CREST AUDIO

X-Monitor
Mixing Console

SERIES

# Owner's Manual

# Specifications



| | |
|---|---|
| **frequency response** | +0/-1dB **20Hz–20kHz ref 1kHz**—any input to any output |
| **THD** | any output <.01% THD **20Hz–20kHz @ +15dBu out** |
| **noise** | mic ein better-than -128dBu **20Hz–20kHz**—150ohm source, 60dB gain |
| **crosstalk** | channel mute >80dB channel routing >80dB<br>channel fader attenuation >90dB aux send attenuation >75dB |
| **phase shift** | < +/- 30 degrees, **20Hz–20kHz**—mic-in to main-out |
| **inputs** | mic-in XLR 4k ohm balanced—max voltage gain to group balanced out = 98dB<br>line-in TRS >10k ohms balanced |
| **outputs** | left/right/mono—group, aux, matrix—monitor-out **all 100 ohms balanced**<br>headphones to drive > eight-ohms |
| **insert** | send 50 ohms ground-compensated on TRS jack<br>return >10k ohms balanced on TRS jack |
| **nominal output level** | +4dBu max level **+26dBu balanced** into >1k ohms |
| **input channel eq** | high freq +/- 15dB shelf at **12kHz**<br>hi-mid freq +/- 15dB bell freq range **400Hz–8kHz**, Q=1.5<br>low-mid freq +/- 15dB bell freq range **80Hz–2kHz**, Q=1.5<br>low freq +/- 15dB bell-boost/shelf-cut freq center **80Hz**, Q=.7 on boost<br>high-pass filter -12dB/octave freq range **20Hz–400Hz**<br>separate on-switches for eq and high-pass filter |
| **output features** | five-band eq on all main outputs high-pass filter:-12dB/octave freq range **20Hz–400Hz**<br>separate on-switches for eq and high-pass filter |
| **channel metering** | five-segment LED ladder with VU-type response—displays pre-fader signal level<br>top red-LED warns of impending overload anywhere within the channel |
| **master metering** | fourteen mechanical VU-type meters with LED illumination<br>twelve-meters showing group-out<br>two dedicated solo-meters |
| **signal generator** | pink-noise generator can feed the talk-back section |
| **construction** | chassis is powder-coated **14-gauge galvanized steel** with internal-bracing<br>modules are powder-coated **18-gauge galvanized steel** with baked-epoxy screening |
| **dimensions and weights** | see dimension-drawing |
| **warranty** | five-years |

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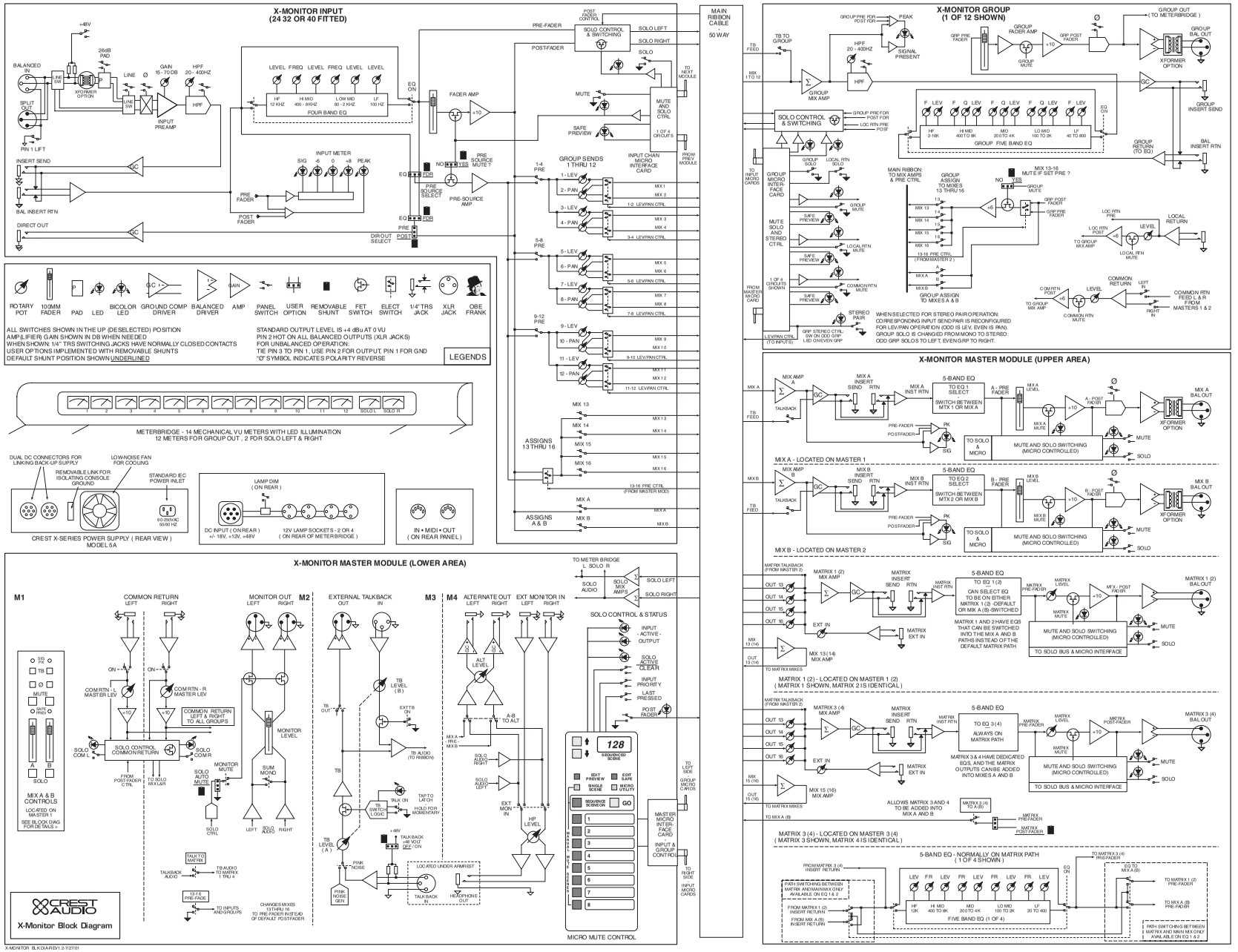



X-MONITOR BLKDIA REV1.2-7/27/01

# How to use this manual

## Format

This manual uses a format that is intended to be easy to read, yet technical for those who need to know all the details. For feature descriptions, this is done by devoting the left side of each page to 1) an overall module picture, 2) a block diagram, and 3) a control closeup. These images all pertain to the features and control descriptions on the right side of the page. Also, for certain features like the microprocessor system and the solo system that appear over and over again, references are made to sections devoted to these features.

The intention is to make the manual easy to read while including all the technical details needed for getting the most out of the X-Monitor console, a flexible and feature-rich addition to Crest Audio's growing line of audio mixing console products.

## Conventions

### Control Icons

This manual uses little pictures, or icons to illustrate what the control descriptions are referring to. This makes it possible to avoid redundant wording and makes the control descriptions clear.

Switch in the UP, non-activated position


Switch in DOWN, activated position

Switch that illuminates when in the DOWN position

Momentary switch that illuminates when activated

Illuminated LED, indicating that its associated feature is activated

Potentiometer

Standard 1/4" TRS jack (used for line level inputs and insert sends)

1/4" TRS jack with normal switching (used on insert returns)

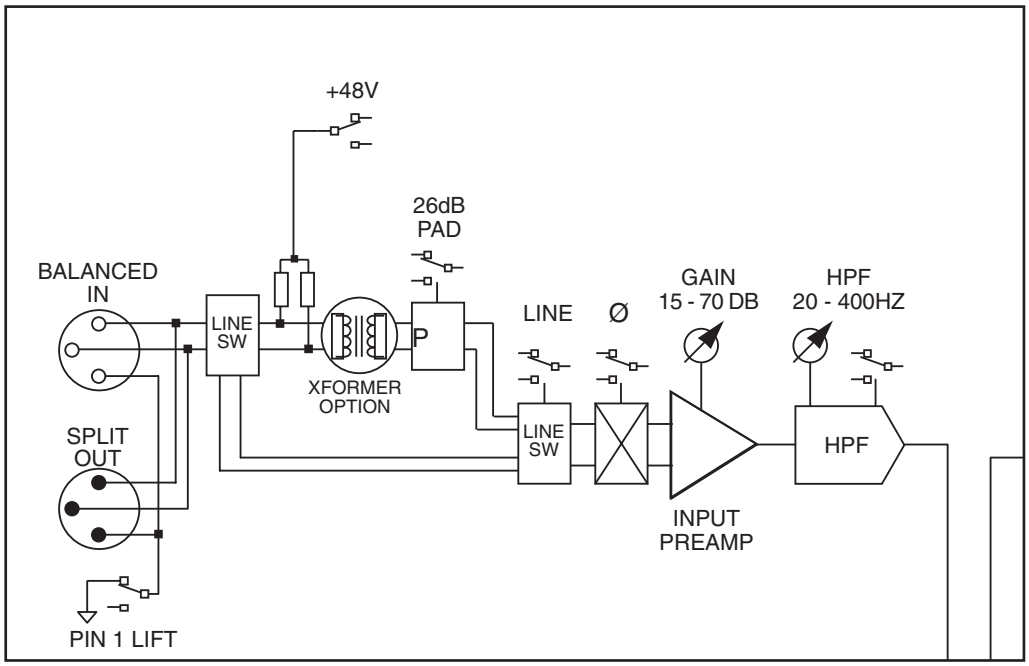
Female XLR input jack

Male XLR output jack

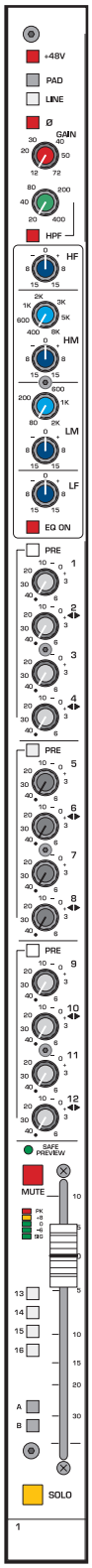
# ❶ Mono input module



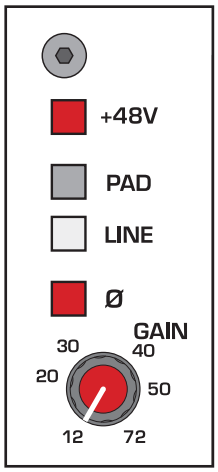
## Block diagram




## Input Module




## Controls



## Features

**Phantom power +48V**

48 volts DC is applied to pins 2 and 3 on the mic-input XLR connector. This option is used with condenser microphones and active direct boxes that require an external DC voltage (phantom power) in order to operate.

The 48V switch should not be engaged when using standard (dynamic) microphones, or other sources that do not use phantom power.

**Pad**

The mic-input signal is attenuated by 28dB to prevent some signals (e.g. kick drum or lead vocal) from overloading the preamp stage. The pad is used to bring a hot mic-input signal down to a controllable level. The pad is not functional when the LINE switch is depressed.

**Line**

The input preamp circuit is set up to accept a mic-level signal. This signal is brought in via the XLR mic-input connector located on the rear panel. The 1/4" TRS input jack is disabled.

The input preamp circuit is set up to accept a line-level signal from either the XLR mic-input connector or the 1/4" TRS input jack, both located on the rear panel. When a plug is inserted into the 1/4" TRS input jack, the XLR mic-input connector is disabled.

If the 48V phantom power switch is engaged, depressing this Line switch disconnects phantom power from the mic input XLR.

**Polarity reverse—ø**

This feature is used for correcting or minimizing polarity and phase related errors. For example, occasionally a balanced input connection is reverse-wired before it gets to the mixing console. This can happen in microphones, or in snake line interfaces. By using the polarity reverse feature, this type of error can be corrected.

- Normal polarity
- Polarity inverted

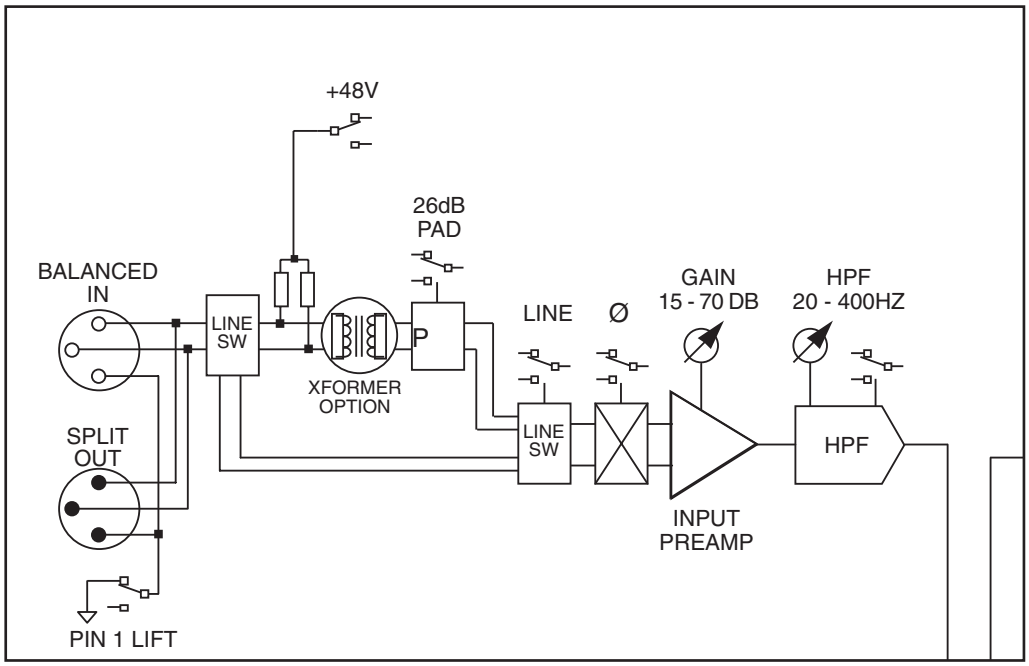
When similar signals from different channels are combined, phase cancellations can occur.

Reversing the polarity of an input signal often corrects such phasing errors.

# ❶ Mono input module



## Block diagram

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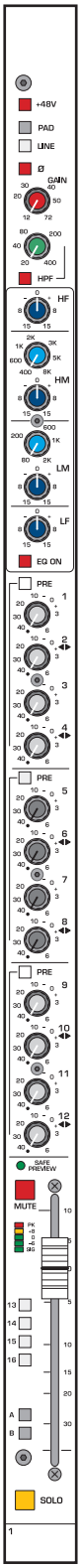


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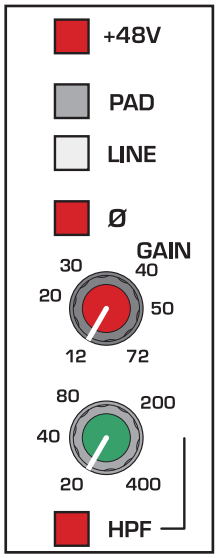


## Features

### Gain

The Input gain control range is closely related to the status of the PAD switch and the LINE switch. In order to establish proper gain structure in the console, input gain settings must be set correctly.

If the channel peak LED is illuminated, first try lowering the input gain control.
Only when this method is unsuccessful should the pad switch be engaged.

**LINE—switch-up** **PAD—switch-up**
12 to 72dB of gain can be added the mic-input signal.
The impedance at the input XLR is 4kΩ.

**LINE—switch-up** **PAD—switch-down**
-16 to 44dB of gain can be added to the mic-input signal.
The impedance at the input XLR is 4kΩ.

**LINE—switch-down** **PAD—switch-up or -down**
-10 to 45dB of gain can be added the line-input signal.
The impedance at the input XLR and input 1/4" TRS is 20kΩ.

### High-pass filter—HPF

Proper use of the high-pass filter reduces or eliminates unwanted low frequencies without substantially affecting the program material. Quite often such unwanted low frequencies are included with in-coming mic- or line-input signals. For example, stage rumble or wind can be picked up through vocal mics. The slope of the high-pass filter is -12dB per octave.

#### HPF

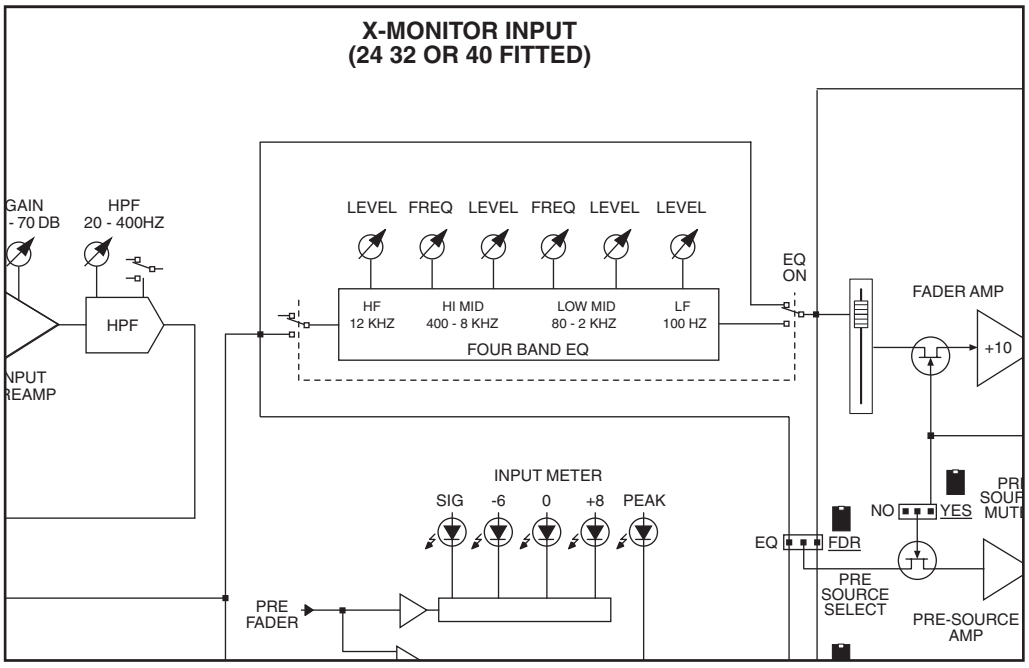
High-pass filter is on.

#### HPF—variable control

When the high-pass filter is on, this control selects a frequency between 20Hz and 400Hz as the point where attenuation begins.

# 1 Mono input module

## Block diagram

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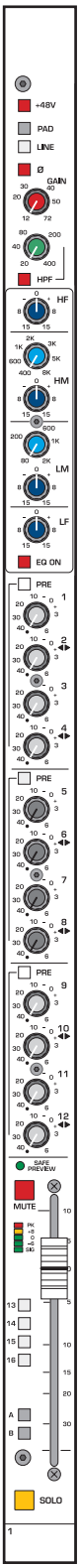


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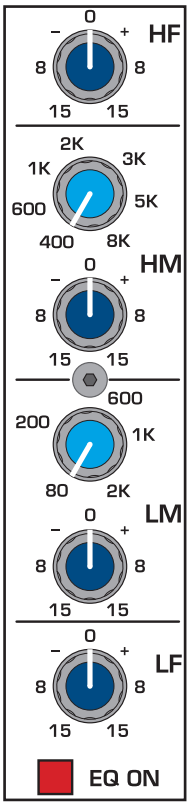


## Input EQ features

Many audio signals coming into the console require some degree of corrective eq in order to be part of a good sounding mix. The X-Monitor Input EQ allows the user to tailor the incoming sound.

The input EQ consists of four bands: high, high-mid, low-mid, and low. The high band is shelving, the low band offers shelving cut with a bell boost. The two mid-bands are bell shaped with a Q of 2 and a generous overlap of adjacent operating frequencies. An independent, variable high pass filter provides additional problem-solving flexibility.

**High frequency—HF**

**Boost / Cut** 15dB boost and cut at 12 kHz. Shelving eq.

**High mid—HM**

**Boost / Cut** 15dB boost and cut with a Q of 2.

**Frequency** Continuously sweepable between 400 Hz and 8 kHz.

**Low mid—LM**

**Boost / Cut** 15dB boost and cut with a Q of 2.

**Frequency** Continuously sweepable between 100 Hz and 2 kHz.

**Low frequency—LF**

**Boost / Cut** 15dB boost and cut at 100 Hz. Bell boost / Shelving cut.

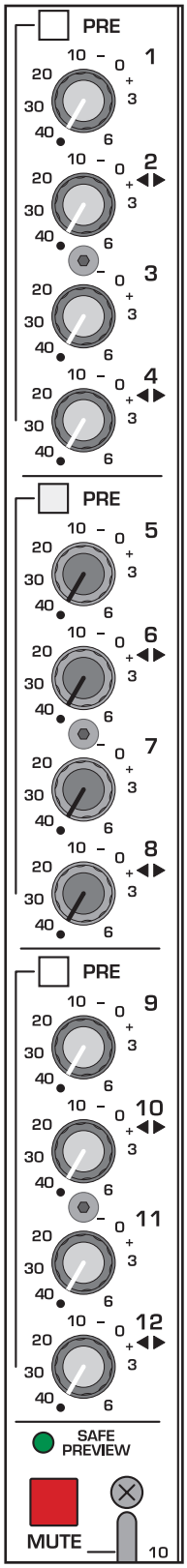
**Eq on**

Equalizer is on. This switch is used to activate the EQ section and can be used to make A/B comparisons between "flat" and eq'd signals.

