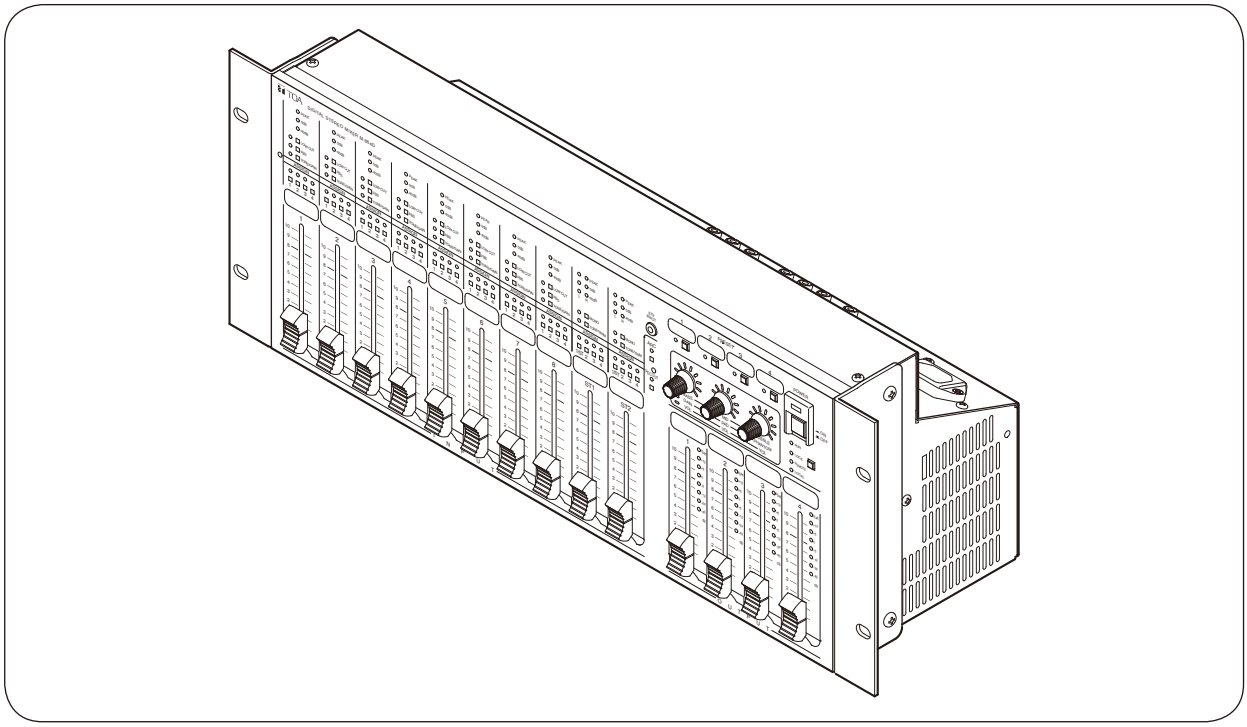
TOA

OPERATING INSTRUCTIONS

DIGITAL STEREO MIXER M-864D



Thank you for purchasing TOA's Digital Stereo Mixer.
Please carefully follow the instructions in this manual to ensure long, trouble-free use of your equipment.

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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 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.



- 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

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

⚠ WARNING

When Installing the Unit

- Do not expose the unit to rain or an environment where it may be splashed by water or other liquids, as doing so may result in fire or electric shock.
- Use the unit only with the voltage specified on the unit. Using a voltage higher than that which is specified may result in fire or electric shock.
- Do not cut, kink, otherwise damage nor modify the power supply cord. In addition, avoid using the power cord in close proximity to heaters, and never place heavy objects -- including the unit itself -- on the power cord, as doing so may result in fire or electric shock.
- Avoid installing or mounting the unit in unstable locations, such as on a rickety table or a slanted surface. Doing so may result in the unit falling down and causing personal injury and/or property damage.

- Since the unit is designed for indoor use, do not install it outdoors. If installed outdoors, the aging of parts causes the unit to fall off, resulting in personal injury. Also, when it gets wet with rain, there is a danger of electric shock.

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 qualified service personnel.
- Do not place cups, bowls, or other containers of liquid or metallic objects on top of the unit. If they accidentally spill into the unit, this may cause a fire or electric shock.
- Do not insert nor drop metallic objects or flammable materials in the ventilation slots of the unit's cover as this may result in fire or electric shock.
- The apparatus shall be connected to a main socket outlet with a protective earthing connection.
- The socket-outlet shall be installed near the equipment and the plug shall be easily accessible.

⚠ CAUTION

When Installing the Unit

- Never plug in nor remove the power supply plug with wet hands, as doing so may cause electric shock.
- When unplugging the power supply cord, be sure to grasp the power supply plug; never pull on the cord itself. Operating the unit with a damaged power supply cord may cause a fire or electric shock.
- When moving the unit, be sure to remove its power supply cord from the wall outlet. Moving the unit with the power cord connected to the outlet may cause damage to the power cord, resulting in fire or electric shock. When removing the power cord, be sure to hold its plug to pull.
- Do not block the ventilation slots on the unit's both sides, top panel, and rear side. Doing so may cause heat to build up inside the unit and result in fire. Also, periodically clean the ventilation slots of dust.
- 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.
- Be sure to follow the instructions below when rack-mounting the unit. Failure to do so may cause a fire or personal injury.
  - · Install the equipment rack on a stable, hard floor. Fix it with anchor bolts or take other arrangements to prevent it from falling down.
  - · When connecting the unit's power cord to an AC outlet, use the AC outlet with current capacity allowable to the unit.

  (Every version except the M-864D CU for US)
  - · The supplied rack-mounting screws can be used for the TOA equipment rack only. Do not use them for other racks.

  (M-864D CU for US)
  - · Rack-mounting screws are not supplied with the unit. Prepare them that are appropriate for the equipment rack.
  - · Be sure to complete installation and cable connections before connecting the unit's power plug to the power source. When uninstalling the unit or disconnecting the unit's cables, be sure to disconnect the power plug from the power source first. Doing otherwise may result in electric shock.
- LAN Connector cannot connect to Connector which might catch overvoltage.

When the Unit is in Use

- (When using the ZM-9011/9012/9013/9014 Remote Control Panel)
  Be sure to use the dedicated AC Adapter or its equivalent.
  Using other AC adapter may cause a fire.
- 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.



The lighting 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 operation and maintenance (servicing) instruction in the literature accompanying the appliance.

3. GENERAL DESCRIPTION

The M-864D is a Digital stereo mixer equipped with digital signal processing functions such as Automatic Resonance Control function (ARC), Feedback Suppressor function (FBS), Automatic stereo input mute function*[1], Tone controller, and PEQ.
Tone control and gain adjustment can be made through the front panel operation.
Further, each input has a built-in analog gain control circuit.
It can be mounted in a 19-inch EIA component rack (4U size*[2]).

*[1] Auto mute function or Ducker function
*[2] 1U size = 44.5 mm (standard size)

4. FEATURES

- A stereo mixer with 22 input channels (8 monaural inputs and 7 stereo inputs) and 6 output channels (4 monaural outputs and 1 stereo recording output).
- Assignable each input to 6 output channels (OUTPUTs 1 – 4, REC OUT L/R) individually.
- Adjustable for intelligible sound output (ARC function) by automatically creating a sound field compensation filter (ARC filter).
- Automatic feedback suppressor (FBS function).
- Stereo inputs muted automatically by detecting the monaural input signal (Automatic Mute function).
- Monaural inputs with a built-in analog gain control circuit (0 to +60 dB).
- Monaural inputs capable of supplying phantom power (+24 V, 10 mA).
- Stereo inputs with a built-in analog trim control circuit (–∞ to 0 dB).
- Volume adjustable with 60 mm (2.36") faders.
- Each function settable at the M-864D using its front-mounted switches and faders.
- Advanced settings using the M-864D PC Software* via LAN.
- Designed for use in conjunction with the optional Remote Control Panels ZM-9011, ZM-9012, ZM-9013, and ZM-9014 (collectively referred to as “ZM Remote controller” in this manual), enabling volume control, channel ON/OFF, and Preset memory recall.

* Can be downloaded from the TOA DATA Library (https://www.toa-products.com/international/).

5. HANDLING PRECAUTIONS

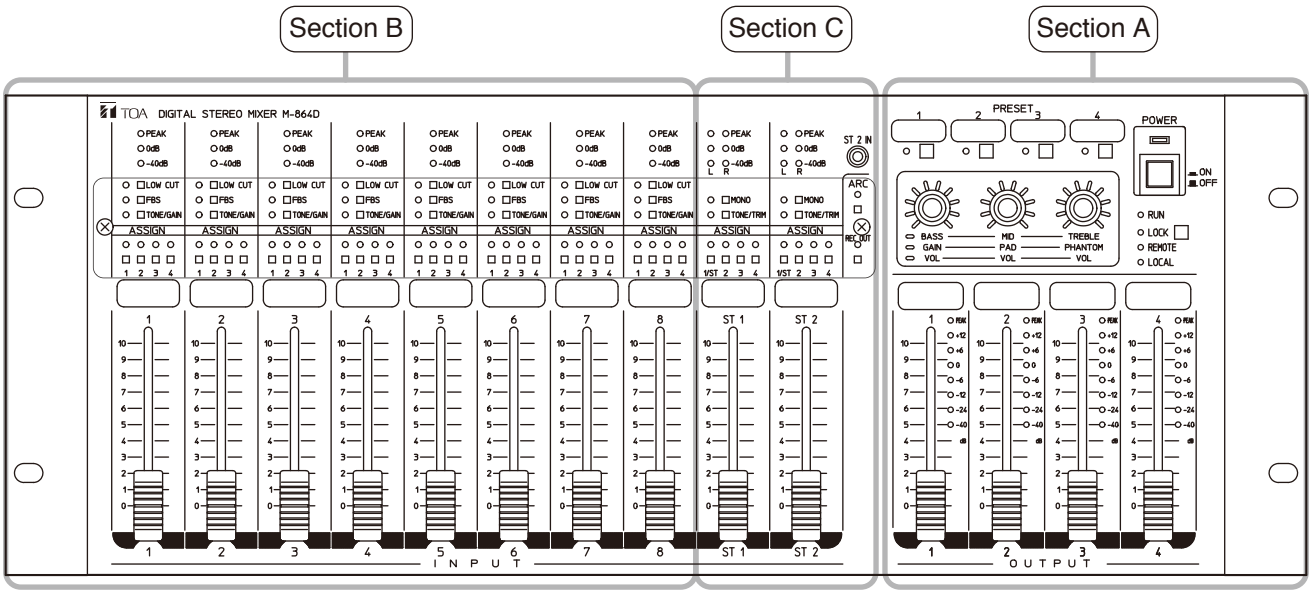
- The supplied power supply cord is designed for exclusive use with this unit. Never use it with other equipment.
- Install the unit in locations where the temperature is between 0 and +40 °C (32 and 104°F) and the moisture is less than 90% (no dew condensation must be formed).
- The M-864D is a precision audio component. To prevent failure, avoid locations where the unit may be exposed to strong shocks or vibrations.
- To clean, be sure to first switch off the unit's power, then wipe with a dry cloth. When the unit gets very dirty, use a cloth damped in a neutral cleanser. Never use benzene, thinner, alcohol, or chemically-treated cleaning cloth because such volatile liquids could deform or discolor the unit.

