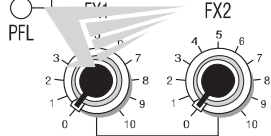
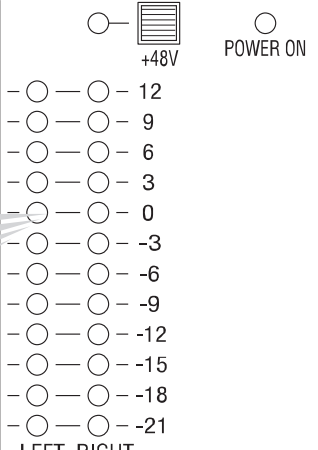
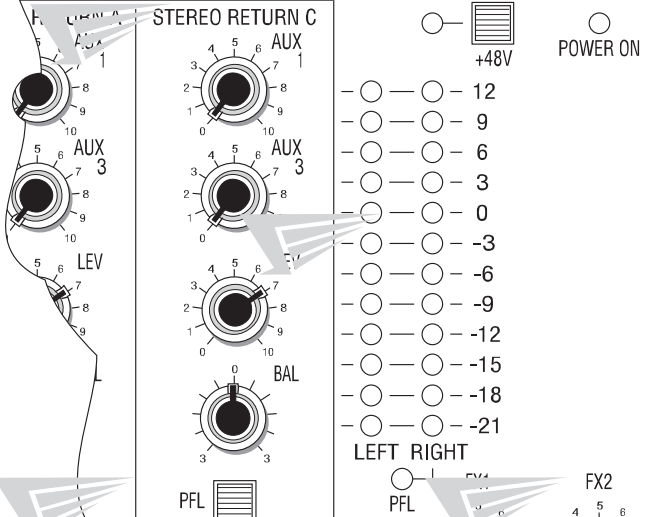




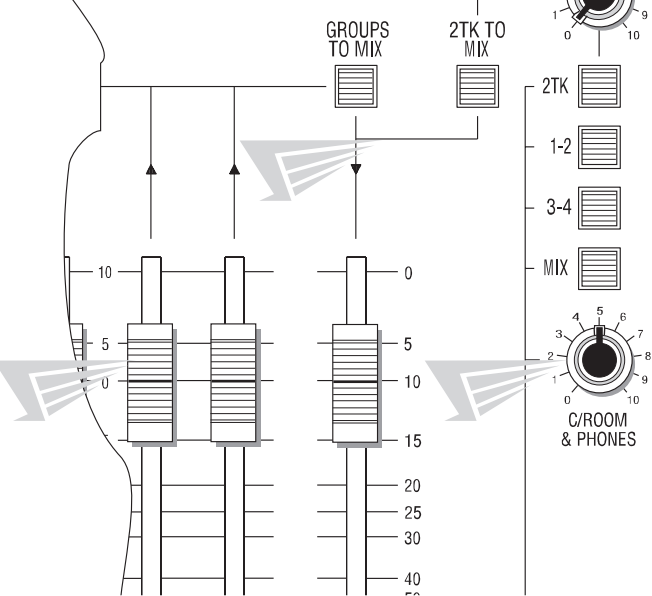
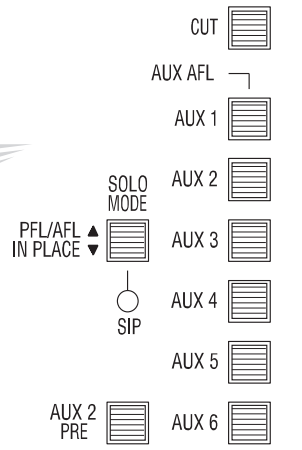
SPIRIT FOLIO RAC PAC



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SPIRIT FOLIO RAC PAC

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SPIRIT FOLIO RAC PAC

PRODUCT GUIDE

S 3 4 MIX

INTRODUCTION

Thank you for buying a **SPIRIT FOLIO RAC PAC** mixer, brought to you with pride by the **SPIRIT** team of Peter, Graham, Martin, Ian, Stuart, Peter, George, Colin, James, Chris, Mukesh, Andy, Candy and Simon. We hope you have as much fun as we did!

Owning a **SPIRIT** console brings you the expertise and support of one of the industry's leading manufacturers and the results of over 20 years experience supporting some of the biggest names in the business.

Built to the highest standards using quality components, **FOLIO RAC PAC** is designed to be as easy to use as possible, but some time spent **NOW**, looking through this manual and getting to know your new mixer will give you lots of helpful tips and confidence, away from the pressures of an important session. Don't be afraid to experiment to find out how each control affects the sound - this will only extend your creativity and help you to get the best from your mixer.

SAFETY PRECAUTIONS

For your own safety and to avoid invalidation of the warranty please read this section carefully.

The FOLIO RAC PAC desk must only be connected through the Power Supply Unit supplied.

The wires in the mains lead are coloured in accordance with the following code:

Green and Yellow:	Earth
Blue:	Neutral
Brown:	Live

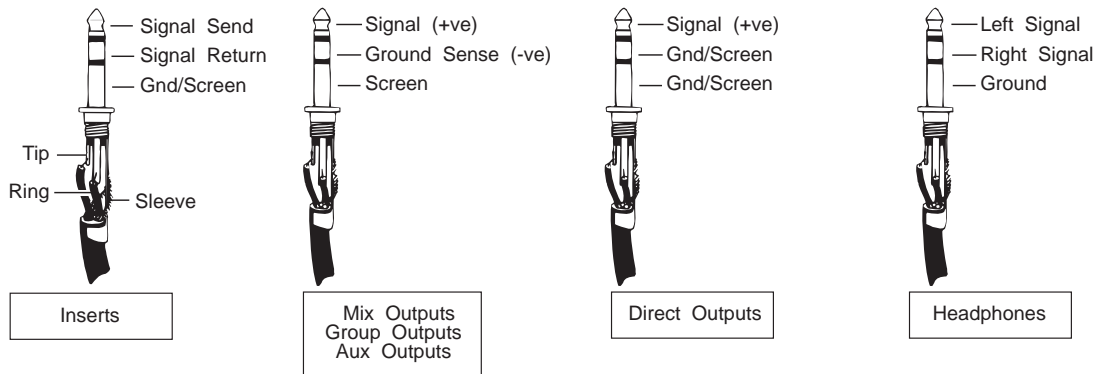
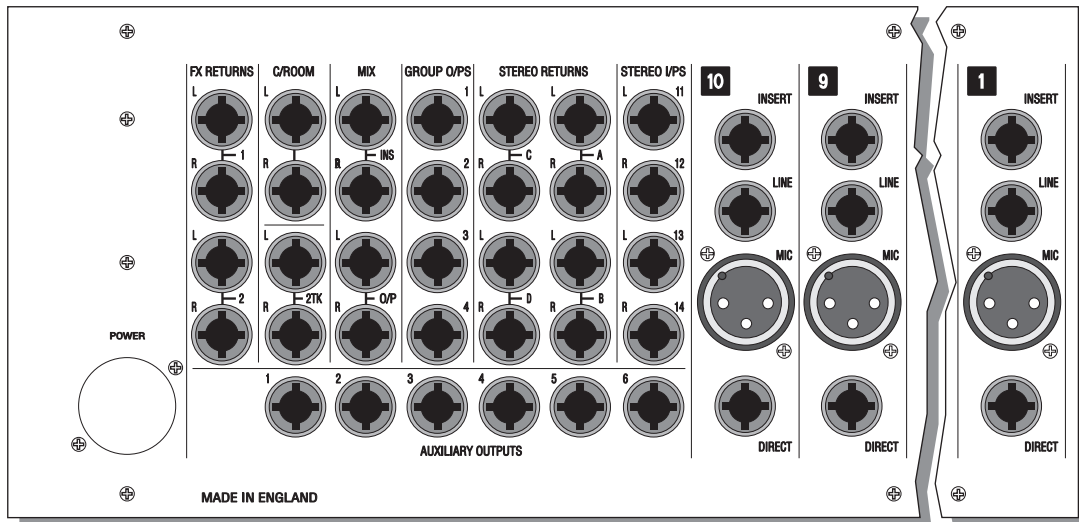
As the colours of the wires in the mains lead may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:

- The wire which is coloured Green and Yellow must be connected to the terminal in the plug which is marked with the letter E or by the earth symbol.
- The wire which is coloured Blue must be connected to the terminal in the plug which is marked with the letter N or coloured Black.
- The wire which is coloured Brown must be connected to the terminal in the plug which is marked with the letter L or coloured Red.

Ensure that these colour codings are followed carefully in the event of the plug being changed.

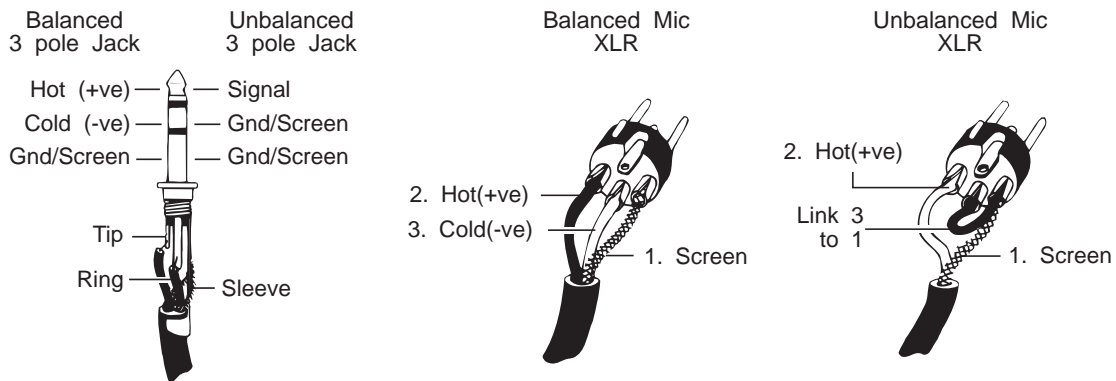
The power supply contains no user-serviceable parts. Refer all servicing to a qualified service engineer, through the appropriate Soundcraft dealer.

