SONIFEX
S O V E R E I G N

**SOVEREIGN MIXER
USER HANDBOOK**

MX-10	**10 Channel Modular Broadcast Mixing Desk**
MX-14S	**14 Channel Modular Broadcast Mixing Desk**
MX-PSU	**Sovereign Power Supply**

Contents

Warranty And Safety Information

Warranty Registration
Sovereign Mixing Consoles

Warranty Details

This Sovereign range of audio equipment is guaranteed for 12 months from the date of purchase.

The components and materials used are guaranteed against defects and faulty workmanship. Sonifex undertake to replace or repair faulty items at its discretion, within the warranty period, on a return to factory basis.

In order to register the date of purchase so that we can keep you informed of any design inprovements or modifications, it is important to complete the WARRANTY REGISTRATION DOCUMENT and return it to :-

Sonifex Ltd,
61, Station Road,
Irthlingborough,
Northants.,
NN9 5QE
ENGLAND

The registration document carries the following information for servicing :-

SOVEREIGN TYPE   _____
SERIAL NUMBER   MX_____
VOLTAGE   V_____

Safety Of Mains Operated Equipment
Sovereign Mixing Console

Preparing the Machine for Use

Each Sovereign is shipped with a separate power supply in protective packaging and should be inspected for damage before use. Where an item is found to have transit damage, notify the carrier immediately with all the relevant details of the shipment. Packing materials should be kept for inspection.

MX-PSU Power Supply Unit

The MX-PSU is a 2U high rack-mount unit which can supply +15V, -15V and +48V to either the MX10 or MX14S mixer. A lead with an IP40 678 series 7 way plug on each end is used to connect the power supply to the mixer.

The power supply should be installed where there is adequate ventilation for heat to circulate from the rear of the unit. The mixer has a heat-sink attached to the rear panel which radiates some heat.

Three LED's on the front of the unit indicate whether the power to the three voltage rails is being supplied correctly. If one of the LED's fails, then there is a problem with the power supply unit.
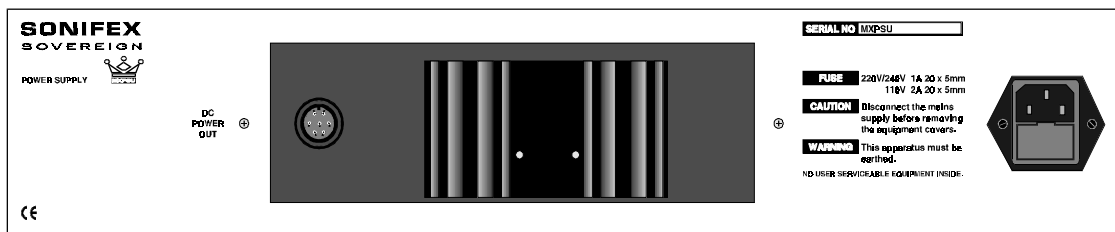
Equipment Safety

This equipment has been designed to meet the safety regulations currently advised in the country of purchase.

It is important to connect the mains supply in accordance with the information given. Ensure that the rear panel mains voltage statement on the separate power supply indicates that your equipment is suitable for your mains supply voltage and that the mains supply fuse is correctly rated. The fuse as supplied is correct for the voltage setting.

The power cable supplied carries an EARTH conductor which is connected internally to the equipment chassis ground. This connection through a properly wired power connector is essential for safe operation. Disconnection of this earth connection may render the equipment unsafe, with a consequential possible electrical shock hazard from exposed metallic parts.

This equipment will operate in a horizontal position.

CE   This equipment conforms to the safety regulations specified by use of the CE Mark.

**Warning : Always switch the power supply off before connecting or
disconnecting the console power supply cable, removing or repairing modules and servicing.**

Voltage Setting Checks

The rear panel of the equipment carries the Serial Number of the machine. The operating voltage of the Sovereign power supply is selectable at the fuse carrier on the power inlet port of the MX-PSU unit. Ensure that the machine operating voltage is correct for your mains power supply. The safety specification of your Sovereign power supply complies with local requirements and must be earthed through the mains connector. The available voltage settings are : -

110V	Code A
220V	Code E
240V	Code U

Power Cable and Connection

The IEC power connector or power lead provided must be connected as follows. The mains lead wires supplied with the equipment are coloured in accordance with the following code : -

Green	-	**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 of your plug, proceed as follows :-

Green and Yellow wire green-	- must be connected to the terminal marked with E the colour green or yellow.
Blue wire	- must be connected to the terminal marked N or coloured black.
Brown wire	- must be connected to the terminal marked L or coloured red.

Fuse Rating

The Sovereign MX-PSU is supplied with a single fuse in the live conducting path of the power infeed at the power supply. (A spare fuse is also contained in the fuse-holder housing. For reasons of safety it is important that the correct rating and type of fuse is used. Incorrectly rated fuses could present a possible fire hazard, under equipment fault conditions. The fuse ratings for Sovereign are :-

Country code A	110 V operation	- 2.0A 5 x 20mm SB
Country code E	220/240 V operation	- 1.0A 5 x 20mm SB

Removing the Covers of the Power Supply

WARNING : The power must be switched off at the supply or the power lead must be disconnected before attempting to remove the panels or cover. Removal of the panels and cover can expose dangerous voltages. The cover is connected to the chassis ground of the equipment by means of fixing screws. It is essential to maintain this earth-ground connection to maintain a safe operating environment. In addition, to provide an Electromagnetic Shield, contact between the cover and the chassis must be maintained when in use.

Limitation of Liability

Limited Warranty - Sonifex warrants that the Sovereign hardware will be free from defects in materials and workmanship under normal use and service for a period of one year from the date of receipt. Any implied warranties on the hardware are limited to one (1) year, respectively, or the shortest period permitted by applicable law, whichever is greater.

Customer Remedies - Sonifex's entire liability and your exclusive remedy shall be, at Sonifex's option, either (a) return of the price paid or (b) repair or replacement of the hardware that does not meet Sonifex's Limited Warranty and which is returned to Sonifex with a copy of your receipt or invoice. This Limited Warranty is void if failure of the hardware has resulted from accident, abuse, or misapplication. Any replacement hardware will be warranted for the remainder of the original warranty period or 30 days, whichever is longer.

No other warranties - To the maximum extent permitted by applicable law, Sonifex disclaims all other warranties, either express or implied, including but not limited to implied warranties or merchantability and fitness for a particular purpose, with respect to the Sovereign, the accompanying product manual(s) and written materials, and any accompanying hardware. The Limited Warranty contained herein gives you specific legal rights.

No Liability for Consequential Damages - To the maximum extent permitted by applicable law, Sonifex and its suppliers shall not be liable for any other damages whatsoever (including, without limitation, damages for loss of business profits, business interruption, loss of business information, or other pecuniary loss) arising out of the use of or inability to use this Sonifex product, even if Sonifex has been advised of the possibility of such damages. In any case, Sonifex's entire liability under any provision of this agreement shall be limited to the amount actually paid by you for the Sovereign. This Agreement is governed by the laws of England.

Sonifex Ltd can not be held liable for any loss of audio output due to equipment failure.

1. Introduction

1.1. Introduction

Sovereign is a range of modular mixing consoles designed for local radio stations and self-op studios. With VCA's controlled by faders, two main output groups, built-in 4 way stereo distribution amplifier and optional script space, Sovereign offers the flexibility of larger consoles at a reduced price.

Sovereign mixers are available in two frame sizes : the MX10, which can contain 10 input modules and the MX14S which has room for 14 input modules plus a 7 module script space (or 21 modules in total).

Each console has an additional output module to the far right which controls the monitoring, pre-fade listen and talkback functions together with the output selection of the two groups. The output module can optionally contain master faders for production use. The meter bridge contains a speaker, a digital timer and either VU or PPM meters.

The modular approach to the design means that module replacement, or expansion of the system can be carried out quickly and efficiently. All modules are internally connected by a strong bus cable which clips into place - removal of the cable and two screws allows any input module to be removed. Easy access is provided at the rear of the unit for all connections.

Despite the low price of the consoles, innovative design techniques and the selection of quality components have ensured that top audio performance is produced. The use of VCA's controlled by the fader operation ensures tight stereo tracking and eliminates mechanical and electronic noise. ALPS long throw faders give a smooth, repeatable response and the XLR Neutrik connectors used are an industry standard.

Each unit is supplied complete with power supply which provides +15V, -15V and +48V to the console.

1.1.1. Features

- Fully modular build with two different frame sizes available.
- Optional script space.
- Built-in 4 way stereo Distribution Amplifier.
- True cleanfeed output on each telco input.
- ALPS faders controlling VCA operation.
- VU metering or optional PPM's.
- Optional Production Output module with master faders.
- Digital timer, custom assignable to specific input modules.
- Control room and studio monitor muting.
- Two output groups.
- Mono output feed.
- Optional gram amp for dual stereo module.

1.1.2. Module Features

There are four different input modules available for installation in the mixer as well as a blank module and Script space. The Output module controls the monitoring and master output functions, and a meter bridge is used to house the meters, a speaker and the digital timer.

The modules are each covered in a separate section of this handbook, but a summary follows :

1.1.2.1 Mic/Line Input Module

The Mic/Line Input module is a mono input controlled by a button switch to select either Mic or Mono Line. Equalization is fitted as standard on this module and is enabled by the EQ button, providing ± 7.5dB at HF (8kHz) and LF (100Hz). The Mic input has a jumper selectable high pass filter to remove low frequency intrusions and a Pan control is also available to facilitate stereo imaging.

Module gain is coarse set with preset multi-turn controls recessed at the top of the module - the gain is trimmed with a panel Trim knob providing ± 15dB of gain. The module has a Pre Fade Listen facility that is automatically disabled when the fader is opened. The module is held in a mute status until the channel On button is pressed and the fader is opened.

There are logic remote input controls for Mic Cough muting and external Reverse Talkback, with output controls to start and stop by fader or by using the On button. The remote outputs are connected to a 9 way D type and are fed from NPN opto-isolators. The Mic module provides a jumper selectable output to facilitate either Control Room or Studio Monitor muting with jumper selectable Timer remote start.

1.1.2.2 Dual Stereo Input Module

Each module has dual switchable stereo line inputs with optional EQ. Input 1 is made on balanced XLR connectors with gain adjustable from the front panel. Input 2 can be hard-wired on the Remote connector and has gain adjustable by Preset potentiometers on the PCB. Remote control can be used for Remote Start and Stop.

This module shares many features with the Mic/Line module except for the following differences : It has two stereo inputs instead of two mono inputs, the pan control is replaced by a balance control for small adjustments to the stereo image, and there is no EQ and Cough or Reverse Talkback remotes.

The remote output operation can be jumper configured to be either momentary (about half a second) or latched, to give a continuous output - a feature that may be required for some types of turntables.

An optional RIAA equalised gram amplifier is available for this module for use with turntables.

1.1.2.3 Telco Input Module

This module controls the connection to the telephone balance unit and has EQ, coarse and fine gain control, PFL and A & B output select. It has only one mono input, the other XLR connector being used for the cleanfeed output to the telephone hybrid. This output is a true cleanfeed (not mix minus) which consequently prevents phasing problems. The presenter can talk off-air with a caller whilst the programme is being output.

The bus system allows for two cleanfeed signals meaning that a maximum of two telco modules per mixer can be fitted. The Hold button becomes the Line Hold Remote Divert control for the hybrid via the remote connector - no stop remote is needed.

1.1.2.4 Transmission Router Module

This module allows the user to select one of four external sources to be routed through the desk and transmitted instead of the local source (i.e. the mixing console). The four external inputs are connected on a 25-way D-Type (balanced) and there is an XLR connector for output to the main transmission feed. When fitted, this output replaces the Master Output of the mixer.

The Meter Select button determines what is shown on the meters. Either the local output, or the transmission from the external source, routed through the desk, can be displayed.

1.1.2.5 Outside Source Select Module

If you need to be able to select from a large number of different incoming sources, then this module can be used. It provides two banks of six inputs, one of which from each bank can be switched to an output. The two outputs can then be connected to one or two stereo channel modules via an external cable, to be routed through the mixer.

1.1.2.6 Master Monitor and Output Module

This module is common to every mixer and contains the two main stereo outputs, a mono output, four DA outputs, meter selection and monitor selection controls for both Control Room (local) and Studio (remote). The monitor panel also has two external stereo inputs for monitoring either off air or another studio. The mono output can be derived from either of the main outputs via switch controlled logic.

The meters can read either output A, output B, or the selected source from the control room monitor switches, including PFL. Signals from output A, output B, and external inputs 1 and 2 can be independently routed to either Studio or Control Room Monitors/Headphones offering total flexibility. PFL signals can be routed to either Monitor Speakers and/or Headphones. The control room has the extra facility of split PFL on headphones - main programme fed to one ear with PFL fed to the other.

1.1.2.7 Meter Bridge

The meter bridge is fitted with VU or optional PPM meters which can monitor either of the two main output groups, or selected monitor output.

A speaker on the left of the bridge provides local monitoring of the talk-back and pre-fade signals, with adjustable level controls. The speaker is muted automatically when the Control Room mute is active, to prevent feedback.

To ensure that a programme is on schedule and for the monitoring of significant times, a digital timer is fitted next to the speaker which has Start, Stop and Reset buttons. The timer can be used manually, or controlled by the operation of particular channels.

1.2. Installation Notes

1.2.1. Atmosphere

The Sovereign mixer should be installed in an area which is not subject to excessive heat or cold. Also, you should avoid installing it in atmospheric conditions which are dusty, smoky or dirty, or where there is moisture or vibration.

Do not use liquids to clean the front of the mixer - wiping with a soft, dry cloth is advised. Use only water or ethyl alcohol to clean the Scratch Pads.

1.2.2. Electromagnetic Radiation

Note that there can be a degredation of the audio quality if the Sovereign mixer is used near to strong sources of electromagnetic radiation. Strong sources include video monitors, and mains cabling. The mixer power supply should also be installed at least 1 metre from the mixer itself.

1.2.3. Dimensions and Cut-Out Sizes

The Sovereign mixers consist of a steel chassis surrounded with an ash trim. The dimensions for the mixer below include the ash trim. The cut-out size is for reference only and should be checked with your mixer.

View From Side

225mm

65mm

490mm

View From Above

490mm

625mm (MX10)

1020mm (MX14S)

View From Above

460mm

545mm (MX10)

940mm (MX14S)

The mixer can rest on internal bearers
which are 20mm deep from the top surface.
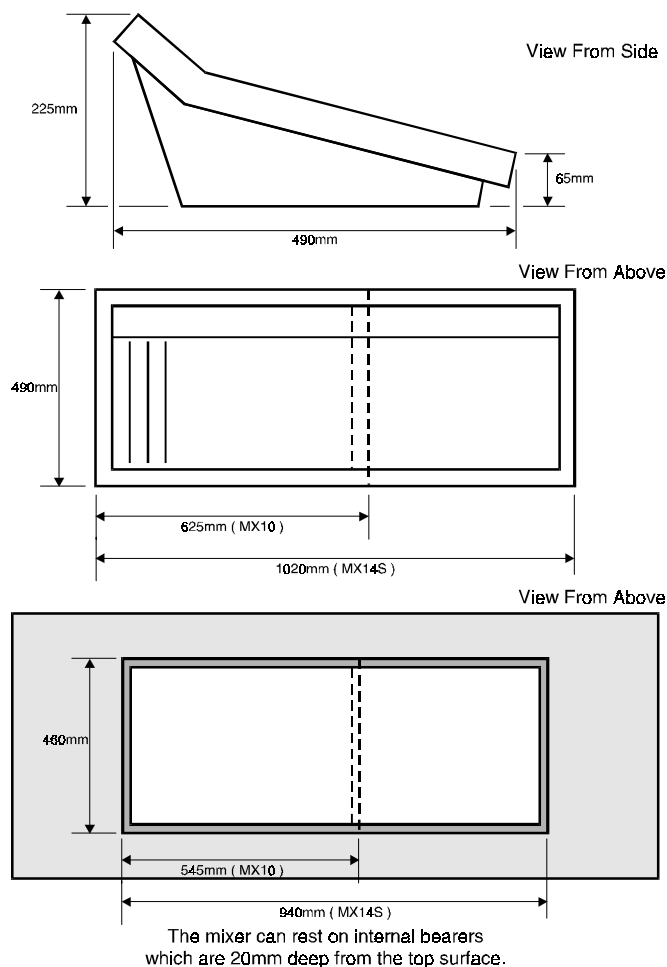
**Fig 1-1 : Sovereign Mixer Dimensions
and Cut-Out Sizes**

1.2.4. Module Configuration

Each of the modules is configured by jumper settings which are displayed in the "Module Options and Jumper Settings" section of each Chapter. You should ensure that you are thoroughly familiar with the settings available for each module before attempting installation of the mixer. This is because some options, such as Talk-back, may involve configuring a number of different modules, including the Master Output and Monitor Module.

