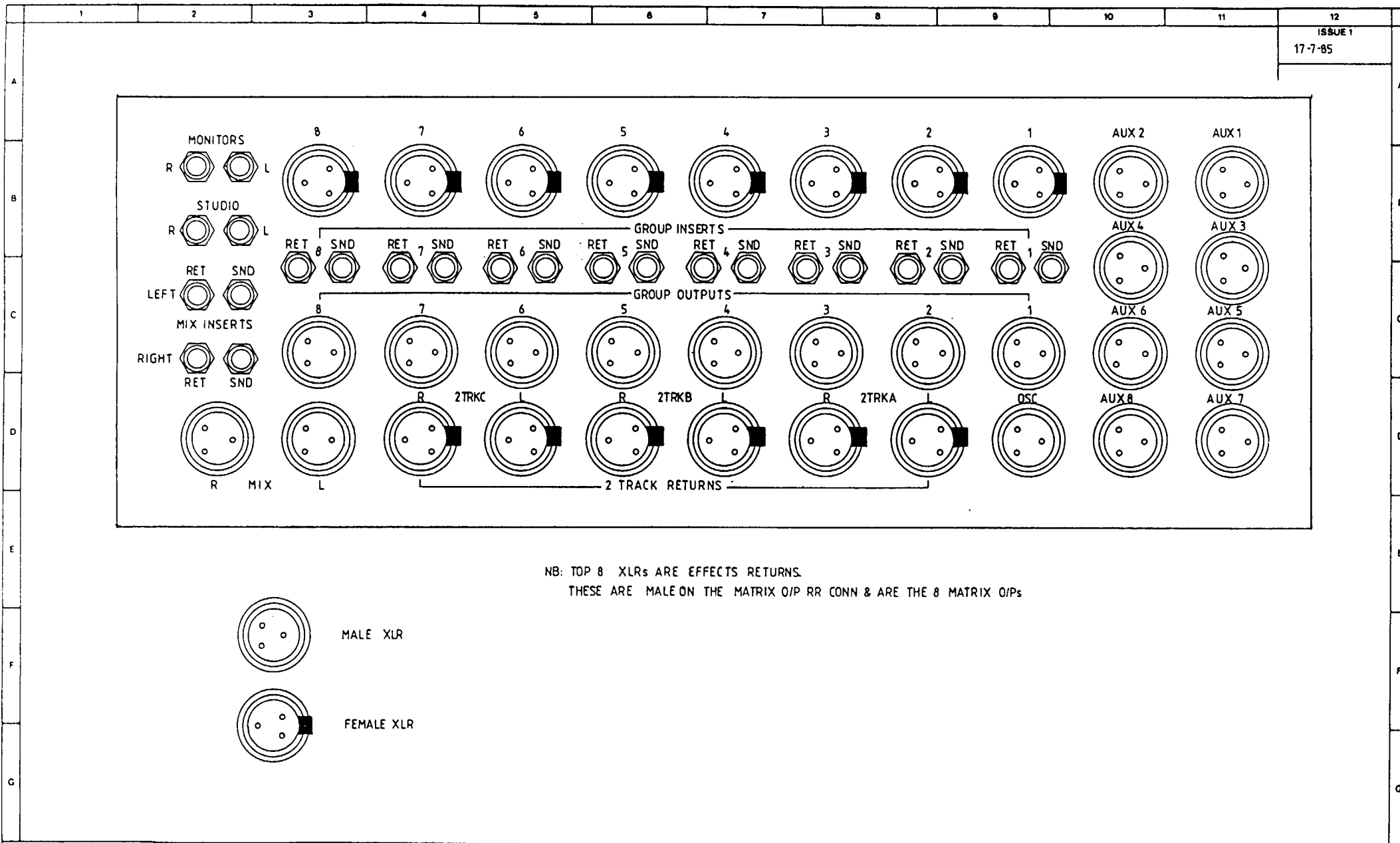
Inputs are provided for channels A and B Left and Right. These XLRs should be wired as follows:-

Pin 1: Ground
Pin 2: COLD (Out of phase signal)
Pin 3: HOT (In phase signal)