6. INSTALLATION PRECAUTIONS

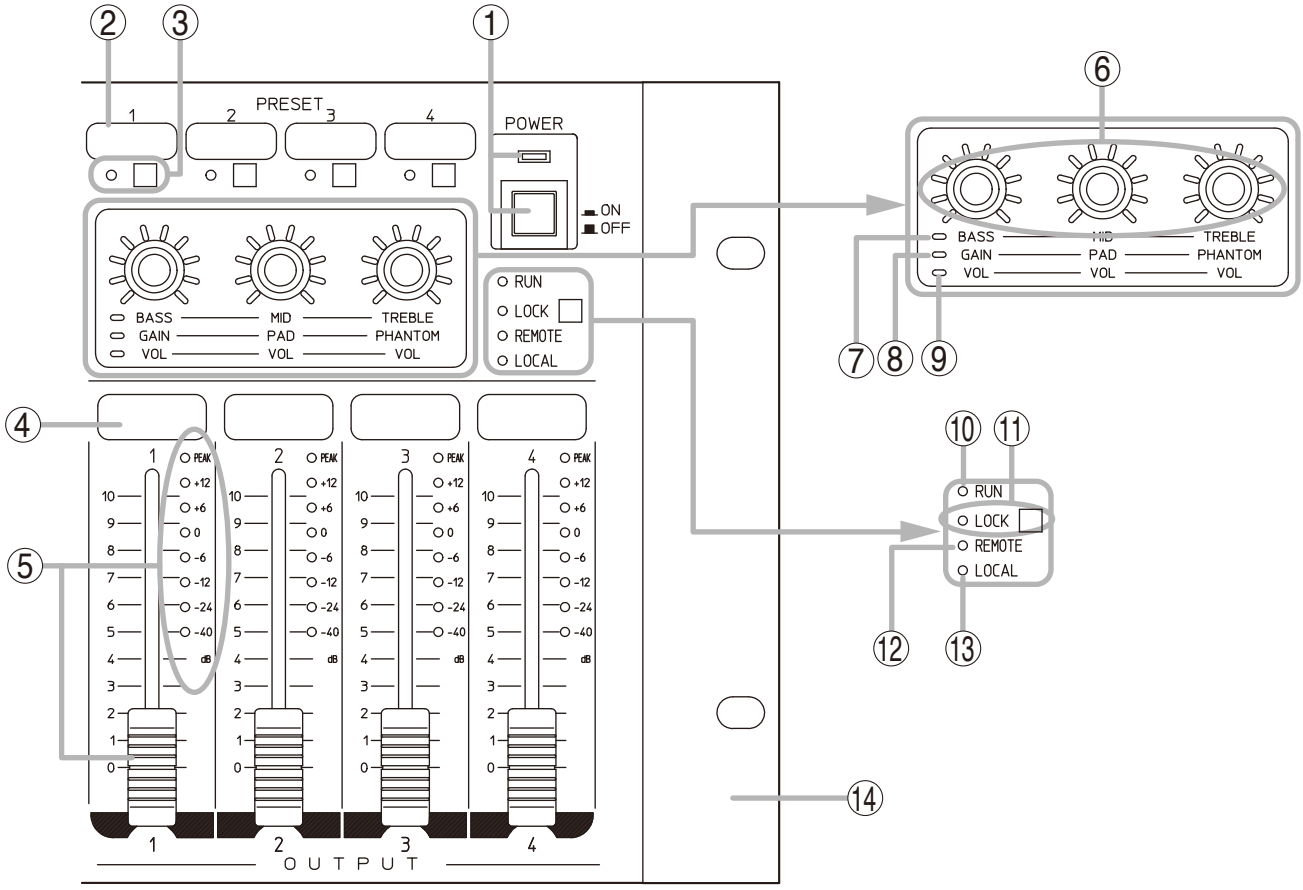
- Be sure to install and connect the unit before the connection to the AC mains outlet. Remove the unit's power supply cord from the AC mains outlet when uninstalling or disconnecting the unit.
- The socket-outlet shall be installed near the equipment and the plug shall be easily accessible.

7. NOMENCLATURE AND FUNCTIONS

[Front]



• **Section A**



1. **Power switch and Power indicator [POWER] (Green)**
   Press this switch to turn on the power, and the indicator lights.
   To turn off the power, press this switch again. The indicator goes off.

2. **Preset memory name label attaching space**
   Affix a label with the printed Preset memory contents or name.

3. **Preset memory key and Preset memory indicator [PRESET 1 – 4] (Green)**
   Used to recall the settings stored in the Preset memory or store the current parameters.
   The indicator lights when the Preset memory has been selected with the key. (See p. 37.)

4. **Output name label attaching space**
   Affix a label with the printed output name.

5. **Output volume fader and output level indicators [OUTPUT 1 – 4] (Green, orange, red)**
   Adjusts the output volume level.
   The volume level increases by moving up the fader, and decreases by moving it down.
   The respective indicator of –40, –24, –12, –6, 0, +6, +12, or PEAK lights depending on the output signal level.
   Output level indicates the post-fader level value.
   Decrease the volume level when the PEAK indicator remains lit.

6. **Control knobs and setting value indicators (Green, orange)**
   Adjust the corresponding control when in Tone control mode, Gain control mode, or Trim control mode.
   To switch to each respective control mode, use the Tone/Gain selection switch (18) or Tone/Trim selection switch (25). (See p. 16 and p. 19.)
   Also, adjust the recording output volume level. (See p. 25.)
   The setting value indicators differ in lighting and flashing status depending on the control mode. For details, read the description of each function.

7. **Tone control mode indicator [BASS, MID, TREBLE] (Green)**
   Lights while in Tone control mode.

8. **Gain control mode indicator [VOL, PAD, PHANTOM] (Orange)**
   Lights while in Gain control mode.

9. **Trim control mode indicator [VOL, VOL, VOL] (Orange)**
   Lights while in Trim control mode or when the Recording output switch (31) is pressed.

10. **Operation status indicator [RUN] (Green, orange, red)**
    Indicates the M-864D's operation status.

Lights green:	Normal operation status
Flashes orange:	Built-in fan failure
Flashes red:	Malfunction of Digital signal processing (DSP)
Unlit:	CPU failure

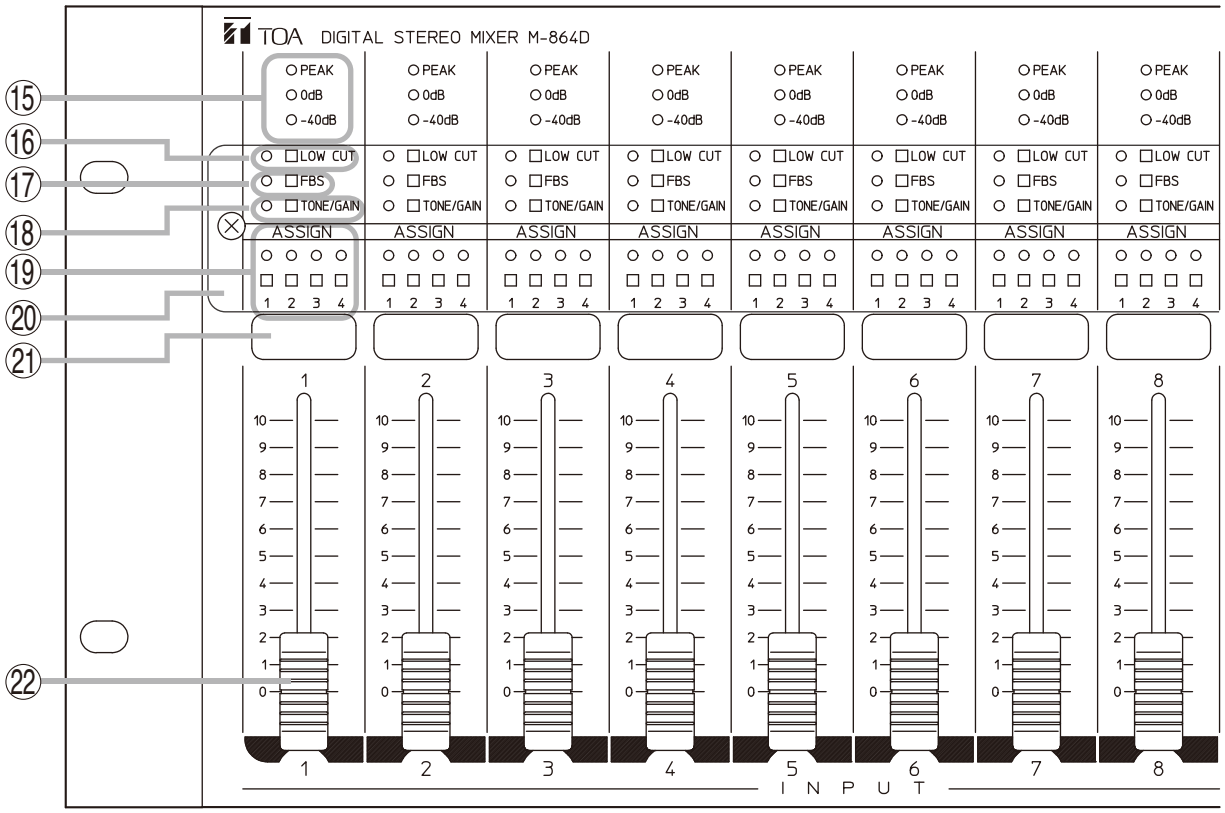
11. **System lock key and System lock indicator [LOCK] (Orange)**
    Press this key when wishing to prohibit the M-864D's front panel operation. (See p. 39.)
    The indicator lights when the key is pressed.
    Set the operations to be prohibited using the M-864D PC Software.
    The M-864D is allowed to prohibit all the target functions by the factory default.

12. **Remote control indicator [REMOTE] (Green)**
    Lights green during operation by a PC, ZM Remote controller, and external control device.

13. **Local indicator [LOCAL] (Green)**
    Lights green when the M-864D's front panel operation is available.

14. **Mounting bracket**
    Allows to mount the M-864D in an EIA component rack.

• **Section B**



15. Input level indicators [–40 dB, 0 dB, PEAK] (Green, red)
Light green depending on the input signal level. (Peak indicator lights red.)
Input level indicates the pre-fader level value.
Adjust the input gain when the PEAK indicator remains lit. (See p. 16, "PHANTOM POWER, PAD, AND GAIN SETTINGS.")

16. Low cut switch and Low cut indicator [LOW CUT] (Green)
The indicator lights when the switch is pressed and the internal low cut filter is enabled.
Cutoff frequency: 100 Hz*
* It can be adjusted in the range of 20 Hz to 20 kHz using the M-864D PC Software.
See the separate Software instructions, which can be downloaded from the TOA DATA Library (https://www.toa-products.com/international/).

