

PULSE



12 CHANNEL LINE MIXER

Model: RMX112



INFORMATION ON WASTE DISPOSAL FOR CONSUMERS OF ELECTRICAL & ELECTRONIC EQUIPMENT. When this product has reached the end of its life it must be treated as Waste Electrical & Electronic Equipment (WEEE). Any WEEE marked products must not be mixed with general household waste, but kept separate for the treatment, recovery and recycling of the materials used. Contact your local authority for details of recycling schemes in your area.

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TROUBLESHOOTING

Symptom	Likely Cause	What to do
No sound	Speaker not connected to active AC power	Verify that the speaker is connected and that the circuit is on.
	Power not switched on	Switch on the power and verify that the 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 and replace with the same type and specification.
No sound Speaker comes on	Signal source (mixer, Amp instrument) is not sending	*Check that the signal LED indicators are lit. *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 the 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 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 on the speaker. Review the manual for your mixer and adjust the controls as needed. *Input sensitivity (gain). *Channel faders. *Master faders.
Hum or Buzz	Improper A/C grounding, ground loops	*"Lift" audio ground using XLR/F to XLR/M adaptor 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 equipments to drive your EON speakers. *Use the "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.

IMPORTANT!

Please read this manual carefully before operating this unit for the first time and retain for future reference.

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	≤-82dB @ 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 1 minute
	Between Live+Negative → IN/OUT Terminal (Positive+Negative)	3000VAC at Test, Frequency 50/60Hz, Leakage Current: 5mA for 1 minute
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)	483x195x44mm
	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 components shall only be replaced by the component specified in the documentation, for safety reasons.



Protective grounding terminal.



Alternating current/voltage.



Hazardous live terminal.



ON: Denotes that the apparatus turns on.

OFF: Denotes that 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 with your service.

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



This product should not be placed in municipal waste and should be treated as Waste Electrical & Electronic Equipment (WEEE).

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 the apparatus on.

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

The cover should be removed by qualified personnel only.

There are no user serviceable parts inside.

• Fuse

To prevent a fire, be sure to use fuses with a 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 disconnect the power source.

• Protective Grounding

Be sure to connect the protective grounding in order to prevent an electric shock before turning on the apparatus.

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

• Operating Conditions

Do not expose to rain or moisture. Do not immerse the appliance in water or any other liquids.

Do not use this appliance in the immediate surroundings of a bath, a shower or a swimming pool.

Install in accordance with the manufacturer'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 INFORMATION

- 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 a replacement of the obsolete outlet.

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

• Cleaning

When the apparatus needs cleaning, you can blow off dust from the apparatus with a blower, or by using a clean, dry cloth.

Don't use any chemicals, abrasives or 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.

