PUBLIC ADDRESS SYSTEM

OPERATION MANUAL

T-8S02

MIXER PRE-AMPLIFIER

Please follow the instructions in this manual to obtain the optimum results from this unit.
We also recommend that you keep this manual handy for future reference.

TABLE OF CONTENTS

1. SAFETY PRECAUTIONS

- Be sure to read the instructions in this section carefully before use.
- Make sure to observe the instructions in this manual as the conventions of safety symbols and messages regarded as very important precautions are included.
- We also recommend you keep this instruction manual handy for future reference.

Safety Symbol and Message Conventions

Safety symbols and messages described below are used in this manual to prevent bodily injury and property damage which could result from mishandling. Before operating your product, read this manual first and understand the safety symbols and messages so you are thoroughly aware of the potential safety

⚠ **WARNING**	Indicates a potentially hazardous situation which, if mishandled, could result in death or serious personal injury.
⚠ **CAUTION**	Indicates a potentially hazardous situation which, if mishandled, could result in moderate or minor personal injury, and/or property damage.

⚠ WARNING

When Installing the Unit

- Do not expose the unit to rain or an environment where it may be splashed by water or other liquids, as doing so may result in fire or electric shock.
- Use the unit only with the voltage specified on the unit. Using a voltage higher than that which is specified may result in fire or electric shock.
- Do not cut, kink, otherwise damage nor modify the power supply cord. In addition, avoid using the power cord in close proximity to heaters, and never place heavy objects -- including the unit itself -- on the power cord, as doing so may result in fire or electric shock.
- Be sure to replace the unit's terminal cover after connection completion. Because high voltage is applied to the speaker terminals, never touch these terminals to avoid electric shock.
- Be sure to ground to the safety ground (earth) terminal to avoid electric shock. Never ground to a gas pipe as a catastrophic disaster may result.
- Avoid installing or mounting the unit in unstable locations, such as on a rickety table or a slanted surface. Doing so may result in the unit falling down, causing personal injury and/or property damage.

When the Unit is in Use

- Should the following irregularity be found during use, immediately switch off the power, disconnect the power supply plug from the AC outlet and contact your nearest dealer. Make no further attempt to operate the unit in this condition as this may cause fire or electric shock.
  - If you detect smoke or a strange smell coming from the unit.
  - If water or any metallic object gets into the unit
  - If the unit falls, or the unit case breaks
  - If the power supply cord is damaged (exposure of the core, disconnection, etc.)
  - If it is malfunctioning (no tone sounds.)
- To prevent a fire or electric shock, never open nor remove the unit case as there are high voltage components inside the unit. Refer all servicing to your nearest dealer.
- Do not place cups, bowls, or other containers of liquid or metallic objects on top of the unit. If they accidentally spill into the unit, this may cause a fire or electric shock.
- Do not insert nor drop metallic objects or flammable materials in the ventilation slots of the unit's cover, as this may result in fire or electric shock.

⚠ CAUTION

When Installing the Unit

- Never plug in nor remove the power supply plug with wet hands, as doing so may cause electric shock.
- When unplugging the power supply cord, be sure to grasp the power supply plug; never pull on the cord itself. Operating the unit with a damaged power supply cord may cause a fire or electric shock.
- When moving the unit, be sure to remove its power supply cord from the wall outlet. Moving the unit with the power cord connected to the outlet may cause damage to the power cord, resulting in fire or electric shock. When removing the power cord, be sure to hold its plug to pull.
- Do not block the ventilation slots in the unit's cover. Doing so may cause heat to build up inside the unit and result in fire.
- Avoid installing the unit in humid or dusty locations, in locations exposed to the direct sunlight, near the heaters, or in locations generating sooty smoke or steam as doing otherwise may result in fire or electric shock.

When the Unit is in Use

- Do not place heavy objects on the unit as this may cause it to fall or break which may result in personal injury and/or property damage. In addition, the object itself may fall off and cause injury and/or damage.
- Make sure that the volume control is set to minimum position before power is switched on. Loud noise produced at high volume when power is switched on can impair hearing.
- Do not operate the unit for an extended period of time with the sound distorting. This is an indication of a malfunction, which in turn can cause heat to generate and result in a fire.
- Contact your dealer as to the cleaning. If dust is allowed to accumulate in the unit over a long period of time, a fire or damage to the unit may result.
- If dust accumulates on the power supply plug or in the wall AC outlet, a fire may result. Clean it periodically. In addition, insert the plug in the wall outlet securely.
- Switch off the power, and unplug the power supply plug from the AC outlet for safety purposes when cleaning or leaving the unit unused for 10 days or more. Doing otherwise may cause a fire or electric shock.

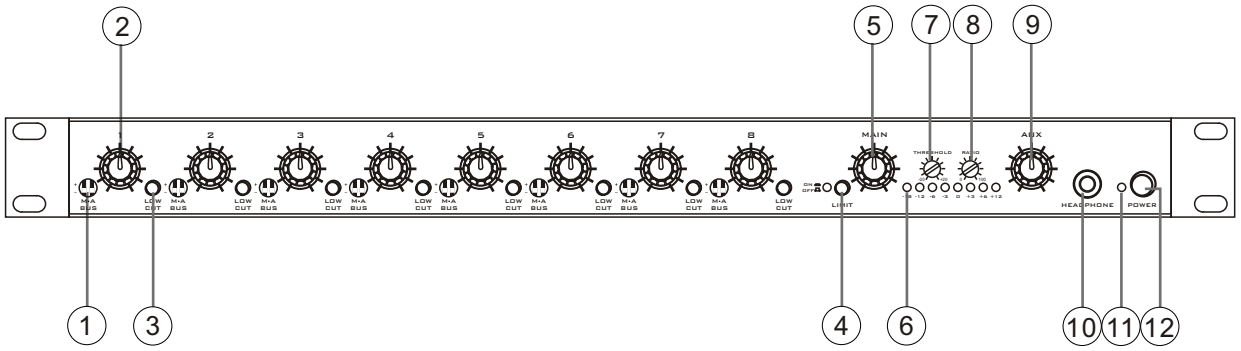
An all-pole mains switch with a contact separation of at least 3 mm in each pole shall be incorporated in the electrical installation of the building.

