



OPERATING INSTRUCTIONS

700 SERIES AMPLIFIERS

A-706, A-712, A-724

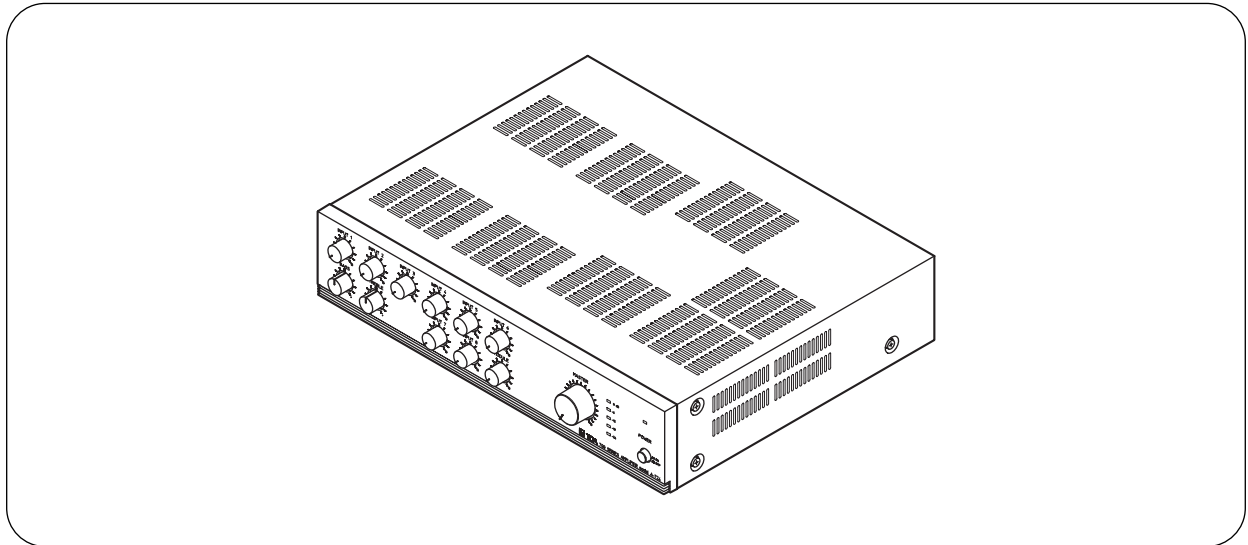


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Thank you for purchasing TOA's 700 Series Amplifiers.

Please carefully follow the instructions in this manual to ensure long, trouble-free use of your equipment.

TOA Corporation

1. IMPORTANT SAFETY INSTRUCTIONS

- Read these instructions.
- Keep these instructions.
- Heed all warnings.
- Follow all instructions.
- Do not use this apparatus near water.
- Clean only with dry cloth.
- Do not block any ventilation openings. Install in accordance with the manufacture'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 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.
- Only use attachments/accessories specified by the manufacturer.
- Use only with the bracket specified by the manufacturer, or sold with the apparatus.
- Unplug this apparatus during lightning storms or when unused for long periods of time.
- 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.

2. SAFETY PRECAUTIONS



The lightning flash with arrowhead symbol, within an 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 to persons.



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

- Before installation or use, be sure to carefully read all the instructions in this section for correct and safe operation.
- Be sure to follow all the precautionary instructions in this section, which contain important warnings and/or cautions regarding safety.
- After reading, keep this 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 hazards.



WARNING

Indicates a potentially hazardous situation which, if mishandled, could result in death or serious personal injury.

- 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.
- Avoid installing or mounting the unit in unstable locations, such as on a rickety table or a slanted

When Installing the Unit

- The unit shall not be exposed to dripping or splashing. To reduce the risk of fire or electric shock, do not expose this unit to rain or moisture.

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 TOA 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 TOA dealer.
- No objects filled with liquids, such as vases, shall be placed on 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

Indicates a potentially hazardous situation which, if mishandled, could result in moderate or minor personal injury, and/or property damage.

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

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.

ATTENTION

L'appareil ne doit pas être exposé aux éclaboussures ou écoulements et tous objets remplis de liquide, tels que vases, ne doivent pas être sur l'appareil.

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.
- 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 TOA 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.

