mbi

# SERIES 5

# USER GUIDE

CE This equipment complies with the EMC Directive 89/336/EEC

For further details contact:
Harman International Industries Ltd,
Cranborne House, Cranborne Road,
Potters Bar, Hertfordshire, EN6 3JN, U.K.

Tel: +44 (0) 1707 665000
Fax: +44 (0) 1707 660482

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Soundcraft Electronics Ltd.
Cranborne House,
Cranborne Road,
Cranborne Industrial Estate,
Potters Bar,
Herts.,
England.
EN6 3JN.

Tel: 0707 665000
Fax: 0707 660482

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# Introduction

# Introduction

The Series 5 is designed for use by local and community radio stations. It includes an essential combination of mono, stereo and telephone inputs, together with a master section and a monitor section.

The meter-pod houses 2 LED bargraphs. An optional meter-pod housing 2 PPMs or 2 VU meters is available.

The console contains the following modules:

4 Mono Input modules. Each module may be used for Mic/Line inputs and has a connector for remote operation of the following facilities: Cough switch, Cue Lamp, Start & Stop relays, Talk-Back and Send/Return for effects. A 3-band fixed frequency EQ section is standard.

2 Telco (Telephone Communication) modules. In addition to outputting to the programme, each Module provides for on and off-air telephone conversations with the Presenter, Guests or Producer. A 3-band fixed frequency EQ section is standard.

6 Stereo modules. Each channel accepts one of two switch-selectable stereo sources. One is the normal source, such as a CD player or cart. machine, which is hard wired to the multipin connector. The other may be an alternative or temporary source which is connected via XLR connectors. There are also connections for the remote operation of Start & Stop relays for both of the sources. A 3-band fixed frequency EQ section is standard.

The Master section contains the Master Stereo fader, Master Mono fader, an Auxiliary Master level control, Stereo and Mono Desk Outputs and an Auxiliary Output. It also has two mono Effects Return inputs.

The Monitor section provides the controls for four areas of monitoring: Presenter's headphones and loudspeakers, Studio headphones and loudspeakers. Each has its own level control and can monitor the following: programme, aux, external or PFL. There is also provision for reverse talkback to the Presenter's headphones and loudspeakers.

# Precautions and Safety Instructions

## General Precautions

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

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

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

## Handling and Transport

The console is a very rugged unit, designed for long service. However, care in handling and transportation will ensure a long and trouble-free life. If the console is to be regularly moved we recommend that it is installed in a foam lined flight case. At all times avoid applying excessive force to any knobs, switches or connectors.

## Power supplies & cables

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

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

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

Always ensure that that you use the correct power supply for your console. Each Series 5 console requires the DCP100 power supply.

## *Signal Levels*

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

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

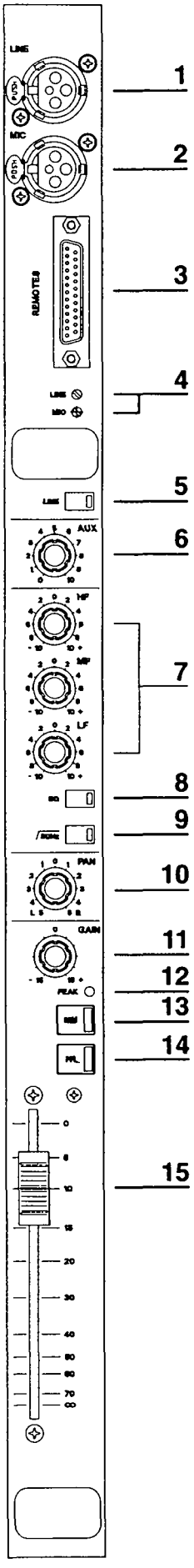
***Caution!*** **DO NOT use unbalanced microphones or battery powered condenser microphones without isolating the +48V phantom power - degraded performance or damage to the microphone may result.**

# Mono Input Channel

*Description & Operation*

*Specification*

# Mono Input Channel




## *Input Stage*

**1** The **LINE INPUT** is via a standard female XLR-3 connector. It is available when the **LINE** switch is depressed.

**2** The **MIC INPUT** is via a standard female XLR-3 connector. It is available when the **LINE** switch is released.

**3** **REMOTES** Socket

This 25-way D-type female connector allows you to implement the following facilities:

**COUGH/REVERSE TALKBACK Switch**

This user-provided facility has two functions, as follows:

1) The Input Channel is muted when all of the following conditions are met: The Mic input is selected, the Fader is up and the Cough Switch is closed. This allows the Presenter/Guest to temporarily mute his or her microphone.

2) The Cough Switch allows the Guest to force a PFL so that he or she may talk to the Presenter. This forced PFL occurs when all of the following conditions are met: The Mic input is selected, the Fader is down and the Cough Switch is closed (*see the Applications section*).

**CUE LAMP**

This user-provided facility will be controlled via relay contacts which close when all of the following conditions are met: The Mic input is selected, the Fader is up and the REM switch is depressed (*see the Applications section*).

**START RELAY**

The contacts of this relay will close when all of the following conditions are met: The Line input is selected, the REM switch is depressed and the Fader is up. The relay contacts can either close momentarily or they may latch, depending upon link 6 (*see the Applications section*).

**STOP/RE-CUE RELAY**

The contacts of this relay will close momentarily when the following conditions are met: The Line input is selected and the REM switch is released and/or the Fader is down (*see the Applications section*).

**TALK-BACK SWITCH**

This user-provided switch will, when closed, route the signal from the pre-fade section of the circuit onto the T/B OUTPUT bus and also to the Continuous Talkback Output socket of the Monitor section. The major use of this facility is that the T/B OUTPUT bus feeds the Telco Channels and will allow the Presenter, Guest or Producer to talk to a telephone Caller off-air (*see the Applications section*).

**SEND/RETURN**

This allows for the use of an effects machine to be added to the mono input channel, e.g. voice processor, echo. The send and return lines are unbalanced and care will need to be taken with the length and type of leads which are used. This facility is enabled by the removal of link 5 (*see the Applications section*).

**4** Two **COARSE ADJUSTMENT PRESET POTS** are available, one for each of the input sockets. They allow for the coarse adjustment of input levels.

**5** The **LINE** switch selects the Line Input socket when depressed and the Mic Input socket when released. A LED in the switch glows red when the Line Input is selected.

## *Auxiliary Send*

**6** The **AUX** control routes the input channel signal onto the Auxiliary Mix bus. The input channel signal may be fed to the Auxiliary control either pre-fade or post-fade. The factory default is pre-fade but this can be changed via a link on the pcb (*see the Applications section*).

## *Equaliser*

**7** The **HF EQ** control provides high frequency (above 8.5kHz) boost and cut of +/-10dB. The **MF EQ** control provides medium frequency boost and cut of +/-10dB at 3kHz. The **LF EQ** control provides low frequency (below 180Hz) boost and cut of +/-10dB.

**8** When the **EQ** switch is depressed, the EQ section, described above, is switched into the signal path. A yellow LED glows to indicate this. When the switch is released the signal path bypasses the EQ section.

**9** When the **80Hz** switch is depressed an 80Hz high-pass filter is switched into the signal path. A yellow LED glows to indicate this. This control is useful for filtering-out low frequency hum.

## *Level Control*

**10** The **PAN** control determines the position of the signal within the stereo image. Rotation fully anticlockwise feeds the signal solely to the left mix bus, whilst rotation clockwise sweeps the image to the right mix bus.

**11** The **GAIN** control provides +/- 15dB gain.

**12** The **PEAK** LED glows to give a warning of possible overload.

## *Cueing*

**13** The **REM** (Remote) switch works in conjunction with the Fader microswitch. There is a red LED in the REM switch which will glow at two levels of brightness. The LED will glow at half brightness if the Fader is down when the REM button is pushed; you may regard this as the REM circuit being armed but not active. To make the REM circuit active the Fader must be moved away from the down position. The LED will glow at full brightness to indicate that the REM circuit is now active. When the REM circuit is active it will, depending upon other switch settings, control the Cue Lamp, Start Relay and Stop Relay: full details are given above. If the REM switch is pushed whilst the Fader is already away from the down position then the REM circuit will be active as soon as the REM switch is pushed and the LED will glow at full brightness to indicate this.

