

# Soundcraft

## 200B

### USER MANUAL

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SOUNDCRAFT SERIES 200B MIXING CONSOLE

CONTENTS	PAGE NO.
1.00 CONSOLE SPECIFICATION	2
2.00 GENERAL DESCRIPTION	3
2.01 Input Module	4
2.02 Master Module	7
2.03 Optional Stereo Input Module	12
3.00 CONNECTIONS AND WIRING	15
3.01 Input Connection Panel	15
3.02 Output Connection Panel	16
3.03 Stereo Input Rear Connection Panel	18
3.04 General Wiring	19
3.05 Interface levels	21
3.06 Fuse Ratings	22
4.00 8-TRACK OPERATION	23
4.01 P.A. APPLICATIONS	27
4.02 OPERATION OF STEREO INPUT	28
5.00 MAINTENANCE	29
5.01 General Fault Finding	29
5.02 Removing Modules	30
5.03 Meter Alignment	31
5.04 Lamp Replacement	31
5.05 Power Supply Servicing	32
6.00 GLOSSARY OF TERMS USED	33
7.00 TECHNICAL DESCRIPTION	35
7.01 General description	35
7.02 Input Channels	36
7.03 Group Outputs	36
7.04 Master LH PCB (Auxiliary Masters)	37
7.05 Master RH PCB	37
8.00 WARRANTY	39
9.00 CUSTOMER SPARES KIT LIST	41
10.00 SCHEMATICS	42

\*Note

CPS 450 or 650 Power Supplies have separate  
USER MANUAL.



## 2.00 SOUNDCRAFT SERIES 200B CONSOLE

### GENERAL DESCRIPTION

The Soundcraft Series 200B is designed primarily for up to 8-track recording, as well as public address and monitor applications.

The console has 4 main buses, 4 auxiliary outputs and dedicated mix outputs. All inputs are electronically balanced.

Electronic balancing reduces the degradation of signal quality which is introduced by more conventional transformer coupled designs, ensuring superior transient response, minimal phase shift and excellent common mode rejection even at high frequencies.

The outputs, with the exception of the Mix Outputs and the Control Room Outputs, are "GROUND COMPENSATED" to minimise hum or interference in differing environments, where earthing rules, etc may not always have been adhered to.

The Microphone Input impedance is greater than 2kOhms, which will not cause any loading effects on any normally used microphone. The Line level Input has an input impedance of greater than 10kOhms, which is high enough to ensure that it will interface with most studio peripheral equipment without causing loading effects.

The auxiliary sends are selectable between both Pre/Post EQ and Pre/Post Fade by the use of push-on links (Jumpers) on the PCB.

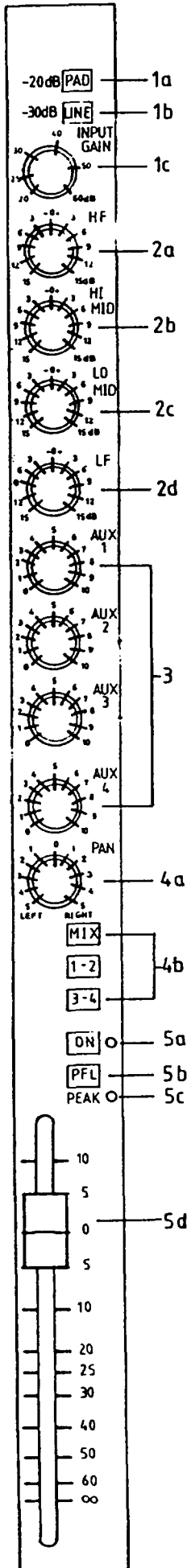
Metering is via 4 VUs reading Group Outputs 1-4. Meters 3 and 4 are switchable as a pair to read the monitor source. This may be either the stereo mix bus, the 2-track return or any PFL/AFL signal.

The power supply is an external unit supplying the console with 17volts positive and negative rails and +48V Phantom Power supply.

The console is designed to work at either +4dBu or -10dBV (Tascam) level. Changing between the two requires altering an internal switch on the group outputs and adding push-on jumpers on the input channel PCBs.

The console is available with 8, 16, or 24 input modules. There is also an optional rack mounting version with a maximum of 8 input modules. A stereo Line input module will also be available for use with stereo effects devices, keyboards etc. In a broadcast situation this module is available to introduce stereo cart machines, turntables etc into the console.

## 2.01 INPUT MODULE



### 1. Channel Input Section

The Channel can be operated in either Mic or Line Input modes. Both the Mic Input and the Line Input are electronically balanced for optimum low noise performance.

Mic Input impedance is greater than 2kOhms and Line Input impedance is greater than 10kOhms.

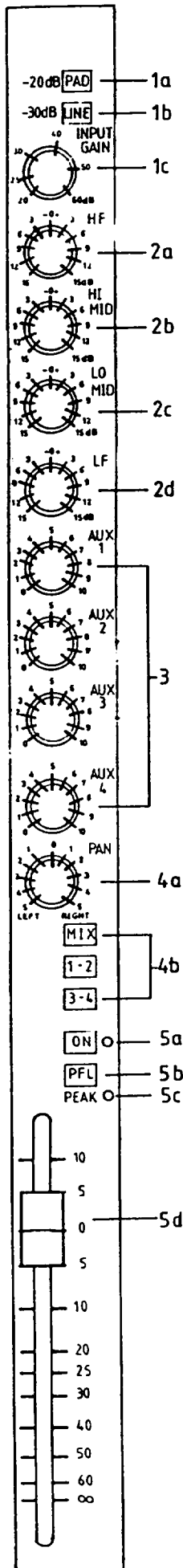
- a) **PAD**  
Pressing the PAD button inserts a 20dB attenuator into the Mic path.
- b) **LINE**  
The high level Line Input is selected by pressing the LINE button. Tape returns should be re-patched into the Line Input socket for remix purposes.
- c) **INPUT GAIN**  
The Input Gain is used to ensure that the source, whether Mic or Line sufficiently "drives" the module. If the source signal is too high, causing distortion, the level may be attenuated to match the working level of the module. If the source signal is too low, it may be boosted to reach the working level of the module.

To achieve the optimum working level for the module, and for the console, first set the fader(s) and the relevant group fader to unity gain, and then adjust the input gain(s) so that you are sending sufficient level to tape for optimum signal to noise, without introducing distortion.

### 2. Equaliser Section

The Equaliser on each module is a 4-band, fixed frequency design. All amplitude pots are centre detented for easy zeroing.

- a) **HF**  
Provides 15dB of boost or cut at 12kHz. The control has 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.



- b) HI MID  
15dB of boost or cut is available at 5kHz with a "peak/dip" characteristic. ie. Having reached maximum amplitude (or minimum in the case of cut), the amplitude response returns to zero on either side of that frequency. The shape of the curve, when plotted, gives a characteristic bell shape.
- c) LO MID  
15dB of boost or cut is available at 250Hz with a "peak/dip" characteristic.
- d) LF  
15dB of boost or cut is available at 60Hz with a "shelving" characteristic.

3. Auxiliary section

There are four auxiliary sends available for use as echo, foldback or other auxiliary effects units.

For each pair of Auxiliary sends there are three options on where to take the auxiliary send from, these are:-

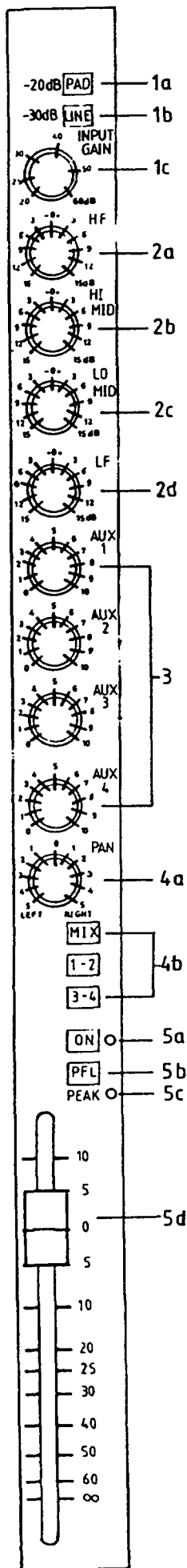
- i. Pre-EQ and Pre-Fade.
- ii. Post-EQ and Pre-Fade.
- iii. Post-EQ and Post-Fade.