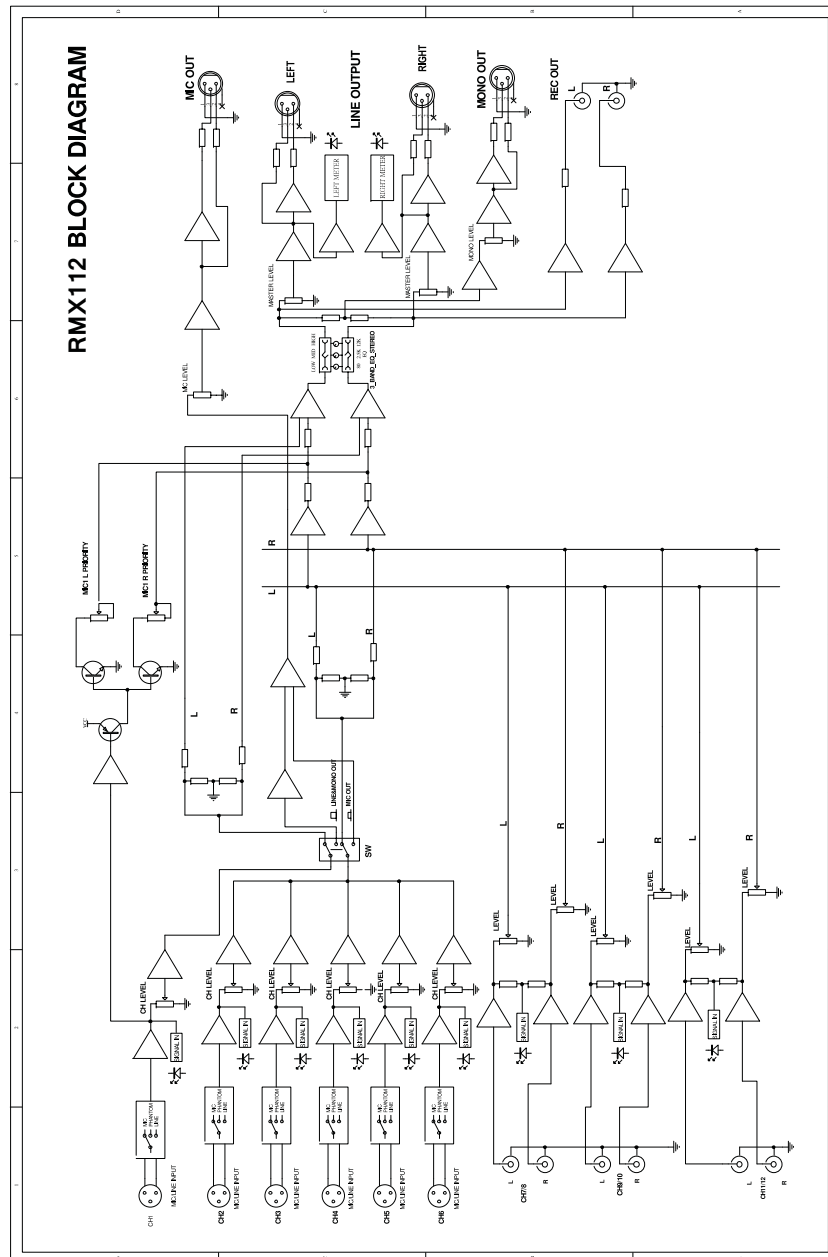
Servicing is required when the apparatus has been damaged in any way, such as power supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

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

TECHNICAL SPECIFICATIONS

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 MICINPUT → MAIN OUT (XLR,balanced)
	50dB CH MICINPUT → REC OUT (Unbalanced)
	60dB CH MICINPUT → MIC OUT (Unbalanced)
	60dB CH MICINPUT → 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	20Hzto22kHz, +/-2dBu
Distortion(THD&N)	≤0.03% at 1kHz
Sensitivity	0 dBu
Max. Input	+21 dBu
Maximum Voltage Gain	20dB CH MICINPUT → MAIN OUT (XLR,balanced)
	10dB CH MICINPUT → REC OUT (Unbalanced)
	20dB CH MICINPUT → MIC OUT (Unbalanced)
	20dB CH MICINPUT → 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	+21dBu
Maximum Voltage Gain	10dB CH MICINPUT → MAIN OUT(XLR,balanced)
	0dB CH MICINPUT →REC OUT(Unbalanced)
	4dB CH MICINPUT → MONO OUT(Unbalanced)
SNR (Signal to Noise Rate)	≥103dB

BLOCK DIAGRAM



INTRODUCTION

The RMX112 is a professional compact mixer preamplifier. The RMX112 offers a smooth, accurate, natural and open sound from this apparatus, ideal for gigs, recording and fixed PA installations.

The RMX112 12 Channel Line Mixer is easy to operate, but we advise you to go through each section of this manual carefully in order to get the best out of the RMX112.

