

Public Address System





CONSTANT VOLTAGE MIXER-AMPLIFIERS

MODEL:
ED-120M
ED-240M
ED-360M
ED-480M
ED-600M

Warning: Before attempting to connect, operate or adjust this Amplifier, please read these instructions completely and carefully and save this Manual

IMPORTANT SAFETY INSTRUCTIONS

1. Read these instructions - All the safety and operating instructions should be read before this product is operated.
2. Keep these instructions - The safety and operating instructions should be retained for future reference.
3. Heed all warnings - All warnings on the appliance and in the operating instructions should be adhered to.
4. Follow all instructions - All operating and use instructions should be followed.
5. Do not use this apparatus near water - The appliance should not be used near water or moisture - for example, in a wet basement or near a swimming pool, and the like.
6. Clean only with dry cloth.
7. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9. Do not defeat the safety purpose of the polarized or grounding plug. A polarized plug has two blades with one wider than the other. A grounding plug has two blades and a third grounding prong. The wide blade or the third prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. 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.
11. Only use attachments/accessories specified by the manufacturer.
12. Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over. 
13. Unplug the apparatus during lightning storms or when unused for long periods of time.
14. Refer all servicing to qualified service personnel. 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.
15. Please keep the unit in a good ventilation environment.
16. **WARNING:** To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture. The apparatus shall not be exposed to dripping or splashing and that no objects filled with liquids, such as vases, shall not be placed on apparatus.
17. **WARNING:** The mains plug or appliance inlet is used as disconnect device, the disconnect device shall remain readily operable.
18. Power Sources – This product should be operated only from the type of power source indicated on the rating label. If you are not sure of the type of power supply to your home, consult your product dealer or local power company. For products intended to operate from battery power, or other sources, refer the operating instructions.
19. Safety Check – Upon completion of any service or repairs to this product, ask the service technician to perform safety checks to determine that the product is in proper operating condition.
20. Don't touch conductive parts of output terminals to prevent hazardous electrical shock. The external wiring connected to the terminals requires installation by an instructed person or the used of ready-made leads or cords.
21. This equipment is for commercial & professional use only.
22. This product is in compliance with EU WEEE regulations. Disposal of end of life product should not be treated as municipal waste. Please refer to your local regulations for instructions on proper disposal of this product. 
23. To prevent hazardous electrical shock, do not touch the conductive parts of the output terminals. The external wiring connected to the terminals requires installation by an qualified technician or the use of ready made leads or cords.
24. Please locate the apparatus at places nearby power socket for quick power disconnection in emergency.



Protective earthing terminal. The apparatus should be connected to a mains socket outlet with a protective earthing connection.



This lightning flash is intended to alert the user to the presence of non-insulated "dangerous voltage" on the output terminals that may be of sufficient magnitude to constitute a risk of electric shock. The external wiring connected to the terminals requires installation by an instructed person or the used of ready-made leads or cords.



CAUTION

RISK OF ELECTRIC SHOCK
DO NOT OPEN



CAUTION: To reduce the risk of electric shock, do not remove any cover. No user-serviceable parts inside. Refer servicing to qualified service personnel only.



The lightning flash with arrowhead symbol within the equilateral triangle is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock.



The exclamation point within the equilateral triangle is intended to alert the user to the presence of important operation and maintenance (servicing) instructions in the literature accompanying this appliance.

CAUTION: To prevent electric shock, do not use this polarized plug with an extension cord, receptacle or other outlet unless the blades can be fully inserted to prevent blade exposure.

Table of Contents

Introductions -----	2
Features -----	3
Controls-----	4
Setups-----	6
Operations-----	10
Madia module -----	14
Block Diagram -----	15
Specifications -----	16

Introductions



Welcome

Congratulation and thank you for the purchasing ED series, a multi-function commercial amplifier. These amplifiers are designed to provide a big impact in sound reproduction and to produce the best and highest quality audio at an affordable price. We wish you great enjoyment and satisfaction when using your amplifier, whether you are an installation, or reinforcement engineer.

Unpacking and Installation

Although it is neither complicated to install nor difficult to operate your amplifier, a few minutes of your time is required to read this manual for a properly wired installation and becoming familiar with its features and how to use them. Please take a great care may be needed when moving your set and are required if it ever becomes necessary to return your set for service. Never place the unit near radiator, in front of heating vents, to direct sun light, in excessive humid or dusty location to avoid damages and to guaranty a long reliable use.

Connect your unit with the system components according to the description on the following pages.