3. GENERAL DESCRIPTION

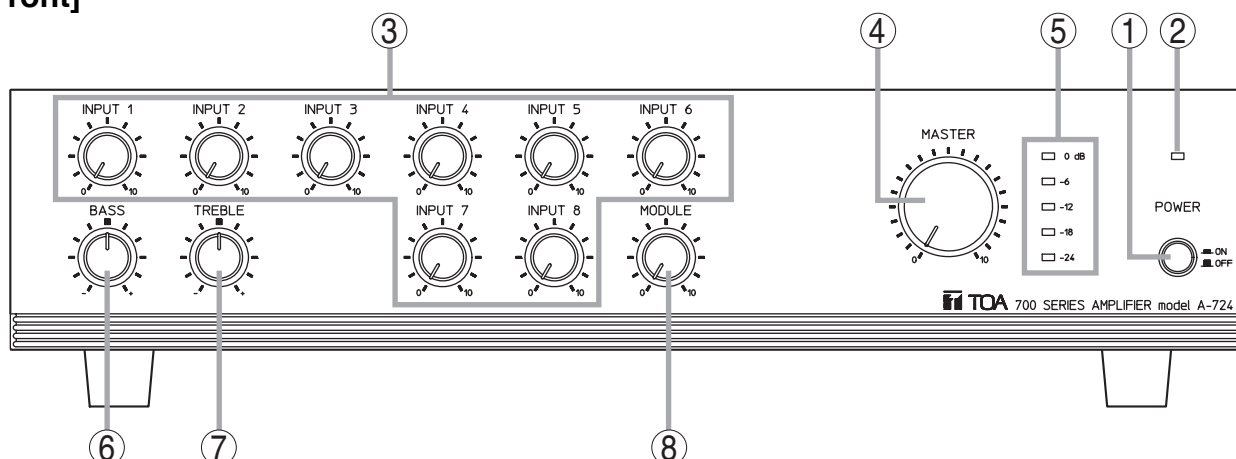
Equipped with 6 LINE/MIC selectable inputs, 2 LINE inputs and 1 MODULE input, the A-706, A-712, and A-724 PA amplifiers are designed to suit PA system applications such as announcements, BGM and broadcasting in churches, large rooms and factories.

4. FEATURES

- Power output of 60 W (A-706), 120 W (A-712), and 240 W (A-724).
- Mute Receive function assignable to all inputs, and Mute Send function assignable to Inputs 1 – 3 and Mute input.
- An equalizer or other signal processor connectable between PWR AMP IN and PRE AMP OUT terminals to make fine adjustment of sound.
- Tone controls (bass and treble).
- Output level meter.
- Master volume control for adjusting overall input signal level.
- Microphone gain trims for adjusting MIC level on Inputs 1 – 6.

5. NOMENCLATURE AND FUNCTIONS

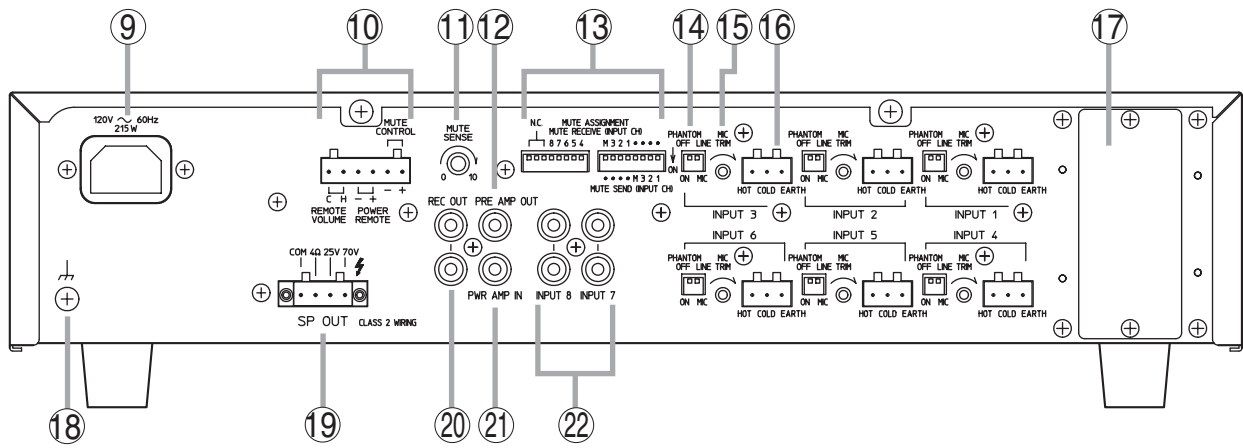
[Front]



This figure represents the A-724.

- 1. Power switch [POWER]**
Press to turn ON the power.
Press again to turn the power OFF.
- 2. Power indicator**
Lights green when the power is switched on.
- 3. Input 1 – 8 volume controls [INPUT 1 – 8]**
Adjust the corresponding input signal levels. Turn each control clockwise to increase and counterclockwise to decrease the level.
- 4. Master volume control [MASTER]**
Adjusts the overall signal level. Turn the control clockwise to increase and counterclockwise to decrease the level.
- 5. LED level meter**
Indicates an output level.
- 6. Bass control [BASS]**
Adjusts bass response. Turn clockwise to increase bass output, and counterclockwise to decrease it. The center position provides flat characteristics.
- 7. Treble control [TREBLE]**
Adjusts treble response. Turn clockwise to increase treble output, and counterclockwise to decrease it. The center position provides flat characteristics.
- 8. Module input volume control [MODULE]**
Adjusts the signal level of the module input on the rear panel. Turn the control clockwise to increase and counterclockwise to decrease the level.

[Rear]



This figure represents the A-724.

9. AC inlet

Connect the supplied power cord.

10. Remote control connector

Removable terminal block.

(1) Remote volume control terminals [REMOTE VOLUME]

[REMOTE VOLUME]

Connecting a 10 kΩ linear taper volume control across these terminals will allow remote control of preamplifier output and speaker output levels.

(2) Power remote control terminals [POWER REMOTE]

[POWER REMOTE]

Allows remote control of the unit's power ON/OFF.