CONNECTORS

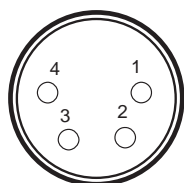


INPUTS, 2 TRACK RETURNS & FX RETURNS

(Note: All inputs are balanced, but unbalanced sources may be used as shown)



POWER CONNECTOR PINOUTS



(viewed from cable end)

Pin 1	20V AC
Pin 2	n/c
Pin 3	0V
Pin 4	20V AC

CONNECTIONS - INPUT CHANNELS

STEREO INPUTS

These BALANCED inputs are similar to the Line inputs, and can be used as additional sources for keyboards, drum machines or as returns from processing units. Mono sources can be fed to both paths by plugging into the Left jack only.

MIC INPUT

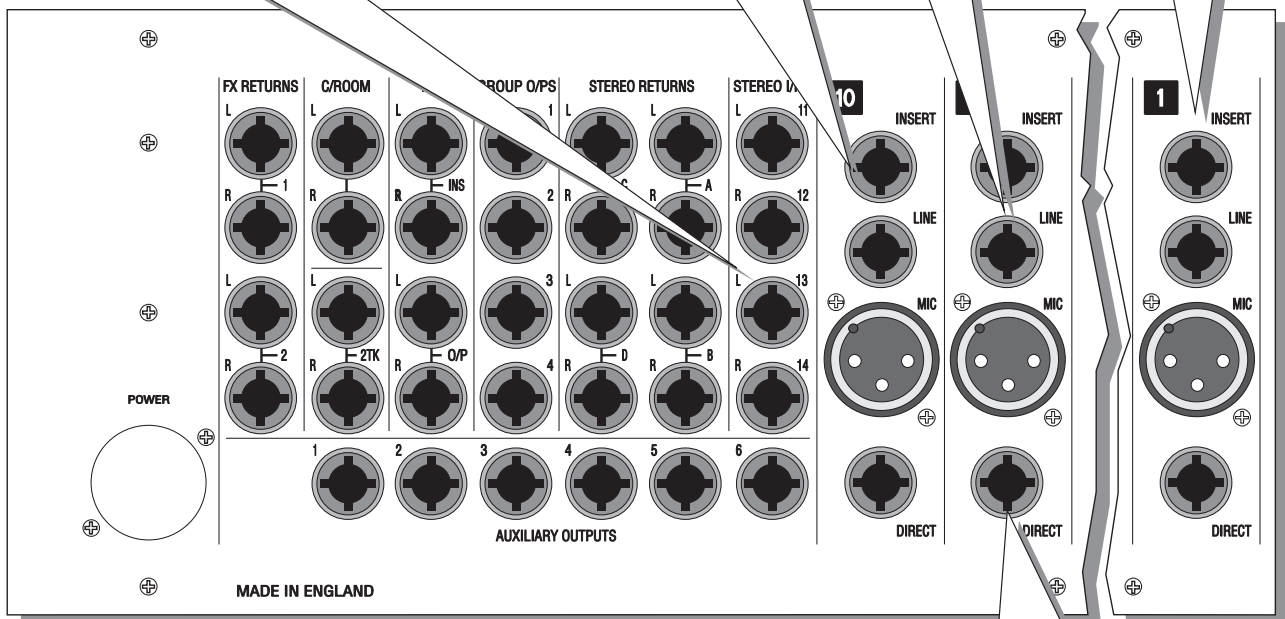
The mic input accepts XLR-type connectors and is designed to suit a wide range of BALANCED or UNBALANCED low-level signals. Professional dynamic, condenser or ribbon mics are best because these will be LOW IMPEDANCE and therefore offer best noise immunity. 48V PHANTOM POWER can be supplied to all sockets by pressing the switch on the front panel. Unplug any mics if you want to use the corresponding LINE input to avoid the load presented by the mic affecting the Line input gain.

INSERT

External effects processors connected here are 'inserted' into the signal path, after the High Pass Filter and before the EQ section. The Insert is bypassed except when a plug is inserted.

LINE INPUT

Use the LINE input for sources other than mics, such as keyboards, drum machines or guitars. The input is BALANCED for low noise and immunity from interference, but you can use unbalanced sources (see later in this manual for wiring details) although you should keep cable lengths as short as possible to minimise interference pickup on the cable. Unplug anything in the MIC input if you want to use this socket.



CHANNEL DIRECT OUTPUT

This independent output comes after the channel fader but is unaffected by the routing switches or PAN control. It is therefore an ideal source for external processing units or to send directly to the tracks of a tape machine for multitrack recording.

CONNECTIONS - MASTER SECTION

FX RETURNS

Two UNBALANCED stereo FX Returns are a good place to connect Effects Units to bring the treated signal back into the mix without using up valuable input channels.

CONTROL ROOM OUTPUTS

Connect your monitor amplifier and loudspeakers here to listen to the selected monitor source. Plugging headphones in the front panel jack breaks the signal to these sockets.

MIX INSERTS

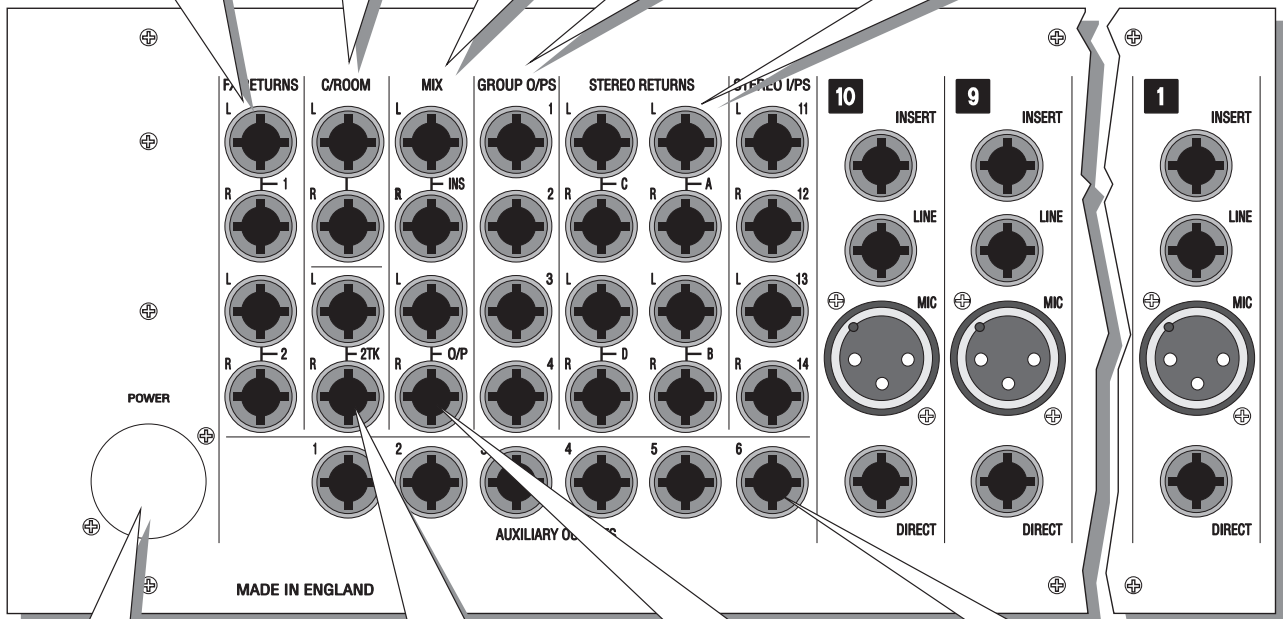
External effects processors connected here are 'inserted' into the signal path, before the fader. The sockets are bypassed except when a jack is inserted.

GROUP OUTPUTS

The output of each Group is available at these sockets as a ground compensated signal to directly feed amplifiers, tape tracks for recording

STEREO RETURNS

Four UNBALANCED Stereo Returns are a good place to connect Effects Units or tape outputs without using up valuable input channels. Between the four Returns it is possible to feed any Group or the mix and a choice of three auxiliary sends.



POWER INPUT

Connects to the Rac Pac Power Supply.

2 TRACK RETURN

The UNBALANCED 2 Track return is a stereo input intended for the connection of tape machine outputs but can also be used as an additional stereo input feeding to the mix if required.

MIX OUTPUT

Ground compensated output amplifiers feed Mix Left and Right to these jacks.

AUXILIARY OUTPUTS

Individual ground compensated output jacks for each of the six Auxiliary Sends.

INITIAL SETTING UP

You will probably use your **SPIRIT FOLIO RAC PAC** with a wide range of different types of sound source, and these will be at varying signal levels. It is important to set the GAIN of the inputs correctly to give the best performance.

Set up the individual Mono input channels as follows:

- Plug in the chosen source (usually the MIC input for mics and the LINE input for anything else). Plug in phantom powered mics before switching the phantom power on. Set the channel fader fully down.
- Set the Group and Master Faders at '0' and GROUPS TO MIX pressed.
- Select MIX to C/Room & Phones.
- Check that SOLO MODE is released.
- Release the channel routing switches to route to Groups 1-2
- Provide the chosen source with a typical signal level and press the latching PFL button by the fader. The level of signal will be shown on the right-hand Bargraph Meter (the Left meter will be switched off when the PFL button is down).
- Adjust the input GAIN until the meter is just reaching the amber LED (0dB) at a typical maximum source level with a steady signal. If the source signal is rich in high-level transients (e.g. drums) a rather higher meter reading of +6/+9 will be needed to achieve an equivalent average level. This leaves enough headroom to cope with peaks in the signal without distortion.
- Adjust each input channel in the same way.
- If you find that you cannot set a reasonable level within the range of the GAIN control when using a MIC input on the Mono channels, try the LINE input instead.