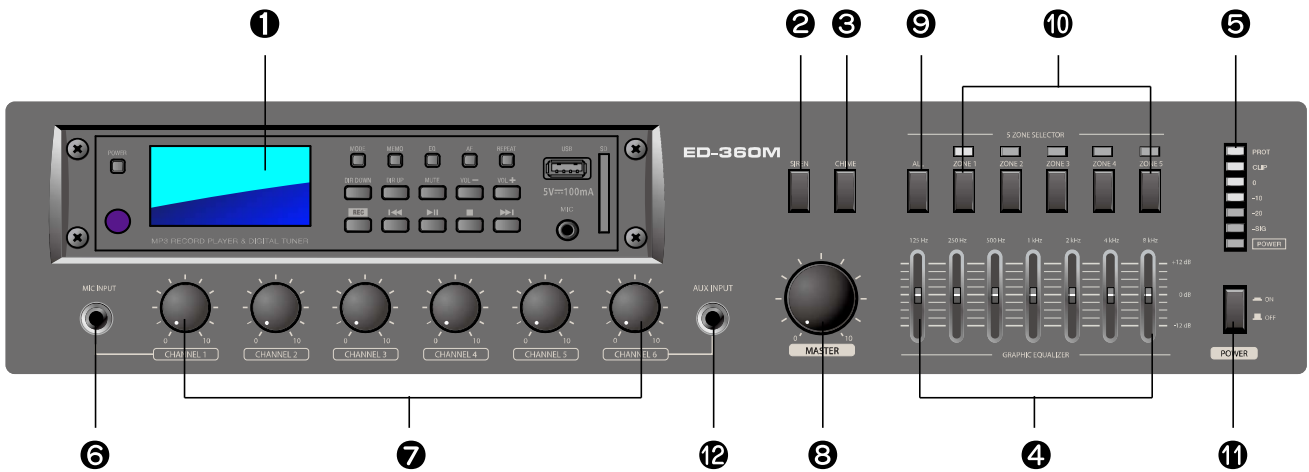
Features

The ED series mixer amplifiers are comprehensive, all-in-one solutions for commercial and industrial applications. These low-cost units provide all necessary features in a simple building-block format.

- * Six microphone or line inputs with 1/4 inch phone, XLR and RCA jacks.
- * Acceptable wide range input level.
- * One remote microphone input with RJ45 terminal.
- * M.O.H(Music On Hold) output.
- * One telephone paging input with EURO block terminal.
- * Phantom power for all of MIC channels.
- * Three layer priority muting.
- * Advanced protection system includes current limiting, over current and thermal protection.
- * Desktop and 19-inches rack mountable type.
- * Seven bands graphic equalizer.
- * Expendable by adding audio mixer and power amplifier with LINK and PRE-AMP terminal.
- * Low distortion and low noise level.
- * Compact size and lightweight.
- * Ideal commercial and industrial use.

Controls

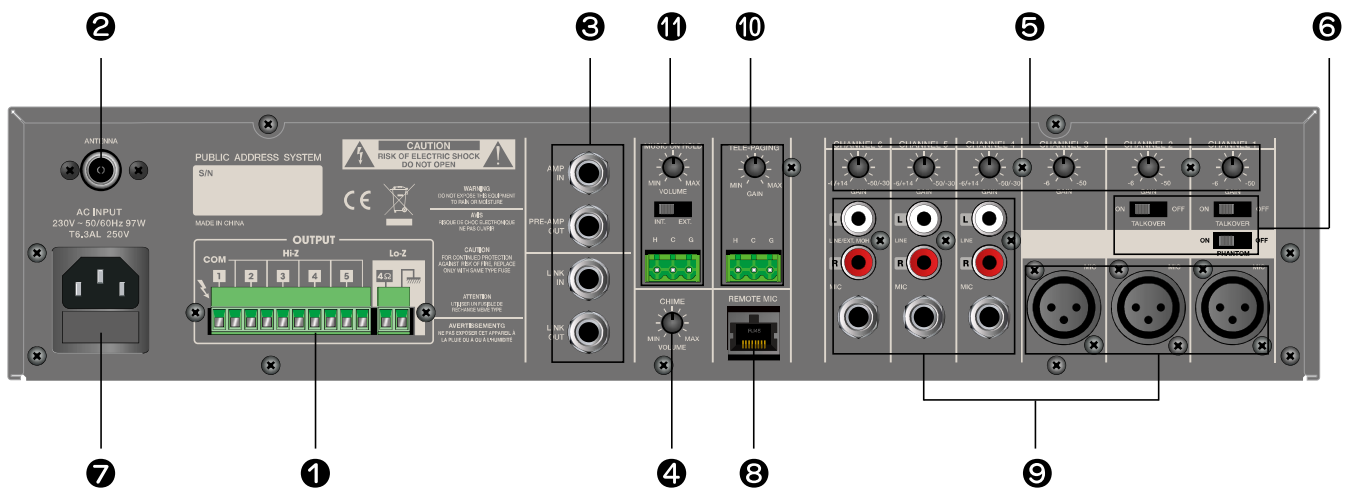
FRONT PANEL



[Figure 1.1 Front panel diagram]

1. Bay for adding optional music source (CD player with AM/FM Tuner or MP3 player).
2. Siren switch.
3. Pre-announce chime switch.
4. Graphic equalizer control (125Hz/250Hz/500Hz/1KHz/2KHz/4KHz/8KHz).
5. Indicators (Protection/Output level/Power).
6. MIC input .
7. Input channel volume controls.
8. Master volume controls.
9. All speaker zone output selector.
10. Individual speaker zone output selector.
11. Power switch.
12. Aux input .