**14** The **PFL** (Pre-Fade Listen) switch allows you to listen, via the Monitors section, to an the input on this channel. When the Fader is moved away from the down position the PFL circuit is automatically deactivated: PFL cannot therefore be activated when the Fader is up. A red LED glows to indicate that the PFL circuit is active. If the REM switch's LED is glowing at half brightness and the PFL switch is pressed the START relay will operate.

## *Output To The Programme*

**15** The smooth-action, 100mm **FADER** gives a gain of unity (0dB) when it is in the fully up position. The scale alongside the Fader indicates the attenuation, in dB, for any position. There is a microswitch attached to the Fader which detects when it is in the fully down position. This microswitch helps to control many of the features which are described in this section.

The input to the channel will be on-air whenever the Fader is open (unless the cough switch is closed).

Note: Each Mono Input channel can be configured as a Local or Distant channel. This controls which monitor circuit will be muted when the channel's Fader is opened and the mic is selected.

## *Specifications*

**Microphone Input**

Electronically balanced

| | |
|---|---|
| Input Impedance | >1.5kΩ |
| Maximum I/P level | -2dBu |
| Sensitivity Range | -70dBu to -23dBu |
| CMRR | >100dB @70dB gain |
| EIN | -128dB, 200R source |

**Line Input**

Electronically balanced

| | |
|---|---|
| Input Impedance | >20kΩ |
| Input Range | -10dBu to 0dBu |

**Equalisation**

| | |
|---|---|
| LF | +/- 10dB shelving at 180Hz |
| MF | 10dB cut and boost at 3kHz |
| HF | +/-10dB shelving at 8.5kHz |

**General**

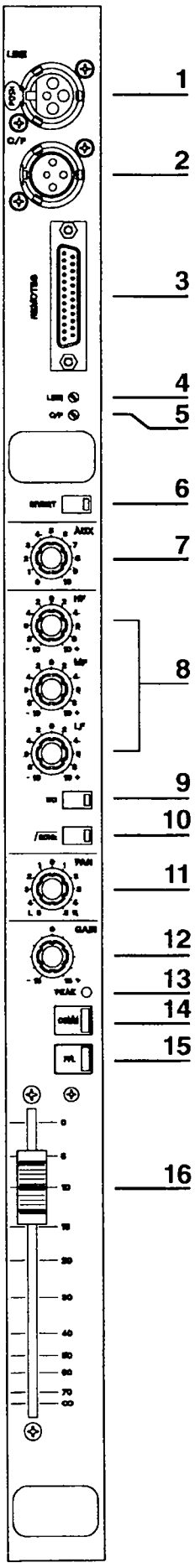
| | |
|---|---|
| Insert Send Level | -6dBu |
| THD | 0.006% @1kHz 0dBu |

# Telco Channel

*Description & Operation*

*Specification*

# Telco Channel




## *Input Stage*

The Telco module must be connected to the telephone system via a telephone hybrid circuit. The Applications section of this manual gives more details.

**1** The **LINE** input is a female XLR into which the output from an external telephone hybrid may be plugged. It is a balanced input.

**2** The **C/F** (Clean Feed) output is a male XLR connector which may be plugged into the input of an external telephone hybrid. The Clean Feed signal (also known as Mix Minus) is the programme output signal *minus* the phone signal. It is a balanced output.

**3** **REMOTES** Socket

This 25-way D-type female connector allows you to implement the following facilities:

**Telephone Divert**

See Divert Switch.

**Talkback Enable**

This user-provided switch will, when closed, cause the Caller to hear a reduced programme output plus the signal on the T/B OUTPUT bus. This bus will have the signal from the inbuilt mic plus the signal from any of the Mono Input modules if their respective Talkback Switches are closed (see the Applications section).

**External Talkback**

This allows the Producer to talk to the Caller. It consists of a balanced audio input and also two contacts which may be shorted via a user-provided switch. When the switch is closed the Caller will hear a reduced programme plus the input to the External Talkback circuit (see the Applications section).

**4** **LINE** (Coarse Adjust) allows the coarse adjustment of the Line input level.

**5** **C/F** (Coarse Adjust) allows for the reduction, to a minimum, of the Caller's signal in the Clean Feed output. This is factory set and should not require further adjustment.

**6** The **DIVERT** switch on the module is a 1-pole 2-way switch; these connections are available on the Remote socket. It is possible to connect this switch to the external telephone hybrid to enable the Caller to be diverted to, for example, a standard telephone. You will need to consult the telephone hybrid circuit's handbook for its requirements.

## *Auxiliary Send*

**7** The **AUX** control routes the Caller's signal onto the Auxiliary Mix bus. The signal may be fed to the Auxiliary control either pre-fade or post-fade. The factory default is pre-fade but this may be changed via a link on the pcb (*see the Applications section).*

## Equaliser

**8** The **HF EQ** control provides high frequency (above 8.5kHz) boost and cut of +/-10dB. The **MF EQ** control provides medium frequency boost and cut of +/-10dB at 3kHz. The **LF EQ** control provides low frequency (below 180Hz) boost and cut of +/-10dB.

**9** When the **EQ** switch is depressed, the EQ section, described above, is switched into the signal path. A yellow LED glows to indicate this. When the switch is released the signal path bypasses the EQ section.

**10** When the **80Hz** switch is depressed an 80Hz high-pass filter is switched into the signal path. A yellow LED glows to indicate this. This control is useful for filtering-out low frequency hum.

## Level Control

**11** The **PAN** control determines the position of the signal within the stereo image. Rotation fully anticlockwise feeds the signal solely to the PROGRAM MIX L bus, whilst rotation clockwise sweeps the image to the PROGRAM MIX R bus.

**12** The **GAIN** control provides +/- 15dB gain.

**13** The **PEAK** LED glows to give a warning of possible overload.

## Cueing

**14** When the **COMM** circuit is active the Caller will hear a reduced programme plus the signal on the T/B OUTPUT bus. This bus will carry the signal from the inbuilt mic plus the signal from any of the Mono Input modules if their respective Talkback Switches are closed. In addition the Caller's input will be put on the PFL MIX L & R buses and a PFL condition is signalled on the PFL Enable bus. The Presenter will therefore hear the caller as a PFL. The LEDs in the COMM and PFL switches will glow. The COMM circuit will be deactivated when the Fader is moved away from the down position, or when the COMM switch is pushed a second time.

**15** When the **PFL** circuit is active the Caller's input will be put onto the PFL MIX L & R buses. The Presenter will therefore hear the caller as a PFL. The LED in the PFL switch will glow. The PFL circuit will be deactivated when the Fader is moved away from the down position.

## Output To The Programme

**16** The smooth-action, 100mm **FADER** gives a gain of unity (0dB) when it is in the fully up position. The scale alongside the Fader indicates the attenuation, in dB, for any position. There is a microswitch attached to the Fader which detects when the Fader is in the fully down position. This microswitch helps to control many of the features which are described in this section.

The input to the channel will be on-air whenever the Fader is up .

# Specifications

**Line Input**

Electronically balanced

| | |
|---|---|
| Input Impedance | >20kΩ |
| Input Level | -10dBu to 0dBu |

**Clean Feed Output**

Electronically balanced

| | |
|---|---|
| Output Impedance | <75Ω |
| Output Level | 0dBu |

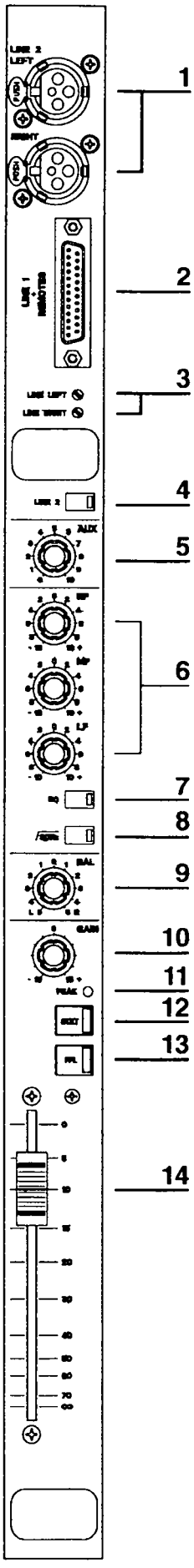
**Equalisation**

| | |
|---|---|
| LF | +/- 10dB shelving at 180Hz |
| MF | 10dB cut and boost at 3kHz |
| HF | +/-10dB shelving at 8.5kHz |

# Stereo Input Channel

*Description & Operation*

*Specification*




# Stereo Input Channel

## *Input Stage*

**1** The **LINE 2 (LEFT** and **RIGHT)** female XLR connectors provide for an alternative or temporary source. The inputs are electronically balanced.