17. Feedback Suppressor switch and Feedback suppressor indicator [FBS] (Green)
The Feedback Suppression function is enabled when this switch is pressed, and the indicator lights. (See p. 27.)

18. Tone/Gain selection switch and Tone/Gain control mode indicator [TONE/GAIN] (Green, orange)
Each time the switch is pressed, the mode switches among Standby mode, Tone control mode, and Gain control mode.
The indicator goes off in Standby mode, lights green in Tone control mode, and lights orange in Gain control mode.

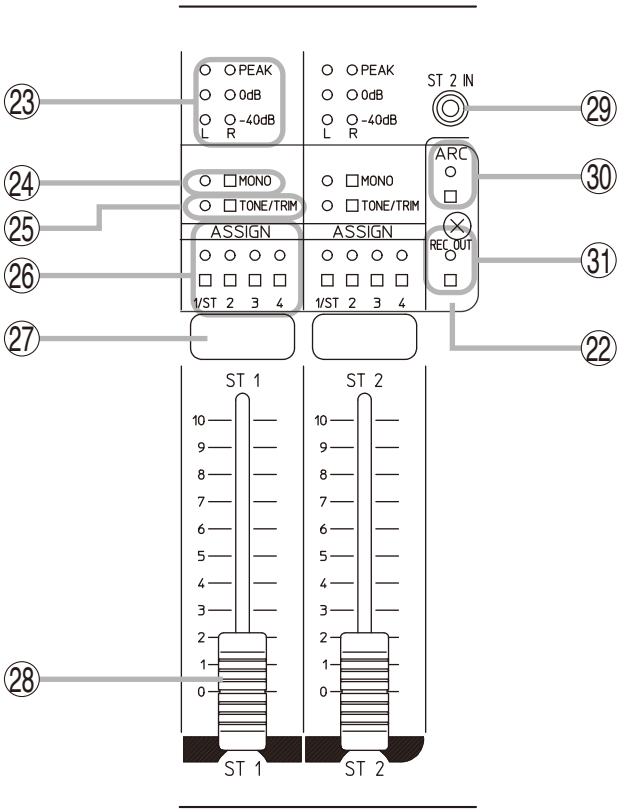
19. Assignment switches and Assignment indicators [ASSIGN 1 – 4] (Green)
Used to select the output destination of the post-fader signals adjusted by the monaural input volume fader (22) of each channel.
The corresponding indicator lights when the switch is pressed, and the monaural input (1 through 8) signal is output to the corresponding bus (1 through 4).

20. Protective cover (accessory)
Used to protect settings such as Low cut switch (16) and Assignment switch (19) settings.

21. Input name label attaching space
Affix the label with the printed input name.

22. Monaural input volume fader [INPUT 1 – 8]
Adjusts the monaural input volume level.
The volume level increases by moving up the fader, and decreases by moving it down.

• **Section C**



23. Input level indicators [–40 dB, 0 dB, PEAK] (Green, red)

Light green depending on the input signal level. (The peak indicator lights red.) Input level indicates the pre-fader level value.

Adjust the trim control when the PEAK indicator remains lit. (See p. 19, "TRIM CONTROL.")

The ST1 L channel's input level indicator shows the total level of 3 inputs (A, B, and C) provided at the STEREO INPUT 1 L channel.

Likewise, the ST1 R channel's input level indicator shows the total level of 3 inputs (A, B, and C) provided at the R channel.

The ST2 L channel and the ST2 R channel indicate the levels in the same way.

24. Monaural summing switch and Monaural summing indicator [MONO] (Green)

The indicator lights when the switch is pressed, and stereo input signals applied to L and R channels can be mixed and output (monaural). (See p. 23.)

25. Tone/Trim selection switch and Tone/Trim control mode indicator [TONE/TRIM] (Green, orange)

Each time the switch is pressed, the mode switches among Standby mode, Tone control mode, and Gain control mode.

The indicator goes off in Standby mode, lights green in Tone control mode, and lights orange in Trim control mode.

26. Assignment switches (Stereo) and Assignment indicators [1 – 4] (Green)

Used to select the output destination of the post-fader signals adjusted using the stereo input volume fader (28) of each channel.

The corresponding indicator lights when the switch is pressed, and the signals applied to the Stereo input 1 and 2 are output to the corresponding bus (1 through 4).

1/ST: Outputs L channel signals from the Output 1.
2: Outputs R channel signals from the Output 2.
3: Outputs L + R channels signals from the Output 3.
4: Outputs L + R channels signals from the Output 4.

Note

With the switch "1/ST" or "2" pressed, pressing the Monaural summing switch (24) causes the input signals to be mixed and sent as summing output, outputting the L + R channels signals to the Output 1 and 2 individually.

27. Input name label attaching space

Affix the label with the printed input name.

28. Stereo input volume fader [ST 1 – 2]

Adjusts the stereo input volume level.

The volume level increases by moving up the fader and decreases by moving it down.

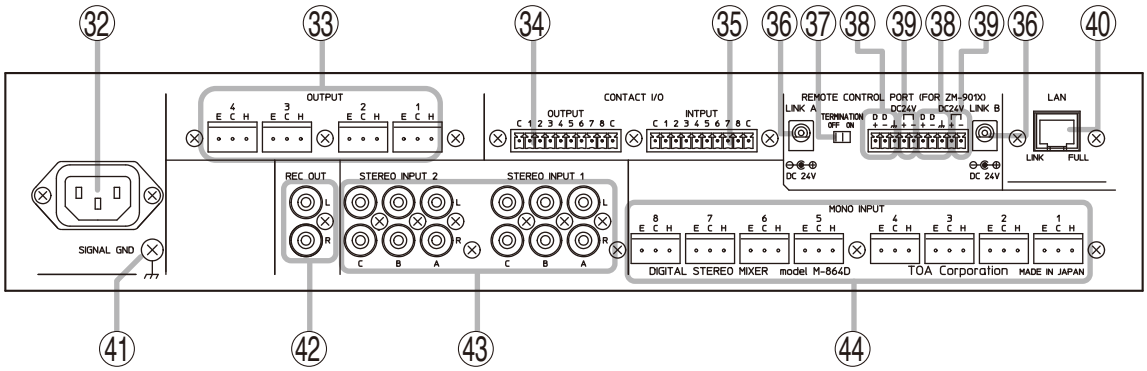
29. Front-mounted Stereo input 2 jack [ST 2 IN]
–10 dB*, 10 kΩ, unbalanced type, stereo mini jack. It is internally connected in parallel to the Stereo input 2. Adjust the input level with the Stereo 2 Input volume fader (28).

30. ARC switch and ARC operation indicator [ARC] (Green)
Press this switch to enable the Automatic Resonance Control function (ARC).
Hold down this switch for 3 seconds to start the ARC measurement, and the ARC operation indicator flashes.
Upon measurement completion, the ARC filter is set, and the ARC indicator lights. (See p. 28.)

31. Recording output switch and Recording output indicator [REC OUT] (Green)
The indicator lights when the switch is pressed, and the Control knob (6) is allowed to adjust the recording output volume. (See p. 25.)

* 0 dB = 0.775 V

[Rear terminal section]



32. AC inlet
Connect this inlet to the AC wall outlet using the supplied dedicated power cord.

33. Output terminals [OUTPUT 1 – 4]
+ 4 dB*, 600 Ω, balanced type, removable terminal block.
The input channel signals assigned to Buses 1 through 4 using the Assignment switches (19 and 26) are output from each individual output terminal.
Buses 1 through 4 correspond to the output terminals 1 through 4, respectively.

34. Contact output terminals [OUTPUT C, 1, 2, 3, 4, 5, 6, 7, 8, C]
Removable terminal block, 8-channel contact output terminal.
Perform function assignment to each contact by a PC using the M-864D PC Software.

35. Contact input terminals [INPUT C, 1, 2, 3, 4, 5, 6, 7, 8, C]
Removable terminal block, 8-channel contact input terminals.
Perform function assignment to each contact by a PC using the M-864D PC Software.

36. AC adapter input [LINK A and LINK B]
Connect the dedicated AC adapter or its equivalent* that supplies 24 V DC power to the ZM Remote controller.

* Use the AD-246 AC adapter (optional) or its equivalent. As for the usable adapter, consult your TOA dealer.

37. Termination switch [TERMINATION ON, OFF]
Used to turn ON or OFF the termination of 120 Ω for parallel connection.

38. Data line connection terminals [D+, D–]
Connect the data line from the ZM Remote controller to these terminals.
Match the polarity.

39. 24 V DC output terminals [DC 24 V, + and –]
Supply 24 V DC to the ZM Remote controller.

40. LAN port
Connect this port to the LAN-connected switching hub using a LAN cable.
The MX-864D's default IP address is "192.168.14.1."
Perform settings by a PC using the M-864D PC Software.
• **Link indicator**
Lights when the link is established and during data transmission or reception.
• **Full indicator**
Lights during Full duplex operation.

41. Functional ground terminal
Connect this terminal to the functional ground of external equipment if much noise is encountered when the digital audio processor is connected to the external equipment. The noise may be reduced
Note: This ground is not for protective ground.

42. Recording output terminals [REC OUT L, R]
–10 dB*, 1 kΩ, unbalanced type, RCA jack.
Mixed signal of Buses 1 through 4 selected by the M-864D PC Software is output.

43. Stereo input terminals [STEREO INPUT 1, 2, A, B, C]
–10 dB*, 10 kΩ, unbalanced type, RCA jack. (See p. 54, "BLOCK DIAGRAM.")

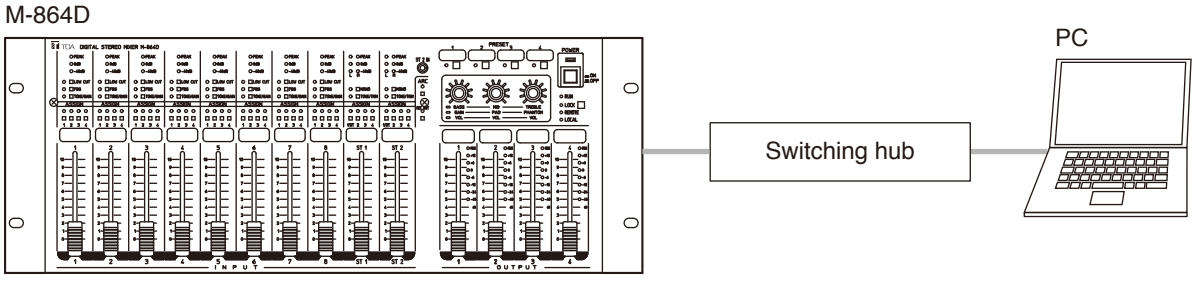
44. Monaural input terminals [MONO INPUT 1 – 8, E, C, H]
–56 to +4 dB*, 10 kΩ (PAD ON)/7 kΩ (PAD OFF), balanced type, removable terminal block.
Input sensitivity can be selected by the Control knobs (6) when the control mode is the Gain control mode.

