MIXER PREAMPLIFIER

User's Manual

NF03570-1.1

INDEX

TROUBLE SHOOTING

Symptom	Likely Cause	What to do
No sound	Speaker not connected to active AC power	Verify that speaker is connected and that the circuit is on
	Power not switched on	Switch on power and verify that power Led is on
No sound, speaker is connected to working AC power but won't come on	Speaker power cable is faulty or improperly connected.	*Re-seat the power cable at both ends; *Substitute a known-good power cable
	Blown fuse	*Check fuse & replace with same type "spare fuse in holder"
No sound Speaker comes on	Signal source (mixer, Amp instrument) is not sending	*Check if the signal LED indicators are lit on *Verify that the tape or CD is playing; *Use headphones to verify that the instrument is actually sending an audio signal
	Faulty cables & connections	*Disconnect and re-seat signal cables; *Replace suspected cable with a known-good cable
No sound with microphone connected to MIC / LINE input	Microphone requires phantom power	The EON does not supply phantom power. Switch to a dynamic microphone, use a battery powered microphone (if possible), use an external phantom power supply for condenser type microphones.
Signal sounds distorted and very loud, LIMIT light is lit most of the time	Excessive input signal, trying to exceed the capabilities of the speakers	*Reduce the output level of the source; *Turn down the level controls on the speaker; *Use additional EON speakers
Lots of hiss in sound, mixer controls are at very low settings.	Improper gain structure	*Make sure that the MIC / LINE switch is in the LINE (disengaged) position; *Reduce the level settings at speaker, Review the Owner's Manual for your mixer and adjust controls as needed; *Input sensitivity (gain); *Channel faders; *Master faders;
Hum or Buzz	Improper A/C gounding, ground loops	*"lift" audio ground by using XLR/F to XLR/M adapter on one end *Re-route audio cables away from AC power and lighting cables.
	Excessively long unbalanced cable run	*Use the balanced outputs (if available) of your mixer or source equipment to drive your EON speakers. *Use "DI" (direct injection) box to convert unbalanced equipment output to a balanced output.
	Improper system gain structure	Reduce the INPUT level controls and increase the output level of your source devices.

Impedance	Microphone Input	1.4k Ohms
	All Other Input	10k Ohms or Greater
	All Other Outputs	120 Ohms
Equalizer	High	±15 dB @12 kHz
	Mid	±12 dB @2.5 kHz
	Low	±15 dB @80 Hz
Crosstalk	Adjacent Input	≦-70dB@1kHz(Ch1-6);≦-68 dB@ 1KHz (CH7-12)
	Input to Output	≦-82 dB @ 1KHz (CH level at max, EQ at MID, MAIN level and other at min, SW at line)
Main Mix Section	Line output	0 dBu(±2dBu) Balanced(CH level &MAIN & EQ at MID, other at min, sw at line)
	MIC output,MONO output	0 dBu(±2dBu) Unbalanced, 1/4" Jacks(CH level &MAIN & EQ at MID, other at min, sw at line)
	Max output	+21 dBu Blanced/Unbalanced, 1/4" Jacks
	Noise (Bus noise)	≦-83dB @ 20Hz~22KHz (channel & MAIN level & EQ at MID, other at min, sw at line)
Dielectric Strength	Between Live+Negative→Earth	1500VAC at Test,Frequency 50/60Hz,Leakage Current: 5mA for 1minute
	Between Live+Negative→IN/OUT Terminal(Positive+Negative)	3000VAC at Test,Frequency 50/60Hz,Leakage Current: 5mA for 1minute
Insulation Resistance	Between Live+Negative→Earth (A Voltage of 500VDC)	>2MΩ
	Between Live+Negative→IN/OUT Terminal(Positive+Negative) (A Voltage of 500VDC)	>4MΩ
Power supply	Main voltage	220~240VAC/110~120VAC ~ 50/60Hz or 24VDC
Physical	Dimension (WxDxH)	483*195*44mm
	Weight	Net :2.9kg

SAFETY RELATED SYMBOLS

The symbol is used to indicate that some hazardous live terminals are involved within this apparatus, even under the normal operating conditions.

The symbol is used in the service documentation to indicate that specific component shall be only replaced by the component specified in that Documentation for safety reasons.

⏚ Protective grounding terminal.

~ Alternating current /voltage.

ϟ Hazardous live terminal .

ON: Denotes the apparatus turns on.

OFF: Denotes the apparatus turns off, because of using the single pole switch, be sure to unplug the AC power to prevent any electric shock before you proceed your service.

WARNING: Describes precautions that should be observed to prevent the danger of injury or death to the user.