Stereo inputs 11-14 do not have a GAIN control, since the typical source for these inputs will be external tape machines or effects units which have a much more predictable signal level. Set the +4/-10 switch to +4 (released) initially, and check the input level with the PFL switch as described above. If the level is too low, switch to the -10 input setting.

You will now have initial settings for each of the input sources and are ready to start building a mix.

- Connect your power amplifiers and speakers and set the gain of the amplifiers to about 70%.
- Move the individual channel faders gradually to the required working level, listening carefully for any hint of feedback or overload. You may find that the input gain settings will need to be edged back slightly as the mix is built up.
- Listen carefully for the characteristic sound of 'feedback'. If you cannot achieve a satisfactory input level setting without feedback, adjust microphone and speaker positions and try again.

Careful microphone placement and the choice of a suitable type of microphone is important for vocals. The aim should be to place the microphone as close as possible to the source, to cut out unwanted surrounding sounds. This allows a lower gain setting on the mixer and helps to avoid feedback. You will also find that a well-placed microphone will not need any appreciable equalisation.

SETTING UP FOR RECORDING

While the connections to the **FOLIO RAC PAC** for PA work are quite straightforward, recording is rather more demanding because the mixer is not only required to mix down input signals but also to provide a monitor mix for artists to hear previously recorded tracks when overdubbing new parts. Two typical set-ups are as follows:

STEREO RECORDING TO DAT

- Connect input sources and set gain as described above. Route the channels via the groups to Mix. Connect the Mix L/R outputs to the tape inputs.
- Connect the tape outputs to the 2TK Returns. Set the level control on these returns at zero.
- Connect a monitor amplifier for foldback headphones or a monitor speaker to the Aux 1 output. Set the amplifier volume to a normal listening level.
- Use the Aux 1 send controls on the tape channels to set up a mono monitor mix. (make sure that all other Aux 1 controls are fully off)
- If a compressor is to be used on an individual source, connect this to the channel insert point.
- Connect any effects required using Aux 2-6, and return them to the mix on the FX Returns or unused Stereo Returns to allow the effect to be balanced with the original source.

It is important to match the input and output levels of your mixer and recording device to avoid distortion and create the best recording.

- Set the recording level as recommended for your recording device, feeding a suitable signal from the Group or Mix outputs.
- Monitor the signal going to the recorder by selecting the appropriate source on the C/Room & Phones source select switches. Gradually increase the 2TK return level control while alternately switching between the monitor source and 2TK until no change in level is detected.

8 TRACK RECORDING

- Connect input sources and set gain as described above. Set the C/Room & Phones source to MIX.
- Check that the GROUPS TO MIX button is released.
- Connect the direct outputs on the eight required channels to the recorder inputs.
- Connect a monitor amplifier for foldback headphones or a monitor speaker to the Aux 1 or Aux 2 (set PRE) output. Set the amplifier volume to a normal listening level.
- If a compressor or other effect is to be used on an individual source, connect this to the channel insert point.
- Connect the recorder outputs to the 4 stereo returns. Route the returns to MIX. Alternatively, if only one or two tracks are being recorded, the machine outputs could be brought back to spare mono inputs and routed to a group for monitoring.

The C/Room & Phones will now be listening to the monitor mix, or, if selected to Groups will carry the source mix. Note that the balance of these mixes will be essentially the same.

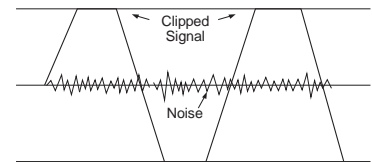
This configuration allows a very high quality recording to be made, with the signal passing through the shortest signal path. The mixer may be reconfigured for a separate mix-down session to a stereo master at a later date.

THE CONTROLS IN DETAIL

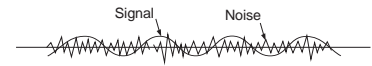
MONO INPUT CHANNELS 1-10

1 TRIM

The TRIM control sets how much of the source signal is sent to the rest of the mixer. Too high, and the signal will distort as it overloads the channel and causes clipping. Too low, and the level of any background hiss will be more noticeable and you may not be able to get enough signal level to the output of the mixer. This is shown in the diagram on the right:



If the signal level is too high, clipping distortion may occur.



If the signal level is too low it may be masked by the noise.

Setting the knob to the "+4U" mark gives unity gain on the LINE input for nominal +4dBu sources, which will be suitable for most professional equipment. Note that some sound equipment, particularly that intended for semi-professional use, operates at a lower level (-10dBV) and will therefore need a higher gain setting to give the same output level. A second point marked "-10U" indicates the unity gain setting for -10dBV sources.

See "Initial Setting Up" to learn how to set the GAIN correctly.

MIC INPUT

The mic input accepts XLR-type connectors and is designed to suit a wide range of BALANCED or UNBALANCED low-level signals, whether from delicate vocals requiring the best low-noise performance or close-miked drum kits needing maximum headroom. Professional dynamic, condenser or ribbon mics are best because these will be LOW IMPEDANCE. While you can use low-cost HIGH IMPEDANCE mics, you do not get the same degree of immunity to interference on the microphone cable and as a result the level of background noise may be higher. If you turn the PHANTOM POWER on (top right-hand side of the mixer) the socket provides a suitable powering voltage for professional condenser mics.

DO NOT use unbalanced sources with the phantom power switched on. The voltage on pins 2 & 3 of the XLR connector may cause serious damage.

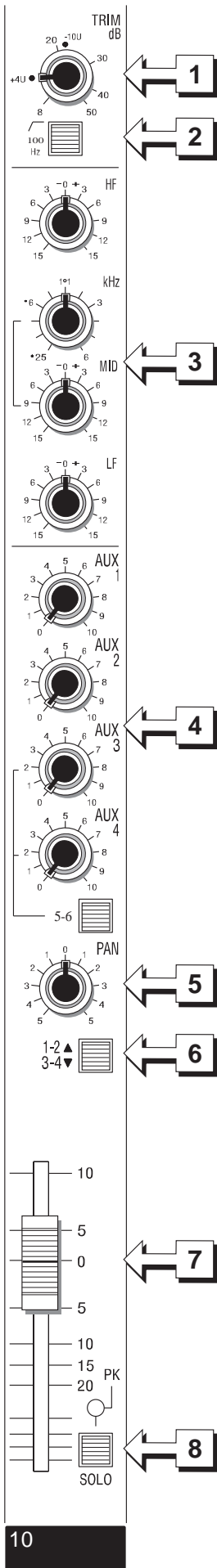
Unplug any mics if you want to use the corresponding LINE Input to avoid the load presented by the mic from affecting the Line Input gain.

LINE INPUT

Accepts 3-pole 'A' gauge (TRS) jacks. Use this input for sources other than mics, such as keyboards, drum machines, synths, tape machines or guitars. The input is BALANCED for low noise and immunity from interference, but you can use UNBALANCED sources by wiring up the jacks as shown in the "Connectors" section earlier in this manual, although you should then keep cable lengths as short as possible to minimise interference pick-up on the cable. Unplug anything in the MIC input if you want to use this socket.

2 100HZ HI-PASS FILTER

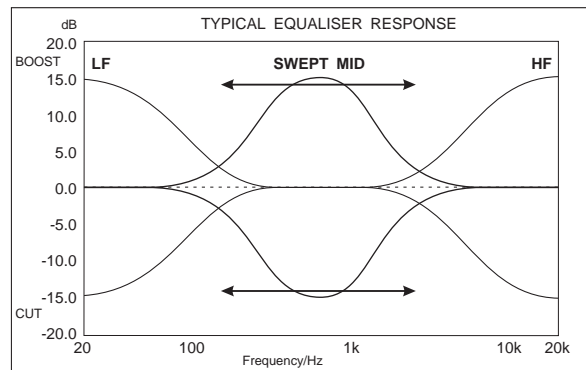
Pressing this switch reduces the level of bass frequencies only, and is a real bonus for such a small mixer. Use this in live PA situations to reduce stage rumble or 'popping' from microphones.



10

3 EQUALISER

The Equaliser (EQ) allows precise manipulation of the sound, particularly to improve the sound of microphone sources where the original signal is often far from ideal due to poor acoustics or restrictions on where to place microphones and where slight boosting or cutting of particular voice frequencies can really make a difference to clarity. The EQ allows enough control to improve, for instance, bad recordings or the precision to gently enhance vocal or live instrument tracks. There are three sections, HF, MID and LF giving the sort of control usually only found on much larger mixers. The EQ knobs can have a dramatic effect, so use them sparingly and listen carefully as you change any settings so that you get to know how they affect the sound.



The EQ allows enough control to improve, for instance, bad recordings or the precision to gently enhance vocal or live instrument tracks. There are three sections, HF, MID and LF giving the sort of control usually only found on much larger mixers. The EQ knobs can have a dramatic effect, so use them sparingly and listen carefully as you change any settings so that you get to know how they affect the sound.

HF EQ

Turn to the right to boost high (treble) frequencies by up to 15dB at 12kHz, adding crispness to cymbals, vocals and electronic instruments. Turn to the left to cut these frequencies by up to 15dB, reducing hiss or over-emphasis of high-frequency consonants, which can occur with certain types of microphone. Set the knob in the centre-detented position when a flat response is required.

MID EQ

There are two knobs which work together to form a SWEPT MID EQ. The lower knob provides 15dB of boost and cut, just like the HF EQ knob, but the frequency at which this occurs can be set by the upper knob over a range of 250Hz to 6kHz. This allows some truly creative improvement of the signal in live situations, because this mid band covers the range of most vocals. Listen carefully as you use these controls together to find how particular characteristics of a vocal signal can be enhanced or reduced. Set the lower knob to the centre-detented position when not required.