Rear Panel



[Figure 1.2 Rear panel diagram]

1. Speaker outputs connector (4-ohm, selectable ,70V and 100V).
2. Antenna.
3. Expansion ports (AMP-IN/AMP-OUT/LINK-IN/LINK-OUT).
4. Pre-announce chime level control.
5. Gain controls for variable input level.
6. Phantom power and priority control switches.
7. AC power inlet.
8. Remote microphone station input connector and output level control.
9. Signal input connectors.
10. Telephone paging input connector.
11. M.O.H(Music On Hold) output and level control.

Setups

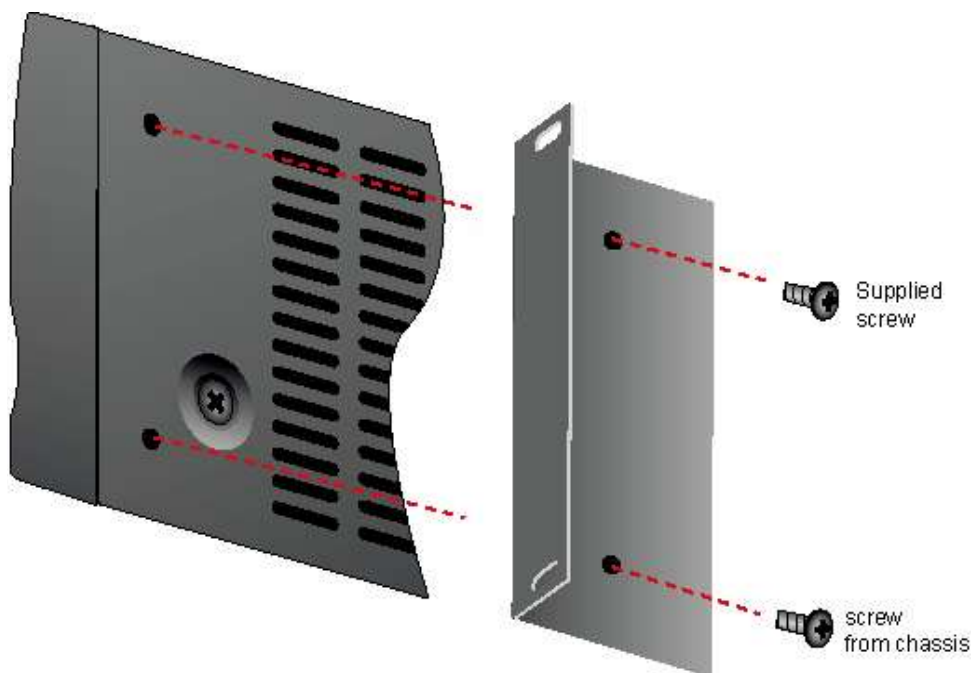
Installation

CAUTION : Before you begin, make sure your mixer-amplifier is disconnected from the power source, with the power switch in the “OFF” position and all level controls turned completely down(counter-clockwise).

You may stack mixer-amplifiers without using a cabinet or you may place a single mixer-amplifier on a surface with 12-inches (about 30cm) of air space around the unit for convection cooling. When using an equipment rack, do not mount units directly on top of each other. Allow 2U between units for convection cooling. The side walls of the rack should be a minimum of 2-inches (about 5cm) away from the amplifier sides, and the back of the rack should be a minimum of 4-inches (about 10cm) from the mixer-amplifier rear panel.

How to attach rack ears.

1. Locate the two rack ears and four rack-ear screws supplied.
2. Place a rack-ear flush with the right front of the chassis.
3. Insert a screw into the bottom hole of the rack-ear and chassis. Screw it in.
4. Insert a screw into the top hole of the rack-ear and chassis. Screw it in.
5. Repeat steps 2 to 4 for the left side of the chassis.
6. Remove the four legs from bottom of unit.
7. Please refer to Figure 2.1