These options are selected by a series of push-on links (jumpers) as marked on the PCB.

eg.

	Pre	Post	Pre	Post
Aux 1&2	---	.	---	.
Aux 3&4	.	---	.	---
	EQ		FADER	

Refer to the Input module circuit diagram, (ED2183) and the Input module signal flow diagram, (ED2227).



#### 4. Routing Section

The channel input can be routed to any or all of the 4 Group outputs and the stereo mix by selecting the relevant routing button.

- a) PAN POT  
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 the 6dB loss required for constant voltage panning.
- b) ROUTING  
Selection of any of the routing buttons assigns the channel input signal to any pair of group outputs or the stereo mix via the Pan Pot. By panning left the signal may be routed to odd numbered groups and by panning right the signal may be routed to even numbered groups.

#### 5. Channel status section

- a) ON  
The channel "ON" status is indicated by a green LED.
- b) PFL  
Pressing PFL (Pre-fade listen) solos the signal from that module on the monitor/headphone outputs, along with any other modules that have their PFL button down. The PFL signal is taken after the insert return but before the ON switch.
- c) PEAK  
The PEAK LED illuminates when the signal level at the insert send point is 4dB below clipping.
- d) CHANNEL FADER  
The Channel fader is a long throw linear fader. Infinity cut off is greater than 90dB.

## 2.02 MASTER MODULE

The Master Module contains the VU meters, the Group/Returns sections, Oscillator, Talkback, the Auxiliary masters and the Control Room Monitor section

### 1. The VU meters

The four VU meters usually monitor the outputs from the 4 groups, or Tape/FX Returns. Pressing the MNTR button changes the function of meters 3 and 4. These may now be used to monitor the main mix bus, or the auxiliaries, 3 reads left and 4 reads right.

If PFL or AFL has been pressed then the meters will monitor the PFL/AFL buses which feed the monitors/headphones.

### 2. Group/Return section

The Group/Return section handles the functions of 2 Tape/FX Returns and a Group Output. The monitor section may be used to monitor either the group output or the corresponding return when this is selected by the appropriate RET button. Returns 1-4 are positioned at the bottom and Returns 5-8 at the top.

#### i. RETURNS 5-8

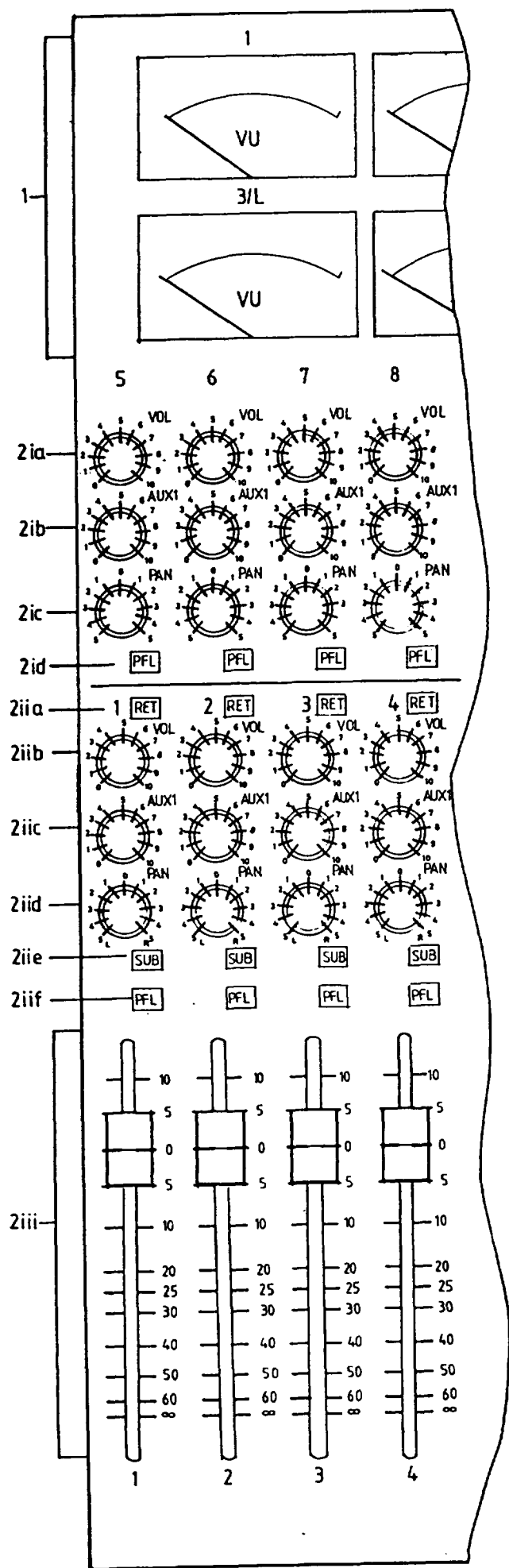
These are dedicated Tape/FX Return monitors.

#### a) VOL

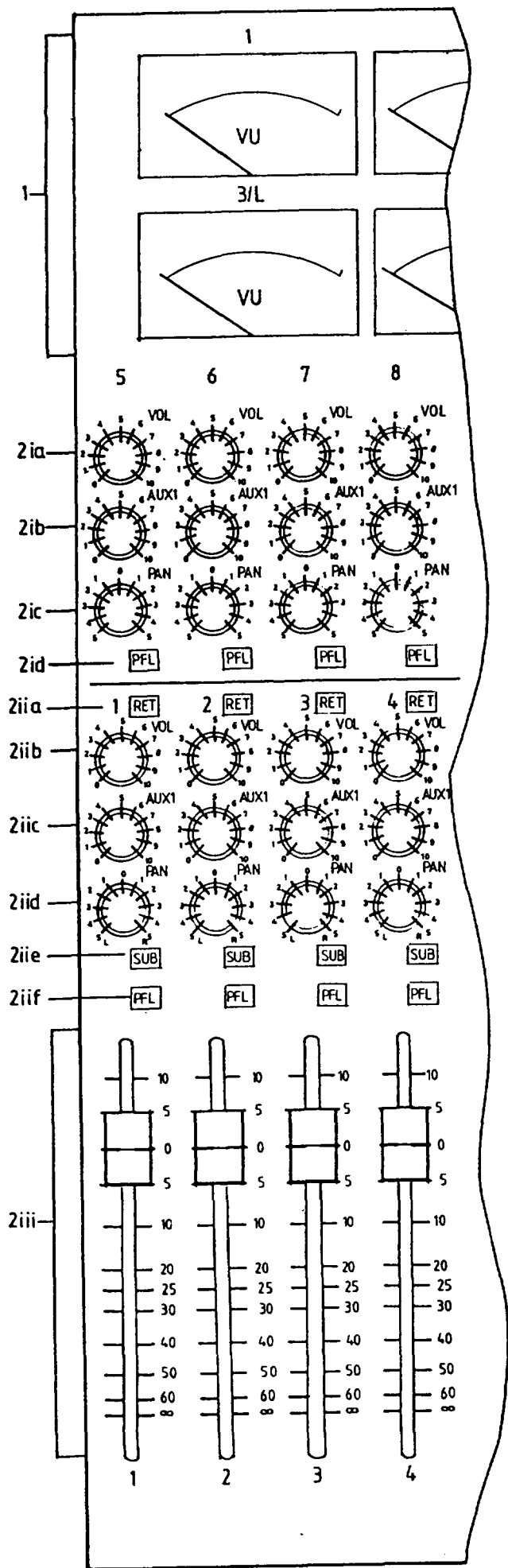
The Monitor Volume control enables the monitor contribution to the stereo mix to be adjusted in level, allowing a satisfactory monitor balance to be achieved during record and playback.