TOLERANCES HOLE SIZES AFTER PARTING		GENERAL TOLERANCES	HOLE INDEX	MATL	DRN	SOUNDCRAFT ELECTRONICS LTD UNIT 2, BOREHAMWOOD INDUSTRIAL PARK, ROWLEY LANE, BOREHAMWOOD, HERTFORDSHIRE WD6 5PZ. TELEPHONE: 01-207-8080 FACSIMILE No. 2070184	TITLE S800B 4WY STEREO REAR CONN PANEL.
0-3mm ± 0.10 0-00		Unless otherwise not applicable.	<input type="checkbox"/>		AB		
OVER 3-6mm ± 0.12 0-00		± 0.00mm (0-000")	<input type="checkbox"/>	FINISH	TRCD		
OVER 6-10mm ± 0.15 0-00		± 0.00mm (0-010")	<input type="checkbox"/>	SCALE	CHKD		
OVER 10-15mm ± 0.15 0-00		± 0.10mm (0-000")	<input type="checkbox"/>			THIRD ANGLE PROJECTION THIS DRAWING TO COMPLY TO BS 308.	DRG. No. M12508
OVER 15-25mm ± 0.21 0-00		HOLE CENTRES ± 0.004"	<input type="checkbox"/>				
OVER 25mm ± 0.25 0-00		ALL ANGLES 0-90°	<input type="checkbox"/>				
		Unless otherwise stated					





TOLERANCES HOLE SIZES AFTER FINISHING		GENERAL TOLERANCES Delete where not applicable. ± 0.00mm (0-020") ± 0.05mm (0-010") ± 0.12mm (0-008") HOLE CENTRES ± 0.004" ALL ANGLES ± 0.004" Unless otherwise stated.		HOLE INDEX <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		MATL FINISH SCALE		DRN AB TRCD CHKD		SOUNDCRAFT ELECTRONICS LTD UNIT 2, BOREHAMWOOD INDUSTRIAL PARK, ROWLEY LANE, BOREHAMWOOD, HERTFORDSHIRE WD6 5PZ. TELEPHONE: 01-207-5050 FACSIMILE No. 2070194		TITLE S800B STD O/P REAR CONN PANEL	
OVER 0-3mm - + 0.10 - 0.00													
OVER 3-6mm - + 0.12 - 0.00													
OVER 6-10mm - + 0.15 - 0.00													
OVER 10-15mm - + 0.18 - 0.00													
OVER 15-20mm - + 0.21 - 0.00													
OVER 20mm - + 0.25 - 0.00													
						THIRD ANGLE PROJECTION THIS DRAWING TO COMPLY							
												DRG. No. M12494	

2.12 OUTPUT CONNECTOR PANEL (Standard)

1. Monitors (L&R)

These stereo standard jacks carry the signal to the control room monitor speakers, they are unbalanced and are wired as follows:-

Tip: HOT
Ring: Common Ground
Sleeve: Common Ground

2. Studio (L&R)

These stereo standard jacks carry the signal to the studio speakers and are wired as above.

3. Mix Inserts (L&R)

These stereo standard jacks carry the insert sends and returns. The insert send is normalled to the insert return, inserting a jack into the insert return breaks the signal flow from the insert send jack and replaces it with the signal on the jack plug. They are wired the same as the Monitor (L&R) sockets.

4. Group Inserts

These stereo standard jacks carry the group insert sends and returns and are wired as above.

5. Effects Returns

These are electronically balanced outputs and are wired as follows:-

Pin 1: Ground
Pin 2: COLD (Out of phase signal)
Pin 3: HOT (In phase signal)

6. Group Outputs

The Group Outputs are electronically balanced and are wired as above.

7. 2-track Returns

These are electronically balanced as are wired the same as the Effects Returns.

8. Mix Outputs and Aux Outputs

Both the Mix Outputs, left and right, and the Auxiliary Outputs are electronically balanced and are wired the same as the Effects Returns.

2.13 OUTPUT CONNECTOR PANEL (Matrix)

1. Monitors (L&R)

These stereo standard jacks carry the signal to the control room monitor speakers, they are unbalanced and are wired as follows:-

Tip: HOT
Ring: Common Ground
Sleeve: Common Ground

2. Studio (L&R)

These stereo standard jacks carry the signal to the studio speakers and are wired as above.

3. Mix Inserts (L&R)

These stereo standard jacks carry the insert sends and returns. The insert send is normalled to the insert return, inserting a jack into the insert return breaks the signal flow from the insert send jack and replaces it with the signal on the jack plug. They are wired the same as the Monitor (L&R) sockets.

4. Group Inserts

These stereo standard jacks carry the group insert sends and returns and are wired as above.

5. Matrix Outputs

These are electronically balanced outputs and are wired as follows:-

Pin 1: Ground
Pin 2: COLD (Out of phase signal)
Pin 3: HOT (In phase signal)

6. Group Outputs

The Group Outputs are electronically balanced and are wired as above.