* 0 dB = 0.775 V

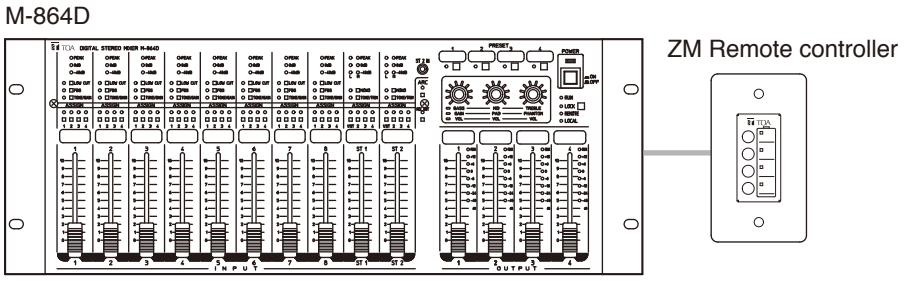
8. SYSTEM CONFIGURATION EXAMPLE

The M-864D can be used alone or in conjunction with a PC and external control device.

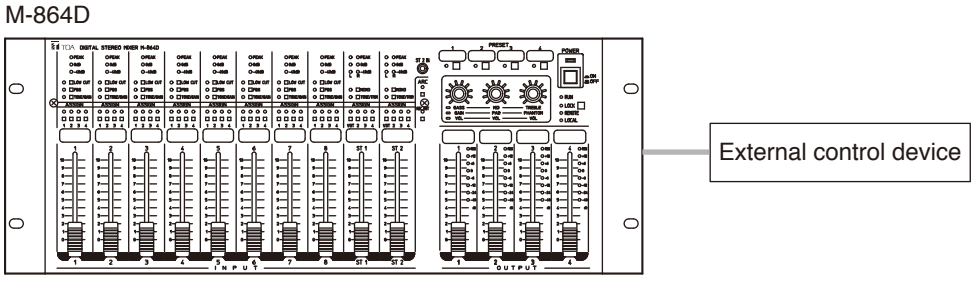
• Using the M-864D unit in conjunction with a PC



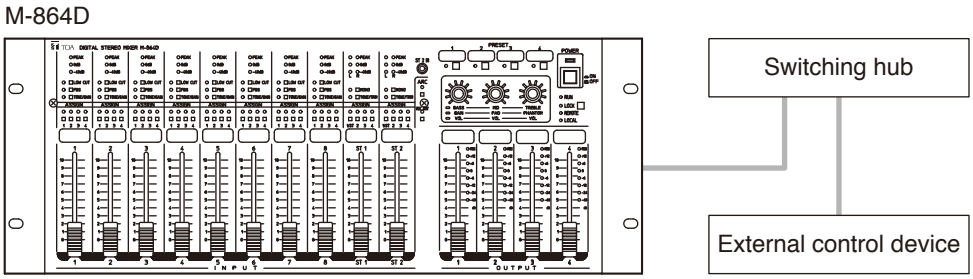
• Using the M-864D unit in conjunction with the ZM Remote controller



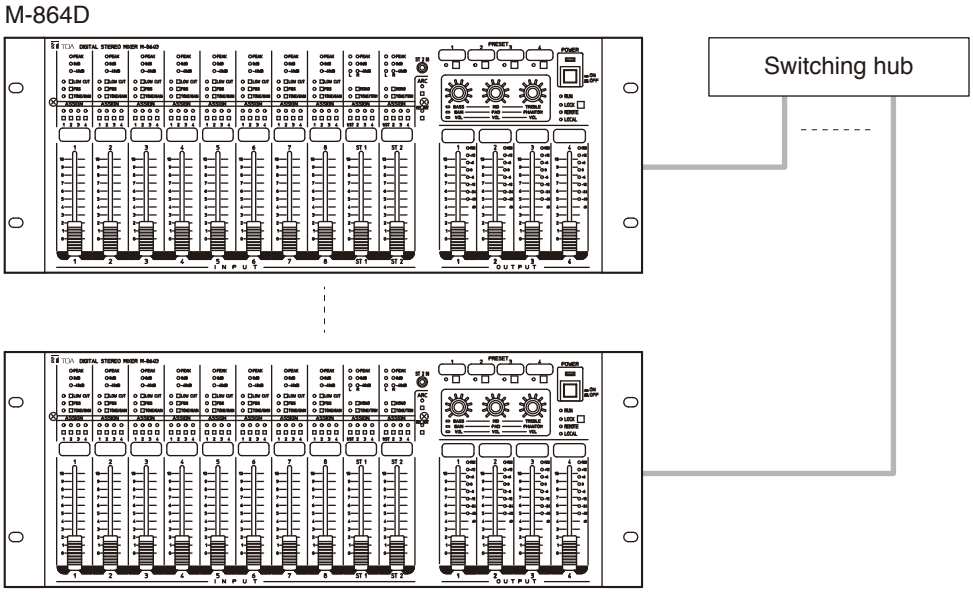
• Using the M-864D unit in conjunction with the external control device



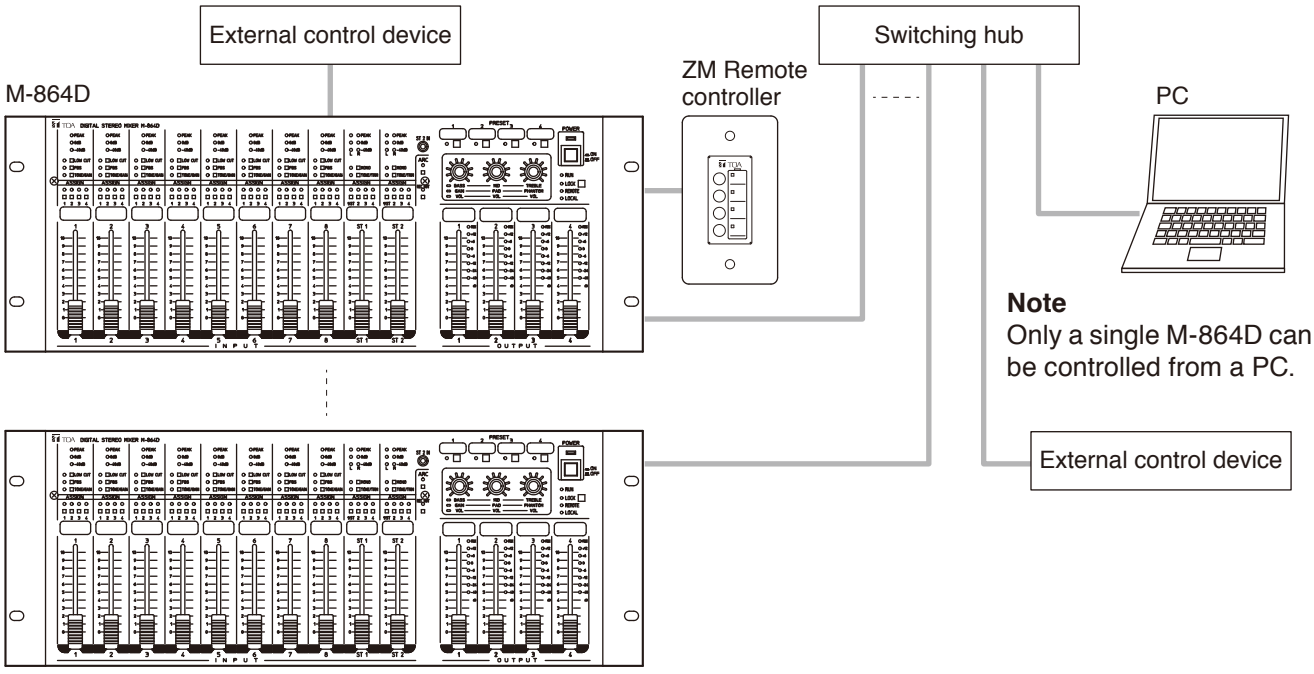
• Using the M-864D in conjunction with the external control device via LAN (Ethernet)



• Using multiple M-864D units (up to 5 M-864D units)
In this event, Preset memory switching interlocks among up to 5 M-864D units.

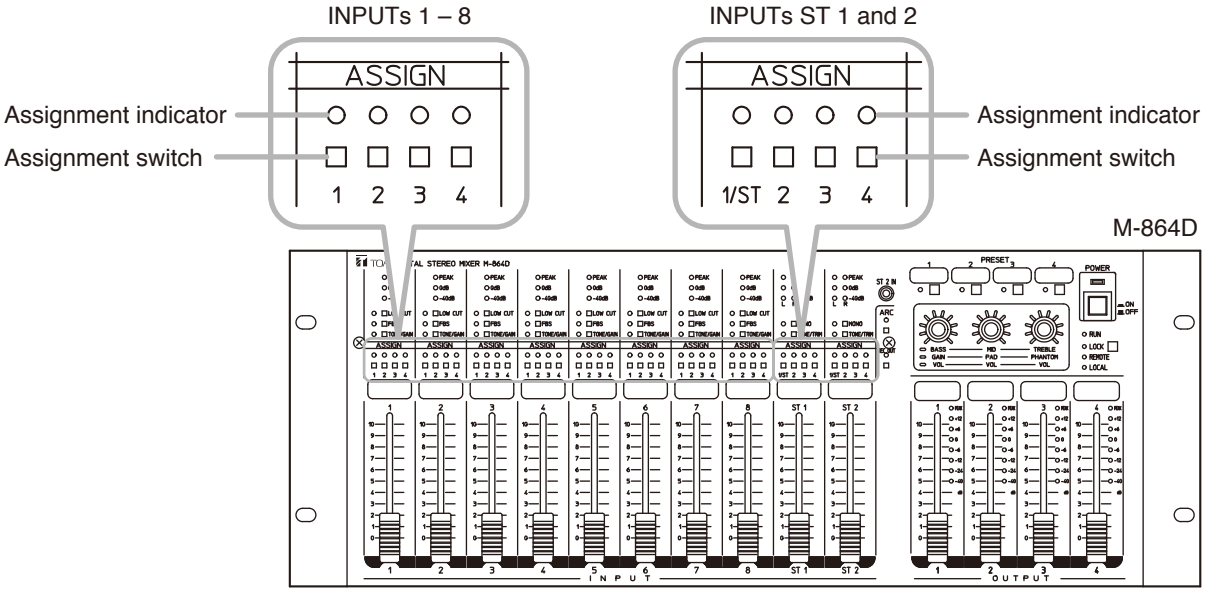


• Using multiple M-864D units (up to 5 units) in conjunction with the external control device and ZM Remote controller to be directly connected, and a PC and external device via LAN.



9. ASSIGNMENT SETTINGS

It is possible to assign each input to 4 output channels (OUTPUT 1, 2, 3, and 4).