# 1 Mono input module



## Controls

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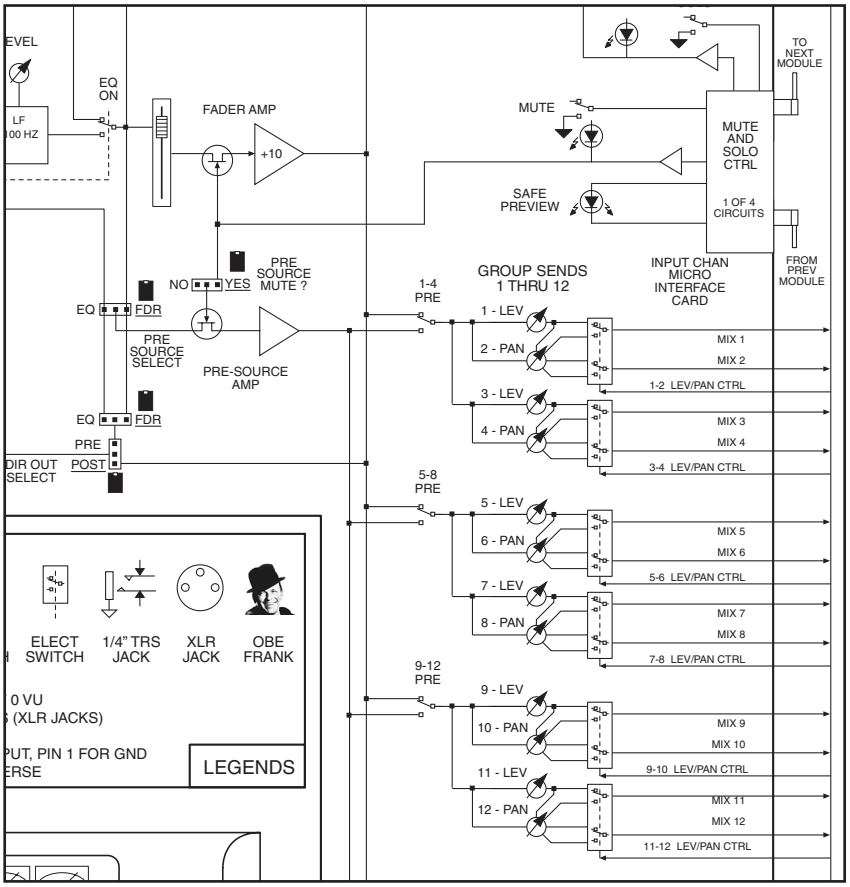


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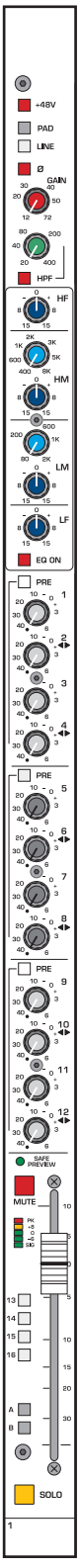


## Mix send features

The X-Monitor input strip has twelve Mix sends. Pre/Post fader switching is done in three groups of four, 1 through 4, 5 through 8, and 9 through 12. These Mix sends are routed to their corresponding outputs for creating up to twelve individual mono monitor mixes. They can also be configured as stereo pairs, creating up to six stereo mixes. When configured for stereo operation, the odd numbered pot becomes the stereo level control and the even numbered pot becomes the pan control. Stereo configuration is done in stereo pairs (1&2, 3&4, 5&6...) and is selected in the Group output section (see Group output section for more information.

**Mix Sends 1-4, 5-8, 9-12**

These knobs adjust the amount of signal sent to the twelve outputs. Unity gain occurs at the the zero (1 - 2 o'clock) setting.

In mono mode, each control independently determines the send level for the respective mix. When stereo mode is selected, the top (odd numbered) control sets signal level while the bottom (even numbered) control pans the signal between odd and even group buses (odd = left, even = right).

With a FOH Console, it's typical to make Aux sends Post-fader for driving effects, and Pre-fader when used for monitors. With a Stage Monitor Console such as the X-Monitor, all Mix Sends are normally set for Post-Fader; the Engineer uses the Channel fader to control the level to all mixes.

**Mix PRE switches 1-4, 5-8, 9-12**

The PRE switches determine the source for the three groups of four MIX sends. The signal that these switches use for the PRE setting can be further defined by changing the position of a couple of internal jumpers. See **INTERNAL JUMPER OPTIONS.**

MIX SENDS are post-insert, post-eq, post-mute, post-fader
MIX SENDS are post-insert, post-eq, post-mute, pre-fader

**Safe preview**

Safe Preview LED
See LOCAL MICROPROCESSOR CONTROL section

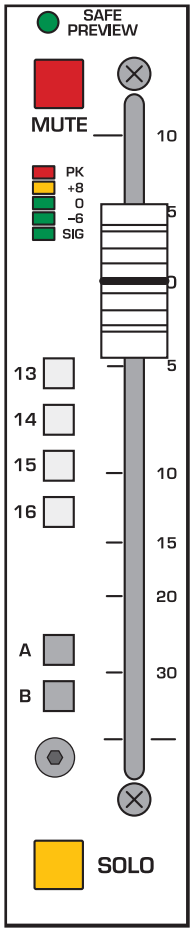
**Mute**

Mute switch
See LOCAL MICROPROCESSOR CONTROL section

# 1 Mono input module



## Controls

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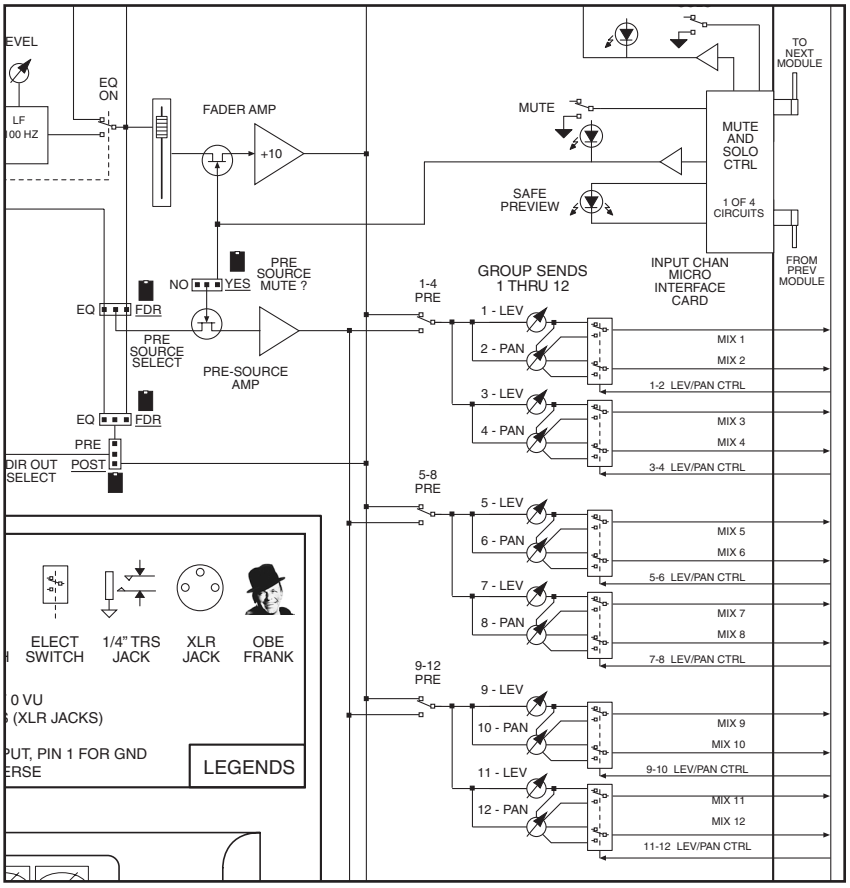
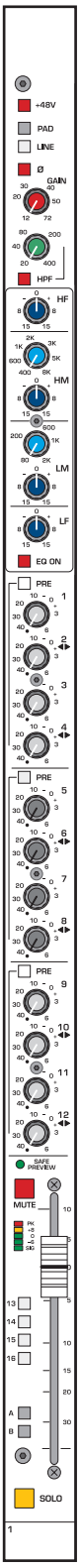



## Input Module



## Level meter features

**Level meter**

Each input includes a five-segment LED meter for visually monitoring signal levels. This is essential for setting up and maintaining proper gain structure.

**Peak indicator—PK**

The input signal is monitored at several points throughout the channel. These points are the mic preamp, the EQ stage and the fader stage. Overload at any of these stages will cause the red peak-LED to light.
The channel gain should reduced if this occurs.

**Signal level LEDs**

These three LEDs light up at +8—yellow, 0—green, and -6 dB—green. This level range -6 to +8 is the optimum operating range. Compressed or relatively constant signals should remain close to 0.

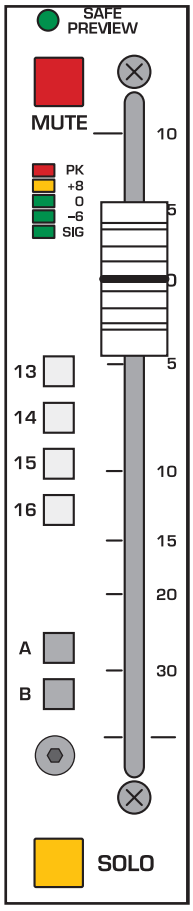
**Signal present indicator—SIG**

This green-LED varies in brightness in response to signal levels between -40 dB and -6 dB.

# 1 Mono input module



## Controls

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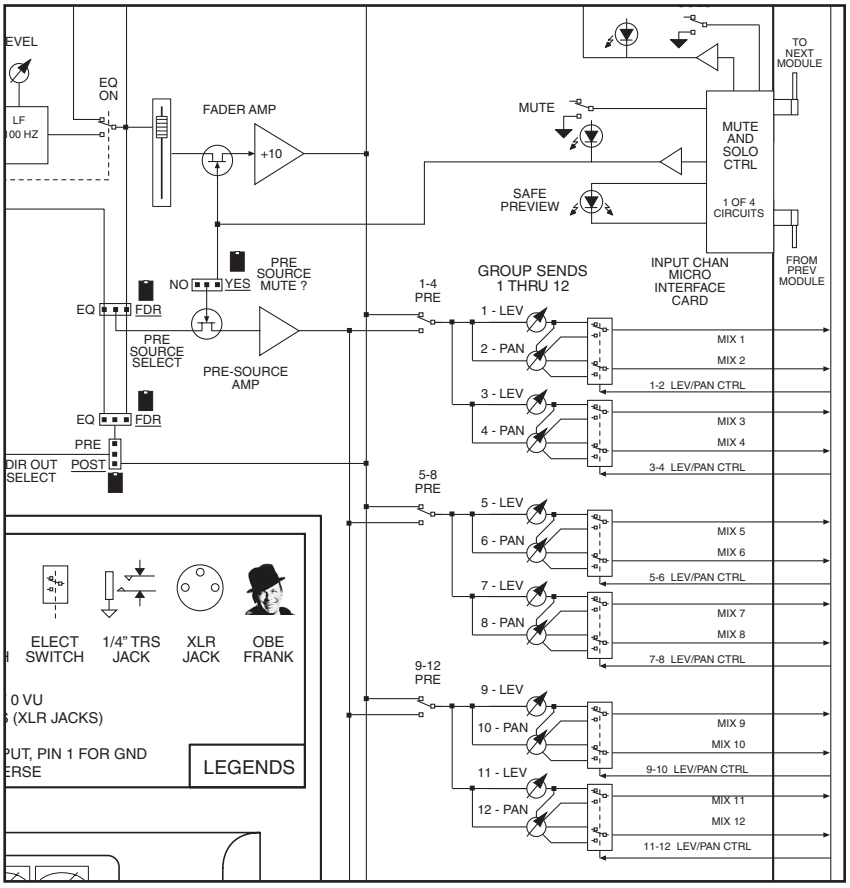


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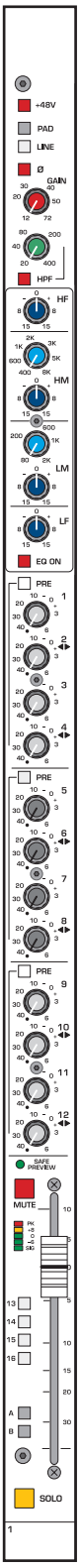


## Bus assignment features

In addition to providing full variable send capabilities in the Mix section, the X-Monitor also offers audio grouping facilities for sending input signals to the output matrix section, and directly to the A and B output masters for creating additional mixes. All assignments are normally derived Post-fader(post-eq and post-mute).

**Bus assignments 13, 14, 15 & 16**

The input signal is assigned to Buses 13 thru 16 which feed Matrix 1 - 4, located above the master control section. The feed to Buses 13-16 is normally Post-fader. All Bus 13-16 sends (from Inputs and Groups) can be globally switched to Pre-fader by using the 13-16 PRE switch, located in the Master section.

**A Bus assignment**

The Input signal is assigned to the main A output bus. This feed is always Post-fader.

**B Bus assignment**

The Input signal is assigned to the main B output bus. This feed is always Post-fader.

**Input fader**

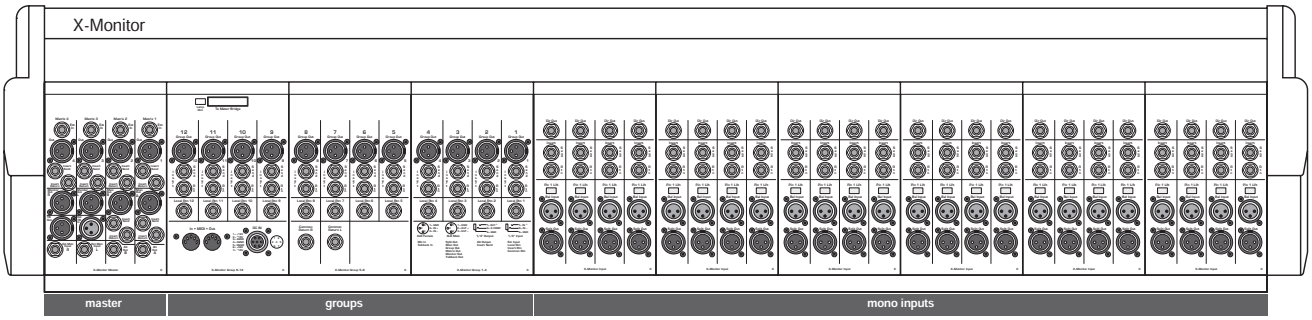
The 100mm channel fader is the primary level control for all Post-fader signals being sent to any of the console's mix buses. The fader offers greater than 90dB of attenuation and up to 10dB of boost . Normal operation is between -10 and 0.

**Solo switch**

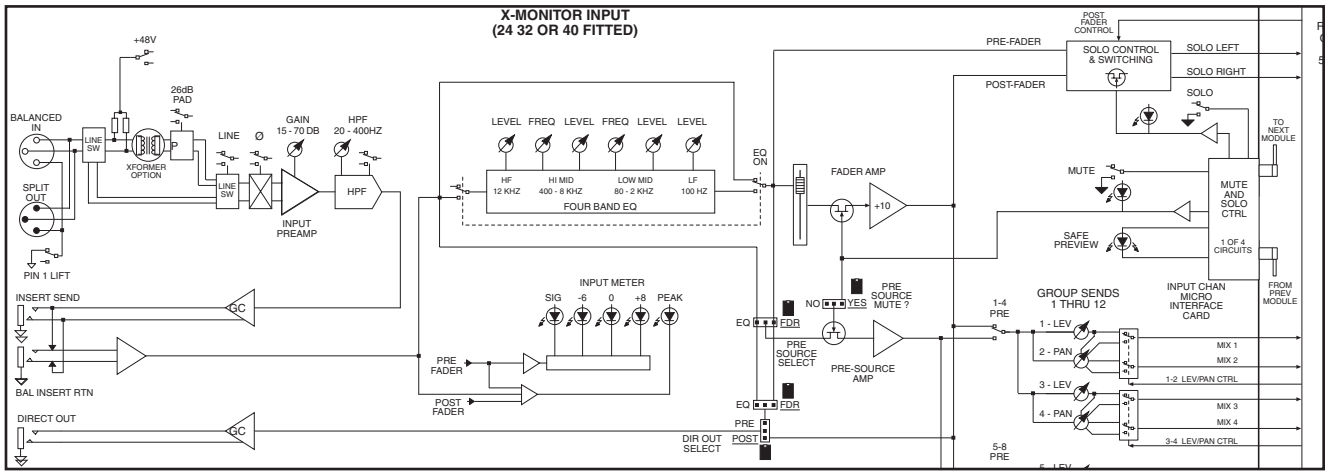
Pressing this momentary switch will include (illuminate) or exclude (not-illuminated) the channel from the consoles solo system. See Master Control Section for information on Solo options.

# 1 Mono input module

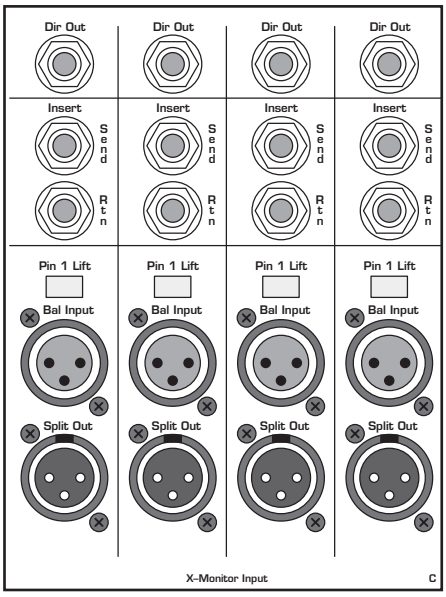
## X-Monitor rear-view (28 channel, 40 position frame shown)



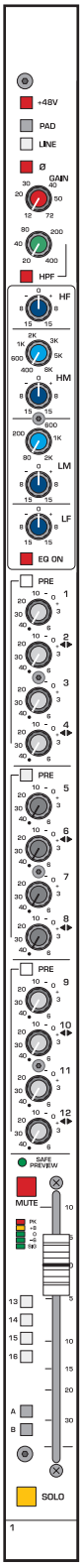

## Block diagram




## Rear Connector Panel

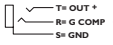



## Input Module



## Rear panel features

**Direct out 1/4" TRS jack**

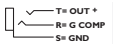


The input channel's signal is available at this output jack. The D.O. signal is derived Post-fader (post-eq and post-mute). This output jack is ground-compensated.

**Insert points**

Separate 1/4" TRS jacks provide the facilities for inserting an external signal processor into the signal path of the input channel.

**Insert send**



This jack serves as an output for connection to the input of a signal processor. The signal is derived after the mic preamp and HPF but before the eq section. Plugging a 1/4" TRS plug into this jack does not break the signal flow of the channel. This output jack is ground-compensated.

**Insert return**

The output of a signal processor is fed to this jack. It can accept a balanced or unbalanced signal and is located pre-eq. Plugging a 1/4" TRS plug into this jack breaks the normal signal flow of the channel.

**Passive splitter features**

The input of the X-Monitor includes a simple passive splitter for running input signals parallel to another desk, typically a front-of-house console. In most cases this can eliminate the need for a separate splitter box.

**Pin 1 lift**


When this button is depressed, the XLR Mic-In and Splitter-Out Pin-1 connection is isolated from the chassis ground of the console. The Pin-1 connection is maintained between the two jacks, but is isolated from the mixer ground.
NOTE: When the Pin-1 Lift switch is depressed, the phantom power (+48V) from the X-Monitor won't function for that XLR input. Phantom power needs the Pin-1 ground connection for the return path for the +48 volts.

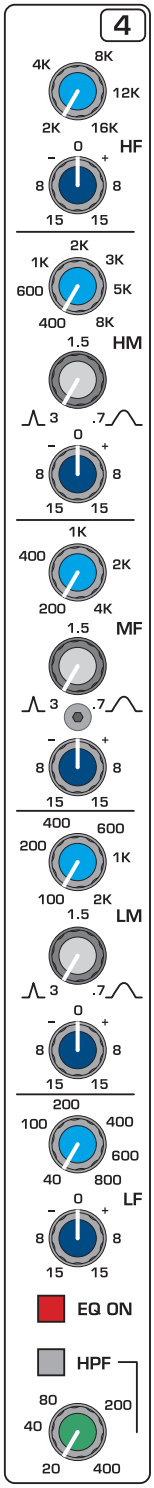
**Balanced Input XLR connector—Bal In**

This balanced female XLR (Pin 2 Hot) accepts a low-impedance microphone signal, or a line-level signal, depending on position of the LINE switch on the front panel.

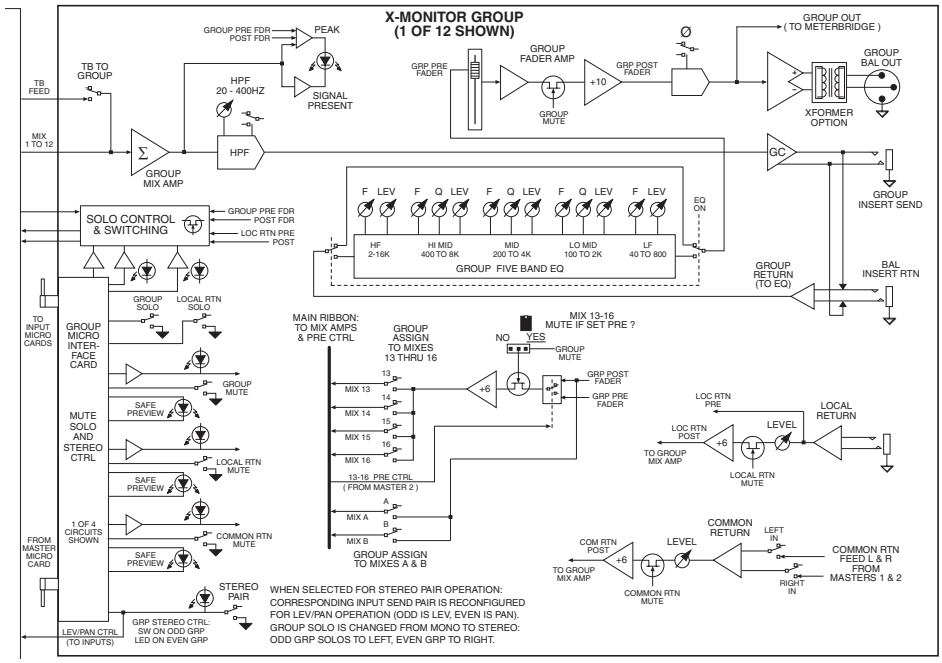
**Splitter Out**

This male XLR allows the channel input to be patched to another piece of audio equipment, such as a front-of-house console. It is simply a parallel connection of whatever is plugged into the Input XLR.
NOTE: All pins (1,2,3) are wired in parallel with the corresponding pins of the female XLR. The Pin-1 Lift does NOT disconnect any of these parallel connections.