Disposing of this product should not be placed in municipal waste and should be separate collection.

CAUTION: Describes precautions that should be observed to prevent danger of the apparatus.

WARNING

- **Power Supply**

Ensure the source voltage matches the voltage of the power supply before turning ON the apparatus.

Unplug this apparatus during lightning storms or when unused for long periods of time.

- **External Connection**

The external wiring connected to the output hazardous live terminals requires installation by an instructed person, or the use of ready-made leads or cords.

- **Do not Remove any Cover**

There are maybe some areas with high voltages inside, to reduce the risk of electric shock, do not remove any cover if the power supply is connected.

The cover should be removed by the qualified personnel only.

No user serviceable parts inside.

- **Fuse**

To prevent a fire, make sure to use fuses with specified standard (current, voltage, type). Do not use a different fuse or short circuit the fuse holder.

Before replacing the fuse, turn OFF the apparatus and disconnected the power source.

- **Protective Grounding**

Make sure to connect the protective grounding to prevent any electric shock before turning ON the apparatus.

Never cut off the internal or external protective grounding wire or disconnect the wiring of protective grounding terminal.

- **Operating Conditions**

This apparatus shall not be exposed to dripping or splashing and that no objects filled with liquids, such as vases, shall be placed on this apparatus.

To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.

Do not use this apparatus near water. Install in accordance with the manufacture-r's instructions. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat. Do not block any ventilation openings.

No naked flame sources, such as lighted candles, should be placed on the apparatus.

IMPORTANT SAFETY INSTRUCTIONS

- Read these instructions.
- Follow all instructions.
- Keep these instructions.
- Heed all warnings.
- Only use attachments/accessories specified by the manufacturer.

- **Power Cord and Plug**

Do not defeat the safety purpose of the polarized or grounding type plug.

A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.

Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.

- **Cleaning**

When the apparatus needs a cleaning, you can blow off dust from the apparatus with a blower or clean with rag etc.

Don't use solvents such as benzol, alcohol, or other fluids with very strong volatility and flammability for cleaning the apparatus body. Clean only with dry cloth.

- **Servicing**

Refer all servicing to qualified personnel. To reduce the risk of electric shock, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so .

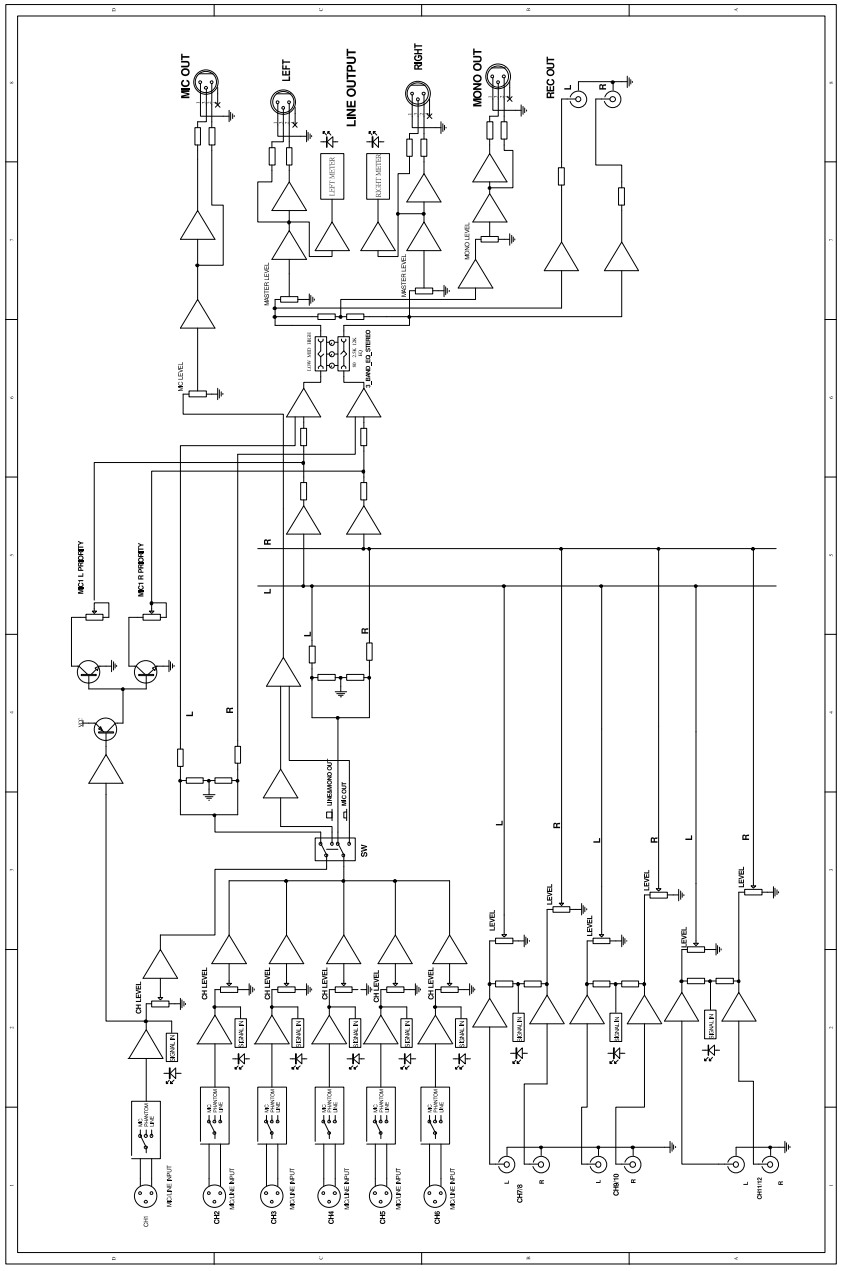
Servicing is required when the apparatus has been damaged in any way , such as power supply cord or plug is damaged , liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture , does not operate normally, or has been dropped.