9.1. Assignment Switches of Inputs 1 through 8

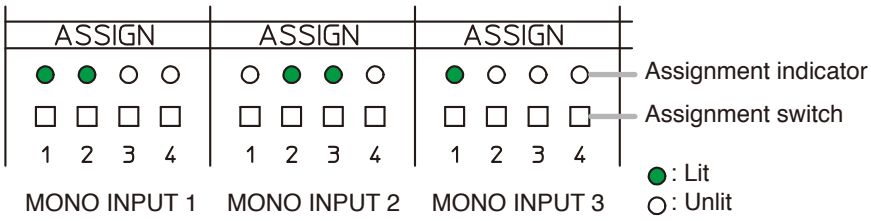
It is possible to assign each monaural input to Outputs 1 through 4.
Pressing the Assignment switch 1 causes the corresponding indicator to light, routing the input signal to the OUTPUT 1. The Assignment switches 2 through 4 serve as the same function as the Assignment switch 1.

Assignment switch	Output destination
1	OUTPUT 1
2	OUTPUT 2
3	OUTPUT 3
4	OUTPUT 4

[Assignment setting example]

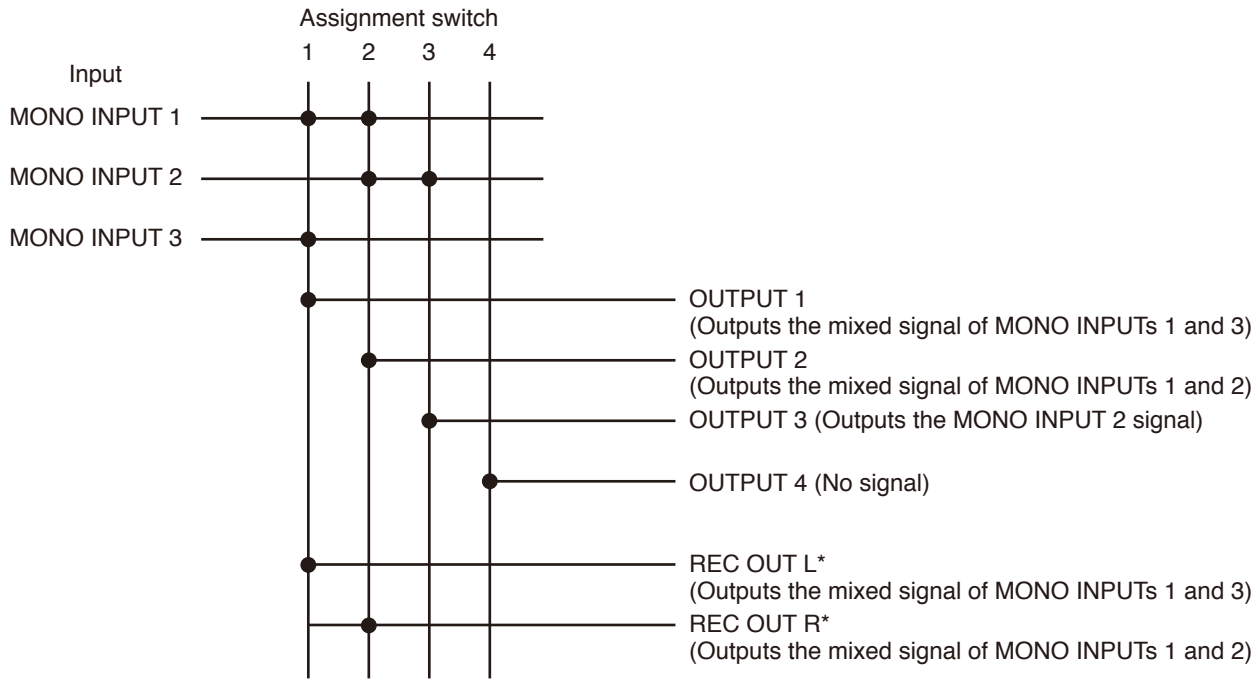
Set the Assignment switches of the inputs as the table below.

Input	Assignment switch
MONO INPUT 1	1, 2
MONO INPUT 2	2, 3
MONO INPUT 3	1



Note
Use a fine-tipped object to press in the Assignment switch.

The figure below shows a signal flow.



* Set the REC OUT assignment using the M-864D PC Software.
The REC OUT default assignment is as follows.
REC OUT L: Assignment switch 1
REC OUT R: Assignment switch 2

9.2. Assignment Switches of INPUTs ST1 and ST2

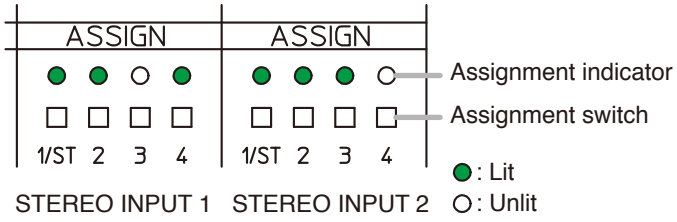
It is possible to assign Stereo inputs 1 and 2 to Outputs 1 through 4.
Pressing each Assignment switch causes the corresponding indicator to light, routing the input signal as shown in the table below.

Assignment switch	Output destination	Signal
1	OUTPUT 1	L channel
2	OUTPUT 2	R channel
3	OUTPUT 3	L + R channel
4	OUTPUT 4	

[Assignment setting example]

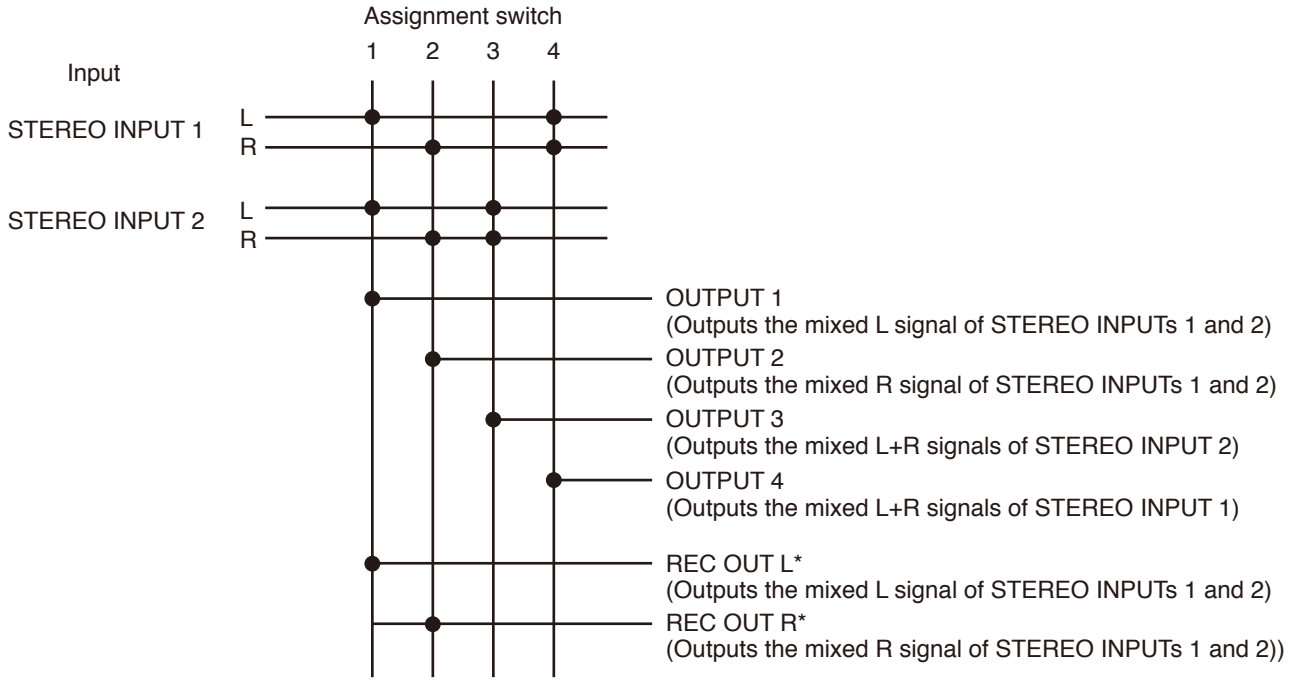
Set the Assignment switches of the inputs as the table below.

Input	Assignment switch
STEREO INPUT 1	1, 2, 4
STEREO INPUT 2	1, 2, 3



Note
Use a fine-tipped object to press in the Assignment switch.

The figure below shows a signal flow.



* Set the REC OUT assignment using the M-864D PC Software.
The REC OUT default assignment is as follows.
REC OUT L: Assignment switch 1
REC OUT R: Assignment switch 2

10. PHANTOM POWER, PAD, AND GAIN SETTINGS

The input sensitivity and phantom power ON or OFF can be set to Monaural inputs 1 through 8 depending on the devices to be connected.
Perform these settings by the control knobs after placing the M-864D in Gain control mode.

10.1. Setting Procedures

Step 1. Place the M-864D in Gain control mode.

Step 2. Perform settings as follows depending on the device to be connected. (See the next page.)

Device to be connected	Settings	
	Phantom power	PAD
Dynamic microphone	OFF	OFF
Condenser microphone (When phantom power is required)	ON	OFF
Line input device	OFF	ON

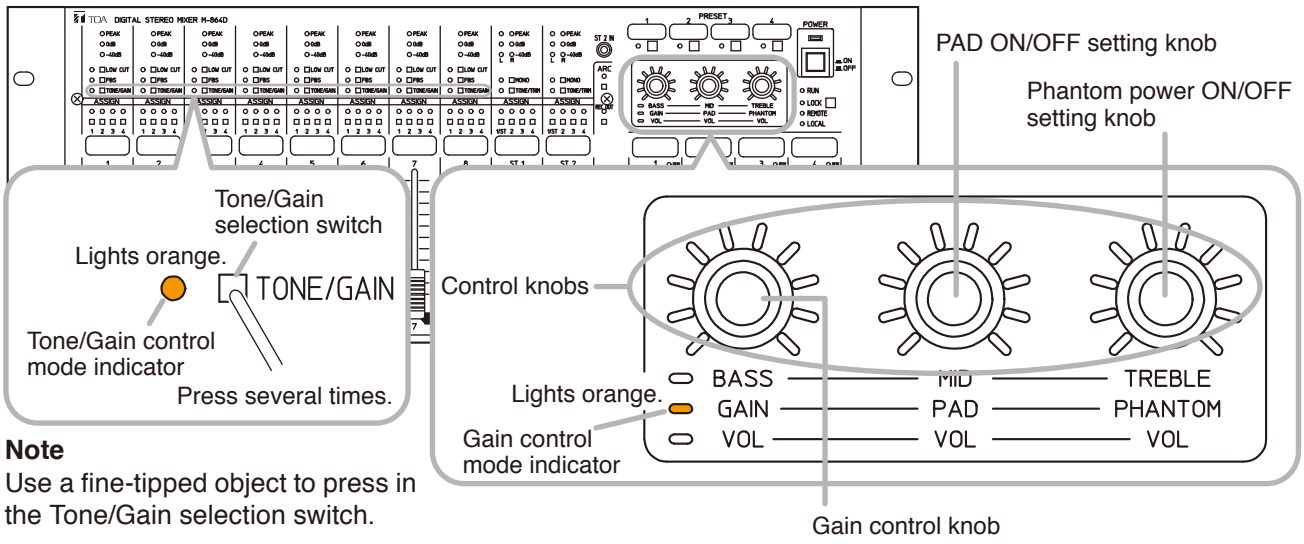
Step 3. Adjust the gain. (See the next page.)