7. 2-track Returns

These are electronically balanced and are wired the same as the Matrix outputs.

8. Mix Outputs and Aux Outputs

Both the Mix Outputs, left and right, and the Auxiliary Outputs are electronically balanced and are wired the same as the Matrix Outputs.

3.00 INSTALLATION

3.01 APPLYING POWER

Before switching on the Series 800B check that the mains voltage selector on the power supply unit is set to the correct mains voltage for your area, and that the fuse is of the correct rating.

For operation on voltages between 220 and 240VAC, the fuse should be rated at 3.15 amps, 20mm anti-surge.

For operation on voltages between 100 and 120 VAC, the fuse should be rated at 6.3 amp, 20mm.

Do not replace the fuse with any other type, as this could become a safety hazard, and will void the warranty.

3.02 Interface levels

The Series 800B is normally supplied to provide compatible level interfacing with standard professional equipment. ie. +4dBu (ref 0.775V). However, if you have an 8012 Recording Output module provision has been made to allow the user to modify the tape interface levels for use with semi-professional equipment, operating at -10dBV (ref 1.00volt).

The change in tape interface level operating level is accomplished by reducing the console group output level by the required amount, and increasing the console monitor gain by an identical amount, and can be done by the addition of 3 resistors and the removal of a link on each group output circuit board.

GROUP OUTPUT LEVEL

1. Remove link 18
2. Add resistor in position RX1.

MONITOR RETURN GAIN

Add resistor in position RX2 and RX3.

The value of the resistor must be the same for RX1, RX2 and RX3 for correct operation. For interface to the normal Teac/Tascam level of -10dBV, a value of 1kOhms is suitable.

CONTROL ROOM, STUDIO AND AUXILIARY OUTPUTS

Powerful amplifiers are often rated at 300mV sensitivity, for full output. In such cases, an attenuator should be installed at the input of the power amplifier, to attenuate the +4dBv (1.228) signal from the console, by approximately 10 to 15dB. This can be achieved by using a 2.2kOhm series resistor, and a 680 Ohm, shunt resistor across the amplifier input.

3.03. Connector Conventions

All XLR type connections are normally wired to the following standard:-

Pin 1 GROUND
Pin 2 COLD (Out of phase signal)
Pin 3 HOT (In phase signal)

All main outputs are electronically balanced. The Soundcraft output stage allows either the Hot or Cold to be grounded, without any change in output level or other adverse effects, in the same way as a transformer coupled output. This allows much greater freedom when interfacing to a variety of unbalanced and balanced equipment and a minimisation of earth loop problems.

In most cases, the output can be viewed in the same way as a transformer coupled output, but without the signal degradation inherent in transformer design. However, if the output is driving a long cable run into an unbalanced input, it is usually beneficial to unbalance the output directly at the console to avoid instability.

NB: During the currency of this manual, the XLR standard may be changed to the European convention of:

Pin 1: GROUND
Pin 2: HOT (In phase signal)
Pin 3: COLD (Out of phase signal)

If in doubt, check with your dealer or the manufacturer at time of purchase.

3.04. General Wiring Procedures

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

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

1) Initial Wiring Considerations.

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

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

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

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

2) Audio Wiring

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

- a) Connect Control Room Monitor system to the console, and check for any hum, buzz, or RFI. Only when you are satisfied with the quietness of the console and the monitor system should you proceed with the next step.
- b) Connect multitrack tape recorder, via noise reduction system if applicable, and again check that the system is still clean.
- c) Connect stereo tape recorders, studio monitors, echo and foldback sends one at a time, checking and isolating any connection which degrades performance.
- d) Connect all peripheral devices.
- e) Connect all microphone lines.

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

3) Shielding

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

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

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

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

Combinations of unbalanced, balanced and electronically balanced, (differential), systems mean that there are nine interconnection permutations. The optimum of the screen in each case is shown in Table 1.

TABLE 1

	OUTPUT	INPUT	SCREEN
1	Unbalanced	Unbalanced	Source
2	Unbalanced	Balanced	Source
3	Unbalanced	Differential	Source
4	Balanced (Note 1)	Unbalanced	Destination
5	Balanced	Balanced	Source
6	Balanced (Note 2)	Differential	Destination
7	Differential (Note 3)	Unbalanced	Source
8	Differential	Balanced	Source
9	Differential	Differential	Source

Note 1 - The shield is connected to the destination earth point, which is opposite to normal practice, because the signal wires being shielded are referenced to the input earth, not the output earth.

Note 2 - If the output transformer is centre tapped to earth, the screen should be connected at the source.