FEATURES

The RMX112 mixer preamplifier is designed for professional application with the following features:

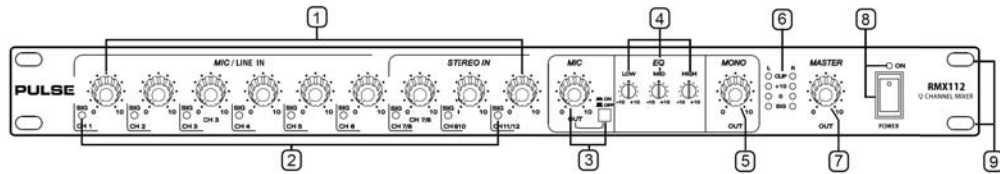
- MONO channels
- 6 combo inputs
- MIC, MIC with phantom power, LINE switch selector
- Low-distortion MIC pre-amp with high dynamic range, balanced XLR and TRS input jacks
- Phantom power on each MIC input channel
- CH level control, signal LED to indicate input signal
- MIC I priority mute potentiometer
- Stereo channels
- CH 7/8, CH 9/10, CH 11/12 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 metres, using mater level to control LINE OUTPUT signal
- Switchable AC220-240V or DC24V operating voltage

GETTING STARTED

- Check the AC voltage available in your country before connecting your RMX112 to the AC socket.
- Be sure that the main power switch is turned off before connecting to the AC socket.
- You should also make sure that all input and output controls are turned down in order to avoid damage to your speaker and avoid excessive noise.
- Before turning on the RMX112 you should connect it to a power amplifier and turn on the mixer BEFORE the power amplifier. Once you have finished your working session, turn the mixer off AFTER the power amplifier.
- Before disconnecting the RMX112, always turn off the power switch.

CONTROL ELEMENTS

FRONT PANEL



1. MIC INPUT VOLUME KNOBS

MIC channel 1 has priority over other MIC input channels. This function 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 if it's too low, it 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 channels may have different input sources (i.e. 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

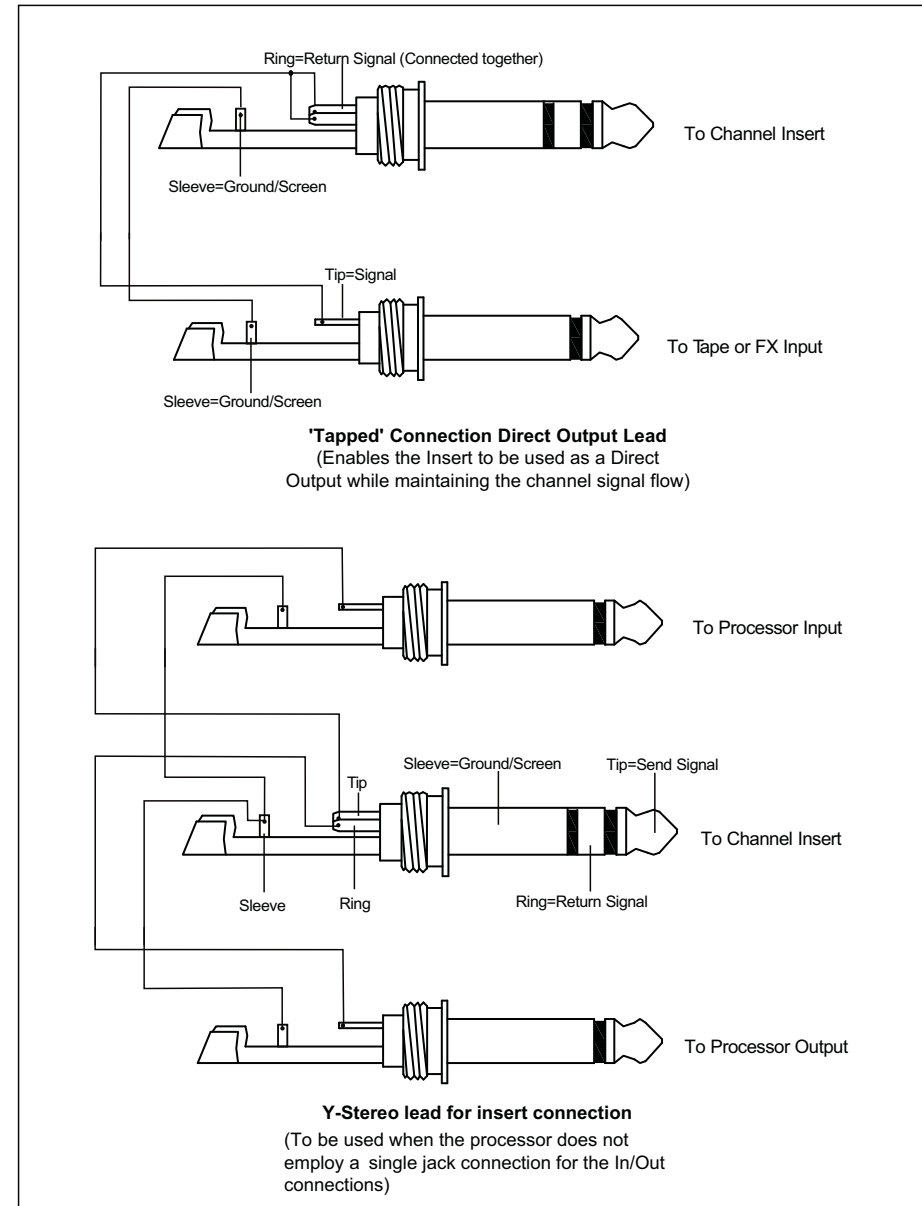
The "MIC/LINE SWITCHABLE" button is used for selecting the MIC out or LINE out. When the button is pressed, only CH1-CH6 have output from MIC out. The MIC volume knob is activated (at present MIC 1 has no priority).
 The volume can be adjusted by rotating the knob to increase/decrease the MIC output 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 RMX112 is equipped with 3-band mid sweep EQ: LOW, MID & HIGH.

