
Soundcraft
Sapphyre

Sapphyre *Lc*

USER GUIDE

Contents

Introduction to Sapphyre / Sapphyre LC	1
<i>Precautions & Safety Instructions</i>	<i>2</i>
Installation	5
<i>Connections</i>	<i>7</i>
<i>Installing the Optifile LC Automation</i>	<i>8</i>
Module Block Diagrams	9
Module Descriptions, Specifications & Operation	
<i>Input/Output Module RS9496/RS5144</i>	<i>17</i>
<i>LC Input/Output Module RS5495/RS5496</i>	<i>23</i>
<i>Dual Stereo Input Module RS9499</i>	<i>29</i>
<i>Dual Line Input Module RS9498</i>	<i>33</i>
<i>Master Module RS9497 & Meters</i>	<i>37</i>
The Sapphyre / Sapphyre LC Patchbay	43
<i>Introduction</i>	<i>44</i>
<i>I/O Patchcard Facilities</i>	<i>46</i>
<i>Master Patch Facilities</i>	<i>47</i>
<i>Stereo Input Patch Facilities</i>	<i>47</i>
<i>Dual Line Input Patch Facilities</i>	<i>48</i>
<i>Tie Line Patch Facilities</i>	<i>49</i>
<i>EDAC Pinouts</i>	<i>50</i>
Specifications	57

Using the Sapphire	59
<i>Introduction to Multitrack Recording</i>	60
<i>Recording</i>	60
<i>Basic Concepts</i>	61
<i>Tracklaying</i>	61
<i>Monitoring from Tape</i>	62
<i>The Solo System</i>	63
<i>Auxiliary Sends</i>	63
<i>Stereo Inputs as Effects Returns</i>	64
<i>Track Bouncing</i>	64
<i>Mixing</i>	65
<i>Introduction</i>	65
<i>Auxiliaries</i>	65
<i>Noise Gate</i>	66
<i>Creating Extra Inputs</i>	66
<i>Grouping</i>	67
Appendices	71
<i>Specification Notes</i>	72
<i>Dimensions</i>	73
<i>Sample Configurations</i>	74
<i>Warranty</i>	75
<i>Glossary</i>	76

Introduction to Sapphyre / Sapphyre LC

Sapphyre sets a new standard for compact multitrack recording consoles, with performance capable of exceeding that of digital mastering systems.

The console is of the in-line monitor type, i.e. the monitoring path is physically in the same module as the corresponding input channel. This means that there are as many monitor paths available as there are input channels. The routing system allows any channel to route to any tape send via the 8 mix buses, or a channel can go direct to its own tape send, bypassing the bus.

The Input/Output module is particularly flexible, allowing several of the module elements to appear in either the channel or monitor path. There is a highly versatile noise gate in every module which can be placed in either path, and a 4-band equaliser in two sections, each of which may also be switched to either path.

The console is available in a range of frame sizes to accommodate 20, 28, 36, 44 or 52 Input/Output modules. Each frame includes comprehensive master facilities and 3 Dual Stereo Inputs, primarily intended for use a stereo Effects Return modules, but equally useful for bringing stereo sources such as CD players, multi-output instruments or stereo tape machines into the console.

A Dual Line Input module is also available to increase the number of line inputs on mixdown, and this module is specifically designed for use with MIDI-sequenced electronic instruments. This module provides two identical full-featured line inputs routed straight to the mix. Frames may be specified with Dual Line inputs in place of I/O modules in blocks of four.

A full width meterbridge provides 20-segment LED meters for each I/O module, and 8-segment LED meters for each Dual Line Input and VU Master meters.

Special provision is made for the interfacing of tape machines operating at +4dBu or -10dBV, with duplicated connectors provided for 2-track Tape Returns and Mix outputs and level switching on Tape Sends and Returns on each I/O module.

Sapphyre condenses the essential features and performance of the large studio console into a mixer within reach of everyone. Sapphyre is equally suited for additional rooms in big commercial studios, professional musician/producers with home studios, small broadcast production suites or video post production.

Sapphyre is available with an integral 8-module wide panel that provides patching for up to 52 I/O modules (48 tape tracks), Master functions and a maximum of 144 tie lines (96 are fitted as standard). The patchbay accommodates Stereo input and Dual Line input options, and provides the majority of external connections on EDAC multipin connectors.

Sapphyre LC

Sapphyre LC is an automation-ready version of the Sapphyre. The Sapphyre LC offers the following features in addition to those offered by the Sapphyre.

- VCA fader automation on all long-throw monitor faders
- Mute writing direct from the console controls
- Subgrouping of monitor faders
- VCAs are bypassed when the automation is not powered up.

The automation is provided by AD Systemes' Optifile LC.

Precautions and Safety Instructions

General Precautions

Avoid storing or using the mixing console in conditions of excessive heat or cold, or in positions where it is likely to be subject to vibration, dust or moisture. Do not use any liquids to clean the fascia of the unit: a soft dry brush is ideal. Use only water or ethyl alcohol to clean the trim and scribble strips. Other solvents may cause damage to paint or plastic parts.

Avoid using the console close to strong sources of electromagnetic radiation (e.g. video monitors, high power electric cabling): this may cause degradation of the audio quality due to induced voltages in connecting leads and chassis. For the same reason, always site the console power supply away from the unit .

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

Handling and Transport

The console is supplied in a wooden crate. If it is necessary to move it any distance after installation it is recommended that this packing is used to protect it. Be sure to disconnect all cabling before moving. If the console is to be regularly moved we recommend that it is installed in a foam lined flight case. At all times avoid applying excessive force to any knobs, switches or connectors.

Power supplies & cables

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

Always use the power supplies and power cables supplied with the mixer: the use of alternative supplies may cause damage and voids the warranty; the extension of power cables may result in malfunction of the mixing console.

Warning! Always switch the power supplies off before connecting or disconnecting the console power cable, removing or installing modules, and servicing. In the event of an electrical storm, or large mains voltage fluctuations, immediately switch off the PSU and unplug from the mains.

Always ensure that that you use the correct power supply for your console. Two CPS450 units are required for the 20 and 28 I/O consoles, while the 36 and 44 I/O consoles require one CPS450 and one CPS550. Different configurations of power socket are used for the each supply to prevent incorrect connection.

The Sapphire LC also requires a CPS150 to power the VCA PCBs which are used by the automation.

Signal Levels

It is important to supply the correct input levels to the console, otherwise signal-to-noise ratio or distortion performance may be degraded; and in extreme cases damage to the internal circuitry may result. Likewise, on all balanced inputs avoid sources with large common mode DC, AC or RF voltages, as these will reduce the available signal range on the inputs. Note that 0dBu = 0.775V RMS.

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

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

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

The Line inputs have a sensitivity variable between -20dBu and +10dBu, and can also handle a maximum input level up to 26dBu. Note that the maximum input level for unbalanced inputs is 6dB less than that for balanced signals, so very high level unbalanced signals (e.g. loudspeaker outputs of power amplifiers) may cause distortion. The input impedance is greater than 15k Ω , balanced.

The main outputs of the console (Mix Left & Right) have dual output level with independently buffered outputs feeding separate connectors to suit +4dBu or -10dBV equipment, and these have an output impedance of <75 Ω and a drive capability of +27dBu into 600 Ω . The Control Room Monitor outputs and separate ALT Left & Right outputs are similar but are available as +4dBu output level only.

Tape Sends are available as +4dBu or -10dBV outputs, depending on the position of the -10 switch on the rear panel. The Sends are balanced with an output impedance of <75 Ω .

The Aux outputs have a nominal output level of +4dBu and an output impedance of <75 Ω . These outputs can deliver full level (+27dBu balanced) into loads of greater than 600 Ω .

Insert Sends are unbalanced and have a nominal output level of -2dBu at an output impedance of <75 Ω , and a maximum output level of +21dBu into load impedances of greater than 2k Ω .

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

Installation

Connectors

Installing the Optifile LC Automation

Installation

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

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

Always ensure that you use the correct power supplies for your console. Two CPS450 units are required for the 20 and 28 I/O consoles, while the 36 and 44 I/O consoles require one CPS450 and one CPS550. Different configurations of power socket are used for each supply to prevent incorrect connection.

The Sapphyre LC also requires a CPS150 to power the VCA PCBs which are used by the automation.

Wiring Considerations

A For optimum performance it is essential for the earthing system to be clean and noise-free, as all signals are referenced to this earth. A central point should be decided on for the main earth point, and all earths should be 'star-fed' from this point. It is recommended that an individual earth wire be run from each electrical outlet, back to the system star point to provide a safety earth reference for each piece of equipment.

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

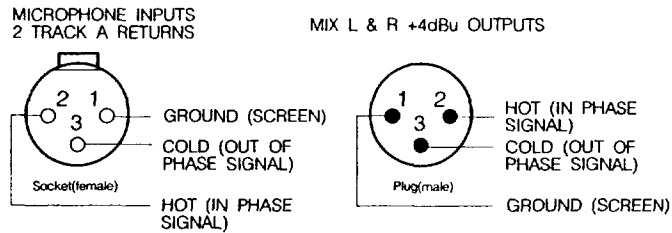
C Avoid locating mains distribution boxes near audio equipment, especially tape recorders, which are very sensitive to electro- magnetic fields.