**2** The **LINE 1 + REMOTES** 25-way D-type female socket provides the connections for the Line 1 Inputs and also the remote controls for Line 1 and Line 2 inputs. The inputs are electronically balanced.

The remote controls, which are duplicated for both Line 1 and Line 2, are described below. Only one of the two Start relays (Line 1 Start or Line 2 Start) will be active at any time, depending upon the setting of the LINE 2 switch. The two Stop/Re-cue relays are controlled similarly.

**Start Relay**

The contacts of this relay will close when the STRT switch is depressed and the Fader is up, or it will close when the PFL switch and the STRT switches are depressed. The relay contacts can either close momentarily or they may latch, depending upon link 6 (*see the Applications section*).

**Stop/Re-Cue Relay**

The contacts of this relay will close momentarily when the STRT switch is released or the Fader is down, or, the STRT switch is released or the PFL switch is released (*see the Applications section*).

**3** The **LINE LEFT** and **LINE RIGHT COARSE ADJUSTMENT PRESET POTS** allow for the coarse adjustment of the inputs on Line 1 only. The inputs to Line 2 can be boosted by 10dBv if links 1 and 2 are present on the circuit board (*see the Applications section*).

**4** The **LINE 2** switch selects, as the input source, Line 2 when depressed and Line 1 when released. A red LED glows to indicate when Line 2 is selected.

## *Auxiliary Send*

**5** The **AUX** control routes both the left and right stereo input signals onto the AUXILIARY MIX bus. The input channel signal may be fed to the Auxiliary control either pre-fade or post-fade. The factory default is pre-fade but this can be changed via a link on the pcb (*see the Applications section*).

## *Equaliser*

**6** The **HF EQ** control provides high frequency (above 8.5kHz) boost and cut of +/-10dB. The **MF EQ** control provides medium frequency boost and cut of +/-10dB at 3kHz. The **LF EQ** control provides low frequency (below 180Hz) boost and cut of +/-10dB.

**7** When the **EQ** switch is depressed, the EQ section, described above, is switched into the signal path. A yellow LED glows to indicate this. When the switch is released the signal path bypasses the EQ section.

**8** When the **80Hz** switch is depressed an 80Hz high-pass filter is switched into the signal path. A yellow LED glows to indicate this. This control is useful for filtering-out low frequency hum.

## *Level Control*

**9** The **BAL** control allows the stereo image to be balanced. It has a range of ±6dB.

**10** The **GAIN** control provides +/- 15dB gain.

**11** The **PEAK** LED glows to give a warning of possible overload.

## *Cueing*

**12** The **STRT** switch works in conjunction with the Fader microswitch. There is a red LED in the STRT switch which will glow at two levels of brightness. The LED will glow at half brightness if the Fader is down when the STRT button is pushed; you may regard this as the STRT circuit being armed but not active. To make the STRT circuit active the Fader must be moved away from the down position. The LED will glow at full brightness to indicate that the STRT circuit is now active. When the STRT circuit is active it will, depending upon other switch settings, control the Start Relay and Stop/Re-cue Relay: full details are given above. If the STRT switch is pushed whilst the Fader is already away from the down position then the STRT circuit will be active as soon as the STRT switch is pushed and the LED will glow at full brightness to indicate this.

**13** The **PFL** (Pre-Fade Listen) switch allows you to listen, via the Monitors section, to an the input on this channel. When the Fader is moved away from the down position the PFL circuit is automatically deactivated. A red LED glows to indicate that the PFL circuit is active. If the STRT switch's LED is glowing at half brightness and the PFL switch is pressed the START relay will operate.

## *Output To The Programme*

**14** The smooth-action, 100mm **FADER** gives a gain of unity (0dB) when it is in the fully up position. The scale alongside the Fader indicates the attenuation, in dB, for any position. There is a microswitch attached to the Fader which detects when the Fader is in the fully down position. This microswitch helps to control many of the features which are described in this section.

The input to the channel will be on-air whenever the Fader is open.

# Specifications

**Line Inputs**

Electronically balanced

| | |
|---|---|
| Input Impedance | >10kΩ |
| Input Levels: | Line 1 -10dBu to 0dBu,<br>Line 2 0dBu or -10dBv selectable |

**EQ**

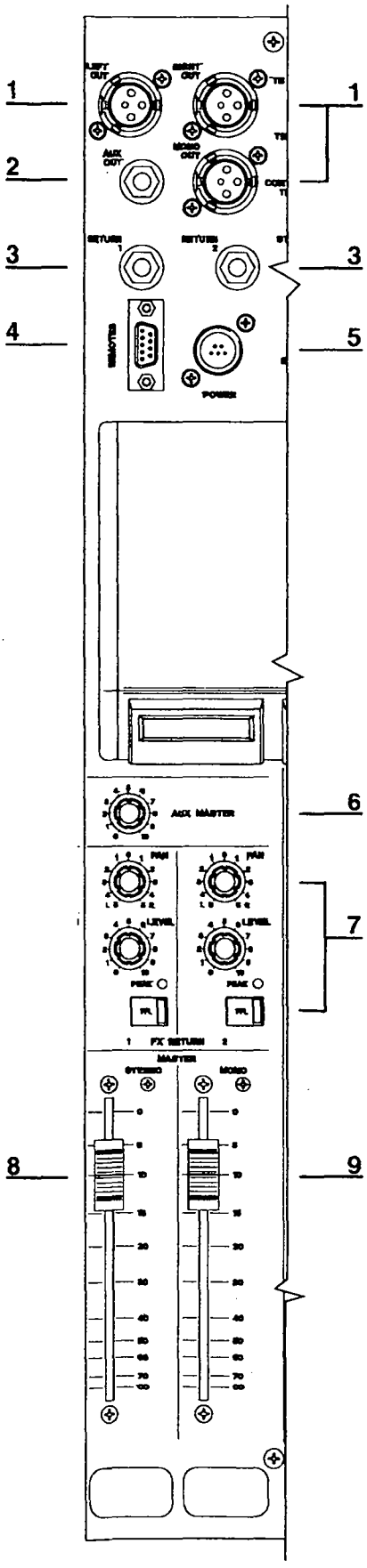
| | |
|---|---|
| LF | +/- 10dB shelving at 180Hz |
| MF | 10dB cut and boost at 3kHz |
| HF | +/-10dB shelving at 8.5kHz |

# Master Section

*Description & Operation*

*Specification*

# Master Section




## Outputs

**1 Programme Outputs**

The **LEFT OUT** male XLR connector provides an electronically balanced output from the PGM MIX L bus. The Stereo Master Fader (8) controls the level of the output.

The **RIGHT OUT** male XLR connector provides an electronically balanced output from the PGM MIX R bus. The Stereo Master Fader (8) controls the level of the output.

The **MONO OUT** male XLR connector provides an electronically balanced output which is the sum of the PGM MIX R and PGM MIX L buses. The Mono Master Fader (9) controls the level of the output.

## Auxiliary Output

**2** The **AUX OUT** ¼" jack socket provides an electronically balanced output from the AUX MIX bus. The AUX MASTER pot (6) controls the level of the output.

## Effects Inputs

**3** The **RETURN 1 and 2** ¼" jack sockets provide a balanced input. The inputs here are fed onto the PGM MIX L and PGM MIX R buses, via the LEVEL and PAN controls.