The mains plug is used as the disconnect device, the disconnect device shall remain readily operable.

TECHNICAL SPECIFICATIONS

Input Channels	**Mono channels(CH1-CH6)**	
	Microphone Input	Electronically Balanced, Discrete Input Configuration
	Frequency Response:	20Hz to 22kHz, +/-2dBu
	Distortion(THD&N)	≦0.03% At 1kHz
	Sensitivity	-40dBu
	Max. Input	-19dBu
	Maximum Voltage Gain	60dB CH MIC INPUT→MAIN OUT(XLR,balanced)
		50dB CH MIC INPUT→REC OUT(Unbalanced)
		60dB CH MIC INPUT→MIC OUT(Unbalanced)
		60dB CH MIC INPUT→MONO OUT(Unbalanced)
	SNR(Signal to Noise Rate)	≧103dB
	Phantom power(Mic Pin2/Pin3 & Pin1)	+18V～+21V with switch control
	Line Input	Electronically Balanced
	Frequency Response:	20Hz to 22kHz, +/-2dBu
	Distortion(THD&N)	≦0.03% At 1kHz
	Sensitivity	0 dBu
	Max. Input	+21 dBu
	Maximum Voltage Gain	20dB CH MIC INPUT→MAIN OUT(XLR,balanced)
		10dB CH MIC INPUT→REC OUT(Unbalanced)
		20dB CH MIC INPUT→MIC OUT(Unbalanced)
		20dB CH MIC INPUT→MONO OUT(Unbalanced)
	Stereo channels(CH7/8-CH11/12)	
	Line Input	Electronically balanced
	Frequency Response:	20Hz to 22kHz, +/-2dBu
	Distortion(THD&N)	≦0.03% At 1kHz
	Sensitivity	+10dBu
	Max. Input	+21 dBu
	Maximum Voltage Gain	10dB CH MIC INPUT→MAIN OUT(XLR,balanced)
		0dB CH MIC INPUT→REC OUT(Unbalanced)
		4dB CH MIC INPUT→MONO OUT(Unbalanced)
	SNR(Signal to Noise Rate)	≧103dB

BLOCK DIAGRAM



INTRODUCTION

Thank you very much for expressing your confidence in our products by purchasing this mixer pre amplifier. The preamplifier is a professional compact preamplifier. You will get smooth, accurate more natural and open sound from this apparatus, and it is really ideal for gigs, recording and fixed PA installations.
This pre amplifier is very easy to operate but we advise you to go through each section of this manual carefully. In this way you will get the best out of this mixer preamplifier.

Features:

This mixer preamplifier is designed for professional application with following features:

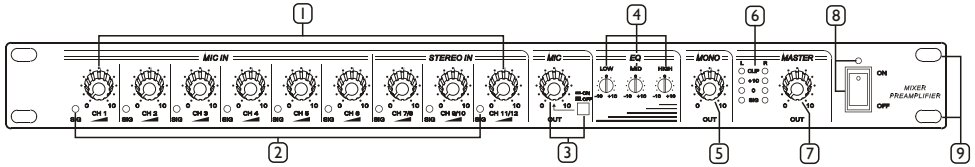
MONO channels:
6 COMBO inputs
MIC, MIC with Phantom power, LINE switch selector.
Low-distortion MIC pre-amp with high dynamic range, Balanced XLR and TRS input jacks.
Phantom power on each MIC input channel.
CH level control, SIGNAL LED to indicate input signal.
MIC 1 PRIORITY MUTE potentiometer
STEREO channels
CH7/8, CH9/10, CH11/12 RCA inputs
Input level control, input signal LED
STEREO LINE OUTPUT, balanced XLR for mixing LEFT/RIGHT output
MONO OUTPUT and level control
MIC OUT for monitoring CH1-CH6 output and MIC/LINE SWITCH control, LEVEL to change output signal
STEREO REC OUT, RCA for mixing L/R OUT
3-BAND EQ for LOW, MID, HIGH
MASTER level controls the main output level, output signal LED
4-segment signal level meters, using master level to control LINE OUTPUT signal