No-voltage make contact input.

(3) Mute control terminals [MUTE CONTROL]

Shorting these terminals mutes the Mute Receive inputs (the inputs set to be muted). The mute control works regardless of whether or not there is a signal to a Mute Send input (the input set to activate muting).

11. Mute sensitivity control [MUTE SENSE]

Adjusts the threshold level in a range of 36 dB for the Mute Send inputs to activate the mute function. Turn clockwise to increase the threshold level (lower sensitivity), and counterclockwise to decrease the level (higher sensitivity).

12. Preamplifier output jack [PRE AMP OUT]

0 dB, 600 Ω, unbalanced RCA jack. Outputs all input signals. Connects to a signal processor such as a limiter or equalizer. (Refer to p. 7.)

13. Mute assignment switches [MUTE ASSIGNMENT]

[MUTE ASSIGNMENT]

Assign the individual inputs to Mute Receive (inputs to be muted) or Mute Send (inputs to activate muting) function. When a signal enters a Mute Send input, Mute Receive inputs are all muted.

(1) Mute Receive assignment switches [MUTE RECEIVE (INPUT CH)]

[MUTE RECEIVE (INPUT CH)]

Allow all inputs (INPUT 1 – 8 and Module) to be assigned to Mute Receive function.

(2) Mute Send assignment switches [MUTE SEND (INPUT CH)]

[MUTE SEND (INPUT CH)]

Allow the inputs 1 – 3 and Module input to be assigned to Mute Send function.

Notes

- Avoid assigning both functions to the same input.
- The audio signal level to activate muting is independent of input volume settings. So, the Mute Receive input is muted if a signal enters the Mute Send input even when the input volume is turned down. To avoid unwanted muting caused by unintentional inputs such as background noise and noise sound, it is recommended to cut the audio signal at the input equipment (such as a microphone with talk switch).

14. Function switches

(1) Phantom power ON/OFF switch [PHANTOM ON, OFF]

[PHANTOM ON, OFF]

Turns on or off the phantom power for the corresponding input. This switch is valid only when the LINE/MIC selector switch is set to the MIC position.

(2) LINE/MIC selector switch [LINE, MIC]

Selects the input sensitivity of LINE or MIC as follows:

LINE: –10 dB

MIC: –70 to –50 dB, adjustable with the Microphone gain trimmer (15).

15. Microphone gain trims [MIC TRIM]

Adjust the microphone input gain for the inputs set to MIC.

16. Input 1 – 6 connectors [INPUT 1 – 6]

–10 dB (LINE) or –70 to –50 dB (MIC) selectable, 600 Ω, balanced, removable terminal blocks.

Either LINE or MIC level can be selected by the Function switch (14).

When MIC level is selected, the input sensitivity can be adjusted from –70 to –50 dB with the Microphone gain trim (15).

The inputs 2 and 3, which are electronically

balanced, can be converted into transformer-balanced type by using optional transformers IT-455.

17. Module input slot

Accepts TOA's 900 series module.

18. Functional ground terminal

Hum noise may be generated when external equipment is connected to the unit. Connecting this terminal to the functional ground terminal of the external equipment may reduce the hum noise.

Note: This terminal is not for protective earth.

19. Speaker output terminals [SP OUT]

4 Ω, 25 V and 70 V outputs, removable terminal block. Connects to speakers.

20. Recording output jacks [REC OUT]

0 dB, 600 Ω, unbalanced RCA jacks. Output all input signals before they enter the master volume control. Connect a cassette deck, etc. when recording the broadcast contents.

21. Power amplifier input jack [PWR AMP IN]

0 dB, 600 Ω, unbalanced RCA jack. Accepts output signals from the signal processor connected to the Preamplifier output jack (12). (Refer to p. 7.)

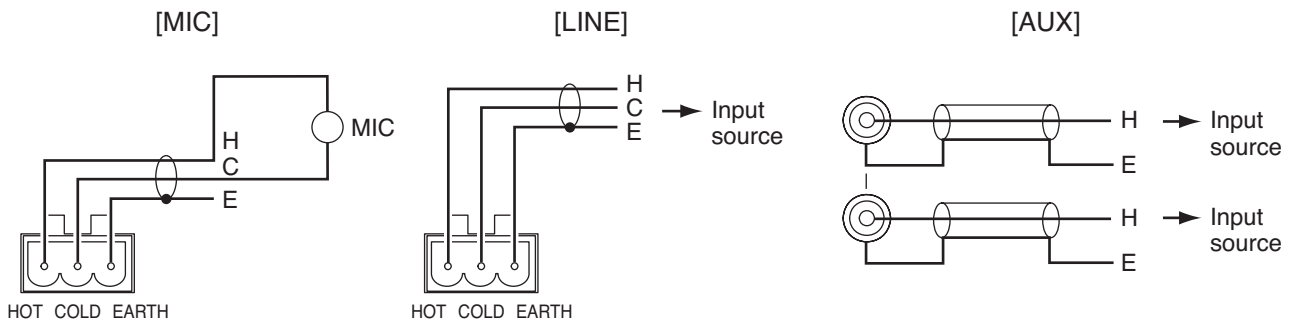
Inserting an RCA plug disconnects the internal power amplifier section from the preamplifier section.