1.3. Connectors and Cabling

Many of the problems associated with installing and maintaining a mixing console are due to the use of poor cables or faulty connections. It is recommended that, whereever possible, pre-wired cables are purchased from recommended manufacturers. If you need bespoke cables making, please ensure that the work is carried out by a qualified engineer.

The main types of connectors used with the Sovereign mixers are the following :

1.3.1. XLR 3 Pin Connectors

The following diagram shows the pin details for the 3 pin XLR sockets and plugs :

Line & Mic Inputs   **C/F, Left and Right Stereo Outputs**

Pin 2. Hot (In Phase) Signal
Pin 1. Ground (Screen) Signal
Pin 3. Cold (Out Of Phase) Signal

3 Pin Socket (Female)

Pin 2. Hot (In Phase) Signal
Pin 1. Ground (Screen) Signal
Pin 3. Cold (Out Of Phase) Signal

3 Pin Plug (Male)
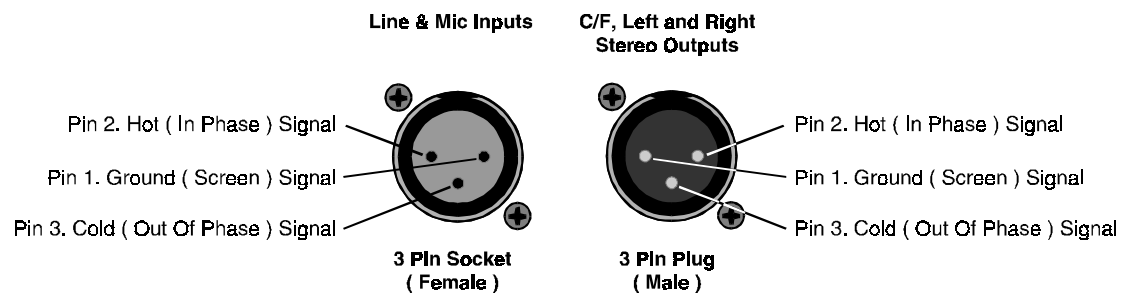
Fig 1-2 : XLR Connectors

1.3.2. 1/4" 'A' Gauge Stereo Jack Plugs

1/4" 'A' Gauge Stereo Jack Plugs can be connected as follows :

1/4" 'A' Gauge Stereo Jack Plug used for T/B In and T/B Out

Tip - Hot (In Phase) Signal
Ring - Cold (Out Of Phase) Signal
Sleeve - Ground (Screen) Signal

1/4" 'A' Gauge Stereo Jack Plug used for Headphones and Monitors

Tip - Left Signal
Ring - Right Signal
Sleeve - Ground (Screen) Signal
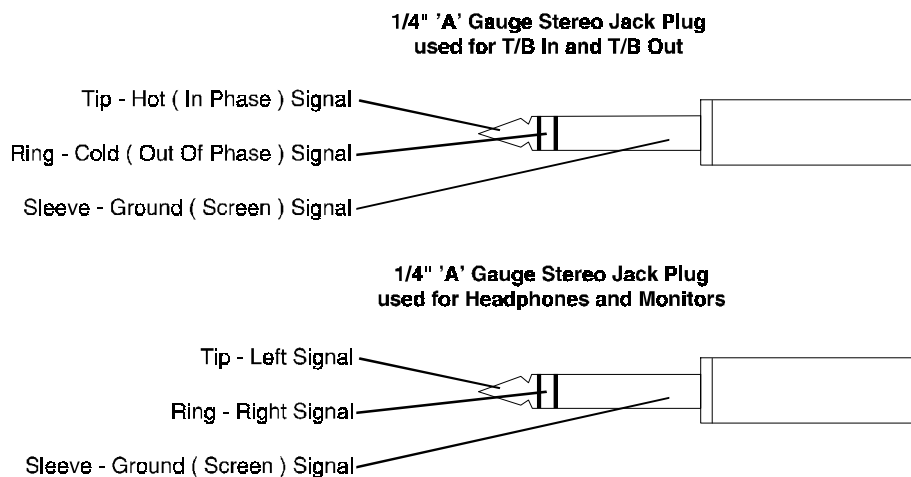
Fig 1-3 : 1/4" Jack Connectors

1.3.3. D-Type Connectors

Two different D-Type connectors are used on the Sovereign. 9 Pin Plug connectors are used for the Input Remotes and the External Inputs and 15 Pin Socket connectors are used for the DA Outputs and Mono Output.

9 Pin D-Type Plug used for Remotes and Ext Inputs

15 Pin D-Type Socket used for DA and Mono Outputs

Pin 6

Pin 9

Pin 1

Pin 5

Pin 15

Pin 9

Pin 8

Pin 1
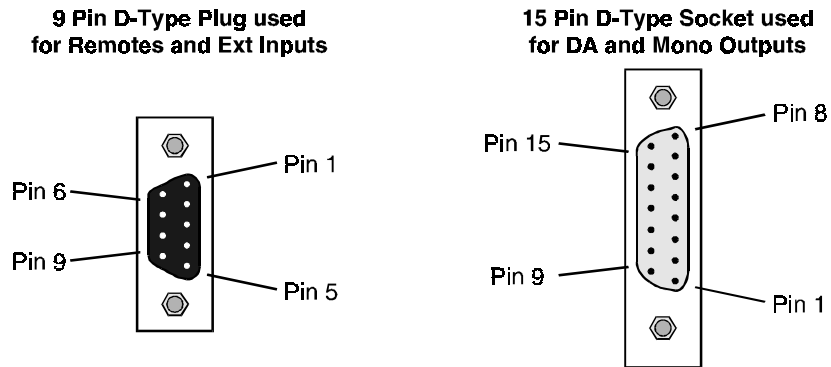
Fig 1-4 : D-Type Connectors

1.4. System Block Diagram
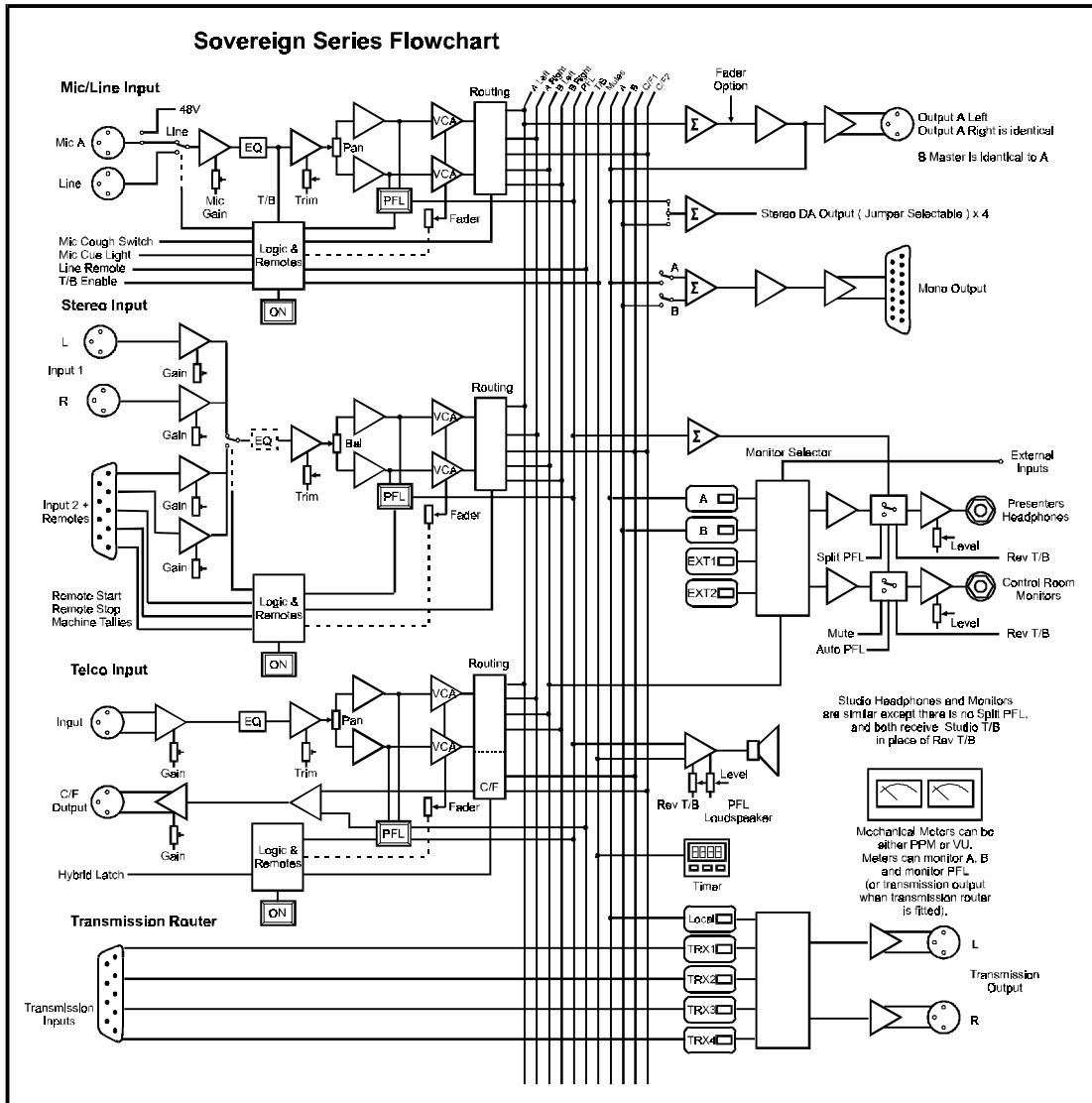
Fig 1-5 : Sovereign Block Diagram

2. Mic/Line Input Module

2.1. Panel Controls
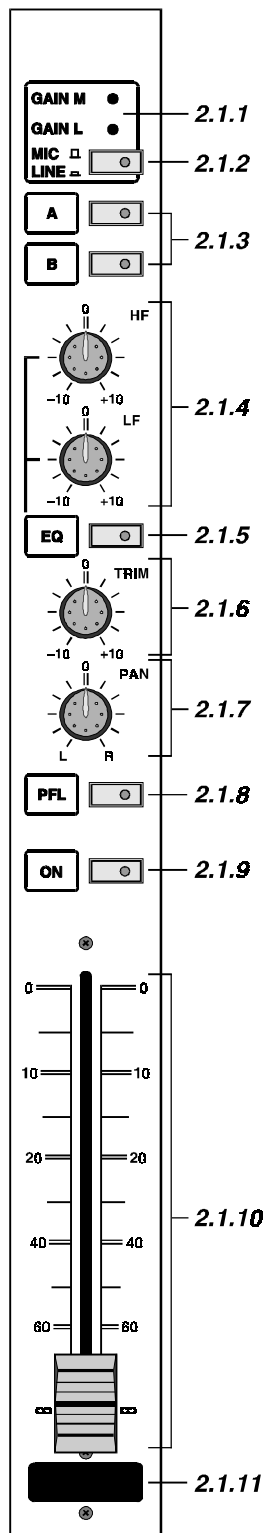
Fig 2-1 Mic/Line Module

2.1.1. Course Gain Adjustment

Two preset pots are available for adjustment of the input gain for the mic and line levels. The mic pot provides 53dB of gain adjustment allowing an input range of -13dB to -66dB, and should be configured initially to give an 0dB output level for the expected input. The line pot provides 16dB of gain adjustment allowing an input range of +6dB to -10dB, reference 0dB output. Fine level adjustment can be made by using the Trim knob.

2.1.2. Mic/Line Select Button

This button switches the module between receiving the microphone input (with the switch released) and the line input (with the switch depressed, and the red LED on).

2.1.3. Output Select

The signal from the mic/line module can be routed to either output A, output B, to both, or to neither. When a red LED is illuminated, it indicates that the signal is routed to that output.

2.1.4. Equalisation

The HF (treble) and LF (bass) controls are used to adjust the equalisation of the signal. The HF EQ boosts and cuts the signal by ± 7.5dB at 8kHz. The LF EQ boosts and cuts the signal by ± 7.5dB at 100Hz.

2.1.5. EQ Enable Button

With the EQ button depressed, the Equalisation described above is switched into the signal path. The red LED illuminates when the button is depressed. To bypass the EQ section, release the button.

2.1.6. Trim Knob

The Trim knob provides an additional ±15dB of gain to fine-tune the signal level.

2.1.7. Pan Knob

The Pan knob is used to shift the stereo image of the mono mic or line input. Full anti-clockwise shifts the signal to the left of the stereo bus (decreases right channel by -70dB, increases left channel by +3dB); full clockwise shifts the signal to the right (decreases left channel by -70dB, increases right channel by +3dB)

2.1.8. Pre-Fade Listen (PFL) Button

With the PFL button depressed, the incoming signal on this channel is routed to the PFL bus so that it can be heard in the Monitors section (by selecting Auto-PFL). The PFL only operates when the fader is fully down, unless jumper J11 is not fitted when the PFL will operate with the fader either up or down. PFL is active when the Yellow LED is illuminated in the button.

2.1.9. On Button

The On button can be used to start and stop (selectable by jumper settings) a remote piece of equipment, as well as working in conjunction with the fader open signal to allow output from the channel. For the fader to operate, the On button must be illuminated. The Green LED in the button glows at two brightnesses. If the fader is down when the On button is pushed, the LED glows at half brightness and the circuitry can be regarded as being armed. To activate the circuitry, the fader should be moved away from the down position - the LED then glows with full power.

If the On button is pushed while the fader is already away from the down position, the circuitry will be enabled as soon as the button is pushed.

2.1.10. Fader

The 100mm long throw ALPS VCA fader provides a unity gain (0dB) when fully open. The scale shows the attenuation. The fader open signal is produced by a voltage detecting op-amp and is disabled when the fader is in the fully down position. The fader open signal is used for the fader start/timer functions. The channel input is routed to the outputs whenever the fader is open and the On switch and output switch are selected, provided that the Cough remote is not being used.

2.1.11. Scratch Pad

A white pad is provided at the bottom of the module on to which you can write the function of the channel, for example, "Presenter's Mic".

2.2. Rear Panel
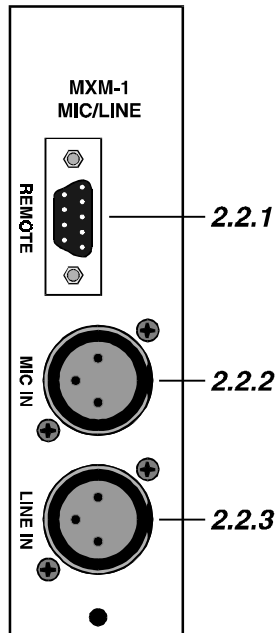
Fig 2-2 Mic/Line Rear Panel

2.2.1. Remote Connector

The 9 pin D-Type plug remote connector provides the inputs and outputs for the following functions :

- Remote Start
- Remote Stop
- Cough Input Mute/Reverse Talkback
- External Talkback Control

The following pins are used for the connections :

Pin 1 :   Opto isolated start NPN collector.
Pin 2 :   Opto isolated start NPN emitter.
Pin 3 :   Opto isolated stop NPN collector.
Pin 4 :   Opto isolated stop NPN emitter.
Pin 5 :   Cough input mute/Rev talkback (make to 0V).
Pin 6 :   0V (Common).
Pin 7 :   Screen/Chassis.
Pin 8 :   External talkback control (make to 0V).
Pin 9 :   0V (Common).