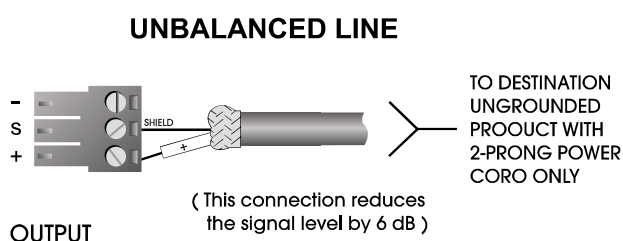
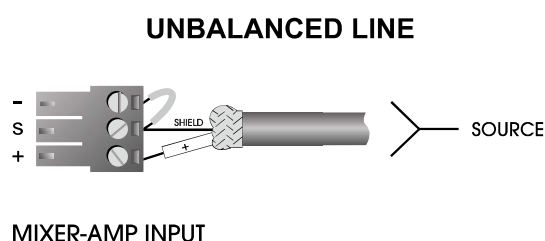
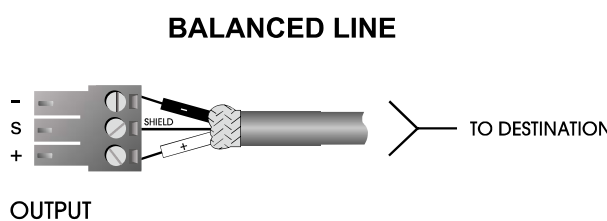
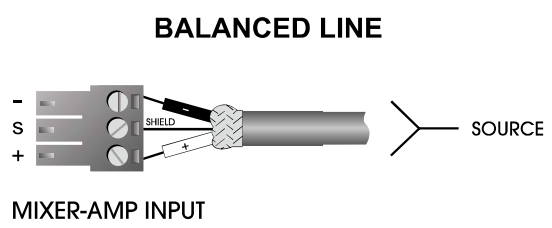


[Figure 2.1 How to connect rack ears]

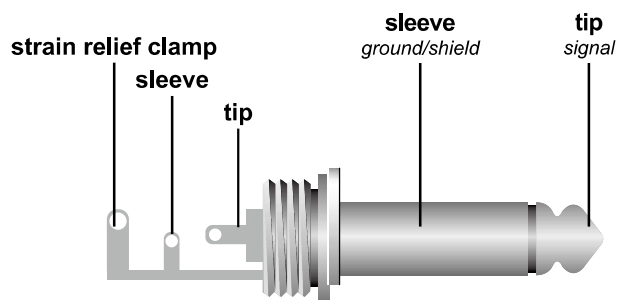
Wiring guide

Choose input wire and connectors

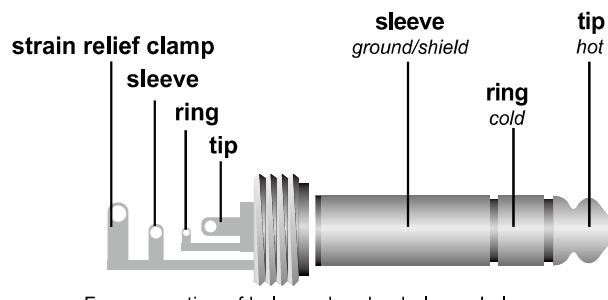
We recommends using pre-built or professionally wired balanced line. 22 to 24 gauge cables. Figure 2.2 shows connector pin assignments for wiring. The RCA input connections can also be used for unbalanced inputs.



Unbalances 1/4" Connector

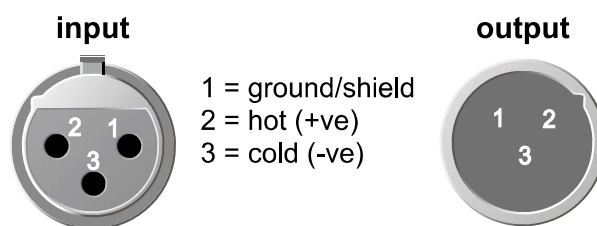


Balances TRS 1/4" Connector



For connection of balanced and unbalanced plugs, ring and sleeve have to be bridged at the stereo plug.

XLR Balanced Wiring Guide



For unbalanced use pin 1 and pin 3 have to be bridged

[Figure 2.2 Input wire and connectors]

Choose output wire and connectors

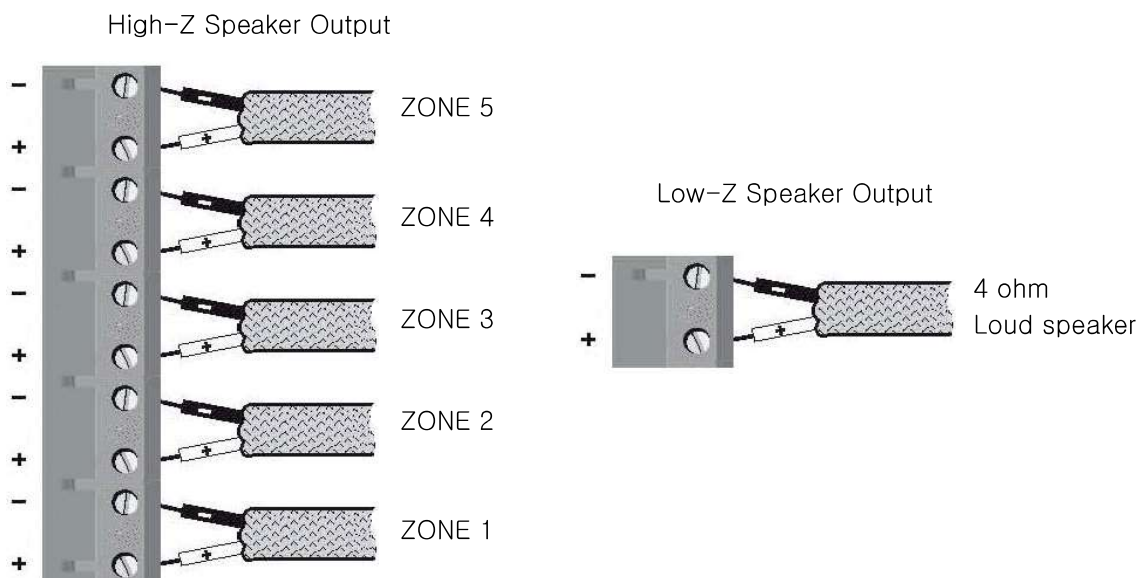
For the amplifier output connectors, We recommends using pre-built or professionally wired, high-quality, and heavy gauge speaker wires. You may use EURO blocks for your output connectors. To prevent the possibility of short-circuits, wrap or otherwise insulate exposed loud-speaker cable connectors.