22. Input 7 and 8 jacks [INPUT 7, 8]

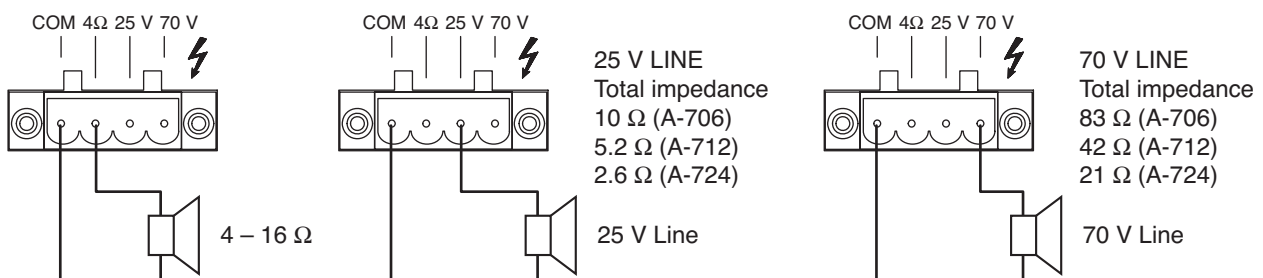
-20 dB, 10 kΩ, unbalanced RCA jacks. Accept output signals from external equipment.

6. CONNECTIONS

6.1. Input Connections



6.2. Speaker Connections



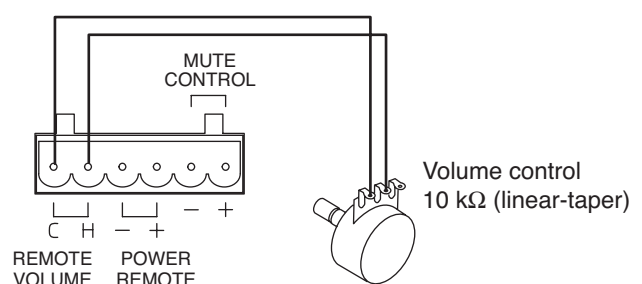
Notes

- Do not use both the 4 Ω, 25 V and 70 V terminals at the same time.
- Impedances indicated in the figures represent the total speaker system (load) impedances.

6.3. Remote Volume Control Connection

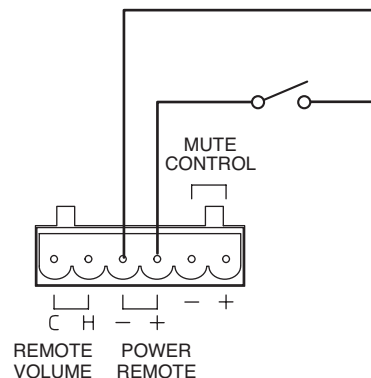
The external volume control can remotely adjust the signal level at post-master volume control.

When performing the remote volume control, adjust the master volume control in advance noting that its setting limits the maximum signal level adjustable with the volume control. Be sure to avoid turning fully down the master volume control.



6.4. Remote Power ON/OFF Control Connection

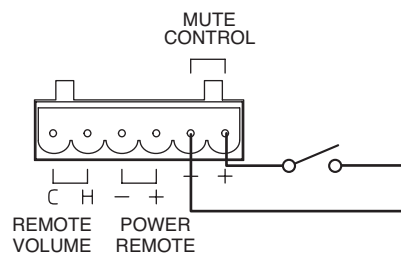
To perform this control, be sure to turn the power switch OFF. Shorting the power remote control terminals turns the power on, and opening them turns the power off. With the power switch ON, the power on/off cannot be remotely controlled.



6.5. Mute Control Connection

Shorting the mute control terminals mutes the Mute Receive inputs (the inputs set to be muted).

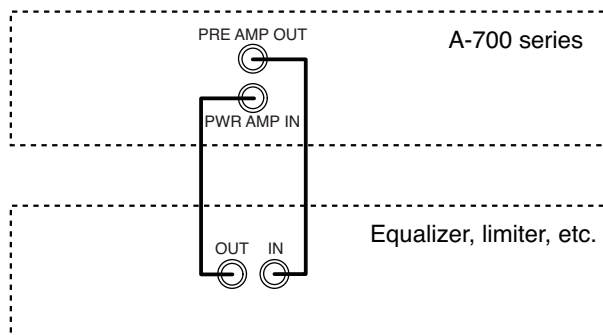
Note
The mute control works regardless of whether or not there is a signal to a Mute Send input (the input set to activate muting).