2.2.2. Mic In Connector

This XLR 3 pin socket is used for the microphone and has the following connections :

Pin 1 :   Screen.
Pin 2 :   Phase.
Pin 3 :   Non-phase.

2.2.3. Line In Connector

This is an XLR 3 pin socket used for the electronically balanced line input and has the following pin details :

Pin 1 :   Screen.
Pin 2 :   Phase.
Pin 3 :   Non-phase.

2.3. Module Options and Jumper Settings

The mic/line module can be configured in a number of different ways depending on the jumper options set on the board. The options available are :

- Using a phantom powered microphone.
- Enable full LF Response on microphone input.
- Select remote start/stop for microphone or line.
- Enable continuous momentary start from channel On button.
- Select momentary or latched start.
- Select to stop on fader down, or stop on fader down or on button off.
- Select monitor mute for studio or control room.
- Set channel to start the timer automatically.
- Enable/disable the remote stop.
- Enable or disable the auto pre-fade listen fader cancel.

2.3.1. Summary of Jumper Settings for Mic/Line Module
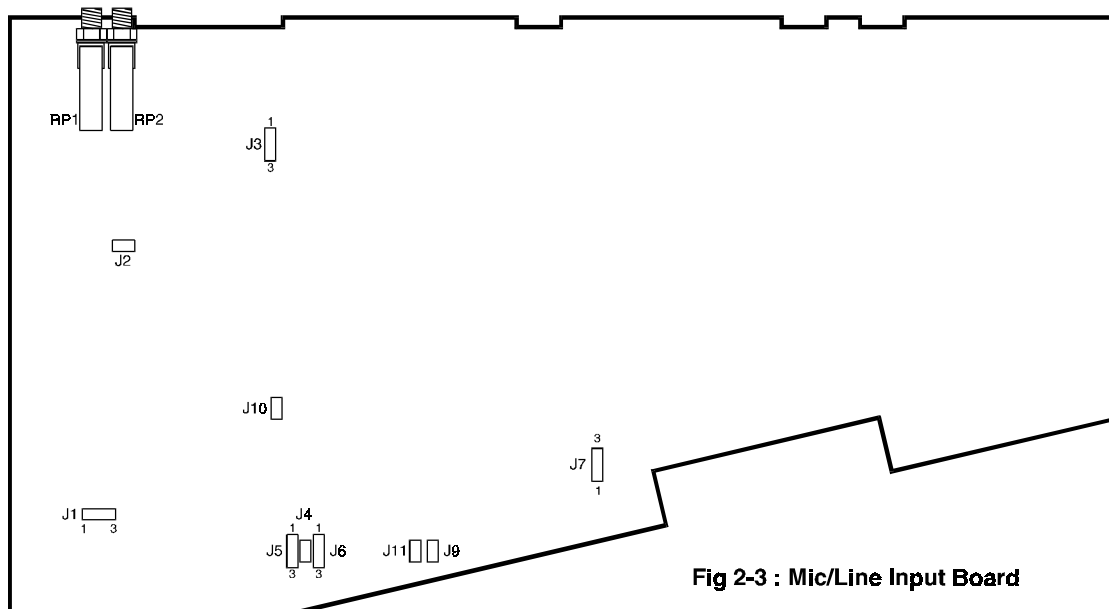
Fig 2-3 : Mic/Line Input Board

Jumper	Set Over Pins	Effect
J1	1 & 2	Phantom power used.
	2 & 3	**Normal operation.**
J2	**1 & 2**	**Full LF response on microphone input.**
	None	LF roll off.
J3	**1 & 2**	**Remote start/stop in line mode.**
	2 & 3	Remote start/stop in microphone mode.
	None	Remote start/stop operates with both inputs.
J4	1 & 2	Enable continuous momentary start from channel on button.
	None	**Disable continuous momentary start from channel on button.**
J5	**1 & 2**	**Momentary start.**
	2 & 3	Latched start.
	None	No start function.
J6	**1 & 2**	**Fader stop.**
	2 & 3	Fader and button stop.
J7	1 & 2	Studio monitor mute.
	2 & 3	**Control room monitor mute.**

Note : Items in bold are set as default when shipped.

Jumper	Set Over Pins	Effect
J9	1 & 2	Auto timer start.
	None	**No auto timer start.**
J10	1 & 2	Remote stop is disabled.
	None	**Remote stop operates.**
J11	**1 & 2**	**Auto pre-fade cancelled by PFL button or fader open.**
	None	Auto pre-fade cancelled by PFL button only.

Note : Items in bold are set as default when shipped.

2.3.2. Using a Phantom Powered Microphone

If you are using a phantom powered microphone, jumper J1 must be set over pins 1 and 2. If a normal microphone is being used, then set the jumper over pins 2 and 3. With phantom power selected, a voltage of +48V is applied to pins 2 and 3 of the XLR connector to power the microphone, supplied through 6k8 resistors giving a current of 14mA. If a phantom powered microphone is attached without setting the jumpers to 1 and 2, the microphone will not operate. When using a phantom powered microphone, ensure that the mixer is switched off when the microphone is plugged in to the XLR connector.

2.3.3. Enable LF Response on Mic Input

The LF (bass) response on the mic input can be configured so that it is less responsive. Set J2 to have a full LF response or remove the jumper to have the LF roll-off. You may require less LF response if, for example, the microphone being used is susceptible to low, rumbling noises or the studio is acoustically poor (such as large vehicles passing the station causing low acoustic rumbles).

2.3.4. Select Remote Start/Stop for Mic or Line

The mic or line inputs can be remotely started by use of the On button with the fader up. The remote start is enabled by setting jumper J3 over pins 1 and 2 for the line input, or over pins 2 and 3 for the mic input. If J3 is not set, the remotes operate in either mic or line mode.
This can also be used if you have a Mic/Live display - the jumper should be set over pins 2 and 3 and the start output used to control the display.

2.3.5. Enable Continuous Momentary Start From On Button

The On button can be made to remotely Start and Stop external equipment. If you require each press of the On button to just send a Start signal, then set jumper J4. This might be useful for a piece of external equipment which only has one remote input for starting and stopping.
If jumper J4 is not Set, each press of the On button will alternately send Start and Stop signals.

2.3.6. Start Select - Momentary or Latched

The remote start can be made either momentary or latched by setting the jumper J5 to 1 and 2 (for momentary) or 2 and 3 (for latched). If no jumper is set, the Start remote does not operate.

2.3.7. Stop Select - On Fader Down, or With Button Up

The input which is being remotely started can be remotely stopped as well. There are two options available for stopping : To remotely stop when the fader is down, set the jumper J6 over pins 1 and 2. To remotely stop when the fader is down or the On button is pressed up, set J6 over pins 2 and 3.

2.3.8. Monitor Mute Select - Studio or Control Room

This option is for use with the mic input. When a microphone is live to air, the monitor speakers in the room containing the microphone will need to be muted so that there is no feedback. So, for example, if the mic input is being used for a microphone in the studio, the studio monitors should be muted. Setting J7 over pins 1 and 2 will mute the studio monitors when the fader is up, setting J7 over pins 2 and 3 will mute the control room monitors.

2.3.9. Set to Start the Timer Automatically

Each of the channels can be configured so that the timer on the meter bridge is controlled by the use of the fader. This may be useful for timing the duration of music tracks or presenter speech. Set jumper J9 to control the timer with the module fader being configured. Remove jumper J9 to disable timer control.

When controlled by a channel fader, the timer operates in the following way. When the fader is opened, if the timer is not already running, it will reset the counter and start the timer. If the timer is already running when the fader is opened, the counter begins counting but freezes for 3 seconds, so that you can view and note the "start" time. After three seconds the counter will jump to show the increasing time and will then continue.

The timer will be stopped by a manual stop. The timer can only be reset when in the Stop mode.

2.3.10. Disable the Remote Stop Function

The remote Stop function can be disabled by setting J10. Leaving the jumper off enables the remote Stop function.

2.3.11. Enable the Automatic Pre-fade Listen Fader Cancel

The PFL function can be cancelled by the fader opening or by using the PFL button if jumper J11 is set. When J11 is off, the PFL function is not cancelled by the fader open signal.

2.4. Applications

This section of the handbook provides examples of how to configure the module for typical applications :

2.4.1. Controlling a Mic/Live Display

A mic/live display can be controlled in different ways. If you have only one mic channel, the display can be controlled directly from the mic channel remote output, as shown below. If you have a number of mic channels, the display can be controlled from the Mute output on the Master Output and Monitor Module (see the Section on this module for further details).

A mic/live display should be active when the presenter's mic is open, i.e. when the fader is open and the On button is down. So, for the presenter's mic channel, J3 should be placed over pins 2 and 3 (so that the remote start/stop operates for the mic channel), J4 should be off (to disable the continuous momentary start) and J5 should be set over pins 2 and 3 (so that the remote start operation is latched).

The connections that need to be made are as follows :
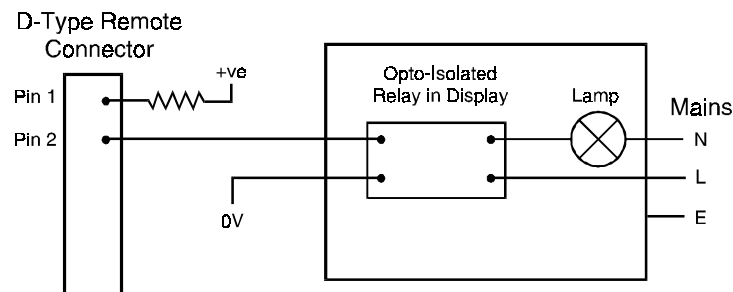

Fig 2-4 : Connections for Mic/Live Display

2.4.2. Enabling Talkback Between Studios

Talkback is used for off-air communication between studios, or between the Presenter, the Studio guests and callers on the telephone line. A switch can be set-up for a guest in the studio to talkback to the presenter (reverse talkback) when the switch is pressed. The talkback switch also acts as the Cough switch (see below), which operates when the fader to the Studio microphone is closed (as opposed to open, when the Cough function operates).

When the talkback switch is connected between pins 8 and 9 of the remote connector, the pre-fade input signal is fed to the T/B mix bus which also appears at the T/B output connector on the rear of the monitor panel. See Fig 2-5 for connection details.

For the Presenter to hear the reverse talk-back from the Studio automatically, the CR Monitor and Phones should be permanently set to AUTO PFL. Also, the Presenter's microphone module should have pins 8 and 9 of the remote connector permanently linked so that his voice is always output to the T/B bus.

2.4.3. Setting the Cough Switch

A cough switch can be set-up for a guest in the studio to mute the mic output when the cough switch is pressed (so that the guest's coughing is not routed to the mixer outputs). This function operates when the Studio microphone fader is open. When closed, the switch operates as reverse talk-back.

The cough switch can be connected between pins 5 and 6 on the remote D-Type connector, for the guest's mic channel. See Fig 2-5 for connection details.

2.4.4. Allowing the Studio Guest to talk to a Telephone Caller (Telco Talkback)

As well as providing a Talkback switch, a switch can be added in the Studio so that a guest can talk to a caller. The following diagram shows the connections that need to be made, assuming that two telco modules are used. If only one telco module is used, the diode feed can be ignored.
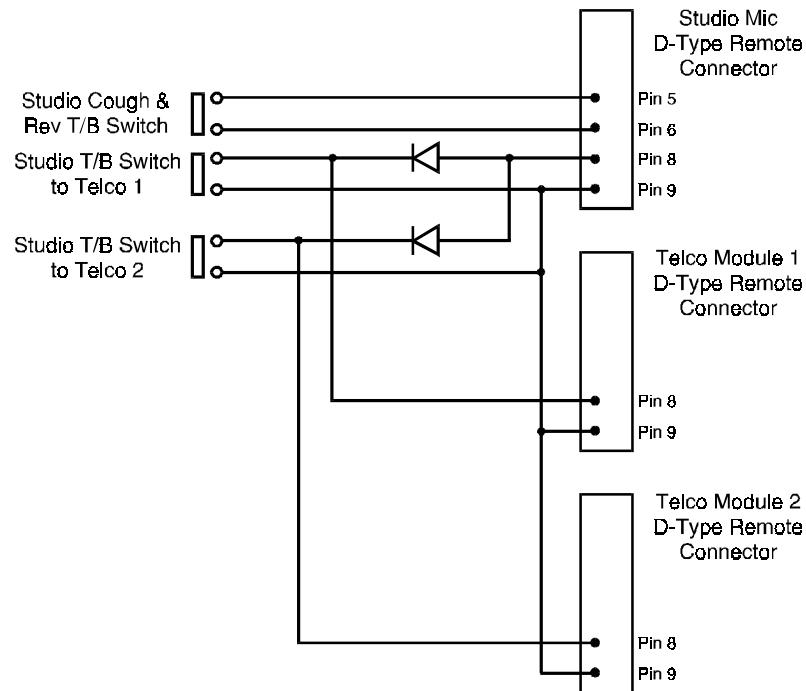

Fig 2-5 : Connections for Reverse and Telco Talk-back

Whenever the Telco Talkback switch is used, the telco output is mixed with the main "A" output and the T/B output, whilst also enabling the PFL.

3. Dual Stereo Line Input Module
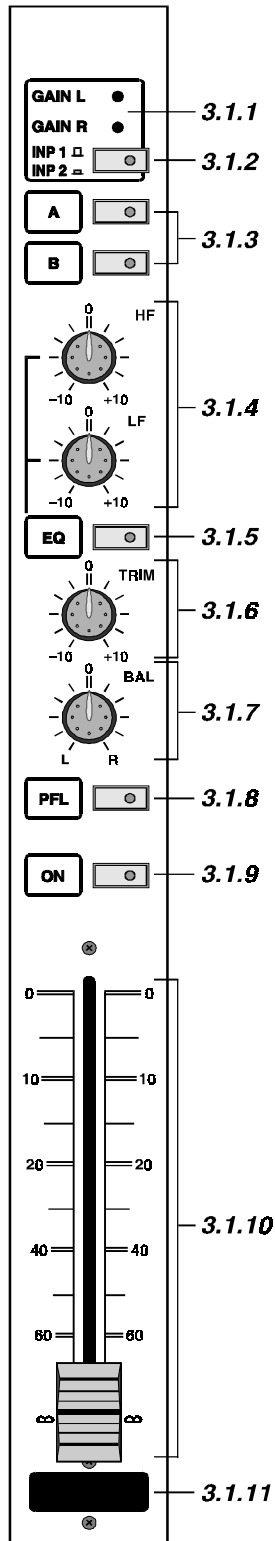
3.1. Panel Controls

Fig 3-1 Dual Stereo Line Module

3.1.1. Course Gain Adjustment

Two preset pots are available for adjustment of the input gain for the left and right line levels of Input 1. The pots provide 16dB of gain adjustment allowing an input range of +6dB to -10dB, reference 0dB output. Fine level adjustment of Input 1 gain can be made by using the Trim knob. The gain for Input 2 can be altered by adjusting two potentiometers on the PCB (See Section 3.3.9).

3.1.2. Input 1/Input 2 Select Button

This button switches the module between receiving input 1 (with the switch released) and input 2 (with the switch depressed, and the red LED on). Input 1 is fed from the XLR sockets and Input 2 is situated on the D-Type Remote connector. If the optional internal gram amplifier has been fitted, the turn-table should be connected to Input 2.

3.1.3. Output Select

The signal from the dual stereo module can be routed to either output A, output B, to both, or to neither. When a red LED is illuminated, it indicates that the signal is routed to that output.