Using the guidelines below, select the appropriate size wire based on the distance from amplifier to speaker. The wire sizes apply to the 4-ohm tap.

Distance	Wire Size
Up to 25 ft.	16 AWG
26~40 ft.	14 AWG
41~60 ft.	12AWG
61~100 ft.	10AWG
101ft~150 ft.	8AWG
151~200 ft.	6AWG

NOTE : Custom wiring should only be performed by qualified personnel. Class 2 wiring is required.

CAUTION : Never use shielded cable for output power wiring. Figure 2.3 shows connector pin assignments for wiring.







[Figure 2.3 Pin assignments for speaker connecting]

Connections

INPUT : Connect microphones or balanced line-level sources to mixer-amplifier balanced inputs. Set Gain volume accordingly. Connect unbalanced line-level signals to RCA input connectors.

OUTPUT : Maintain proper polarity on output connectors.

For each output channel, connect the output EURO block terminals to the loudspeaker loads. 4Ω Use terminals marked  (GND) and  for a 4-ohm loudspeaker load, or use terminals marked  to  and COM for constant-voltage loudspeaker loads.

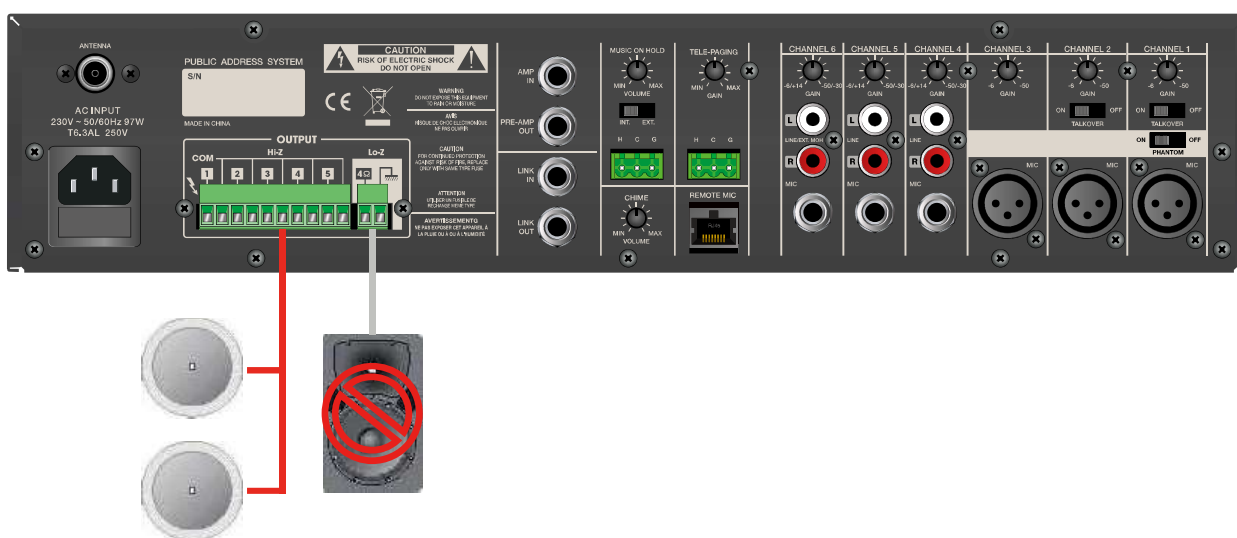
Connect the COM terminal to speaker negative(-) lead; connect one of the other terminals to speaker positive(+) lead.

The impedance and output voltage are same as following Table 2.1.

ED-120M	4Ω / 22V	41Ω / 70V	83Ω / 100V
ED-240M	4Ω / 31V	21Ω / 70V	42Ω / 100V
ED-360M	4Ω / 38V	13Ω / 70V	28Ω / 100V
ED-480M	—	—	21Ω / 100V
ED-600M	—	—	16Ω / 100V

[Table 2.1 Output voltage and impedance]

NOTE : Impedances indicated in the table 2.1 represent the total speaker system impedances.
CAUTION : Never use both the Low-Z(4 ohms) and Hi-Z(70V and 100V) terminals at the same time.