6.6. External Equipment Connection to the PRE AMP OUT and PWR AMP IN Terminals

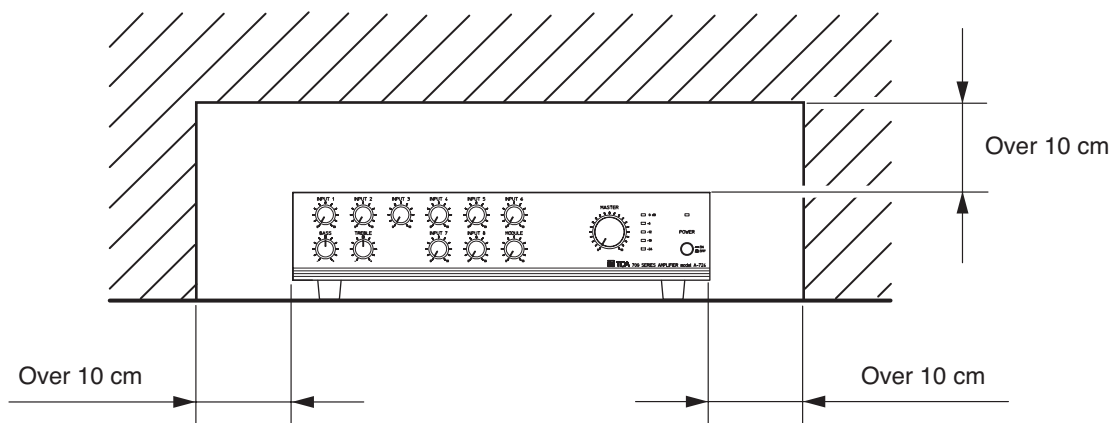
By connecting a signal processor such as an equalizer or limiter between the preamplifier section (PRE AMP OUT) and the power amplifier section (PWR AMP IN) of the A-700 series, signals can be tailored for desired sound output.

Note
Inserting an RCA plug into the PWR AMP IN terminal disconnects the internal power amplifier section from the preamplifier section.



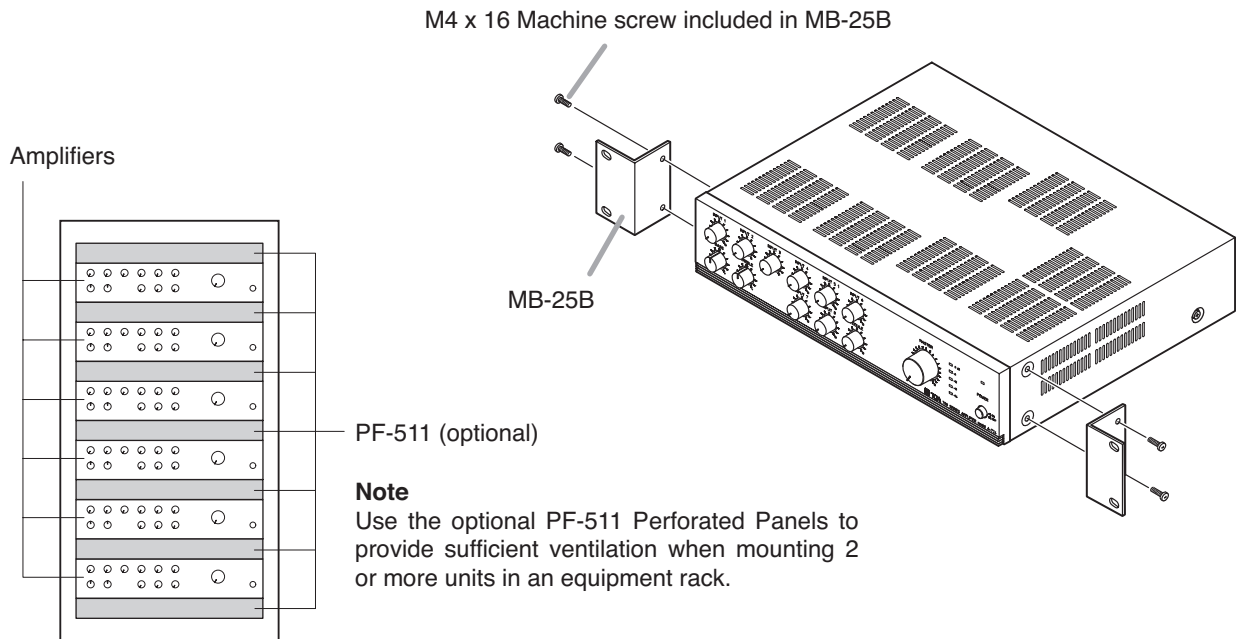
7. INSTALLATION

To prevent the internal temperature rise, keep the unit at least 10 cm away from objects that may obstruct air flow.



8. RACK MOUNTING

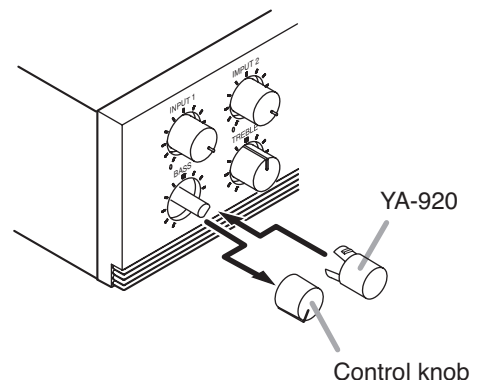
To mount the unit in a standard 19" equipment rack, use the optional MB-25B Rack Mounting Bracket. Attach the MB-25B to the unit using the supplied 4 screws. When using other screws, each screw must be shorter than 16 mm.