GETTING STARTED

(1) Please check the AC voltage available in your country before connecting your preamplifier to the AC socket;
(2) Be sure that the main power switch is turned off before connecting to the AC socket. Also you should make sure that all input and output controls are turned down. This will avoid damage to your speaker and avoid excessive noise.
(3) Before turn on the preamplifier you should connect it to a power amplifier and turn on the mixer BEFORE the power amplifier. Once you have finished your working session you shall turn the mixer off AFTER the power amplifier.
(4) Before disconnecting the preamplifier always turn off the power switch.
(5) Do not use solvents to clean your preamplifier. A dry and clean cloth will be OK.

CONTROL ELEMENTS

FRONT PANEL



1.MIC INPUT VOLUME KNOBS

MIC channel 1 would have priority over other MIC input channels. This functions can be disabled by adjusting the MIC priority knob at the back of the unit.

Adjustment of high gain may distort the original signal but too low may cause insufficient signal.

Trim each channel individually by fixing the main output to a certain level while turning off other channels. Repeat this step and mark the level at each knob to avoid constant sound setup.

The rotary knobs for microphone inputs 1 to 6, 7/8, 9/10,11/12 are for adjustment of input signal levels. In setup, adjust this gain to the optimum level according to the required output level.

Different channel may have different input source(ie:condenser or dynamic MIC, etc)

2.SIGNAL LED

The presence of the input signal is indicated at this LED. The strength of input signal shall determine the brightness of the LED indicators.

3.MIC/LINE SWITCHABLE BUTTON& MIC CONTROL KNOB

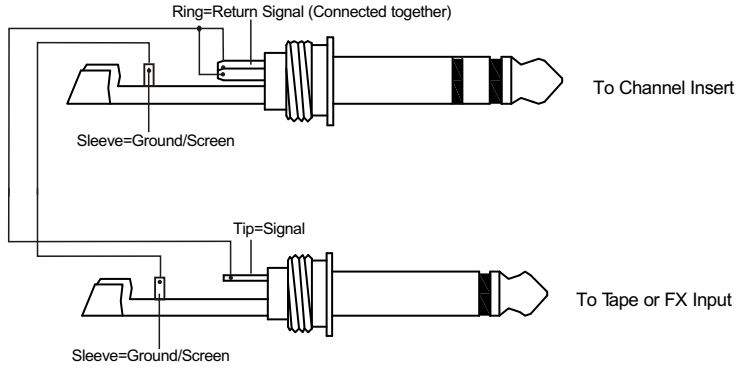
The MIC / LINE SWITCHABLE button is used for selecting the MIC out or LINE out. When the button is pressed, only CH1-CH6 have output from MIC out, MIC volume knob is activated(at present the MIC1 has no priority). The volume can be adjusted by rotating the knob to increase/ decrease the MIC output level. But LINE out has no output(this function is used for monitoring the MIC out from CH1-CH6). When the button is released, all out have signal output except MIC out.

4. EQUALIZER

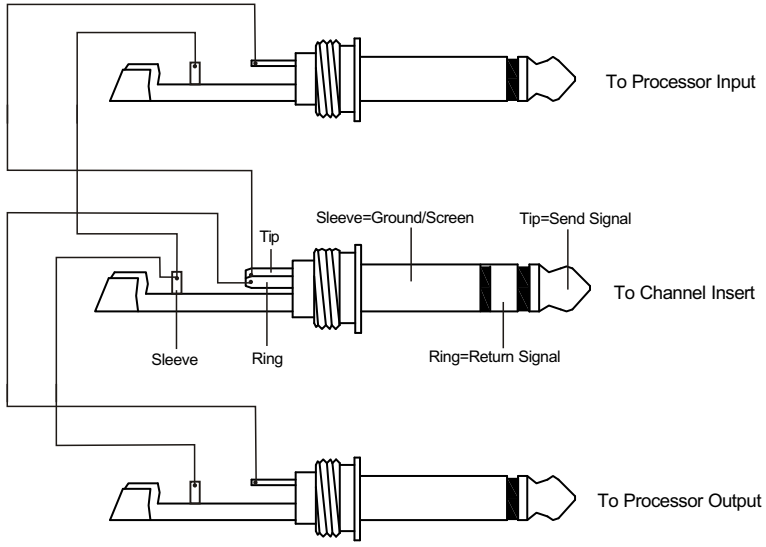
The pre amplifier is equipped with 3-band mid sweep EQ: LOW, MID & HIGH.