#### b) AUX 1

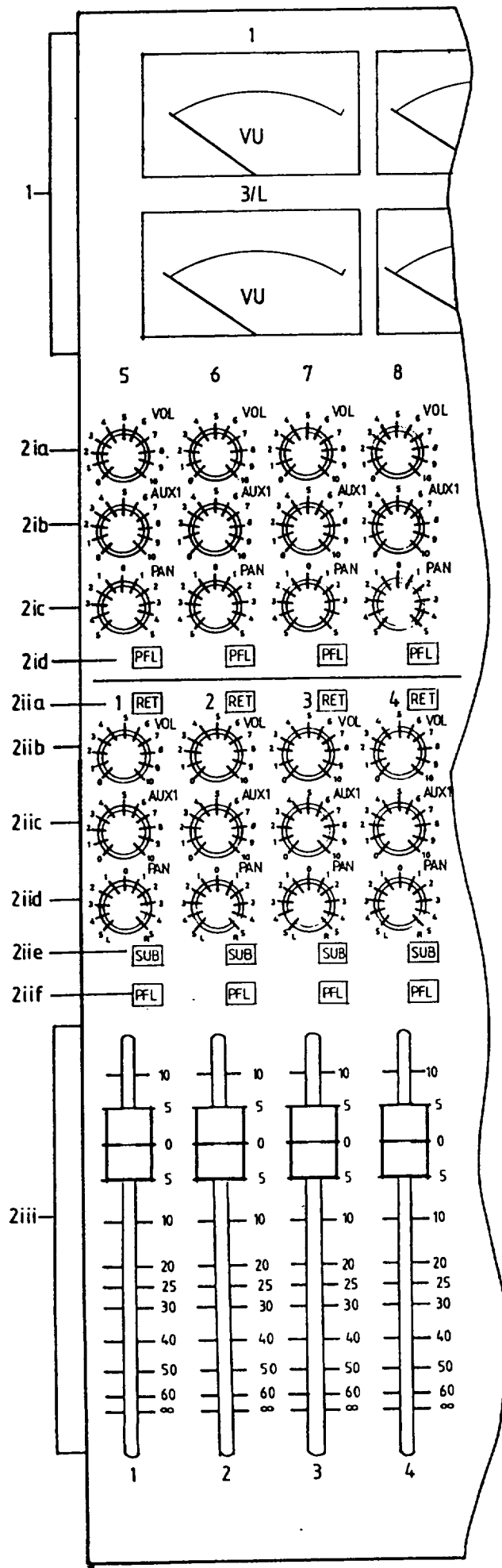
The auxiliary send is post fader and may be used to provide headphone mixes during recording and overdubbing.







- c) PAN  
The PAN control allows the monitor signal to be panned to the correct position within the stereo mix.
- d) PFL  
The PFL facility on the monitor signal is independent of the monitor volume.
- ii. SECTIONS 1-4  
These may be used to monitor either the associated group outputs OR one of the Tape/FX Returns 1-4.
  - a) RET  
When the RET button is pressed the monitor source will be the Tape/FX Return. When the Return button is up the monitor source will be the Group Output.
  - b) VOL  
The Monitor Volume control enables the monitor contribution to the stereo mix to be adjusted in level, allowing a satisfactory monitor balance to be achieved during record and playback.
  - c) AUX 1  
The auxiliary send is post fader and may be used to provide headphone mixes during recording and overdubbing.
  - d) PAN  
The PAN control allows the monitor signal to be panned to the correct position within the stereo mix.
  - e) SUB  
When the SUB button is pressed the group fader below overrides the VOL control and accesses the mix bus via the pan pot, and consequently the main master outputs.



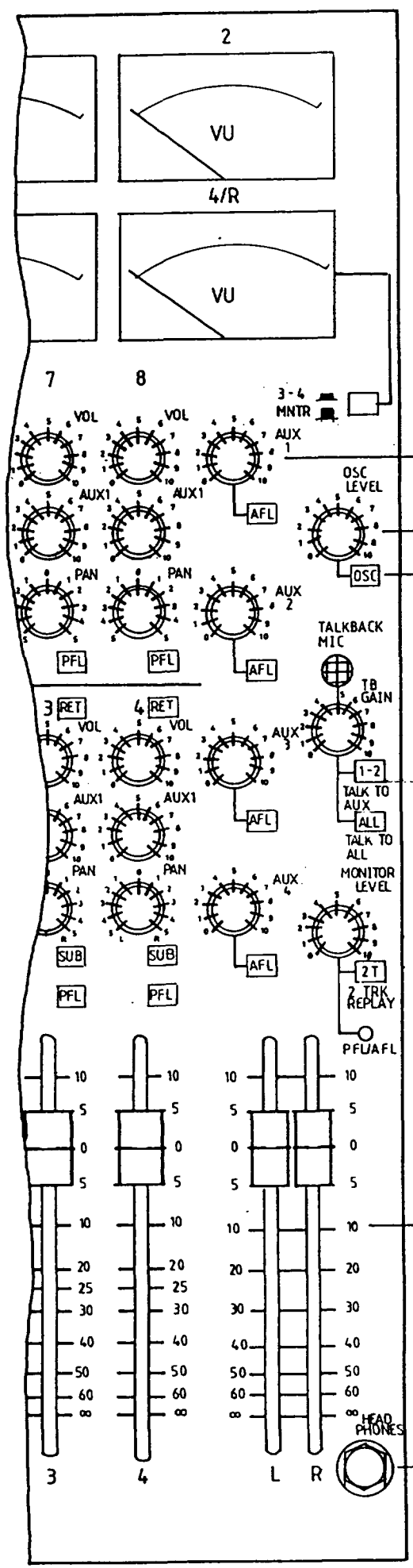
The VOL control, although bypassed, is not redundant. If RET is selected, the VOL controls the signal from the appropriate return socket and routes it to the Group below. This additional signal may be regarded as a separate input with level control and aux send BUT it can only access one group. ie. for Return 1, Group 1.

f) PFL

The PFL facility on the monitor signal is independent of the monitor volume.

iii. GROUP FADERS

The 4 long throw, linear faders control the overall group output levels.



3. Auxiliary Master Section

Each of the four auxiliary buses has its own master level control and an AFL select. The AFL works in the same way as the PFL bus. eg. AFL solos the signal from that Auxiliary master on the monitor, (headphone output), along with any other Auxiliary masters with AFL selected.

4. Oscillator

- a) OSC LEVEL  
The oscillator may be adjusted in level.
- b) ON  
The ON switch enables the internal 1kHz Oscillator and routes it to the Group and Auxiliary buses.

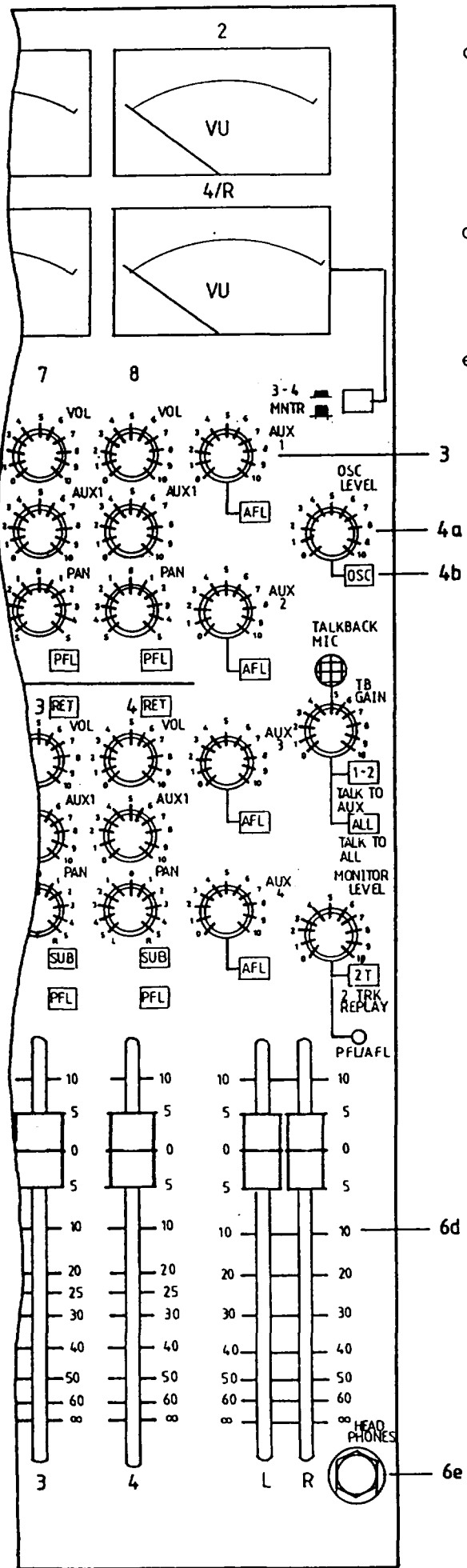
5. Talkback

The Talkback microphone is an electret microphone and has variable gain controlled by the Talkback Gain pot. The Talkback signal overrides the Oscillator.