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

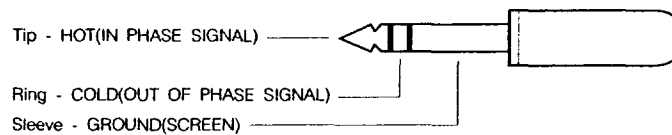
Connections

Wiring conventions

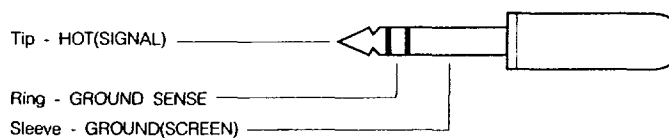
The standard Sapphyre / Sapphyre LC console uses two different types of audio connector, 3 pin XLR (top diagram) and 1/4" three pole ('A' gauge or stereo) jacks. The latter are used in several configurations, as shown below. The Patchbay versions of Sapphyre / Sapphyre LC use Bantam jacks instead of 1/4" 'A' gauge jacks, except for the Headphones output.



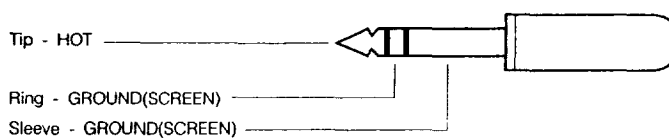
1/4" 'A' Gauge Stereo Jack Plug used as balanced input:
line inputs, 2 Track B returns, insert returns



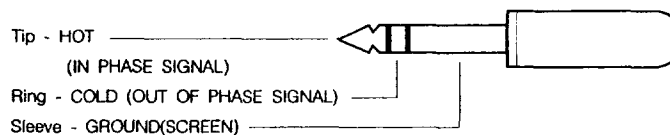
1/4" 'A' Gauge Stereo Jack Plug used as ground compensated output:
Mix L & R insert send, Group insert send



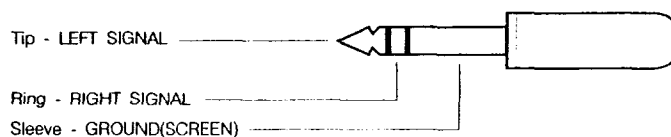
1/4" 'A' Gauge Stereo Jack Plug used as unbalanced output: I/O insert send



1/4" 'A' Gauge Stereo Jack Plug used as balanced output:
Aux, foldback, monitor, mix -10dBV outputs; tape sends



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



Installing the Optifile LC Automation

There is an IDC socket for each group of eight I/O channels. In addition there is a power connector for the VCA PCBs. The power for these is provided by a Soundcraft CPS150 power supply unit.

It is suggested that the ribbon cables are not connected, or disconnected, to the IDC sockets whilst power is applied to the console or the automation system.