3.1.4. Equalisation (Optional)

Dual Stereo LineThe HF (treble) and LF (bass) controls are used to adjust the equalisation of the signal. The HF EQ boosts and cuts the signal by ± 7.5dB at 8kHz. The LF EQ boosts and cuts the signal by ± 7.5dB at 100Hz.

3.1.5. EQ Enable Button (Optional)

With the EQ button depressed, the Equalisation described above is switched into the signal path. The red LED illuminates when the button is depressed. To bypass the EQ section, release the button.

3.1.6. Trim Knob

The Trim knob provides an additional ±15dB of gain to fine-tune the signal level.

3.1.7. Bal Knob

The Balance knob is used to adjust the stereo image of the signal on the stereo line input. Full anti-clockwise reduces the right channel by -3dB and increases the left channel by +6dB. Full clockwise reduces the left channel by -3dB and increases the right channel by +6dB.

3.1.8. Pre-Fade Listen (PFL) Button

With the PFL button depressed, the incoming signal on this channel is routed to the PFL bus so that it can be heard in the Monitors section (by selecting Auto-PFL). The PFL only operates when the fader is fully down, unless jumper J11 is not fitted when the PFL will operate with the fader either up or down. PFL is active when the Yellow LED is illuminated in the button.

3.1.9. On Button

The On button can be used to start and stop (selectable by jumper settings) a remote piece of equipment, as well as working in conjunction with the fader open signal to allow output from the channel. For the fader to operate, the On button must be illuminated. The Green LED in the button glows at two brightnesses. If the fader is down when the On button is pushed, the LED glows at half brightness and the circuitry can be regarded as being armed. To activate the circuitry, the fader should be moved away from the down position - the LED then glows with full power.

If the On button is pushed while the fader is already away from the down position, the remote circuitry will be enabled as soon as the button is pushed.

3.1.10. Fader

The 100mm long throw ALPS VCA fader provides a unity gain (0dB) when fully open. The scale shows the attenuation. The fader open signal is produced by a voltage detecting op-amp and is disabled when the fader is in the fully down position. The fader open signal is used for the fader starttimer functions. The channel input is routed to the outputs whenever the fader is open and the On switch and output switch are selected.

3.1.11. Scratch Pad

A white pad is provided at the bottom of the module on to which you can write the function of the channel, for example, "CD 1".
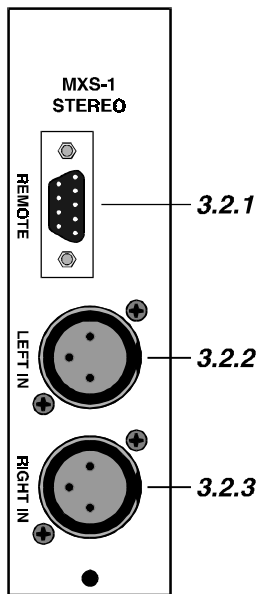
3.2. Rear Panel

MXS-1
STEREO

REMOTE

LEFT IN

RIGHT IN

3.2.1

3.2.2

3.2.3

Fig 3-2 : Dual Stereo
Line Rear Panel

3.2.1. Remote Connector

The 9 pin D-Type plug remote connector provides the balanced input for Line 2 and the remote outputs for the Start and Stop functions. Note that there is just one start and stop remote for both inputs.

The following pins are used for the connections :

Pin 1 :   Opto isolated start NPN collector.
Pin 2 :   Opto isolated start NPN emitter.
Pin 3 :   Opto isolated stop NPN collector.
Pin 4 :   Opto isolated stop NPN emitter.
Pin 5 :   Input 2 Left Phase.
Pin 6 :   Input 2 Left Non-Phase.
Pin 7 :   Screen/Chassis.
Pin 8 :   Input 2 Right Phase.
Pin 9 :   Input 2 Right Non-Phase.

When the gram amp option is used with the stereo channel, the record deck connections should be made to Input 2 on this connector. The left and right screen connections from the record deck should be connected to the left and right non-phase pins (6 and 9) respectively.

3.2.2. Left Input Connector

This XLR 3 pin socket is used for the the left channel input of Input 1 and is electronically balanced. It has the following connections :

Pin 1 :   Screen.
Pin 2 :   Phase.
Pin 3 :   Non-phase.

3.2.3. Right Input Connector

This XLR 3 pin socket is used for the the right channel input of Input 1 and is electronically balanced. It has the following connections :

Pin 1 :   Screen.
Pin 2 :   Phase.
Pin 3 :   Non-phase.

3.3. Module Options and Jumper Settings

The dual stereo line module can be configured in a number of different ways depending on the jumper options set on the board. The options available are :

- Select remote start/stop for line input 1 or line input 2.
- Enable continuous momentary start from channel On button.
- Select momentary or latched start.
- Set channel to start the timer automatically.
- Enable/disable the remote stop.
- Enable or disable the auto pre-fade listen fader cancel.

The gain of Input 2 can be defined by adjusting two potentiometers on the PCB. An option is available for fitting the module with an internal gram amplifier, so that a turntable can be connected directly to the dual stereo input.

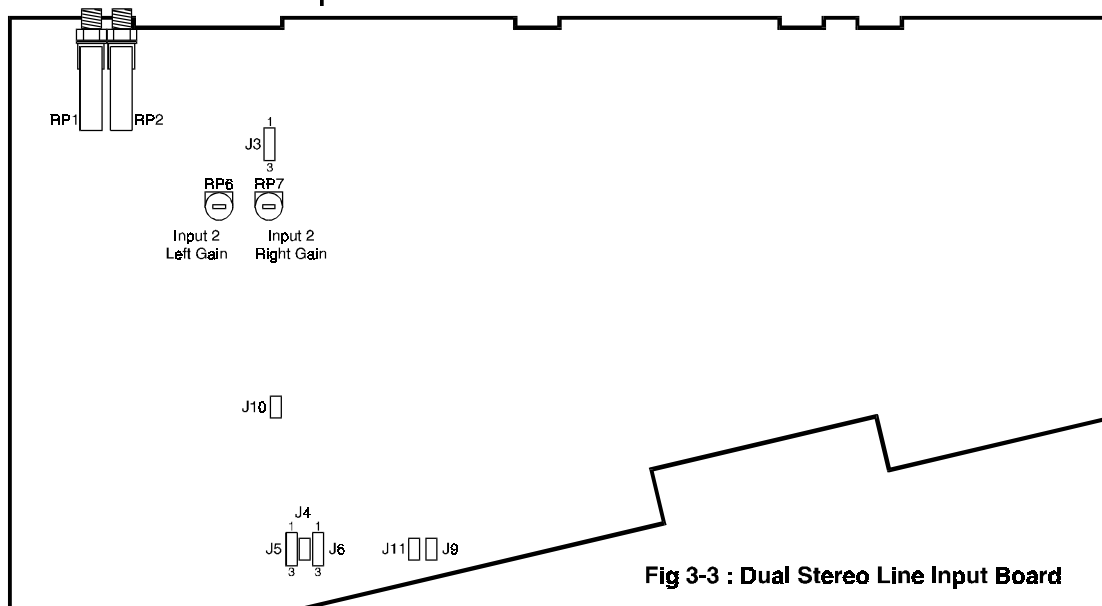### 3.3.1. Summary of Jumper Settings for Dual Stereo Line Input Module

Fig 3-3 : Dual Stereo Line Input Board

Jumper	Set Over Pins	Effect
J3	1 & 2	Remote start and stop operates with line input 2 (D-Type Input).
	2 & 3	**Remote start and stop operates with line input 1 (XLR input).**
	None	Remote start and stop operates with both inputs.
J4	1 & 2	Enable continuous momentary start from channel on button.
	None	**Disable continuous momentary start from channel on button.**
J5	**1 & 2**	**Momentary start.**
	2 & 3	Latched start.
	None	Start function does not work.
J6	**1 & 2**	**Fader stop.**
	2 & 3	Fader and button stop.
J9	**1 & 2**	**Auto timer start.**
	None	No auto timer start.
J10	1 & 2	Remote stop is disabled.
	None	**Remote stop operates.**
J11	**1 & 2**	**Auto pre-fade cancelled by PFL button or fader open.**
	None	Auto pre-fade cancelled by PFL button only.

Note : Items in bold are set as default when shipped.

3.3.2. Select Remote Start/Stop for Line Input 1 or 2

There is just one set of remote start and stop connections for both Line Inputs 1 and 2. Jumper J3 selects which input is connected to the piece of equipment that needs to be controlled remotely. With J3 set over pins 1 and 2, the remotes will only operate when Input 2 is selected. With J3 set over pins 2 and 3, the remotes will only operate when Input 1 is selected.

If J3 is not set, the remote start and stop will operate whether Input 1 or Input 2 are selected.

3.3.3. Enable Continuous Momentary Start From On Button

The On button can be made to remotely Start and Stop external equipment. If you require each press of the On button to just send a Start signal, then set jumper J4. This might be useful for a piece of external equipment which only has one remote input for starting and stopping.

If jumper J4 is not Set, each press of the On button will alternately send Start and Stop signals.

3.3.4. Start Select - Momentary or Latched

The remote start can be made either momentary or latched by setting the jumper J5 to 1 and 2 (for momentary) or 2 and 3 (for latched). If no jumper is set, the Start remote does not operate.

3.3.5. Stop Select - On Fader Down, or With Button Up

The input which is being remotely started can be remotely stopped as well. There are two options available for stopping : To remotely stop when the fader is down, set the jumper J6 over pins 1 and 2. To remotely stop when the fader is down or the On button is pressed up, set J6 over pins 2 and 3.

3.3.6. Set to Start the Timer Automatically

Each of the channels can be configured so that the timer on the meter bridge is controlled by the use of the fader. This may be useful for timing the duration of music tracks. Set jumper J9 to control the timer with the module fader being configured. Remove jumper J9 to disable timer control.

When controlled by a channel fader, the timer operates in the following way. When the fader is opened, if the timer is not already running, it will reset the counter and start the timer. If the timer is already running when the fader is opened, the counter begins counting but freezes for 3 seconds, so that you can view and note the "start" time. After three seconds the counter will jump to show the increasing time and will then continue.

The timer will be stopped by a manual stop. The timer can only be reset when in the Stop mode.

3.3.7. Disable the Remote Stop Function

The remote Stop function can be disabled by setting J10. Leaving the jumper off enables the remote Stop function.

3.3.8. Cancel the Automatic Pre-fade Listen

The PFL function can be cancelled by the fader opening or by using the PFL button if jumper J11 is set. When Jll is off, the PFL function is not cancelled by the fader open signal.

3.3.9. Gain Adjustment for Input 2

The gain for the secondary stereo line input (on the D-Type connector) is altered by adjusting two single turn 20k potentiometers, RP6 and RP7, on the circuit board. Placement of the pots is shown in Fig 3-4.
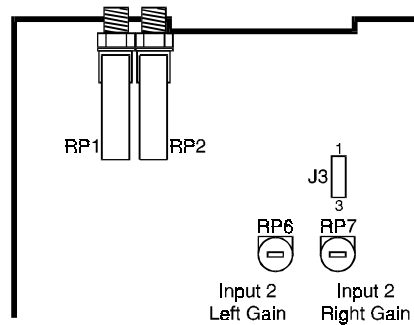

Fig 3-4 : Input 2 Gain Adjustment

The pots provide 16dB of gain adjustment allowing an input range of +6dB to -10dB, reference 0dB output. RP6 controls the left input whilst RP7 controls the right input.

3.3.10. Using the Optional Gram Amplifier

An RIAA equalised gram(aphone) amplifier can be fitted to the dual stereo module so that a turntable can be connected directly to the input. The amplifier takes the form of a PCB which is added to the stereo module, together with one or two minor board modifications.

For the gram amplifier to operate, the turn-table must be connected to Input 2 (the D-Type connector) of the dual stereo module.
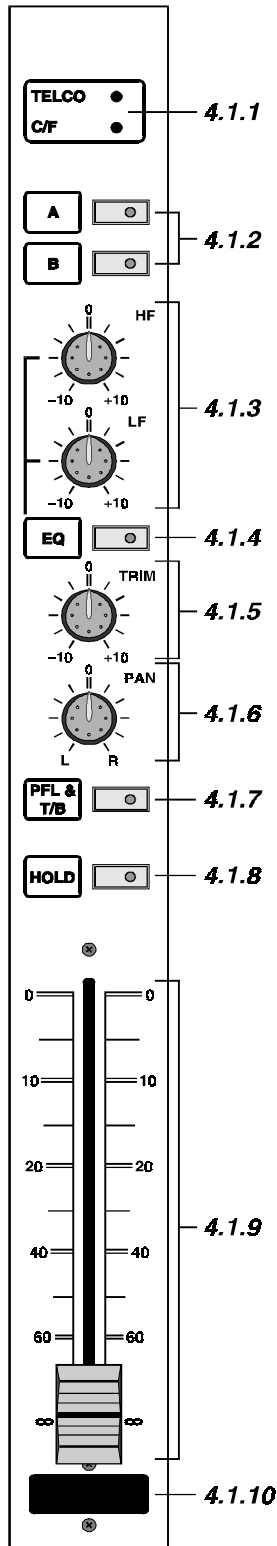
4. Telco Module

4.1. Panel Controls

Fig 4-1 Telco Module

4.1.1. Course Gain Adjustment

Two preset pots are available for adjustment of the input gain of the telco signal and the output gain of the cleanfeed. The C/F pot provides 10dB of gain adjustment allowing an output range of -6dB to +4dB, and should be configured initially to give an 0dB output level for the expected input. The telco pot provides 16dB of gain adjustment allowing an input range of +6dB to -10dB, reference 0dB output. Fine level adjustment can be made by using the Trim knob.

4.1.2. Output Select

The signal from the telco module can be routed to either output A, output B, to both, or to neither. When a red LED is illuminated, it indicates that the signal is routed to that output. It should be noted that output A controls the cleanfeed signals and so should always be designated as the main programme output if telco channels are being used.

4.1.3. Equalisation

The HF (treble) and LF (bass) controls are used to adjust the equalisation of the signal. The HF EQ boosts and cuts the signal by ± 7.5dB at 8kHz. The LF EQ boosts and cuts the signal by ± 7.5dB at 100Hz.

4.1.4. EQ Enable Button

With the EQ button depressed, the Equalisation described above is switched into the signal path. The red LED illuminates when the button is depressed. To bypass the EQ section, release the button.

4.1.5. Trim Knob

The Trim knob provides an additional ±15dB of gain to fine-tune the signal level.

4.1.6. Pan Knob

The Pan knob is used to shift the stereo image of the line input. Full anti-clockwise shifts the signal to the left of the stereo bus (decreases right channel by -70dB, increases left channel by +3dB); full clockwise shifts the signal to the right (decreases left channel by -70dB, increases right channel by +3dB).

4.1.7. Pre-Fade Listen (PFL) and Talkback (T/B) Button

With the PFL button depressed, the incoming signal on this channel is routed to the PFL bus so that it can be heard in the

Monitors section (by selecting Auto-PFL). The PFL only operates when the fader is fully down, unless jumper J11 is not fitted when the PFL will operate with the fader either up or down. PFL is active when the Yellow LED is illuminated in the button.

The PFL button on the telco channel also switches the programme output and the talkback bus to the cleanfeed output, so that the presenter can talk to the caller.

4.1.8. Hold Button

The Hold button is used as the Remote Divert for the telephone hybrid unit. It also controls the cleanfeed audio output in conjunction with the output A select button (but not B). When both the output A and the Hold button are On, audio is enabled at the cleanfeed output. If either the Hold button or output A are not selected, the cleanfeed output is muted.

In operation, this means that the presenter can talk in PFL mode with the caller by pressing the Hold button. The presenter can then put the caller to air by pressing the A output button.

4.1.9. Fader

The 100mm long throw ALPS VCA fader provides a unity gain (0dB) when fully open. The scale shows the attenuation. The fader open signal is produced by a voltage detecting op-amp and is disabled when the fader is in the fully down position. The fader open signal can be used for the fader start/timer functions. The channel input is routed to the outputs whenever the fader is open and the output switch is selected.