-LOW

This is the bass control. It is used to boost male voice, kick-drum or bass guitar. Your system will sound much bigger than what it is. The gain range goes from -15dB to +15dB with a centre frequency of 80Hz.



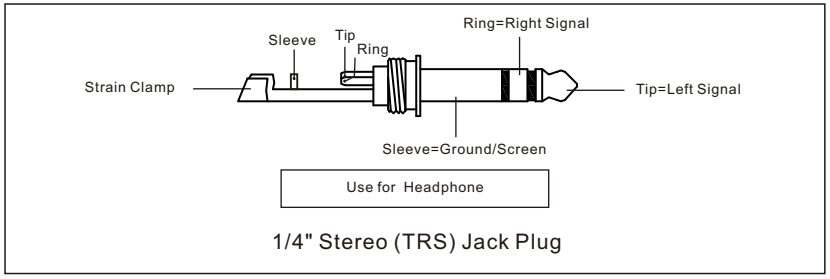
'Tapped' Connection Direct Output Lead
(Enables the Insert to be used as a Direct Output while maintaining the channel signal flow)



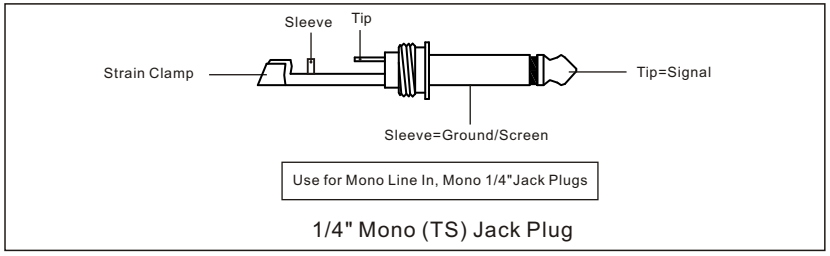
Y-Stereo lead for insert Connection
(To be used when the processor does not employ a single jack connection for the In/Out Connections)

Some Final Tips on Wiring Configuration

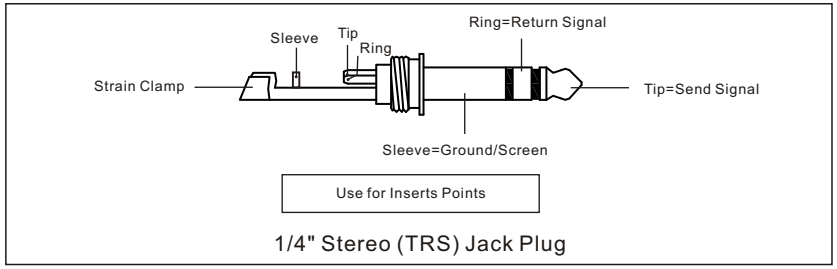
You can connect unbalanced equipment to balanced inputs and outputs. Simply follow these schematics.



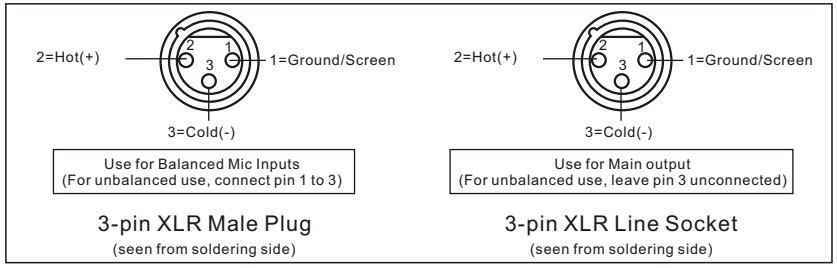
1/4" Stereo (TRS) Jack Plug



1/4" Mono (TS) Jack Plug



1/4" Stereo (TRS) Jack Plug



3-pin XLR Male Plug
(seen from soldering side)

3-pin XLR Line Socket
(seen from soldering side)

-MID

This is the midrange control. It provides -12dB to +12dB boost or cut with a centre frequency of 2.5kHz. It can affect most fundamental frequencies of all musical instruments and human voice.