Module Block Diagrams

I/O Module

LC I/O Module

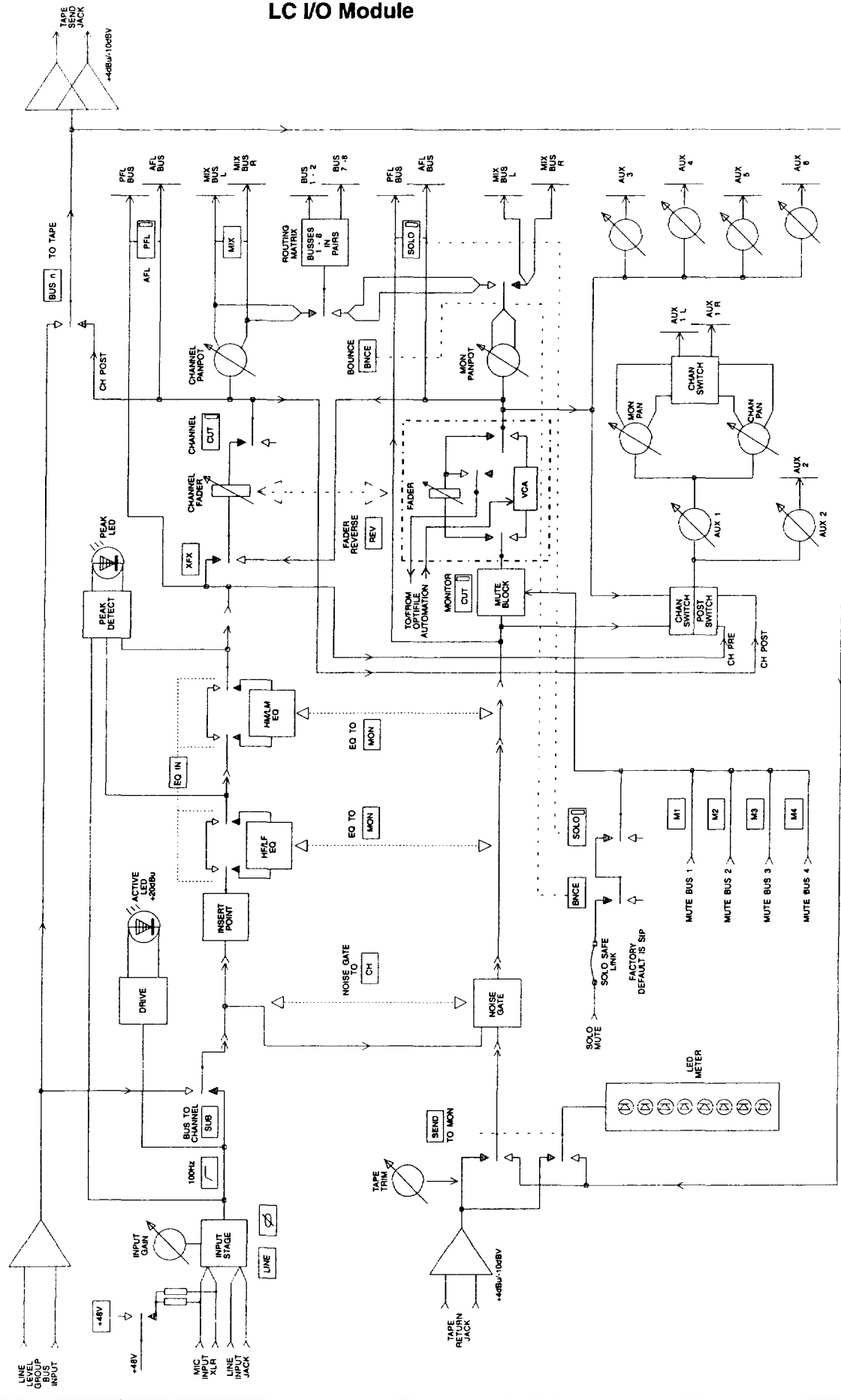
Dual Line Input

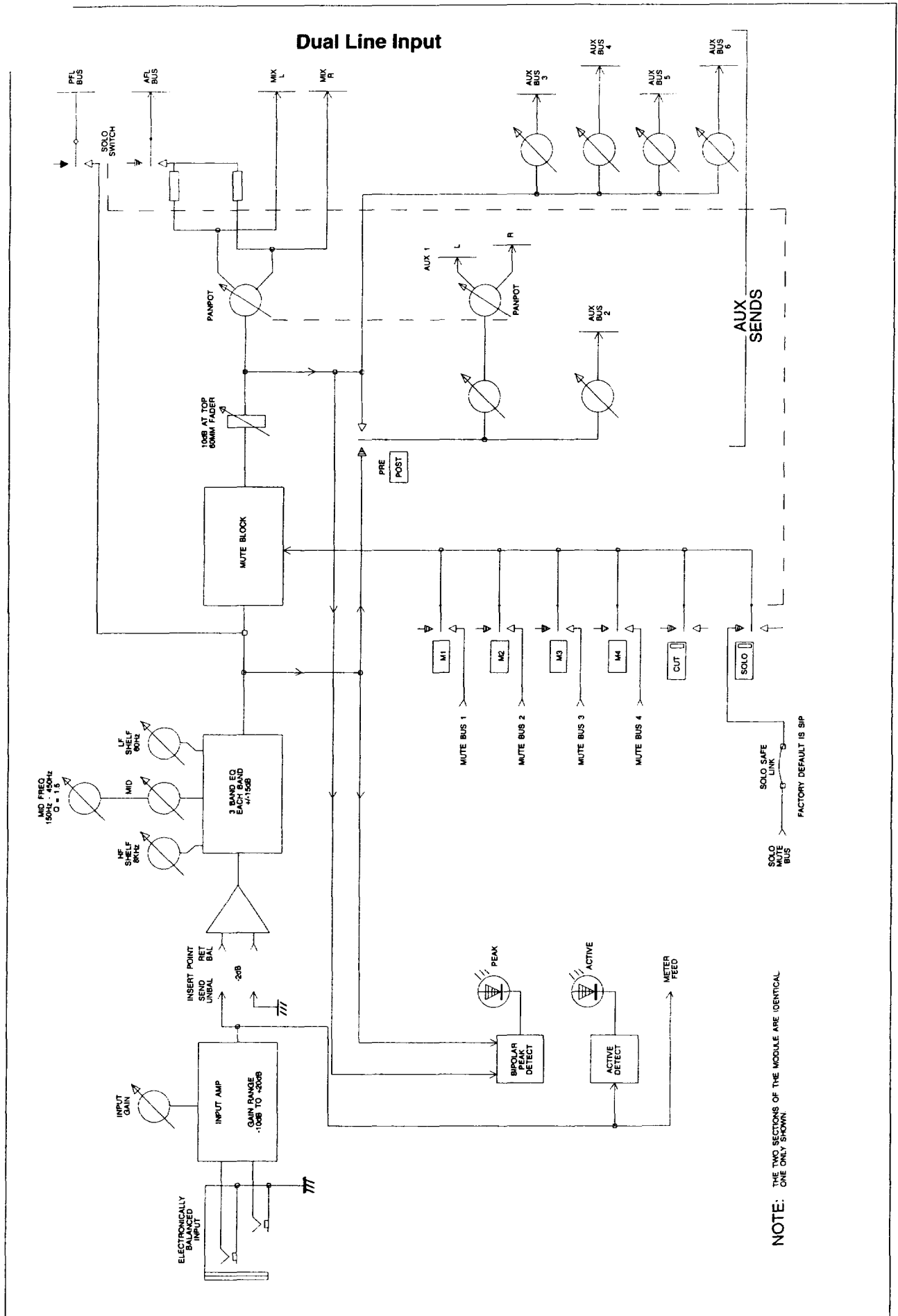
Dual Stereo Input

Ancillary Circuits

Master Module

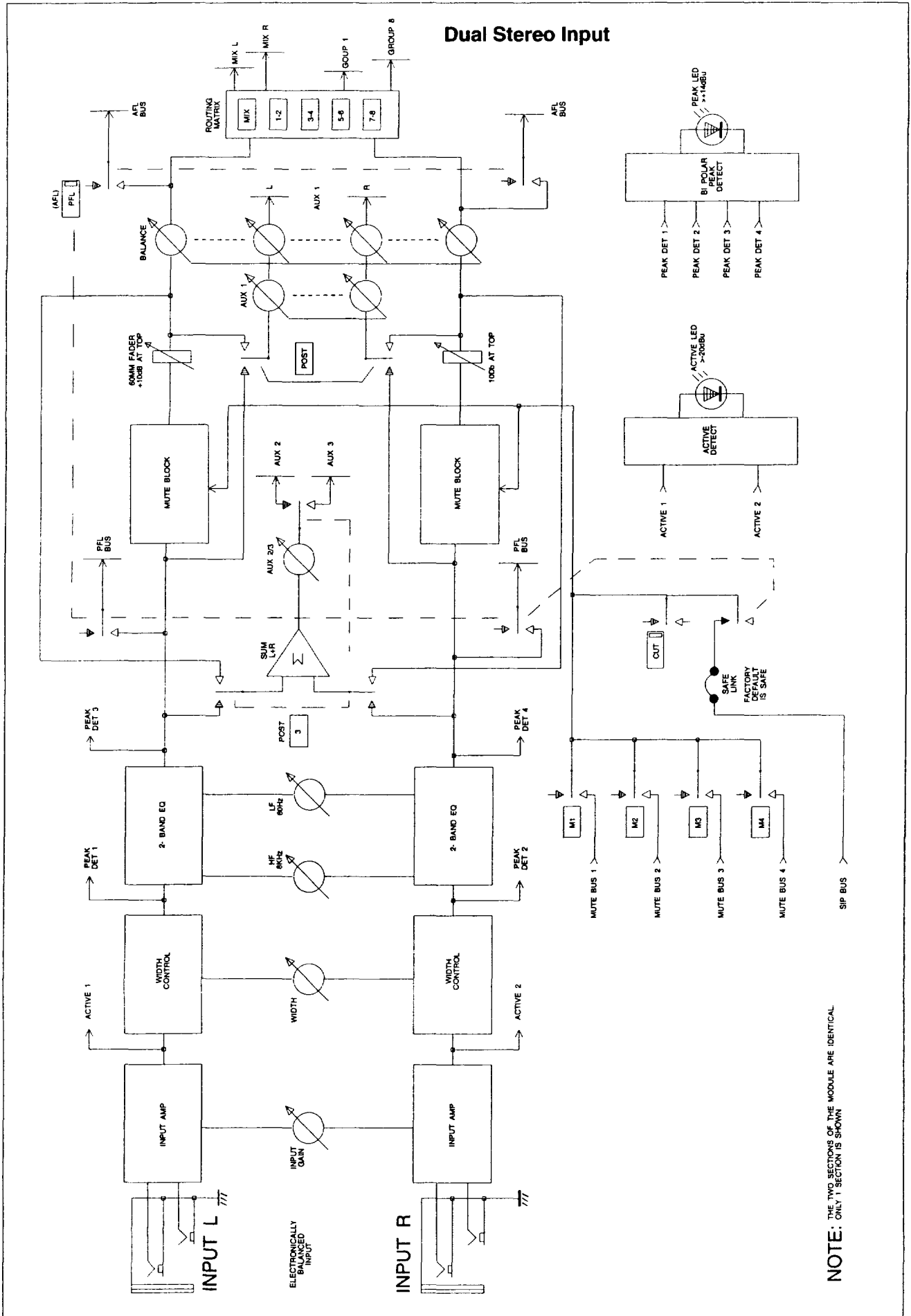
LC I/O Module





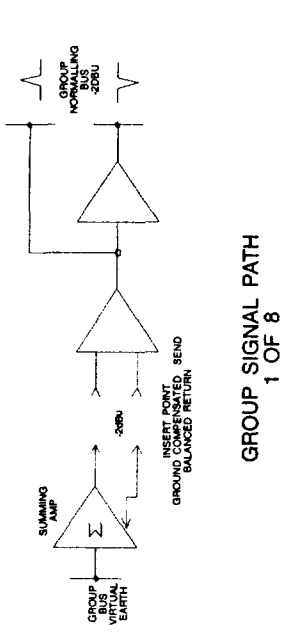
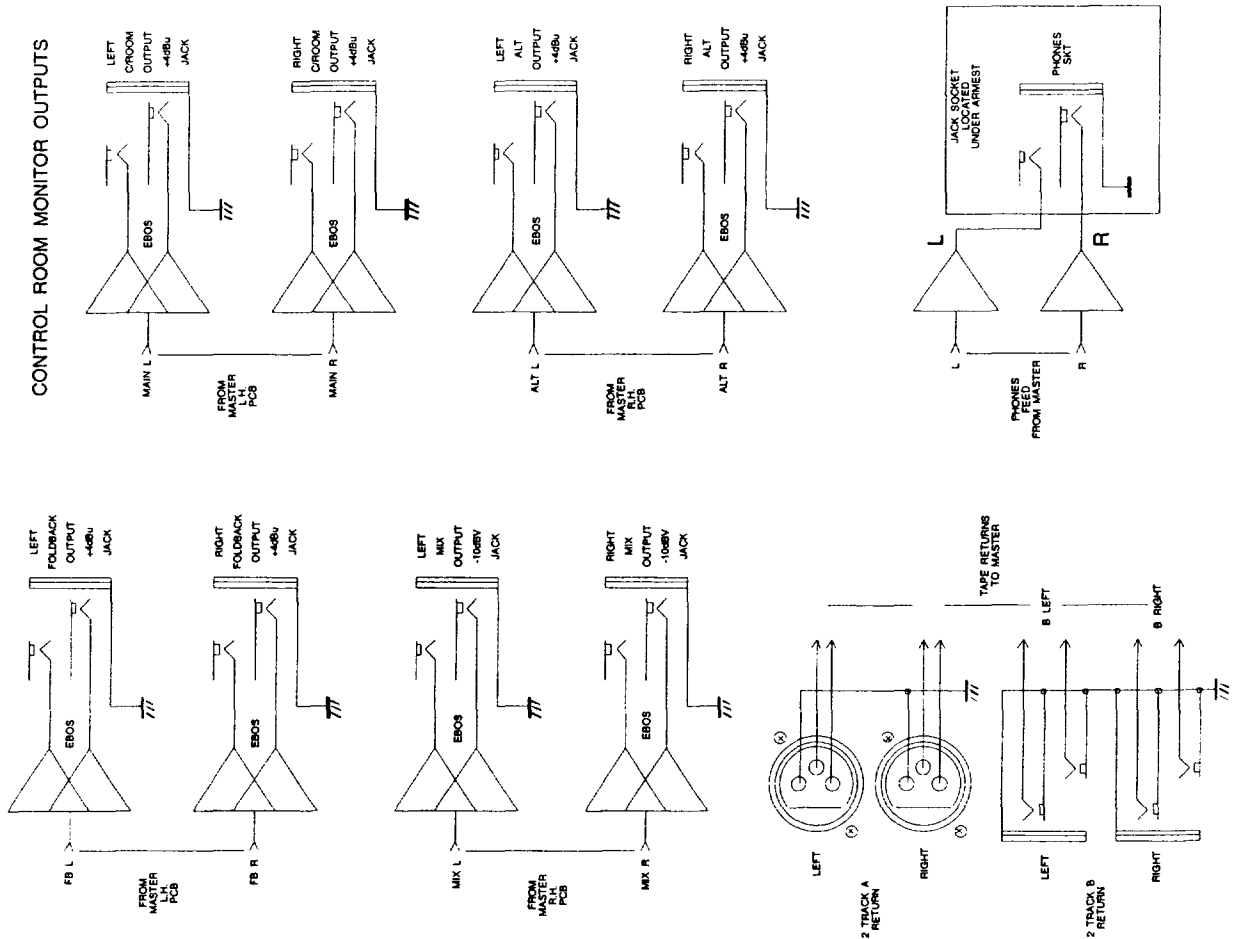
SOLO SAFE LINK
SOLO MUTE BUS
FACTORY DEFAULT IS SIP

NOTE: THE TWO SECTIONS OF THE MODULE ARE IDENTICAL. ONE ONLY SHOWN.