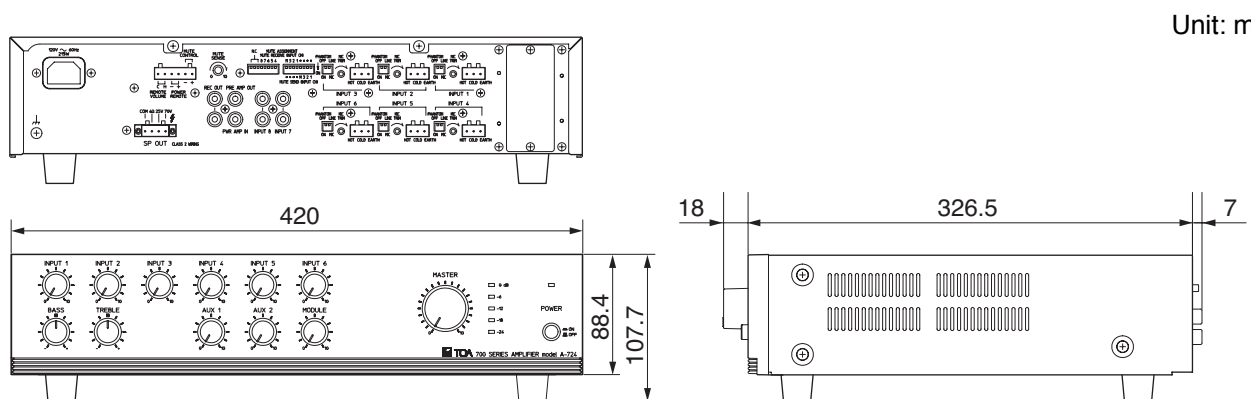
9. CONTROL SETTINGS

Output levels are adjustable with individual volume controls. For music play or announcements, adjust the corresponding volume control so that the red indicator doesn't light. Note that the sound quality is downgraded when the red indicator remains lit.

To prevent the accidental change of the settings of input volume and tone (Bass and Treble) controls, remove their knobs after setting them to the desired position and attach the supplied or optional YA-920 Volume Control Covers instead.

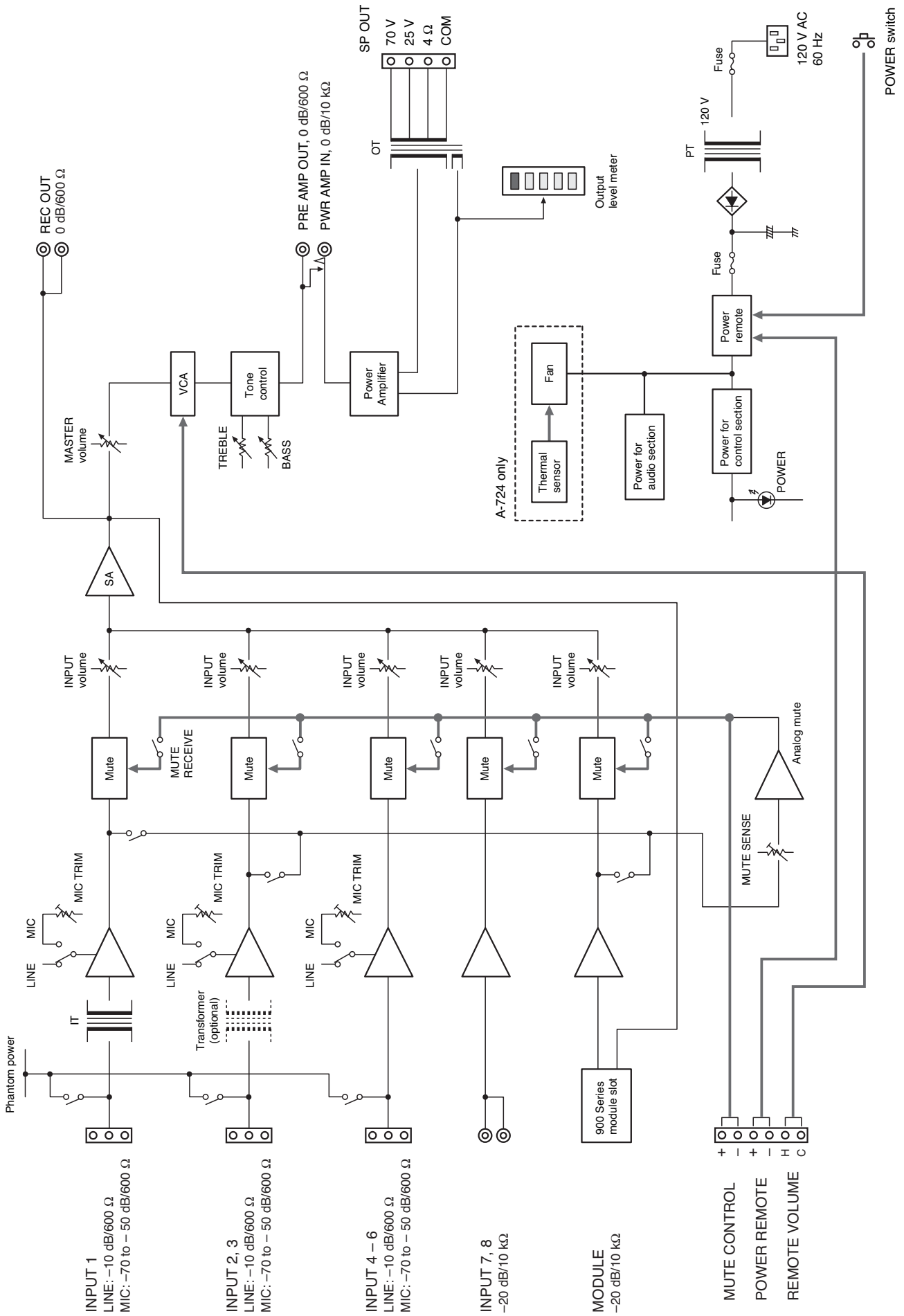


10. DIMENSIONAL DIAGRAM (Applicable to all models)



This figure represents the A-724.