- a) TB TO ALL  
This routes the Talkback signal to the Group buses and all four Auxiliaries.
- b) TB TO AUX 1-2  
This sends the Talkback signal to Auxiliaries 1 and 2.

6. Monitor Section

- a) MON VOL  
The Monitor Volume is controlled by a variable gain pot.
- 6db) 2T  
This allows the signal from the 2-track master machine to be routed to the monitor speakers/headphones.



- c) SOLO LED  
The SOLO LED illuminates whenever a PFL has been selected on an Input module or Group Output OR when an AFL has been selected on the Auxiliary masters.
- d) MASTER FADERS  
The long throw master faders control the overall level of the stereo mix.
- e) PHONES  
The headphone socket expects to see 600 Ohms. Monitor speakers are cut when headphones are inserted. The socket is wired as follows:-

Tip: LEFT  
 Ring: RIGHT  
 Sleeve: GROUND

## OPTIONAL STEREO INPUT MODULE

The optional stereo input module is available in blocks of 2.

### 1. Channel Input Section


The channel Line Input is electronically balanced with an input impedance of greater than 10kOhms, which is high enough to interface to any normal professional peripheral equipment without loading the source.

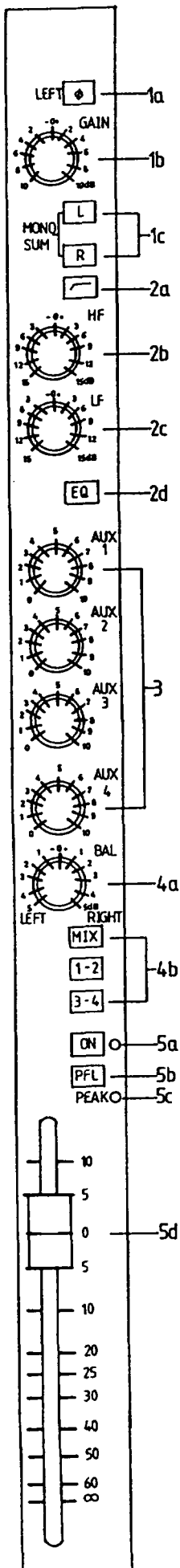
The interface level can be either +4dBu or -10dBV. To select -10dBV remove jumpers J1 and J2 on the input PCB.

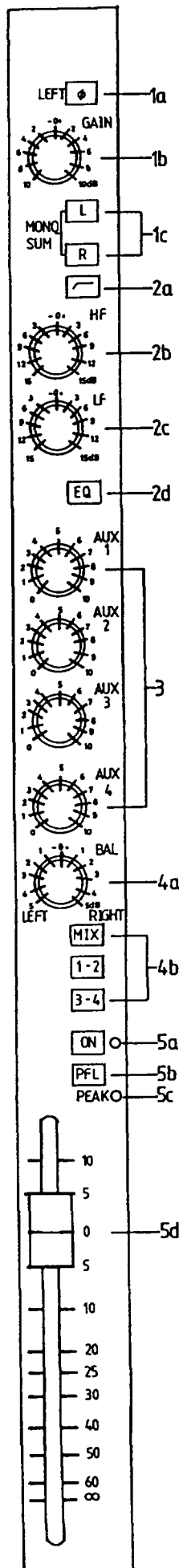
- a)  $\phi$ (Phase)  
Pressing the Phase button will invert the phase on the left-hand input only to correct for any input mismatch.
- b) INPUT GAIN  
The Input Gain can be varied between -10dB and +10dB of gain using the Gain Trim control.
- c) L & R
  - i With both these switches out the module works in stereo mode.
  - ii With either L or R switched in, both channels of the module are fed by either the left or right input.
  - iii With both switches pressed, both channels of the module are fed by a mono sum of the left and right input.

### 2. Equaliser Section

The Equaliser is a versatile unit, allowing 3 areas of control over the audio spectrum. All amplitude pots are centre detented for easy zeroing.

- a)  (High Pass Filter)  
The High Pass Filter operates at 100Hz with an ultimate slope of 12dB/Octave. This will effectively remove low frequency stage rumble, and other extraneous signals.





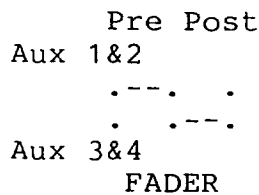
- b) HF (High Frequency)  
15dB of boost or cut is available at 10kHz, with a "shelving" characteristic, ie. the slope of the EQ curve does not keep rising with frequency but, having reached the desired amount, flattens out or "shelves" from that frequency on.
- c) LF (Low Frequency)  
15dB of boost or cut is available at 60Hz, with a "shelving" characteristic.
- d) EQ  
The Equaliser circuitry can be switched in and out of the signal path, independently of the high pass filter.

### 3. Auxiliary section

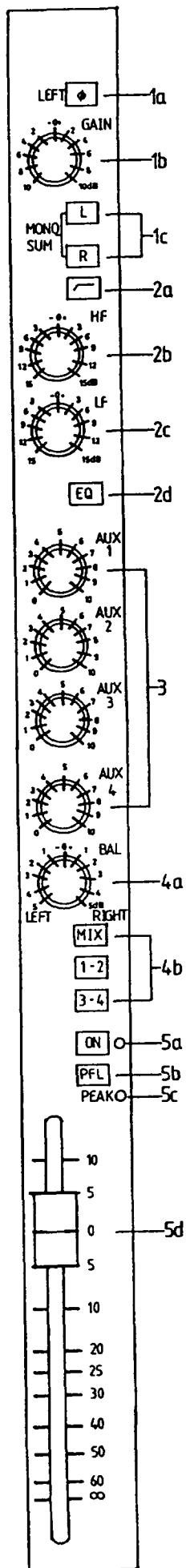
There are four auxiliary sends available for use as echo, foldback or other auxiliary effects units.

Each pair of Auxiliaries may be pre selected either pre or post fader. These options are selected by a series of push-on links (jumpers) as marked on the PCB.

eg.



Refer to the Stereo Input module circuit diagram, (ED2298) and the Stereo Input module signal flow diagram, (ED2259).



#### 4. Routing Section

The channel input signal may be routed to any pair of Group Outputs, (1-2, 3-4) and/or the Stereo Mix, by selecting the relevant routing button.

- a) **BALANCE**  
The balance control corrects or deliberately creates any changes in stereo imaging before the fader and the auxiliary sends. The balance control has a range of +5dB.
- 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.
- b) **PFL**  
Pre-Fade Listen solos the Pre-fader, post insert jack signal independently of the the ON switch. This gives a mono check of the signal, after the insert point but before the on/off switch. PFL operation is indicated by a red master warning LED on the master module.
- c) **PEAK**  
A red LED indicates the peak signal level. This gives a visual indication that the higher signal, either Right or Left, before the insert points 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.

### 3.00 CONNECTIONS AND WIRING

There are two types of standard connector panel on the Series 200B console. These are the Input connector panel and the main output connector panel. There is always one output panel, but the input panels each serve 8 input modules. So if you have a 16 input console you will have two input panels.

If you have the rack mounting version the input and output connection panels are not separate.

#### 3.01 INPUT CONNECTION PANEL

The Input panel serves 8 Input modules and the panel is labelled accordingly. ie. 1-8, 9-16 etc.

##### a) INS

These stereo standard jacks carry both the insert send and the insert return signals. Under normal conditions with nothing inserted the signal is normalised through by the jack socket and thus inserting a jack will automatically break this link.