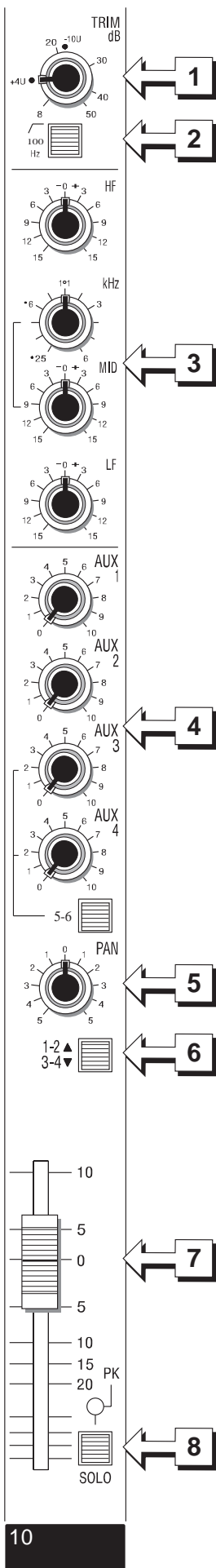
LF EQ

Turn to the right to boost low (bass) frequencies by up to 15dB at 60Hz, adding warmth to vocals or extra punch to synths, guitars and drums. Turn to the left to cut low frequencies by up to 15dB for reducing hum, stage rumble or to improve a mushy sound. Set the knob to the centre-detented position when not required.

4 AUX SENDS

These controls route the input channel signal to any one or more of six Auxiliary which are used to set up separate mixes for FOLDBACK, EFFECTS or recording, and the combination of all the Aux Sends is mixed to the corresponding Aux Output at the rear of the mixer. The controls are specially chosen to give a particularly smooth and useful control range all round the scale while still maintaining nearly 90dB cut-off when turned anticlockwise.

Aux 1 is always PRE-FADE and pre-EQ which is ideal for Foldback or Monitor feeds where the send needs to be independent of the fader so that, for instance, the mix to artists headphones is not affected by changes in fader level.



Aux 3 and 4 are always POST-FADE, ideal for Effects where it is useful for the Aux Send to fade up and down with the fader. For flexibility, the Master Section AUX2 PRE switch allows you to switch AUX 2 from post- to pre-fade across the whole mixer as required.

Aux 5 & 6 are identical to Aux 3 & 4 and may be selected as an alternative by pressing the 5-6 switch.

Leave all of the knobs turned fully left when not in use.

5 PAN

This control sets the amount of the channel signal feeding the pairs of Groups, allowing you to move the source smoothly across the stereo image. When the control is turned fully right or left you are able to place the signal at unity gain to either Groups 2 & 4 or 1 & 3 respectively.

6 ROUTING

This switch selects either Groups 1 & 2 (switch released) or Groups 3 & 4 (switch pressed) as the destination for the channel signal after it has passed through the PAN control.

7 FADER

The linear FADER gives you smooth control of the overall signal level in the channel strip, allowing precise balancing of the various source signals being mixed to the Master Section. You get most control when the input GAIN is set up correctly, giving a normal fader position around the '0' mark, generous control range below and some gain in hand above the mark when you need that little bit extra. See the 'Initial Setting Up' section for help in setting a suitable signal level.

Note that the post-fader signal is available as a DIRECT OUTPUT from the channel to feed tape tracks or other external equipment.

8 SOLO

The latching SOLO switch has two distinctive modes of operation, depending on the position of the master section SOLO MODE switch. When this switch is released (AFL/PFL) all channel SOLO switches function as PFL (Pre-Fade-Listen). When SOLO MODE is pressed (IN PLACE) all SOLO switches become a SOLO-IN-PLACE facility.

In PFL/AFL mode, pressing the SOLO switch feeds the pre-fade channel signal to the monitor output, headphones and Right Bargraph Meter, replacing the selected source. You use this switch to listen to a channel signal without affecting the mixer outputs, to check the signal quality or simply to check that it is there!

In SOLO mode, pressing one or more channel SOLO switches mutes all other channels leaving the selected channels alone in the mix. The Stereo Returns or FX Returns are not muted, and this allows the selected channels to be monitored in their true stereo position, including any effects which may have been added.

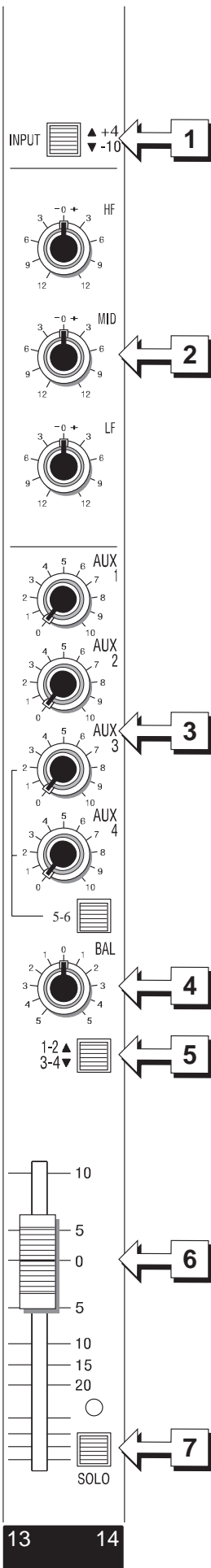
The associated PEAK LED indicator normally warns when an excessively high signal level is present in the channel. The signal is sampled just after the EQ section and the LED will light approximately 4dB before clipping. This point is post-insert, and will therefore take into account the effect of any equipment connected to the Insert jack.

When the SOLO switch is pressed the LED lights continuously to show which channels are being monitored.

STEREO INPUT CHANNELS 11-14

These inputs accept 3-pole 'A' gauge (TRS) jacks. Use these inputs for sources such as keyboards, drum machines, synths, tape machines or as returns from processing units. The inputs are **BALANCED** for low noise and immunity from interference, but you can use **UNBALANCED** sources by wiring up the jacks as shown in the "CONNECTIONS" section earlier in this manual, although you should then keep cable lengths as short as possible to minimise interference pick-up.

If you wish to use the channel with a mono source, plugging into the Left jack automatically feeds the source to both sides of the channel.



1 INPUT +4/-10

Most professional equipment uses input and output levels of +4dBu, but semi-professional tape machines or hi-fi systems use a lower level of -10dBV. This switch allows you to match the sources connected to the Stereo input jacks to either standard, which is important to ensure the best possible sound quality. If you are not sure which input level is appropriate, start with the switch UP to select +4dBu. If you are unable to achieve an adequate signal level (even with the fader at maximum), press the switch in for -10dBV.

2 EQUALISATION

HF EQ

Turn to the right to boost high (treble) frequencies, adding crispness to percussion from drum machines, synths and electronic instruments. Turn to the left to cut these frequencies, reducing hiss or excessive brilliance. Set the knob in the centre-detented position when not required. The control has a shelving response giving 12dB of boost or cut at a fixed frequency of 12kHz.

LFEQ

Turn to the right to boost low (bass) frequencies, adding extra punch to synths, guitars and drums. Turn to the left to reduce hum, boominess or improve a mushy sound. Set the knob to the centre-detented position when not required. The control has a shelving response giving 12dB of boost or cut at a fixed frequency of 60Hz.

3 AUX SENDS

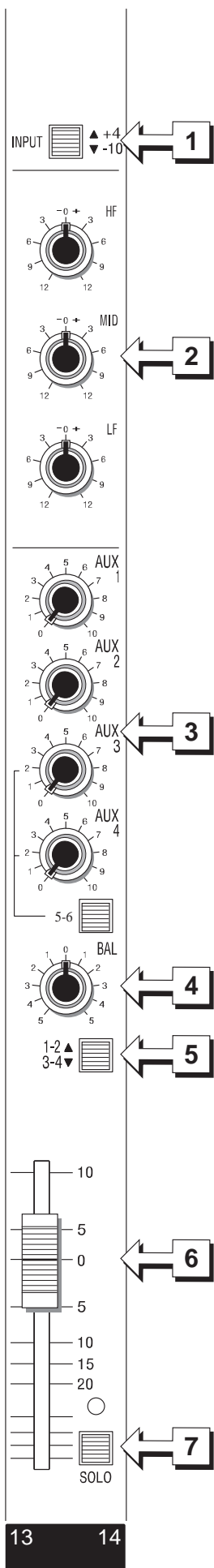
These controls route a mono sum of the channel signal to any one or more of six Auxiliary which are used to set up separate mixes for FOLDBACK, EFFECTS or recording, and the combination of all the Aux Sends is mixed to the corresponding Aux Output at the rear of the mixer. The controls are specially chosen to give a particularly smooth control range at the lower end of the scale where it is most needed - quite unique on a mixer of this type.

Aux 1 is always **PRE-FADE** which is ideal for Foldback or Monitor feeds where the send needs to be independent of the fader so that, for instance, the mix to artists headphones is not affected by changes in fader level.

Aux 3 and 4 are always **POST-FADE**, ideal for Effects where it is useful for the Aux Send to fade up and down with the fader. For flexibility, the Master Section **AUX2 PRE** switch allows you to switch AUX 2 from pre- to post-fade across the whole mixer as required.

Aux 5 & 6 are identical to Aux 3 & 4 and may be selected as an alternative by pressing the 5-6 switch.

Leave all of the knobs turned fully left when not in use.



4 BALANCE

This control sets the amount of the channel signal feeding the pairs of Groups, allowing you to balance the source in the stereo image. When the control is turned fully right or left you feed only that side of the signal to the Groups selected by the Routing switch (see below).

5 ROUTING

This switch selects either Groups 1 & 2 (switch released) or Groups 3 & 4 (switch pressed) as the destination for the channel signal after it has passed through the BAL control.

6 FADER

The linear FADER gives you smooth control of the overall signal level in the channel strip, allowing precise balancing of the various source signals being mixed to the Master Section. It is important that the input level is set correctly with the +4/-10 switch to give maximum travel on the fader which should normally be used at around the '0' mark. See the 'Initial Setting Up' section for help in setting a suitable signal level.