2. FEATURES

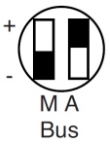
1. 8-channel separate switcher inputs.
2. dual lines design with main channel/assistive channel to output selector.
3. each input adopts insert Eroupean terminal.
4. seperate spare input.
5. XLR balance input & output.
6. multi-channel audio source mix up with public bus.
7. main output has each input with the selector switch of line and Mic.
8. each input can gain control.
9. each input is with low cut filter.
10. phantom power offer power for condenser Mic.
11. each input seperately control knob input PWL.
12. main output & spare output seperately control knob.
13. airproof potentiometer to low noise and long life.
14. external power source.
15. main output with compressor.
16. compressor with by-pass switch.
17. compressor adjustable threshold values and rate can be controlled.
18. LED drawing indicated output.
19. earphone output function.

3. NOMENCLATURE AND FUNCTIONS

3.1 FRONT PANEL

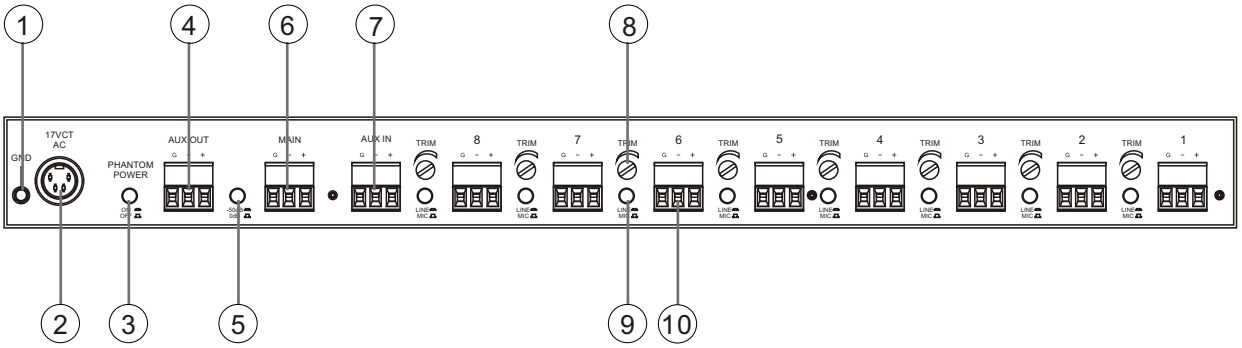


1. Main/Auxiliary Bus Selector (one per channel)
   A 4-position switch which selects destination of channel input. Input can berouted to: a) the main bus (M-up, A-down); b) the auxiliary bus (M-down,A-up-shown at right); c) both the main and auxiliary buses (both up); or d) neither bus (both down).

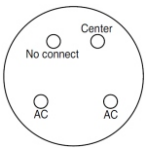


2. Channel Volume Control Knob (one per channel)
   Controls the volume of the channel input to any and all outputs simultaneously.
3. Low Cut Switch
   Helps eliminate low frequency noise (100Hz 18dB/octave).
4. Main Output Compressor/Limiter Switch and LED
   Note: Works only on main bus. Reduces distortion of the main output (due to clipping) by controlling its dynamic range. When the LED (red) is lit, the Compressor/Limiter is on.
   The brighter the LED, the more the signal is being compressed.
5. Main Output Volume Control Knob
   Controls the output signal volume of the main bus.
6. LED Bar Graph Output Meter
   Displays output signal level in decibels, ranging from -18 (green) to +12 (red) VU. 0 VU = +4dBm.
   This meter can be set to indicate the signal level of either the main or auxiliary bus and to indicate either the average or peak signal. (See page 18 for details.)
7. Threshold Control
   Screw-pot adjustment sets the signal level (-20 to +20 VU; factory setting is 0 VU) at which the Compressor /Limiter becomes active.
8. Ratio Control
   Screw-pot adjustment sets the amount of compression (0-100%; factory setting is 100%) of the signal above the threshold.
9. Auxiliary Output Volume Control Knob
   Controls the output signal volume of the auxiliary bus output and to the headphones.
   (There is no connection between this bus and the Compressor/Limiter.)
10. Headphone Jack
    A 1/4 inch-diameter TRS mono-only jack for the connection of headphones. (Only monitors AUX bus.)
11. Power Indicator LED
    LED displays mixers powered state. Lit when power is on. Not lit when power is off.
12. Power Switch Button
    Push button to turn unit on "in" position); push again to turn unit off ("out" Position).

3.2 REAR PANEL



1. Ground Connection on Rear Panel
   Access to ground.
2. AC Power Jack
   Mixer power supply input.
   Accepts a 4-pin DIN connection from a 17V CT 1.5 Amp transformer.