[Figure 2.4 Wrong connection]

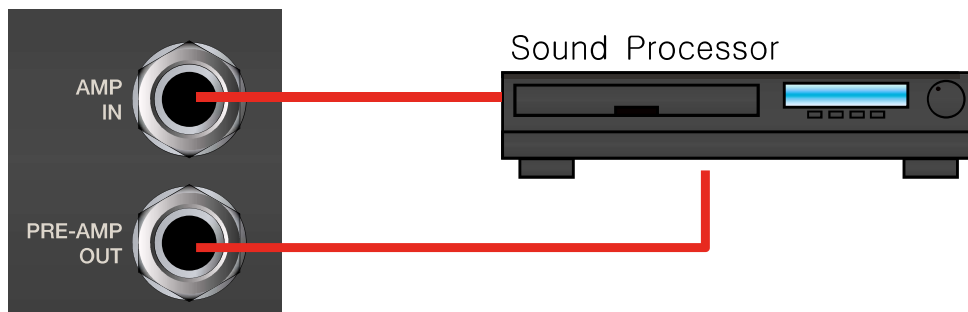
Operations

External equipments connection

By connecting a signal processor such as an equalizer or limiter between the mixer section(PRE-AMP OUT) and the power amplifier section(AMP IN) of the ED series, signals can be tailored for desired sound output.

NOTE

Inserting a 1/4-inch phone plug into AMP IN terminal disconnects internal power amplifier section from the mixer section.



[Figure 3.1 External equipments connection]

Expansion ED series

ED series mixer-amplifier allows expansion with LINK IN and LINK OUT connector.

If you need more input and output, just this function allows you can do that.

This function affect which signals are heard when another mixer or ED series mixer-amplifier are wired to the mixer-amplifier.



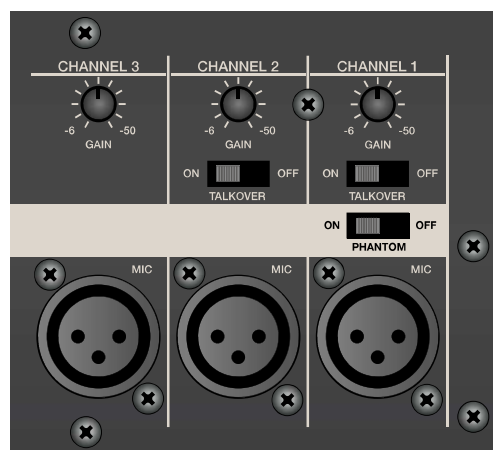
[Figure 3.2 Expansion ED series]

Priority

This function allows talk over for MIC channel 1 and 2. All other input signals are muted when this function is activated during stay “ON” position. Figure 3.3 shows the talkover switches and its “ON” and “OFF” positions.

Phantom power

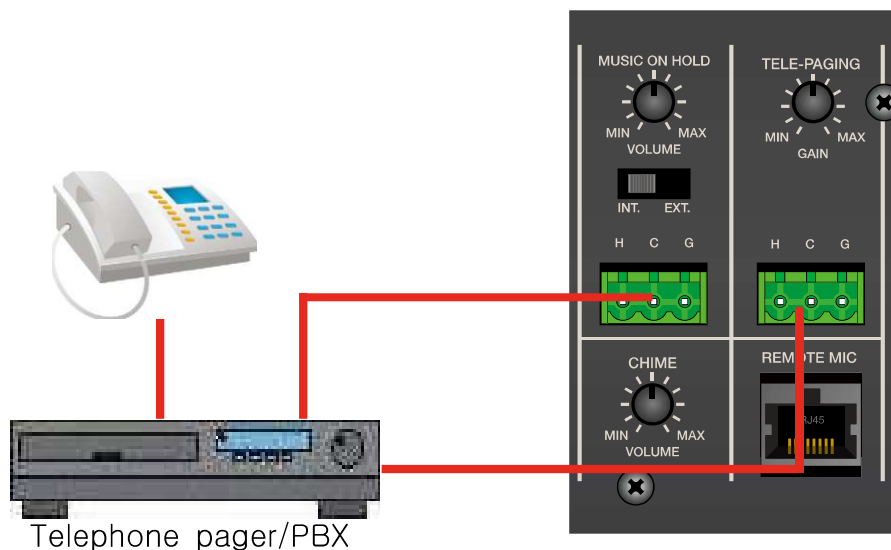
ED series mixer-amplifier supply DC+15Volts phantom power to use condenser microphone with all of MIC channels. Figure 3.3 shows the phantom power switches and its “ON” and “OFF” positions.



[Figure 3.3 Phantom and Priority]

Music On Hold

Connect mixer-amplifier MUSIC ON HOLD connector to music-on-hold input on telephone interface/PBX like telephone pager. Set MUSIC ON HOLD volume to proper level. ED series mixer-amplifier supply two way of MUSIC ON HOLD function. When MUSIC ON HOLD slide switch is “INT” position, MUSIC ON HOLD output is routed from option CDP or MP3 module internally. When the slide switch is “EXT” position, MUSIC ON HOLD output is routed from LINE IN channel (only channel 6) connected external music source.