-HIGH

This is the treble control. You can use it to get rid of high frequency of human voice. The gain range goes from -15dB to +15dB with a centre frequency of 12kHz.

5.MONO

The level control knob sets the level of mono output signal, ranging from - ∞ to +10 dBu.

6.L/R LED METER

The LED meter indicate the level of input signal. Also a clipping indicator is supplied.

7.MASTER

This knob is used for adjusting the LINE output level. To avoid over amplification, it's recommended that this level be set properly.
It is advisable that the gain be set to minimum when powering the system as well as shutting down as this can eliminate sudden signal burst to your system.

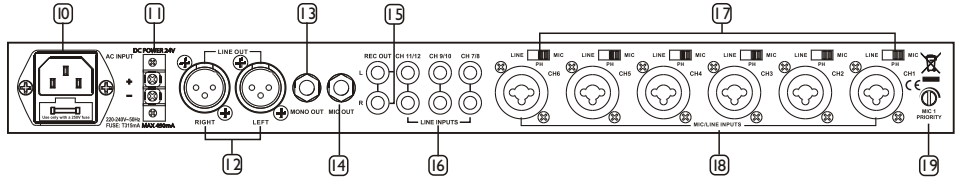
8.POWER SWITCH &LED INDICATOR

This switch controls to power on/off the unit. When the unit is switched on, the LED will light up. The unit is also provided a 24V DC backup power supply. Then the switch will control its on/off.

9.MOUNTING EAR

The mounting ear is adopted to easily install the unit on the rack.

REAR PANEL



10.AC INLET with FUSE HOLDER

This connector is meant for the connection of the supplied power cord. Please check the Voltage accepted by the unit and the Voltage available from AC sockets before connecting the unit to the Mains.

11.DC POWER SUPPLY

This pre-amplifier can also operate using 24V DC power supply. When both the AC and DC source is connected, is shall operate using AC main whereas the DC supply shall be only consumed whenever the former failed.

12. LINE OUT

These stereo outputs are supplied with the XLR jacks, delivering signal output from all input sources.

13.MONO OUT

This 1/4" phone jack is unbalanced TRS connector. It can be regarded as a sum output of the left and right of MAIN MIX.

14.MIC OUT

This 1/4" phone jack is unbalanced TRS connector used for microphone output.

15.REC OUT(PHONE JACK)

These unbalanced RCA jacks are to be connected to recording media such as cassette tape recorder.

16.LINE INPUTS

Double-line inputs(RCA connectors for stereo music sources). The left and right channels are combined, resulting in a single mono signal that can be directed to one or two the audio outputs.

17.LINE/MIC/PHANTOM POWER SWITCH

This switch is used for selecting the LINE, MIC or phantom power(+18~21V). Push the switch to left, the input enters into LINE mode; put the switch in the middle position, the +18V phantom power come into force; and push the switch to right, the input becomes MIC mode.