4.1.10. Scratch Pad

A white pad is provided at the bottom of the module on to which you can write the function of the channel, for example, "Presenter's Mic".
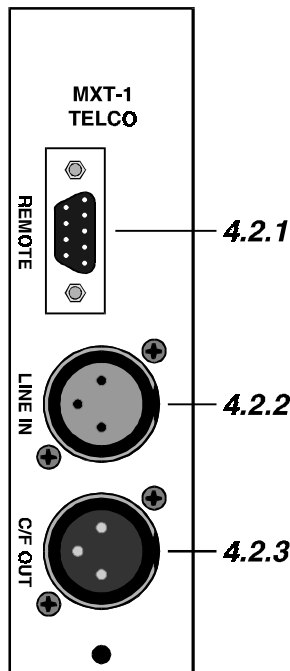
4.2. Rear Panel

MXT-1
TELCO

REMOTE

4.2.1

LINE IN

4.2.2

C/F OUT

4.2.3

**Fig 4-2 Telco
Rear Panel**

4.2.1. Remote Connector

The 9 pin D-Type plug remote connector provides the inputs and outputs for the following functions :

- Telephone Balance Unit Divert control.
- External Talkback Control

The following pins are used for the connections :

Pin 1 : Opto isolated TBU divert NPN collector.
Pin 2 : Opto isolated TBU divert NPN emitter.
Pin 3 : N/C.
Pin 4 : N/C.
Pin 5 : N/C.
Pin 6 : 0V (Common).
Pin 7 : Screen/Chassis.
Pin 8 : External talkback control (make to 0V).
Pin 9 : 0V (Common).

4.2.2. Line Input Connector

This XLR 3 pin socket is used for the line input from the output of a connected telephone hybrid. It has the following connections :

Pin 1 : Screen.
Pin 2 : Phase.
Pin 3 : Non-phase.

4.2.3. Clean-Feed Output Connector

This is an XLR 3 pin plug used for the electronically balanced clean-feed output which is connected to the input of a telephone hybrid unit. The clean-feed signal is the programme output signal with the phone signal (caller's voice) removed. It has the following pin details :

Pin 1 : Screen.
Pin 2 : Phase.
Pin 3 : Non-phase.

4.3. Module Options and Jumper Settings

The telco module can be configured in a number of different ways depending on the jumper options set on the board. The options available are :

- Select momentary or latched TBU Divert.
- Select which Clean-feed bus should be used.
- Set channel to start and stop the timer automatically.
- Enable or disable the auto pre-fade listen.

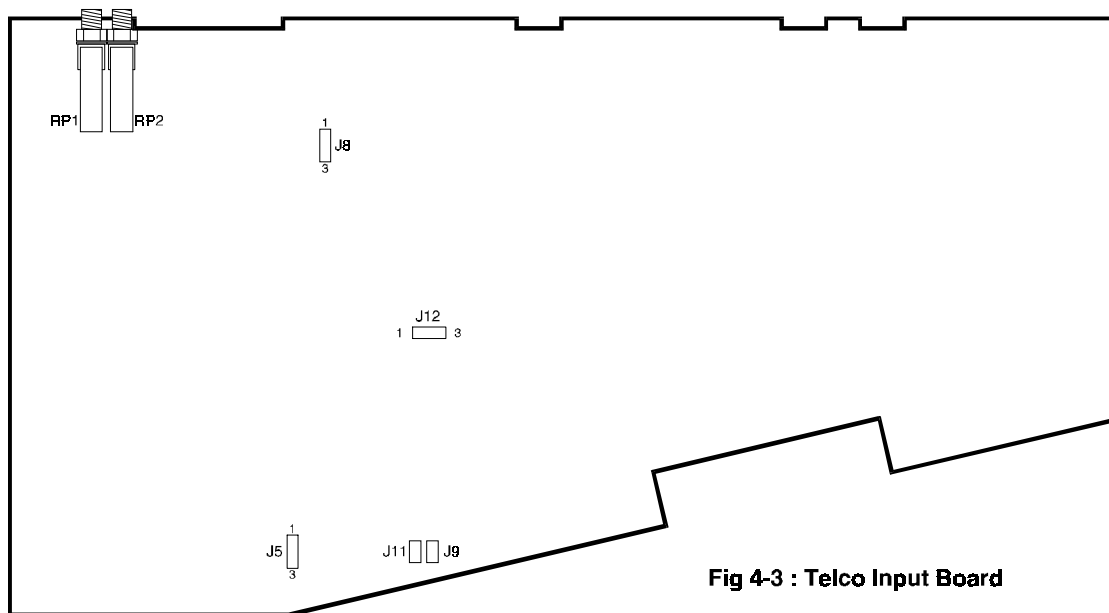### 4.3.1. Summary of Jumper Settings for Telco Module

Fig 4-3 : Telco Input Board

Jumper	Set Over Pins	Effect
J5	1 & 2	Momentary Divert.
	2 & 3	**Latched Divert.**
J8	1 & 2	Use clean-feed bus 2 for this module (See J12 also).
	2 & 3	**Use clean-feed bus 1 for this module (See J12 also).**
J9	1 & 2	Auto timer start.
	None	**No auto timer start.**
J11	**1 & 2**	**Auto pre-fade cancelled by PFL button or fader open.**
	None	Auto pre-fade cancelled by PFL button only.
J12	1 & 2	If J8 is set to 1 & 2, set J12 to 1 & 2 also - this jumper terminates the cleanfeed bus.
	2 & 3	**If J8 is set to 2 & 3, set J12 to 2 & 3 also - this jumper terminates the cleanfeed bus.**

Note : Items in bold are set as default when shipped.

4.3.2. Divert Select - Momentary or Latched

The remote Divert for the TBU can be made either momentary or latched by setting the jumper J5 to 1 and 2 (for momentary) or 2 and 3 (for latched). If no jumper is set, the Divert remote does not operate.

4.3.3. Clean-Feed Bus Output Select

The jumper J8 defines which Clean-Feed bus should be used inside the console for the particular telco channel being configured. There can only be a maximum of two telco channels in each mixer because there are only two clean-feed buses available.

If you have one telco module, set this jumper over pins 2 and 3 so that Clean-feed bus 1 is used. If you have two telco channels, set one module so that J8 is over pins 1 and 2 , and the other module so that it is over pins 2 and 3.

Jumper J12 should be configured in the same way as J8 to help prevent cross-talk between the two cleanfeed channels (Note : Some mixers have not been fitted with this jumper. They have had a hardware modification made to overcome any possible problems).

4.3.4. Set to Start the Timer Automatically

Each of the channels can be configured so that the timer on the meter bridge is controlled by the use of the fader. This may be useful for timing the duration of a caller's conversation. Set jumper J9 to control the timer with the module fader being configured. Remove jumper J9 to disable timer control.

When controlled by a channel fader, the timer operates in the following way. When the fader is opened, if the timer is not already running, it will reset the counter and start the timer. If the timer is already running when the fader is opened, the counter begins counting but freezes for 3 seconds, so that you can view and note the "start" time. After three seconds the counter will jump to show the increasing time and will then continue.

The timer will be stopped by a manual stop. The timer can only be reset when in the Stop mode.

4.3.5. Cancel the Automatic Pre-fade Listen

The PFL function can be cancelled by the fader opening or by using the PFL button if jumper J11 is set. When Jll is off, the PFL function is not cancelled by the fader open signal.

4.4. Additional Options

Whenever a telco module is installed into a mixer, configuration settings in the Master Output and Monitor Module have to be altered as well. These are to reduce cross-talk in the telco module and involve the placement of two jumpers in each of the output boards. Please refer to Section 5.6.1.3 for further information.

4.5. Applications

This section of the handbook provides examples of how to configure the module for typical applications :

4.5.1. Connecting a Telephone Balance Unit (Hybrid)

A telephone balance unit can be connected as per the following diagram :

Fig 4-4 : Sovereign Connections to a Telephone Hybrid Unit
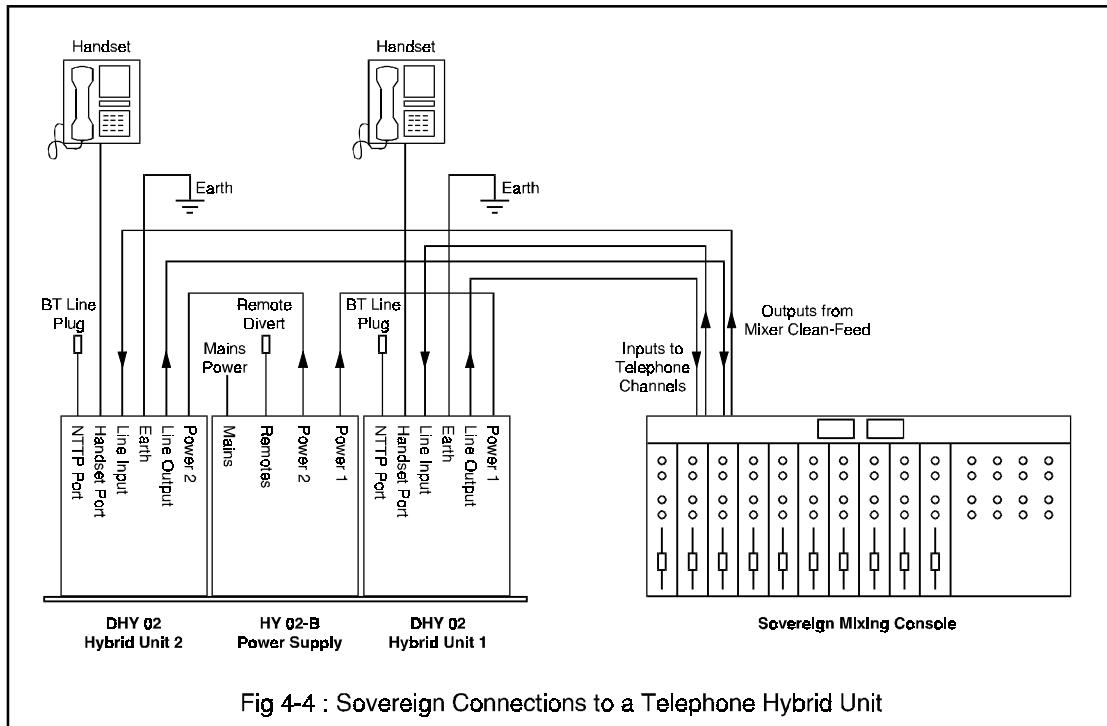
Connect the Line Output of the TBU to the input of the telco channel of the mixer. Connect the cleanfeed signal from the telco channel to the Line Input of the TBU.

4.5.2. Configuring Talkback to/from the Caller

Talk-back can be used for off-air communication between the Presenter, the Guest and the caller on the telephone line.When the talkback switch is connected between pins 8 and 9 of the remote connector, the pre-fade input signal is fed to the T/B mix bus. For more information on configuring the talk-back connections, please refer to Sections 2.4.2 and 2.4.4.

Usually, the presenter's mic channel will be permanently connected to the the T/B bus so that the talkback works automatically.

5. Transmission Router Module

5.1. Panel Controls

5.1.1. Source Select Buttons

These five buttons control which signal is routed through to the output. The top four buttons, TRX 1 - TRX 4, allow the user to select one of four external sources. These sources are connected on the rear of the module using the 25 pin D-Type connector.

Selecting LOCAL will route to the output any desk channels which are selected to output A.

Note that the master output must be taken from this module instead of from the rear of the Output Module. The Master Outputs A and B on the Output Module will still operate, but will not transmit the external signals, only the local ones.

5.1.2. Meter Select

The Meter Select button determines what is shown on the meters. With the button depressed and the LED illuminated, the transmission from the external source can be displayed. When the button is in the up position, the local output is shown at the meters - this is the normal configuration when the external inputs are not being used.
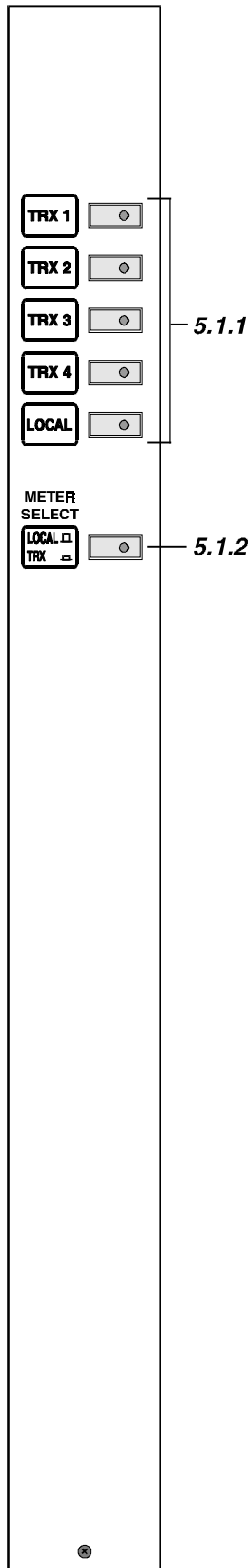
Fig 5-1 Transmission Router Module

5.2. Rear Panel

MXR-1
TRANSMISSION

L TRX OUTPUT R

5.2.1

5.2.2

TRX INPUTS

5.2.3
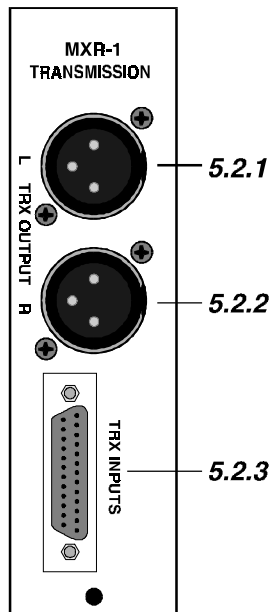
Fig 5-2 : Tranmission Router Rear Panel

When the Router module is fitted, the TRX OUTPUT left and right connectors take the place of the Master Output A connectors on the Output Module and reflect the signal selected on the Source Select Buttons.

5.2.1. Left Transmission Output

This XLR 3 pin plug connector provides a balanced master bus output for the left channel, with the following connections.

Pin 1 :   Screen
Pin 2 :   Phase
Pin 3 :   Non-phase

5.2.2. Right Transmission Output

This XLR 3 pin plug connector provides a balanced master bus output, with the following connections.

Pin 1 :   Screen
Pin 2 :   Phase
Pin 3 :   Non-phase

5.2.3. Transmission Input

The 25 pin D-Type socket connector provides the stereo balanced inputs for the four external sources, with the following pins used :

Pin 1 :   Left phase input EXT 1
Pin 2 :   Left chassis (screen) input EXT 1
Pin 3 :   Right non-phase input EXT 1
Pin 4 :   Left phase input EXT 2
Pin 5 :   Left chassis (screen) input EXT 2
Pin 6 :   Right non-phase input EXT 2
Pin 7 :   Left phase input EXT 3
Pin 8 :   Left chassis (screen) input EXT 3
Pin 9 :   Right non-phase input EXT 3
Pin 10 : Left phase input EXT 4
Pin 11 : Left chassis (screen) input EXT 4
Pin 12 : Right non-phase input EXT 4
Pin 13 : N/C
Pin 14 : Left non-phase input EXT 1
Pin 15 : Right phase input EXT 1
Pin 16 : Right chassis (screen) input EXT 1
Pin 17 : Left non-phase input EXT 2
Pin 18 : Right phase input EXT 2
Pin 19 : Right chassis (screen) input EXT 2
Pin 20 : Left non-phase input EXT 3
Pin 21 : Right phase input EXT 3
Pin 22 : Right chassis (screen) input EXT 3
Pin 23 : Left non-phase input EXT 4
Pin 24 : Right phase input EXT 4
Pin 25 : Right chassis (screen) input EXT 4

5.3. Installing the Module

Important Note : If your mixer has already been fitted with this module, you need only note that the Master Output of the mixer should be taken from this module, instead of from the rear of the Output Module. The external sources are not routed through the Output Module and so, do not appear on it.