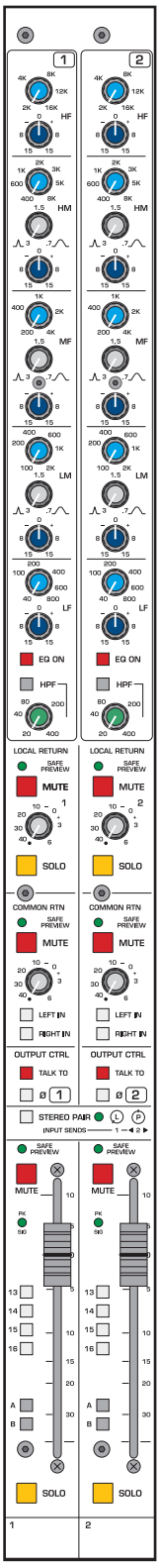
## Controls




## Block diagram




## Group Module Pair



## Output EQ features

The five-band output EQ consists of two semi-parametric bands and three full parametric bands. The High and Low bands are shelving eq with frequency select and boost/cut controls. The three mid bands, High mid, Mid, and Low mid are full parametric with frequency, bandwidth, and boost / cut controls. All bands offer a generous overlap of adjacent operating frequencies.

**High frequency—HF**

**Frequency** Continuously sweepable between 2 kHz and 16 kHz.

**Boost / Cut** 15dB boost and cut. Shelving eq.

**High mid—HM**

**Frequency** Continuously sweepable between 400 Hz and 8 kHz.

**Q (Bandwidth)** Continuously variable between 3 and .7

**Boost / Cut** 15dB boost and cut.

**Mid frequencies—MF**

**Frequency** Continuously sweepable between 200 Hz and 4 kHz.

**Q (Bandwidth)** Continuously variable between 3 and .7

**Boost / Cut** 15dB boost and cut.

**Low mid—LM**

**Frequency** Continuously sweepable between 100 Hz and 2 kHz.

**Q (Bandwidth)** Continuously variable between 3 and .7.

**Boost / Cut** 15dB boost and cut.

**Low frequency—LF**

**Frequency** Continuously sweepable between 40 Hz and 800 Hz.

**Boost / Cut** 15dB boost and cut. Shelving eq.

**Eq on**

Equalizer is on. This switch is used to activate the EQ section and can be used to make A/B comparisons between "flat" and eq'd signals.

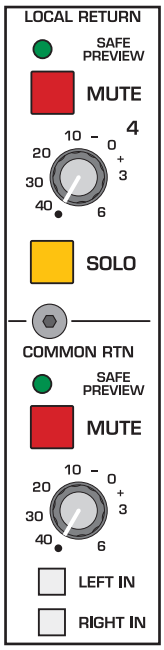
**HPF**

High pass filter is on. The high pass filter cuts low frequencies to eliminate rumble and feedback with minimal effect on program material.

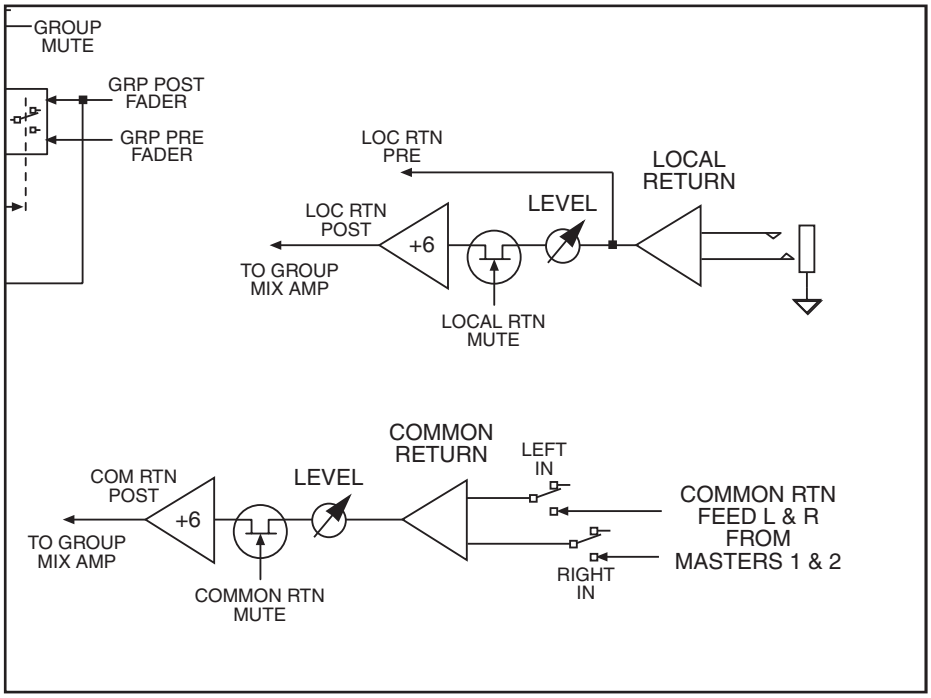
**HPF Frequency**

Continuously variable between 20 Hz and 400 Hz. The high pass filter has a slope of -12 dB per octave.

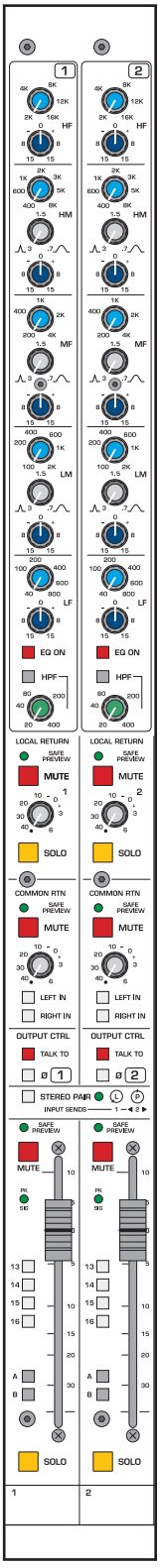
### Controls




### Block diagram




### Group Module Pair



## Output features

**Local Return**

Each Output group has its own local return. This external input appears as a 1/4" TRS balanced line level input connector on the module rear panel.

**Safe preview**

Safe Preview LED
See LOCAL MICROPROCESSOR CONTROL section

**Mute**

Mute switch
See LOCAL MICROPROCESSOR CONTROL section

**Local return level**

Controls the level of the local return signal into the group.

**Solo switch**

Pressing this momentary switch will include (illuminate) or exclude (not-illuminated) the local return from the consoles solo system. See Master Control Section for information on Solo options.

**Common Return**

The X-Monitor has a pair of 1/4" TRS balanced line level input connectors on the module rear panel. Any signals patched into these jacks are available to all of the output groups.

**Safe preview**

Safe Preview LED
See LOCAL MICROPROCESSOR CONTROL section

**Mute**

Mute switch
See LOCAL MICROPROCESSOR CONTROL section

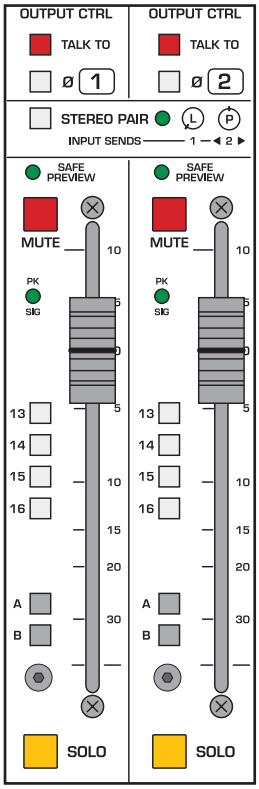
**Common return level**

Controls the level of the Common return into the group.

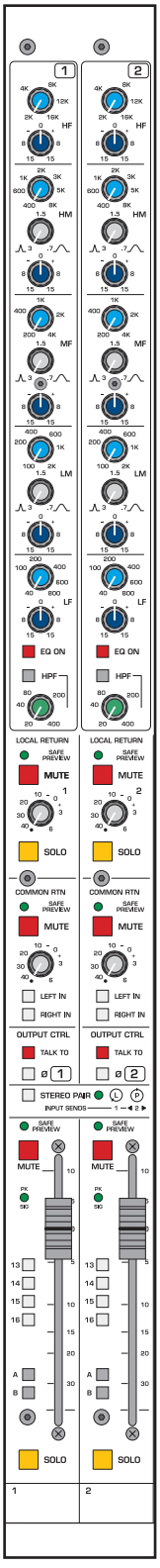
**Left in / Right in assignment buttons**

These buttons are used to assign the Left, Right or both of the Common return signals to the output group.

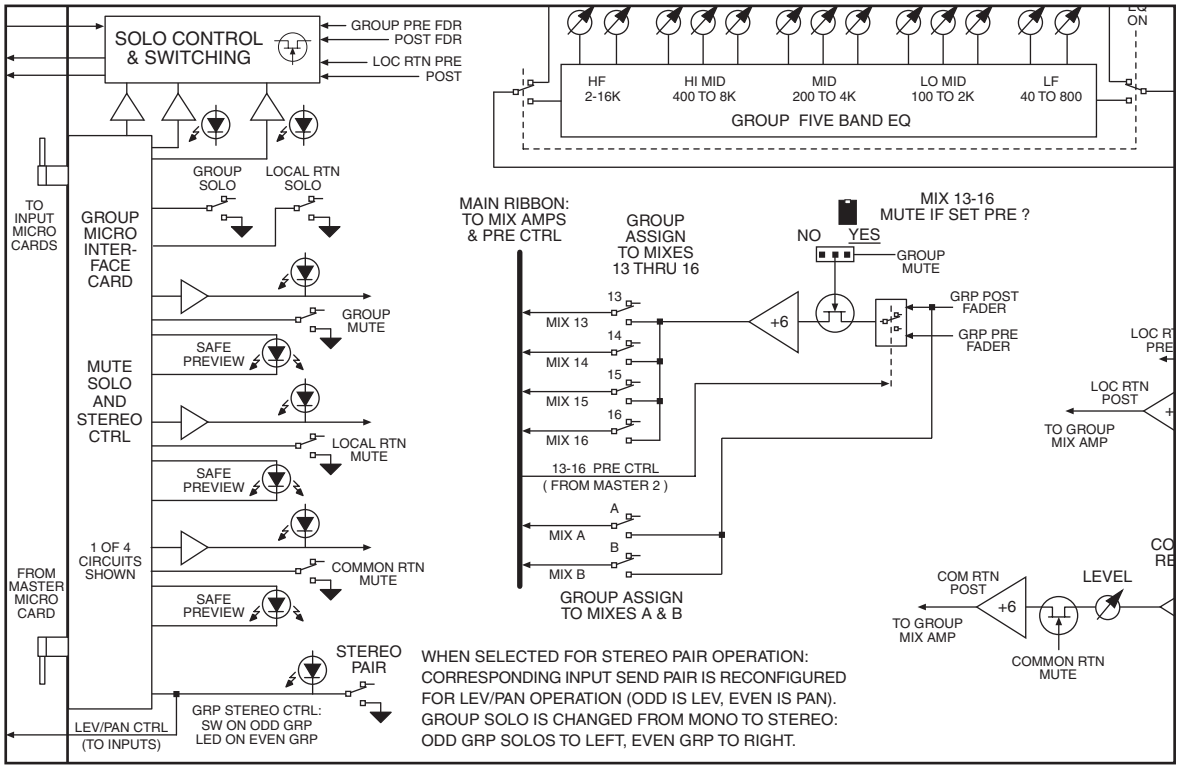
## Controls




## Group Module Pair




## Block diagram




WHEN SELECTED FOR STEREO PAIR OPERATION:
CORRESPONDING INPUT SEND PAIR IS RECONFIGURED FOR LEV/PAN OPERATION (ODD IS LEV, EVEN IS PAN).
GROUP SOLO IS CHANGED FROM MONO TO STEREO:
ODD GRP SOLOS TO LEFT, EVEN GRP TO RIGHT.

## Output features

### Output Control

#### Talk to

The Talk back signal is assigned to the group. The level of the Talk back signal is controlled by the Talk Back level control in the Master section.

#### Polarity reverse

The polarity of the Group output is reversed.

#### Stereo Pair

This switch with accompanying LED globally sets the configuration of the input Mix pots associated with each pair of outputs. For each odd/even pair, the Mix send pots are configured as Level / Pan. The odd numbered control sets the level, and the even numbered control adjusts the stereo placement (pan).

#### Safe preview

Safe Preview LED
See LOCAL MICROPROCESSOR CONTROL section

#### Mute

Mute switch
See LOCAL MICROPROCESSOR CONTROL section

#### PK / SIG

The Peak / Signal level LED indicates the output level. It illuminates green, varying in intensity with the level of the audio signal. Red (Peak) indicates peaks and distortion. Peak is sensed both before and after the fader, while signal level is sensed before the fader only.

#### Bus assignments 13, 14, 15 & 16

The Group signal is assigned to Buses 13-16 which feed Matrix 1 - 4, located above the master control section. The feed to Buses 13-16 is normally Post-fader. All Bus 13-16 sends (from Inputs and Groups) can be globally switched to Pre-fader by using the 13-16 PRE switch, located in the Master section.

#### Bus A assignment

The Group signal is assigned to the main A output bus. This feed is always Post-fader.

#### Bus B assignment

The Group signal is assigned to the main B output bus. This feed is always Post-fader.

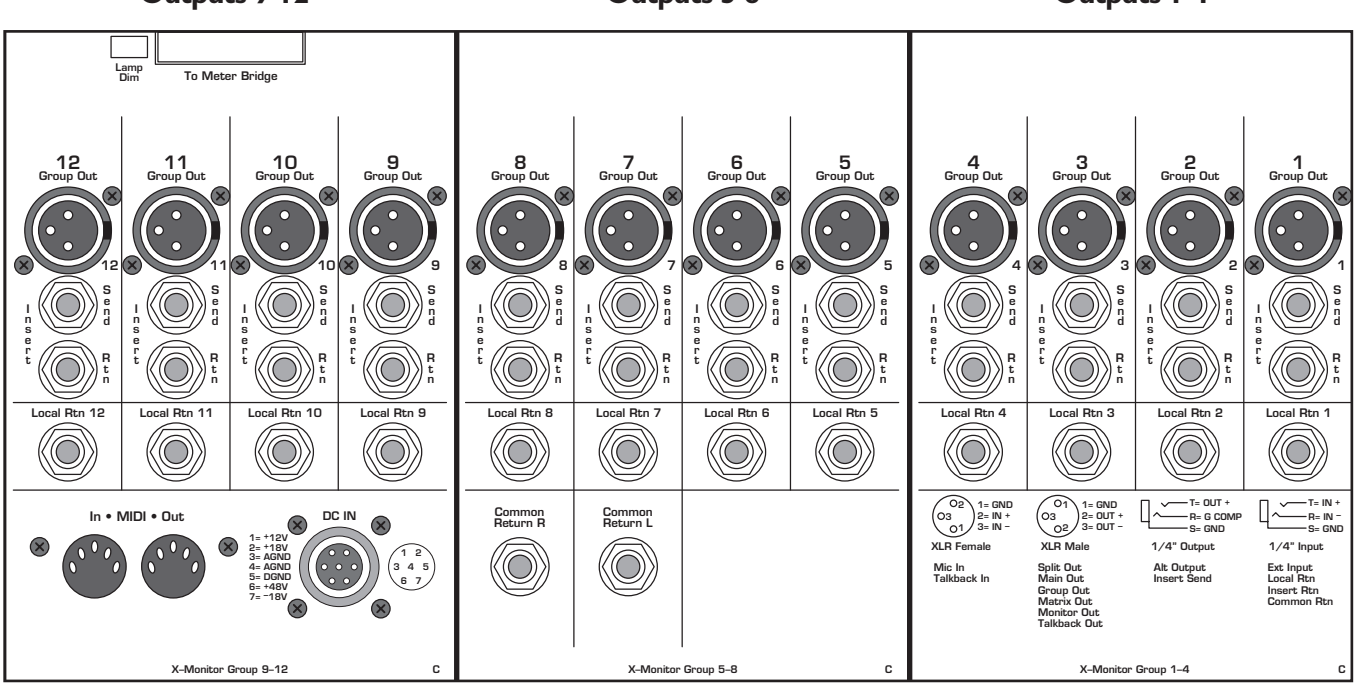
#### Group fader

The 100mm fader controls the level of the Group output and any Post-fader send.

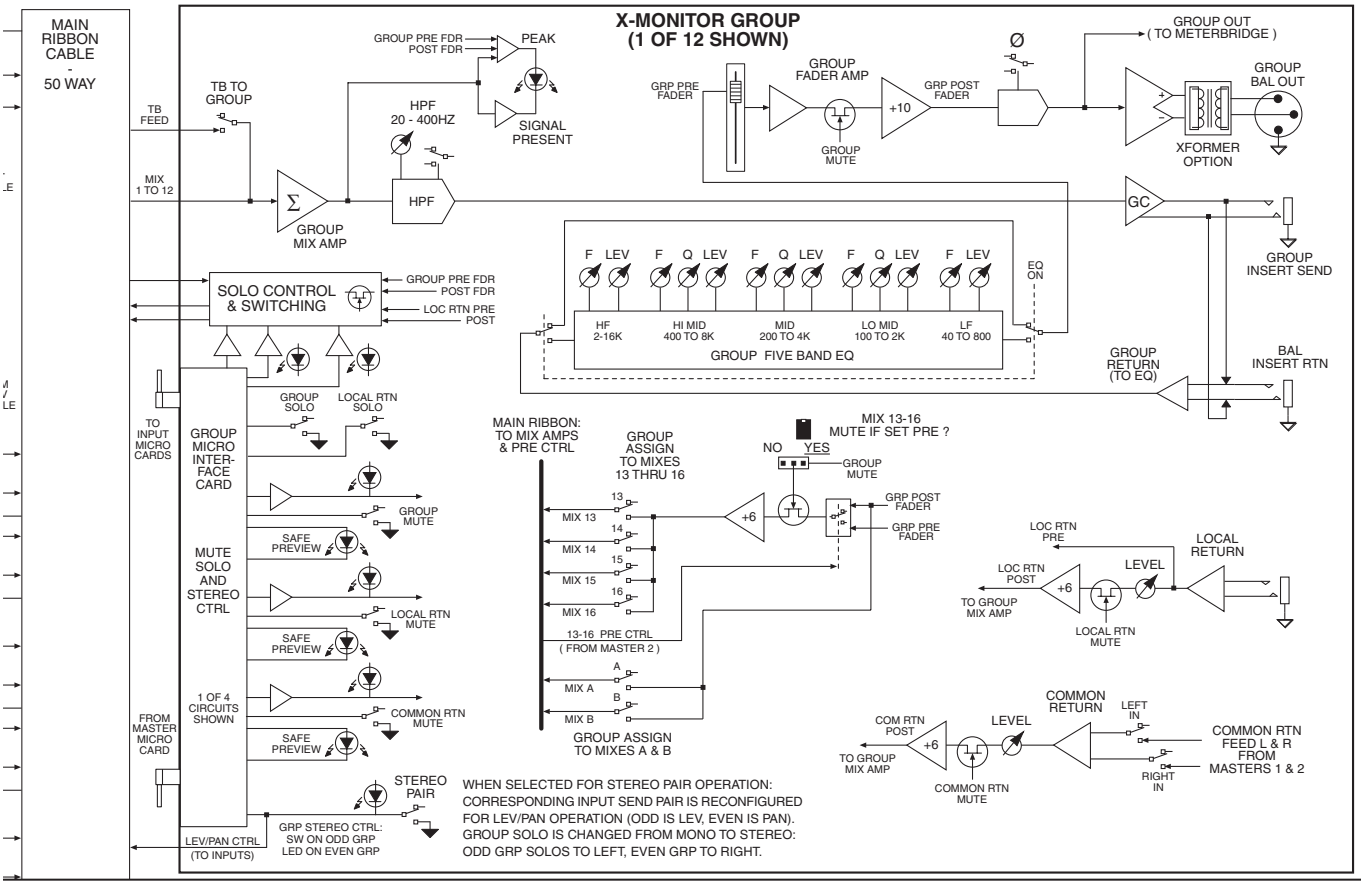
#### Solo switch

Pressing this momentary switch will include (illuminate) or exclude (not-illuminated) the group from the consoles solo system. See Master Control Section for information on Solo options.

## Group Output Rear Panel




## Block diagram



## Output features

### Output Connectors - Each Group

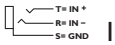
#### Group Out

Male XLR carries the post fader Group output signal. This output is designed to drive output impedances greater than 600 ohms. The associated group metering follows signal levels that appear on this output connector.

#### Insert Send & Return

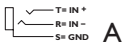
Separate 1/4" TRS jacks are used for pre fader insert connectors. Signal is fed full time to ground compensated insert send connector. When a connector is plugged into the fully balanced 1/4" return jack, the internal signal path is broken, with the external (processed) signal continuing its signal flow through the module. This pair of connectors is used to "patch" external signal processing such as 1/3 octave EQ into the module's signal path.