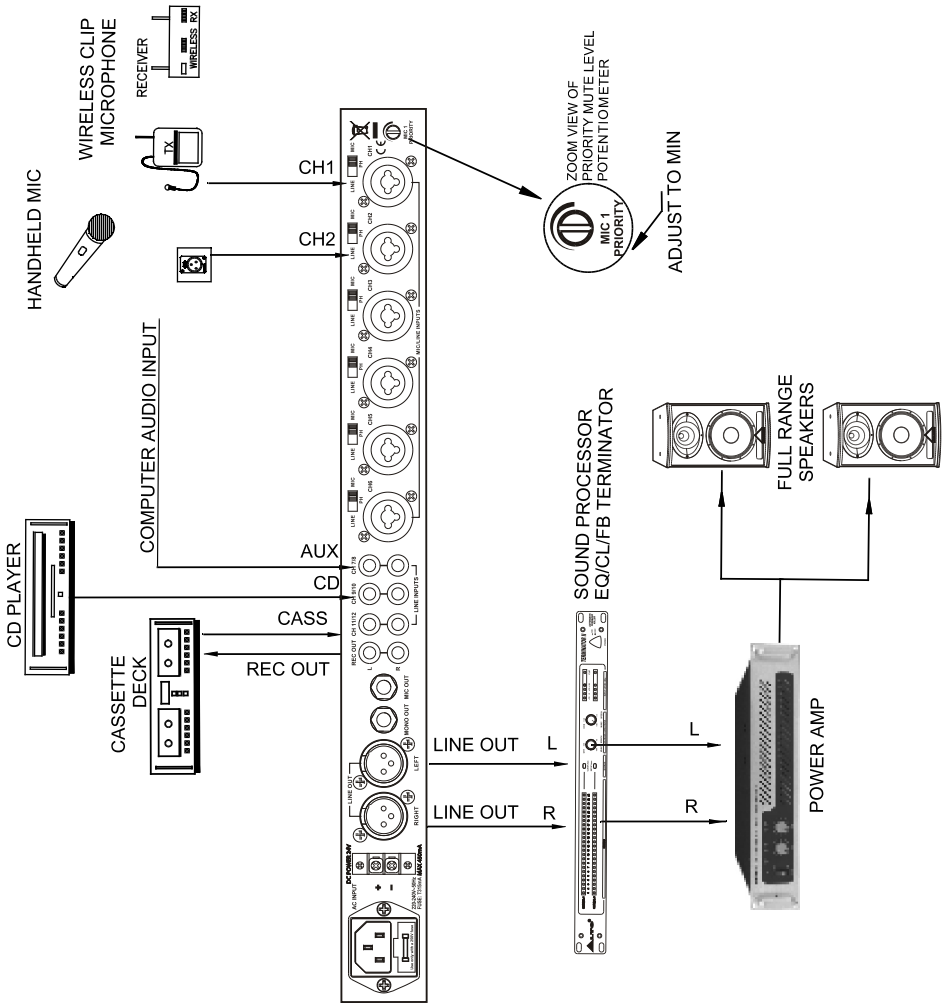
18. MIC/LINE INPUTS

These balanced/unbalanced combo connector are used for the MIC/LINE signal input.

19. MIC 1 PRIORITY POTENTIOMETER

The muting circuitry activates in the presence of signal from Mic 1.This potentiometer determines the mixing level of Mic or line input signals with signals of priority channels, adjusting it to minimum shall cut off all other inputs when signal is presence in priority channel (Mic 1). Whereas setting it to max shall allow free mix of all signals including priority input.
Some application shall not require this feature, such as in the hall of prayer, thereby to bypass the circuitry, adjust the level to the maximum.

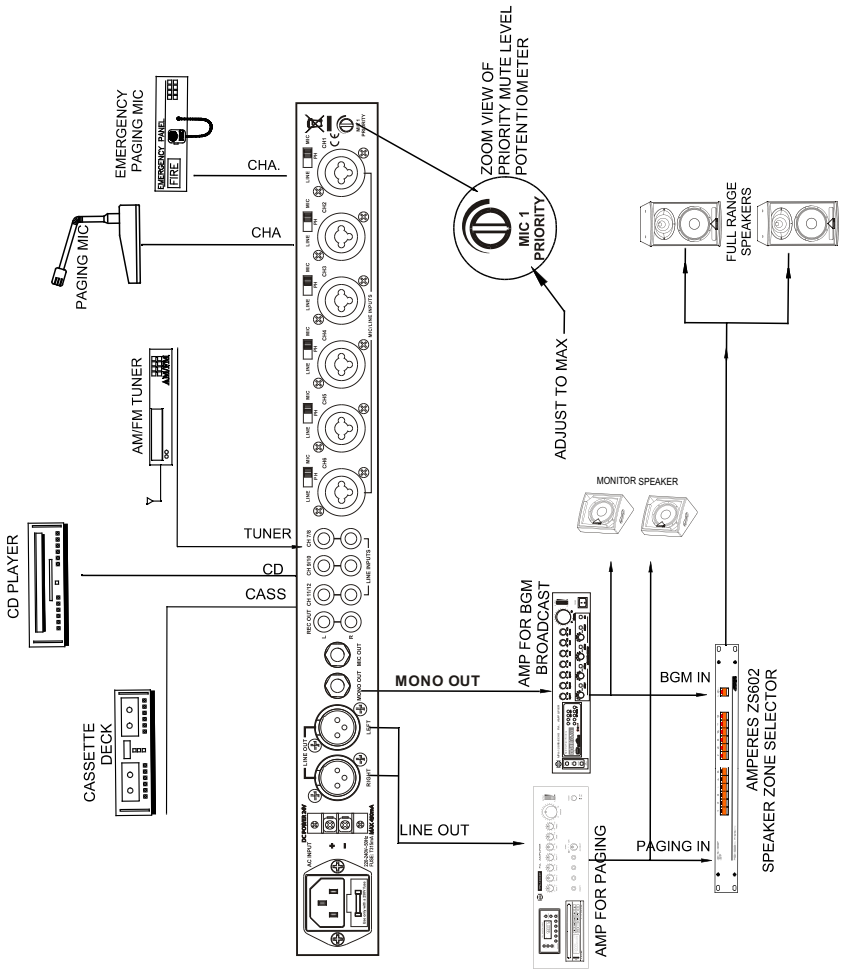
Application Example (2).....Lecture Hall/ Conference Room



The above schematic shows a simple setup for sound reinforcement in lecture theatre or conference room or hall of prayer.