When the Transmission Router module is installed, the cabling within the mixer is altered so that the metering can be monitored directly from this module, as opposed to through the Output Module.

It is essential that the Transmission Router module is installed immediately to the left of the Output Module, so that the supplied cables will be long enough. Installing the Transmission Router Module can be achieved as follows :

- Remove the Output Module and the panel to the left of it.
- The Output Module is made up of four PCB's attached vertically to the front panel. The leftmost PCB from the front, Output Board A, has the connection for the meter panel. Disconnect the meter connector from Output Board A and connect it to the Transmission Router Module in connector position CN4. There should be no connection to the meter connector on Output Board A.
- On the Output Module, there is a small cable that attaches to all four PCB's. The Transmission Router Module is supplied with a small 16 way cable assembly with five connectors on it. Replace the existing cable on the Output Module with the new cable and connect the spare left hand connector to the Transmission Router Module in connector position CN3.
- There are no jumper settings or options available for the Transmission Router Module, so it can be plugged straight into the mixer chassis, once the cables have been fitted. Reinstall the Output Module and the Transmission Router Module ensuring that the bus connector is fitted to the bottom of each of the PCBs in the modules.
- Swap the output connectors from Output Module A to the Transmission Router Module.

Your mixer is now fitted with the Transmission Router Module.

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6. Outside Source Select Module

6.1. Panel Controls

6.1.1. Outside Source Select Buttons

There are two banks of six buttons, each bank routing one of the six inputs to an output. In each bank select one of the buttons. If two or more buttons are selected, the input with the lowest number (1 - 6) will be routed.

Note that none of the LEDs in the buttons light up - you can tell which input is being routed by checking which one is depressed.

The two outputs from this module must be routed to the inputs of another module on the desk. So, you must remember that once you have selected buttons on this channel, you will probably need to bring them up on another channel in the desk.

OUTSIDE SOURCE SELECT BANK 1

1
2
3
4
5
6

6.1.1

OUTSIDE SOURCE SELECT BANK 2

1
2
3
4
5
6
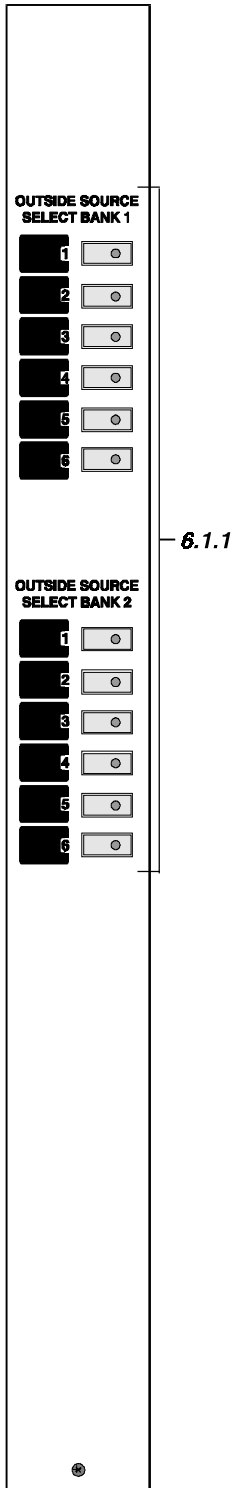
Fig 6-1 Outside Source Select Module

6.2. Rear Panel & Connections

```
MXI-1
2 X 6 SOURCE
SELECT




──── 6.2.1



●
```
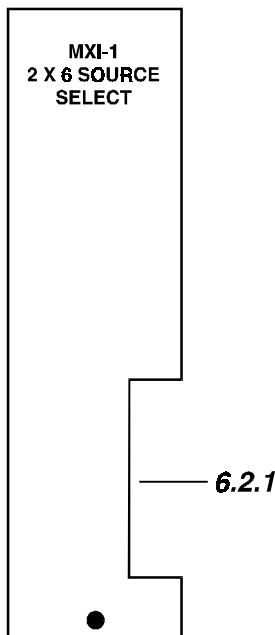
Fig 6-2 : Outside Source Selece Rear Panel

6.2.1. Cut-Out For Cables

The rear of the output source select module simply contains a hole through which the inputs and outputs can be connected.

6.2.2. Connections for Main Board

There are three D-Type connectors on the main PCB of the output source select module.
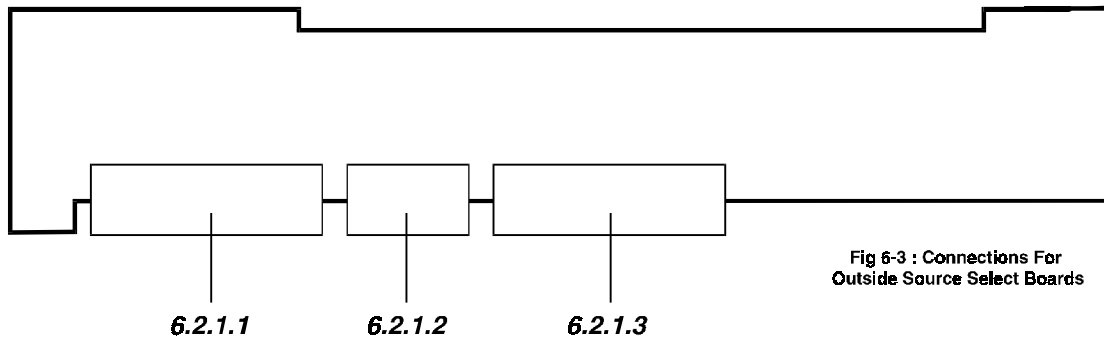
Fig 6-3 : Connections For Outside Source Select Boards

6.2.1.1   *6.2.1.2*   *6.2.1.3*

6.2.2.1 Bank 1 Inputs

The 25 pin D-Type plug (male) connector provides the stereo balanced inputs for the six external sources for bank 1, with the following pins used :

Pin 1 :   Right phase input 1
Pin 2 :   Left phase input 1
Pin 3 :   Right phase input 2
Pin 4 :   Left phase input 2
Pin 5 :   Right phase input 3
Pin 6 :   Left phase input 3
Pin 7 :   Right phase input 4
Pin 8 :   Left phase input 4
Pin 9 :   Right phase input 5
Pin 10 : Left phase input 5
Pin 11 : Right phase input 6
Pin 12 : Left phase input 6
Pin 13 : Chassis (screen)
Pin 14 : Right non-phase input 1
Pin 15 : Left non-phase input 1

Pin 16 : Right non-phase input 2
Pin 17 : Left non-phase input 2
Pin 18 : Right non-phase input 3
Pin 19 : Left non-phase input 3
Pin 20 : Right non-phase input 4
Pin 21 : Left non-phase input 4
Pin 22 : Right non-phase input 5
Pin 23 : Left non-phase input 5
Pin 24 : Right non-phase input 6
Pin 25 : Left non-phase input 6

6.2.2.2 Outputs

The 9 pin D-Type socket (female) connector provides the two stereo balanced outputs for banks 1 and 2, with the following pins used :

Pin 1 :   Chassis (screen)
Pin 2 :   Right phase output bank 2
Pin 3 :   Left phase output bank 2
Pin 4 :   Right phase output bank 1
Pin 5 :   Left phase output bank 1
Pin 6 :   Right non-phase output bank 2
Pin 7 :   Left non-phase output bank 2
Pin 8 :   Right non-phase output bank 1
Pin 9 :   Left non-phase output bank 1

6.2.2.3 Bank 2 Inputs

The 25 pin D-Type plug (male) connector provides the stereo balanced inputs for the six external sources for bank 2, with the following pins used :

Pin 1 :   Right phase input 1
Pin 2 :   Left phase input 1
Pin 3 :   Right phase input 2
Pin 4 :   Left phase input 2
Pin 5 :   Right phase input 3
Pin 6 :   Left phase input 3
Pin 7 :   Right phase input 4
Pin 8 :   Left phase input 4
Pin 9 :   Right phase input 5
Pin 10 : Left phase input 5
Pin 11 : Right phase input 6
Pin 12 : Left phase input 6
Pin 13 : Chassis (screen)
Pin 14 : Right non-phase input 1
Pin 15 : Left non-phase input 1
Pin 16 : Right non-phase input 2
Pin 17 : Left non-phase input 2
Pin 18 : Right non-phase input 3
Pin 19 : Left non-phase input 3
Pin 20 : Right non-phase input 4
Pin 21 : Left non-phase input 4
Pin 22 : Right non-phase input 5
Pin 23 : Left non-phase input 5
Pin 24 : Right non-phase input 6
Pin 25 : Left non-phase input 6

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7. Master Output and Monitor Module

The Master Output and Monitor Module is common to every mixer and can be divided into the following main areas :

- Outputs.
- Meter follow selection.
- Studio monitor and phones selection.
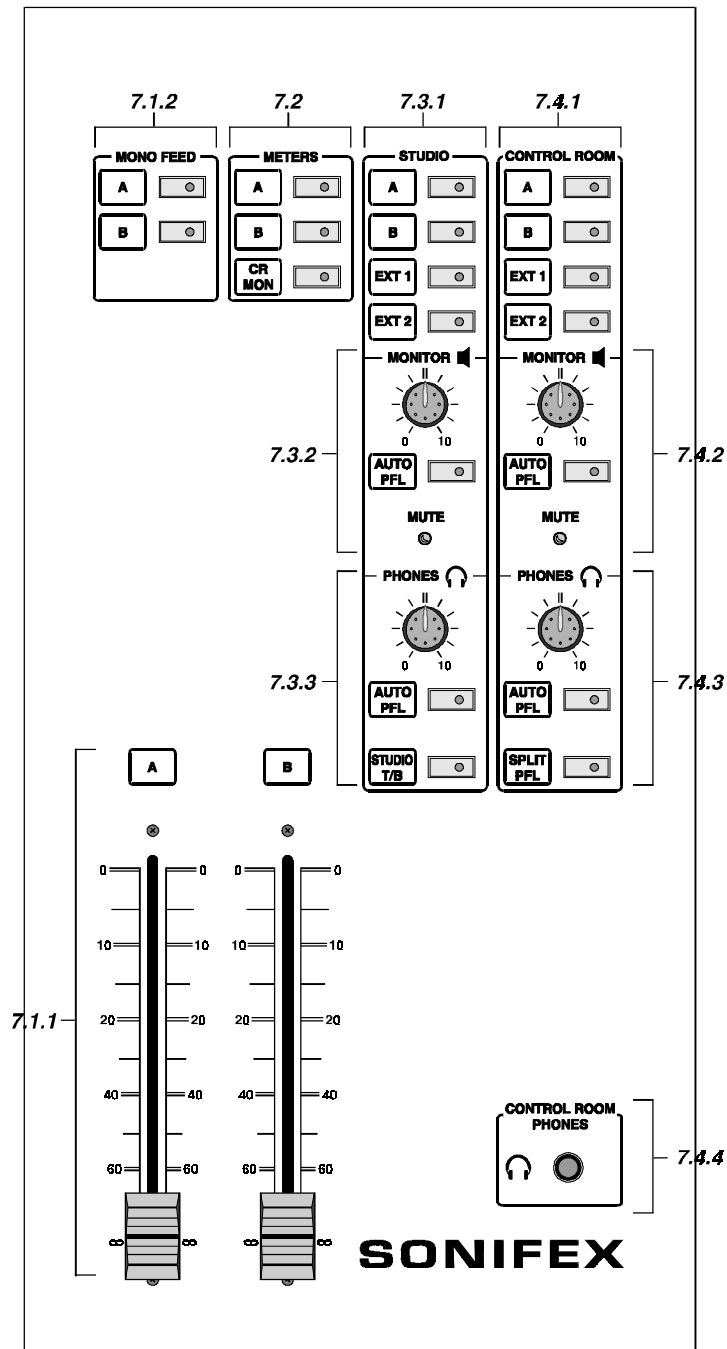- Control room monitor and phones selection.

Fig 7-1 : Master Output and Monitor Module

7.1. Outputs

7.1.1. Master Output Faders (Optional)

The 100mm long throw ALPS VCA carbon fader provides a unity gain (0dB) when fully open. The scale shows the attenuation. These faders are optional and are not supplied as standard. They should be added in any situation where the levels of the master outputs, A and B, may need to be altered, for example in a production studio. For on-air use, they will generally not be needed, because the output level for the A and B outputs should be fixed. The master outputs are the XLR connectors on the rear of the module.

7.1.2. Mono Feed Output Selection
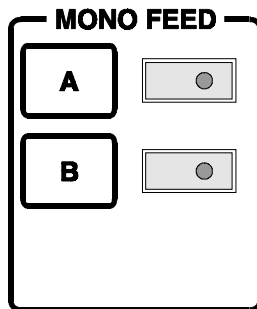
The mono feed is usually used as the main output if you are broadcasting in mono, or have an AM service. The output connections are found on pins 6 and 13 of the 15 pin D-Type socket on the rear panel. Either output A, output B, or both, can be assigned to the mono output by selecting the appropriate buttons. The red LED illuminates in the button when the output is selected.

7.1.3. DA Outputs

Every Sovereign mixer is fitted as standard with a Distribution Amplifier in the output section. This provides four balanced stereo outputs which are normally used to feed the inputs of recording units, to record audio from the desk. The configuration of each DA output is managed by the use of jumpers on the two output PCB's. Jumpers J3 - J6 can be used to set the left and right DA outputs 1 - 4 independently to either output A or B. This is covered in Section 7.6.

7.2. Meter Follow Selection
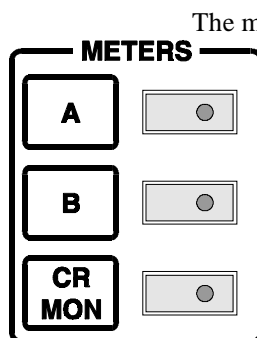
The meters are housed in the meterbridge section, to the right of the MX10 and in the middle of the MX14S. The display on the meters can be altered to show any combination of the A output, the B output, or whatever is selected on the Control Room section of this module. When a red LED is illuminated, it indicates that that signal is routed to the meters. For example, if CR MON is selected for the meters, and the CONTROL ROOM has EXT 1 selected, then the meters will display the EXT 1 signal.

The CR MON selection will also display the PFL signal on the meters, if either AUTO PFL, or SPLIT PFL are selected. In the case of the SPLIT PFL, the input (A, B, EXT 1 or EXT 2) is mono summed to the left meter while the PFL is summed on the right meter.

7.3. Studio Monitor and Phones Selection

This section of the module can be divided into three areas :

- Studio Input Selection
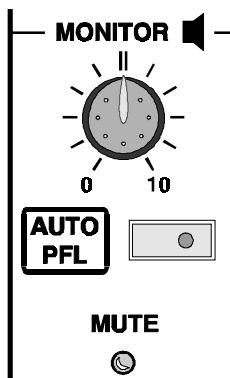- Studio Monitor Selection
- Studio Phones Selection

7.3.1. Studio Input Selection
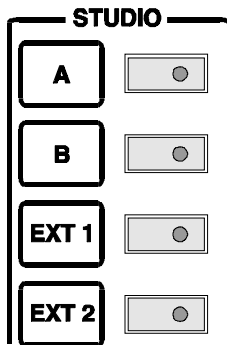
Signals to be monitored by the studio monitors or headphones are selected by using the buttons at the top of the panel. They can be used to show any combination of the A output, the B output, the External Input 1 or the External Input 2. When a red LED is illuminated, it indicates that the signal is routed to the Studio module.

External Inputs are normally used for monitoring the off-air signal or another studio.

7.3.2. Studio Monitor Selection

Input to this section is derived from Studio Input Section at the top of the panel.

The STUDIO MONITOR section will affect the output to any amplifier connected to the 1/4" jack studio monitor socket. The output must be amplified in order to drive studio speakers. The monitor level can be adjusted by use of the level knob which alters the output between cut-off, when set to 0, and unity gain 0dB, at 10.

With the AUTO PFL button depressed, the yellow LED glows in the button and any channels set to PFL are automatically routed to the studio monitors.