3. Phantom Power Switch
   When activated, supplies 30V DC power to all inputs set to MIC level.
4. Auxiliary Bus Output
   Balanced, line-level, connection to auxiliary output bus.
5. Main Output Microphone/Line Switch
   Selects main output to be either MIC (-50dB) or line (0dB) level.
6. Main Bus Output
   Balanced connection to main output bus.
7. Auxiliary Input
   Balanced, buffered, uncontrolled, line-level terminals for additional (ninth) input connection directly to the summing buses selected by internal jumpers. The factory default is both jumpers installed. (See page 18 for details.)
8. Input Gain/Trim Control Screw
   Adjusts gain of input stage, over a range of 40dB.
9. Input Pad Microphone/Line Switch
   Selects either MIC (-50dB) or line (0dB) level for corresponding input connection.
10. Input
    Balanced input connection (pluggable terminal strip).

3.3 Helpful Hints

Electrical equipment operates best in a clean, dry, well-ventilated environment free of vibration and electromagnetic fields. The following are some guidelines to achieve optimal performance.

Avoid placing the mixer and cables near heat sources. Be particularly aware of other audio equipment, such as amplifiers, which can produce a great deal of heat when operating.

To minimize hum in the system, avoid placing the mixer and cables near radio frequency devices and other electromagnetic field sources such as:
Fluorescent lights
Electrical motors
SCR dimmers
AC power lines, etc.

Note: Always use 2-conductor shielded cable to reduce EMI or RF interference to the Line/MIC inputs.

Keep the mixer and other equipment clean and free of dust by wiping occasionally with a soft, damp cloth.

Protect the mixer from electrical damage by disconnecting it from the power source whenever it will be unused for a week or longer.

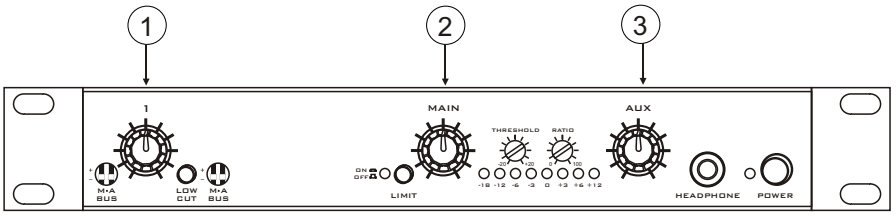
The Bogen mixer is easy to install and adjust. The only tools needed are:
1. Slotted screwdriver
2. Phillips-head screwdriver

4. INSTALLATION

Note: Take the mixer out of the box and inspect for shipping damage. If there is obvious physical damage to the outside of the mixer, contact the supplier of the mixer before you begin installation.

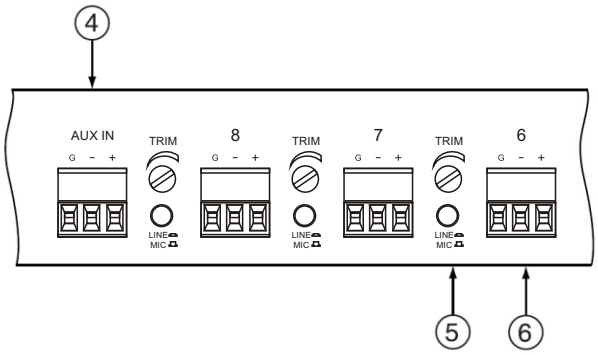
Rack Mounting: To mount the CAM8PRO to a 19" rack, lift the unit up to the front of the rack and secure it to the front of the rack with the necessary screws (not included with this unit).

A. Turn all mixer Volume Control Knobs [Channel(s) (1), Main (2), and Auxiliary (3)] to zero.

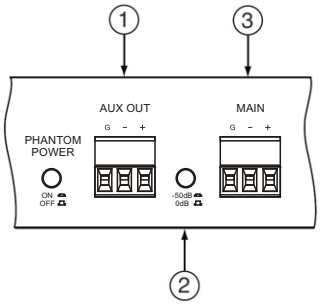


Turn amplifier(s) volume controls to the 7 o'clock position.

B. Connect Inputs.
Connect lead into desired pluggable terminal strip (6) on rear panel.
Press Input Pad Microphone/Line Switch (5) to appropriate position: "in" for line input or "out" for MIC input. Note that the input from some mics is actually close to line level (-20dB) and for such mics the switch should be at "Line". Set switch for all unused channels at Line level. The Auxiliary Input (4) is Line level only.



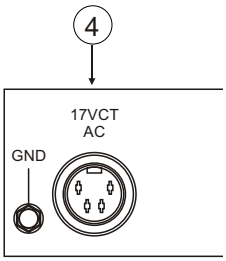
C. Connect Output: Make a connection between Main Bus Output Terminals (3) and an input jack of an amplifier. Press Main Output Microphone/Line Switch (2) to appropriate position: "in" for line-level output (0dB) or"out" for mic-level (-50 dB) output



If desired, also connect Auxiliary Bus Output Terminals (1) to a second destination device. The auxiliary output is line-level only.

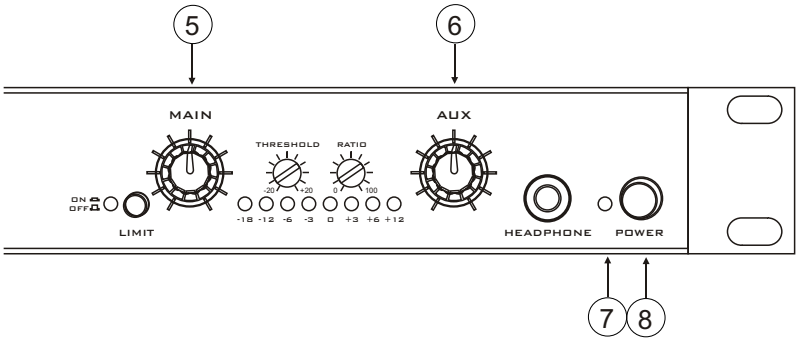
D. Connect mixer power supply to an AC power outlet and to the AC Power Jack (4) (located on far left side of rear panel).