Note 3 - When an active differential output is operated in unbalanced mode, it is very important that the output current returns to earth via the shortest, least reactive route. Check for instability at the output.

N.B.

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

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

4.00 MAINTENANCE

Every console that leaves Soundcraft undergoes a thorough testing at all stages of manufacture. These tests include individual testing of every function on all the PCB's, a thorough testing of all the functions of the completed mixer, a soak test of 48 hours before the final test, which consists of listening, measuring and mechanical function checks prior to packaging and shipment. In this way we try to ensure that any faulty components or manufacture show up long before the console leaves the company. Thus a long and trouble-free life can be expected.

Although all Soundcraft Consoles have been designed with long term reliability in mind, it is inevitable that occasional maintenance will be required. However, due to the amount of attention given to the problems of maintenance during the design stages of this console, and the modular construction, servicing tends to be extremely simple to carry out, with the minimum of test equipment needed to isolate and rectify faults.

4.01 General Fault Finding

With the exception of the electronically balanced microphone amplifier, and the hybrid discrete/op amp summing amps, all signal electronics are configured around high slew rate, low noise integrated circuits. The microphone amplifier is a proprietary design, utilizing a discrete transistor, noise cancelling front end, differentially summed via a low noise integrated circuit.

The use of integrated circuits means that the majority of audio faults can be repaired by simply replacing the I.C., having first isolated the fault to a particular stage in the signal chain. The isolation can often be done without even having to remove the module from the console, by judicious use of insert points, and/or switching the module to various modes. As with all servicing a good knowledge of the basic signal flow is necessary for best results. Each module should be viewed as a number of signal blocks, through which the signal must flow. If the signal appears at the input to a block, but not at the output, then the fault lies within that block. By dividing a module into individual sections, what at first appears to be an extremely complicated piece of equipment can be simplified into a series of sequential stages. This is the basic first move in all types of fault finding, and usually requires no more than a certain amount of logical thought. Servicing a console is more a matter of clear thinking and having an understanding of what should be happening, than having a highly developed technical knowledge.

To illustrate the method of logical fault finding, let us assume that we have a non functioning input module, in both microphone and line modes.

The first step is to ensure that a fault really does exist! Check that the module is in the correct mode of operation, and that no jacks are inserted in the insert points, which may be interrupting the signal flow.

If in doubt about the module operation, set up an adjacent module in exactly the same way, which will allow a direct comparison between a working and possible non-working module.

Route the channel directly to MIX, so that the channel may be monitored in the normal way. Using an oscillator set it to approximately 1kHz and patch the oscillator signal into the channel Line Input. If all is well, an undistorted signal should now be heard. More likely, because of the fault it won't.

Large sections of the module circuitry can be by-passed by switching out the Hi-pass filter and the equalizer.

If switching out a section causes the signal to re-appear, then the fault is located in that section, which can then be traced at component level, by removing the module from the console frame, and reconnecting it via extender cables.

With the module installed on extender cables, access is now available to all parts of the module, and the signal may be traced through the various stages, using an oscilloscope, millivoltmeter, or even high impedance headphones. Refer to the Block Schematic which shows the signal flow through the modules. When a point is reached where the signal is not present, or is distorted, the probable faulty components can be checked out and if necessary replaced. Integrated circuits, due to their internal complexity, are the most likely cause of problems, followed by mechanical components such as switches and faders, which are susceptible to physical contamination from oxidation, dust and liquids.

4.02 Removing Modules

Remove the 2 module retaining screws, which will allow the module to be carefully withdrawn from the console. The ribbon cable will now be exposed, and may be detached from the module. The module will still have some cables attached, but these are sufficiently long to allow the module to be completely withdrawn from the console. Extender cables can now be plugged into the main ribbon cable, and the module, taking care not to twist the extender cable. A module should NOT be unplugged or plugged in with the power ON.

4.03 METER ALIGNMENT

Each VU meter has its own individual drive card attached to the rear of the meter. This card also contains the detection and the drive circuitry for the peak LED which is pre-set to indicate a peak level of 8dB above 0VU.

0VU is normally adjusted to indicate a line level of +4dBu ie. a level of 1.228 volts. However, it can be re-adjusted to indicate a different line level if required by the pre-set potentiometer on the drive card.

Connect a millivoltmeter to the group output. Route the oscillator set to 1kHz to the group and adjust the group output level to read the required level on the millivoltmeter. (Normally this would be +4dBu). Adjust the VU drive pre-set to indicate 0VU on the VU meter and repeat for all other groups and the stereo mix meters.