## Muting

**4** The 9-way D-type **REMOTES** male connector provides two 2-pole 1-way relay contacts. One is controlled by the LOCAL MUTE bus and the other is controlled by the DIST MUTE bus. The relay contacts close when the appropriate mute is active. These relays may be used to provide 'On-Air' lamps in the Control Room and the Studio (*see the Applications section*).

## Power Input

**5** The 5-way locking **POWER** connector is the power input to the console. The console requires +17V, -17V and +48V.

## Auxiliary Control

**6** The **AUX MASTER** pot controls the level of the signal at the Aux Output socket. The signal is fed to the Aux Master control from the AUX MIX bus.

## *Effects Control*

7 The following **FX** controls are duplicated for both FX Return 1 and FX Return 2.

**PAN**

This control determines the position of the signal within the stereo image. Rotation fully anticlockwise feeds the signal solely to the left, whilst rotation clockwise sweeps the image to the right.

**LEVEL**

This controls the level of the signal being fed to the PGM MIX L and PGM MIX R buses.

Note: FX Returns are always connected to the PGM MIX L and PGM MIX R buses.

**PEAK**

This LED glows to give a warning of possible overload.

**PFL**

A red LED glows to indicate that the PFL circuit is active. When it is active the FX Return signal is passed to the PFL MIX L and PFL MIX R buses.

## *Master Output Control*

**8** The **STEREO MASTER FADER** is a smooth-action 100mm fader. It controls the signal level at the Output Left and Output Right XLR sockets.

**9** The **MONO MASTER FADER** is a smooth-action 100mm fader. It controls the signal level at the Mono Output XLR socket.

# Specifications

**Mix Left, Right & Mono**

| | |
|---|---|
| Max. output | +21dBu |
| Output impedance | <75Ω |

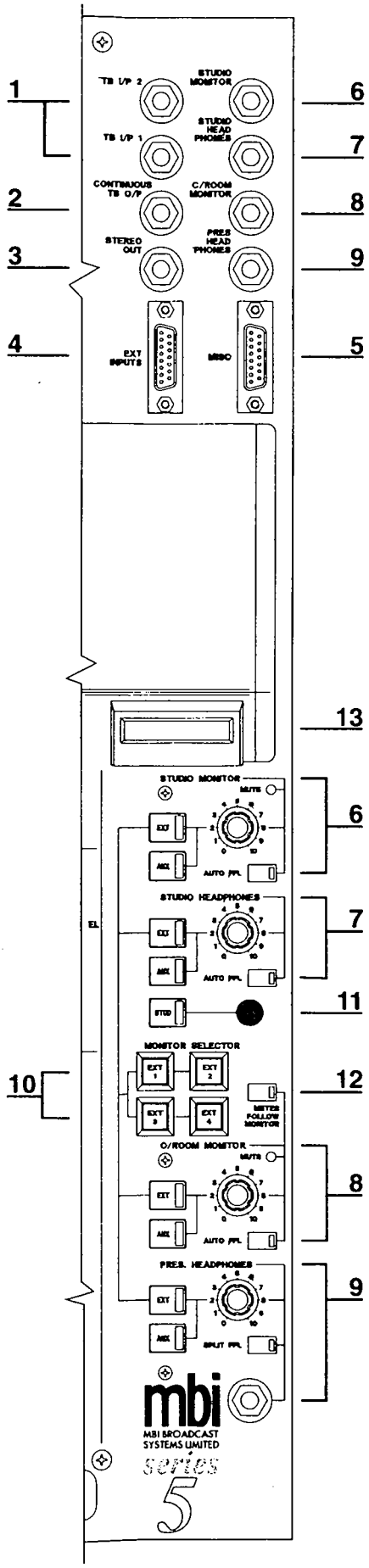
**General**

| | |
|---|---|
| THD | < 0.03% |
| Crosstalk | < 60dB |

# Monitor Section

*Description & Operation*

# Monitor Section




## *Input/Output Sockets*

**1** The **TB I/P 1** and **T/B I/P 2** inputs are via 3-pole ¼" 'A' gauge jack sockets. They each provide the means of connecting a microphone, at line level, and an activating switch to provide talkback to the Control-room. The signal from each mic is passed to the Control-room monitor and the Presenter's headphones (*see the Applications section*).

**2** The **CONTINUOUS TB O/P** is via a 3-pole ¼" 'A' gauge jack socket. The signal available at this socket is a mix of the following inputs: the inbuilt mic in the console, and talkback signals from Mono-input channels, e.g. when user-provided cough switches are depressed (*see the Applications section*).

**3** The **STEREO OUT** output is provided via a 3-pole ¼" 'A' gauge jack socket. It provides buffered versions of the DESK O/P L & R buses.

**4** **EXT INPUTS** are provided on a 15-way D-type male connector. Four Stereo channels are provided, channels 1 and 2 have balanced inputs whilst channels 3 and 4 have unbalanced inputs.

**5** The **MISC** socket provides the following signals:

Chassis, Ref and Logic Ground
Audio and Logic power supply rails
MFM (Meter Follows Monitor) signals
PFL signals
Stereo Output signals
Local Mute control signal
Talkback output
PFL logic control signal.

*See the Applications section.*

## *Studio*

### 6 STUDIO MONITOR

This output is via a 3-pole ¼" 'A' gauge jack socket. The output must be amplified in order to drive speakers.

The Studio Monitor has 4 sources of input. They are: Desk, Ext, Aux and PFL. The default source, which is selected at power-on, is Desk, i.e. the program output.

**EXT**

This switch selects the external inputs as the source of the Studio Monitor. A green LED glows to indicate that it has been selected. To de-select this input you may either press this switch again to return to Desk, or you may press the AUX switch.

**AUX**

This switch selects the auxiliary input as the source of the Studio Monitor. A red LED glows to indicate that it has been selected. To de-select this input you may either press this switch again to return to Desk, or you may press the EXT switch.

**MUTE**

This red LED glows to indicate that the Studio Monitor output has been muted. This occurs when any mics connected to Mono Input Channels which are designated as Distant are being used.

**AUTO PFL**

When this switch is depressed any PFL selected from any of the channels will be fed to the Studio Monitor. The PFL signal will replace the existing signal. A red LED in the switch glows to indicate that this feature is enabled.

When the switch is released PFL signals will not be fed to the Studio Monitor.

**LEVEL Control**

This controls the level of output fed to the output socket.

Note: When the studio talkback switch is depressed the signal from the selected source is replaced by the signal from the inbuilt mic plus the signal from the T/B Mix bus.

## 7 STUDIO HEADPHONES

This output is via a 3-pole ¼" 'A' gauge jack socket.

The Studio Headphones have 4 sources of input. They are: Desk, Ext, Aux and PFL. The default source, which is selected at power-on, is Desk, i.e. the program output.

**EXT**

This switch selects the external inputs as the source of the Studio Headphones. A green LED glows to indicate that it has been selected. To de-select this input you may either press this switch again to return to Desk, or you may press the AUX switch.

**AUX**

This switch selects the auxiliary input as the source of the Studio Headphones. A red LED glows to indicate that it has been selected. To de-select this input you may either press this switch again to return to Desk, or you may press the EXT switch.

**AUTO PFL**

When this switch is depressed any PFL selected from any of the channels will be fed to the Studio Headphones. The PFL signal will replace the existing signal. A red LED in the switch glows to indicate that this feature is enabled.

When the switch is released PFL signals will not be fed to the Studio Headphones.

**LEVEL Control**

This controls the level of output fed to the output socket.

Note: When the studio talkback switch is depressed the signal from the selected source is replaced by the signal from the inbuilt mic plus the signal from the T/B Mix bus.

## *Control Room*

### 8 C/ROOM MONITOR

This output is via a 3-pole ¼" 'A' gauge jack socket. The output must be amplified in order to drive speakers.

The Control-room Monitor has 4 sources of input. They are: Desk, Ext, Aux and PFL. The default source, which is selected at power-on, is Desk, i.e. the program output.