7 SOLO

The latching SOLO switch has two distinctive modes of operation, depending on the position of the master section SOLO MODE switch. When this switch is released (AFL/PFL) all channel SOLO switches function as PFL (Pre-Fade-Listen). When SOLO MODE is pressed (IN PLACE) all SOLO switches become a SOLO-IN-PLACE facility.

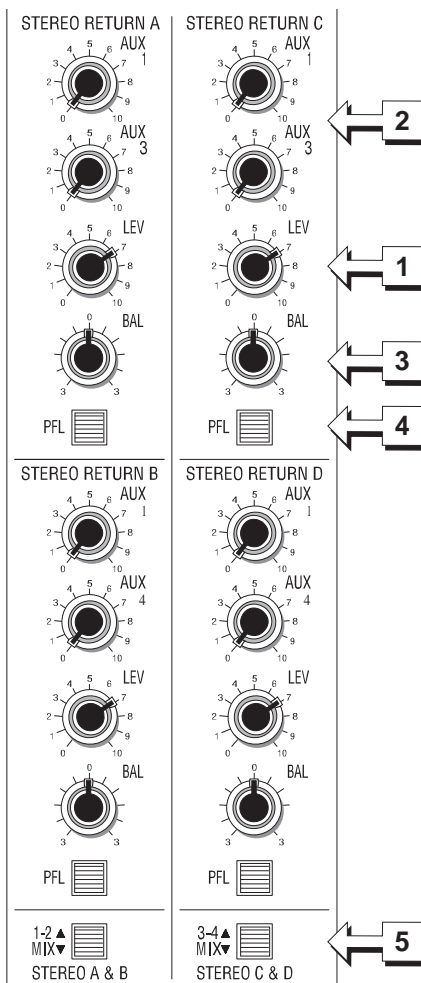
In PFL/AFL mode, pressing the SOLO switch feeds a mono sum of the pre-fade channel signal to the monitor output, headphones and Right Bargraph Meter, replacing the selected source. You use this switch to listen to a channel signal without affecting the mixer outputs, to check the signal quality or simply to check that it is there!

In SOLO mode, pressing one or more channel SOLO switches mutes all other channels leaving the selected channels alone in the mix. The Stereo Returns or FX Returns are not muted, and this allows the selected channels to be monitored in their true stereo position, including any effects which may have been added.

When the SOLO switch is pressed the associated LED lights continuously to show which channels are being monitored.

STEREO RETURNS

There are four Stereo Returns, which have similar controls but different routing configurations to provide the maximum flexibility. Each Return has an unbalanced stereo input on 3-pole 'A' gauge (TRS) jacks. If a mono source is to be used, plugging into the Left jack automatically feeds the signal equally to both sides of the Return.



1 LEVEL

The LEVEL control sets the overall signal level, and enough gain is available to match both +4dBu and -10dBV sources. Rotation clockwise increases the gain of the input.

2 AUXILIARY SENDS

Each Return may access Aux 1 (Pre-fade) and one of the post-fade sends. Returns A & C feed to Aux 3 and Returns B & D feed to Aux 4. The controls should be turned fully anticlockwise when not in use.

3 BALANCE

This control sets the amount of the channel signal feeding the pairs of Groups or Mix, allowing you to balance the source in the stereo image. When the control is turned fully right or left you feed only that side of the signal to the destination selected by the Routing switch (see below).

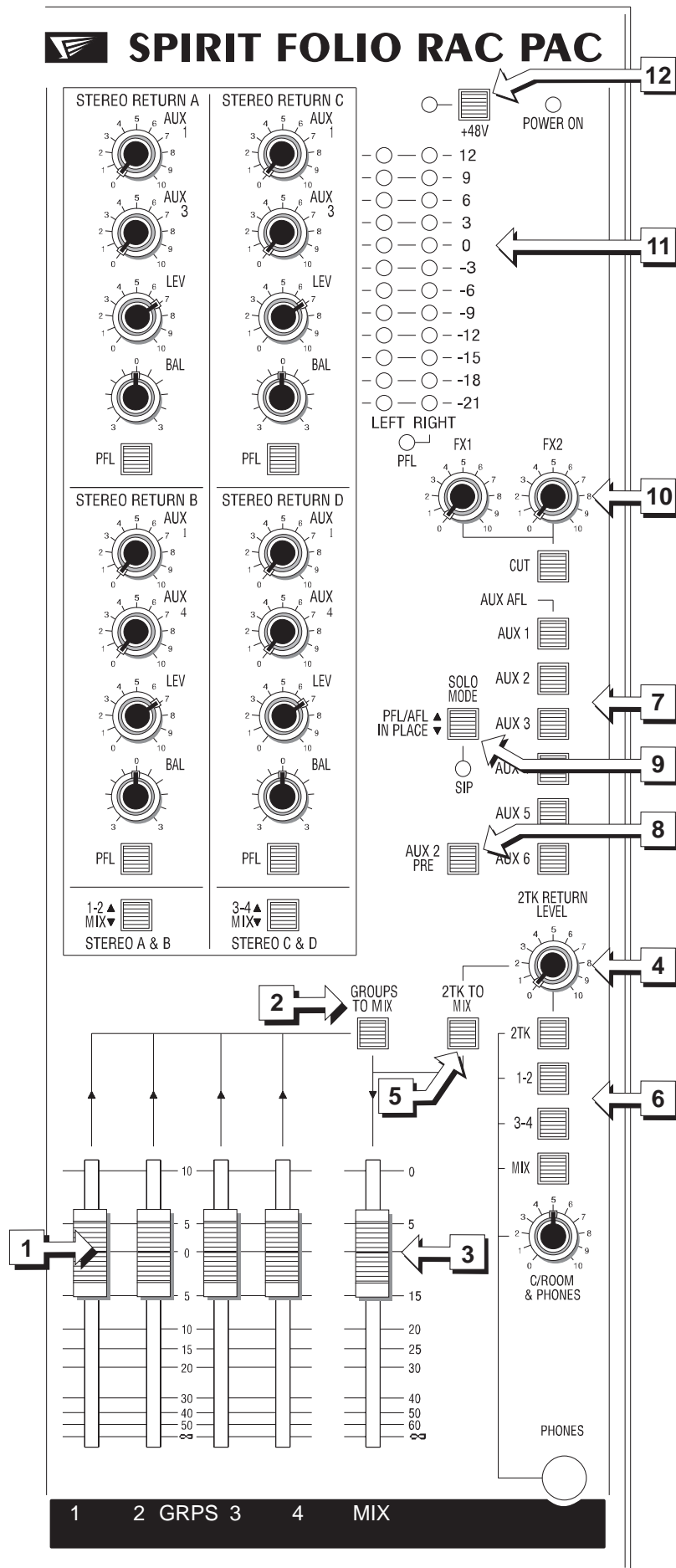
4 PFL

When the PFL (Pre-Fade-Listen) switch is pressed a mono sum of the pre-fade signal is fed to the headphones or monitor output, replacing the selected source. The PFL LED on the Master section illuminates to warn that the headphones, monitor and right bargraph meter are now responding to the PFL/AFL selection.

5 ROUTING

This switch selects either a pair of Groups (switch released) or Mix (switch pressed) as the destination for the Stereo Return signal after it has passed through the BAL control. Returns A & B route to Groups 1 & 2, and Returns C & D route to Groups 3 & 4. The left return signal feeds the odd-numbered Group or Mix Left, while the right return signal feeds the even-numbered Group or Mix Right.

SPiRiT FOLiO RAC PAC



MASTER SECTION

1 GROUP FADERS

Four Group FADERS set the overall level of the Groups, allowing the combined control of a selected number of input sources. The Groups may feed external equipment directly through the ground compensated Group output jacks, or may be mixed together to the stereo Mix output (see below). The faders should normally be set close to the '0' mark if the input GAIN settings have been correctly set, giving plenty of control below the mark and additional gain in hand if required.

2 GROUPS TO MIX

Pressing this switch routes all Groups to the main stereo Mix. Groups 1 & 3 feed Mix Left and Groups 2 & 4 feed Mix Right.

3 MIX FADER

A stereo fader controls the output level of the stereo Mix. The outputs are ground compensated 3-pole 'A' gauge (TRS) jacks. The Mix Left and Right signal paths have pre-fade INSERT points which provide a means of diverting the signal to an external processing unit such as a compressor or limiter. Inserting a jack into the insert breaks the signal path and allows the INSERT SEND (on the tip of the jack) to feed the input of the external unit and the INSERT RETURN (on the ring of the jack) to receive the corresponding output. Note that if the tip and ring of the jack are shorted together the signal path remains unbroken and the Insert may then be used as a way of tapping off the Mix signal before the fader.

4 2 TRACK (2TK) RETURN LEVEL

The unbalanced 2TK return jacks are an ideal place to connect the playback of a tape machine, without using up any of the LINE inputs. This control sets the level of playback signal fed either to the MIX (when 2TK TO MIX is pressed) or the headphones or monitor output, when 2TK is pressed. When set fully clockwise the inputs will be matched to -10dBV sources, or will suit a +4dBu source with the LEVEL control at a lower setting. A mono source may be fed automatically to both left and right by plugging into the Left return jack only.

The 2TK RETURN is also the best way of connecting a tape or CD player to feed pre-show music to a PA rig, since this leaves all input settings unaltered. It can also serve as the return from an Effects unit to save using up Line Inputs.

5 2TK TO MIX

Press this switch to route the 2TK RETURN signal directly to the mix outputs. Adjust the input level with the 2TK RETURN LEVEL control. The 2TK Return signal will now be present at the Mix outputs, at a level set by the Master Fader.