E. Power up mixer:



Press Power Switch (8) to "in" position. [Power Indicator LED (7) will be lit if mixer is powered]. Set Main Output Volume Control Knob (5) to 2 o'clock. If auxiliary output is desired, also set Auxiliary Output Volume Control Knob (6) to 2 o'clock.

Power up amplifier:

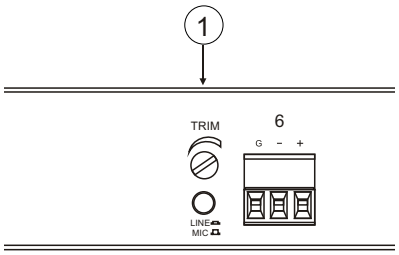


Note: Mixer will produce signal transients on power up and power down. Always turn the mixer on first before turning on the amplifier and always turn the amplifier off first before turning off the mixer.

5. OPERATION

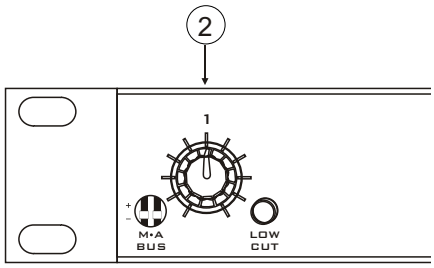
The primary goal when establishing the gain settings of the mixers is to have each channel operating at the maximum gain without clipping, while leaving adequate headroom on the volume control knob.

The channel Input Gain/Trim Control (1) on the rear panel of the mixers directly controls the microphone pre-amplifier gain available at each channel.



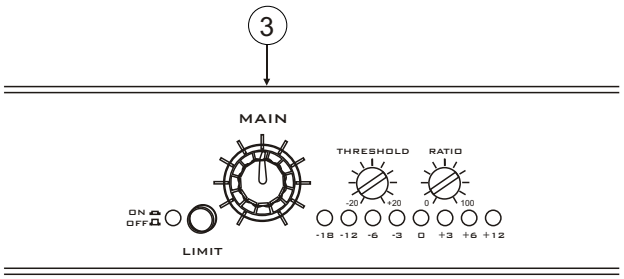
The Volume Control (2) on the front panel controls how much of the gain is routed to the main output stage. The front panel controls should optimally operate between the 9 and 2 o'clock position when gain structure is correct (see example on page 13).

E. Power up mixer:



The Main Output Volume Control Knob (3) on the front panel controls the mixer's final amplifier stage to the master output. This control should optimally operate between the 9 and 2 o'clock positions when gain structure is correct.

With all channels operating, the main output meter should show a signal output range between 0 and +6VU. Adjust the main output control accordingly. If the output occasionally peaks in the range of +6 and +12VU, activate the Compressor/Limiter (see page 16).



The amplifier for the loudspeakers should be the final control for establishing volume levels.

Note: The channel Input Gain/Trim Controls are factory preset to produce a 0dB signal level at the master output when the front panel volume controls are set at the 2 o'clock position. This setting is optimal with most input devices.

5.1 Troubleshooting Gain Structure

If the procedure followed to this point does not give satisfactory results, follow the appropriate adjustment sequence below:

If channel clipping occurs

If the signal is clipping or producing audible distortion, the gain is too high. Reduce the Input Gain/Trim Control (rear panel) by turning it counterclockwise until clipping does not occur. Also make sure that the new setting of the gain control offers a usable control range between the 9 o'clock and 2 o'clock positions on the front panel volume control knob.

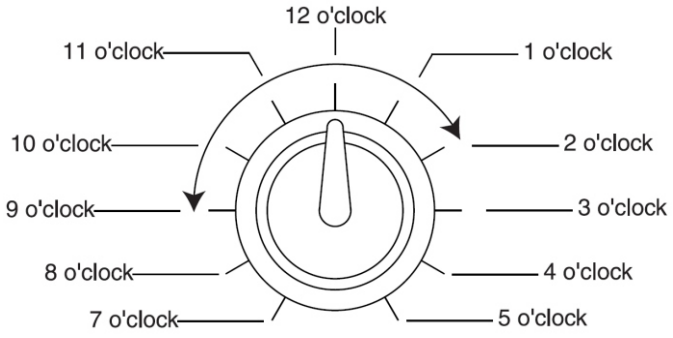
If channel volume is too low

If a channel must be set above the 2 o'clock position to provide adequate volume, the input gain setting is too low. Turn the volume control knob to the 1 o'clock position and increase the input gain by turning the input gain/trim control clockwise until clipping occurs, or VU meter is over 0 VU. Then adjust the gain to a setting just below the clipping level.

If channel volume is too high

If a channel is not clipping but must be set below the 9 o'clock position to achieve the proper volume level, the input gain control setting is too high. Reduce the Input Gain/Trim Control by turning it counterclockwise. Set the volume control knob to the 9 o'clock position and continue to adjust the gain control until the desired volume level is achieved.

Range for optimal volume control operation settings (indicator positions).