**EXT**

This switch selects the external inputs as the source of the Control-room Monitor. A green LED glows to indicate that it has been selected. To de-select this input you may either press this switch again to return to Desk, or you may press the AUX switch.

**AUX**

This switch selects the auxiliary input as the source of the Control-room Monitor. A red LED glows to indicate that it has been selected. To de-select this input you may either press this switch again to return to Desk, or you may press the EXT switch.

**MUTE**

This red LED glows to indicate that the Control-room Monitor output has been muted. This occurs when any mics connected to Mono Input Channels which are designated as Local are being used.

**AUTO PFL**

When this switch is depressed any PFL selected from any of the channels will be fed to the Control Room Monitor. The PFL signal will replace the existing signal. A red LED in the switch glows to indicate that this feature is enabled.

When the switch is released PFL signals will not be fed to the Control Room Monitor.

If either of the reverse talkback inputs (TB INPUT 1 or 2) are being used they will over-ride all other signals to the Control Room Monitor.

**LEVEL Control**

This controls the level of output fed to the output socket.

### 9 PRES. HEADPHONES

There are two 3-pole ¼" 'A' gauge jack sockets. The Presenter's Headphones have 4 sources of input. They are: Desk, Ext, Aux and PFL. The default source, which is selected at power-on, is Desk, i.e. the program output.

**EXT**

This switch selects the external inputs as the source of the Presenter's Headphones. A green LED glows to indicate that it has been selected. To de-select this input you may either press this switch again to return to Desk, or you may press the AUX switch.

**AUX**

This switch selects the auxiliary input as the source of the Presenter's Headphones. A red LED glows to indicate that it has been selected. To de-select this input you may either press this switch again to return to Desk, or you may press the EXT switch.

**SPLIT PFL**

When this switch is depressed any PFL selected from any of the channels will be summed and fed to the right-hand channel of the Presenter's Headphones. The existing source to the headphones is summed and fed to the left-hand channel of the headphones. A red LED in the switch glows to indicate that this feature is enabled.

When the switch is released PFL signals, when present, will be fed to both sides of the Presenter's Headphones.

When there is no PFL signal the Presenter will hear the selected Monitor input through both sides of the headphones in either of the above cases.

If either of the reverse talkback inputs (TB INPUT 1 or 2) are being used they will over-ride all other signals to the Presenter's headphones. The input of the reverse talkback inputs will be heard through both sides of the headphones.

**LEVEL Control**

This controls the level of output fed to the output socket.

## *External Inputs*

### 10 MONITOR SELECTOR

Each of the monitor/headphone circuits described above may select Ext as an input source. The Ext source has four inputs which may be selected by depressing the desired switch: Ext1 to Ext4. A green LED in each switch indicates its selection. Depressing one of these switches automatically deselects the previously selected Ext input, therefore only one of the four Ext inputs may be selected at any time.

Note: Ext 1 is the default input which is selected at power up.

## *Talkback*

**11** When the **STUD** switch is depressed the Studio Headphones and Monitor circuits will have their existing sources replaced by the signal from the inbuilt **MIC** summed with the T/B MIX bus.

Note: the switch is non-latching; it also does not turn the mic on: its output is always present on the T/B OUTPUT bus. The signal T/B OUTPUT bus is always available at the Continuous Talkback Output socket.

## *Metering*

**12** When the **METER FOLLOW MONITOR** switch is released the Meters will follow the Desk output but will be interrupted by any PFL signal. When the switch is depressed the meters will follow the Control-room Monitor. A red LED in the switch glows to indicate that the Meters are following the Control-room Monitor.

Note: The Meters will follow the Monitor even if talkback to the Control-room is used, i.e. the meters will not follow the talkback signal.

**13** The standard metering consists of two 20-LED **BARGRAPHS** which indicate levels between -20dBu and +16dBu.

An optional replacement pod housing 2 **PPM** or **VU METERS** is available.

The meter pod is secured with barbed plastic clips and may be removed by pulling firmly upwards. The ribbon cable connector must be released by opening the side clip on the PCB connector. Replacement is the reversal of the above.

# Applications

*Connections and Connectors*

*Mono Input Channel*

*Telco Input Channel*

*Stereo Input Channel*

*Master Section*

*Monitor Section*

# Applications

This section is intended to help you to connect, to the console, the external equipment which you need. It also identifies all of the user-definable options which are available and gives the location of the links involved.

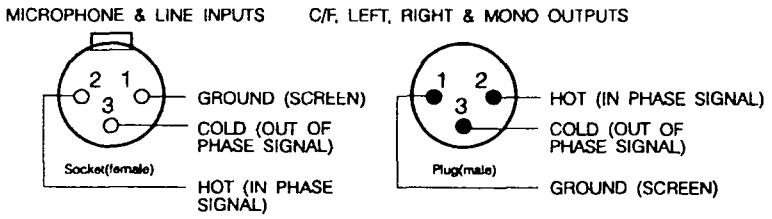
## *Connections And Connectors*

Although this may seem to be a simple subject, faulty connectors and cabling are the source of most sound system problems. Correctly-made cables of the proper type will ensure peak performance from your console.

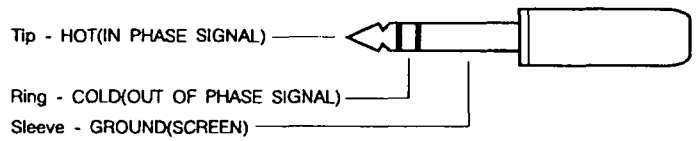
Three different types of connectors are used on your console: 3-pin XLR, ¼" 3-pole jack sockets and D-type connectors.

Note: The Module Descriptions sections of this manual give details of the type and gender of the chassis mounted connectors.

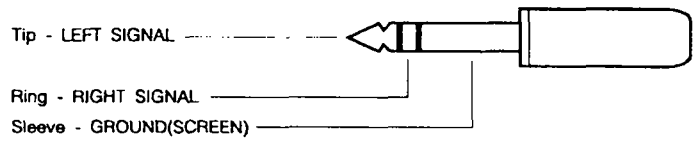
The following diagram shows details of the first two types.




¼" 'A' Gauge Stereo Jack Plug used as balanced outputs/inputs, Aux and Effects Returns




¼" 'A' Gauge Stereo Jack Plug used for stereo outputs, Headphones and Monitors




The following pages give details of all of the connectors which are not covered by the above diagram.

## *Mono Input Channel*

**REMOTES SOCKET (25-pin D-type female)**

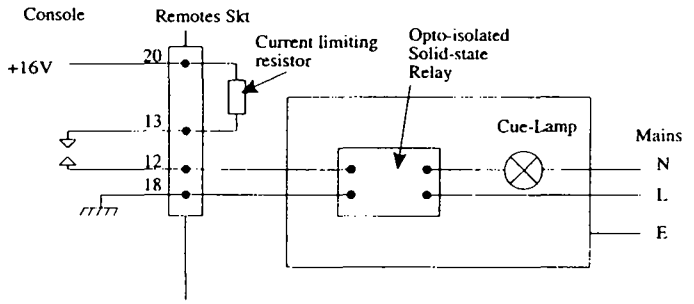
This socket provides for the following facilities:

**Input 1 Cue Lamp**

A relay switch closes between pins 12 & 13 of the Remotes socket when the following conditions are all met:

The Mic input is selected, the REM button is depressed and the Fader is up.

The following diagram shows one possible method of using this relay switch to control a cue lamp. It is vital that mains voltages are NOT connected to any of the connectors on the console.




**Input 2 Start**

A relay switch closes between pins 8 & 9 of the Remotes socket when the following conditions are all met:

The LINE input is selected, the REM button is depressed and the Fader is up.

Note: The relay may be configured to pick momentarily or latch depending upon link 6: if link 6 is present it causes the relay to latch.

**Input 2 Stop/Re-Cue**

A relay switch closes momentarily between pins 6 & 7 of the Remotes socket when the following conditions are all met:

The LINE input is selected, the REM button is released and the Fader is down.