[Figure 3.4 Music on hold]

Signal input gain control

ED series mixer-amplifier can accept variable and wide range input signal with trim pot. Adjusts the trim pot in a range of 44dB to accept variable external equipments. Figure 3.5 shows detail input sensitivities.



[Figure 3.5 Acceptable input sensitivity per each channels]

Priority Control

ED series mixer-amplifier has three layer priority mute function. When higher level source is activated, other input signals are muted except same priority level source.

CH3~CH6 > CH1~CH2, Remote MIC, Chime > Telephone Paging

Remote Microphone Control

ED series mixer-amplifier can be connected a remote paging microphone station (EM-5). The remote microphone station(EM-5) can select 5 individual zone and play pre-announce chime.

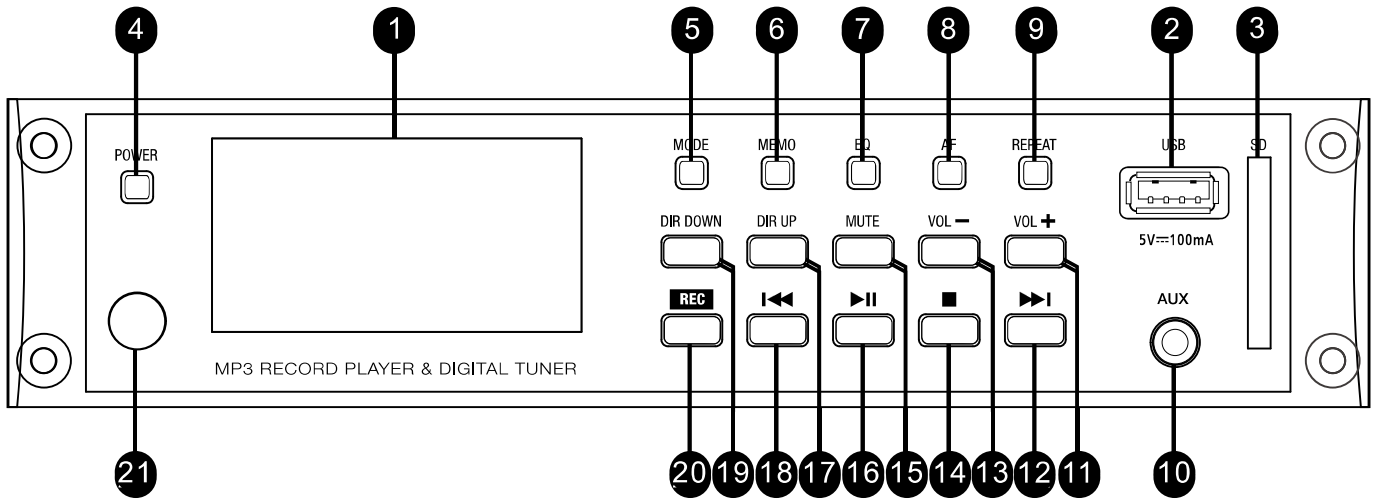
It should be connected by UTP CAT5 cable.



[Figure 3.6 Remote Microphone Station connections]

CAUTION : This port is not network terminal. Do not connect to network device.