10.2. Setting Methods

10.2.1. Placing the M-864D in Gain control mode

Press the Tone/Gain selection switch of the desired monaural input channel several times until the Tone/Gain control mode indicator lights orange.
The Gain control mode indicator lights orange.

M-864D



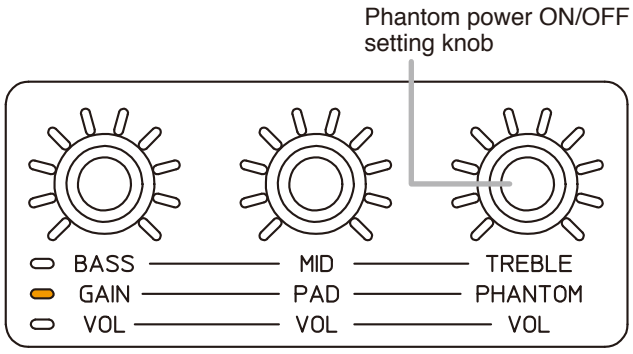
Note
Use a fine-tipped object to press in the Tone/Gain selection switch.

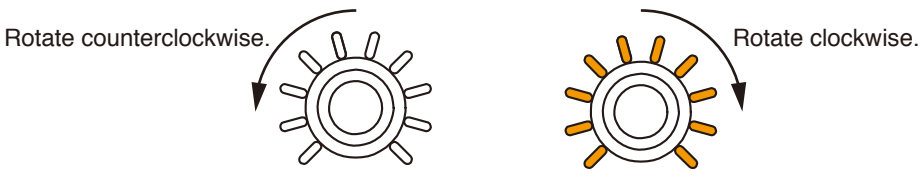
10.2.2. Phantom power ON/OFF setting

The phantom power ON or OFF can be set to Monaural inputs 1 through 8.
Rotating the Phantom power ON/OFF setting knob clockwise turns the phantom power ON, and counterclockwise turns it OFF for the channel of which Tone/Gain control mode indicator is lighting orange.

Default setting: OFF
Phantom power: +24 V, 10 mA

When the phantom power is ON, all the setting value indicators around the control knob light, and when OFF, they go off.





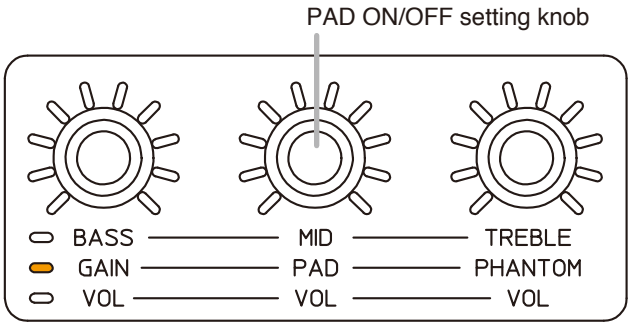
All indicators go off.
Phantom power OFF
(Default setting)

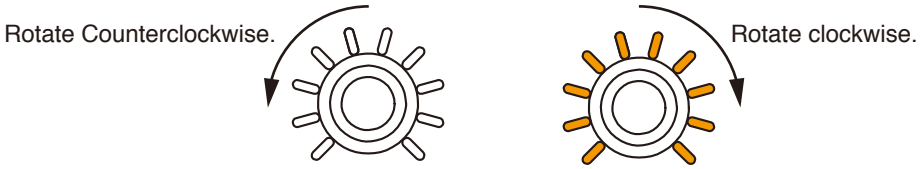
All indicators light.
Phantom power ON

Note
Turn the phantom power ON only when connecting a microphone which requires phantom power.
With the phantom power ON, connecting the device not requiring phantom power may cause the M-864D and this connected device to fail.

10.2.3. PAD ON/OFF setting

The PAD ON or OFF can be set to Monaural inputs 1 through 8.
When the input level is high, turn on the PAD.
The attenuation circuit of the input level is activated by turning on the PAD, eliminating the input clip.
Rotating the PAD ON/OFF setting knob clockwise turns the PAD ON, and counterclockwise turns it OFF for the channel of which Tone/Gain control mode indicator is lighting orange. (Default setting: ON)
When the PAD is ON, all the setting value indicators around the control knob light, and when OFF, they go off.



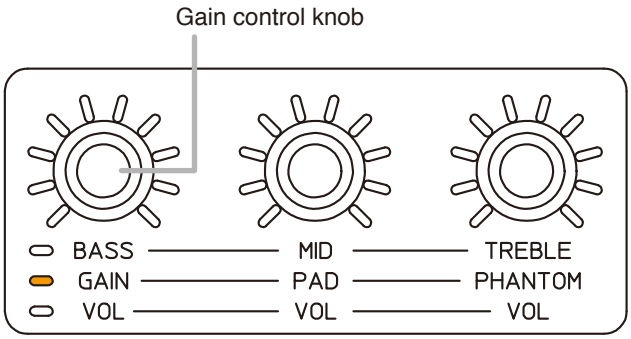


All indicators go off.
PAD OFF

All indicators light.
PAD ON (Default setting)

10.2.4. Adjusting the Gain

It is possible to adjust gains of the Monaural inputs 1 through 8.
Rotating the Gain control knob clockwise amplifies the gain of the channel of which Tone/Gain control mode indicator is lighting orange.
(For the default value and setting range, refer to the next page.)



Default value	When PAD set to ON:	0 dB
	When PAD set to OFF:	+15 dB
Setting range	When PAD set to ON:	0 to +18 dB in 1 dB steps
	When PAD set to OFF:	+15 to +60 dB in 1 dB steps

The figures below show the relationship between the setting value indicators around the control knob and the gain.

[When PAD set to ON]



1 indicator lights.
0 dB

One scale advances in 2 dB steps.

5 indicators light.
+8 dB

One scale advances in 2 dB steps.

All indicators light.
+18 dB

[When PAD set to OFF]



1 indicator lights.
+15 dB

1 scale advances in 5 dB steps.

5 indicators light.
+35 dB

1 scale advances in 5 dB steps.

All indicators light.
+60 dB

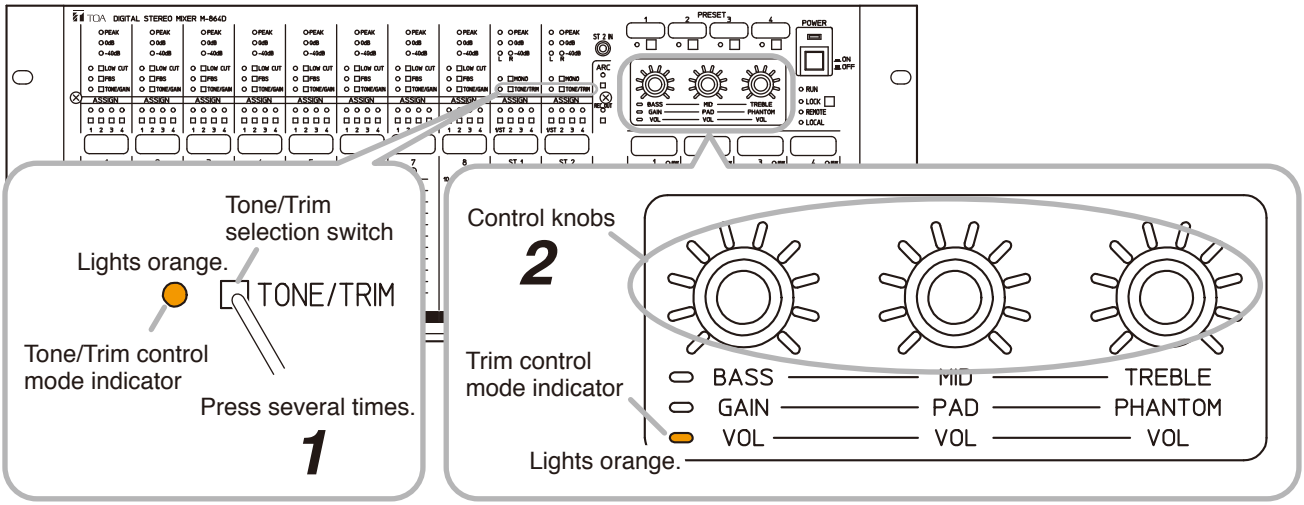
: Lit
: Unlit

11. TRIM CONTROL

It is possible to adjust input levels of the Stereo Inputs 1 and 2.
If the input devices' output levels are uneven among them, this function serves to align the input levels.
Each of A, B, and C inputs provided at the Stereo inputs 1 and 2 can be individually adjusted.

Step 1. Place the M-864D in Trim control mode.
Press several times the Tone/Trim selection switch of the Stereo input channel for which input level is to be adjusted until the Tone/Trim control mode indicator lights orange.
The Trim control mode indicator lights orange.

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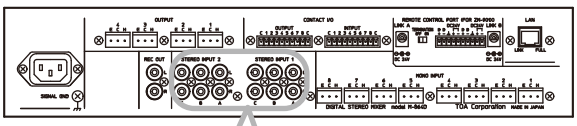
Note: Use a fine-tipped object to press in the Tone/Trim selection switch.

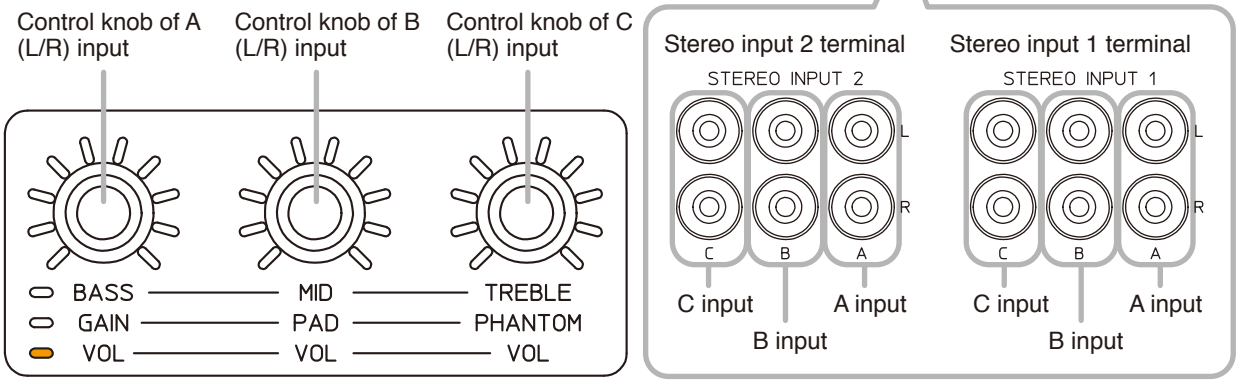
Step 2. Adjust the gains by rotating each control knob.
A (L/R) input of the stereo input: Rotate the left knob.
B (L/R) input of the stereo input: Rotate the center knob.
C (L/R) input of the stereo input: Rotate the right knob.