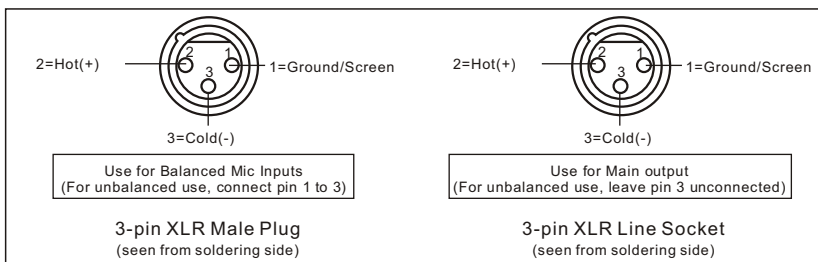
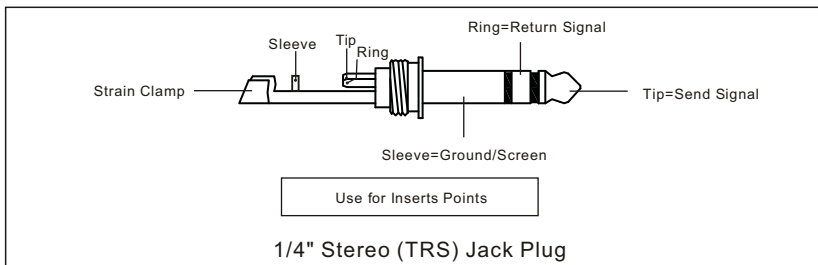
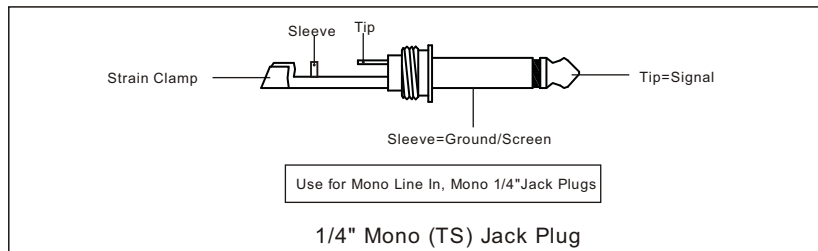
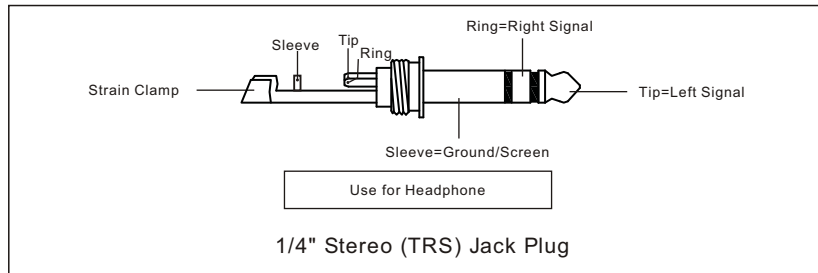
- LOW