The insert point is post EQ but BEFORE the PFL, ON switch and fader.

Tip:        Insert return (Unbalanced)  
Ring:       Insert send (Unbalanced)  
Sleeve:    COMMON GROUND

##### b) LINE

These stereo standard jacks carry the balanced Line Input, and are wired as follows:-

Tip:        HOT (In phase signal)  
Ring:       COLD (Out of phase signal)  
Sleeve:    GROUND

##### c) MIC

These carry the balanced microphone inputs and are wired as follows:-

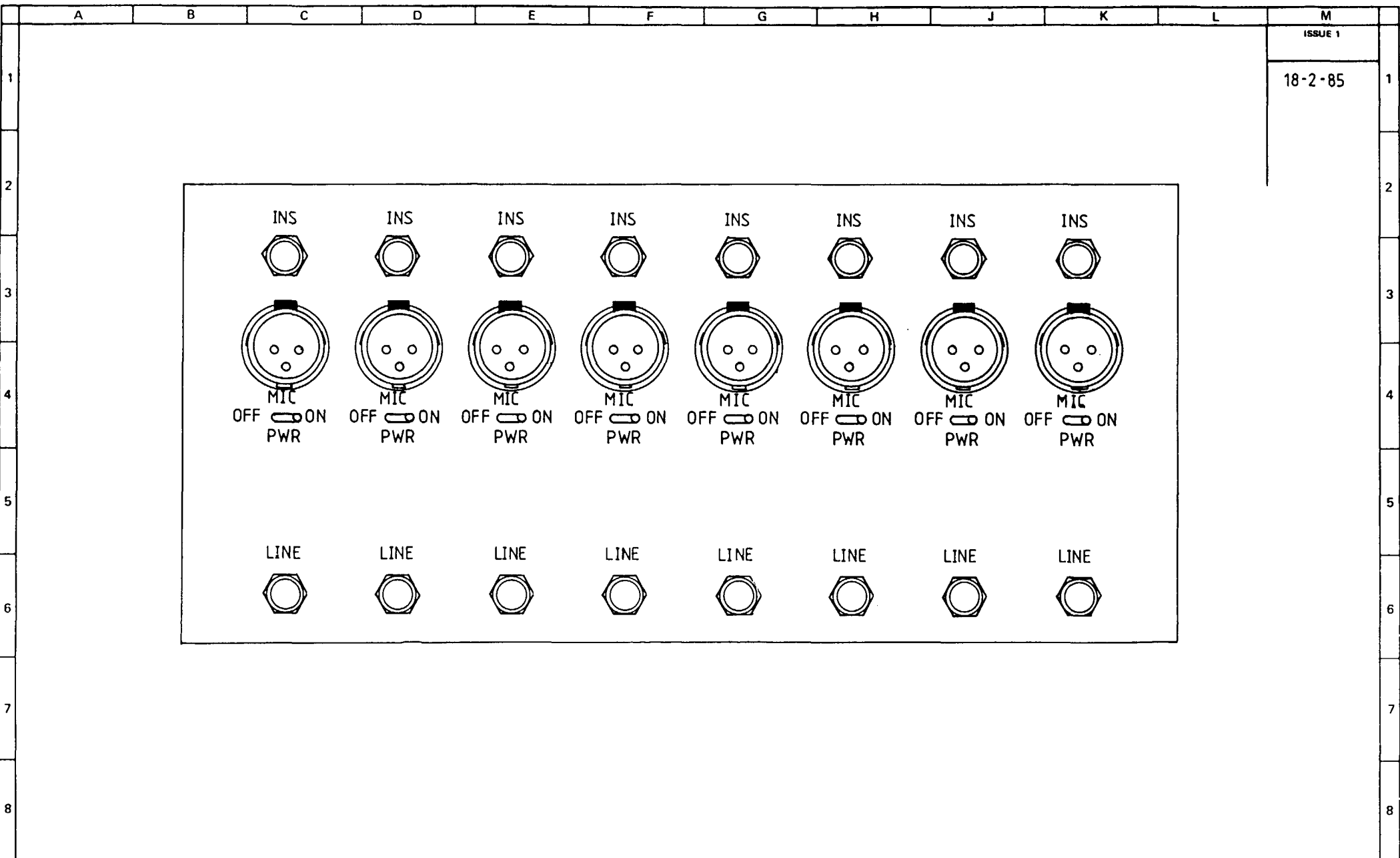
Pin 1:     GROUND  
Pin 2:     HOT (In phase signal)  
Pin 3:     COLD (Out of phase signal)

##### d) PWR

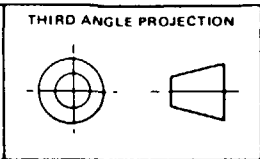
The PWR switch provides phantom power of +48volts for capacitor microphones.

NB: It is not advisable to use an unbalanced microphone, or DI boxes with the Phantom power on.





ISSUE 1  
18-2-85



TOLERANCE  
All imperial dimensions  $\pm 0.010$   
All metric dimensions  $\pm 0.25\text{mm}$   
All angles  $\pm 0.50^\circ$   
Unless otherwise stated

HOLE INDEX

MATL  
FINISH  
SCALE

DRN AB  
TRCD  
CHKD

SOUNDCRAFT ELECTRONICS LTD  
5-8 GREAT SUTTON STREET  
LONDON EC1V 0BX.  
TELEPHONE. 01-261-3631/2/3  
TELEGRAMS. SOUNDCRAFT LDN EC1  
TELEX. UK. No. 21198. USA. No. Z24408

TITLE S200B  
8WAY I/P REAR CONN  
PANEL  
DRG. No. MI2422

### 3.02 OUTPUT CONNECTION PANEL

#### a) GROUP OUTPUTS 1-4

These carry the signal from the Group Outputs and are Ground Compensated, they are wired as follows:-

Pin 1: GROUND  
Pin 2: HOT  
Pin 3: COLD

As the console only has the 4 outputs to feed all 8 tracks of the tape machine either

- i. Parallel the connections of the inputs on the 8-track of tracks 1-4 and 5-8, using the tape machines logic to ensure that you record on the correct tracks,
- OR
- ii. Use a box which changes over the feeds either individually or all together,
- OR
- iii. Simply manually plug the correct outputs from the console into the inputs of the 8-track on an individual basis as the session progresses.