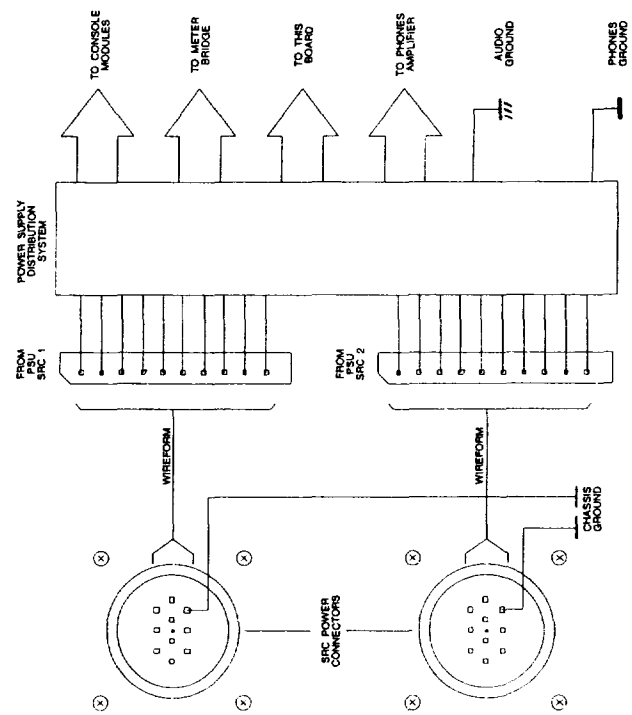


Ancillary Circuits (in base)

CONTROL ROOM MONITOR OUTPUTS

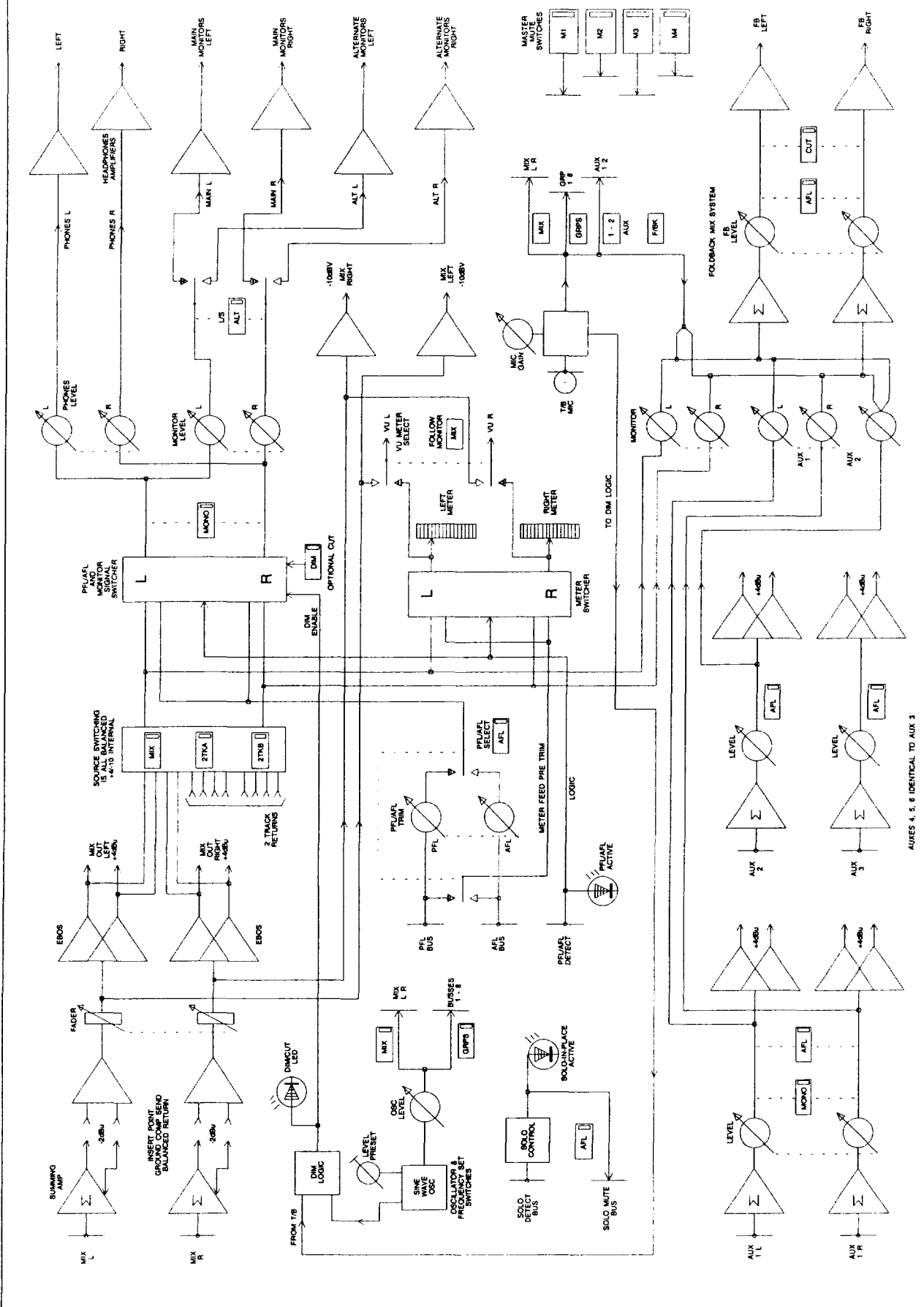


GROUP SIGNAL PATH
1 OF 8



NOTE: CHASSIS GROUND IS A DIRECT CONNECTION BETWEEN SRC CONNECTORS AND CONSOLE FRAME FOR SAFETY REASONS. THIS MUST NOT BE REMOVED.

Master Module

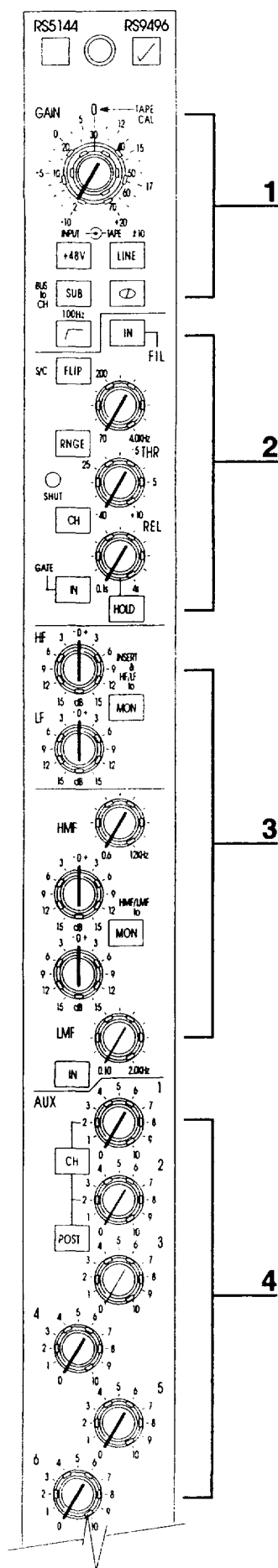


AUXES 4, 5, 6 IDENTICAL TO AUX 3

**Input/Output Module
RS9496/RS5144**

*Description
and Operation*

Input/Output Module RS9496/RS5144



The Input/Output module carries both a channel(input) path and a monitor path. The channel path feeds the tape track with the same number (or one of eight mix busses) while the monitor path is fed by the track with the same number. Several of the module elements can appear in either path for flexibility, and these are described below.

Module Identification

At the top of the module there are two boxes which indicate the module number: RS9496 for non-patchbay consoles, and RS5144 for patchbay versions. The two modules have identical functions and differ only in the rear connections.

Channel Path

1 The channel input section has both Microphone and Line inputs, sharing a common **GAIN** control. The gain of the patented padless microphone amplifier is adjustable using the top of the dual concentric knobs over a sensitivity range -2dBu to -70 dBu. Line input sensitivity is adjustable from +10dBu to -20dBu. The 0dBu point for the Line input is clearly marked.

Phantom Power may be applied to the microphone input by pressing the **+48V** switch. Modules may be optionally fitted with transformer coupling - refer to your dealer for suitable transformers.

The **LINE** switch selects the line input jack socket.

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

A fixed frequency 100Hz 2nd order is provided which may be switched into the input path by pressing the **100Hz** switch.

The **(BUS to CH)SUB** switch allows the output from one of eight mix busses to be switched into the channel path, allowing full-facility subgrouping. The busses feed I/O modules in blocks of eight, so that for instance Bus 1 appears on I/O modules 1,9,17,25 or 33. The bus number is marked on the top scribble strip.

2 A **NOISE GATE** may be inserted in the signal path by pressing **(GATE)IN** and this is normally placed in the monitor path. Pressing **CH** swaps the gate to the channel path.

The sidechain is normally fed from the source feeding the gate. The **(S/C)FLIP** switch swaps the source for the sidechain to the other signal path (i.e. channel path if the gate is placed in the monitor path), which may then be used to provide external keying for the noise gate.

The **RNGE** switch increases the attenuation range of the gate from 15dB (default) to 60dB.

The **THR**eshold control allows the opening point of the gate to be varied from -40dB to +10dB (referred to tape monitor input level).

The **(FIL)IN** switch places a wide bandpass filter in the sidechain, with a centre frequency variable from 70Hz to 4kHz by the **FIL** knob.

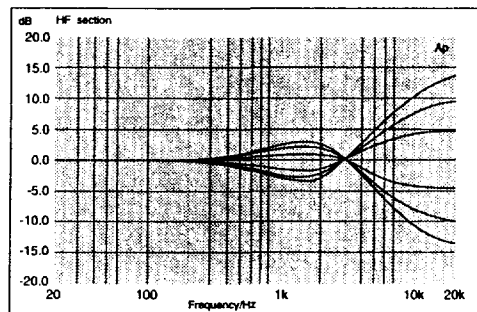
The **RE**lease control normally varies the recovery time after gating from 0.1 to 4 seconds. If **HOLD** is pressed the release time is fixed at 0.1 seconds and the **REL** control varies the **HOLD** time (the time delay between the trigger signal going away and the gate starting to close) for up to 2 seconds.

The **SHUT** LED illuminates to show when the gate is shut.