The Mute function operates, and the MUTE LED glows, whenever a mic channel is used which has been designated to mute the studio monitors (See Section 2.3.8), i.e. a studio microphone. This is to prevent feed-back. Two pairs of contacts on the Remote connector also close whenever the Mute function operates, to control external equipment, or lights.

7.3.3. Studio Phones Selection
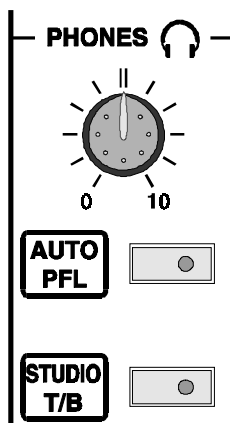
Input to this section is derived from Studio Input Section at the top of the panel.

The STUDIO PHONES section will affect the output to any headphones connected to the 1/4" jack studio phones socket. The phones level can be adjusted by use of the level knob which alters the output between cut-off, when set to 0, and unity gain 0dB, at 10.

With the AUTO PFL button depressed, the yellow LED glows in the button and any channels set to PFL are automatically routed to the studio headphones, independently of the studio monitors.

The STUDIO T/B button allows the presenter in the Control Room to transmit talkback to the Studio Monitors and Phones when the button is depressed.

7.4. Control Room Monitor and Phones Selection

This section of the module can be divided into three areas :

- Control Room Input Selection
- Control Room Monitor Selection
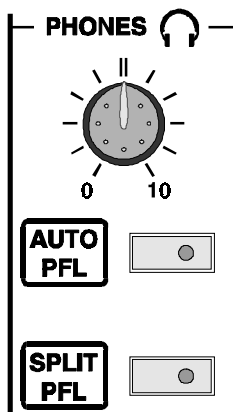- Control Room Phones Selection

7.4.1. Control Room Input Selection
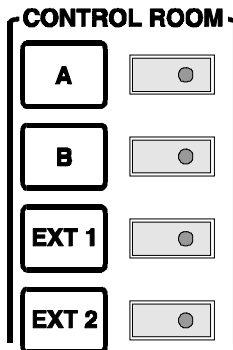
Signals to be monitored by the CONTROL ROOM (CR) monitors or headphones are selected by using the buttons at the top of the panel. They can be used to show any combination of the A output, the B output, the External Input 1 or the External Input 2. When a red LED is illuminated, it indicates that the signal is routed to the CR module.

External Inputs are normally used for monitoring the off-air signal or another studio.

7.4.2. Control Room Monitor Selection
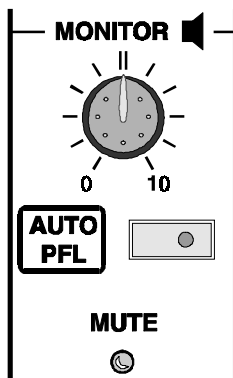
Input to this section is derived from Control Room Input Section at the top of the panel.

The CONTROL ROOM MONITOR section will affect the output to any amplifier connected to the 1/4" jack CR monitor socket. The output must be amplified in order to drive the CR speakers. The monitor level can be adjusted by use of the level knob which alters the output between cut-off, when set to 0, and unity gain 0dB, at 10.

With the AUTO PFL button depressed, the yellow LED glows in the button and any channels set to PFL are automatically routed to the CR monitors.

The Mute function operates, and the MUTE LED glows, whenever a mic channel is used which has been designated to mute the CR monitors (See Section 2.3.8), i.e. a Control Room microphone. This is to prevent feed-back. Two pairs of contacts on the Remote connector also close whenever the Mute function operates, to control external equipment, or lights.

7.4.3. Control Room Phones Selection

Input to this section is derived from Control Room Input Section at the top of the panel.

The CONTROL ROOM PHONES section will affect the output to any headphones connected to the 1/4" jack CR phones socket. The phones level can be adjusted by use of the level knob which alters the output between cut-off, when set to 0, and unity gain 0dB, at 10.

With the AUTO PFL button depressed, the yellow LED glows in the button and any channels set to PFL are automatically routed to the CR headphones, independently of the studio monitors.

The Control Room headphones have the additional facility of SPLIT PFL - with this button selected, the main programme is fed to one ear with the PFL signal fed to the other.

7.4.4. Control Room Phones Socket

CONTROL ROOM PHONES

The CR headphones can be plugged into the rear panel, or into the phones socket on the front of the Master Output Module.
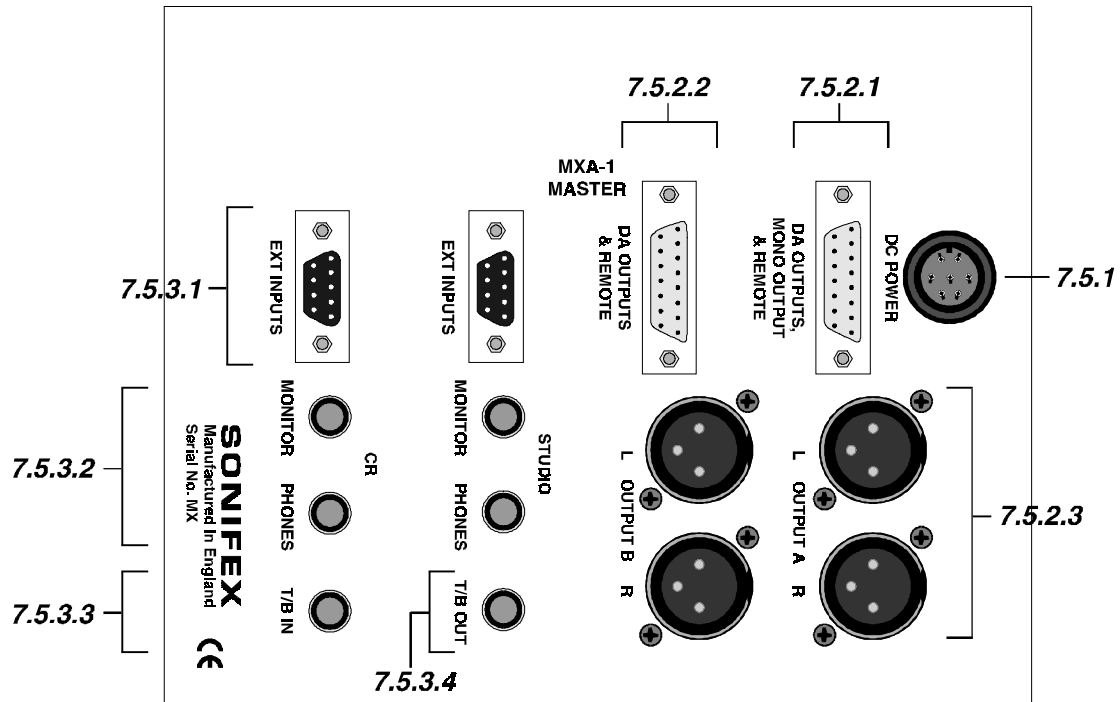
7.5. Rear Panel

Fig 7-2 : Master Output and Monitor Module Rear Panel

The rear panel can be divided into three sections :

- DC Power
- Output Connections
- Monitoring Connections

7.5.1. DC Power

This is an IP40 678 series 7 way socket which connects the Sovereign mixer to the mixer power supply.

7.5.2. Output Connections

These comprise two sets of XLR and D-Type connectors on the right of the panel, in Fig 7-2 above.

7.5.2.1 Main Output 1 : DA Outputs, Mono Output & Remote

This is a D-Type 15 Pin female socket which contains the balanced stereo distribution amplifier outputs 1 and 2, the balanced mono output (pins 6 and 13) and two pairs of Control Room Mute remote contacts. When the Control Room Mute is operational, the contacts close between pins 7 & 14 and pins 8 & 15. This may be useful for an On-Air sign for the Control Room area.

Pin 1 :   Screen.
Pin 2 :   Left phase output DA1.
Pin 3 :   Right phase output DA1.
Pin 4 :   Left phase output DA2.
Pin 5 :   Right phase output DA2.
Pin 6 :   Phase output mono.
Pin 7 :   Normally open contact 1A (makes to Pin 14) Control Room Remote 1.
Pin 8 :   Normally open contact 2A (makes to Pin 15) Control Room Remote 2.

Pin 9 : Left non-phase output DA1.
Pin 10 : Right non-phase output DA1.
Pin 11 : Left non-phase output DA2.
Pin 12 : Right non-phase output DA2.
Pin 13 : Non-phase output mono.
Pin 14 : Normally open contact 1B (makes to Pin 7) Control Room Remote 1.
Pin 15 : Normally open contact 2B (makes to Pin 8) Control Room Remote 2.

7.5.2.2 Main Output 2 : DA Outputs and Remote

Distribution Amplifier : This is a D-Type 15 Pin female socket which contains balanced stereo distribution amplifier outputs 3 and 4, and two pairs of Studio Mute remote contacts. When the Studio Mute is operational, the contacts close between pins 7 & 14 and pins 8 & 15. This may be useful for an On-Air sign for the Studio area.

Pin 1 : Screen.
Pin 2 : Left phase output DA3.
Pin 3 : Right phase output DA3.
Pin 4 : Left phase output DA4.
Pin 5 : Right phase output DA4.
Pin 6 : N/C
Pin 7 : Normally open contact 1A (makes to Pin 14) Studio Remote 1.
Pin 8 : Normally open contact 2A (makes to Pin 15) Studio Remote 2.
Pin 9 : Left non-phase output DA3.
Pin 10 : Right non-phase output DA3.
Pin 11 : Left non-phase output DA4.
Pin 12 : Right non-phase output DA4.
Pin 13 : N/C
Pin 14 : Normally open contact 1B (makes to Pin 7) Studio Remote 1.
Pin 15 : Normally open contact 2B (makes to Pin 8) Studio Remote 2.

7.5.2.3 Master A and B, Left and Right Outputs

These XLR 3 pin plugs are the two master bus balanced stereo outputs A and B, as referenced by the output selection buttons along the top of the input channels. Any channel with A, or B, selected will be routed to the respective output.

Pin 1 : Screen
Pin 2 : Phase
Pin 3 : Non-phase

Important Note : When the Transmission Router Module is fitted, the main A Output should be taken from the rear of the Router Module, not from the Master A Output. This is because the external signals are not routed through the Output Module and so do not appear at these outputs.

7.5.3. Monitoring Connections

These comprise of two sets of jack sockets and D-Type connectors on the left of the panel, in Fig 7-2.

7.5.3.1 External Inputs (Studio and Control Room)

This D-Type 9 Pin male plug contains the balanced stereo External Inputs for the Studio and Control Room. The Studio and Control Room connectors have the same pin connection details.

Pin 1 : Screen.
Pin 2 : Ext 1 Left phase.

Pin 3 :   Ext 1 Right phase.
Pin 4 :   Ext 2 Left phase.
Pin 5 :   Ext 2 Right phase.
Pin 6 :   Ext 1 Left non-phase.
Pin 7 :   Ext 1 Right non-phase.
Pin 8 :   Ext 2 Left non-phase.
Pin 9 :   Ext 2 Right non-phase.

7.5.3.2 Monitor and Phones (Studio and Control Room)

The 1/4" 'A' gauge stereo jack sockets provide separate outputs for the Studio and Control Room monitor and phones outputs. Control Room headphones can also be plugged into the front panel of this module.

Tip :   Left Signal.
Ring :   Right Signal.
Sleeve : Screen.

7.5.3.3 T/B In (Control Room)

The 1/4" 'A' gauge stereo jack socket provides the Reverse Talkback Input for the Control Room.

Tip :   Signal Phase (unbalanced).
Ring :   Control input make to sleeve.
Sleeve : Common (screen, non-phase).

7.5.3.4 T/B Out (Studio)

The 1/4" 'A' gauge stereo jack socket provides the Talkback output from the Studio.

Tip :   Signal Phase.
Ring :   Control output. Switch makes to sleeve internally
Sleeve : Screen

7.6. Module Options and Jumper Settings

There are two sets of two PCB's in this module, the Output Boards and the Monitor Boards. Each board is loaded with different components and has different jumper settings depending on the configuration required. The jumper settings are given below.

7.6.1. Output Boards

These boards are all mounted in the Output Module, which is situated on the right hand side of the mixer.

J1 ☐☐ J2

J6 ☐☐☐☐ J5
J3 J4
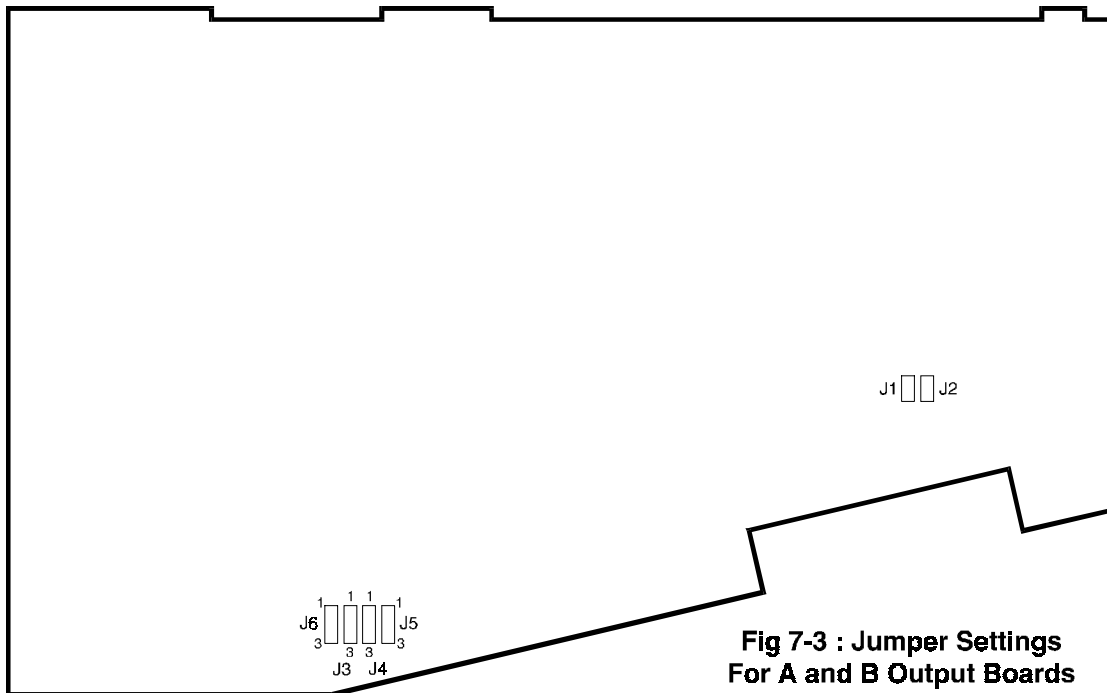
**Fig 7-3 : Jumper Settings
For A and B Output Boards**

7.6.1.1 Output Board A

Jumper	Set Over Pins	Effect
J1	1 & 2	Fit if telco channel 1 is not used (to prevent cross-talk).
J2	**1 & 2**	**Fit if telco channel 2 is not used (to prevent cross-talk).**
J3	1 & 2	Distribution output 1 Left connected to stereo B.
	2 & 3	**Distribution output 1 Left connected to stereo A.**
J4	1 & 2	Distribution output 1 Right connected to stereo B.
	2 & 3	**Distribution output 1 Right connected to stereo A.**
J5	1 & 2	Distribution output 2 Left connected to stereo B.
	2 & 3	**Distribution output 2 Left connected to stereo A.**
J6	1 & 2	Distribution output 2 Right connected to stereo B.
	2 & 3	**Distribution output 2 Right connected to stereo A.**

Note : Items in bold are set as default when shipped.

7.6.1.2 Output Board B

Jumper	Set Over Pins	Effect
J1	1 & 2	Fit if telco channel 1 is not used (to prevent cross-talk).
J2	1 & 2	Fit if telco channel 2 is not used (to prevent cross-talk).
J3	**1 & 2**	**Distribution output 3 Left connected to stereo B.**
	2 & 3	Distribution output 3 Left connected to stereo A.