Note that the peak LED will always indicate a level of 8dB above whatever the 0VU level has been set to.

4.04 LAMP REPLACEMENT

Illumination of the VU meters is provided by 2 wire ended lamps in each meter. These are 9 volt lamps wired in parallel. The lamps in each group of 4 meters are wired in series and powered by the + 17volt audio supply. A series resistor provides turn on surge current limiting to prolong lamp life.

The stereo mix meters have an additional series resistor to simulate the voltage drop of the missing pair of meters.

To replace the lamps, first remove the VU meter front cover. This is best done by applying upward pressure to the underside of the meter front cover and then pulling the top of the cover forward. The 2 lamps will now be visible and can be unsoldered and replaced.

It is recommended that both lamps be replaced even if only one has failed, as the remaining lamp will have been overstressed and its life substantially reduced.

4.05 Power Supply Servicing

The Series 1600 Power Supply Unit provides the following regulated supply rails are provided;

- i) +/- 17 volts, Audio
- ii) + 24 volts, (not used)
- iii) + 48 volts, Phantom Power
- iv) +/- 7.5 volts, logic

If a power supply fault is suspected, first ensure that it really is the P.S.U. which is at fault, and not a short circuit in the console. This can be checked by disconnecting the P.S.U. from the console, and measuring the voltage at the connector. A load across the supply should be provided, to simulate the normal load conditions imposed by the console.

A 10 Ohm, 20 Watt resistor across each of the audio supply rails and a 20 Ohm, 5 Watt resistor across the +24 volt rail is suitable. The phantom power supply can be loaded with a 2.2kOhm, 1 Watt resistor.

The ripple and noise value of the various supply rails can now be measured, using a millivoltmeter or an oscilloscope, and a value of at least -80dB, (ref 0.775V, DIN audio should be obtained on the audio), on the phantom supply rails.

If a fault is found to exist in the P.S.U., disconnect the mains supply and remove the cover. Check visually for any obvious problems, such as blown fuse, burnt components, etc. If nothing obvious is observed, reconnect the mains and measure the voltages across the various electrolytic smoothing capacitors, which should be as follows;

Audio Supply	C12,C14 = +26volts
	C13,C15 = -26volts
+24volt Supply	C1,C2 = +36volts
Phantom Supply	C8 = +59volts
Logic Supply	C32 = +13volts
	C33 = -13volts

Differences of +10% are acceptable, due to variations in the incoming mains voltage. If satisfactory, the problem lies in the regulator section. If not, however, check the bridge rectifier, smoothing capacitor and transformer for failure.

AUDIO SUPPLY

Theory of operation

(Numbers in brackets refer to the negative regulator)

The bipolar audio supply is a dual tracking regulator, with overvoltage protection, capable of supplying up to 5 Amps at +17volts.

The amount of current drawn is sensed by the voltage drop across the parallel resistors, R33, R34, R15 for the positive rail, and R35, R36, for the negative rail. As the current drawn increases to cause a voltage drop approaching 0.6 volt, TR17, (TR18), will begin to turn on, which in turn will turn on TR 15, (TR 16). This will starve TR 5, (TR 7), of base current, from the current source, TR 6, (TR 8), and therefore start to turn TR 19, (TR 20), (the main pass transistors), off, thereby reducing the output voltage.

Output voltage regulation is by means of TR 9, and TR 10, (TR 11, TR 12). TR 9, (TR 11), compares the voltage across zener diode ZD 2, (ZD 3), with the voltage across the output, via the potential divider R 41, R 39, (R 42, R 40), and attempts to keep them equal. For example, if the output voltage starts to rise, the voltage at the base of TR 9, (TR 11), will start to exceed the emitter voltage set by the zener diode and the transistor will start to turn on. This will turn TR 10, (TR 12), on which will starve TR 5, (TR 7), of current, turning TR 19, (TR 20), off and, therefore, reducing the output voltage accordingly.

The positive and negative regulators are made to track each other by means of the cross connection diode D 7, and TR 13, (TR 14). Under normal circumstances, when both output voltages are equal, the base of TR 13, (TR 14), will be approximately at the mid point of the supply rails, ie. at 0volts plus the diode voltage drop.

However, if for example the negative supply should start to fall, the mid point voltage will now move positive with respect to the 0V rail, and will start to turn on TR 13. This will starve TR 5, (TR 7), of current and therefore reduce the positive supply voltage to regain equilibrium between the supplies.

Servicing

As the bipolar audio supply is arranged as a tracking regulator, a fault on one half of the supply will usually affect the other half in the same manner.