11. BLOCK DIAGRAM



12. SPECIFICATIONS

[A-706]

Power Source	120 V AC, 60 Hz
Rated Output	60 W
Power/Current Consumption	155 W (rated output), 68 W (based on UL60065), under 250 mA (when power switch is OFF)
Frequency Response	50 – 20,000 Hz (± 3 dB)
Distortion	Under 2% at 1 kHz, rated power
Input	INPUT 1 – 6: -70 to -50 dB*, 600 Ω (MIC)/ -10 dB*, 600 Ω (LINE) INPUT 1: Transformer-balanced, removable terminal block (3 pins) INPUT 2 – 6: Electronically-balanced, removable terminal block (3 pins) Note: Each of INPUT 2 and 3 can be converted into transformer-balanced type by using an optional transformer IT-455. INPUT 7 – 8 (LINE): -20 dB*, 10 k Ω , unbalanced, RCA jack MODULE: -20 dB*, 10 k Ω PWR AMP IN: 0 dB*, 10 k Ω , unbalanced, RCA jack (An equalizer or other signal processor connectable between PRE AMP OUT and PWR AMP IN terminals)
Output	REC OUT: 0 dB*, 600 Ω , unbalanced, RCA jack PRE AMP OUT: 0 dB*, 600 Ω , unbalanced, RCA jack SPEAKER OUT: 70 V line (83 Ω), 25 V line (10 Ω), and 4 – 16 Ω , removable terminal block (4 pins)
Phantom Power (+23 V DC)	ON or OFF for each INPUT 1 – 6 (MIC input) with switch setting
S/N Ratio (Band pass: 20 – 20,000 Hz)	Over 55 dB (INPUT 1 – 6, mic trim volume: max., 600 Ω terminated) Over 70 dB (INPUT 1 – 6, mic trim volume: min., 600 Ω terminated) Over 76 dB (Master volume: max.) Over 90 dB (All input volume: min.)
Tone Control	Bass: ± 10 dB at 100 Hz, Treble: ± 10 dB at 10 kHz
Control Input	REMOTE VOLUME: Removable terminal block POWER REMOTE: No-voltage make contact input, removable terminal block, Open voltage: Under 14 V DC, Short-circuit: Under 0.5 mA MUTE CONTROL: No-voltage make contact input, removable terminal block, Open voltage: Under 17 V DC, Short-circuit: Under 1.5 mA
Indicator	5-point LED output level meter, Power indicator LED
Operating Temperature	-10°C to $+40^{\circ}\text{C}$
Finish	Panel: ABS resin, black, hair line Case: Steel plate, black
Dimensions	420 (w) x 107.7 (h) x 351.5 (d) mm
Weight	9.5 kg

* 0 dB = 1 V

Note: The design and specifications are subject to change without notice for improvement.

• Accessories

AC power cord (2 m)	1	Removable terminal plug (3 pins)	6
Removable terminal plug (4 pins)	1	Volume control cover YA-920	4
Removable terminal plug (6 pins)	1		

• Optional products

Input transformer: IT-455	Rack mounting bracket: MB-25B
Available as a service part with the order code 114-03-120-40.	Volume control cover: YA-920
Additionally needed is the insulating sheet also available as a service part with 131-27-700-90.	900 series module
	Perforated panel: PF-511

[A-712]