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.



Some Final Tips on Wiring Configuration

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



-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 from a 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 $-\infty$ to +10 dBu.

6. L/R LED METER

The LED meter indicates the level of input signal. A clipping indicator is also supplied.

7. MASTER

This knob is used for adjusting the LINE output level. To avoid over amplification, it's recommended that this level is set properly.

It is advisable that the gain be set to minimum when powering the system as well as shut down as this can eliminate a sudden signal burst to your system.

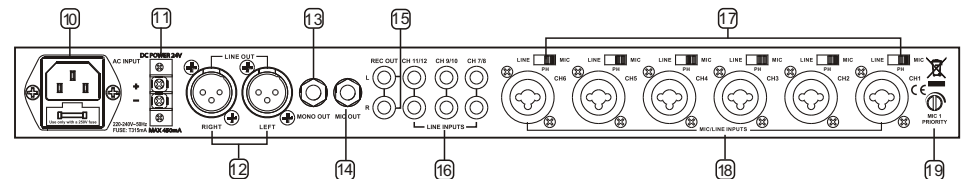
8. POWER SWITCH & LED INDICATOR

This switch controls the power for the unit. When the unit is switched on, the LED will light up. The unit is also provided with a 24V DC backup power supply.

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

The RMX112 preamplifier can also operate using 24V DC power supply. When both the AC and DC source is connected, it shall operate using AC main, whereas the DC supply shall only be consumed whenever the former fails.

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.