The tracking facility can be disabled for test purposes by connecting each end of Diode D 7 to ground.

All transistors and diodes should be checked for normal operation, and replaced if necessary. Bear in mind that a failure of one semiconductor will often cause the failure of other associated components.

NB: During the currency of this manual, the PSU circuit diagram may change. However, the theory of operation and the component numbers referred to above will remain the same.

4.06 SOUNDCRAFT MEDIUM POWER SUPPLY UNIT

The new power supply for the Series 800B and Series 1600 provides the following regulated supply rails;

- i) +/- 17 volts, Audio
- ii) + 24 volts, (not used)
- iii) + 48 volts, Phantom Power
- iv) +/- 7.5 volts, (not used)

POWER SUPPLY SERVICING

If a power supply fault is suspected, first ensure that it really is the P.S.U. which is at fault, and not a short circuit in the console. This can be checked by disconnecting the P.S.U. from the console, and measuring the voltage at the connector. A load across the supply should be provided, to simulate the normal load conditions imposed by the console.

A 10 Ohm, 20 Watt resistor across each of the audio supply rails and a 20 Ohm, 5 Watt resistor across the +24 volt rail is suitable. The phantom power supply can be loaded with a 2.2kOhm, 1 Watt resistor.

The ripple and noise value of the various supply rails can now be measured, using a millivoltmeter or an oscilloscope, and a value of at least -80dB, (ref 0.775V, DIN audio should be obtained on the audio), on the phantom supply rails.

If a fault is found to exist in the P.S.U., disconnect the mains supply and remove the cover. Check visually for any obvious problems, such as blown fuse, burnt components, etc. If nothing obvious is observed, reconnect the mains and measure the voltages across the various electrolytic smoothing capacitors, which should be as follows;

Audio Supply	C1	= +26volts
	C5	= -26volts

+24volt Supply	C9	= +36volts
----------------	----	------------

Phantom Supply	C13,C14	= +59volts
----------------	---------	------------

Differences of +10% are acceptable, due to variations in the incoming mains voltage. If satisfactory, the problem lies in the regulator section. If not, however, check the bridge rectifier, smoothing capacitor and transformer for failure.

MEDIUM POWER SUPPLY TECHNICAL DESCRIPTION

The operation of this power-supply is relatively conventional, and so only a brief description will be given.

Mains input is via a standard IEC mains connector, the live connection being fused by F1. This should be a 3.15 Amp anti-surge type for 220-240V operation, or a 6 Amp anti-surge for 110-120V. Mains voltage selection is by a slide-switch S1, which must be operated by the blade of a small screwdriver.

The mains transformer is a toroidal type for high efficiency and low external hum-field, with an electrostatic shield to prevent radio-frequency interference entering via the mains. There are four secondary windings; two 19V rms for the +/-17V regulators, 26V rms for the +24V regulator, and 48V rms for the +48V phantom supply.

The +17V regulator is built around an LM338K high-quality regulator IC, fed by a standard full-wave rectifier circuit. (REC1 and C1). The third (reference) terminal maintains a constant 1.2V between it and the output terminal, so that R1 and R2 form a potential divider that sets the output voltage; the voltage across R1 is constant, so increasing R2 raises the output voltage. C2 increases ripple-rejection by bypassing AC to ground. C3, C4 reduce the HF output impedance and ensure the regulator's stability.

The +24V regulator is similar to the +17V, except that it has two pre-regulator transistors, TR 6 and TR 7. These act as an emitter-follower driven by R 15, R 16, so as to divide by two the voltage drop across the regulator circuit. This reduces device temperature and ensures that REG 3 will survive a short circuit.

The +48V regulator, however, is a more complex discrete type. The reference for this supply is a Zener diode ZD1, which is decoupled by C15 to reduce internal noise. This Zener is supplied by current from the regulated output by R11. A variable proportion of the output is tapped off by R9, PR1, R10, and applied to the base of comparison transistor TR3. When this base voltage tends to rise compared with the emitter volts set by the Zener, TR3 turns on more, turning on amplifier stage TR2. This diverts current away from series-pass transistor TR5, and reduces the output voltage to the correct value. The converse happens if the output volts should start to fall.

Drive current for TR5 is provided by a constant current source TR1. This improves ripple rejection; TR1 is biased by D1,D2 so that there is a single diode-drop (0.6V) across R8.

TR4 provides overload protection. If the voltage drop across R12 becomes enough to turn on TR4 via R13, then base-drive current is shunted away from TR5 to provide current limiting.