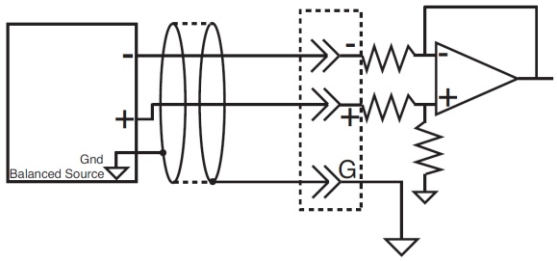


5.2 Recommended Input Wiring Methods

These are the best ways to connect sources to the mixer. The mixer input is always balanced. From the drawings below choose the wiring method for your input device (either balanced or unbalanced).

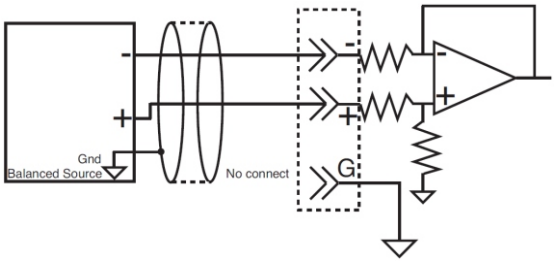
Balanced Source to Balanced Input - Method 1 (Normal)

Shown below is the normal wiring method for a balanced source device. It has +6 dB gain and excellent ground current and noise rejection.



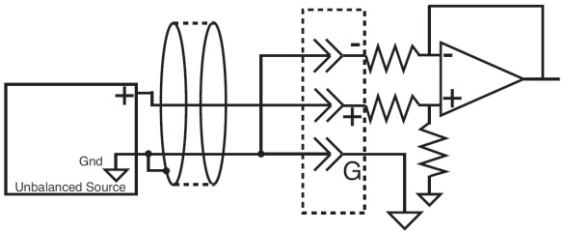
Balanced Source to Balanced Input - Method 2

If the method above does not work in your application, use the wiring shown below. This method can solve certain ground loop problems. It has +6dB gain and good noise and ground loop rejection.



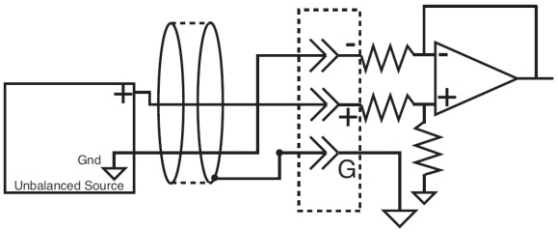
Unbalanced Source to Balanced Input - Method 1

For an unbalanced source device, the drawing below shows the best wiring method.
Because of the design of the mixer, this wiring provides a slight (+6 dB) boost, and moderate noise and ground loop rejection.



Unbalanced Source to Balanced Input - Method 2

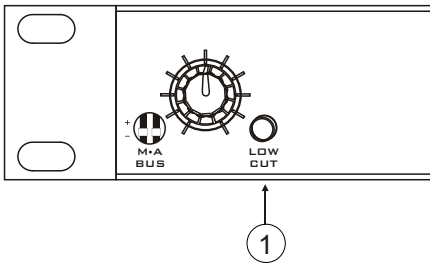
For an unbalanced source device, the drawing below shows an alternative wiring method.
Because the grounding of the minus input is not to the mixer ground, this method does not provide the +6 dB boost. Ground current and noise rejection is good.



5.3 Fine Tuning

Low Cut Switch

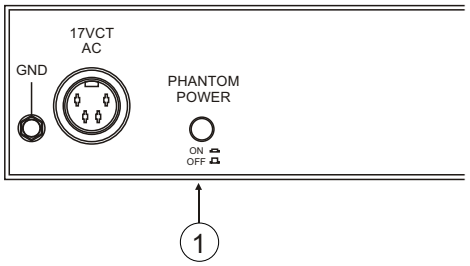
To remove excessive bass from an individual channel, press the Low Cut Switch (1) for that channel.



This feature helps eliminate low frequency noise (signals of 100 Hz and below, such as background rumble from ventilation systems, etc.) and is used primarily with mic-level input. It is particularly effective when handheld mics are used.

Phantom Power

If a condenser microphone(s) is not independently powered, press Phantom Power Switch (2) to the " on" position.

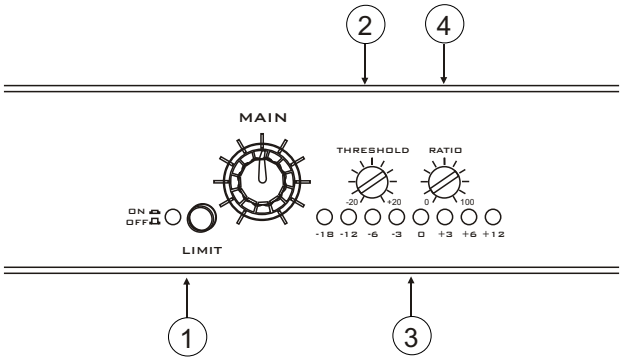


The phantom power switch will power condenser (capacitor) Mics through the Mic cable.
Depressing the button simultaneously applies phantom power to all channels set to mic-level.

5.4 Compressor/Limiter

Low Cut Switch

To remove excessive bass from an individual channel, press the Low Cut Switch (1) for that channel.



The **Compressor/Limiter** (1) is a dynamic range controller that can be used to compensate for signals that may sound unnatural or cause audible distortion. This is indicated by the LED Bar Graph Output Meter (3) occasionally exceeding +12 VU (red).

Note: The Compressor/Limiter only affects the main channel.

A Compressor is used to slightly reduce the dynamic range of a signal. This effect is perceived to quiet loud sounds and boost quiet sounds. A compressor smooths transients.