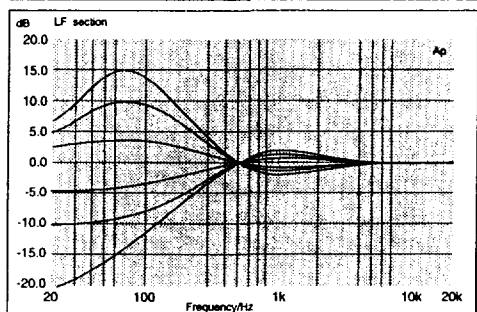
3 The patented Equaliser is a 4-band swept mid design which is arranged as two separate sections. Both sections are normally placed in the channel path, but may be individually switched into the monitor path for mixdown by pressing the corresponding **MON** switch.

Frequency Response Curves of the Equaliser

The HF section is a second order shelving design, giving 15dB cut or boost at a fixed turnover frequency of 12kHz.

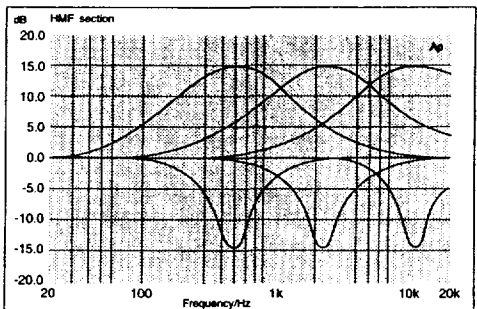


The LF section provides 15dB cut or boost at a fixed turnover frequency of 60Hz, but is asymmetric to avoid too much VLF being recorded by a digital system.

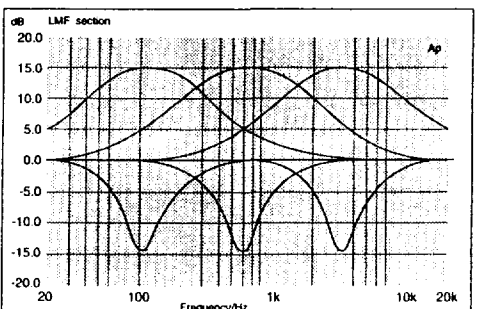


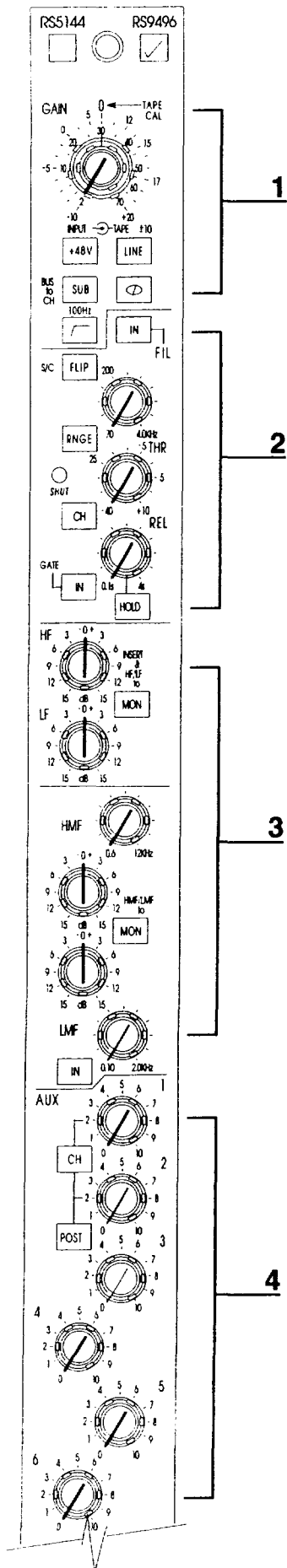
The **INSERT** point is located before this EQ section and moves with it when the **MON** switch is pressed. The send is unbalanced and the return is balanced.

The HMF and LMF sections have a peak boost/notch cut response at centre frequencies variable between 600Hz-12kHz and 100Hz-2kHz respectively by the right-hand (black) knobs. 15dB of cut and boost is available on the left-hand knobs.



The entire EQ section, HF/LF and HMF/LMF, may be switched **IN** or **OUT** with EQ **IN** switch.





4 Six **Auxiliary Sends** are provided, and are arranged in two sections. Aux 1 and 2 are intended primarily for foldback and are normally pre-fade and in the monitor path. Pressing **CH** sources them from the channel and **POST** makes them post-fade. Aux 1 is a stereo send and follows the channel or monitor panpot even when pre-fade.

Aux 3 to 6 are intended mainly for effects sends. They are permanently in the monitor path and post fade.

5 The **CHANNEL FADER** sets the level sent to the tape send, subgroup busses or mix. The fader has 10dB of gain at the top of its travel and is cut by the adjacent **CUT** switch.

The **(FDR)REV** switch swaps the function of the channel fader and the long-throw monitor fader and is only used in special circumstances.

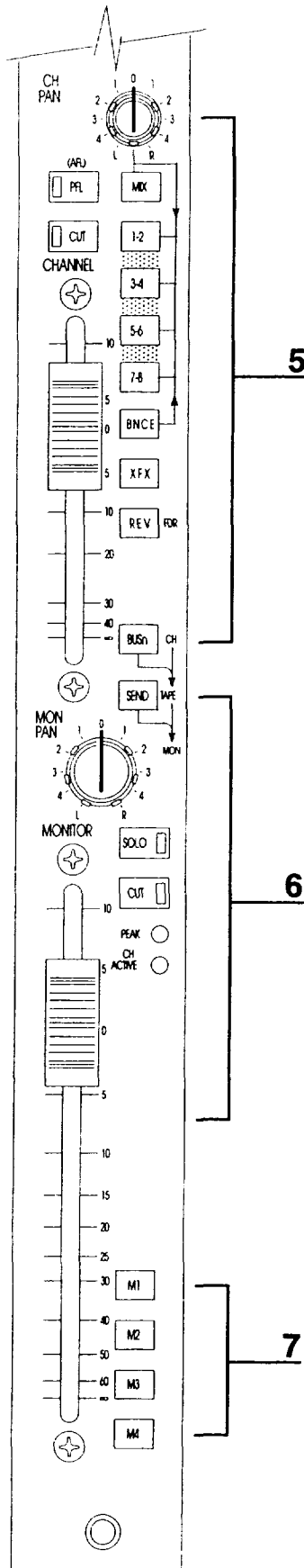
The patented active **CH PAN** control determines the position of the signal within the stereo (L-R) image and routes the signal to any of the eight group busses via the **ROUTING SWITCHES**. Pan left feeds the signal to odd numbered busses and pan right to even busses. The **MIX** switch routes the channel signal to the stereo mix bus so that you can use the channel path as another input on mixdown.

XFX moves the source point for the channel fader to post the monitor fader so that you can use the tape send or routing matrix as additional sends when mixing.

When the bounce switch **BNCE** is pressed the monitor path is unhooked from the mix bus and moved to feed the group routing switches. This allows easy bouncing of tracks and sub-grouping and makes the monitor channel 'solo-safe' to protect the inputs to the group when solo is active.

The **(AFL)PFL** switch allows direct monitoring of the signal at either the input of the channel fader (PFL) or the output of the channel **CUT** switch (AFL). Selection of PFL or AFL is included on the Master module.

The channel fader output normally feeds the Tape Send socket and the signal level is selectable to +4dBu (default) or to -10dBV by pressing the **-10** switch on the rear panel. Alternatively the Tape Send may be sourced from the group bus corresponding to the module position by pressing the **BUS-n** switch. The numbering on the switch shows clearly which of the eight group busses is available, and this repeats every eight modules. See also (1) above.



Monitor Path

6 The monitor path is normally fed from the Tape Return input, to make use of the automatic input/repro switching in the tape machine. A trim control with a range of $\pm 10\text{dB}$ is provided on the lower section of the input gain control (see 1), and this is detented at the nominal centre 0dB point. Note that the Tape Return level is also subject to the **-10** switch to interface to $+4\text{dBu}$ or -10dBv equipment.

Pressing the **SEND** (TAPE - MON) switch feeds the monitor path from that module's Tape Send, enabling you to hear the signal being sent to the tape. The patented active monitor **PAN** control positions the signal across the stereo bus at a level determined by the long-throw monitor **FADER**. This fader has $+10\text{dB}$ gain at the top of its travel and is cut by the adjacent illuminated **CUT** switch.

The monitor **SOLO** system is normally Solo-in-Place(SIP) - pressing the solo button mutes all the other monitor paths (unless they are 'solo safe' by having BNCE selected). Pressing the **SOLO** switch on a BNCEd channel gives AFL/PFL instead, depending on the PFL/AFL status on the Master module. Channels may be individually set as solo-safe by removing internal link LK1 on the right hand circuit board.

A multi-point peak detector illuminates the **PEAK** LED when less than 6dB of headroom remains at three critical places in the signal chain: the Input Pre-amp, the HF/LF EQ and the MF EQ sections.

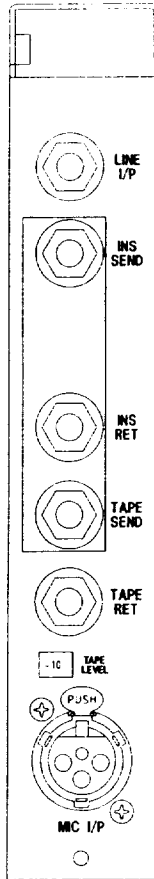
The **CH ACTIVE** LED monitors the output of the input pre-amp and illuminates if the level exceeds -20dBu .