The gain of the channel of which Tone/Trim control mode indicator is lighting orange can be adjusted.

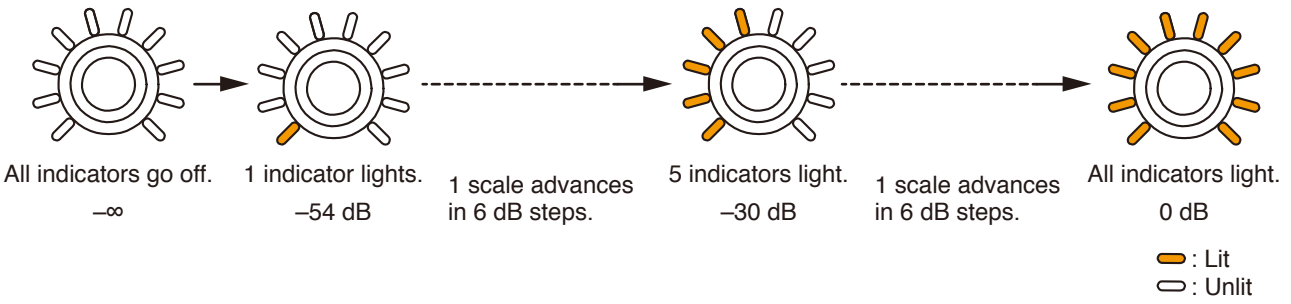
Default value	–18 dB
Adjustment range	–∞, –54 to 0 dB in 1 dB steps

M-864D Rear





The figures below show the relationship between the setting value indicators around the control knob and the gain.



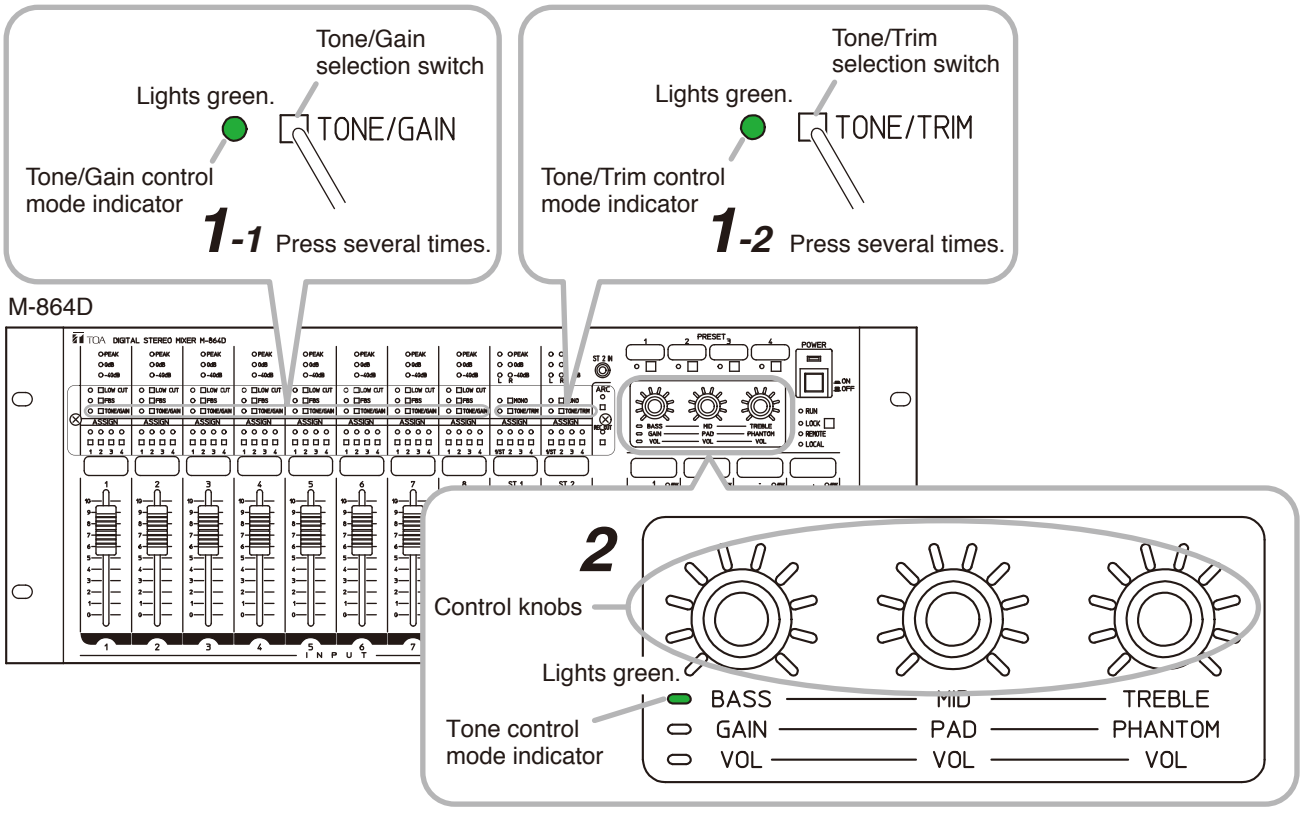
12. TONE CONTROL

It is possible to adjust sound tone of Monaural inputs 1 through 8 and Stereo inputs 1 and 2.

Step 1. Place the M-864D in Tone control mode.

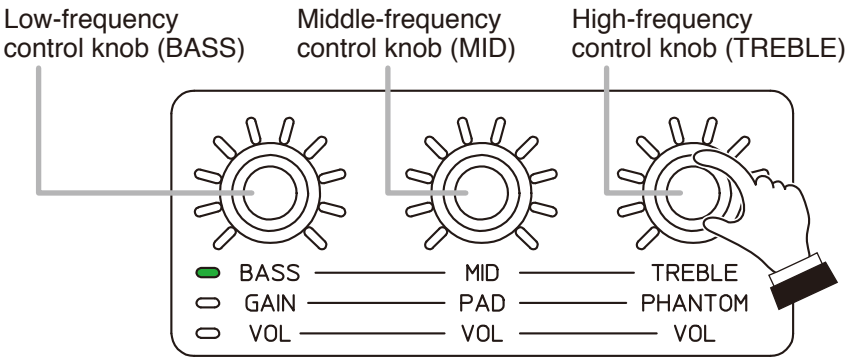
1-1 When adjusting monaural inputs 1 through 8
Press the Tone/Gain selection switch of each monaural input several times until the Tone/Gain control mode indicator lights green.
The Tone control mode indicator lights green.

1-2 When adjusting the Stereo inputs 1 and 2
Press the Tone/Trim selection switch of each Stereo input several times until the Tone/Trim control mode indicator lights green.
The Tone control mode indicator lights green.



Note: Use a fine-tipped object to press in the Tone/Gain selection switch and Tone/Trim selection switch.

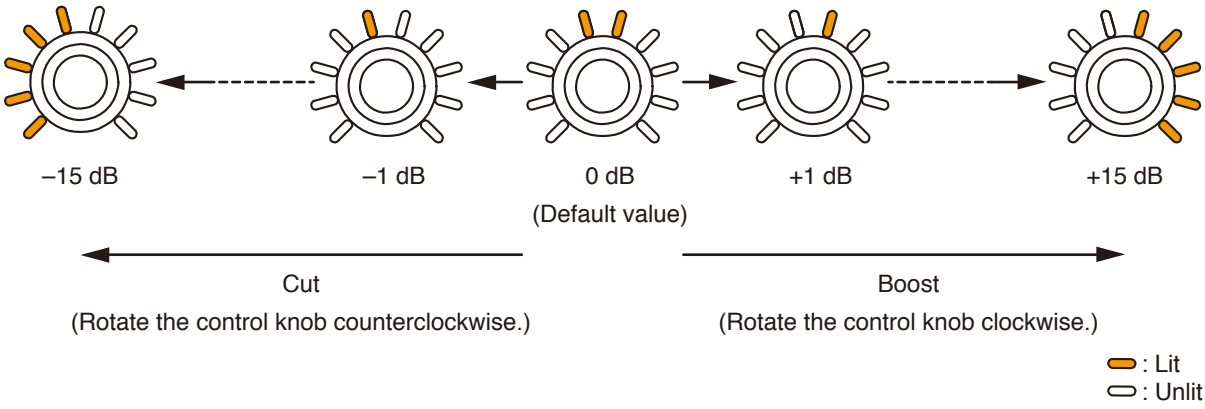
Step 2. Rotate each control knob for BASS, MID, and TREBLE to adjust sound tone.



Control knob	Default value	Setting range
Low-frequency control knob (BASS)	Low shelving filter Center frequency: 80 Hz Gain: 0 dB	–15 to +15 dB in 1 dB steps
Middle-frequency control knob (MID)	Parametric equalizer Center frequency: 800 Hz GAIN: 0 dB Q: 1.8	–15 to +15 dB in 1 dB steps
High-frequency control knob (TREBLE)	High shelving filter Center frequency: 12 kHz GAIN: 0 dB	–15 to +15 dB in 1 dB steps

Note
Filter settings other than described above can be performed using the M-864D PC Software.
For details, read the M-864D Software instruction.

The figures below show the relationship between the setting value indicators around the control knob and the gain. (Common to BASS, MID, and TREBLE)



13. LOW CUT FILTER SETTING

The low cut filter can be set to MONO INPUTs 1 through 8.
This setting can also be performed using the M-864D PC Software.
For details, read the separate Software Instructions.

13.1. What is a Low Cut Filter?

The low-cut filter functions to reduce unnecessary low frequency noise from the audio signal, allowing the target sound to be clearly heard.
The cut-off frequencies of the M-864D's low cut filter are as follows.

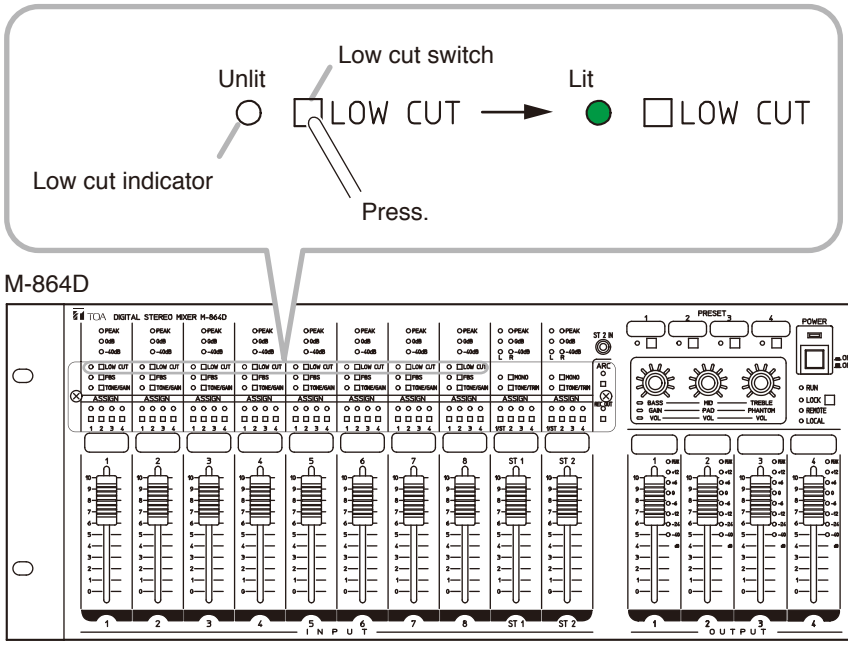
Default value	100 Hz
Variable*	20 Hz to 20 kHz

* Adjustable only using the M-864D PC Software.