A Limiter is used to prevent a signal from exceeding a certain level. This function guards against amplifier or recording level overloads. The Compressor/Limiter is activated by pressing the Main Output Compre -ssor/Limiter Switch.

This dynamic controller allows for compression and limiting functions by controlling threshold and ratio.

The **Threshold Control** (2) is a screw potentiometer that sets what signal level will activate the Compressor/Limiter. It has a range of -20 to +20 dB.

The **Ratio Control** (4) is a screw potentiometer that sets the compression ratio that will be applied when the signal exceeds the threshold. It has a range from 0% to 100%. A Compressor becomes a Limiter when the compression ratio is 10:1 or greater.

The factory setting for the threshold is 0 VU (+4 dB), but this is variable (from -20 dB to +20 dB) and can be changed by adjusting the Threshold Control. Likewise, the factory setting for the compression ratio is 100% (at this maximum setting, the circuit performs the limiter function), but can be set to between 0 and 100% by adjusting the Ratio Control.

Note: The LED Bar Graph Output Meter can be used to view the effects of adjusting the Compressor/ Limiter controls. Turn off power amplifiers while performing these adjustments.

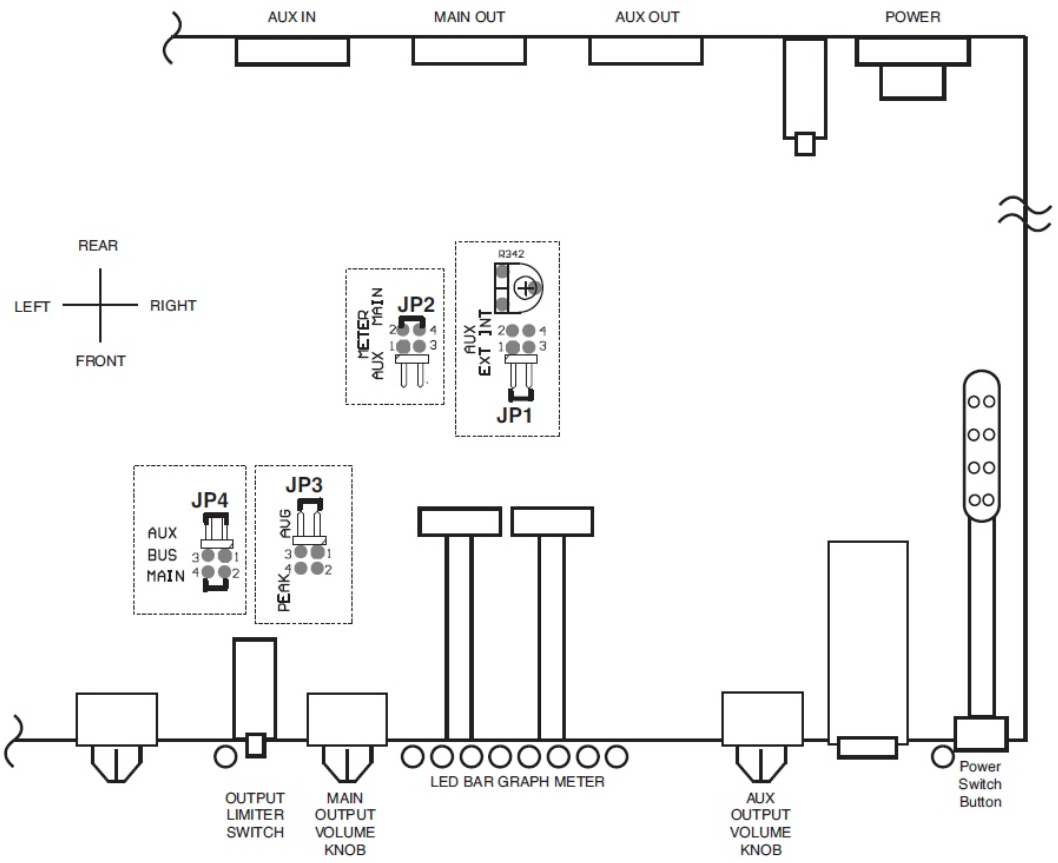
Warning: If the amplifier/speaker combination being used is such that the speaker(s) can be overdriven to failure, always operate the mixer with the Output Limit Switch in the "on" position and the ratio should be set at 100%.

5.5 Special Features Activation

The mixer has several built-in features which are easily activated by making adjustments inside the mixer chassis. Changing the selection of all built-in features requires only the correct placement of internal jumpers or varying the settings of an internal potentiometer.

Note: All the internal components-jumpers and potentiometers-to which adjustments are needed for built-in features are highlighted within dashed areas in the drawing below.

Warning: Adjustments made to any other internal components may void the warranty.



5.6 Jumper Options

Changing Jumper Settings

To change a jumper setting, remove the ten screws secured to the top of the mixer. After removing the top of the mixer, locate the jumper to be changed by referring to the drawing on page 17. Jumpers are included from the factory in positions: JP1: 1-3, JP2: 2-4,JP3: 1-3, JP4: 1-3, 2-4..

Warning: Disconnect AC Power before opening case.

Bar Graph Options

The mixer.s meter can be configured to meter the output of either the main or auxiliary bus. In addition, the bar graph can be configured to register either the peak or average level of the audio signal.

JP2

The LED Bar Graph Output Meter can be set to register either the main or auxiliary bus output audio signal. The choices are:

MAIN installed: The Bar Graph meters the main bus output. This is the factory default.
AUX installed: The Bar Graph meters the auxiliary bus output.
Note: The meter will operate only when a jumper is in one of these two positions.