Note that the priority mute is set to minimum, thus allow free mix of signal from all channels.

Application Example (1).....Paging System



The above schematic illustrates a setup for a basic uninterrupted paging system.

Note that the priority mute level potentiometer is adjusted to the maximum to allow the mute feature to be fully active. This level can be adjusted mid way or so if it is to allow a paging to be made with background music audible at lower volume.
Other equipments such as amplifier changeover, back up batteries, etc are not shown, which may be required according to the building design requirements.

INSTALLATION AND CONNECTION

Ok, you have got this point and you are now in the position to successfully operate your mixer preamplifier. However, we advise you to read carefully the following section to be the real master of you own mixer. Not paying enough attention to the input signal level, to the routing of the signal and the assignment of the signal will result in unwanted distortion, a corrupted signal or no sound at all. So you should follow these procedures for every single channel:

1. Be connecting mics or instruments, make sure that the power of all your systems components including the preamplifier is turned off. Also, make sure all of input&output controls of your preamplifier are turned down. This will avoid damage to your speakers and avoid excessive noise.

2. Properly connect all external devices such as mics, mixers, speakers, effects processor.

3. Now, turn on the power of any peripheral devices, then power up the mixer.
   Note: the power amplifier or powered monitors shall be turned on after preamplifier and turned off before preamplifier.

4. Set the output level of your preamplifier or the connected power amplifier properly.

5. Set HI, MID and LOW EQ controls on middle position.

6. While speaking into the mic(or playing the instrument), adjust the channel Level control in this way you will maintain good headroom and ideal dynamic range.

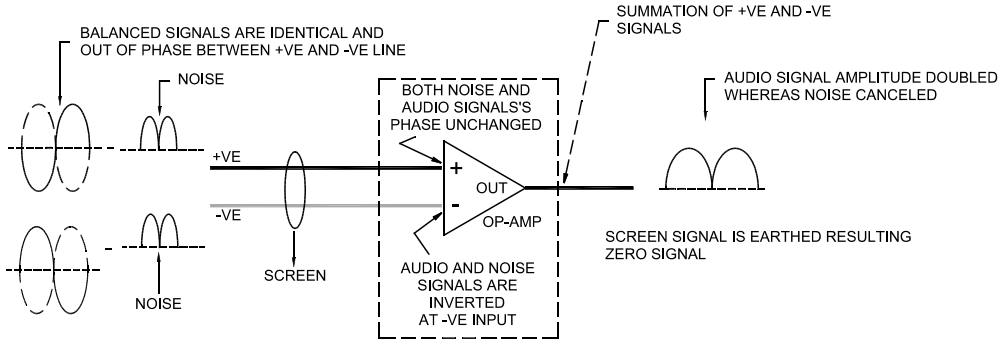
7. You can shape the tone of each channel by adjusting the equalizer controls as desired.

Significant Difference of Unbalanced / Balanced Connections

In unbalanced system, only one conductor carries the useful signal while the other being the ground. Cables run in a distance may act as an antenna picking up radiations from ac sources, or from dimmers as well as other noises. Since there is no out of phase signals in the cabling, the noise signals shall superimpose with useful audio signal. As the signal level is rather small which could not diminish the effects of radiations, they would be amplified as a lot of signal, thereby hum, etc is heard together with audio signal, this could be disastrous if the cable is run in a longer distance which cross with other cabling like dimmer system, etc.

Noise may appear in balanced system but at a much lower magnitude as compared to unbalanced system. Microphones which generate amplitude in millivolts requires a better signal carrying. Method, ie, balanced system. Signal produced are out phase with each other and when reaching the op-amp, one conductor shall be amplifier positively while the other inverted. Noise which do not have polarity shall be cancelled at the op-amp output. Thereby the useful signal is amplified twice while the noise is subdued.

The understanding of how this works can be easily illustrated in the diagram below.



The Proper Cabling - Ground Looping

It is important that the mains power is connected to your equipment with earth and the power system has a proper earthing. When hum exists, it is possibly due to poor grounding connection of your system. There should be only one ground point in the entire system.

Pin 1 of XLR source equipment should be connected whereas at the destination, this pin is dismantled. This shall eliminate grounding loop due to connections of signal ground and power ground. A looped cable resembles an antenna picking up hum and other electromagnetic radiations. Altho ugh earthed equip ment may cause mains hum, disconnecting signal screen is a preferred choice as it has resistance than earth ground..

CONNECTION