#### b) TAPE RETURNS

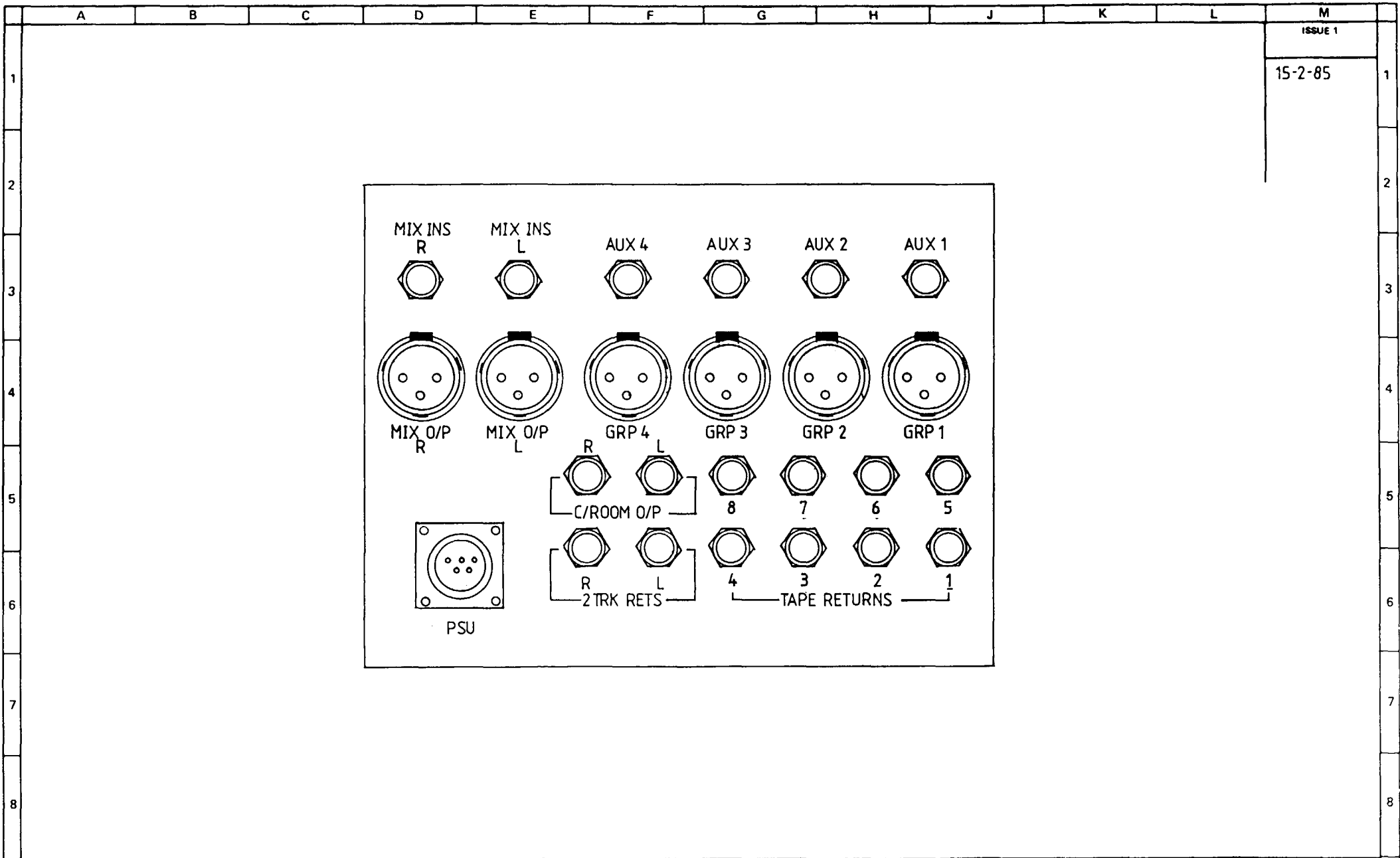
These stereo standard jack sockets carry the Tape Returns and are wired as follows:-

Tip: HOT (In phase signal)  
Ring: COLD (Out of phase signal)  
Sleeve: GROUND

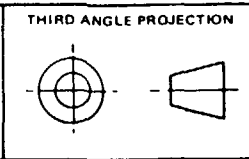
During mix down, you would normally connect the outputs of the 8-track to the Line Inputs on modules 1-8 to make use of the input module's more extensive facilities, thus freeing the RETs inputs for effects returns etc.

It is perfectly feasible to parallel the outputs of the 8-track and to permanently connect one set to the RETs sockets and the other to the line input sockets on modules 1-8. This is assuming that you have more than 8 inputs, so that during mix down, you may bring effects returns etc. down individual input modules.

If you have an 8-track which has dedicated sync outputs, such as the SOUNDCRAFT 381, you would normally connect the sync outputs to RETs 1-8 and the playback outputs to line inputs 1-8.



ISSUE 1  
15-2-85



TOLERANCE  
All imperial dimensions  $\pm 0.010$   
All metric dimensions  $\pm 0.25\text{mm}$   
All angles  $\pm 0.50^\circ$   
Unless otherwise stated

HOLE INDEX

MATL	DRN AB
FINISH	TRCD
SCALE	CHKD

SOUNDCRAFT ELECTRONICS LTD  
5-8 GREAT SUTTON STREET  
LONDON EC1V 0BX.  
TELEPHONE. 01-251-3631/2/3  
TELEGRAMS. SOUNDCRAFT LON EC1  
TELEX. UK. No. 21198. USA. No. 224408

TITLE S200B  
STD O/P REAR CONN  
PANEL  
DRG. No. M12420

c) MIX INSERTS

This stereo standard jack socket allows the Mix bus to be accessed immediately before the Master Faders, and is wired as follows:-

Tip:           Insert return (Unbalanced)  
Ring:          Insert send (Unbalanced)  
Sleeve:       COMMON GROUND

d) 2-TRACK RETURNS

These stereo standard jacks carry 2-track returns and are wired as follows:-

Tip:           HOT (In phase signal)  
Ring:          COLD (Out of phase signal)  
Sleeve:       GROUND

e) AUX OUTPUTS

These are stereo standard jack sockets for the Auxiliary masters and are ground compensated. (MI2426).

Tip:           HOT  
Ring:          COLD  
sleeve:       GROUND

f) MIX OUTPUTS

These sockets carry the main stereo outputs and are balanced. They are wired as follows:-

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

If your master machine is unbalanced, connect the cold pin (3) to ground at the input to your machine, and a standard 1/4" jack from the outputs of the tape machine will suffice.

g) CONTROL ROOM

These unbalanced jack sockets carry the signal to the monitor speakers. This signal path is interrupted when headphones are plugged in to the headphone socket. They are wired as follows:-

Tip:           HOT (In phase signal)  
Ring:          Signal Common  
Sleeve:       Signal Common

### 3.03 OPTIONAL STEREO INPUT REAR CONNECTOR PANEL

Each connector panel for the stereo input modules contains 2 channels, thus, the stereo input modules can only be fitted in blocks of 2. (Either 2 modules or 1 module and 1 blank.)

#### a) L & R LINE INPUTS

The XLR sockets carry the balanced line inputs for the left and right inputs as marked. They are wired as follows:

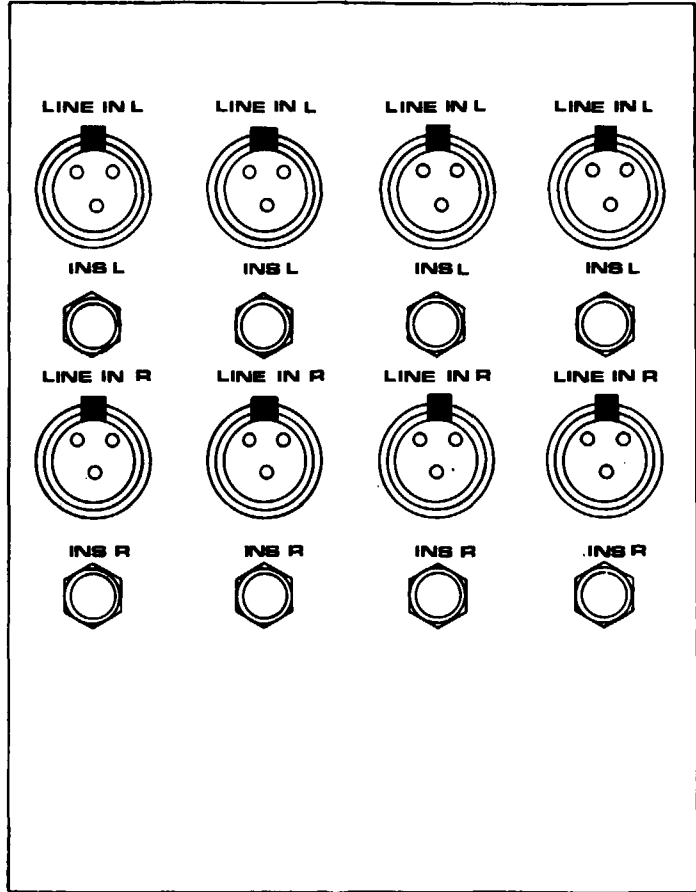
Pin 1: GROUND  
Pin 2: HOT (In phase signal)  
Pin 3: COLD (Out of phase signal)

#### b) L & R INSERTS

These stereo standard jacks carry both the insert sends and returns for the left and right channels as marked and are wired as follows:-

Tip: Return (Unbalanced)  
Ring: Send (Unbalanced)  
Sleeve: Common Ground

ISSUE 1  
16-10-85



**TOLERANCES**  
HOLE SIZES AFTER PAINTING

0-3mm	+ 0.10	- 0.00
OVER 3-6mm	+ 0.12	- 0.00
OVER 6-10mm	+ 0.18	- 0.00
OVER 10-18mm	+ 0.18	- 0.00
OVER 18-25mm	+ 0.21	- 0.00
OVER 25mm	+ 0.25	- 0.00