JP3

The LED Bar Graph Output Meter can be set to register either the peak or average level of the output audio signal. The choices are:

PEAK installed: The Bar Graph meter registers the peak level of the audio output.
AVG installed: The Bar Graph registers the average level of the audio output.
This is the factory default.
Note: The meter will operate only when a jumper is in one of these two positions.

Bus Routing Options

AUX In Jumpers: JP4

These jumpers determine the destination of the Auxiliary Input. The choices are:
MAIN installed: Auxiliary Input is routed to Main Output.
AUX installed: Auxiliary Input is routed to Auxiliary Output.
MAIN and AUX both installed: Auxiliary Input is routed to both Main and AUX outputs.
This is the factory default setting.

AUX Source Jumpers: JP1

These jumpers determine which of two gain controls are used to control the level of the AUX output. The choices are:

INT installed: AUX output gain is controlled by the internal pot, "AUX Pre gain Pot" R342 (see page 17 for location). The front panel AUX output volume knob continues to independently control the gain of the headphone amplifier jack on the front panel. This setting is typically used in a linking situation where the output from a mixer must remain fixed, since JP1 makes the output of that mixer tamper proof (from the front panel).
With INT installed, the front panel AUX volume knob controls only the headphone level.
EXT installed: AUX output gain is controlled by AUX volume knob on front panel.
The 1/4-inch Headphone amp is also controlled by the AUX volume knob, but not independently of the AUX output.
This is the Factory Default.

Note: Never install jumpers in both positions INT and EXT.

6.TROUBLESHOOTING TIPS

NO POWER
Check the connections between the mixer and the power supply and the external AC power supply.
Examine the 4-pin connector as shown on page 22.
Check the wall outlet.

NO SOUND
- Make sure the MIC/Line switch is in the proper position. (This is the most likely cause.)
- Make sure both the master and channel input controls are turned up.
- Check that the source signal cable(s) is properly connected and undamaged.
- Adjust Input Gain/Trim Control potentiometer(s) to increase gain.
- If there is still no sound, try changing input source(s) to different channel(s).

DISTORTED SOUND
- Turn down the master volume control. If distortion persists, input channel(s) gain is the likely cause.
- Check position of all line/MIC switches.
- Determine the distorting input channel(s) by checking them one at a time.
- Decrease gain of input channel(s) causing distortion by turning the screw on the rear panel.

EXCESSIVE HISS or HUM
Hiss: Make sure the volume control knobs for all the unused channels are turned all the way off (i.e., at the 7 o'clock position).

- Make sure that all unused input channels have the MIC/Line switch in the Line position.
- Make sure the MIC/Line switch is in the correct position for both the inputs and the main output.

Hum: MIC lines can easily cause hum. Make sure to locate them away from vibration and magnetic field sources (motors, power supplies and lines, and data lines).

Check MIC lines, especially the shield, for damage.

Another common source of hum is a ground loop, which can result from connecting two or more powered devices together.

Turn both the Main and Auxiliary volume controls down. If the hum is still present, the ground loop or other cause is not in the mixer, but in the devices that come after it in the audio path or in the connection between the mixer and following equipment. (If the hum disappears, then the cause is either in the mixer or in one of the inputs to the mixer. Turn each of the volume controls [both the individual input channels and the two buses] down independently, to determine which one is the source of the hum.)

Check for unbalanced connections; use balanced connections, if possible. For all unbalanced connections, try disconnecting the signal line ground to eliminate multiple ground paths.

7. GLOSSARY

Auxiliary Input - Accepts only a balanced, line-level input (unlike the 8 channels); the auxiliary input has no volume control.

Compression Ratio - The ratio of the output level above the threshold level to the input level above the threshold.

Compression Threshold - The volume level, in dB, which is set as the optimum device operating level, and above which the Compressor/Limiter begins to operate.

Compressor - A special type of limiting device, which controls the total volume level of a signal by compressing the part of the signal which exceeds a predetermined threshold.
The threshold can be varied.

Gain/Trim Control - Gain is the ratio between the input and output signal levels. Trim is the adjustment of the gain of the input stage to offset the differences between input signal levels.

Ground Loop - A condition which can occur when several ground pathways exist between two or more devices and which can cause hum in the audio signal.

Jumper - A short length of conductor used to connect pins electrically.

Limiter - A device that severely (at rates greater than 10:1) restricts the upper dynamic range of a signal, by regulating the rate of increase of an input signals amplitude so that it will not exceed a predetermined threshold.

Line/Microphone Level - The two signal level ranges at which the mixer accepts input.
MIC level is usually -50 dB and Line level is usually +4 dB.

Low Cut Switch - Removes the lower-frequency (<100 Hz) components, which cause rumble, from a signal.

Phantom Power - A method of powering condenser microphones by sending DC current over the same MIC cable that carries the audio signal. Called "Phantom" as there is no visible power cord and the voltage is not perceptible in the audio signal.

Pot - Potentiometer.

RCA Connector - An unbalanced line level connection, also known as"phono connector".

Summing Junction - The point in the T-8S02 circuitry where the audio signals are mixed.