#### Local return

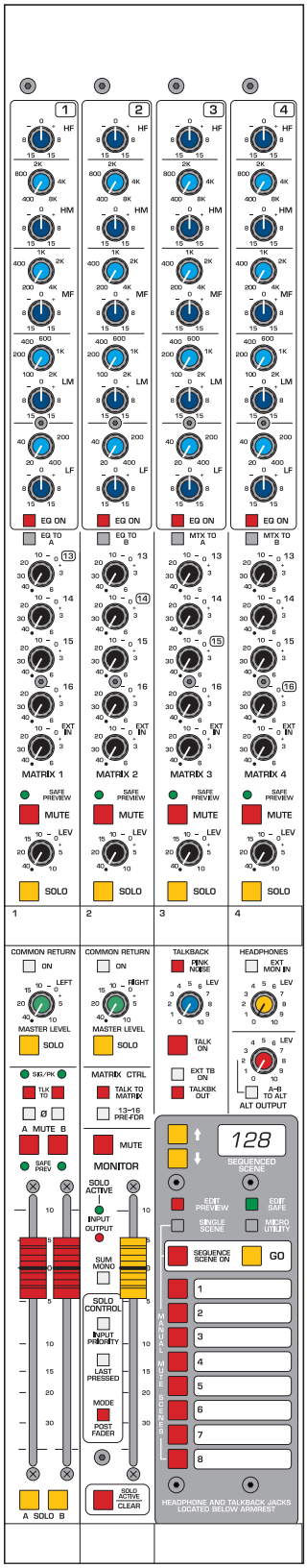


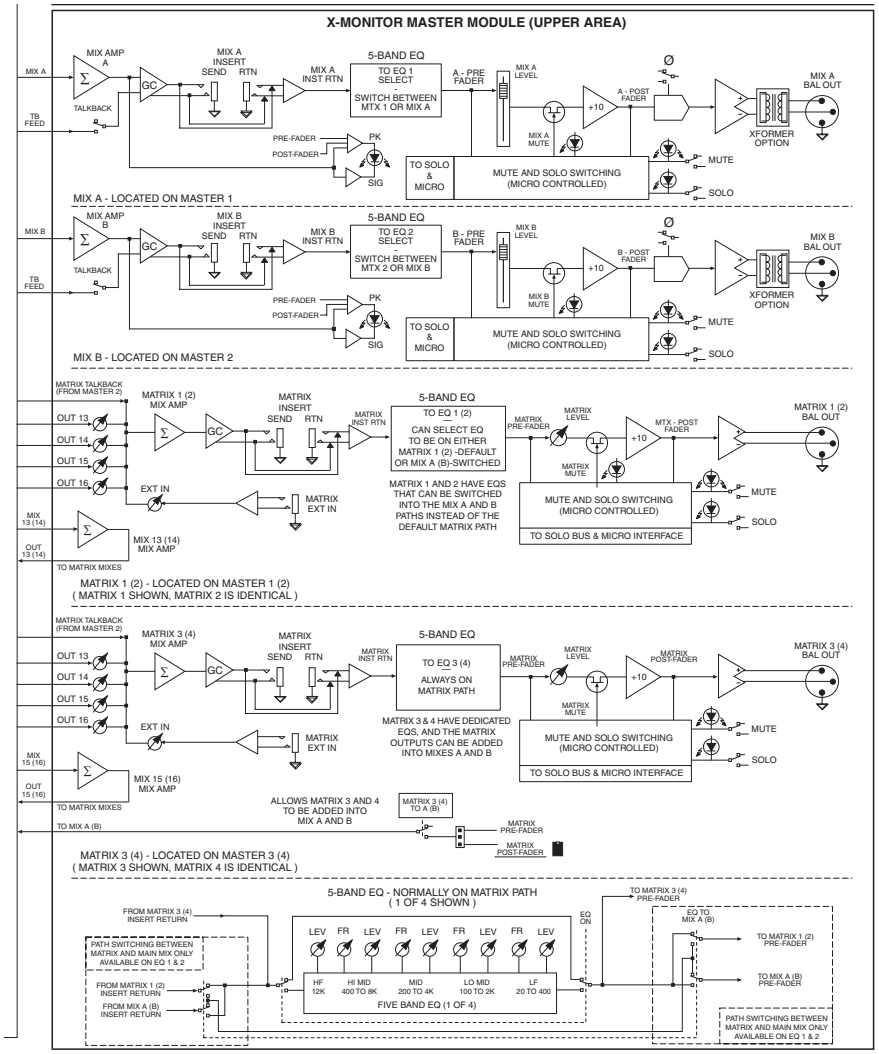

1/4" TRS jack- Balanced (can accept balanced or unbalanced inputs). This input feeds the group by way of the front panel "Local Return" controls. This may be used to bring effects inputs or external mixes into the mix group output channel.

#### Common return (On Rear of Module 5-8)

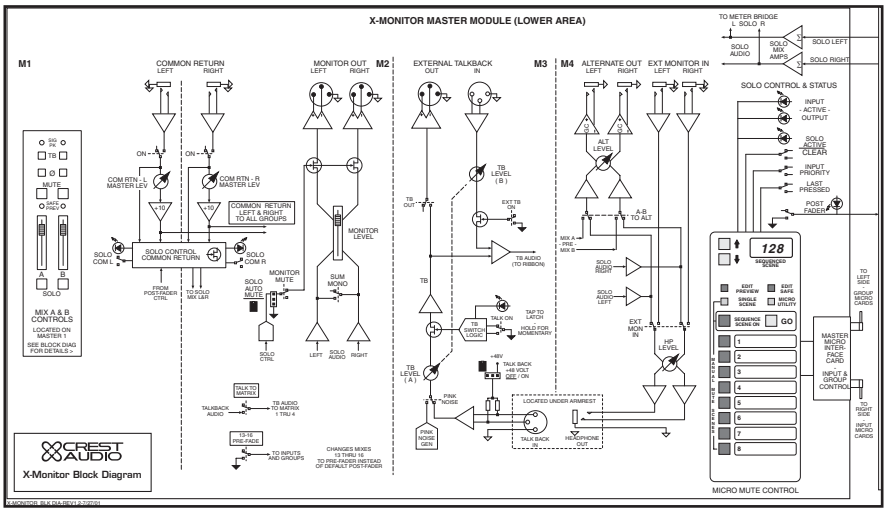



A pair of 1/4" TRS jacks- Balanced (can accept balanced or unbalanced inputs). Signals into these jacks are sent to the Common-return controls on the Master module. Two separate inputs are provided to allow a common left and right signal to feed any of the 12 group mix output channels. Master On switches are provided as well as pre and post fader Solo switching and master level controls. This section may be used to feed reference or click tracks to any of the 12 main output mixes, or common ambience effects.






## Block diagrams



**Master Module Summary**

The MASTER module of X-Monitor serves multiple purpose.
The module contains the following sections:

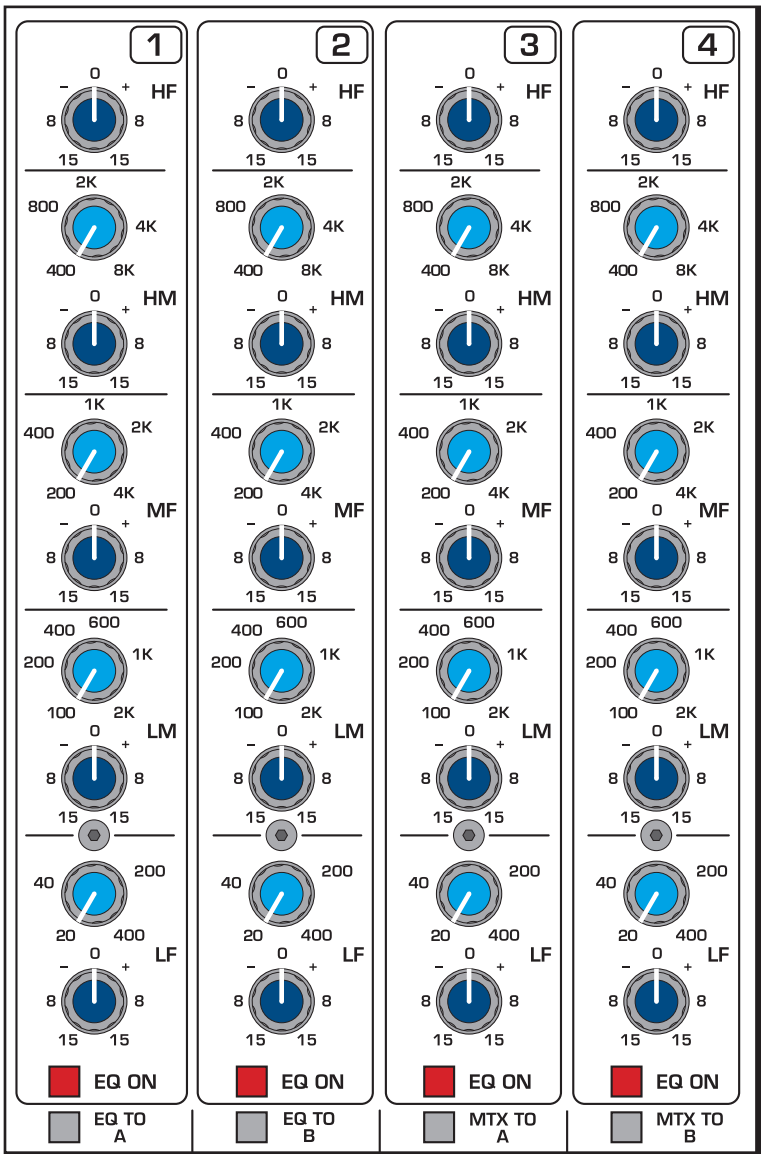
- Matrix Output EQ and high pass filter
- Matrix Output mix
- Matrix Output control
- A and B Output control with 100mm faders
- Common Return master control
- Microprocessor Mute Controller
- Monitor control with 100mm fader
- Alternate and Headphone Outputs
- Talkback Control
- Solo Control

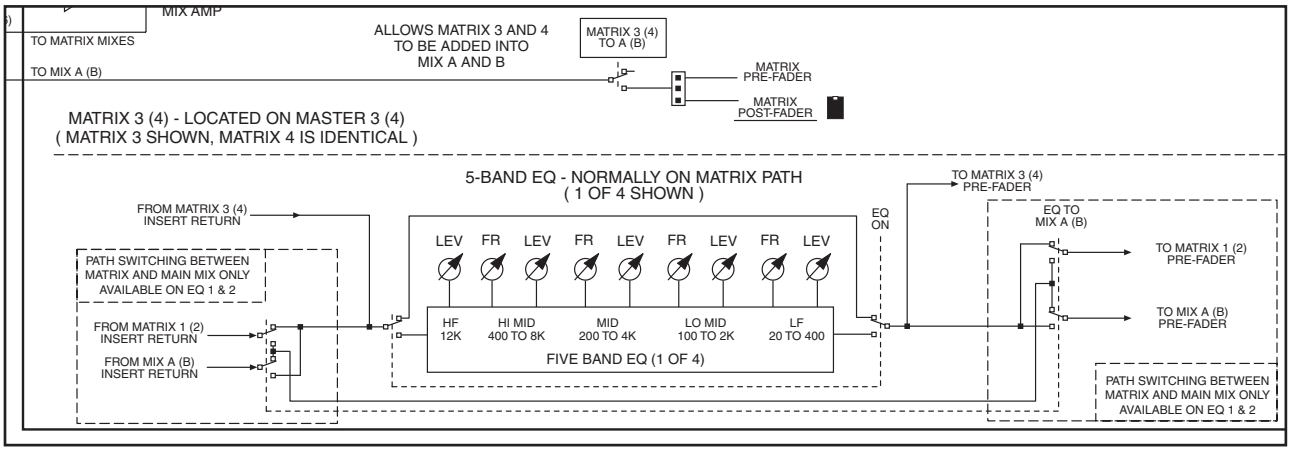
**Matrix section**

X-Monitor includes a unique matrix output system. Signal is assigned from Input and/or Group modules into a mix bus section. These mix buses contains no front panel control or output connectors, but rather are a source for the matrix system. Four output matrixes are included. Each has separate control of master levels from mixes 13, 14, 15, and 16, as well as an external input connector. Each matrix output includes level control, Solo switch and microprocessor mute system. A five-band output EQ is available on each matrix output.

The matrix section may be used in a number of different ways:

Effects Sends - The most basic application of the matrix system is to feed effects devices from individual input channels without any required re-patching. When used in this application, matrix 1 would have mix 13 level control set to unity with all other level controls on matrix 1 (except output level) set fully counter-clockwise (or off). Matrix 2 would have mix 14 level control set to unity with all other level controls on matrix 2 (except output level) set fully counter-clockwise (or off). This same set up would be repeated with matrix 3 (mix 15) and matrix 4 (mix16).


1
2
3
4
HF
HM
MF
LM
LF
EQ ON
EQ TO A
EQ TO B
MTX TO A
MTX TO B


MIX AMP
TO MATRIX MIXES
TO MIX A (B)
ALLOWS MATRIX 3 AND 4 TO BE ADDED INTO MIX A AND B
MATRIX 3 (4) TO A (B)
MATRIX PRE-FADER
MATRIX POST-FADER
MATRIX 3 (4) - LOCATED ON MASTER 3 (4)
( MATRIX 3 SHOWN, MATRIX 4 IS IDENTICAL )
5-BAND EQ - NORMALLY ON MATRIX PATH
( 1 OF 4 SHOWN )
TO MATRIX 3 (4) PRE-FADER
FROM MATRIX 3 (4) INSERT RETURN
EQ ON
EQ TO MIX A (B)
LEV FR LEV FR LEV FR LEV FR LEV
TO MATRIX 1 (2) PRE-FADER
TO MIX A (B) PRE-FADER
PATH SWITCHING BETWEEN MATRIX AND MAIN MIX ONLY AVAILABLE ON EQ 1 & 2
FROM MATRIX 1 (2) INSERT RETURN
FROM MIX A (B) INSERT RETURN
HF 12K
HI MID 400 TO 8K
MID 200 TO 4K
LO MID 100 TO 2K
LF 20 TO 400
FIVE BAND EQ (1 OF 4)
PATH SWITCHING BETWEEN MATRIX AND MAIN MIX ONLY AVAILABLE ON EQ 1 & 2

## Output EQ features

The five-band output EQ consists of a high-freq shelving band followed by four semi-parametric bell-shaped bands. The four bands have frequency and boost / cut controls. All bands offer a generous overlap of adjacent operating frequencies. These Output EQs are normally assigned to the Matrix Outputs. The first two (1 & 2) can be switched over to the Bus A and Bus B Outputs with the EQ to A (B) switches.

**high frequency—HF**

**Boost / Cut** 15dB boost and cut. Shelving eq at 12kHz.

**high mid—HM**

**Frequency** Continuously sweepable between 400 Hz and 8 kHz.

**Boost / Cut** 15dB boost and cut.

**mid frequencies—MF**

**Frequency** Continuously sweepable between 200 Hz and 4 kHz.

**Boost / Cut** 15dB boost and cut.

**Low mid—LM**

**Frequency** Continuously sweepable between 100 Hz and 2 kHz.

**Boost / Cut** 15dB boost and cut.

**Low frequency—LF**

**Frequency** Continuously sweepable between 20 Hz and 400 Hz.

**Boost / Cut** 15dB boost and cut.

**Eq on**

Equalizer is on. This switch is used to activate the EQ section and can be used to make A/B comparisons between "flat" and eq'd signals.

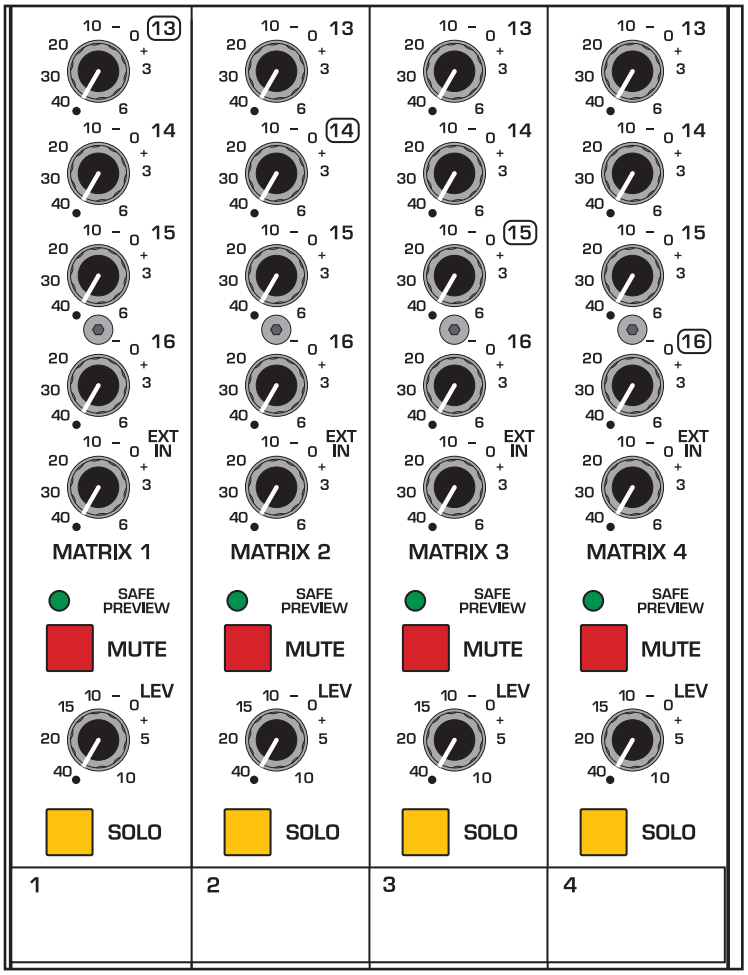
**EQ TO A (B)**

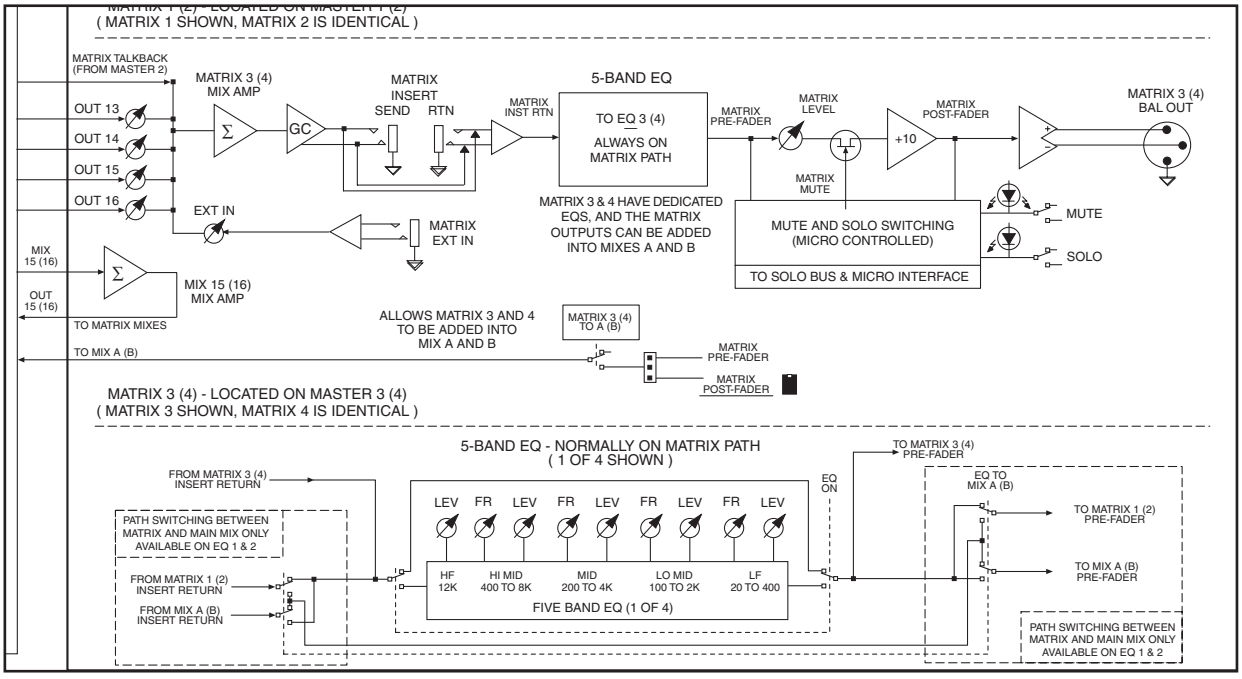
The EQ is in the Matrix signal path, the Bus A (B) path is flat (no EQ).

The EQ is switched to the Bus A(B) signal path, the Matrix path is flat (no EQ).

**MTX TO A (B)**

The post-fader Matrix signal is fed into the Bus A (B) mix. Matrix 3 can feed Bus A, Matrix 4 can feed Bus B. An internal jumper allows this feed to be changed to Matrix pre-fader.