7 Four mute switches allow the monitor path to be controlled by the master mute busses originating on the Master module.

Meters

The I/O bargraph is sourced from the monitor path and follows the monitor **SEND**(TAPE - MON) switch to show either off tape (pre-trim) or group bus levels.

Rear Connector Panel



Connector Pinouts

Microphone Input - Female XLR

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

Line Input - 3 Pole Jack

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

Insert Send - 3 Pole Jack

Tip	Hot(signal)
Ring	Ground
Sleeve	Ground (screen)

Insert Return - 3 Pole Jack

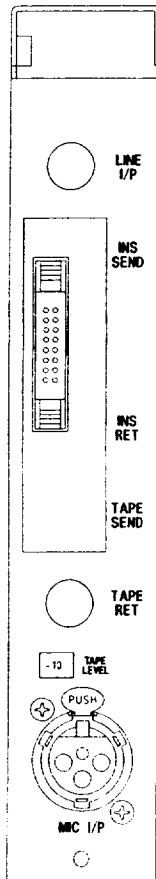
Tip	Hot(in phase signal)
Ring	Cold(out of phase signal)
Sleeve	Ground (screen)

Tape Send - 3 pole Jack

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

Tape Return - 3 Pole Jack

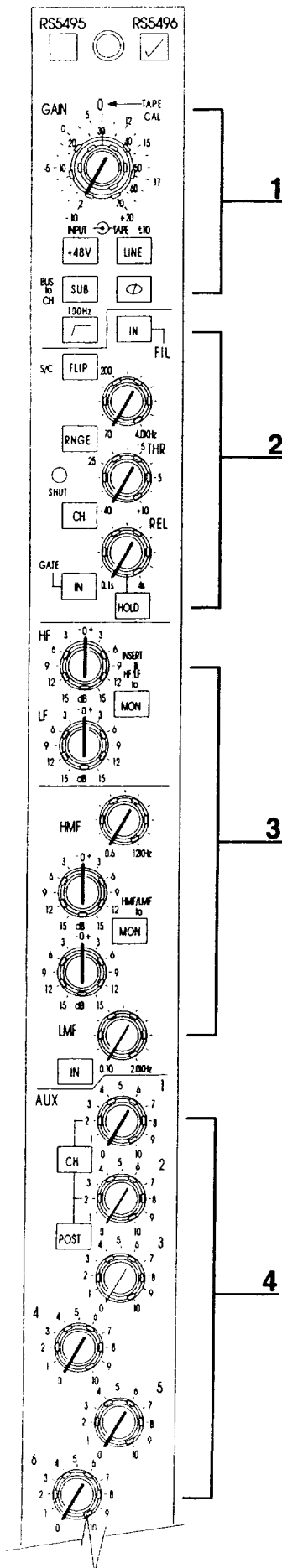
Tip	Hot(in phase signal)
Ring	Cold(out of phase signal)
Sleeve	Ground (screen)



LC Input/Output Module RS5495/RS5496

*Description
and Operation*

LC Input/Output Module RS5495/RS5496



The LC Input/Output module carries both a channel(input) path and a monitor path. The channel path feeds the tape track with the same number (or one of eight mix) while the monitor path is fed by the track with the same number. Several of the module elements can appear in either path for flexibility, and these are described below. The LC Input/Output module also has a VCA which is used by the automation.

Module Identification

At the top of the module there are two boxes which indicate the module number: RS5495 for non-patchbay consoles, and RS5496 for patchbay versions. The two modules have identical functions and differ only in the rear connections.

Channel Path

1 The channel input section has both Microphone and Line inputs, sharing a common **GAIN** control. The gain of the patented padless microphone amplifier is adjustable using the top of the dual concentric knobs over a sensitivity range -2dBu to -70 dBu. Line input sensitivity is adjustable from +10dBu to -20dBu. The 0dBu point for the Line input is clearly marked.

Phantom Power may be applied to the microphone input by pressing the **+48V** switch. Modules may be optionally fitted with transformer coupling - refer to your dealer for suitable transformers.

The **LINE** switch selects the line input jack socket.

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

A fixed frequency 100Hz 2nd order is provided which may be switched into the input path by pressing the **100Hz** switch.

The (BUS to CH)**SUB** switch allows the output from one of eight mix to be switched into the channel path, allowing full-facility subgrouping. The feed I/O modules in blocks of eight, so that for instance Bus 1 appears on I/O modules 1,9,17,25 or 33. The bus number is marked on the top scribble strip.

2 A **NOISE GATE** may be inserted in the signal path by pressing (GATE)**IN** and this is normally placed in the monitor path. Pressing **CH** swaps the gate to the channel path.

The sidechain is normally fed from the source feeding the gate. The (S/C)**FLIP** switch swaps the source for the sidechain to the other signal path (i.e. channel path if the gate is placed in the monitor path), which may then be used to provide external keying for the noise gate.

The **RNGE** switch increases the attenuation range of the gate from 15dB (default) to 60dB.

The **THR**eshold control allows the opening point of the gate to be varied from -40dB to +10dB (referred to tape monitor input level).

The **(FIL)IN** switch places a wide bandpass filter in the sidechain, with a centre frequency variable from 70Hz to 4kHz by the **FIL** knob.

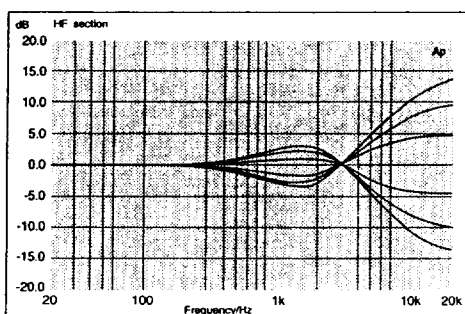
The **RELease** control normally varies the recovery time after gating from 0.1 to 4 seconds. If **HOLD** is pressed the release time is fixed at 0.1 seconds and the **REL** control varies the **HOLD** time (the time delay between the trigger signal going away and the gate starting to close) for up to 2 seconds.

The **SHUT** LED illuminates to show when the gate is shut.

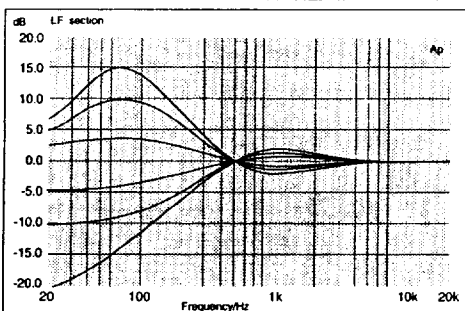
3 The patented Equaliser is a 4-band swept mid design which is arranged as two separate sections. Both sections are normally placed in the channel path, but may be individually switched into the monitor path for mixdown by pressing the corresponding **MON** switch.

Frequency Response Curves of the Equaliser

The HF section is a second order shelving design, giving 15dB cut or boost at a fixed turnover frequency of 12kHz.

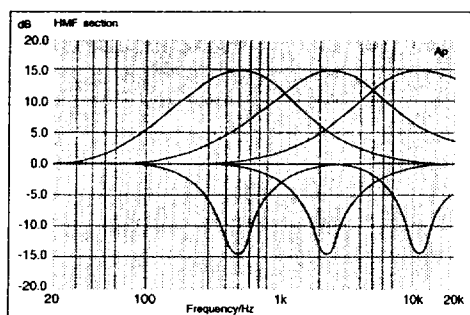


The LF section provides 15dB cut or boost at a fixed turnover frequency of 60Hz, but is asymmetric to avoid too much VLF being recorded by a digital system.

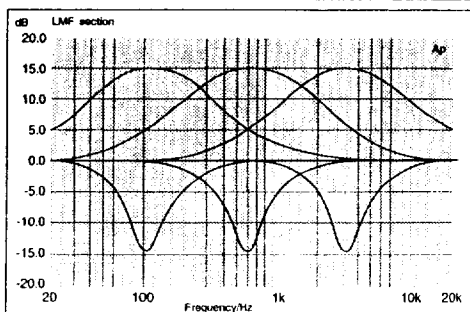


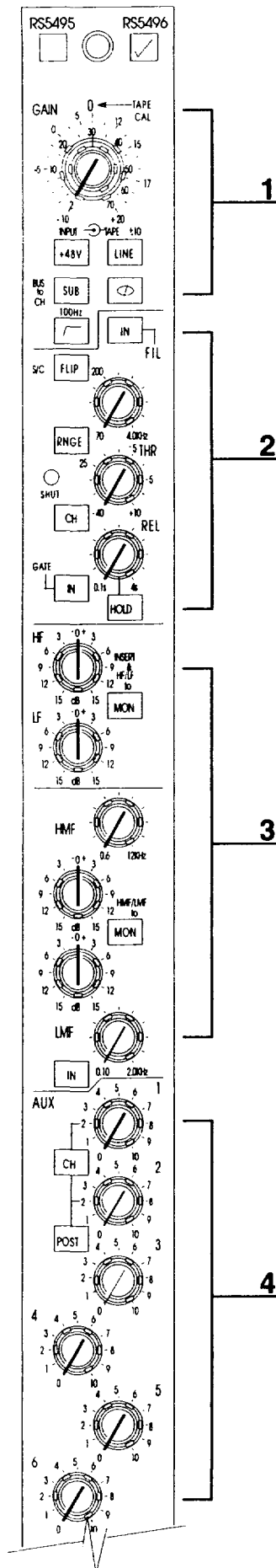
The **INSERT** point is located before this EQ section and moves with it when the **MON** switch is pressed. The send is unbalanced and the return is balanced.

The HMF and LMF sections have a peak boost/notch cut response at centre frequencies variable between 600Hz-12kHz and 100Hz-2kHz respectively by the right-hand (black) knobs. 15dB of cut and boost is available on the left-hand knobs.