5.00 GLOSSARY OF TERMS USED

AFL	After fade Listen: This button will "solo" the signal (or ALL with their AFL buttons down) on the monitors, and the feed for this solo is taken AFTER the fader.
Attenuate	To reduce the electrical level or amount of gain.
Auxiliary Send	Extra output from the console, usually used for echo sends and foldback.
Bus	Wire carrying a signal or sum of a group of signals.
Cold	The negative going current of a signal. With 2 signal wires, one is positive going (hot), and the other is negative going.(cold)
Cut	To cut a channel means to turn it OFF.
dB (decibel)	A logarithmic ratio used to represent voltage or power gain. The reference about which the ratio is made is usually stated.
Ground	Earth or screen of a cable when refering to connecting leads.
Group Output	The output of a group bus which is carrying a sum of all the signals assigned to that group number.
Hot	Positive going current of a signal. With 2 signal wires, one is positive going (hot), and the other is negative going.(cold)
Hz	Measurement of frequency (Hertz) 1Hz = 1 cycle per second.
Insert	An insert point allows peripheral equipment to be introduced into the signal path.
KHz	Measurement of frequency expressed to the power of 1000.i.e. 1kHz = 1000 cycles per second.
kOhm	Measurement of electrical resistance expressed to the power of 1000.i.e. 1kOhm = 1000 Ohms.
Mains	Local Electrical Supply.
Multitrack Logic	Either the multitrack machine's monitor switching or its safe/record switching.

Ohm	Measurement of electrical resistance.
Overdubbing	The process of recording new tracks on a multitrack tape recorder whilst listening back in synchronisation with previously recorded tracks.
Pan Pot	A pan pot places a signal across two stereo lines (left & right) turning it to the left will send all the signal to the left line, and to the right, all of the signal will be sent to the right side. If the pan pot is left at its centre detent, an equal amount of signal will be fed to both sides and the image in the stereo picture will be central.
PFL	Pre fade Listen: This button will "solo" the signal (or ALL with their PFL buttons down) on the monitors, and the feed for this solo is taken BEFORE the fader.
Phantom Power	A voltage (usually +48 Volts) across the microphone input to power capacitor microphones.
POST	Post means after the fader.
PRE	Pre means before the fader.
Ring	The connecting part in the middle of a stereo jack, (it mates second).
Signal to Noise Ratio	The ratio between the level of signal and the level of unwanted noise.
Sleeve	The connecting part of a stereo jack which mates last and is always earth.
Star Point	A single point to which ALL earths are separately connected.
Sync	Used whilst overdubbing; previously recorded tracks are played back through the record head whilst you record on other tracks.
Tip	The connecting part at the end of a stereo jack, (it mates first).
Track Bouncing	Taking a group of previously recorded tracks and recording them as a group onto another track. e.g. bouncing down 4 vocals from 4 tracks to just one track "frees" 3 tracks for fresh recording.

6.00 SOUNDCRAFT RECOMMENDED WARRANTY

(This warranty applies to sales within the UK and should form the basis of the warranty offered by the overseas vendor of Soundcraft products.)

1. `Soundcraft' means Soundcraft Electronics Ltd.
 `End User' means the person who first puts the equipment into regular operation.
 `Dealer' means the person other than Soundcraft (if any) from whom the End User purchased the Equipment, provided such a person is authorised for this purpose by Soundcraft or its accredited Distributor.
 `Equipment' means the equipment supplied with this manual.
2. If within the period of twelve months from the date of delivery of the Equipment to the End User it shall prove defective by reason only of faulty materials and/or workmanship (but not faulty design) to such an extent that the effectiveness and/or usability thereof is materially affected the Equipment or the defective component should be returned to the Dealer or to Soundcraft and subject to the following conditions the Dealer or Soundcraft will repair or at its option replace the defective components. Any components replaced will become the property of Soundcraft.
3. Any Equipment or component returned will be at the risk of the End User whilst in transit (both to and from the Dealer or Soundcraft) and postage must be prepaid.
4. This warranty shall only be available if:-
 - a) the Equipment has been properly installed in accordance with instructions contained in Soundcraft's manual; and
 - b) the End User has notified Soundcraft or the Dealer within 14 days of the defect appearing; and
 - c) no persons other than authorised representatives of Soundcraft or the Dealer have effected any replacement of parts maintenance adjustments or repairs to the Equipment; and
 - d) the End User has used the Equipment only for such purposes as Soundcraft recommends, with only such operating supplies as meet Soundcraft's specifications and otherwise in all respects in accordance with Soundcraft's recommendations.