8. TECHNICAL INFORMATION

SPECIFICATIONS

Model..... T-8S02
Signal-to-Noise .....Ref +26dB V @ 54 dB sys gain = 90dB
MIC Pre-amp Equivalent Input Noise .....-129dB @ 150 ohm, 20 Hz to 20 kHz
Maximum Voltage Gain..... 96dB
Frequency Response ..... ±1dB from 20 Hz to 20 KHz;
+0, -3 dB from 10 Hz to 30 Khz
Crosstalk (adjacent channels)..... better than -90 dB
Phantom Power.....+30V DC

INPUTS 1-8

Input Impedance .....3.5k ohm MIC; 15k ohm Line
Nominal Source Impedance ..... 150 ohm
Line Pad .....-50 dB
Input Gain/Trim Range ..... 40 dB
Nominal Level (input trim pot mid-range) .....-50 dB line pad off; 0 dB line pad on
Minimum Level (input trim pot max gain) .....-70 dB line pad off; -20 dB line pad on
Maximum Level
(input trim pot min gain plus +20 dB headroom) .....-30 dB line pad off; +20 dB line pad on

AUXILIARY INPUT

Input Impedance ..... 20k ohm balanced
Nominal Input Level .....0 dB

OUTPUTS

Output Impedance..... 220 ohm unbalanced, 440 ohm balanced
Nominal Load Impedance ..... > 600 ohm
Nominal Level .....+4 dB RMS
Maximum Level..... +26 dB RMS Balanced
Main Output MIC Pad ..... -50 dB

AUXILIARY CIRCUITS

LED Bar Graph .....-18, -12, -6, -3, 0, +3, +6, +12VU
(0 VU = +4 dB) Average or Peak reading

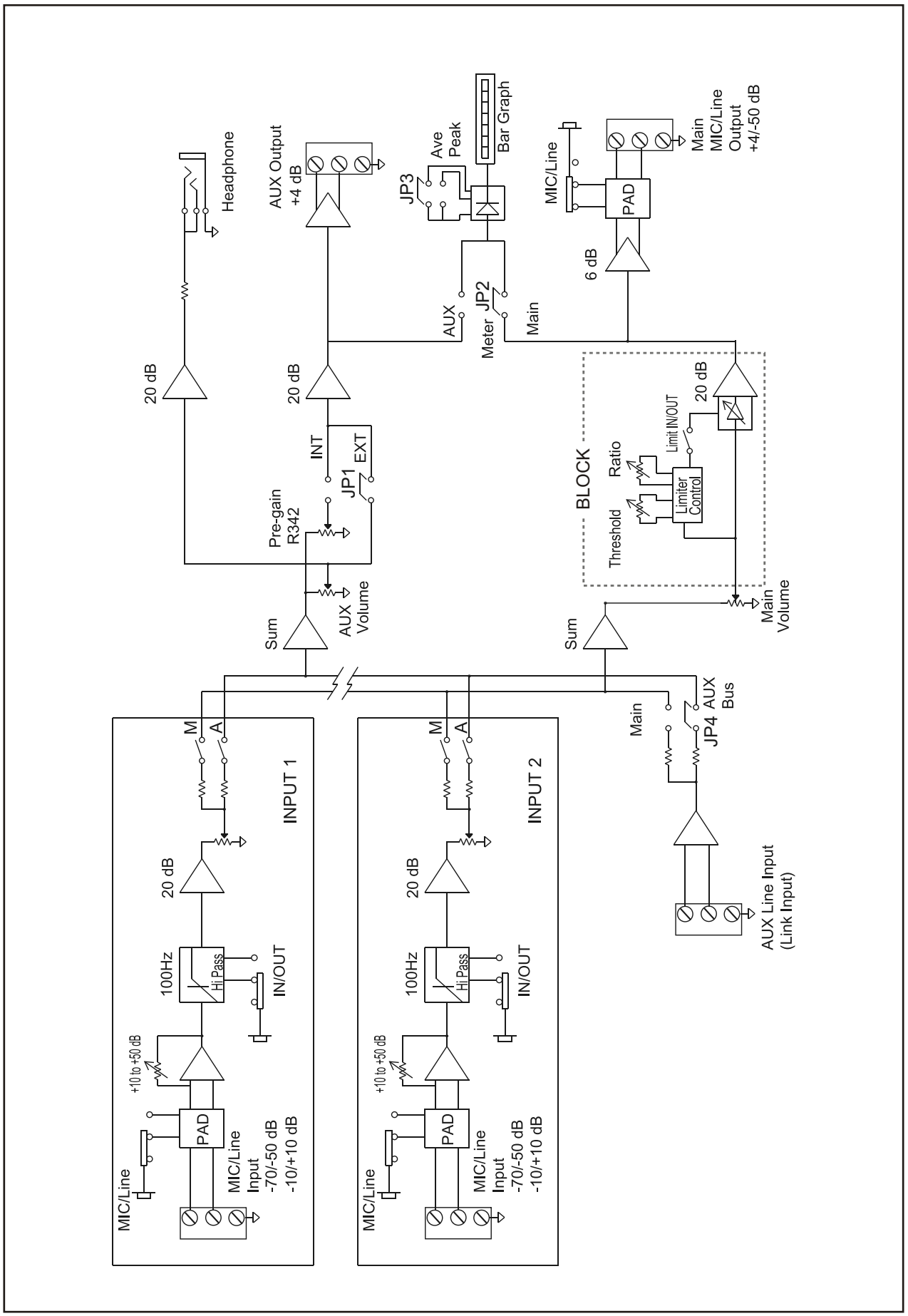
LIMITER/COMPRESSOR

Threshold Adj. Range ..... -20 dB to +20 dB
Ratio Adj. Range ..... 0 to 100%
Low Cut Filter ..... 18 dB/octave at 100 Hz

UNIT SPECIFICATIONS

Power Requirements..... 17V AC center-tapped; 230V AC, 50Hz
Dimensions 484X190X44mm
Product Weight 3.9Kg

9. BLOCK DIAGRAM



PUBLIC ADDRESS SYSTEM

Version V0.1