The entire EQ section, HF/LF and HMF/LMF, may be switched **IN** or **OUT** with EQ **IN** switch.





4 Six **Auxiliary Sends** are provided, and are arranged in two sections. Aux 1 and 2 are intended primarily for foldback and are normally pre-fade and in the monitor path. Pressing **CH** sources them from the channel and **POST** makes them post-fade. Aux 1 is a stereo send and follows the channel or monitor panpot even when pre-fade.

Aux 3 to 6 are intended mainly for effects sends. They are permanently in the monitor path and post fade.

5 The **CHANNEL FADER** sets the level sent to the tape send, subgroup or mix. The fader has 10dB of gain at the top of its travel and is cut by the adjacent **CUT** switch.

The **(FDR)REV** switch swaps the function of the channel fader and the long-throw monitor fader and is only used in special circumstances. If the console is under the control of the automation the Channel Fader and the VCA are swapped.

The patented active **CH PAN** control determines the position of the signal within the stereo (L-R) image and routes the signal to any of the eight group via the **ROUTING SWITCHES**. Pan left feeds the signal to odd numbered and pan right to even. The **MIX** switch routes the channel signal to the stereo mix bus so that you can use the channel path as another input on mixdown.

XFX moves the source point for the channel fader to post the monitor fader so that you can use the tape send or routing matrix as additional sends when mixing.

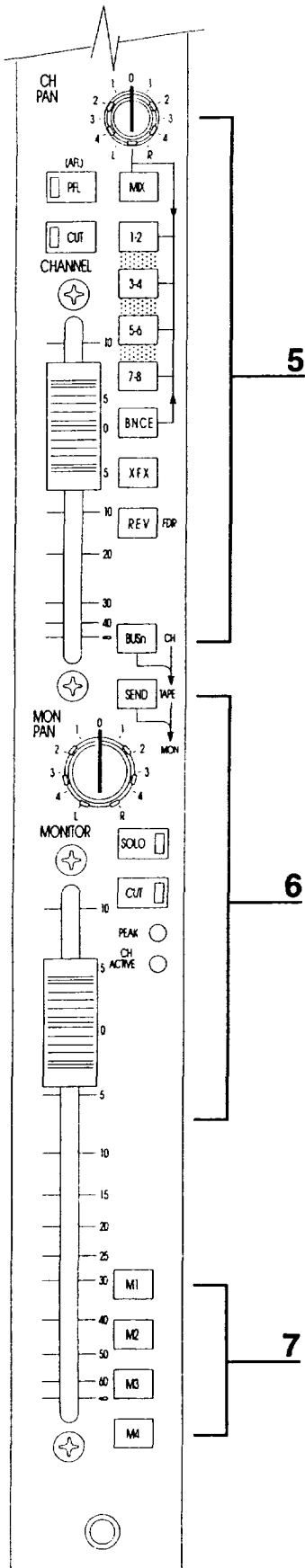
When the bounce switch **BNCE** is pressed the monitor path is unhooked from the mix bus and moved to feed the group routing switches. This allows easy bouncing of tracks and sub-grouping and makes the monitor channel 'solo-safe' to protect the inputs to the group when solo is active.

The **(AFL)PFL** switch allows direct monitoring of the signal at either the input of the channel fader (**PFL**) or the output of the channel **CUT** switch (**AFL**). Selection of **PFL** or **AFL** is included on the Master module.

The channel fader output normally feeds the Tape Send socket and the signal level is selectable to +4dBu (default) or to -10dBV by pressing the **-10** switch on the rear panel. Alternatively the Tape Send may be sourced from the group bus corresponding to the module position by pressing the **BUS-n** switch. The numbering on the switch shows clearly which of the eight group is available, and this repeats every eight modules. See also (1) above.

Monitor Path

6 The monitor path is normally fed from the Tape Return input, to make use of the automatic input/repro switching in the tape machine. A trim control with a range of +/-10dB is provided on the lower section of the input gain control (see 1), and this is detented at the nominal centre 0dB point. Note that the Tape Return level is also subject to the **-10** switch to interface to +4dBu or -10dBv equipment.



Pressing the **SEND (TAPE - MON)** switch feeds the monitor path from that module's Tape Send, enabling you to hear the signal being sent to the tape. The patented active monitor **PAN** control positions the signal across the stereo bus at a level determined by the long-throw monitor **FADER**, or the **VCA** if the console is under the control of the automation.

Manual (Isolate) Mode

In this mode the Fader works conventionally: i.e. the audio signal passes through the fader.

The Fader has +10dB gain at the top of its travel and is cut by the adjacent illuminated **CUT** switch.

Automation Mode

There are three modes of operation under automation control: Write, Read and Update.

Write Mode

In Write mode the Fader position is written to the automation, which then mirrors this position to the VCA. The positional information is also recorded, against time-code, by the automation for later use in Read or Update Mode. The **CUT** switch position is also written to, and recorded by, the automation inasmuch as it represents the Fader being fully down.

Update Mode

The Fader's position is written to the automation and is used by the automation to amend existing (previously written) data. See the Optifile LC User's Manual.

Read Mode

The fader positional information previously recorded, against time-code, by the automation is sent to (Read by) the VCA.

The monitor **SOLO** system is normally Solo-in-Place(SIP) - pressing the solo button mutes all the other monitor paths (unless they are 'solo safe' by having **BNCE** selected). Pressing the **SOLO** switch on a **BNCEd** channel gives **AFL/PFL** instead, depending on the **PFL/AFL** status on the Master module. Channels may be individually set as solo-safe by removing internal link **LK1** on the right hand circuit board.

A multi-point peak detector illuminates the **PEAK** LED when less than 6dB of headroom remains at three critical places in the signal chain: the Input Pre-amp, the HF/LF EQ and the MF EQ sections.

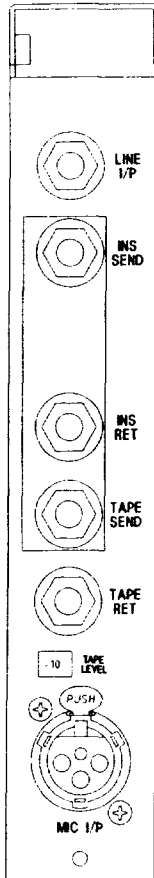
The **CH ACTIVE** LED monitors the output of the input pre-amp and illuminates if the level exceeds -20dBu.

7 Four mute switches allow the monitor path to be controlled by the master mute buses originating on the Master module.

Meters

The I/O bargraph is sourced from the monitor path and follows the monitor **SEND(TAPE - MON)** switch to show either off tape (pre-trim) or group bus levels.

Rear Connector Panel



Connector Pinouts

Microphone Input - Female XLR

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

Line Input - 3 Pole Jack

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

Insert Send - 3 Pole Jack

Tip	Hot(signal)
Ring	Ground
Sleeve	Ground (screen)

Insert Return - 3 Pole Jack

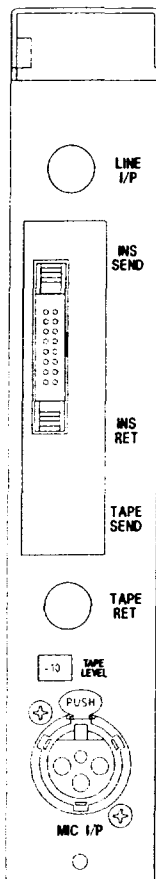
Tip	Hot(in phase signal)
Ring	Cold(out of phase signal)
Sleeve	Ground (screen)

Tape Send - 3 pole Jack

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

Tape Return - 3 Pole Jack

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

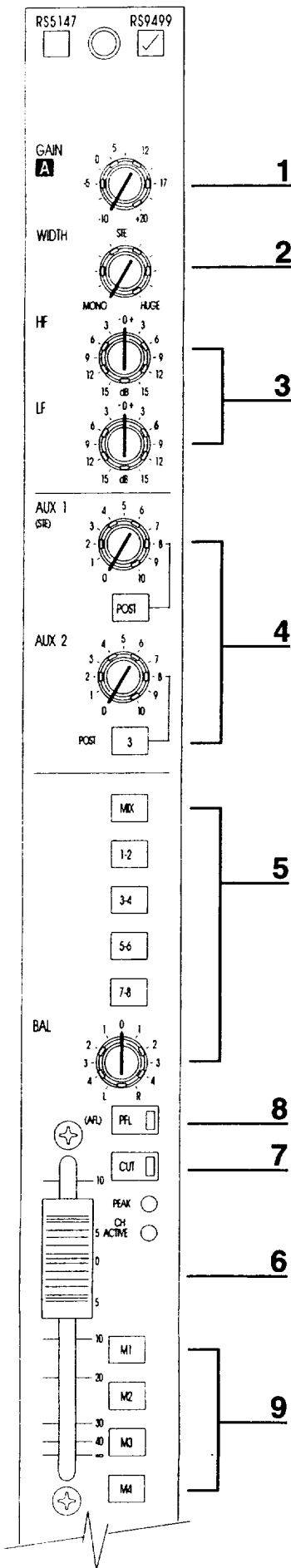


Dual Stereo Input Module RS9499/RS5147

Description

and Operation

Dual Stereo Input Module RS9499/RS5147



The Dual Stereo Input module is primarily intended for use as a stereo effects return, but is equally useful for bringing stereo or multi-output instruments, CD players or stereo tape machines into the console, as the signal paths can be routed to any pair of buses.

The module has two identical stereo Line Input sections, and only one is described:

Module Identification

At the top of the module there are two boxes which indicate the module number: RS9499 for a non-patchbay console and RS5147 for a patchbay version. The two modules have identical functions and differ only in the rear connections.