**Talkback**

Two pins on the Remotes socket are used for this feature, as follows:

| | |
|---|---|
| Ground | Pin 3 |
| Talkback enable | Pin 15. |

A switch may be connected between pins 15 & 3. When this switch is closed the pre-fade input signal is fed to the T/B MIX bus. This would, for example, let a Studio Guest talk off-air to a telephone Caller provided that the Talkback feature on the Telco channel is also used..

**Cough/Reverse Talkback Switch**

This user-provided facility has two functions, as follows:

1) The Input Channel is muted when all of the following conditions are met: The Mic input is selected, the Fader is up and the Cough Switch is closed. This allows the Presenter/Guest to temporarily mute his or her microphone.

2) The Cough Switch allows the Guest to force a PFL so that he or she may talk to the Presenter. This forced PFL occurs when all of the following conditions are met: The Mic input is selected, the Fader is down and the Cough Switch is closed.

Two pins on the Remotes socket are used for this feature, as follows:

| | |
|---|---|
| Ground | Pin 2 |
| Cough | Pin 14 |

A switch may be connected between pins 14 & 2.

**Insert Point (Send/Return)**

Two pins on the Remotes socket are used for this feature, as follows:

| | | | |
|---|---|---|---|
| Send | Pin 22 | Send 0V | Pin 21 |
| Return | Pin 23 | Return 0V | Pin 18 |

You will need to remove link 5 from the PCB in order to use the insert Point.

**Power Rails**

The following power rails are available as follows:

| | |
|---|---|
| +16V | Pin 20 (supplied via a 10R current-limiting resistor) |
| -16V | Pin 19 (supplied via a 10R current-limiting resistor) |
| 0V audio | Pins 18 and 21. |

## *Options*

**Designating a channel as Local or Distant**

Link 2 may be set to A for Local or to B for Distant. This will control which set of speakers is muted when this channel is opened: if A is selected the Control Room Monitor output will be muted, or if B is selected the Studio Monitor will be muted.

**Aux - Pre-fade or Post-fade**

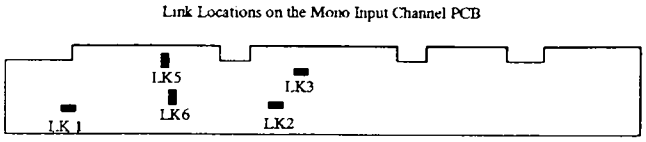
The factory default for the Auxiliary Output on the Mono Input channel is pre-fade. This may be altered to post-fade by moving link 3.

**Phantom Power for Microphones**

If Link 1 is in place then +48V will be present on pins 2 and 3 of the Mic XLR connector. Phantom powered mics should not be plugged in with the +48V switched on. You should also be aware that some mics draw an unusually large current. The current for each mic is limited to 14mA by series resistors.

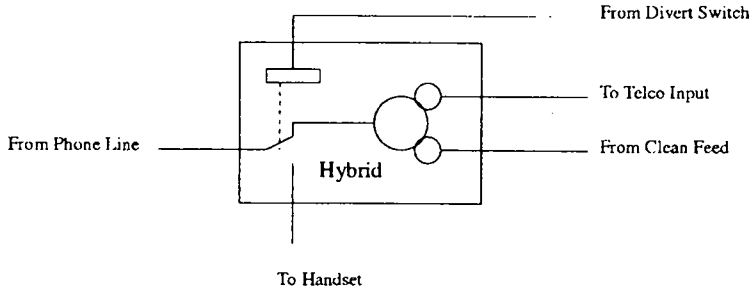
### Link Locations

The following outline diagram of the Mono Input Channel PCB shows the location of the user-changeable links.




## *Telco Input Channel*

The following diagram shows how a Telephone Hybrid may be connected to the Telco Input Channel. A separate Hybrid for each Telco channel will be required.




### REMOTES SOCKET (25-pin D-type female)

This socket provides for the following facilities:

#### Telephone Divert

The Divert Switch on Telco channel is a single-pole 2-way switch. Connections to it are made available on the Remotes socket. The details are as follows:

| | |
|---|---|
| Common | Pin 12 |
| Normally Closed | Pin 13 |
| Normally Open | Pin 11 |

It will be necessary to consult the Hybrid manufacturer's handbook in order to use this switch to control the divert function of the Hybrid you are using. You may have to devise a simple 'interface' to utilise the divert function.

#### Talkback

Two pins on the Remotes socket are used for this feature, as follows:

| | |
|---|---|
| Ground | Pin 2 |
| Talkback enable | Pin 15 |

To use this feature you must connect a switch between pins 2 and 15. When the switch is closed the telephone caller will hear a reduced programme output mixed with the output of the T/B OUTPUT bus. This bus carries the signal from the inbuilt desk mic plus the T/B MIX bus; the T/B MIX bus carries the pre-fade signals from any of the Mono Input channels whose Talkback enable is also active.

If a 2 pole switch is used, the other contacts may be used to enable the Talkback from a Mono Input Channel.

**Ext Talkback (logic)**

Two pins on the Remotes socket are used for this feature, as follows:

| | |
|---|---|
| Ground | Pin 3 |
| Talkback enable | Pin 14 |

To use this feature you must connect a switch between pins 3 and 14. When the switch is closed and the Telco channel Fader is down a PFL condition is forced (the led in the PFL switch glows to indicate this); The pre-fade signal from the Telco input is therefore placed on the PFL MIX L and R buses. In addition the Caller will hear a reduced programme output mixed with the input to the External Talkback input, see below.

**Ext Talkback (audio)**

This is an electronically balanced input.

Two pins, pins 24 and 25, on the Remotes socket are used for this feature.

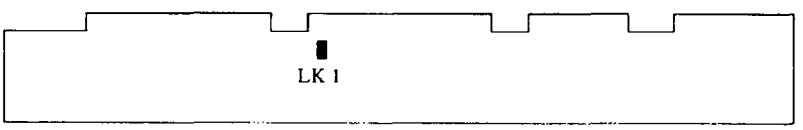
The External Talkback (logic and audio) would normally be connected to a custom-built Producer's Unit. This would contain the switch to control the logic, a mic and preamp to feed the audio input, and facilities for the producer to hear the PFL MIX L & R buses. The PFL signals are available on the MISC socket of the monitor section.

## *Options*

**Aux - Pre-fade or Post-fade**

The factory default for the Auxiliary Output on the Telco channel is pre-fade. This may be altered to post-fade by moving link 1. The location of this link is shown in the following outline diagram of the Telco Channel PCB.

Link Locations on the Telco Input Channel PCB



## Stereo Input Channel

**LINE 1 + REMOTES SOCKET (25-pin D-type female)**

This socket provides for the following facilities:

**Input 1 Left**

This input is electronically balanced. The input pins are as follows:

| | |
|---|---|
| Hot (+ve) | Pin 24 |
| Cold (-ve) | Pin 25 |

**Input 1 Right**

This input is electronically balanced. The input pins are as follows:

| | |
|---|---|
| Hot (+ve) | Pin 22 |
| Cold (-ve) | Pin 23 |

**Input 1 Start Relay**

A relay switch closes between pins 12 & 13.

**Input 2 Start Relay**

A relay switch closes between pins 9 & 8.

**Link for Latching Start**

If Link 6 is present the Start Relays will latch instead of closing momentarily. Link 6 is located as shown in the diagram below.

**Input 1 Stop/Re-cue Relay**

A relay switch closes between pins 11 & 10.

**Input 2 Stop/Re-cue Relay**

A relay switch closes between pins 7 & 6.

**Power Rails**

The following power rails are available as follows:

| | |
|---|---|
| +16V | Pin 20 (supplied via a 10R current-limiting resistor) |
| -16V | Pin 19 (supplied via a 10R current-limiting resistor) |
| 0V audio | Pins 18 and 21 |

## Options

**Aux - Pre-fade or Post-fade**

The factory default for the Auxiliary Output on the Stereo Input channels is pre-fade. This may be altered to post-fade by moving the links (3 and 4) which are located as shown in the diagram below.