Power Source	120 V AC, 60 Hz
Rated Output	120 W
Power/Current Consumption	285 W (rated output), 110 W (based on UL60065), under 400 mA (when power switch is OFF)
Frequency Response	50 – 20,000 Hz (± 3 dB)
Distortion	Under 2% at 1 kHz, rated power
Input	INPUT 1 – 6: -70 to -50 dB*, 600 Ω (MIC)/ -10 dB*, 600 Ω (LINE) INPUT 1: Transformer-balanced, removable terminal block (3 pins) INPUT 2 – 6: Electronically-balanced, removable terminal block (3 pins) Note: Each of INPUT 2 and 3 can be converted into transformer-balanced type by using an optional transformer IT-455. INPUT 7 – 8 (LINE): -20 dB*, 10 k Ω , unbalanced, RCA jack MODULE: -20 dB*, 10 k Ω PWR AMP IN: 0 dB*, 10 k Ω , unbalanced, RCA jack (An equalizer or other signal processor connectable between PRE AMP OUT and PWR AMP IN terminals)
Output	REC OUT: 0 dB*, 600 Ω , unbalanced, RCA jack PRE AMP OUT: 0 dB*, 600 Ω , unbalanced, RCA jack SPEAKER OUT: 70 V line (42 Ω), 25 V line (5.2 Ω), and 4 – 16 Ω , removable terminal block (4 pins)
Phantom Power (+23 V DC)	ON or OFF for each INPUT 1 – 6 (MIC input) with switch setting
S/N Ratio (Band pass: 20 – 20,000 Hz)	Over 55 dB (INPUT 1 – 6, mic trim volume: max., 600 Ω terminated) Over 70 dB (INPUT 1 – 6, mic trim volume: min., 600 Ω terminated) Over 76 dB (Master volume: max.) Over 90 dB (All input volume: min.)
Tone Control	Bass: ± 10 dB at 100 Hz, Treble: ± 10 dB at 10 kHz
Control Input	REMOTE VOLUME: Removable terminal block POWER REMOTE: No-voltage make contact input, removable terminal block, Open voltage: Under 14 V DC, Short-circuit: Under 0.5 mA MUTE CONTROL: No-voltage make contact input, removable terminal block, Open voltage: Under 17 V DC, Short-circuit: Under 1.5 mA
Indicator	5-point LED output level meter, Power indicator LED
Operating Temperature	-10°C to $+40^{\circ}\text{C}$
Finish	Panel: ABS resin, black, hair line Case: Steel plate, black
Dimensions	420 (w) x 107.7 (h) x 351.5 (d) mm
Weight	12 kg

* 0 dB = 1 V

Note: The design and specifications are subject to change without notice for improvement.

• Accessories

AC power cord (2 m)	1	Removable terminal plug (3 pins)	6
Removable terminal plug (4 pins)	1	Volume control cover YA-920	4
Removable terminal plug (6 pins)	1		

• Optional products

Input transformer: IT-455	Rack mounting bracket: MB-25B
Available as a service part with the order code 114-03-120-40.	Volume control cover: YA-920
Additionally needed is the insulating sheet also available as a service part with 131-27-700-90.	900 series module
	Perforated panel: PF-511

[A-724]

Power Source	120 V AC, 60 Hz
Rated Output	240 W
Power/Current Consumption	565 W (rated output), 215 W (based on UL60065), under 60 mA (when power switch is OFF)
Frequency Response	50 – 20,000 Hz (± 3 dB)
Distortion	Under 2% at 1 kHz, rated power
Input	INPUT 1 – 6: -70 to -50 dB*, 600 Ω (MIC)/ -10 dB*, 600 Ω (LINE) INPUT 1: Transformer-balanced, removable terminal block (3 pins) INPUT 2 – 6: Electronically-balanced, removable terminal block (3 pins) Note: Each of INPUT 2 and 3 can be converted into transformer-balanced type by using an optional transformer IT-455. INPUT 7 – 8 (LINE): -20 dB*, 10 k Ω , unbalanced, RCA jack MODULE: -20 dB*, 10 k Ω PWR AMP IN: 0 dB*, 10 k Ω , unbalanced, RCA jack (An equalizer or other signal processor connectable between PRE AMP OUT and PWR AMP IN terminals)
Output	REC OUT: 0 dB*, 600 Ω , unbalanced, RCA jack PRE AMP OUT: 0 dB*, 600 Ω , unbalanced, RCA jack SPEAKER OUT: 70 V line (21 Ω), 25 V line (2.6 Ω), and 4 – 16 Ω , removable terminal block (4 pins)
Phantom Power (+23 V DC)	ON or OFF for each INPUT 1 – 6 (MIC input) with switch setting
S/N Ratio (Band pass: 20 – 20,000 Hz)	Over 55 dB (INPUT 1 – 6, mic trim volume: max., 600 Ω terminated) Over 70 dB (INPUT 1 – 6, mic trim volume: min., 600 Ω terminated) Over 76 dB (Master volume: max.) Over 90 dB (All input volume: min.)
Tone Control	Bass: ± 10 dB at 100 Hz, Treble: ± 10 dB at 10 kHz
Control Input	REMOTE VOLUME: Removable terminal block POWER REMOTE: No-voltage make contact input, removable terminal block, Open voltage: Under 14 V DC, Short-circuit: Under 0.5 mA MUTE CONTROL: No-voltage make contact input, removable terminal block, Open voltage: Under 17 V DC, Short-circuit: Under 1.5 mA
Indicator	5-point LED output level meter, Power indicator LED
Operating Temperature	-10°C to $+40^{\circ}\text{C}$
Finish	Panel: ABS resin, black, hair line Case: Steel plate, black
Dimensions	420 (w) x 107.7 (h) x 351.5 (d) mm
Weight	13.5 kg

* 0 dB = 1 V

Note: The design and specifications are subject to change without notice for improvement.

• Accessories

AC power cord (2 m)	1	Removable terminal plug (3 pins)	6
Removable terminal plug (4 pins)	1	Volume control cover YA-920	4
Removable terminal plug (6 pins)	1		

• Optional products

Input transformer: IT-455	Rack mounting bracket: MB-25B
Available as a service part with the order code 114-03-120-40.	Volume control cover: YA-920
Additionally needed is the insulating sheet also available as a service part with 131-27-700-90.	900 series module
	Perforated panel: PF-511