Jumper	Set Over Pins	Effect
J4	**1 & 2**	**Distribution output 3 Right connected to stereo B.**
	2 & 3	Distribution output 3 Right connected to stereo A.
J5	**1 & 2**	**Distribution output 4 Left connected to stereo B.**
	2 & 3	Distribution output 4 Left connected to stereo A.
J6	**1 & 2**	**Distribution output 4 Right connected to stereo B.**
	2 & 3	Distribution output 4 Right connected to stereo A.

Note : Items in bold are set as default when shipped.

7.6.1.3 Reducing Cross-talk on the Telco Module

If you are using either no, or one, telco module, you will need to fit atleast one of the jumpers J1 or J2. A jumper should be fitted to the channel that you are **not** using, for example, if you are using telco module one, set the jumper over J2. If you are using two telco modules, do not set either of the jumpers. If you are using no telco module, set both J1 and J2.

Note that if one of the jumpers J1 or J2 is set on one of the Output boards, it need not be set on the other Output board.

7.6.1.4 Configuring the Distribution Amplifier Outputs

The jumper settings allow you to configure each of the left and right outputs of the four D.A. outputs to either master output A, or B. For example, you may wish to have D.A. outputs 1 and 2 distributing output A to broadcast audio loggers, whilst D.A. outputs 3 and 4 are set to record special events which can be assigned to the B output, such as a telephone conversation.

7.6.2. Monitor Boards

These boards are all mounted in the Output Module, which is situated on the right hand side of the mixer.
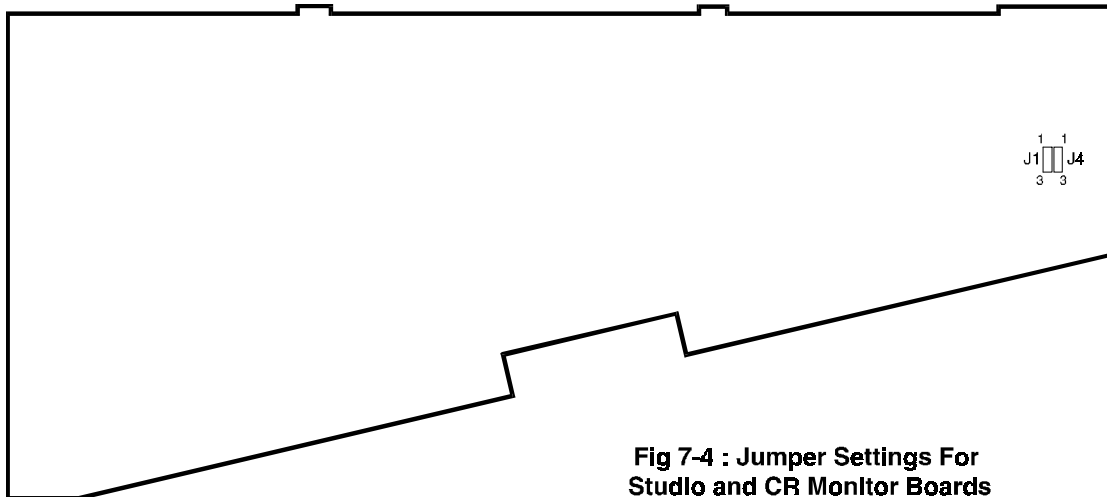
Fig 7-4 : Jumper Settings For Studio and CR Monitor Boards

7.6.2.1 Studio Monitor

Jumper	Set Over Pins	Effect
J1	**1 & 2**	**Enable talkback on studio monitor output.**
	2 & 3	Do Not Fit.
	Unused	Inhibit talkback on studio monitor output.
J4	**1 & 2**	**Enable talkback on studio headphone output.**
	2 & 3	Do Not Fit.
	Unused	Inhibit talkback on studio headphone output.

Note : Items in bold are set as default when shipped.

7.6.2.2 Control Room (CR) Monitor

Jumper	Set Over Pins	Effect
J1	1 & 2	Do Not Fit.
	2 & 3	**Enable talkback on control room monitor output.**
	Unused	Inhibit talkback on control room monitor output.
J4	1 & 2	Do Not Fit.
	2 & 3	**Enable talkback on control room headphone output.**
	Unused	Inhibit talkback on control room headphone output.

Note : Items in bold are set as default when shipped.

7.6.2.3 Inhibiting and Enabling Talkback

If you require talkback to be used between the Control Room and Studio you will need to set jumpers J1 and J4 over pins 1 & 2 on the studio monitor board and over pins 2 & 3 on the Control Room monitor board.

To inhibit the talkback for the Control Room or Studio, do not fit jumpers J1 and J4.

7.7. Applications

7.7.1. Controlling an On-Air Lamp

An on-air lamp can be controlled by use of the Mute output latch available from the Remote connector of the Output Module (7.5.2.1 and 7.5.2.2). An independent set of contacts can be used for the Studio and Control Room to control the two different lights. They can be set up as in the following diagram :
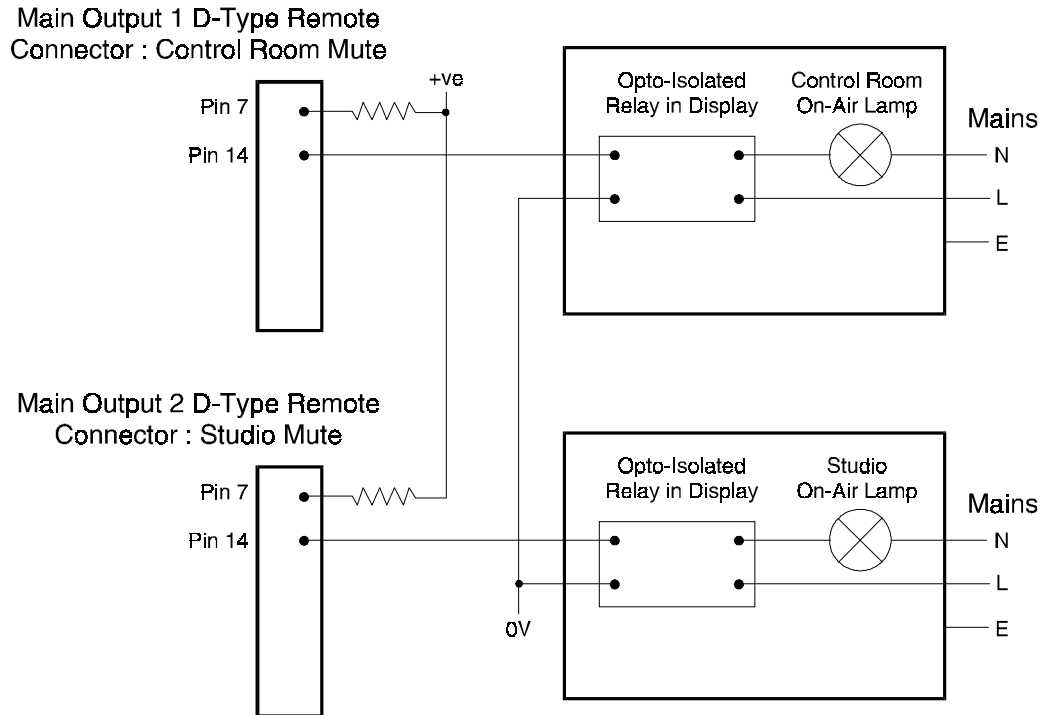
Fig 7-5 : Connections for On-Air Display

8. Meter-Bridge

The meter-bridge section of the mixer contains either VU or PPM meters, a digital timer, and a speaker for talk-back and PFL.

Fig 8-1 : MX10 Meter-Bridge with PPM's

Fig 8-2 : MX14 Meter-Bridge with PPM's and panel plate

In later models of the Sovereign, the MX14 meter-bridge is fitted with a panel plate which can be custom fitted with options for switching, or talkback.

8.1. Meters
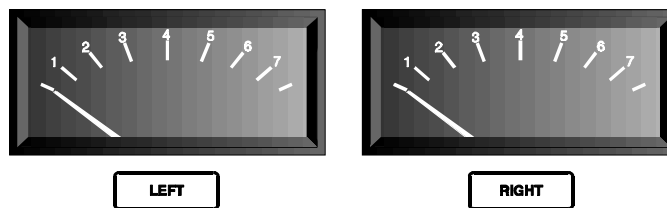
The Sovereign mixers are fitted with VU meters as standard, but can optionally be fitted with PPMs (Peak Programme Meters).

VU meters respond to an average signal level, whereas PPMs respond to peak changes. If a 1kHz sinusoidal signal is input to the mixer and the amplitude adjusted such that the level at the master A output reads +4dB, ref 0.775V r.m.s. 0dBu, the meters will read 0VU.

The PPMs have a 1-7 scale and will be configured such that a 1kHz signal, at 0dB, at the A output will indicate a meter reading of 4. Each mark on the PPM scale indicates a 4dB change in signal level.

8.2. Digital Timer
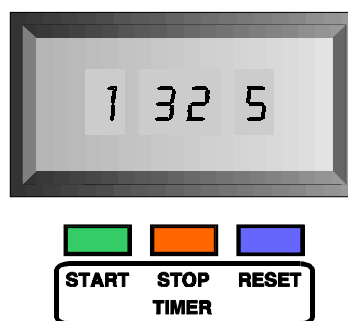
The digital timer has a maximum time display of 9 minutes, 59.9 seconds and can be operated manually, or automatically controlled by any one of the input channels.

Manually, the timer buttons have the following functions :

- Start - Start the timer counting.
- Stop - Stop the timer.
- Reset - Reset the counter to 0.00.0 seconds.

Automatically, the timer can be used by setting jumper J9 on the input module(s) that you wish to use to control the timer. Having the timer operate automatically may be useful for timing the duration of music tracks or presenter speech. Remove the jumper J9 to disable timer control.

When controlled by a channel fader, the timer operates in the following way. When the fader is opened, if the timer is not already running, it will reset the counter and start the timer. If the timer is already running when the fader is opened, the counter begins counting but freezes for 3 seconds, so that you can view and note the "start" time. After three seconds the counter will jump to show the increasing time and will then continue.

The timer will be stopped by a manual stop. The timer can only be reset when in the Stop mode.

8.3. Speaker and Controls
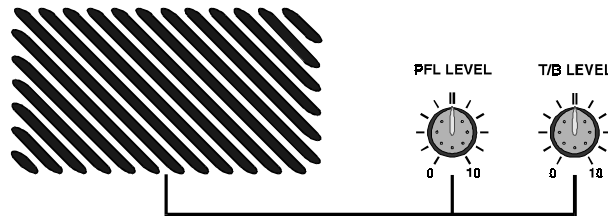
The speaker is used for monitoring PFL and talkback in the Control Room directly from the mixer. Two knobs are available for adjusting the level of the PFL and T/B signals, from cut-off at 0, to unity gain at 10. The speaker is muted automatically when the Control Room mute is active, to prevent feedback.

9.   Specifications

9.1. Technical Specifications

9.1.1. Input/Output Impedances

Mic Input :	> 1.5k ohms electronically balanced.
Mono line input :	> 10k ohms electronically balanced.
Stereo line input :	> 10k ohms electronically balanced.
Main Output :	< 75ohm electronically balanced.
Monitor Output :	< 75 ohm unbalanced.

9.1.2. Frequency Response

Mic Input :	40Hz to 20kHz at -1dB, +0.
Line Inputs :	20Hz to 20kHz at -0.5dB, +0.
Gram Amp Option :	30Hz to 16kHz ± 1.5dB RIAA equalised

9.1.3. Noise (20Hz to 20kHz)

Mic Input E.I.N. :	-128dB with 200 ohm source.
Stereo Inputs :	-100dB (ref +8dB).

9.1.4. Distortion

Total Harmonic	0.015% at 1kHz, 0dBu.
Distortion :	0.025% at 10kHz, 0dBu.

9.1.5. Crosstalk

Inter-channel :	-85dBu.
Left-right :	-88dBu at 1kHz.
	-68dBu at 10kHz.

9.1.6. EQ

LF :	± 7.5dB shelving at 100Hz.
HF :	± 7.5dB shelving at 8kHz.

9.1.7. Common Mode Rejection Ratio

Mic Input :	>100dB at 70dB gain.

9.2. Connections

For connection details of a particular module, please refer to the module's section in this handbook.

Input 1	XLR 3 pin female (Balanced).
Input 2	9 pin D-Type (Balanced).
External Inputs	9 pin D-Type (Balanced).
Cleanfeed Outputs	XLR 3 pin male (Balanced).
A and B Stereo Outputs	XLR 3 pin male (Balanced).
Mono Output	15 pin D-Type (Balanced).
D.A. Outputs (4)	15 pin D-Type (Balanced).
Talkback Input/Output	Stereo Jacks (Unbalanced).
Monitor Output	Stereo Jack (Unbalanced).
Remotes	Inputs : 9 pin D-Type, Outputs : 15 pin D-Type
Headphones	1/4" Stereo Jack.

9.3. Equipment Type

MXB-10	10 Channel base frame
MXB-14	14 Channel base frame
MXT-1	Telco channel
MXM-1	Mic/line channel
MXS-1	Dual switchable stereo channel
MXR-1	Transmission router channel
MXI-1	2 x 6 Way outside source selector
MXB-1	Blank channel
MXS-1	Script space
MXS-EQ1	EQ on stereo channel (per channel)
MXT-2	Telco option to allow mix-minus on B output channel
MX-GRM	Gram amplifier option on dual stereo channel
MX-PPM	PPM meters instead of VU meters
MX-PPT	True PPM meters instead of VU meters
MX-MFO	Master faders on output module
MX-PG	P & G conductive plastic faders

Spares

MX-PSU	19" Rackmount power supply for MX series

10. Glossary

Attenuation	The reduction of a signal level. Attenuation is usually measured in dB.
Balance	The relative levels of the left and right channels of a stereo signal.
Cleanfeed	A cleanfeed is a signal produced by the telco module which is used as the output to be fed back to a caller on a telephone line. The cleanfeed is a sum of all the other signals which constitute the programme output, except for the caller's audio. A cleanfeed signal will generally be of a better quality than a mix-minus signal.
Clipping	The onset of severe distortion in the signal path, usually caused by the peak signal voltage being limited.
CMRR	Common Mode Rejection Ratio. This is the ratio of the extent to which a differential amplifier will cancel noise, which is present on both inputs, compared to its ability to amplify the signal.
Cross-talk	This is the amount of a signal from a bus which appears, or is induced, on a different signal. The problem is usually most prevalent with adjacent channels.
dB (decibel)	A ratio of two voltages or signal levels, expressed by the equation $$dB = 20 \, LOG(V1/V2)$$ Adding the suffix "u" denotes that the signal is relative to 0.775V RMS. Adding the suffix "v" denotes that the signal is relative to 1V RMS.
EIN	Equivalent input noise. It is the ratio of output noise to the gain. It describes the level of noise which would need to be fed into an ideal amplifier to produce the measured output noise.
EQ (Equalisation)	This is a method of cutting or boosting selected bands of frequencies in the signal.
Gain	The degree of amplification, or attenuation, applied to a signal.
LED	Light Emitting Diode.
Mix-minus	A mix-minus is similar to a cleanfeed except that the caller's voice is removed from the signal electronically. Due to phasing problems at the signal band edges, the mix-minus method often produces a lower grade signal.
Pan	This controls the levels sent to the left and right outputs and is an abbreviation of 'panorama'.
PFL (Pre Fade Listen)	This is a method of auditioning audio material independently of the programme output, without routing the signal to air. The PFL button on each channel routes the signal to the PFL bus, where it can be monitored.

TBU	Telephone Balance Unit. This is a unit that connects the telco unit to the telphone line (a two wire to four wire convertor).
T/B	Talk-back (and reverse talk-back). This is the ability for two or more studios to communicate with each other off-air.
Telco	Telephone Communication. The telco module is used by the presenter to talk to telephone callers.
THD	The Total Harmonic Distortion is the percentage presence of signals outside the measured reference frequency.

Index