6 C/ROOM & PHONES SECTION

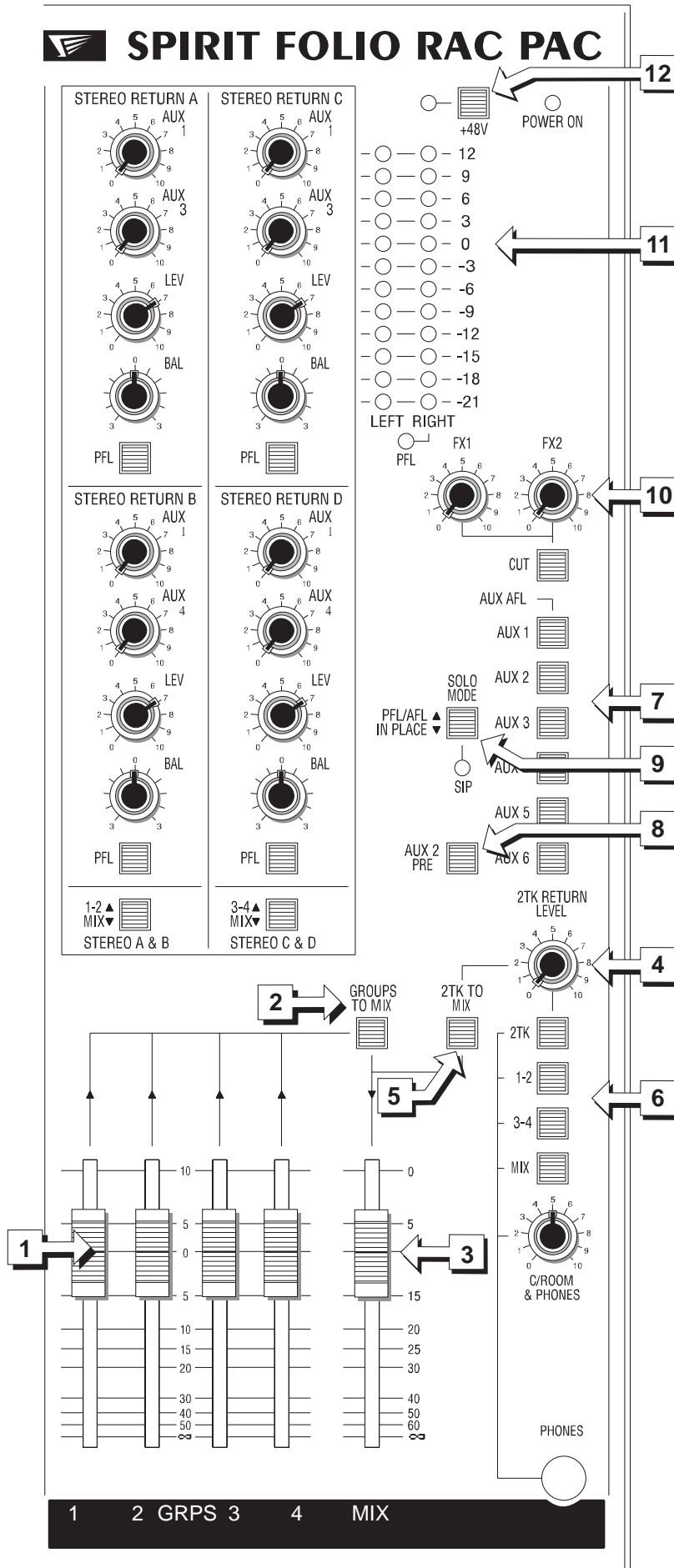
The rotary control sets the output level to the MONITOR LEFT & RIGHT outputs. If HEADPHONES are plugged into the PHNS jack the Monitor outputs are cut off, and the knob then sets the headphone listening level. When the PHONES are unplugged the Monitor output is restored.

The section may listen to a choice of sources: 2TK Return, Groups and Mix as selected on the four switches. The selected source is also displayed on the bargraph meters.

If any PFL or AFL switch is pressed the selected signal is replaced by the appropriate PFL or AFL signal, which will also be displayed on the right bargraph meter.



SPIRIT FOLIO RAC PAC



AUXILIARY MASTERS

The Master section houses the summing amplifiers for each of the Auxiliary Send , and feeds the signal via ground compensated output amplifiers to the Auxiliary Output jacks.

7 AUX AFL

The individual outgoing Aux signals may be monitored on the control room outputs or headphones by pressing the appropriate AFL (After-Fade-Listen) switch. The selected signal is also displayed on the right bargraph meter.

8 AUX 2 PRE

Aux 2 is normally post-fade, but for flexibility it may be switched to pre-fade by pressing the AUX 2 PRE switch. This simultaneously affects all Aux 2 sends across the mixer.

9 SOLO MODE

All channel SOLO switches are normally a non-destructive PFL (Pre-Fade-Listen). When SOLO MODE is pressed, SOLO-IN-PLACE mode is activated. If any channel SOLO switch is pressed the SIP LED will illuminate and all other channels (but not Stereo, FX or 2TK Returns) are cut, leaving the selected channel, complete with effects in the mix. While SOLO-IN-PLACE is active, if any PFL or AFL switch is pressed the C/Room & Phones and meters will silently switch over to monitor the selected signal, but the mix output will remain. Releasing the AFL/PFL re-instates the solo signal.

10 FX RETURNS

The unbalanced FX Return jacks are an ideal place to connect the output of an effects unit, without using up any of the LINE inputs. This control sets the level of the signal fed directly to the MIX. When set fully clockwise the inputs will be matched to -10dBV sources, or will suit +4dBu sources with the controls at a lower setting. A mono source may be fed automatically to both left and right by plugging into the Left return jack only. A CUT switch mutes both FX Returns if required.

11 BARGRAPH METERS

The three colour BARGRAPH METERS have a PEAK response and normally follow the Monitor selection, giving you a constant warning of excessive peaks in the signal which might cause overloading. The fast attack of the meters means that a signal with high level transients (e.g. kick drum) will tend to give a higher reading than a less dynamic signal (e.g. a synth) at the same level. You should therefore aim for an average reading of +6/+9 if the mix contains a high proportion of high level transients and a lower reading of around '0' for steadier signals with the Master Faders at about the '0' mark.

If the output level is too low and hardly registering at all on the meters, the level of background noise may become significant. In this case check that input levels and gain settings are correct (see the section -- Initial Setting Up)

When an AFL or PFL switch is pressed the selected meter signal is muted and the right meter will display the selected PFL/AFL signal.

N.B. The '0' position on the meters corresponds to +4dBu at the selected output.

12 PHANTOM POWER

Many professional condenser mics need PHANTOM POWER, which is a method of sending a powering voltage down the same wires as the mic signal. Press the switch to enable the +48V power to the MIC inputs on channels 1-10.

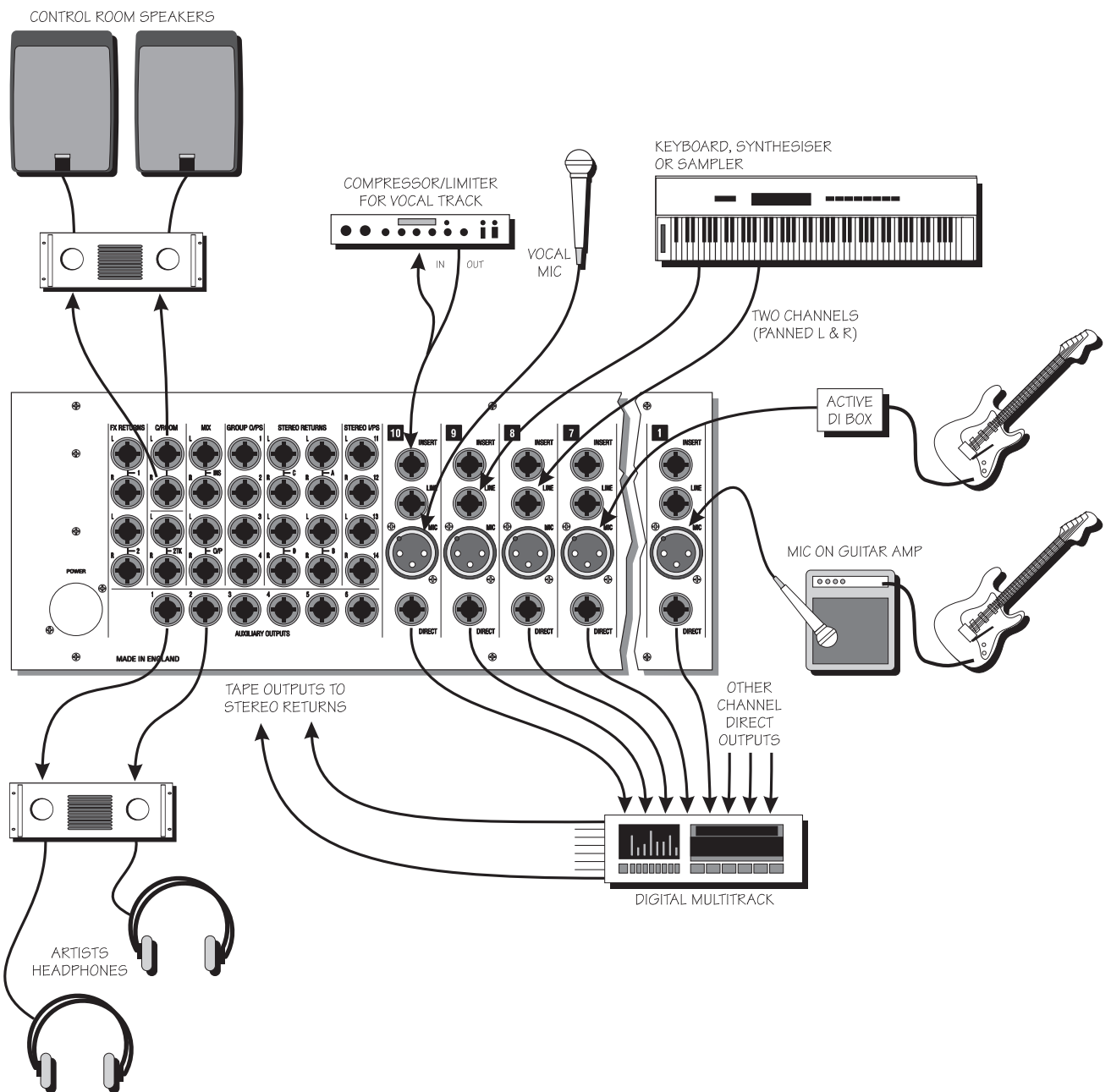
DO NOT turn on the phantom power when using unbalanced mics which may be damaged by the voltage applied to pin 2 & 3 of the mic input XLR.