13
14
15
16
EXT IN
MATRIX 1
MATRIX 2
MATRIX 3
MATRIX 4
SAFE PREVIEW
MUTE
LEV
SOLO
1
2
3
4


( MATRIX 1 SHOWN, MATRIX 2 IS IDENTICAL )
MATRIX TALKBACK (FROM MASTER 2)
OUT 13
OUT 14
OUT 15
OUT 16
MATRIX 3 (4) MIX AMP
GC
MATRIX INSERT
SEND
RTN
MATRIX INST RTN
5-BAND EQ
TO EQ 3 (4)
ALWAYS ON MATRIX PATH
MATRIX PRE-FADER
MATRIX LEVEL
+10
MATRIX POST-FADER
MATRIX 3 (4) BAL OUT
EXT IN
MATRIX EXT IN
MATRIX 3 & 4 HAVE DEDICATED EQS, AND THE MATRIX OUTPUTS CAN BE ADDED INTO MIXES A AND B
MATRIX MUTE
MUTE AND SOLO SWITCHING (MICRO CONTROLLED)
TO SOLO BUS & MICRO INTERFACE
MUTE
SOLO
MIX 15 (16)
OUT 15 (16)
MIX 15 (16) MIX AMP
TO MATRIX MIXES
TO MIX A (B)
ALLOWS MATRIX 3 AND 4 TO BE ADDED INTO MIX A AND B
MATRIX 3 (4) TO A (B)
MATRIX PRE-FADER
MATRIX POST-FADER
MATRIX 3 (4) - LOCATED ON MASTER 3 (4)
( MATRIX 3 SHOWN, MATRIX 4 IS IDENTICAL )
5-BAND EQ - NORMALLY ON MATRIX PATH
( 1 OF 4 SHOWN )
FROM MATRIX 3 (4) INSERT RETURN
PATH SWITCHING BETWEEN MATRIX AND MAIN MIX ONLY AVAILABLE ON EQ 1 & 2
FROM MATRIX 1 (2) INSERT RETURN
FROM MIX A (B) INSERT RETURN
LEV
FR
HF 12K
HI MID 400 TO 8K
MID 200 TO 4K
LO MID 100 TO 2K
LF 20 TO 400
FIVE BAND EQ (1 OF 4)
EQ ON
TO MATRIX 3 (4) PRE-FADER
EQ TO MIX A (B)
TO MATRIX 1 (2) PRE-FADER
TO MIX A (B) PRE-FADER
PATH SWITCHING BETWEEN MATRIX AND MAIN MIX ONLY AVAILABLE ON EQ 1 & 2

## Matrix Mix features

The Matrix section is fed from the internal Bus 13 thru 16 signals. These internal buses get their signal from the Input and Groups via the Bus 13-16 assignment switches. The assignment to Buses 13-16 is normally post-fader, a master switch globally changes this to pre-fader. Each Matrix also has its own External input which can be mixed in with the Bus 13-16 signals. The External Input signal comes from the four 1/4" TRS jacks located on the rear of the Master Module.

**13-** Bus 13 mix level into the Matrix.

**14-** Bus 14 mix level into the Matrix.

**15-** Bus 15 mix level into the Matrix.

**16-** Bus 16 mix level into the Matrix.

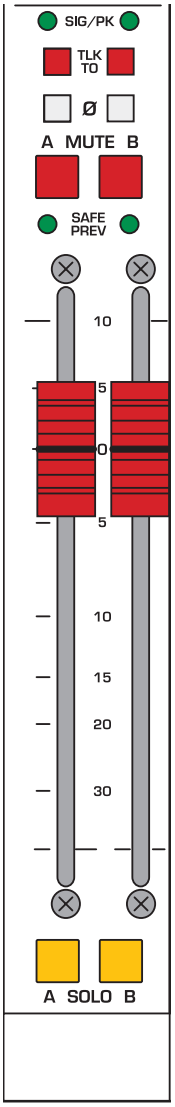
**EXT IN-** External Input mix level into the Matrix, from TRS jack on rear panel

**MUTE-** Micro-controllable mute control. See Micro-instructions for operation.

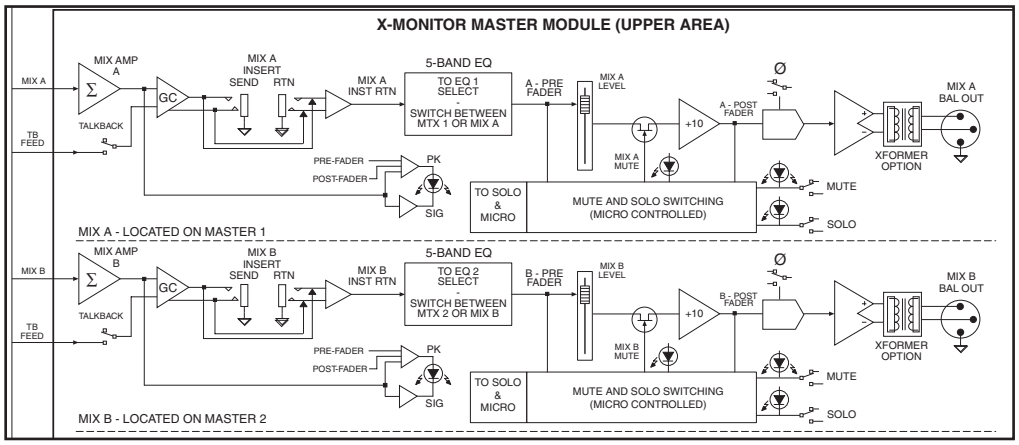
**LEV-** Master Level control for Matrix output.

**SOLO-** Allows monitoring of the Matrix signal in the Solo system. This feed follows the master SOLO MODE switch. Pre-fader monitors the actual Matrix mix-bus, Post-Fader monitors the Matrix signal after the Master Level and Mute controls. In the X-Monitor, the Solo system makes a distinction between Inputs and Outputs. The Matrix Solo is treated as an Output by the Solo system. See the Solo Section of the manual for details on the different Solo functions and modes.

## Module




## Block Diagram



## Bus A & Bus B master controls

The Bus A and Bus B circuits are internal mix buses that can be fed from any Input or Group module by using the A and B assignment switches located next to the fader on each module. The feed to these buses is always post-fader. These buses are similar to the Bus 13-16 internal buses except that:
1) The feed to Bus A & B is always post-fader. Feed to Bus 13-16 can be globally switched to pre-fader.
2) The Bus A & B circuits have their own master faders with TB, Polarity, programmable Mute and Solo switches. Bus 13-16 circuits only feed the matrix section.

**SIG/ PK (Signal/Peak)**

This dual-color LED shows the signal conditions within the Bus A (B) circuits. Varying intensity GREEN shows signal present at the mix bus, RED indicates that signals are approaching or have exceeded clip levels anywhere within the circuits. The Peak circuit monitors the mix bus and the pre and post fader signals. The LED will illuminate RED when any signal comes within 3dB of clipping.

**TLK TO (Talk To)**

 This switch (when depressed) allows the signal from the TalkBack section to be mixed into the Bus A (B) circuits.

**Ø (Polarity Reverse)**

 The polarity of the Bus A (B) output is reversed when this switch is depressed.

**MUTE (Micro-Programmable)**

This switch mutes the Bus A (B) outputs. The SAFE/PREV LED located directly below the switch shows mico-mute status. See the Mico Section of the Owner's manual for details on its operation.

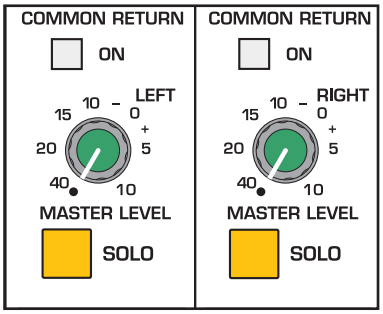
**Fader**

This 100mm fader controls the level of the post-fader output from Bus A (B)

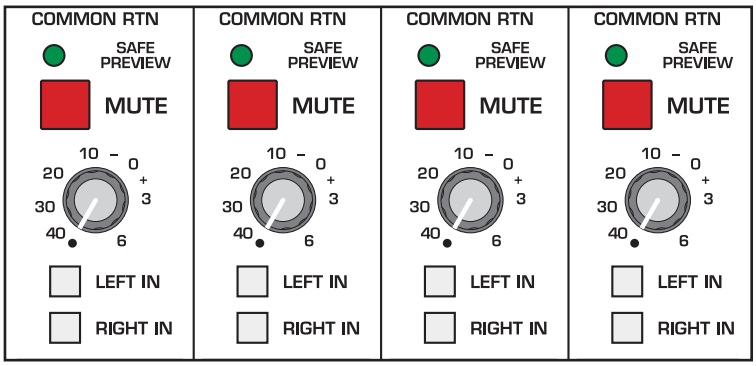
**SOLO**

This switch is used to add/remove the Bus A (B) signal from the Solo Bus. The internal LED (Yel) will illuminate whenever the Solo is active. In the X-Monitor, the Solo system makes a distinction between Inputs and Outputs. The Bus A (B) solo is treated as an Output by the Solo system. Both the pre-fader and post-fader signals can be monitored, See the Solo Section of the manual for details on the different solo functions and modes.

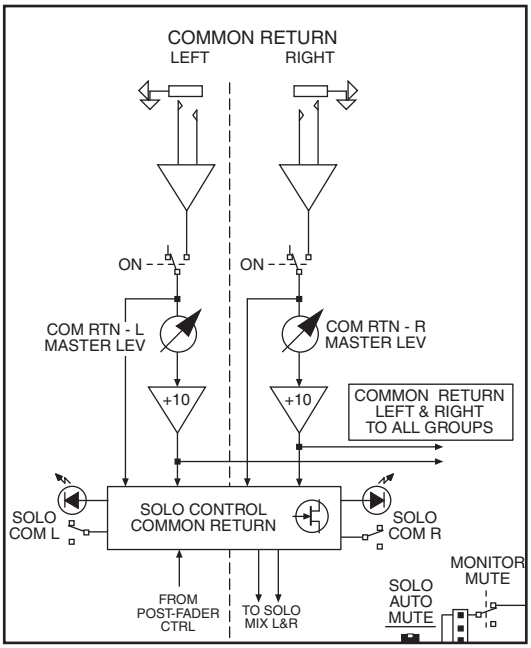
### Master Module Panel



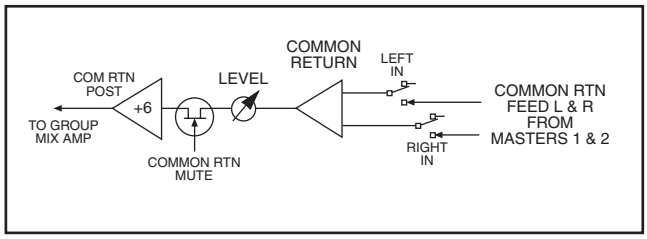

### Group Module Panel



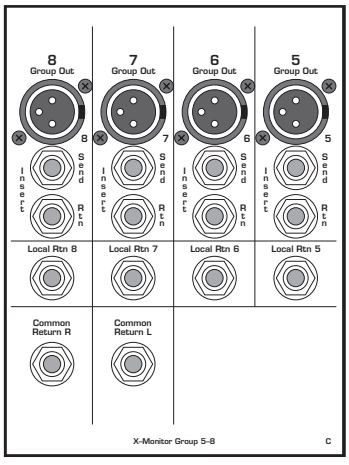

### block diagram (Master)




### block diagram (Group)




### Rear Panel (Group 5-8)



## Common Return Inputs

Two separate inputs are provided to allow a common left and right signal to feed any of the 12 group mix output channels. Master On switches are provided as well as pre and post fader Solo switching and master level controls. This section may be used to feed reference or click tracks to any of the 12 main output mixes, or common ambience effects. The input jacks for the Common Returns are located on the rear of Group Module 5-8. They are balanced 1/4" TRS jacks.

**Controls (Master Module)**

**ON (Left & Right)**

Feeds the buffered input signals into the Common Return control section.

**Master Level (Left & Right)**

This pot controls the overall level of the Common Input. This post-level signal is what is distributed to the twelve Group modules.

**Solo**

This switch is used to add/remove the Common Return signal from the Solo Bus. The internal LED (Yel) will illuminate whenever the Solo is active. In the X-Monitor, the Solo system makes a distinction between Inputs and Outputs. The Common Return solo is treated as an Input by the Solo system. Both the pre-fader and post-fader signals can be monitored, See the Solo Section of the manual for details on the different solo functions and modes.

**Controls (Group Module)**

**MUTE (Micro-Programmable)**

This switch mutes the combined mix of the Common Returns to the Group Mix bus. The SAFE/PREV LED located directly above the switch shows mico-mute status. See the Mico Section of the Owner's manual for details on its operation.

**Level**

This control adjusts the overall level of the combined Common returns to the Group mix bus. This pot can be set independently for each Group to allow a different level of the Common Returns to appear in each Group. The overall level of ALL the Common Return signals is controlled at the Master Module.

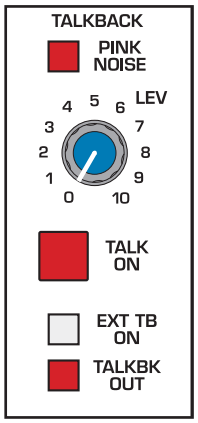
**Left In**

When this switch is depressed, the Common Return LEFT signal from the Master Module is fed to the combining circuit driving the Level pot.

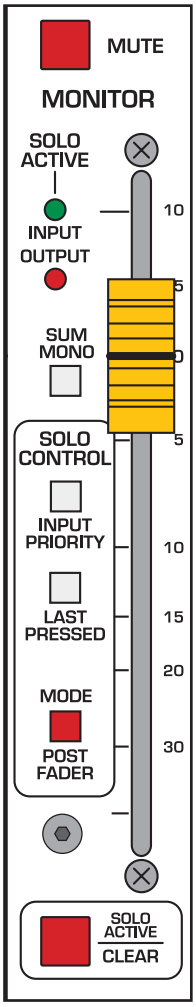
**Right In**

When this switch is depressed, the Common Return RIGHT signal from the Master Module is fed to the combining circuit driving the Level pot.

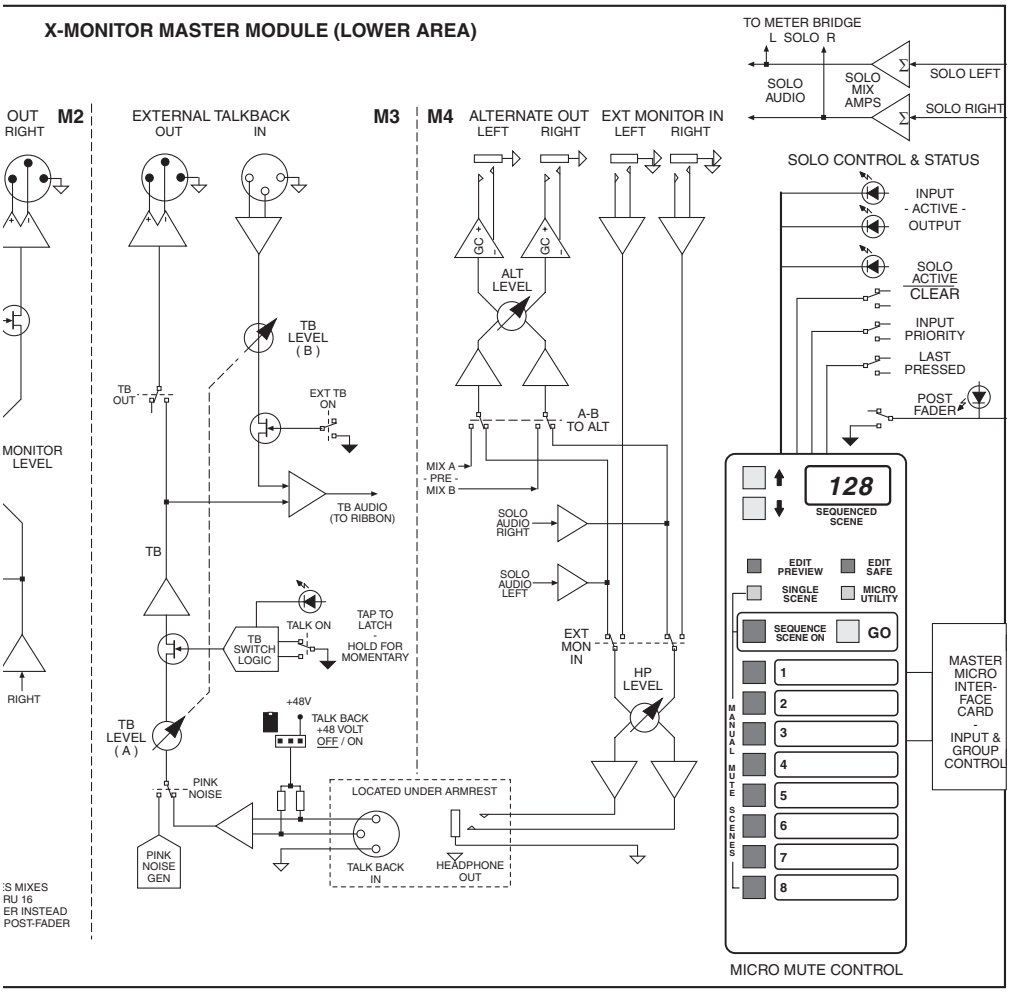
module (TB Controls)



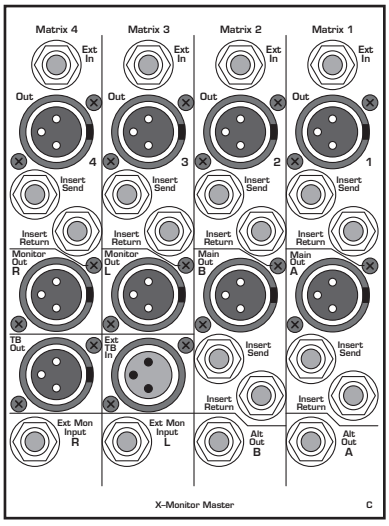

module (Solo Controls)




## Solo & TalkBack block diagram




Rear panel (Master)



## Talkback features

**Talkback control**

The talkback section provides the facilities to take either an external input signal, or an internally generated pink noise signal and route it to the consoles outputs. This is useful for making announcements from the mix position and for performing system diagnostics when other signal sources are not readily available.

**Talkback Sources**
The talkback control section can get its signal from three possible sources.
1) TB IN- An XLR jack located below the consoles armrest. Suited for Mic level inputs, Phantom power is available on this jack via an internal jumper.
2) Pink noise generator, The internal noise generator can be selected with the PINK NOISE switch. Depressing this switch both activates the internal noise generator and de-selects the TB IN jack. Whichever of these two sources is selected is considered the "Internal" signal. NOTE: It is ONLY this "Internal" signal that is fed to the External TB Out XLR jack when the TALK-BACK OUT switch is depressed.
3) External TB IN- This XLR is located on the rear of the Master Module. Its line-level signal is mixed with the "Internal" signal whenever EXT TB ON is depressed. The combination of this Ext Input and the Internal source is what is fed to the modules when the Talkback is active.

**Pink Noise switch**

The talkback control section gets its internal source signal from the Talkback XLR mic inputs.

The talkback control section gets its internal signal from the pink noise generator.

**Talkback Level**

This control sets the level of the talkback signal, whether it is from the external input or consists of the internal pink noise generator.

**TB ON - Talk back on**
This "soft" switch activates the Talkback section. An internal RED LED will illuminate to indicate that the TB is active. The Talkback section must be activate in order for any of its features to work.

Tap switch once - This will toggle the Talkback section on and off. Tap once to turn it on, when you're done tap it again to turn it off.

Press and hold - The switch will work as a momentary button if pressed and held for more than two seconds. While the button is down, the Talkback section is activated. When you release the button, the Talkback section shuts off.

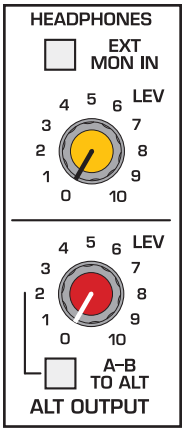
**EXT TB ON**

When this switch is depressed, the signal from the rear-panel Ext TB In jack is mixed with the internal TB signal. The TB Level pot and TALK ON switch control this input.

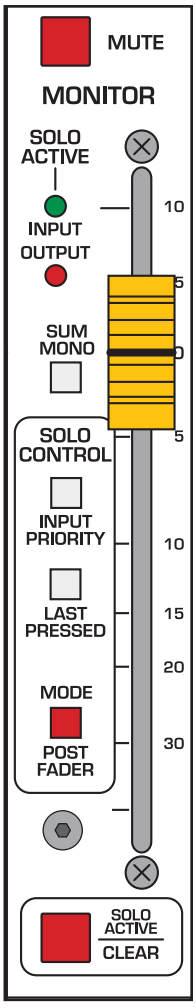
**TALKBACK OUT**

When this switch is depressed, the internal signal from the TB section is sent to the rear-panel Ext TB Out jack. The TB Level pot and TALK ON switch control this output.