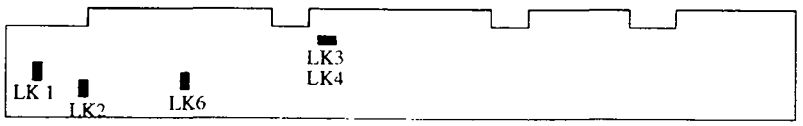
**Links for +10dBV boost on input 2**

If Links 1 and 2 are present the output of the preamps on Input 2 will be boosted by 10dBV. The links are located as shown in the following diagram.

### Link Locations

The following outline diagram of the Stereo Input Channel PCB shows the location of the user-changeable links.

Link Locations on the Stereo Input Channel PCB



## Master Section

**Power Socket**

The connections are as follows:

| | |
|---|---|
| Pin 1 | +17V |
| Pin 2 | -17V |
| Pin 3 | +48V |
| Pins 4, 5 and 6 | tied together and to all grounds |

**REMOTES SOCKET (9-pin D-type male)**

This socket provides for the following facilities:

**Local Mute Relay**

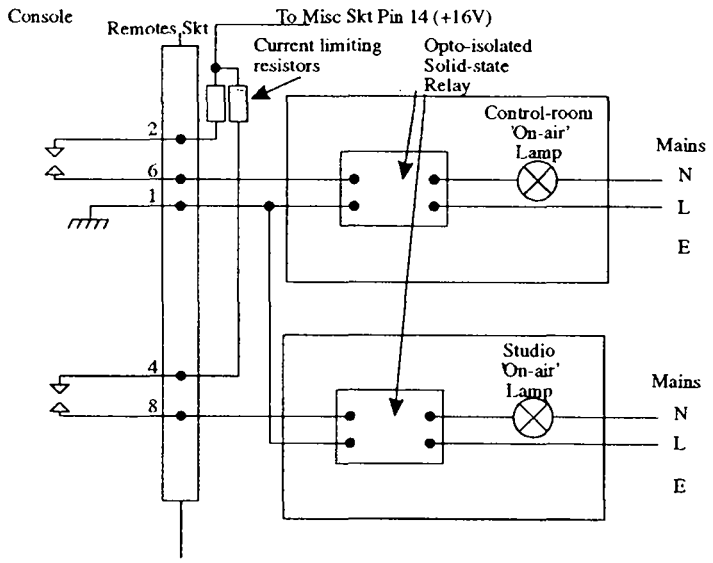
A 2-pole relay switch closes between pins 2 & 6, and pins 3 & 7. This relay could be used to control an 'On-Air' lamp in the Control-Room.

**Distant Mute Relay**

A 2-pole relay switch closes between pins 4 & 8, and pins 5 & 9. This relay could be used to control an 'On-Air' lamp in the Studio.

Pin 1 is a Ground connection.

The following diagram shows one possible method of using these relay switches to control an 'On-Air' lamp. It is vital that mains voltages are NOT connected to any of the connectors on the console.




## Monitors Section

**Talkback 1 and 2**

The TB I/P 1 and 2 inputs are via ¼" 3-pole jack sockets. The connections are:

| | |
|---|---|
| Sleeve | Gnd |
| Ring | Logic control (this is shorted to ground via a switch to activate the Talkback circuit) |
| Tip | An unbalanced audio input |

**Continuous TB O/P**

The connections are

| | |
|---|---|
| Tip | Signal |
| Ring + Sleeve | Ground |

**External Inputs Socket (15-pin D-type male)**

The following **balanced** inputs are provided for:

| | |
|---|---|
| External Input 1 Left+ | Pin 2 |
| External Input 1 Left- | Pin 9 |
| External Input 1 Right+ | Pin 3 |
| External Input 1 Right- | Pin 10 |
| External Input 2 Left+ | Pin 4 |
| External Input 2 Left- | Pin 11 |
| External Input 2 Right+ | Pin 5 |
| External Input 2 Right- | Pin 12 |

The screen for all of these balanced inputs is pin 1.

The following **unbalanced** inputs are provided for:

| | |
|---|---|
| External Input 3 Left | Pin 7 |
| External Input 3 Right | Pin 8 |
| External Input 4 Left | Pin 14 |
| External Input 4 Right | Pin 15 |

The 0V for all of these unbalanced inputs is pins 6 and 13.

**Misc Socket (15-pin D-type female)**

The following table gives the function of each pin in the MISC socket.

| | |
|---|---|
| Pin 1 | Chassis Ground |
| Pin 2 | V- (-16V audio) |
| Pin 3 | V+ (+16V audio) |
| Pin 4 | Ref Ground |
| Pin 5 | MFML (Meter Follows Monitor-Left) |
| Pin 6 | MFMR (Meter Follows Monitor-Right) |
| Pin 7 | PFL Line Left |
| Pin 8 | PFL Line Right |
| Pin 9 | Stereo Left (this is provided from the same source as the Stereo Output Socket) |
| Pin 10 | Stereo Right (this is provided from the same source as the Stereo Output Socket) |
| Pin 11 | Local Mute (logic level signal, 0=local mute is active) |
| Pin 12 | Talkback Output (a direct connection to T/B OUTPUT bus) |
| Pin 13 | PFL Enable (logic level signal, 0=PFL is active) |
| Pin 14 | +16V (Logic) |
| Pin 15 | 0V (Logic) |

These signals are provided because they may be useful if you wanted to provide additional facilities on your console, e.g a Producer's Unit or external meters.

# Appendices

*Glossary*

*System Block Diagram*

*Dimensions*

*Warranty*

# Glossary

**Attenuation** — The reduction of a signal level. The attenuation is usually measured in dB.

**Balance** — The relative levels of the left and right channels of a stereo signal.

**Clipping** — The onset of severe distortion in the signal path, usually caused by the peak signal voltage being limited by the circuit's power supply voltage.

**CMRR** — **C**ommon **M**ode **R**ejection **R**atio. It 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 wanted signal.

**dB (decibel)** — A ratio of two voltages or signal levels, expressed by the equation

$dB=20LOG_{10}(V_1/V_2)$.

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** — **E**quivalent **I**nput **N**oise. 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 (Equaliser)** — A device which allows the cutting or boosting of selected bands of frequencies in the signal path.

**Gain** — The degree of amplification, or attenuation applied to a signal.

**Hybrid** — A device which allows a telephone line to be connected to a broadcast desk in such a way that the caller may hear the programme output without the caller's voice being re-introduced onto the phone line which would cause unwanted feedback.