Note: Mics should always be plugged in before switching the Phantom Power ON.

APPLICATIONS

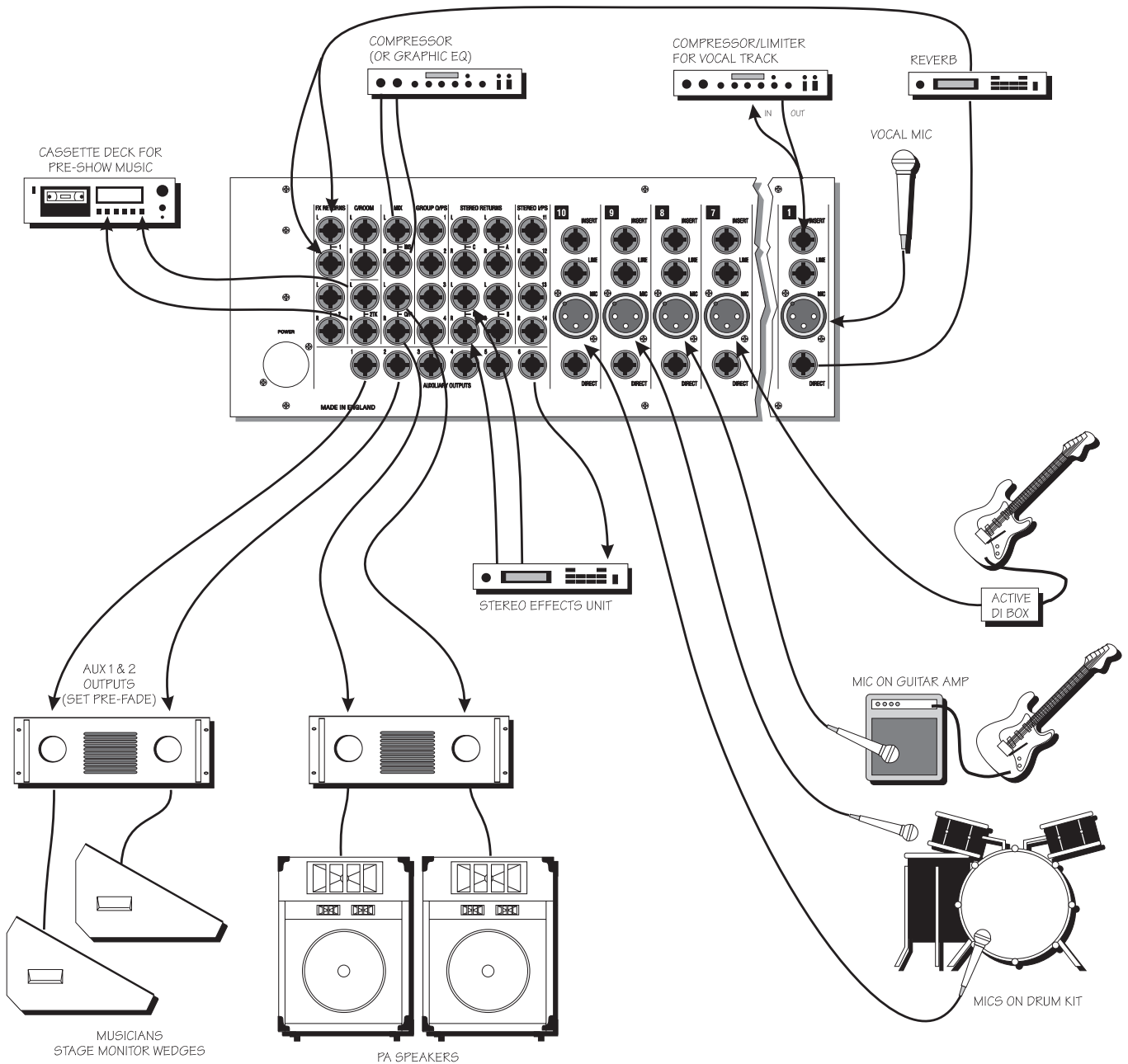
MULTITRACK RECORDING

This example illustrates how Rac Pac may be set up for multitrack recording to eight tracks. Individual instrument or vocal tracks are recorded on Digital Multitracks by connecting the channel Direct Outputs to the tape inputs. The outputs from the Multitrack are brought back on the Stereo Returns (or spare mono channels if only one or two tracks are being recorded). A compressor is included on the insert of one of the vocal channels. An Artists Phones mix is derived from Aux 1 (or Aux 2 selected pre-fade).



STEREO PUBLIC ADDRESS

In this basic PA set-up, various sources are connected to the inputs, microphones to Mic inputs and keyboards etc. to Line inputs. Note that some guitars will not produce sufficient level for a direct connection, and will require a Direct Injection (DI) box connected via the microphone input. The mic channel has a compressor/limiter included in the insert point and a feed to a reverb unit from the direct output. The reverb output is brought back to the mix on FX Return 1. The output is taken from Mix L & R and connected to the speakers via a suitable power amplifier. A compressor/limiter (or graphic equaliser if required) is included in the Mix Inserts, and a cassette machine connects to the 2TK Return to provide interval music. The Groups may be used to combine several inputs under the control of a single fader before mixing to the L & R outputs.

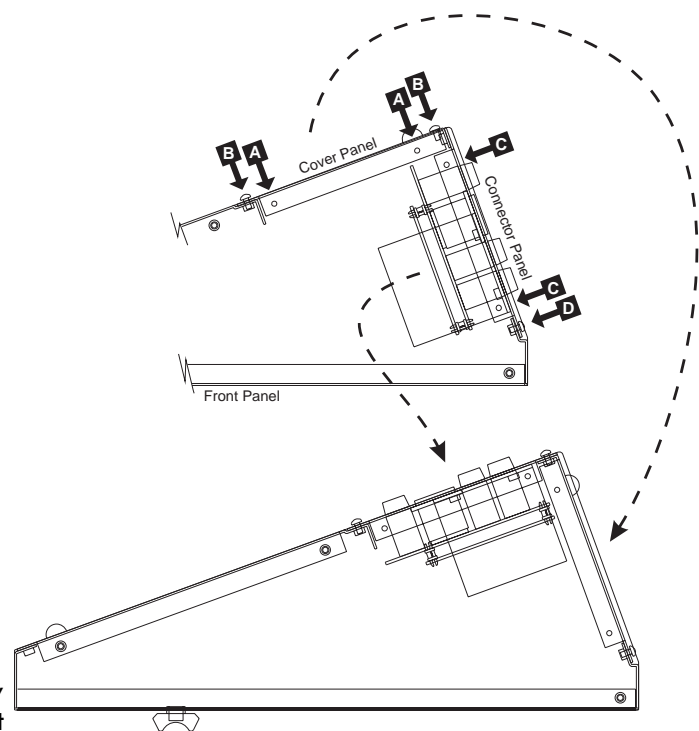


RELOCATING THE CONNECTOR PANEL

The connector panel is fitted as standard to the rear of the frame, allowing the mixer to be used as a free-standing, desktop unit. If the mixer is to be rack-mounted, it may be found more convenient to move the connector panel to the optional position in the base of the frame, opposite the front panel, giving rear access to connectors when fitted in the rack. A cover plate is mounted in the alternative position, and this is swapped with the connector panel in a straightforward procedure described below:

- 1 Carefully lay the mixer face down on a flat surface provided with some protective padding. During the following steps take care not to apply excessive pressure or damage the control knobs.
- 2 Using a cross-head screwdriver remove the four screws "A" (2 each side) fixing the cover plate through the side panels of the mixer.
- 3 Release the cover plate by next removing the six screws "B" fixing the plate to the base panel and connector panel. Lay the cover plate to one side.
- 4 Now remove the three screws "D" fixing the connector panel to the top edge of the mixer. The connector panel will still be supported by the fixings through the side panels.
- 5 Loosen the four screws "C" fixing the connector panel to the side panels. Now, supporting the connector panel with one hand, remove the four screws completely, freeing the panel.
- 6 Swapping the supporting hand, rotate the panel backwards, taking care not to strain or snag any of the ribbon cables, so that the bottom edge now rests on the flange of the base panel, and loosely fit the screws ("A", 4 off) once again through the side panels.
- 7 Pick up the cover plate and, turning it lengthways locate it in the position originally occupied by the connector panel. (Note that the cover plate has one flat edge, and one folded flange. The folded edge ALWAYS faces the back corner of the mixer.)
- 8 Loosely fit the four screws "C" through the side panels, three screws "D" at the top edge, and six screws "B" fixing the connector panel.
- 9 Once you are satisfied that the panels are seated correctly, tighten all screws firmly.

This completes the relocation of the connector panel. Simply reverse the procedure if you wish to return the panel to the original position.



TECHNICAL SPECIFICATION

OUTPUT NOISE

Typical Group Output, Input faders down	-87dBu
Group fader down	-92dBu
Mix output with groups routed to mix	-83dBu
Mix fader down	-98dBu

AUX NOISE

Typical, input sends down	-85dBu
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E.I.N.