5. Defects arising as a result of the following are not covered by this Warranty: faulty or negligent handling, chemical or electro-chemical or electrical influences, accidental damage, Acts of God, neglect, deficiency in electrical power, air-conditioning or humidity control.
6. The benefit of this Warranty may not be assigned by the End User.
7. End Users who are consumers should note their rights under this Warranty are in addition to and do not affect any other rights which they may be entitled against the seller of the Equipment.

7.00 SERIES 800B/1600 CUSTOMER SPARES KIT

Complete Kit Part No: RZ2235

AZ2201	THERMISTOR RA53	1
AZ2202	RES NETWORK 10kx6	1
AZ2204	8P SIL 4x4K7 RES NETWORK	2
AZ2206	8P SIL 4x7K5 RES NETWORK	2
BA0001	DIODE IN4148	3
BB0106	ZENER DIODE 400MW 11V	1
BC0204	BDG RECT KBP02 200V 1.5A	1
BC0207	BDG RECT KBL02	1
BD0301	PNP TRANS 2SA842GR/2SA970GR	1
BD0302	NPN TRANS 2SC1681BL/2SC2240BL	5
BD0306	NPN TRANS BC300	1
BD0311	PNP TRANS BD136	1
BD0312	PNP TRANS PN4 355	2
BD0315	PNP TRANS TIP2955	1
BD0316	NPN TRANS TIP3055	1
BDO317	NPN TRANS BD135	1
BE0403	QUAD OP AMP IC TL074	1
BE0404	SGL OP AMP IC TL071	2
BE0407	SGL OP AMP IC TDA1034/NE5534	1
BE0413	DUAL OP AMP IC TLO72	5
BE0428	DUAL OP AMP IC NE5532	3
BE0430	V.REG +1.2/37V 1.5A (T0220)	1
BE0431	V.REG -1.2/37V 1.5A (T0220)	1
BE0438	V.REG LM338K +1.2/32V 5A (T03)	1
BFO502	QUAD 21/P NAND 4011	1
BF0505	QUAD ANGL SWITCH 4016	1
BF0517	QUAD ANALOGUE GATE DG308/CJ	1
DA0001	PREH S/SP C/D + BRAKT 4K7LIN x2	1
DA0002	PREH S/SP 41P/D 10K + LOG	3
DA0003	PREH S/SP 41P/D 10K + LOG x2	1
DA0004	PREH S/SP 41P/D + BRKT 10K - LOG	1
DA0005	PREH S/SP C/D 47K LIN	1
DA0014	PREH S/SP 10K LIN	1
DD0316	ALPS 90MM MONO FADER SA012C	1
DE0401	CERMET TRIMMER HORIZ 90H 2K2	1
DE0409	CERMET TRIMMER 90V 1K	1
DF0512	C&K PCB MNT MICRO SWITCH	1
DF0515	RAFI ILLUM PUSH SWT LATCHING	1
DF0516	ALPS (SUN TYPE) 2 POLE PUSH SWT	4
DF0517	ALPS (SUN TYPE) 4 POLE PUSH SWT	2
DL1001	NON-ILLUM ROCKER SWT DPST BLK	1
DJ0801	MARQUARDT TAP CHANGE	1
HB0124	S2400/S3B MNS TX TR7228	1
JA0001	TOSHIBA MINI LED GREEN TLG102	1
JA0002	TOSHIBA MINI LED RED TLR102	1
JA0003	TOSHIBA LED RED TLR104	1
JB0110	RS WEDGE BULB 12V T5.5	1
KA0027	ALPS SA012C FDR KNOB WHITE	1
KA0028	ALPS SA012C FDR KNOB RED	1
KA0029	ALPS SA012C FDR KNOB YELLOW	1

KA0030	11MM/LINE 4MMBRN KNOB RE-AN	2
KCO227	C&K 0.45"SQ SWT CAP RED	1
KC0228	C&K 0.45"SQ SWT CAP GREY	1
KC0229	C&K 0.45"SQ SWT CAP GREEN	1
KCO230	RE-AN 11MM KNOB CAP BLACK	2
KC0231	RE-AN 11MM KNOB CAP BLUE	1
KC0232	RE-AN 11MM KNOB CAP GREEN	1
KCO233	RE-AN 11MM KNOB CAP GREY	1
KCO234	RE-AN 11MM KNOB CAP ORANGE	1
KCO235	RE-AN 11MM KNOB CAP RED	1
KCO236	RE-AN 11MM KNOB CAP YELLOW	1
ZD0305	3.15A ANTI-SURGE FUSE	1
ZD0309	FUSEHOLDER (SCHURTER)	1