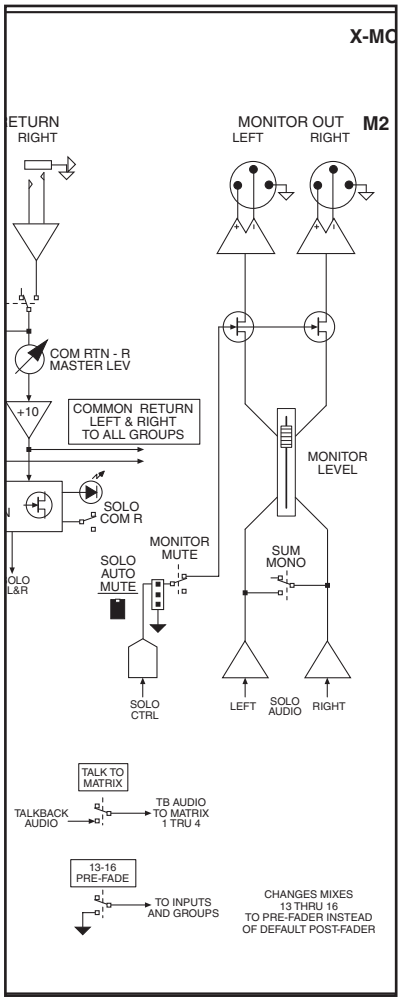
module
(HP Controls)

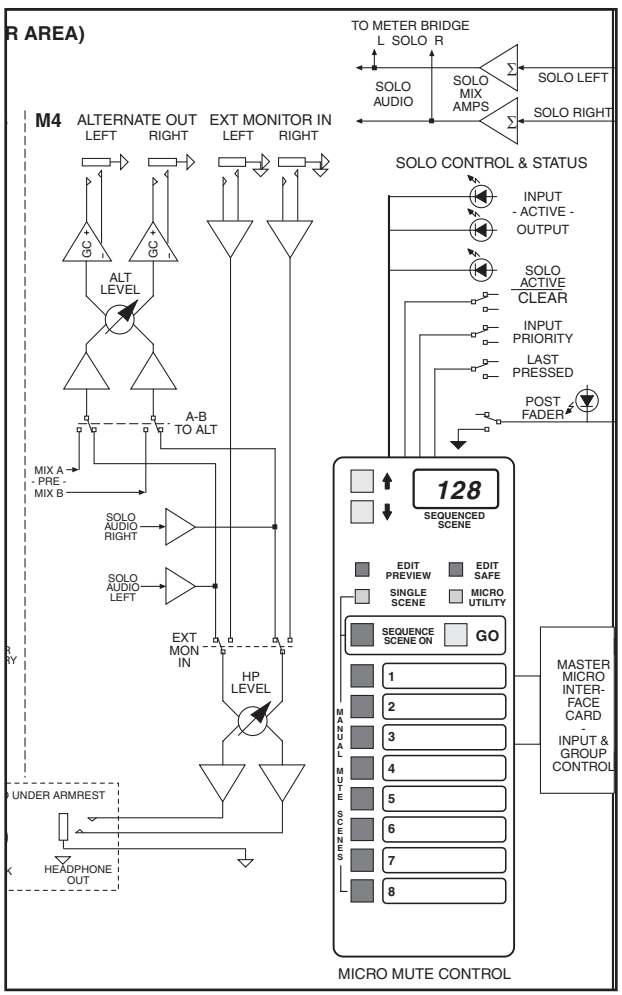



module
(Mon Controls)

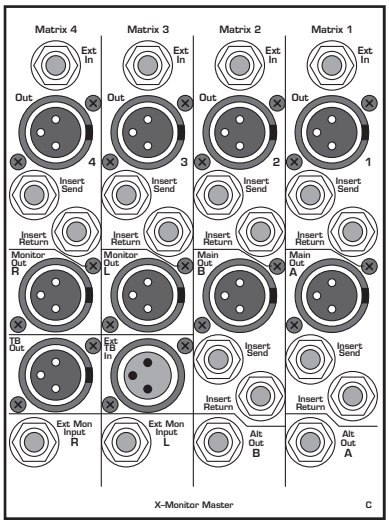



## Monitor & HP block diagrams




Rear panel
(Master)



## Monitor, headphone & alt out features

**Monitor, headphone & alt out control**

The Monitor output normally follows the Solo system, any signals that are solo'd can be heard in both the Headphone and Monitor outputs. A Mute button allows the operator to silence the Monitor output, while an EXT MON IN switch permits the operator to monitor an external source on the headphones. A pair of 1/4" TRS jacks on the rear of the Master Module bring the Ext Input into the headphones. Additionally, another output is provided (Alt Out) which also normally follows the Solo system. An RTA or similar piece of monitoring gear can be driven from this output. For added versatility, the Bus A & B signals can alternately be fed to this output.

**monitor controls**

**MUTE (Monitor Mute)**

The Monitor output is turned off. The XLR output jacks are located on the rear of the Master Module.

**Fader (Monitor Level)**

This 100mm fader controls the level of the Monitor Out.

**SUM MONO (Monitor Source Select)**

The Monitor Out is stereo (for Stereo signals).

 The Monitor Outs are summed to mono. This setting is useful if you are using a single wedge as your monitor speaker.

**Headphone controls**

**EXT MON IN (Headphone Source Select)**

The Headphones follow the Solo system.

 The Headphones are fed from the Ext Mon In jacks on the rear.

**Lev (Headphone Level)**

This pot controls the level of the headphone output. The headphone jack is located under the armrest, next to the TB In jack.

**Alt-out controls**

**Lev (Alt-Out Level)**

This pot controls the level of the Alt Output. The TRS output jacks are located on the rear of the Master module.

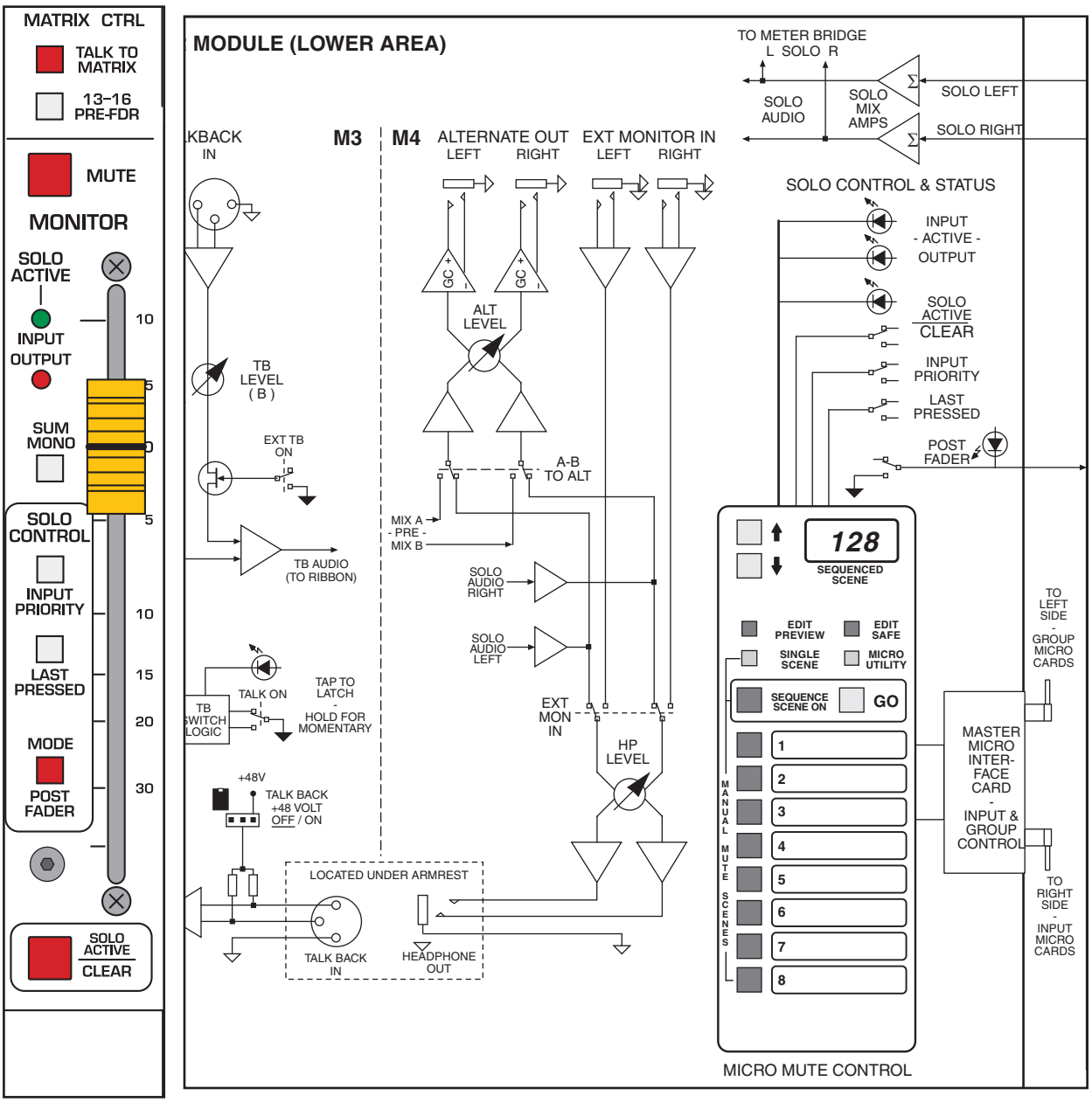
**A-B TO ALT (Alt-Out Source Select)**

The Alt Out follows the Solo system.

The Alt Out is fed from the Bus A & B signals. These signals are not affected by the Bus A & B main faders.

module
(Solo Controls)

## Solo block diagram



## Solo features

### Solo Control System

The X-Monitor is equipped with a powerful stereo solo system. Any input or output can be monitored pre-level (PFL) or after level control (AFL), as desired. The system may be set as additive (all channels selected on solo bus), or exclusive, so that only one solo switch is active at a time ("last pressed"). Input Priority Mode is switch-selectable. This mode gives higher priority to the Inputs and automatically de-selects any solo'd outputs when an Input is solo'd. When the Input is de-selected(or the CLEAR sw is pressed), the previously active Output solo(s) return. Individual LEDs indicate whether the solo system was triggered by an Input or Output. Any signal being solo'd appears on the dedicated left and right solo meters on the meter bridge, and is audible in the stereo headphone system and the Monitor outputs. Solo functions may be canceled by re-tapping any illuminated solo switch, or all solo switches may be simultaneously canceled using the Solo Clear switch.

**Solo controls**

**SOLO ACTIVE (Solo status indicators)**

Input - This Green LED illuminates whenever an Input channel is solo'd.

Output - This Red LED illuminates whenever an Output channel is solo'd.

**INPUT PRIORITY (Solo I/O preference)**

All solo signal sources are given equal weight. Input and Output solos can both be monitored simultainiously.

Greater weight is given to Input Solos (Input channels, Common Returns, Local Returns) than to Output solos.

**LAST PRESSED (Solo Operating Mode)**

Solo system is in "additive" mode. Pressing a solo switch will add that channel to the solo bus, pressing again will remove it. As many channels as desired can be combined and monitored. Input Priority has control over the mix (see above).

Solo system is in Last Pressed mode. Pressing any solo switch will clear (un-solo)any other solo'd. Only one source (the one last-pressed) can be monitored at a time. Pressing the same solo switch again will remove it from the solo system.

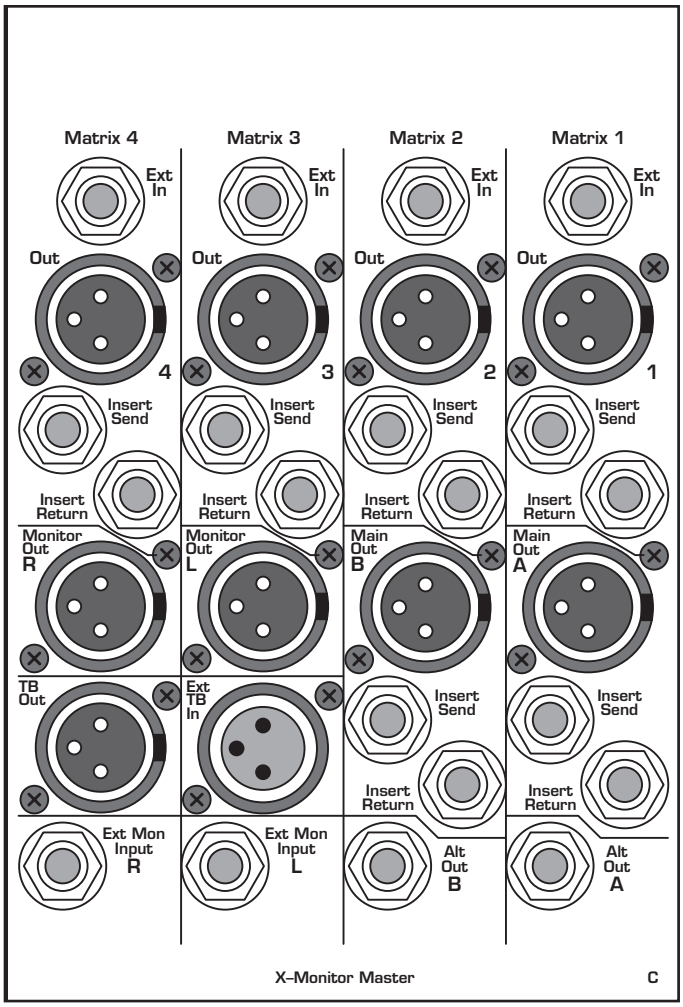
**POST FADER (Solo source select)**

Pre-fader signals are monitored by the Solo system. Fader, Output level controls and Mutes do not affect the signal.

Post-fader signals are monitored. This point is after the Fader or Output level control and also after the Mute switch.

**SOLO ACTIVE / CLEAR (Solo tally / Master clear)**

This momentary, illuminated switch provides two functions.
1. Solo active - When any input/output on the console is solo'd, this switch it lit up.
2. Clear - Pressing this switch will clear (shut off) any inputs/outputs on the console that are solo'd. This is especially useful when the solo system is in Additive mode, to clear multiple solos with one button press. When in Input Priority mode, the first press will clear any Input solos present, the second press will clear any Output solos that may return.


Matrix 4
Matrix 3
Matrix 2
Matrix 1
Ext In
Out
4
3
2
1
Insert Send
Insert Return
Monitor Out R
Monitor Out L
Main Out B
Main Out A
TB Out
Ext TB In
Ext Mon Input R
Ext Mon Input L
Alt Out B
Alt Out A
X–Monitor Master
C

## Master module rear panel

**External Matrix Input connectors (1 through 4)**

These balanced TRS connectors allow external line level signals to be added to the four Matrix buses. Their levels are controlled by the Ext In pots located in the Matrix master section.

**Matrix output connectors (1 through 4)**

These balanced male XLR connectors carry the Matrix master outputs 1 - 4.

**Matrix Insert jacks (1 through 4)**

Insert Send- These ground-compensated TRS connectors allow external gear to be patched into the Matrix signal path. The Insert Send jack is always active, it is fed from the Matrix pre-level signal.

Insert Return- These balanced TRS connectors allow external gear to be patched into the Matrix signal path. When a plug is inserted into the Insert Return jack, the normal Matrix signal path is interupted.

**Main Out A & B output connectors**

These balanced male XLR connectors carry the Bus A & B master outputs.

**Main Out A & B Insert jacks**

Insert Send- These ground-compensated TRS connectors allow external gear to be patched into the Bus A & B signal paths. The Insert Send jack is always active, it is fed from the Bus A & B pre-fader signal.

Insert Return- These balanced TRS connectors allow external gear to be patched into the Bus A & B signal path. When a plug is inserted into the Insert Return jack, the normal Bus signal path is interupted.

**Alt Out A & B**

These ground-compensated TRS connectors carry the Alt A & B master outputs.

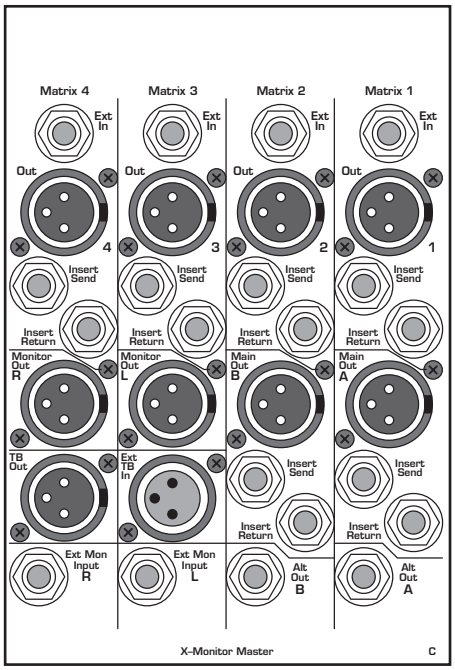
**Monitor Out L & R connectors**

These balanced male XLR connectors carry the Monitor master outputs.

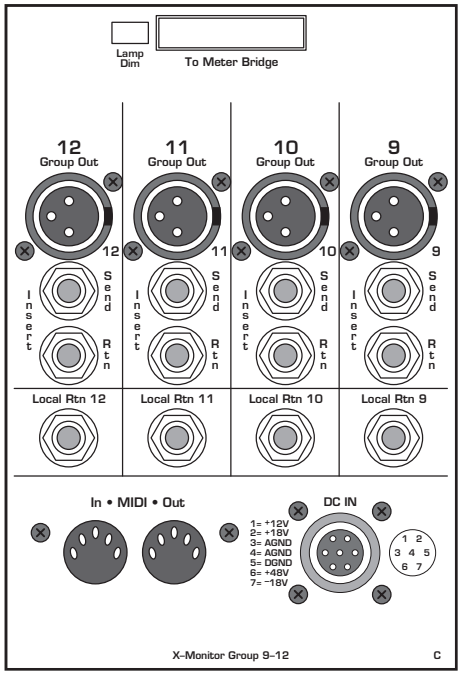
**External Monitor Input connectors L & R**

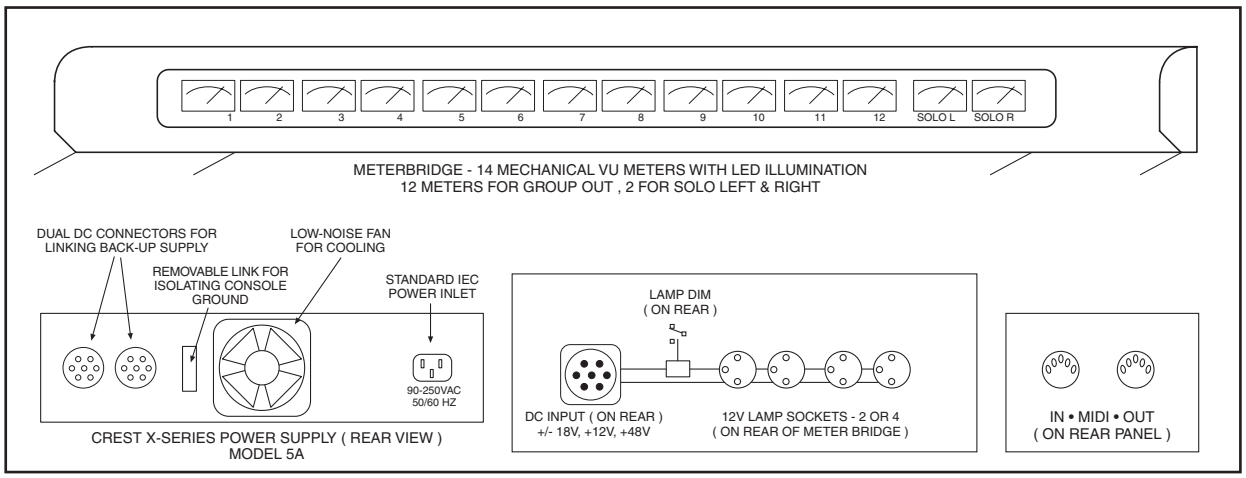
These balanced TRS connectors bring external line level signals into the headphone system. They don't feed any other circuits.

## Master Rear Panel




## Group 9-12 Rear Panel



## Rear panel features

**On Master Module Rear Panel**

**Ext TB In connector**

This bal XLR connector allows an external signal to be fed into the Talkback section. From there, it can be routed to any of the outputs that are fed by the TB bus. The Ext TB output from the FOH console can be patched into here to allow the FOH engineer to communicate with the stage.

**Ext TB Out connector**

This bal XLR connector can feed the internal TB signal to the outside world. Used in conjunction with the Ext TB In & Out of the FOH console, a two-way system can be set up to allow the Monitoring position to communicate with the FOH position.

**On Group Module 9-12 Rear Panel**

**Lamp Dim**

This switch controls the intensity of the external little-lites plugged into the rear of the meterbridge. In the UP position- full voltage is applied to the jacks. The lamp-jacks are current limited to prevent accidents.

In the DOWN position- voltage is applied to the lamp-jacks thru dropping resistors.

**Meterbridge Connector**

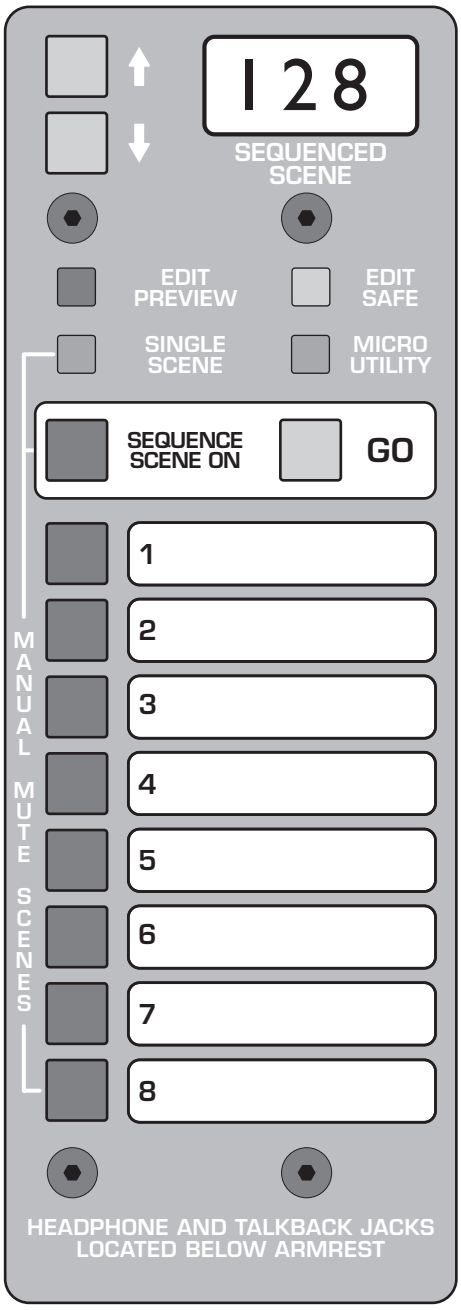
This 34-way socket connects to the meterbridge. The 14 meter signals(Groups 1-12, Solo L-R) are carried to the meterbridge as audio signals, they are rectified to drive the meters within the bridge. Power for the meter illumination (LED) as well as for the little-lites is also provided. All power feeds are current-limited.

**Midi IN and OUT**

These jacks allow the microprocessor system to communicate with MIDI gear. See the section on the Microprocessor for more information. Standard MIDI cabeling should be used.