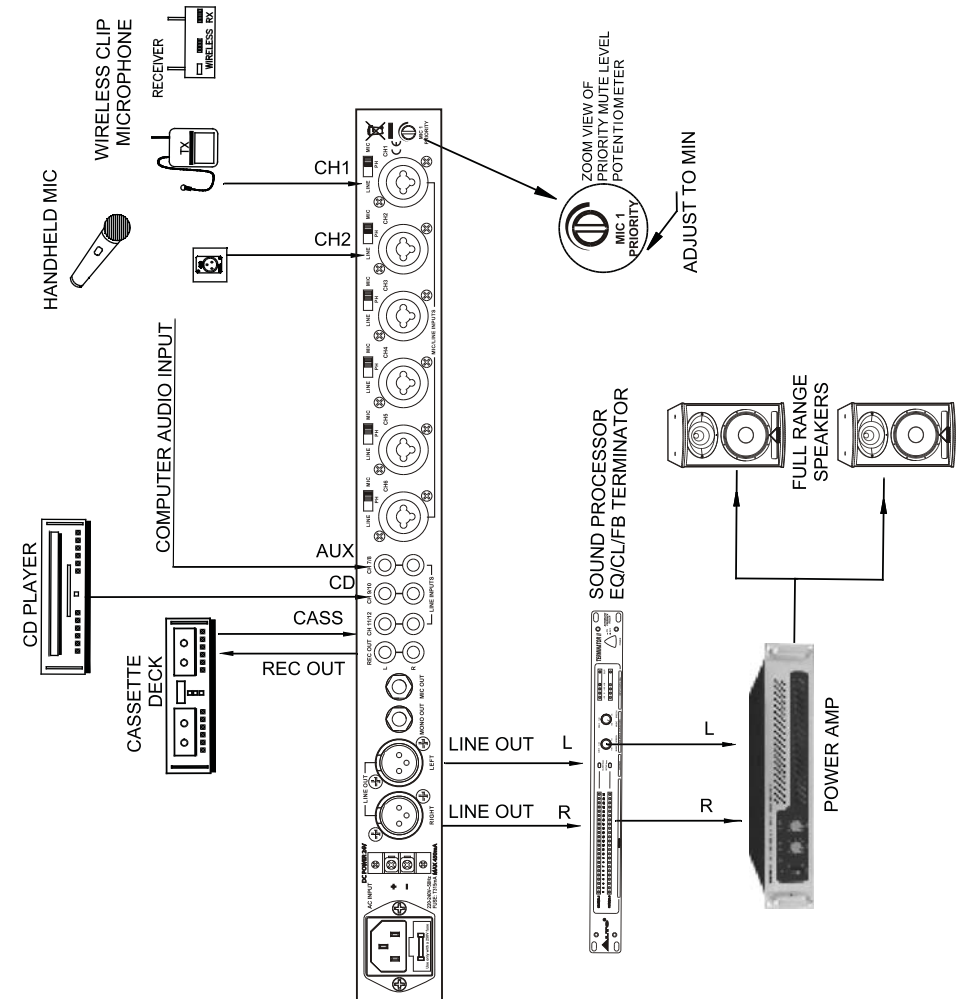
18. MIC/LINE INPUTS

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 a signal from Mic 1. This potentiometer determines the mixing level of the Mic or line input signals, with signals of priority channels. Adjusting it to the minimum shall cut off all other inputs when a signal is present in the priority channel (Mic 1), whereas setting it to the max shall allow the free mix of all signals including priority input. Some applications 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