**GENERAL TOLERANCE**  
Delete where not applicable.

± 0.60mm (0.025")  
± 0.25mm (0.010")  
± 0.12mm (0.008")

**HOLE CENTRES** ± 0.004"  
**ALL ANGLES** ± 0.50°  
Unless otherwise stated.

**HOLE INDEX**

<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>

<b>MATL</b>	<b>DRN</b> AB
<b>FINISH</b>	TRCD
<b>SCALE</b>	CHKD
<p>THIRD ANGLE PROJECTION THIS DRAWING TO COMPLY TO BS308.</p>	

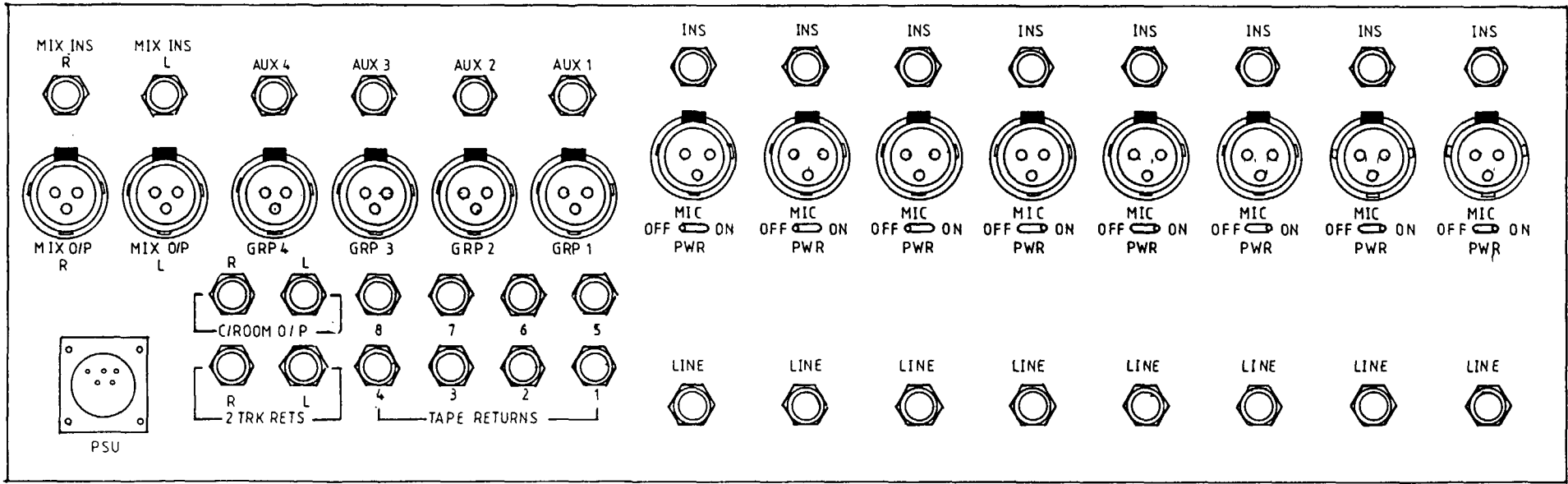
**SOUNDCRAFT ELECTRONICS LTD**  
UNIT 2,  
BOREHAMWOOD INDUSTRIAL PARK,  
ROWLEY LANE,  
BOREHAMWOOD,  
HERTFORDSHIRE WD6 5PZ.  
TELEPHONE: 01-207-5050  
FACSIMILE No. 2070194

**TITLE**  
S200B STEREO I/P  
REAR CONN PANEL

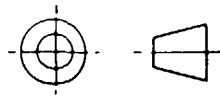
DRG. No. M12515

ISSUE 1

18-2-85



THIRD ANGLE PROJECTION



TOLERANCE

All imperial dimensions  $\pm 0.010$   
 All metric dimensions  $\pm 0.25\text{mm}$   
 All angles  $\pm 0.50^\circ$   
 Unless otherwise stated

HOLE INDEX

MATL

FINISH

SCALE

DRN

AB

TRCO

CHKD

SOUNDCRAFT ELECTRONICS LTD  
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 TELEPHONE. 01-251-3831/2/3  
 TELEGRAMS. SOUNDCRAFT LDN EC1  
 TELEX. UK. No. 21198. USA. No. 224408

TITLE S200B  
 RACK MOUNT REAR  
 CONN PANEL

DRG. No. M12423

### 3.04 GENERAL WIRING PROCEDURE

To take full advantage of your Soundcraft Console, with its excellent signal to noise ratio and low distortion figures, care must be taken that the environment into which you place your console does not degrade its performance.

Typical problems are hum, buzz, instability and radio interference, these are usually problems which are NOT of the console's making. When finally traced, they often turn out to be earth loops or an inferior earthing system. Indeed, in some areas the mains supply earth is inadequate and separate arrangements for earthing must be made.

A separate technical earth should be installed in these instances, and you should ALWAYS check with your electricity supply company to ensure that you do not infringe any regulations.

The installation of a successful earthing system requires careful planning and adherence to the "rules". Outlined below are the main points which should assist you in establishing a good audio earthing system.

#### Central Earth

To provide optimum performance, there should only be ONE earth point, (star point), for the entire audio installation. Each piece of equipment should run a separate lead to this point for its earth. It is not good enough to "daisy chain" - joining several earths together on their way to the earth point is NOT correct.

#### Separate Supplies

A separate mains feed should be used for the audio installation, and ONLY for the audio installation. A separate feed should be taken from the distribution box and use another feed for any other mains outlets such as lighting, kettles etc.

It may be necessary to install an isolating transformer for the audio supply, so that there is positively no interference from the other mains feed. The transformer should be provided with a Faraday shield which should be connected to earth.

#### Location of Equipment

NEVER place audio equipment near the mains distribution box. Especially tape recorders, as these are particularly sensitive to electro-magnetic radiation.



## Racks

A rack full of balanced professional equipment may be earthed as a rack, with the rack being connected to the star point by a separate lead. ANY equipment which has either unbalanced inputs OR outputs should be isolated from the rack and earthed separately to the star point. (Otherwise you will get an earth loop.)

## Audio Connection

Having established the "star" system, then start connecting the various audio lines, listening for hum etc. as you go. If you do it this way, you should be able to isolate a problem quickly. It is probably best to use a logical sequence such as: multitrack, stereo tape machines, monitors, echo sends one by one, effects units and finally microphone lines.

## Audio Shields

The screen should generally only be connected at ONE end of the cable and this is usually at the signal end. However, there are a few exceptions and below is a table covering all the interconnection possibilities. If radio frequency seems to be a major problem, it is probably best to connect the screen via a 0.01 micro-farad capacitor.

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.

#### Ground Compensated Outputs

The main outputs of the Series 200B are Ground Compensated, as already mentioned. When connecting a ground compensated output to an unbalanced destination, make sure that the cold lead is connected to earth at the DESTINATION end. The consideration for wiring the screen at only one end is not of such importance with a ground compensated output. (See MI2426)

#### 3.05 INTERFACE LEVELS

The Series 200B is normally supplied to be compatible with standard professional equipment ie. +4dBu (ref. 0.775 volt).

However, provision has been made to allow the user to operate with semi-professional tape machines etc. which operate at -10dBV (ref. 1.0volt).

The change in tape interface operating level is accomplished by reducing the console group output level and increasing the console monitor return gain by an equal amount.

This is easily achieved by pushing a switch, S5, located on the Output Module PCB. (Switch OUT for +4dBu, switch IN for -10dBV).

MIX OUTPUTS left and right may also interface to -10dBV by removing jumpers J1 and J2. -10dBV operation is also available on 2-track returns left and right, for 2-track return left REMOVE J3 and J4 and 2-track return right REMOVE J5 and J6. (See ED2251 Master Right-hand circuit diagram.)

To allow the Line Input to interface to -10dBV simply remove a link on the Input Module PCB. (See ED2183 - on the circuit diagram this is located just below the LINE switch). This link is located above Conn 1 and immediately left of RIC 1 on the input PCB.