**DC In**

This 7-pin connector is used to connect the power supply DC cable to the console. ONLY Crest approved power supplies should be used. A 25 ft DC cable is normally supplied with the console. If two or more supplies are used for redundant operation, a separate 3 ft DC-Linking cable is used to tie power supplies together.


128
SEQUENCED SCENE
EDIT PREVIEW
EDIT SAFE
SINGLE SCENE
MICRO UTILITY
SEQUENCE SCENE ON
GO
MANUAL MUTE SCENES
1
2
3
4
5
6
7
8
HEADPHONE AND TALKBACK JACKS LOCATED BELOW ARMREST

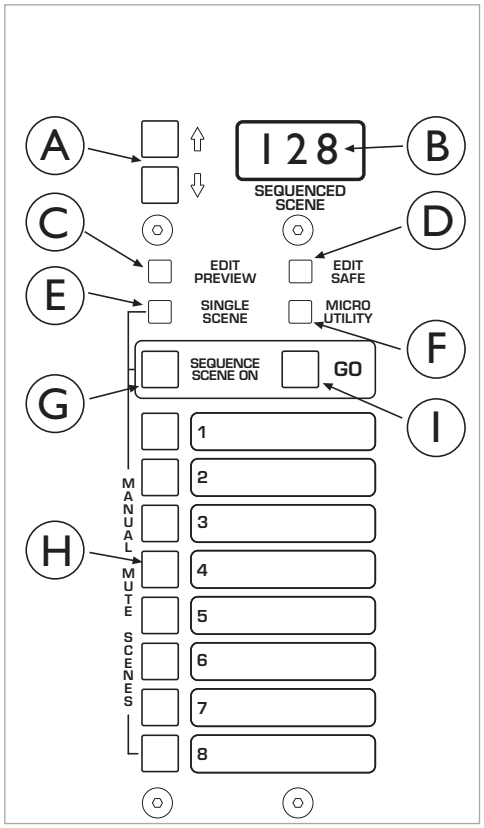
## microprocessor controlled muting

The Crest X-Series of Consoles* is equipped with a micro-controlled Mute Controller which permits the user to set-up a series of Mute Scenes, each controlling any combination of channels and outputs. These Scenes can then be recalled, either singly or in combination, to allow the operator to easily control the mutes during a performance.

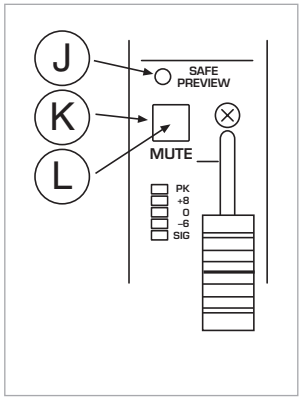
The Mute Controller features 128 Sequenced Scenes (Patches) along with 8 Manual Mute Scenes. The 128 Patches can be stepped through using a single button, or remotely activated by the use of MIDI patch-change commands. The Patches can be combined with the Manual Scenes to allow different combinations of Channel mutes.

The following is a overview of the controls and indicators of the Mute Controller and the Channels (see diagrams on previous page). The following information pertains to X-Eight consoles with Rev 1.12 firmware, and X-Monitor consoles with Rev 1.00 firmware.

**mute control panel**




**typical input or output**



## Mute controller

**A)Up/Down**

Each press of these switches increments or decriments the Patch Display (B). Holding either button down will allow quickly scrolling up or down. The buttons are also used to select the parameters and settings of the system while in Utility mode.

**B)Display**

This 4-character alpha-numeric display normally shows the current Patch (1 through 128) being recalled. It is also used to display the parameters and settings of the system while in Utility mode.

**C)Edit Preview**

Pressing this switch puts the system into Edit/Preview mode, allowing the operator to view and change the contents of any selected Mute Scene. The internal red LED will blink while in this mode, along with the status LEDs (J) of any channels assigned to the selected Mute Scene. Pressing a Channel Mute Sw (K) will add or remove a channel from that Scene. Pressing the Edit/Preview switch again will exit back to normal operating mode.

**D)Edit Safe**

Pressing this switch puts the system into Edit Safe mode, allowing the operator to view and change the contents of the SAFE memory. The internal green LED will blink while in this mode, along with any channels assigned to the Safe Scene. Pressing a Channel Mute Sw (K) will add or remove a channel from the Safe Scene. If a channel is included in the Safe Scene, it can't be muted from a Mute Scene. This allows the operator to remove a channel all Scenes without having to edit any of the Scenes themselves. Pressing the Edit Safe switch again will exit back to normal operating mode.

**E)Single Scene**

There are 9 mute sources available from the Mute Controller: the 8 Manual Mute Scenes (H), and the Sequence Scene (G). Normally any or all of theses 9 sources can be active at one time, which allows the operator to combine different mute patterns. The Single Scene switch, when depressed, permits only 1 of the 9 sources to be active at one time.

**F)Micro Utility**

This latching switch will put the system into Utility mode. The operator can then access and view the various parameters and functions of the controller using the Up/Down buttons (A) and the Display (B).

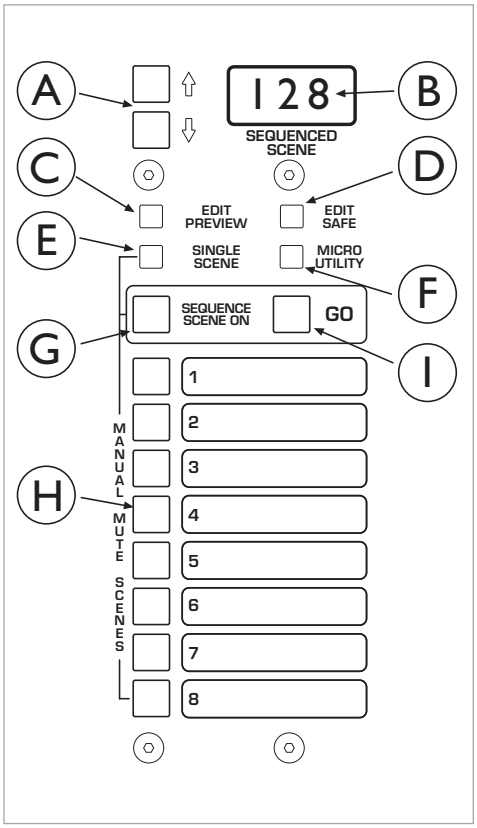
**G)Sequence Scene**

This switch activates the Sequenced Scene (Patch). The display (B) shows which of the 128 possible Scenes are active.

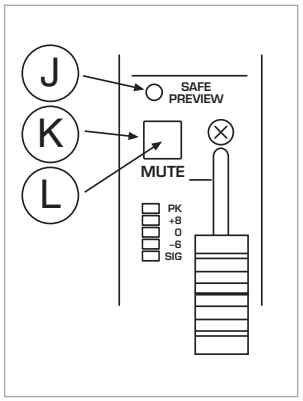
**H)Manual Mutes**

These 8 switches activate the associated Manual Mute Scene. Additionally, these switches, along with (G), select which Mute Scene is being edited when in Edit Preview Mode.

**mute control panel**




**typical input or output**



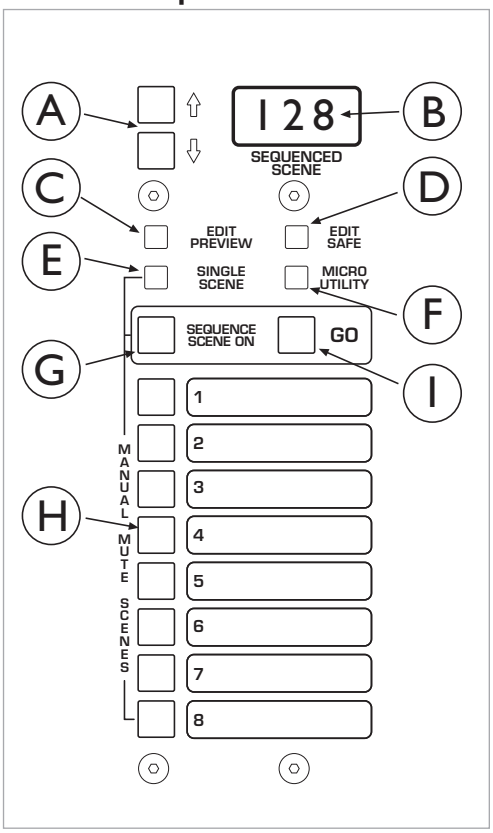
## Mute controller

**I)GO**

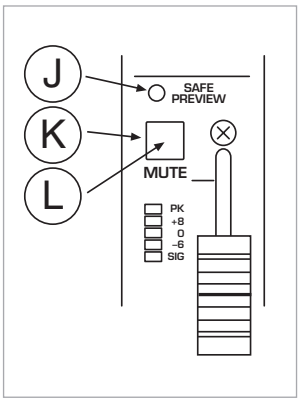
Each press of this switch increments the Sequenced Mutes by one, the display (B) will reflect this. Also used to activate the displayed Scene when an Up/Down (A) button was used to scroll to a new Scene. In this case, an "*" will be displayed as the first character in the display to indicate that the displayed number is not currently the active Scene. Pressing GO will put that displayed Scene into place and clear the "*" from the display.

NOTE: All of the above actions will take place, but the displayed Sequenced Scene will not be active (mutes not enabled) unless the Sequence Scene switch (G) is lit. Each press of these switches increments or decriments the Patch Display (B). Holding either button down will allow quickly scrolling up or down. The buttons are also used to select the parameters and settings of the system while in Utility mode.

**mute control panel**




**typical input or output**



## Channel mute controls

**J)Status LED**

This bi-color LED, associated with each controlled Mute, shows the condition of that mute. One of 5 possible states is possible:
1)Off- The channel is not controlled by the Mute Controller.
2)Steady Red- The channel is being muted by a Mute Scene.
3)Steady Green- The channel is in Safe Mode, can't be muted by any Scene.
4)Blink Red- The system is in Edit Preview Mode and the channel is in the currently selected Scene (only 1 Scene active at a time).
5)Blink Green- The system is in Edit Safe Mode and the channel is included in the Safe Scene.

**K)Mute Switch**

This momentary switch toggles the Channel's local mute and is also used to assign / un-assign channels to Mute and Safe Scenes when in the Edit Modes.

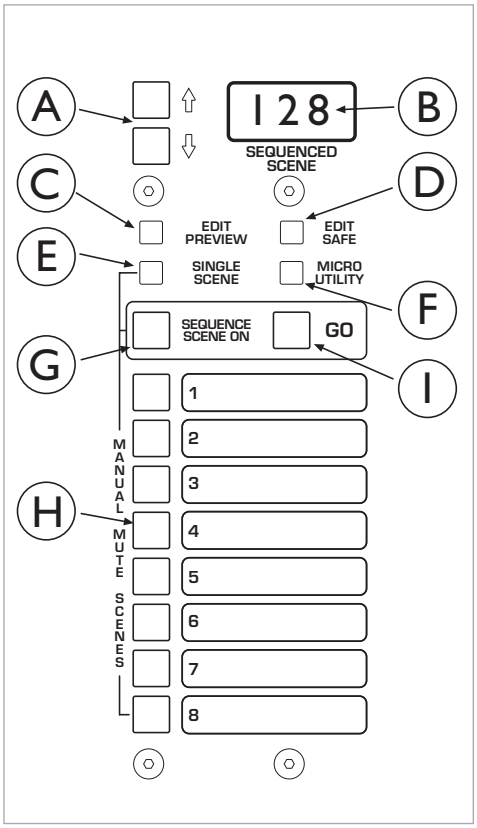
**L)Mute LED**

This internal Red LED will illuminate whenever the channel is muted, either locally or by a Mute Scene.

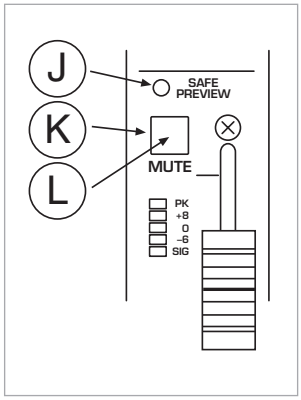
NOTE: If a channel is already locally muted when a relevant Mute Scene is activated, this LED will remain lit. 2 sources are now telling the channel to mute; the Local Mute and the Mute Scene. If the Mute Sw (K) is pressed once, the local mute will be cleared, but no apparent change will occur. The Mute LED (L) will still be lit, and the Status LED (J) will still be steady Red. At this point there is only one source telling the channel to mute; the Mute Scene. If the Mute Scene is then disabled, the channel will un-mute because the Local Mute was previously cleared. The user should be aware of this fact: The Local Mutes can toggle invisibly behind a Mute Scene. For an even number of presses on the Mute Sw (K), the Local Mute will return to its original state, an odd number of presses will change the Local Mute to its opposite state. Each press of this switch increments the Sequenced Mutes by one, the display (B) will reflect this. Also used to activate the displayed Scene when an Up/Down (A) button was used to scroll to a new Scene. In this case, an "*" will be displayed as the first character in the display to indicate that the displayed number is not currently the active Scene. Pressing GO will put that displayed Scene into place and clear the "*" from the display.

NOTE: All of the above actions will take place, but the displayed Sequenced Scene will not be active (mutes not enabled) unless the Sequence Scene switch (G) is lit. Each press of these switches increments or decriments the Patch Display (B). Holding either button down will allow quickly scrolling up or down. The buttons are also used to select the parameters and settings of the system while in Utility mode.

**mute control panel**




**typical input or output**



## Mute scenes

There are nine possible Scene sources: Manual Mute Scenes 1 thru 8, and the Sequence Scene. The Sequence Scene button (G) is the enable switch for the 128 possible Sequenced Scenes. The 8 Manual Mutes are totally independent of the 128 Sequenced Scenes, giving the system a total of 136 possible mute patterns. Each of the 136 patterns can consist of any combination of Channel and Output mutes, all of the nine possible sources can be combined to create additional patterns.

**Creating a Mute Scene (or Editing an existing one):**

1) Press the Edit Preview button (C), it will begin to blink, indicating that the system is in Edit Preview Mode.

2) Select a Scene to Edit: The system will automatically choose a Scene to edit, depending on the status of the system when Edit Preview was selected. If the system was in Single Scene Mode (switch E depressed), the Mute Scene that was currently active will be selected to edit. If the system was in Multiple Scene Mode (switch E not depressed), the Sequence Scene will be automatically selected for editing. If a different Scene than the default is to be edited, that scene should now be chosen by pressing 1 of the 9 possible Mute Scene buttons (G & H), it will illuminate to show its selection. Only one scene can be selected for editing, the condition of the Single Scene button (E) has no effect in Edit mode.

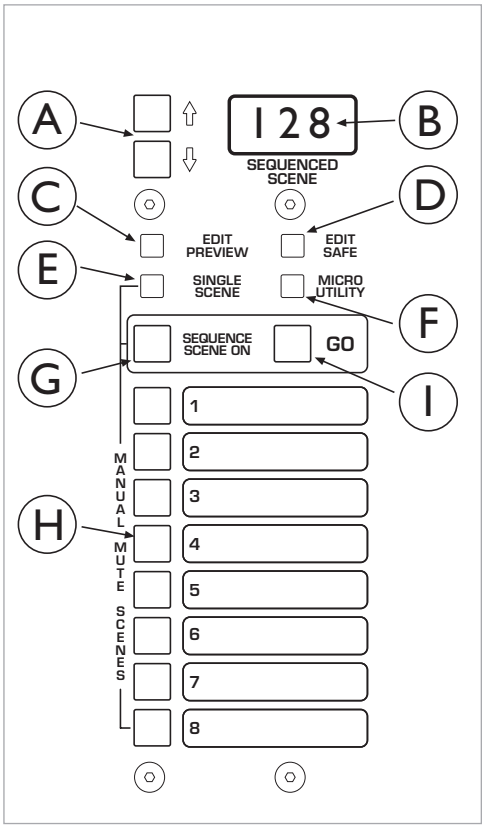
3) If Sequence Scene is selected: If Sequence Scene (G) was selected, then the Up/Down (A) buttons should be used to select the desired Sequenced Scene (Patch) to be edited. The Display (B) will indicate which of the 128 possible patches is being worked on. Note: When returning to Normal Mode, the system will revert back to the Patch that was in place before entering Edit Mode.

4) Assign channels to the Scene: Any channels currently assigned to the Scene being edited will have their Status LEDs (J) blinking Red. Pressing the associated Mute Sw (K) will assign / de-assign that channel to the Scene.

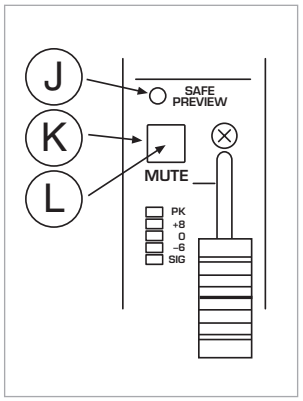
5) Clearing a Mute Scene: If you wish to clear all assigned channels from a Scene, press and hold the Edit Safe (D) button. After a brief delay, the display will change to CLR?; continue to hold the button down until the display shows CLRD. All channels assigned to that Scene will be de-assigned and you can start fresh.

6) Saving your edit: Once you have a Scene configured the way you want it, either press the blinking Edit Preview (C) button to exit Edit Mode and return to Normal Mode, or select another Scene to edit by pressing its associated switch (H), or, if Sequence Scene was selected, press the Up/Down (A) keys to select a new Patch to edit. There is no STORE button to press, the changes take place immediately while editing, and the Scene is saved automatically when a new Scene is selected or upon exiting Edit mode. NOTE: This immediate change will be most apparent when editing a scene that is currently the active scene (the Mute Scene that was ON when you entered Edit mode). The Mute LED (L) will change along with the Status LED (J) as a channel is added or removed from the scene during editing.

**mute control panel**




**typical input or output**



## Copying a mute scene

Mute Scenes can be copied from a Sequenced Scene (Patch) to a Manual Mute Scene. Manual Mutes cannot be copied to Sequenced Scenes or to each other. To copy a Sequenced Scene into a Manual Mute Scene, follow the steps outlined below.

1) Press the Edit Preview button (C), it will begin to blink, indicating that the system is in Edit Preview Mode.

2) Select Sequenced Scenes by pressing the Sequence Scene (G) button; it will illuminate.

3) Scroll to the Scene to be copied using the Up/Down (A) keys to change the Display (B).

4) Hold down the Sequence Scene button. The display will show "Cpy?".

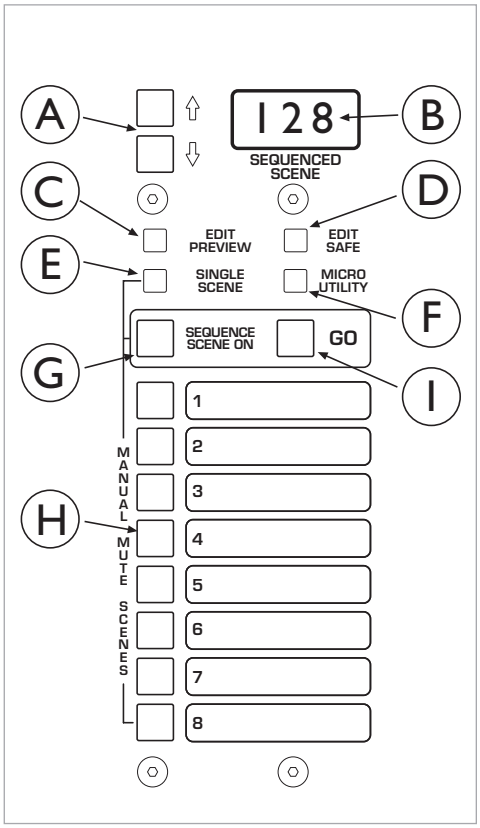
5) Still holding down the Sequence Scene button (G), now also press the desired Manual Mute switch (H). The display will show "Copy", and the Sequenced Scene Mute pattern is copied to the target Manual Mute, over-writing whatever pattern may have originally been there.

6) You can now select the newly created Manual Mute Scene for editing by pressing its select switch (G). The copied Mute pattern will be there, you can use that as a starting point for your edits.

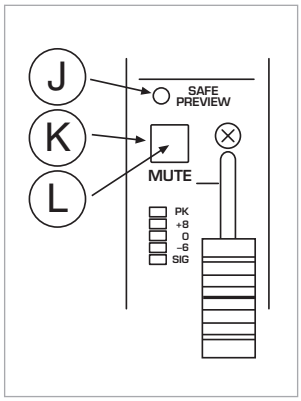
7) Exit back to Normal mode when you're done by pressing Edit Preview (C) again.

NOTE: You can use this copy feature as a way to "Back-up" your Manual Mute Scenes, even though you can't copy from Manual Mutes to any other Mutes. Instead, use the highest numbered Patches (120 to 127) to create the original versions of your Manual Mute Scenes. Then use the copy function to transfer those patterns into the Manual Mutes. You can always go back to the originals (120 to 127) and re-load (copy) them into the Manual Mutes whenever needed. You can also use Patch 128 as an All Mute memory. Program it with all channels muted, you can then copy it to a Manual Mute when you need to start a Scene with all channels muted instead of all channels un-muted ( you already have a way to start a Scene with all channels un-muted, you can hold down the Edit Safe button to clear all mutes in a Scene when editing).

**mute control panel**




**typical input or output**



## The Safe Scene

There may be occasions when a channel needs to be made "Safe" from all programmed mutes. This may occur during a show when an on-stage microphone needs to be used as an announce mic, or a switch-over has to be made to a backup channel due to some technical difficulty. The Safe Scene allows a channel to be removed from the control of all Mute Scenes without having to edit any of the scenes. Once a channel is assigned to the Safe Scene, it will ignore all Mute Scene commands. The Mute Scenes themselves are not altered, it's only the channel's response that has been changed. This allows temporary changes to be made to a show, due to nightly needs, without having to go in and edit the programmed scenes. You'll probably need the original scenes, as is, the next time the show is performed. NOTE: The Local mute command is not affected by this Safe, the Local mute is always effective.