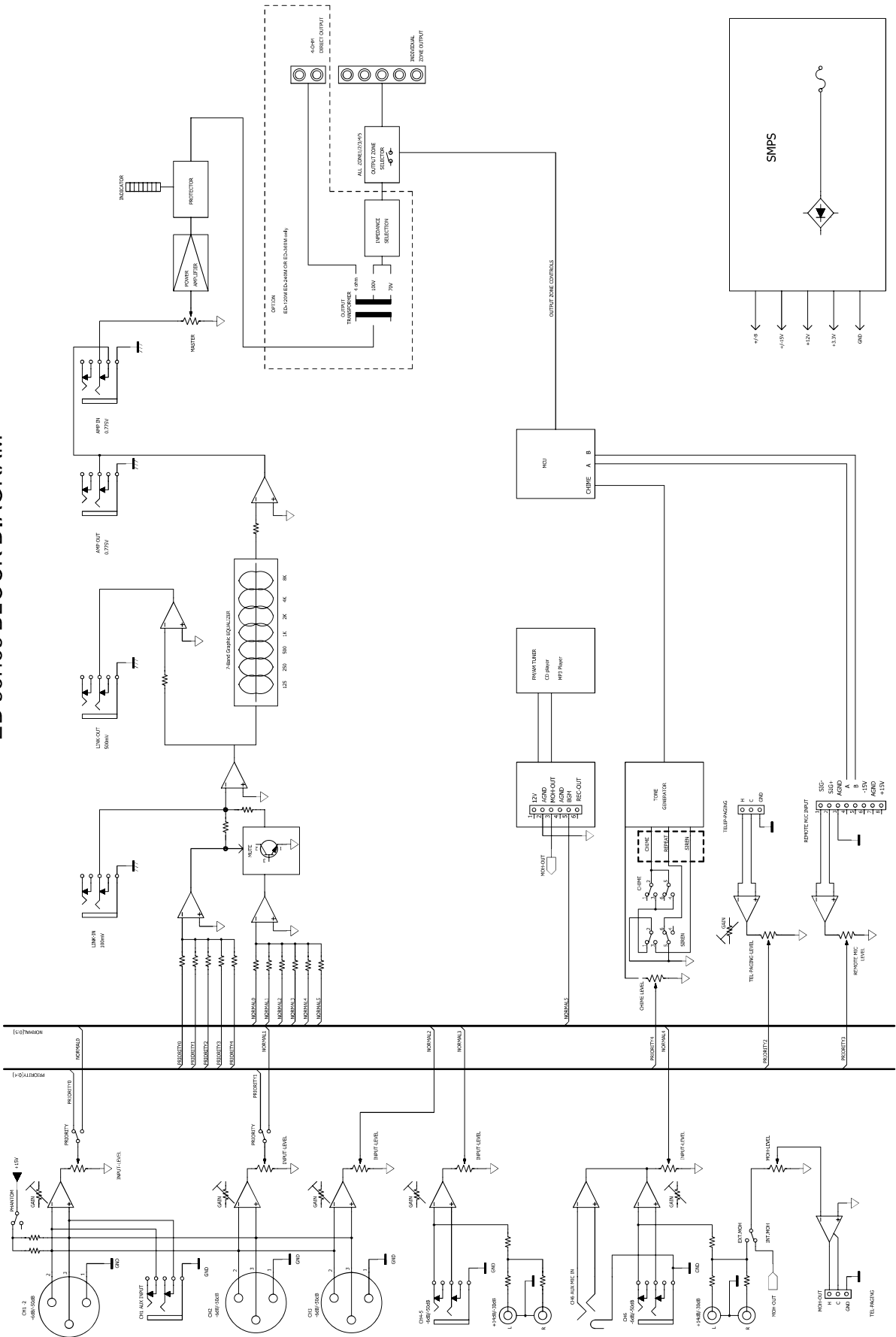
Media module



- 1.LCD Display
- 2.USB
- 3.SD Card Slot
- 4.POWER ON / OFF
- 5.MODE
- 6.MEMORY FOR TUNER FREQUENCY
- 7.EQ SELECT(POP/ROCK/CLASSIC/OFF)
- 8.ALTERNATIVE FREQUENCY
- 9.REPEAT
- 10.MIC input
- 11.VOL+(The volume increase)
- 12.AUTOMATIC OR MANUAL TUNING UP **▶▶** / TRACK SEARCH UP
- 13.VOL-(The volume decrease)
- 14.STOP
- 15.MUTE
- 16.PLAY / PAUSE
- 17.SEARCH DOWN FOLDER FOR USB OR PRESET FREQUENCY FOR TUNER
- 18.AUTOMATIC OR MANUAL TUNING DOWN **◀◀** / TRACK SEARCH DOWN
- 19.SEARCH UP FOLDER FOR USB OR PRESET FREQUENCY FOR TUNER
- 20.RECORD
- 21.IR COMMUNICATION

Block diagram

ED series BLOCK DIAGRAM



Specifications

Performance					
Model Name	ED-120M	ED-240M	ED-360M	ED-480M	ED-600M
Input Sensitivity for full output at maximum gain					
Balanced Microphone Channels	-50dB ± 3dB				
Balanced Line Channels	-22dB ± 3dB				
Balanced Remote Microphone Station	-50dB ± 3dB				
Balanced Telephone Paging	-21dB ± 3dB				
Unbalanced Link-In	-17dB ± 3dB				
Unbalanced Amp-In	0dB ± 3dB				
Frequency Response					
at 1watt from speaker out tap, 100Hz ~10kHz	+1.5/-3dB				
Graphic Equalizer					
125Hz,250Hz,500Hz,1kHz,2kHz,4kHz,8KHz	±12dB±3dB				
Signal to Noise Ratio at rated power output	Less than 90dB				
Crosstalk at all control maximum	-70dB at 1kHz				
Rated Output Power at THD 0.5%	120W	240W	360W	480W	600W
Total Harmonic Distortion(THD) at 1kHz rated power	Less than 0.5%				
Phantom Power	15VDC				
Power Band Width at 1kHz from speaker out tap	80Hz~15kHz with less than 0.5% THD				
DC Output Offset	Less than ±3mV				
Operating Temperature/Humidity at non-condensing	0°~40°C at 95% humidity				
Output Voltage and Impedance					
Construction					
Cooling	Convection Cooled				
Dimensions (Width/Height/Depth)	420 mm X 88 mm X 320 mm				
Net Weight	6.3kg	7.3kg	8.3kg	5.5kg	5.5kg

Necessary modifications are carried out without notice.