**LED** — **L**ight **E**mitting **D**iode.

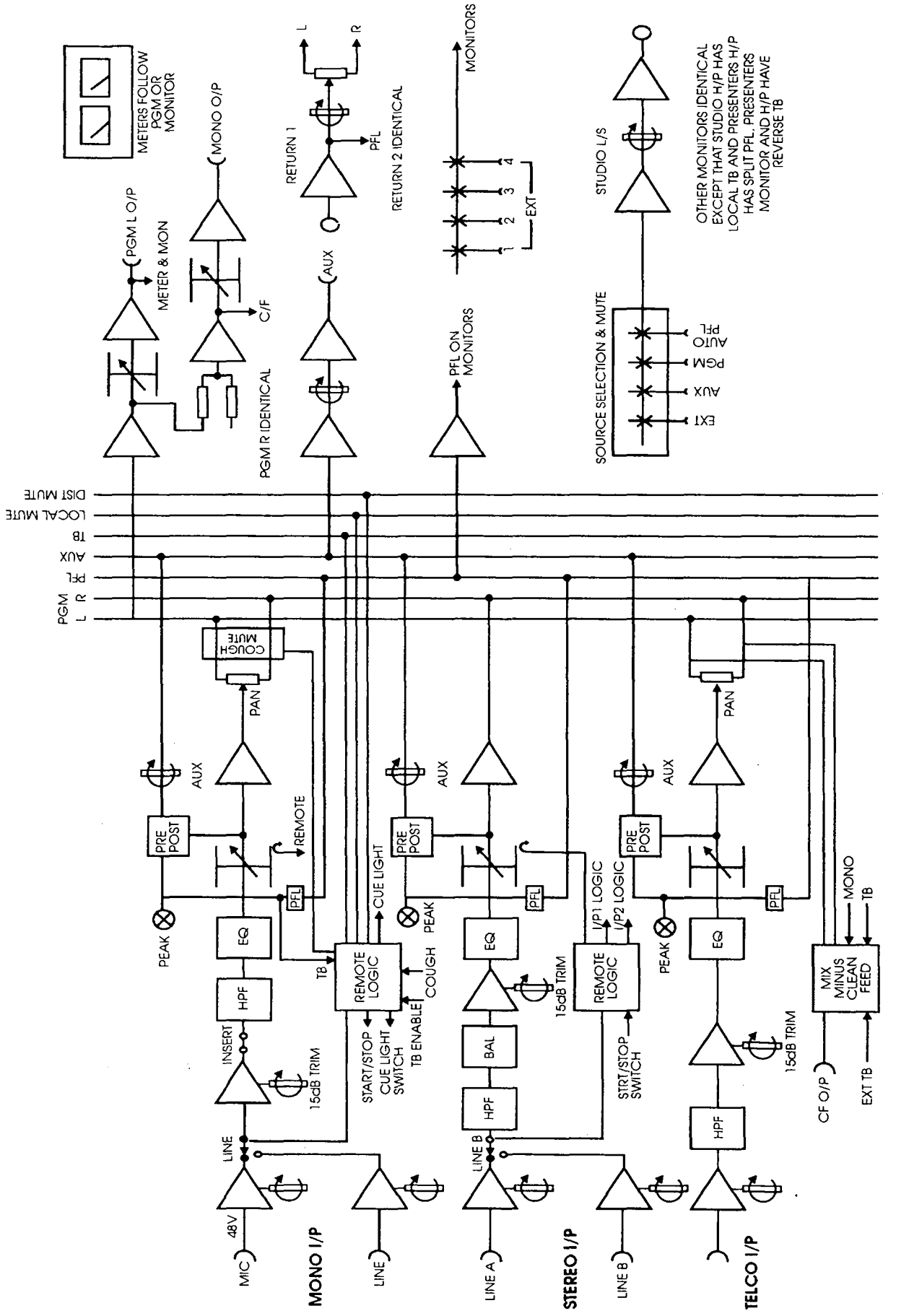
**PAN** — An abbreviation of 'panorama': it controls the levels sent to left and right outputs.

**PFL (pre-fade listen)** — A function which allows the operator to monitor the pre-fade signal independently of the programme mix.

**TELCO** — **TEL**ephone **CO**mmunication.

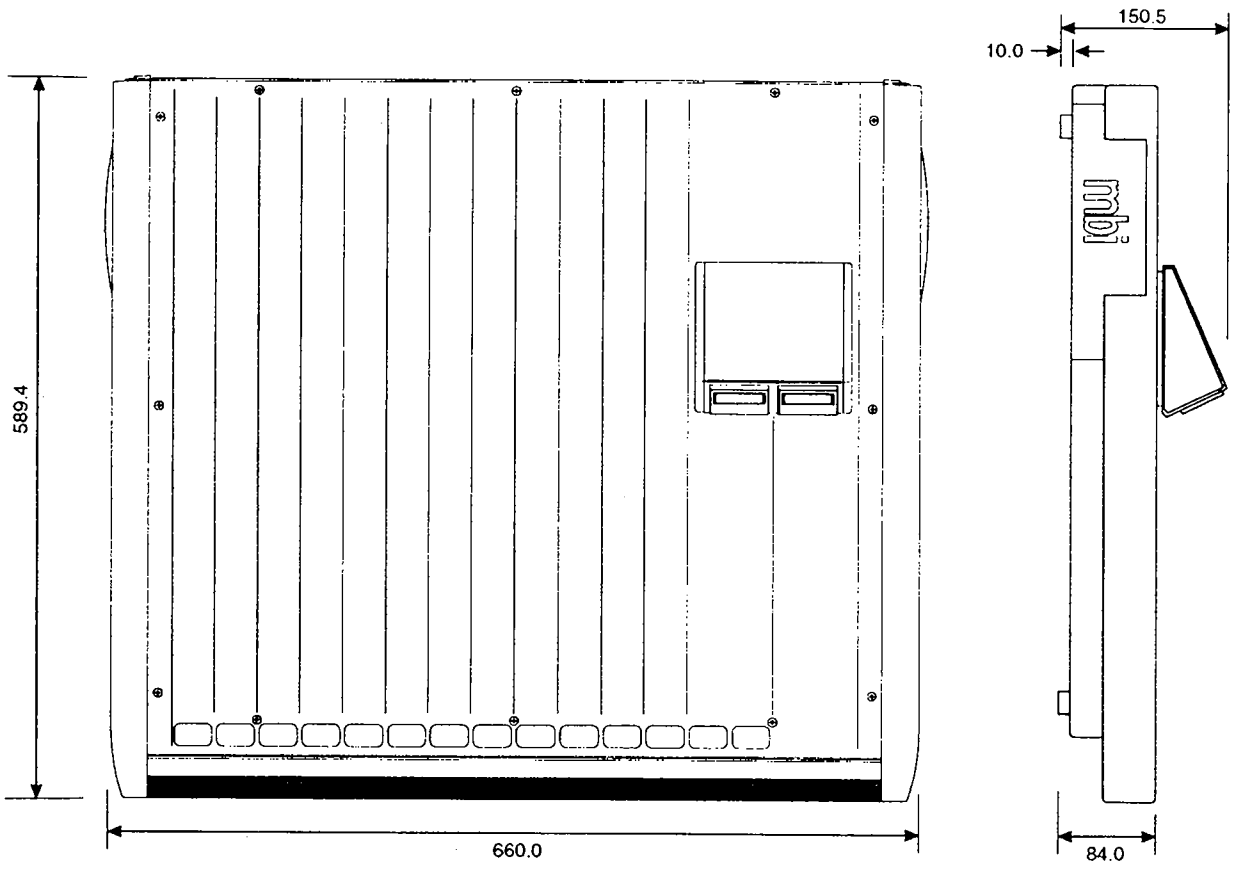
**THD** — **T**otal **H**armonic **D**istortion.

# System Block Diagram



# Dimensions

All dimensions are in millimetres.



# Warranty

1 **Soundcraft** means Soundcraft Electronics Ltd.

**End User** means the person who first puts the equipment into regular operation.

**Dealer** means the person other than Soundcraft (if any) from whom the End User purchased the Equipment, provided such a person is authorised for this purpose by Soundcraft or its accredited Distributor.

**Equipment** means the equipment supplied with this manual.

2 If within the period of twelve months from the date of delivery of the Equipment to the End User it shall prove defective by reason only of faulty materials and/or workmanship to such an extent that the effectiveness and/or usability thereof is materially affected the Equipment or the defective component should be returned to the Dealer or to Soundcraft and subject to the following conditions the Dealer or Soundcraft will repair or replace the defective components. Any components replaced will become the property of Soundcraft.

3 Any Equipment or component returned will be at the risk of the End User whilst in transit (both to and from the Dealer or Soundcraft) and postage must be prepaid.

4 This warranty shall only be available if:

a) the Equipment has been properly installed in accordance with instructions contained in Soundcraft's manual; and

b) the End User has notified Soundcraft or the Dealer within 14 days of the defect appearing; and

c) no persons other than authorised representatives of Soundcraft or the Dealer have effected any replacement of parts maintenance adjustments or repairs to the Equipment; and

d) the End User has used the Equipment only for such purposes as Soundcraft recommends, with only such operating supplies as meet Soundcraft's specifications and otherwise in all respects in accordance Soundcraft's recommendations.

5 Defects arising as a result of the following are not covered by this Warranty: faulty or negligent handling, chemical or electro-chemical or electrical influences, accidental damage, Acts of God, neglect, deficiency in electrical power, air-conditioning or humidity control.

6. The benefit of this Warranty may not be assigned by the End User.

7. End Users who are consumers should note their rights under this Warranty are in addition to and do not affect any other rights to which they may be entitled against the seller of the Equipment.