The Safe Scene is always active, if a channel is assigned to the Safe Scene, it will ignore any mute commands from a Mute Scene. The Status LED (J) of a channel will be a steady Green color if a channel is Safe.
Editing the Safe Scene:

**1) Enter Edit Safe Mode:** Press the Edit Safe button (D), it will begin to blink, indicating that the system is in Edit Safe Mode.

**2) Select a channel to safe:** Pressing the Mute Sw (K) of a channel will assign/de-assign a channel to the Safe Scene. The status LED (J) of any channel assigned to the Safe Scene will blink Green. If a channel is currently muted because of a Mute Scene, assigning it to the Safe Scene will immediately un-mute it.

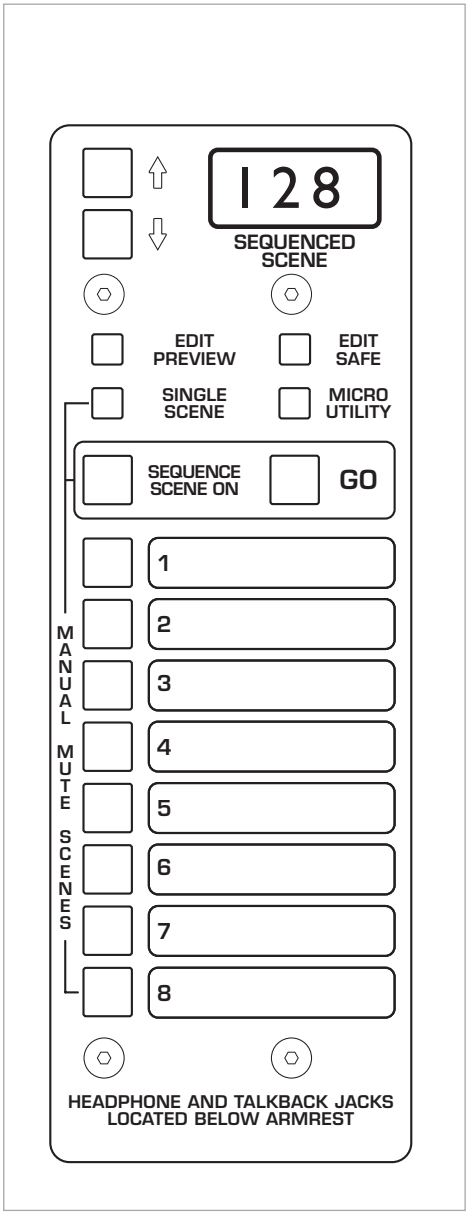
**3) Clearing the Safe Scene:** If you wish to clear all assigned channels from the Safe Scene, press and hold the Edit Preview (C) button. After a second or two, the display will change to CLR?. Continue to hold the button down until the display shows CLRD. All channels assigned to the Safe Scene will be de-assigned and you can start fresh.

**4) Exit Edit Safe Mode:** Press the blinking Edit Safe button (D) again. It will stop blinking and the system will return to Normal mode. Any blinking Green status LEDs will turn to steady Green indicating that the channel is in Safe mode. If a channel was previously being muted by only a Mute Scene (status LED was steady Red), but is now "Safe", the status LED will show steady Green and the Mute LED (L) will be off. If the channel was being muted by a Local mute, it will remain muted. The Safe Scene does not affect Local Mutes.

NOTE: Assigning a channel to the Safe Scene can be done quickly if an emergency arises and a programmed channel has to be un-muted. It's a simple 3 step process:

1) Press the Edit Safe Sw to enter Edit Safe mode
2) Press the Mute Sw of the desired channel- The channel will un-muted at this point.
3) Press the Edit Safe Sw again to return to Normal mode

**mute control panel**



## Utilities

The Mute Controller has a number of parameters that the user can change. A Utility Mode is provided for accessing these settings. The following is a current list of parameters, along with their default and other possible settings. The default setting is shown UNDERLINED. An explanation follows on how to review or change the different settings.

| Display | Meaning | Settings |
|---|---|---|
| ***uP*** | ***Micro Processor*** | ***ON or OFF*** |

Determines whether the Mute System is ON or OFF. When OFF, the entire Mute Scene system is disabled, only the Local mutes will operate. This setting can be used if "Traditional" console operation is desired (i.e. No programmed scenes are wanted).

| | | |
|---|---|---|
| ***M Ch*** | ***MIDI Channel*** | ***01 to 16*** |

Sets the MIDI channel that the Controller uses to communicate to the MIDI world. The Mute Controller can send and receive MIDI Program changes, MIDI dumps etc. It does so on this channel.

| | | |
|---|---|---|
| ***Lock*** | ***Edit Lock*** | ***OFF or ON*** |

If set to ON, prevents any changes to be made to any Mute Scene. If Edit Preview is pressed when LOCK is ON, "Lock" is displayed and the system will not enter Edit Mode.

| | |
|---|---|
| ***Dmp?*** | ***MIDI Dump*** |

When activated, the contents of all the Mute Scenes are transmitted via the MIDI Out jack using SysEx protocol. A librarian or archiving MIDI program can be used to store the Mute settings externally. Note: Loading of external data via SysEx command is always active.

| | | |
|---|---|---|
| ***Base*** | ***MIDI Base*** | ***01 or 00*** |

There are 128 possible MIDI numbers. Do you want to start counting at 01 and count up to 128, or start at 00 and count up to 127 ? Different MIDI devices do it either way. You get to choose.

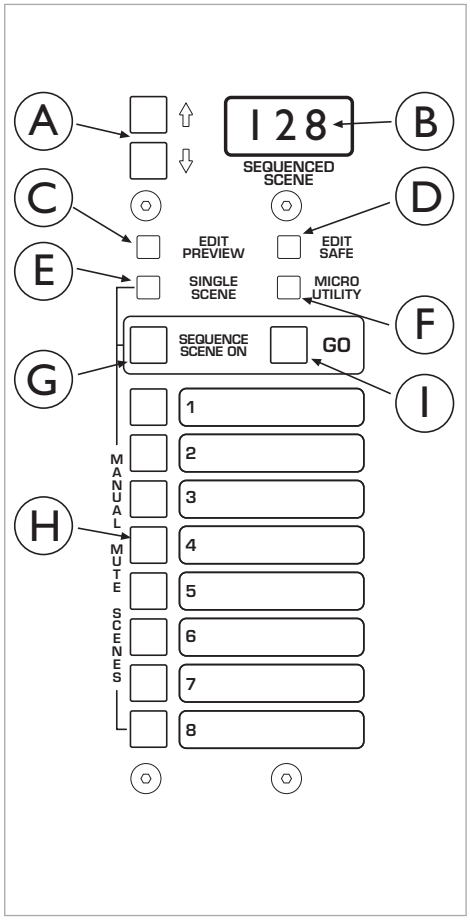
| | | |
|---|---|---|
| ***Ext*** | ***External Ctrl*** | ***OFF or ON*** |

Normally, the Mute System uses its internal Mute Scenes to control the Console mutes. Alternately, MIDI Note Commands can be used to control the channel mutes directly. When Ext is ON, the Display(B) will show "Ext", and the normal Mute Scenes will be disabled. The Controller will now respond only to externally received Note On/Off commands (via MIDI In jack).

| | | |
|---|---|---|
| ***Pgm*** | ***Program Chg*** | ***ON or OFF*** |

The Mute Controller normally sends a MIDI Program change command every time the RECALL (I) button is pressed, corresponding to the Patch number shown in the Display. Also, if a MIDI Pgm Chg is received, the Controller will respond by recalling the Patch Mute matching that Pgm Chng. Setting Pgm to OFF disables the sending and receiving of MIDI Pgm Changes.

**Mute control panel**



## Changing and reviewing the utility changes

The Utility settings can be accessed by entering Utility Mode. Once there, the different parameters can be changed to suit user's preferences. The changes stay in effect until they are again modified by the user, or a System Reset is performed (detailed later) which changes them all back to their default settings.

**Utility Mode:**

**1) Enter Utility Mode:** Press the Micro Utility button (F), it is a latching switch, and the system will stay in Utility Mode while this button is depressed. The Display (B) now shows the first Parameter - " uP " of the Parameter List.

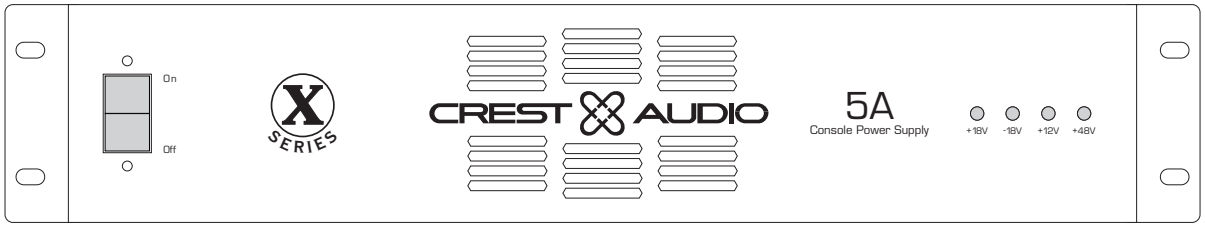
**2) Select a Parameter to edit:** Use the Up/Down keys (A) to scroll thru the list of available Parameters.

**3) View the current Setting:** Press the GO (I) button. The Display will change from showing the Parameter to showing the Parameters current setting.

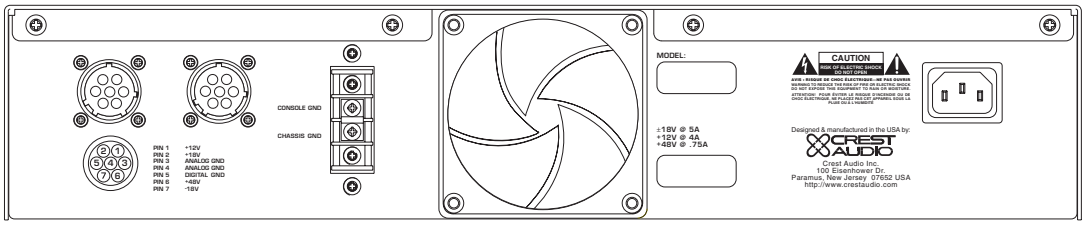
**4) Changing the setting:** While the Display is showing Parameter Settings (not the Parameter itself), the Up/Down keys will scroll thru the list of possible settings for that Parameter. Use the keys to select the new setting and press the GO button again. The Display will briefly show " **** ", the displayed setting will be activated and the Display will go back to showing the Parameter. Note: The only way to get back to showing the Parameter is to press the GO button, so even if no change is desired, the GO button must be pressed. **Make sure the display is showing the desired setting when you press GO.** You are now back at Step 2, and can continue to select and change Parameters.

**5) Exit Utility Mode:** Once you're done, press and release the Micro Utility (F) key, the Mute System returns to Normal Mode with the new settings in place.

Front View




Rear View



## power supply usage

### Console and power supply grounding

Console chassis ground is electrically connected to: the audio ground, pin-1 of XLR connectors, the sleeves of 1/4" sockets, and to the terminal CONSOLE GROUND at the rear of the power supply.

The AC third-wire connection in the power supply cable connects the metal chassis of the power supply to safety ground.

Rack-mounting—the power supply ground may transfer to the rack case through the front fixing screws, though this connection is not reliable.

Sound system use—the grounding requirements may call for the ground link to be disconnected. This is permissible only when an alternative ground path has been provided. If in doubt seek the advice of an experienced electrician.

### Redundant power supplies

The console power supply can be considered the single most important component in an entire sound system. If a power amplifier, a signal processor or a console input goes down in the middle of a show, the show can still go on. But if the console loses its power supply, the show is over. For this reason, it is always good practice to incorporate redundant power supplies for mixing consoles used in professional sound reinforcement applications.

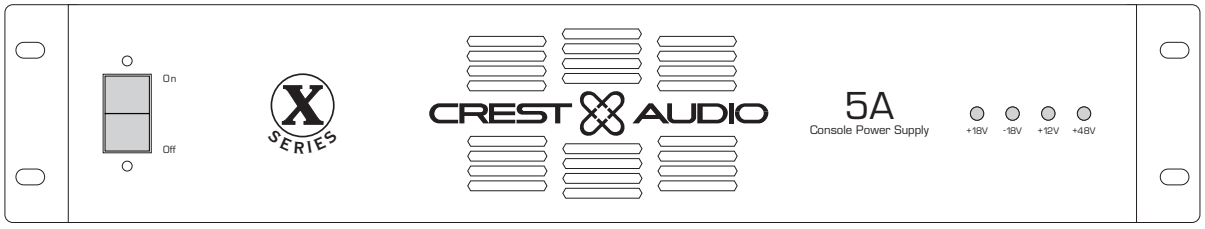
This should be considered a high priority even when using a very reliable power supply. In even the most carefully designed sound systems, each component runs the risk of failure at sometime or another.

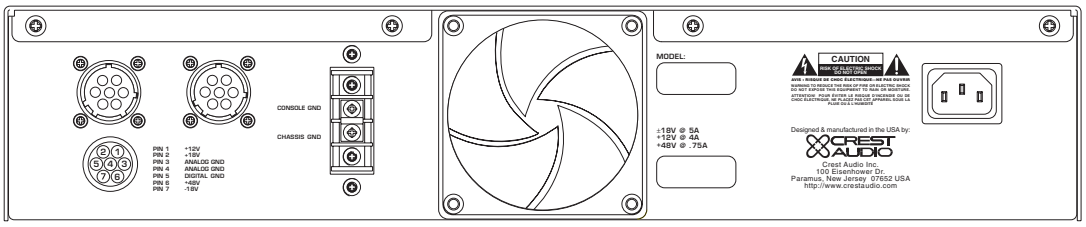
Crest Audio uses two methods for attaching redundant power supplies to consoles. In both methods, the two (or more) power supplies should be kept on while the console is in use to insure a smooth transition in the event that one shuts off.

If one power supply drops in voltage or shuts off completely, the other unit takes over without any interruptions or audible glitches. As an added precaution, the two (or more) power supplies can be fed by separate AC lines. This will guarantee that the console does not shut off if one of the AC lines goes down.

### Multiple power supplies in-series

Crest Audio X-Series consoles use this method for backup. Since each power supply includes voltage switching circuitry, more than two units can be hooked up in series. A DC-Link cable ties the power supplies together. Normally two supplies are used for redundant (fail-safe) operation, but there is no real limit to the number of supplies that can be used. A daisy-chain can be constructed using DC-Link cables to tie each supply to the next. At the end of the chain, the last power supply uses the normal DC power cable to tie the entire power supply chain to the Console.


On
Off
X
SERIES
CREST AUDIO
5A
Console Power Supply
+18V
-18V
+12V
+48V


CONSOLE GND
CHASSIS GND
PIN 1 +12V
PIN 2 +18V
PIN 3 ANALOG GND
PIN 4 ANALOG GND
PIN 5 DIGITAL GND
PIN 6 +48V
PIN 7 -18V
MODEL:
±18V @ 5A
+12V @ 4A
+48V @ .75A
CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN
Designed & manufactured in the USA by:
CREST AUDIO
Crest Audio Inc.
100 Eisenhower Dr.
Paramus, New Jersey 07652 USA
http://www.crestaudio.com

## Power supply usage

### Supply identification

The type of power supply can be identified by the model number shown on the back of the chassis and panel label.

### Power requirements

The X-Series power supplies have certain electrical requirements for proper operation. If possible the power supply should be connected to a dedicated circuit. Should any other appliance on the same circuit draw enough current to overload the circuit, the breaker or fuse will trip causing loss of power to the console.

The power switch on the supply front panel is also a circuit breaker; there is no power fuse. Should the supply ever shut down, or trip at start up, simply toggle the switch to the off position and then push on again.

### Ground linking

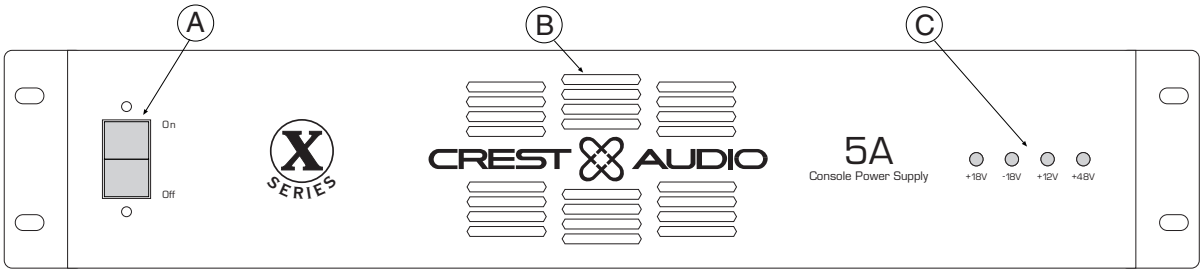
SAFETY CONSIDERATIONS—each new power supply is shipped with the AC third-wire ground connected to the console chassis ground. The connection is made at the rear of the power supply unit. This is necessary for safety reasons so that exposed metal parts are grounded. In the event of a live conductor making contact with the console chassis or the power supply chassis then the current will flow to ground without a safety hazard arising.

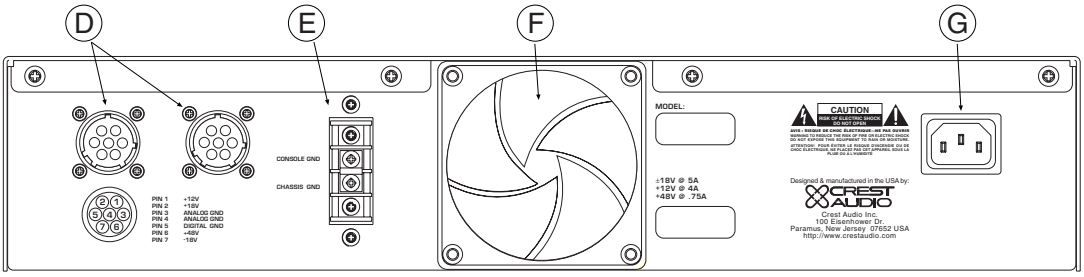
Uninterruptible grounding—in a fixed installation for example, make a connection directly to the console chassis from the safety ground. Disconnect the ground link on the rear of the power supply. This disconnects console ground from power supply AC third-wire ground which could possibly create a hum-loop.

### Twin-supply operation

When twin-supplies (or more) are in use for automatic back-up, then the ground links on both supplies should be fitted.

In a situation where the safety ground to the console chassis has been connected and the ground path via the power supply is causing a hum-loop, then disconnect the ground links on both power supplies.


A
B
C
On
Off
SERIES
CREST AUDIO
5A
Console Power Supply
+18V
-18V
+12V
+48V


D
E
F
G
CONSOLE GND
CHASSIS GND
PIN 1 +12V
PIN 2 +18V
PIN 3 ANALOG GND
PIN 4 ANALOG GND
PIN 5 DIGITAL GND
PIN 6 +48V
PIN 7 -18V
MODEL:
±18V @ 5A
+12V @ 4A
+48V @ .75A
CAUTION
RISK OF ELECTRIC SHOCK DO NOT OPEN
Designed & manufactured in the USA by:
CREST AUDIO
Crest Audio Inc.
100 Eisenhower Dr.
Paramus, New Jersey 07652 USA
http://www.crestaudio.com

## Power supply Controls

### Feature identification

The various switches, connectors, indicators and controls of the X-Series power supply are called out and described below.

### Front Panel

A) Power switch. Used to turn the unit ON and OFF, it also acts as the circuit breaker for the supply. In the case of internal faults or overloads, the breaker will automatically switch to the OFF position.

B) Exhaust Vents. There is an internal fan mounted on the rear of the unit. The fan brings cool air in from the back and exhausts it through these front vents. To insure proper cooling, both these vents and the rear fan should be kept clear of any obstructions.

C) DC Indicator LEDs. These four green LEDs show the status of the DC outputs of the supply. When illuminated, they indicate that the associated DC voltage is OK.

### Rear Panel

D) DC Output Connectors. These two parallel-wired connectors are used to connect the DC output of the supply to the Console, either connector can be used. The spare connector is used when a backup supply is also connected to the Console. For power supply to Console connection, use the normal 25ft male-to-female cable. When attaching a spare supply, use the 4ft male-to-male DC-Link cable.

E) Ground Link. This terminal block makes both the Console Ground and PS Chassis Ground available for connection. Normally a shorting-link is provided that ties the two grounds together. The Console Gnd is the Audio Ground (0 volts) of the power supply, the Chassis Gnd is the case of the PS chassis. Certain situations may arise where a hum-loop may occur due to multiple ground paths being present in a system. Removing this shorting-link may solve a hum problem by breaking one of those paths. NOTE: Removing this shorting-link does NOT lift the PS chassis from the AC third-wire ground. The chassis is ALWAYS tied to the third-wire ground of the AC inlet connector and is there for AC shock protection. If an internal fault occurs in the power supply that puts dangerous voltage on the chassis, this third-wire connection is there to shunt that potentially dangerous voltage to AC ground. That safety connection should never be tampered with.

F) Cooling Fan / Filter. A quiet constant-speed fan draws cooling air in through the external fan-filter and exhausts the heated air through the front panel vents. The filter should be cleaned whenever dust buildup is observed. The snap-off cover can be removed to gain access to the filter. The filter (foam) can be cleaned by rinsing with plain water or by vacuuming.

G) AC Inlet. This standard 15-amp IEC connector is used to bring the local AC mains voltage into the power supply. The power supply is designed to work with any standard voltage used world-wide; 100V to 240V 50/60 Hz.

v. 0.9 08/17/01

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