150R source	-129dBu
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DISTORTION

Mic gain 30dB, to group output @ 14dBu	< 0.005%
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CROSSTALK @1kHz

Input fader attenuation (top to bottom)	>95dB
Aux send attenuation	>88dB
Adjacent channel	>92dB

FREQUENCY RESPONSE

20Hz - 20kHz	
Line input, via group, to mix output	+/-1dB

INPUT & OUTPUT IMPEDANCES

Mic	2k Ω
Line	10k Ω
Outputs	75 Ω

INPUT & OUTPUT LEVELS

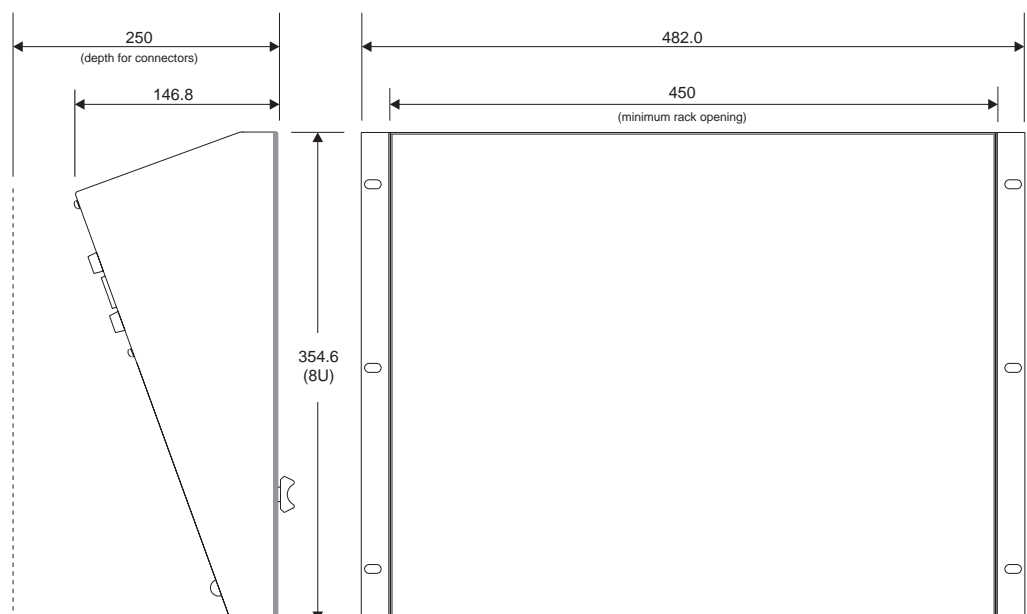
Max mic input	+16dBu
Max line input	+28dBu
Any output	+22dBu
Headphones	150mW into 600 Ω

WEIGHT

Console	Power Pack
6.6 Kg	1.0 Kg

DIMENSIONS

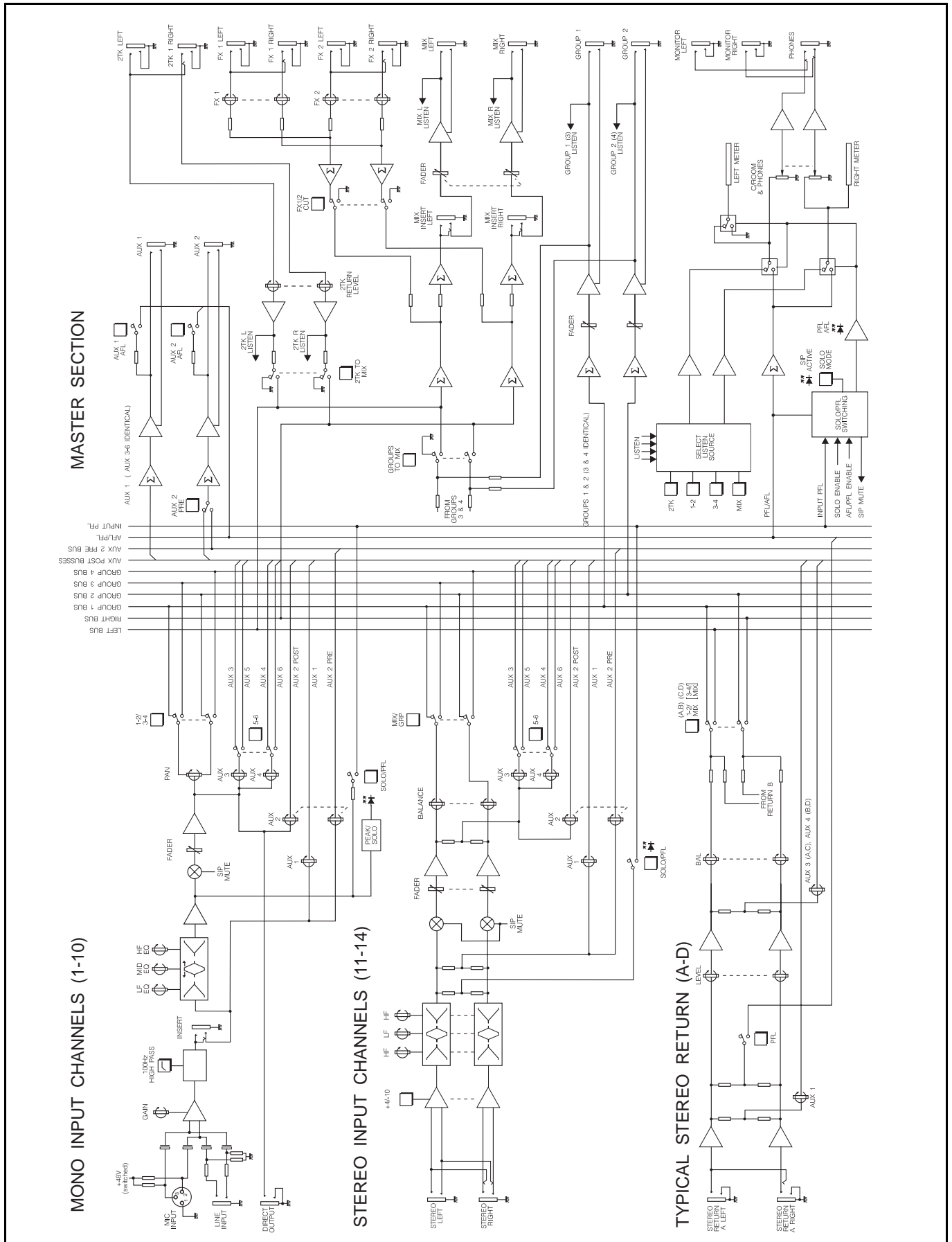
All dimensions are in millimetres



GLOSSARY

AFL (After Fade Listen)	a function that allows the operator to monitor the post-fade signal in a channel independently of the main mix.
Balance	the relative levels of the left and right channels of a stereo signal.
Balanced	a method of audio connection which 'balances' the signal between two wires and a screen which carries no signal. Any interference is picked up equally by the two wires, but out of phase resulting in cancellation of the interference signal.
Clipping	the onset of severe distortion in the signal path, usually caused by the peak signal voltage being limited by the circuit's power supply voltage.
dB (decibel)	a ratio of two voltages or signal levels, expressed by the equation $dB=20\log_{10}(V1/V2)$. Adding the suffix 'u' denotes the ratio is relative to 0.775V RMS.
DI	(direct injection) the practice of connecting an electric musical instrument directly to the input of the mixing console, rather than to an amplifier and loudspeaker which is covered by a microphone feeding the console.
Effects	the use of devices to alter or process the sound to add special effects e.g. reverb, normally as a mix of the original ('dry') sound and the treated version.
Equaliser	a device that allows the boosting or cutting of selected bands of frequencies in the signal path.
Feedback	the 'howling' sound caused by bringing a microphone too close to a loudspeaker driven from its amplified signal.
Foldback	a feed sent back to the artistes via loudspeakers or headphones to enable them to monitor the sounds they are producing.
Frequency response	the variation in gain of a device with frequency.
Ground Compensation	a technique used on unbalanced outputs to cancel out the effect of ground loops caused by connections to external equipment.
Headroom	the available signal range above the nominal level before clipping occurs.
High Pass filter	a filter that rejects low frequencies.
Line level signals	at a nominal level of -10 to +6dBu, usually coming from a low impedance source.
Oscillator	a built-in tone generator for test and line-up purposes.
Peaking	an equaliser response curve affecting only a band of frequencies i.e. based on a bandpass response.
PFL (pre-fade listen)	a function that allows the operator to monitor the pre-fade signal in a channel independently of the main mix.
Phantom Power	the +48V d.c. voltage applied equally to the two signal pins of a balanced mic input to provide powering for condenser microphones.
Post-Fade	the point in the signal path <i>after</i> the channel or master fader and therefore affected by fader position.
Processor	a device which affects the whole of the signal passing through it, e.g. gate, compressor or equaliser
Rolloff	a fall in gain at the extremes of the frequency response.
Shelving	an equaliser response affecting all frequencies above or below the break frequency i.e. a highpass or lowpass derived response.
Signal to Noise Ratio	a expression of the difference in level between the audio signal and background system noise.
Solo-in-Place	a function that allows the operator to listen to a selected channel on its own but complete with all relevant effects, by automatically muting all other inputs.
Spill	acoustic interference from other sources.
Sweep EQ	an Equaliser section (e.g. MID EQ) which operates at a variable rather than fixed frequency giving increased flexibility to the user.
Talkback	the operator speaking to the artistes or to tape via the auxiliary or group outputs.
Tape Return	a line level input provided specifically to receive the playback output of a tape machine
Transient	a momentary rise in the signal level.
TRS Jacks	a 3-pole jack with Tip, Ring and Sleeve connections
Unbalanced	a method of audio connection which uses a single signal wire and the cable screen as the signal return. This method does not provide the noise immunity of a <i>balanced input</i> (see above).

SYSTEM BLOCK DIAGRAM



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