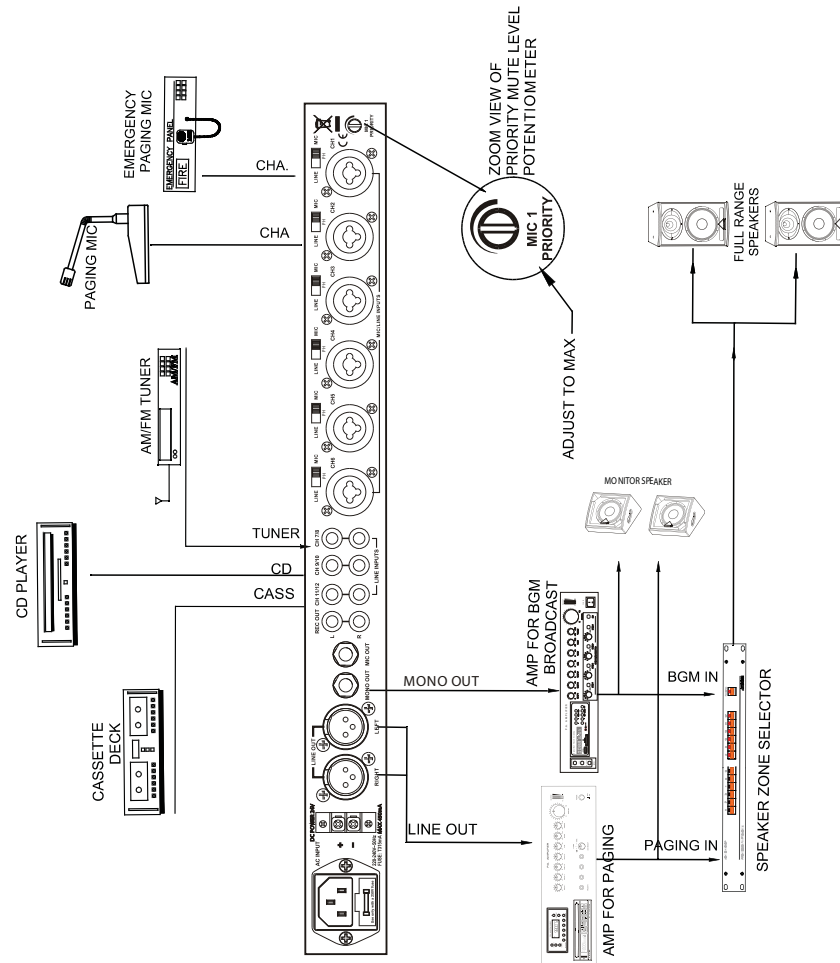


The above schematic shows a simple setup for sound reinforcement in lecture theatres and conference rooms.

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

INSTALLATION AND CONNECTION

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 midway or so, if it is to allow a paging to be made with background music audible at lower volume.

Other equipment such as an amplifier changeover, back up batteries etc. are not shown, which may be required according to the building design requirements.

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.

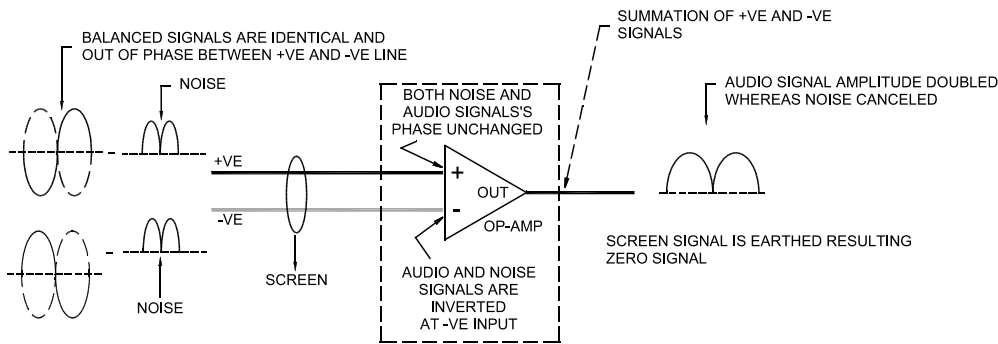
You should follow the following procedures for every single channel:

1. By connecting mics or instruments, make sure that the power of all your system's components, including the preamplifier is turned off. Also, make sure that all of the input and 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 and effects processor.
3. 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 the RMX112 and turned off before the RMX112.
4. Set the output level of your RMX112 or the connected power amplifier properly.
5. Set HI, MID and LOW EQ controls to the middle position.
6. While speaking into the mic (or playing the instrument), adjust the channel level control to 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 an unbalanced system, only one conductor carries the useful signal while the other is ground.
- Cables that run over a distance may act as an antenna picking up radiation from AC sources or from dimmers as well as other noises. As there are no out of phase signals in the cabling, the noise signals shall superimpose with useful audio signal.
- If the signal level is rather small, they will be amplified as a lot of signal; thereby humming etc. is heard together with audio signal.
Note: The effects of radiation would not be diminished.
- This could be a huge issue if the cable is run over a long distance, which crosses with other cabling, like a dimmer system, for example.
- Noise may appear in a balanced system, but at a much lower magnitude compared with an unbalanced system.
- Microphones that generate amplitude in millivolts require a better signal carrying method i.e. a balanced system.
- Signals produced are out of phase with each other and when reaching the op-amp, one conductor shall be positively amplified, while the other inverted.
- Noise that doesn't have polarity shall be cancelled at the op-amp output. Therefore the useful signal is amplified twice while the noise is subdued.

For an understanding of how the works can be easily illustrated, see 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 only be one ground point in the entire system.

Pin 1 of XLR source equipment should be connected whereas at the destination, the 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. Although earthed equipment may cause mains hum, disconnecting signal screen is a preferred choice as it has resistance rather than earth ground.

CONNECTION