POWER AMPLIFIERS are often rated at 300mV sensitivity for full output. In such cases, an attenuator should be installed at the input to the power amplifier to attenuate the +4dB level (1.228 volt) coming from the console, by approximately 10-15dB.

This may be achieved by using a 2.2kOhm series resistor and 680 Ohm shunt resistor across the amplifier's input.

### 3.06 FUSE RATINGS

220-240 volts AC the fuse should be 3.15 amps 20mm anti-surge.

100-120 volts AC the fuse should be 6.3 amps 20mm anti-surge.

BEFORE SWITCHING ON ALWAYS CHECK THAT THE VOLTAGE SELECTOR IS SET CORRECTLY AND THAT THE FUSE IS CORRECT.

#### 4.00 8-TRACK OPERATION

The Series 200B is particularly suited to 8-track recording, since it has a full 8-track monitoring section, 4 auxiliary sends and a lot of flexibility.

The following section contains some suggestions for methods of operation. When reading this section you may wish to refer to the signal flow diagrams, ED2224 and ED2227.

##### 1. Monitoring

The Series 200B is designed for both Loudspeaker monitoring and Headphone monitoring.

To monitor over loudspeakers simply connect the Control Room outputs (located on the output connection panel), to the inputs of your amplifier. It may be necessary to turn the monitor volume pot right down to avoid overloading the input to your amplifier, and in some cases it may be necessary to connect a stereo attenuator in between the two systems. Be sure to take care with earthing.

Try, wherever possible, to have only one earth point for your entire system, and NOT to have all your pieces of equipment earthed in separate places, which is almost guaranteed to give you mains hum: either 50 or 60Hz depending on where you live. (See wiring.)

##### 2. Recording - the first tracks

When laying the first tracks, you will normally have microphones plugged into the Input modules and then in turn you will want to route these to the 8-track machine. The routing switches may be used to send up to 4 tracks at one time. This is usually enough, but it is possible to record on more than 4 tracks at one time if required. For instance, you may only need to record 4 tracks, but would like to put the guide vocal on tape for reference.

To send more than 4 signals or groups of signals to the 8-track, you have 2 options: you may either use the auxiliary buses, if you are not currently using them for echo etc, OR you may take the signals direct from the insert points.

Using the auxiliary buses is a good option, since the auxiliary system is a very similar one to the groups. The circuitry is the same and there is an overall level control for each auxiliary bus, so that you could easily sum several signals and then have overall level control to tape. Effects and echo etc. are best added via the insert points if they are required, thus keeping the auxiliary sends free for recording any groups.

Using the insert points is not such an easy option, but probably a good one if you only need to send one signal and all the auxiliaries are being used. The insert send from the input module comes before the module fader, and so level control to tape will have to be done at the input to the multitrack. Note that the send on the insert socket is the ring of the stereo jack.

To monitor your sends to tape you normally use the level controls 1-4 on the monitor panel, making sure that the RET and SUB buttons are NOT pressed. This will allow you to listen to the 4 group sends from the console. The levels to tape are set via the 4 group faders, the rotary controls 1-4 do not affect the level to tape, only the level to the monitors/headphones.

It is probably best to send to the first 4 tracks recorded to tracks 5-8 (1-4 and 5-8 are usually paralleled - the switching done on the multitrack remote), so that monitoring becomes clearer during overdub.

If you are recording more than 4 tracks in one go or do not send to tracks 5-8 first you will have to control your monitoring statuses from the multitrack remote - see below.

### 3. Overdubbing

When you have recorded the first 4 (or less) tracks, you will need to listen to them back. To do this you just use the rotary controls 5-8, if you have recorded your first tracks on 5-8. Then when you add the next 4 tracks, these correspond to group faders 1-4.

When you send out groups 1-4 (either together or individually) you monitor via rotary controls 1-4, and when you need to listen back to a particular track press the respective RET button.

#### 4. Using the Multitrack controls

If your session involves complications such as repeated overdub, track-bouncing, or recording more than 4 tracks at once, then it is probably best to use the multitracks own controls to determine your monitor status.

Press the 4 RET buttons and from then on the 8 rotary controls form a mix of all 8 outputs from the machine at any one time. When laying a track or tracks, switch the relevant channel(s) to INPUT for laying them and switch them to OUTPUT for listening or overdubbing. (Remember to make sure you are in Sync during all track laying).

#### 5. Progressing towards Mix

As your session progresses, the number of tracks being sent to at any time usually becomes no more than two, and the number of input channels being used also reduces. Assuming that you have enough input modules which are unused, you can start preparing for your mix as you overdub. You may not necessarily mix straight away, but it is often useful to monitor via the Input modules so that EQ may be used and more than one auxiliary send accessed.

Plug the outputs from the 8-track into 8 input modules, (1-8 if possible for simplicity - they may already be plugged in permanently - see connectors and wiring), and turn down all the rotary controls 1-8.

The most straightforward method of obtaining a Mix is to simply select MIX on the routing matrix of the input channels, this routes the signal directly to the main Mix bus. However, should the operator not want to use the mix bus there is another, more complex, method of obtaining a stereo mix.

Reserve one of the pairs of groups for sending to the multitrack, and then route all the other input modules to the other pair. Say, for example, that 3-4 will be used to send to the multitrack, and 1-2 will now form the monitor mix.

Press SUB above faders 1 and 2, set them to unity gain 0dB, and pan 1 hard left and 2 hard right. This pair of faders is now feeding the stereo mix bus and, consequently, the monitor/headphone output.

Now your monitoring can be done via the 8 input modules corresponding to the 8 tracks and the Input/Output status is controlled at the machine. When overdubbing is complete, you are already set up for Remix.

## 6. Mixing down

Connections and switching for mixing down has already been described above, and it should be noted that the monitor channels 5-8 may be used as effects returns as they directly access the stereo mix bus via their pan pots and respective level controls.

It is also possible to use monitor channels 1-4 as effects returns. This may be simply achieved by selecting SUB, which then routes the signal present in the monitor channels directly to the mix bus. Selecting SUB overrides the rotary control but this is not redundant. If RET is selected the VOL controls the signal from the appropriate tape return socket and routes it to the group below. This additional signal may be regarded as a separate input with level control and aux send BUT it can only access one group. ie. for return 1, group 1. If two of these channels, say 1 and 2, were used they can only feed left and right respectively and, therefore, are ideal as a stereo echo return or similar.

The same rules would apply to rotary controls 3 and 4 if their RET and SUB buttons were pressed.

Note that the master faders control the send to the mixdown machine and also feed the monitors/headphones.

The monitor/headphone outputs then have a separate level control and amplifier, but you will not hear anything unless the master faders are up or the 2T button is pressed. 2T feeds the outputs from your mixdown machine directly to the monitor/headphone output.

#### 4.01 P.A. APPLICATIONS

The Soundcraft Series 200B is also suitable for live sound work, either;

- a) providing stage foldback for musicians
- OR
- b) as the front of house desk in a small set up.

To use the Series 200B as a monitor console all instruments are connected to the console via microphones or D/I boxes, in the usual way. Each output would then be assigned to one or more monitor loudspeaker on the stage.

eg. Mix L and R output might feed the sidefills whilst Groups 1-4 may be used to feed the individual musicians monitors.

The Auxiliaries may also be used if more than 6 monitor sends are required.

Should the operator wish to use Effects devices on the foldback then Returns 5-8 may be used to feed the main mix outputs OR, when RET and SUB are pressed on Returns 1-4 signal from Tape Returns 1-4 can access the 4 groups and the Mix outputs.

The operator's monitor is provided by the Phones output.

When used in a small P.A. system the main Mix outputs of the Series 200B can provide the sends for the main PA. Effects Returns can be routed to the mix bus either by using Returns 5-8 OR by selecting RET and SUB on Returns 1-4.

Should the Series 200B be required to provide both the main PA sends and foldback sends then the main mix outputs provide the front of house PA whilst the Auxiliaries may be used to provide the foldback sends, taking the signal for the foldback from the Auxiliary outputs. Using the Auxiliaries for foldback sends allows the Returns to be used for FX Returns on the main PA.