Channel Input

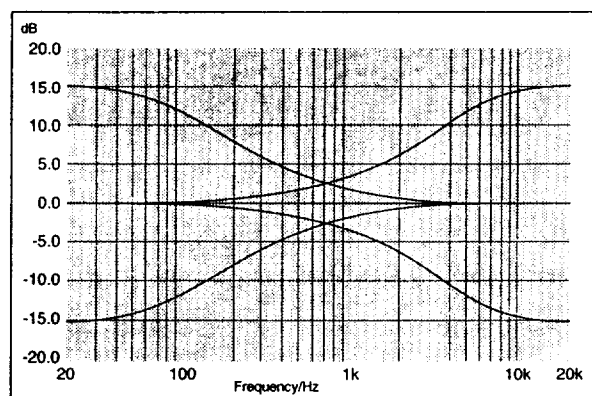
1 The Line inputs from the rear panel jack sockets or patchbay are electronically balanced. The **GAIN** control adjusts the sensitivity from +10dBu to -20dBu.

2 The input is followed by a centre-detented stereo **WIDTH** control (as well as the normal **BALANCE** control - see below) which enables the stereo image to be smoothly varied from **MONO** (fully anticlockwise) through normal stereo (centre) to enhanced wide stereo in the fully clockwise (**HUGE**) position.

Equaliser

3 A 2-band **EQUALISER** has a pair of centre-detented controls giving 15dB cut or boost at turnover frequencies of 60Hz (LF) and 8kHz (HF).

Frequency Response Curves of the Equaliser



Auxiliary Sends

4 Two Aux Sends are provided. **AUX 1** is a stereo send which is normally fed by the post-EQ, pre-mute signal and tracks the **BALANCE** control. Pressing **POST** switches the source to post-fade.

AUX 2 is normally a pre-fade mono sum of the input signal. Pressing the **(POST)3** switch makes it a post-fade mono sum, and routes the output to Aux bus 3 instead.

Routing

5 The stereo signal may be routed to any pair of buses using the routing switches, subject to the position of the **BALance** control.

Channel Status

6 The stereo **FADER** has +10dB gain at the top of its travel.

7 The illuminated **CUT** switch acts before the fader to cut the channel signal.

8 The (AFL)**PFL** switch allows non-destructive monitoring (unlike SIP) of the pre or post fade signals as selected on the Master module.

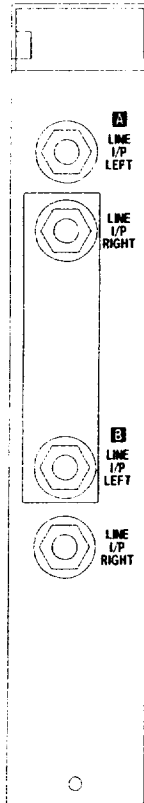
9 Four mute switches place the channel under the control of the selected master mute buss.

Stereo peak detection is provided which illuminates the **PEAK** LED when either the pre-EQ or the post-EQ pre-fade signals have less than 6dB of headroom remaining.

The **CH ACTIVE** LED is sourced from the output of the input pre-amp and illuminates if the signal exceeds -20dBu.

Channels are normally set as solo-safe in SIP mode, and this will be most appropriate when the channel is used as an Effects Return. When the channel is used as a Stereo Input, Solo-in-Place can be enabled by fitting internal jumper JMP1 (section A) or JMP2 (Section B).

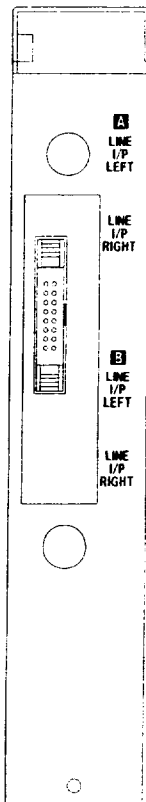
Rear Connector Panel



Connector Pinouts

Line Inputs A & B, L & R - 3 Pole Jack, balanced

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

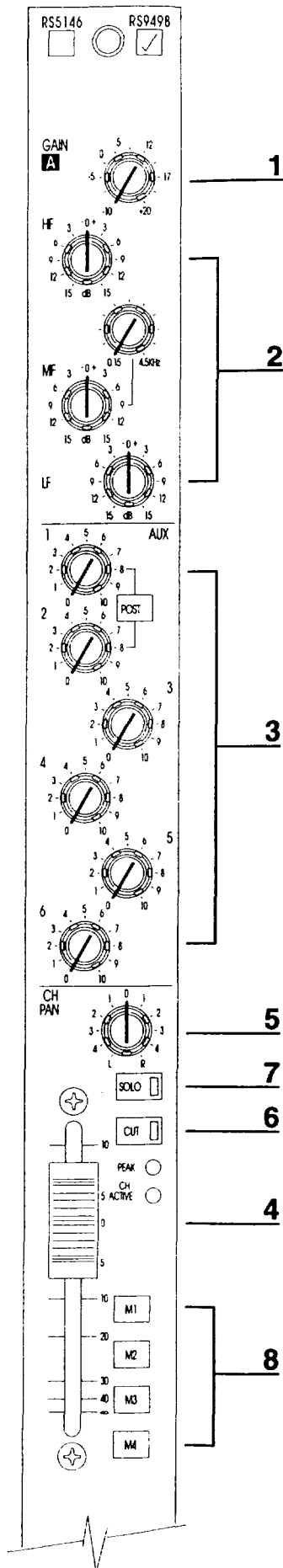


Dual Line Input Module RS9498/RS5146

Description

and Operation

Dual Line Input RS9498/RS5146



The Dual Line Input module allows extra inputs to be added to the mix quickly and easily and is therefore ideal for MIDI-sequenced electronic instruments. The module has two identical Line Input sections, and only one is described:

Module Identification

At the top of the module there are two boxes which indicate the module number: RS9498 for non-patchbay consoles and RS5146 for the patchbay version. The two modules have identical functions and differ only in the rear connections.

Channel Input

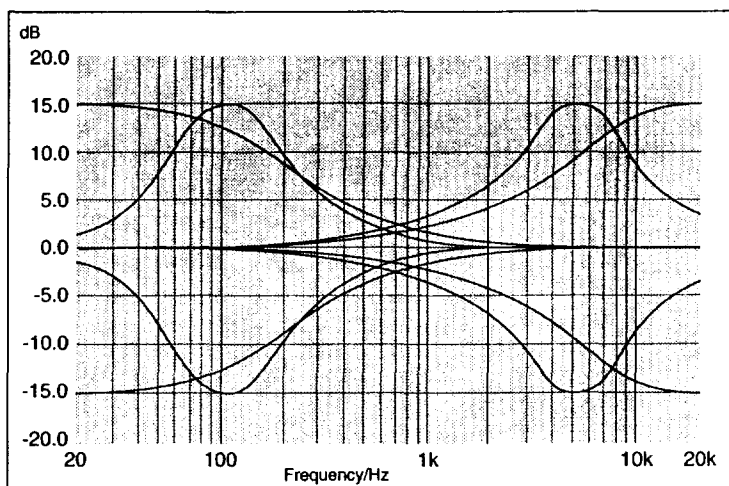
1 The Line inputs are electronically balanced. The **GAIN** control adjusts the sensitivity from +10dBu to -20dBu.

The input stage is followed by the **INSERT** point which has a balanced send and an unbalanced return.

Equaliser

2 The **EQUALISER** is a 3-band semi-parametric. The HF and LF shelving controls give 15dB cut and boost at fixed turnover frequencies of 8kHz and 60Hz respectively. The swept MF control gives 15dB cut or boost at a centre frequency variable from 150Hz to 4.5kHz with a Q of approximately 1.5.

Frequency Response Curves of the Equaliser



Auxiliary Sends

3 Six Aux Sends are provided. **AUX 1** is a stereo send which is normally fed by the post-EQ, pre-mute signal and follows the PAN control. **AUX 2** is similar, but is a mono send. Pressing **POST** switches the source to post-fade for both controls.

AUX 3 to 6 are permanently post-fade.

Channel Status

4 The main signal is permanently routed to the stereo Mix bus via the 60mm **FADER**, which has +10dB gain at the top of its travel.

5 The patented active **PAN** control determines the position of the signal within the stereo image from fully left to fully right. The centre (detented) position gives a 4.5dB level drop.

6 The illuminated **CUT** switch acts before the fader to cut the channel signal.

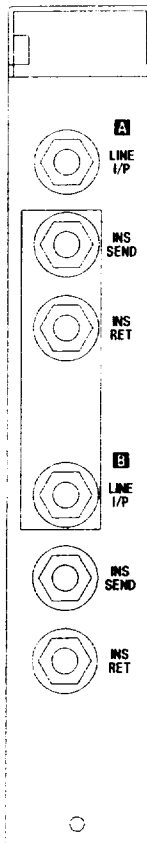
7 The **SOLO** switch normally performs Solo-in Place(SIP) and is linked to the SIP function on the monitor paths of the I/O modules. The function of this switch can be switched to PFL/AFL at the Master module.

8 Four mute switches place the channel under the control of the selected master mute bus.

Multi-point peak detection is provided which illuminates the **PEAK** LED when either the post-EQ or the post-fader signals have less than 6dB of headroom remaining.

The **CH ACTIVE** LED is sourced from the output of the input pre-amp and illuminates if the signal exceeds -20dBu.

Rear Connector Panel



Connector Pinouts

Line Inputs - 3 Pole Jack

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

Insert Sends - 3 Pole Jack

Tip	Hot(signal)
Ring	Ground
Sleeve	Ground (screen)

Insert Returns - 3 Pole Jack

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