13.2. Low Cut Filter Setting

13.2.1. Turning ON the low cut filter

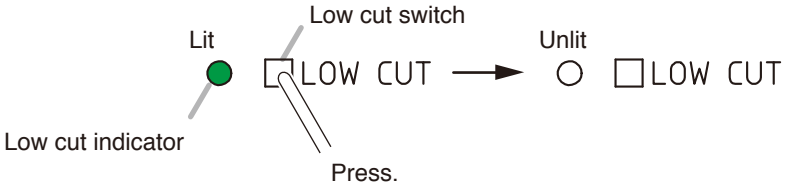
Press the Low cut switch while the Low cut indicator remains unlit.
The Low cut indicator lights, and the Low cut filter turns ON.



Note
Use a fine-tipped object to press in the Low cut switch.

13.2.2. Turning OFF the low cut filter

Press the Low cut switch while the Low cut indicator is lighting.
The Low cut indicator goes off, and the Low cut filter turns OFF.

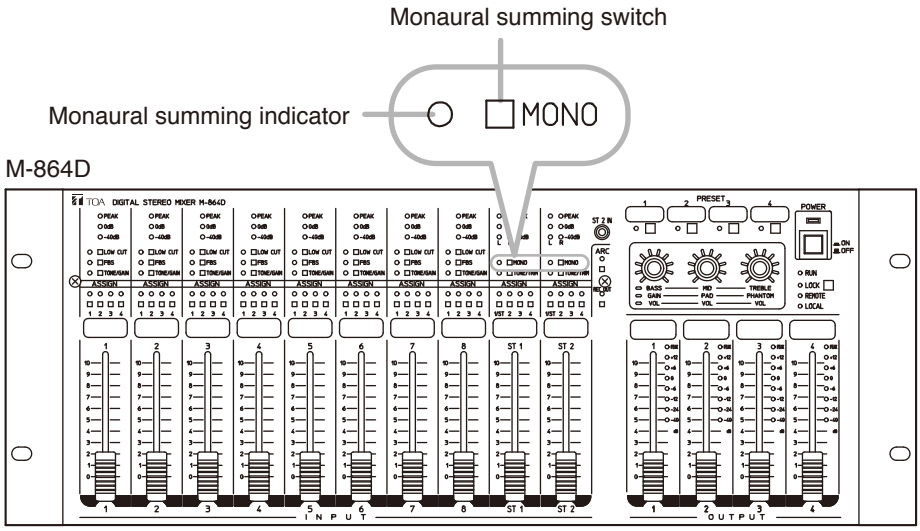


Note
Use a fine-tipped object to press in the Low cut switch.

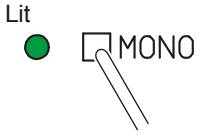
14. USING THE SUMMING OUTPUT

It is possible to mix signals of L and R channels provided at to the STEREO INPUT 1 and STEREO INPUT 2, and output the mixed signals to the OUTPUT 1 and OUTPUT 2.

Note: Mixing signals of the L and R channels are always output to the OUTPUT 3 and OUTPUT 4.

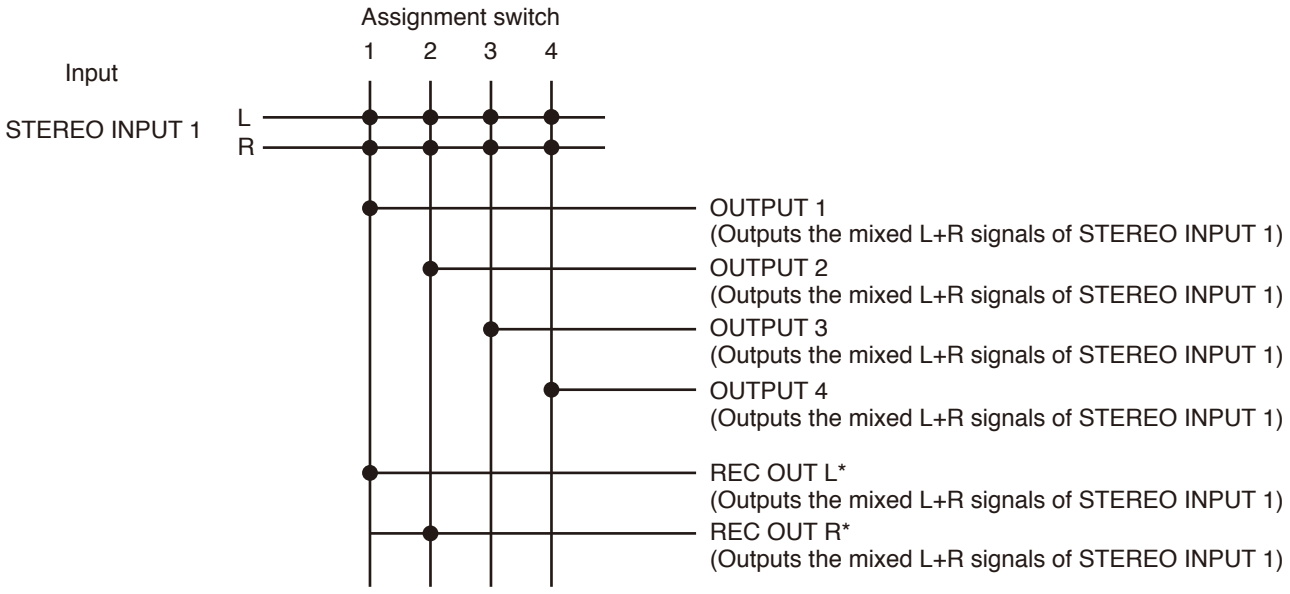


When the indicator lights by pressing the Monaural summing switch, summing output (Mono/MIX) is provided.



Note
Use a fine-tipped object to press in Monaural summing switch.

The figure below shows a signal flow when all the Assignment switches 1 through 4 of the STEREO INPUT 1 are turned to ON.



* Set the REC OUT assignment using the M-864D PC Software.
The REC OUT default assignment is as follows.
REC OUT L: Assignment switch 1
REC OUT R: Assignment switch 2

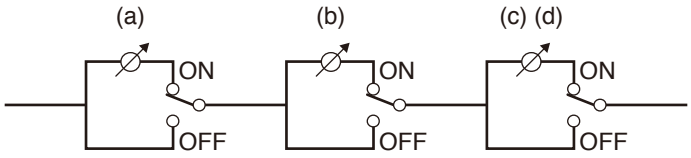
15. VOLUME LEVEL ADJUSTMENT

15.1. Adjusting Input and Output Volume Levels

Each volume level of inputs and outputs can be adjusted in the following 4 methods.

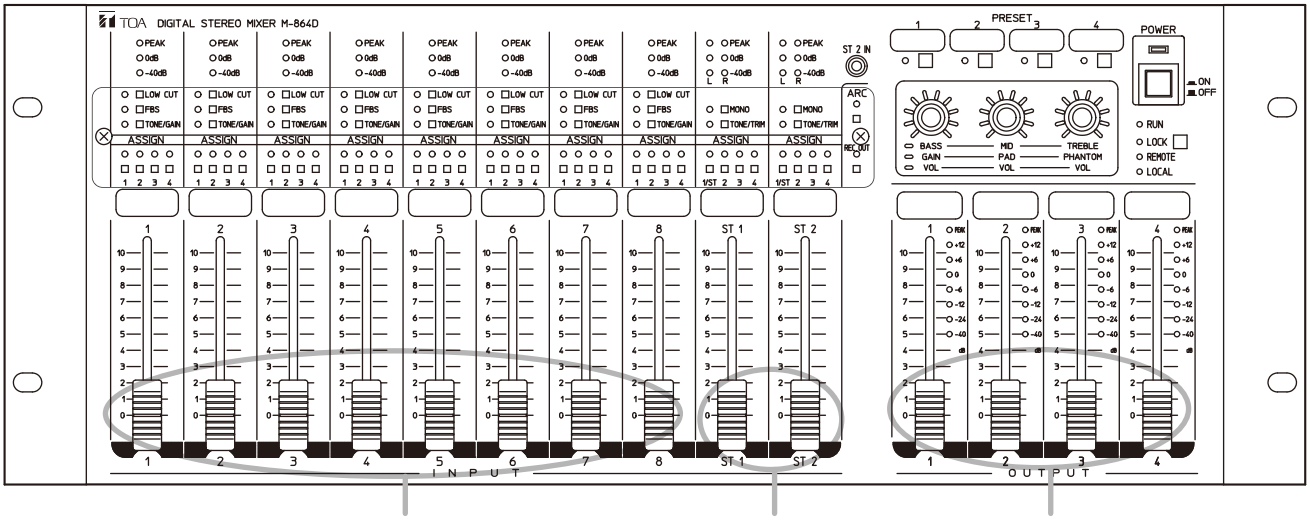
(a) Adjustment by the front panel mounted faders
(b) Adjustment using the M-864D PC Software
(c) Adjustment by the optional ZM Remote controller
(d) Adjustment by the external control device

The configuration of these volume controls is as shown below.



15.1.1. Adjustment by the front panel mounted Faders

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INPUTs 1 – 8 faders ST 1 and ST 2 faders OUTPUTs 1 – 4 faders

- **INPUTs 1 – 8 faders**
  Adjust each input level of the MONO INPUTs 1 through 8.

- **ST1 and ST2 faders**
  Adjust the input levels of the STEREO INPUT 1 (A, B, and C inputs of Stereo input terminals) and STEREO INPUT 2 (A, B, and C inputs of Stereo input terminals, and front mounted Stereo input 2).
  Each input is mixed and output. Adjust the mixing volume with the Trim control.

  Note
  Front mounted Stereo input 2 of the STEREO INPUT 2 is always output.
  For details, read the separate Software instructions.

- **OUTPUTs 1 – 4 faders**
  Adjust each output level of the OUTPUTs 1 through 4.

15.1.2. Adjustment using the M-864D PC Software

The volume level can be adjusted using the M-864D PC Software.
For details, read the separate Software instructions.

15.1.3. Adjustment by the optional ZM Remote controller

The volume level can be remotely controlled by the ZM Remote controller.
Read p. 50 for the connections and p. 48 for the operation.

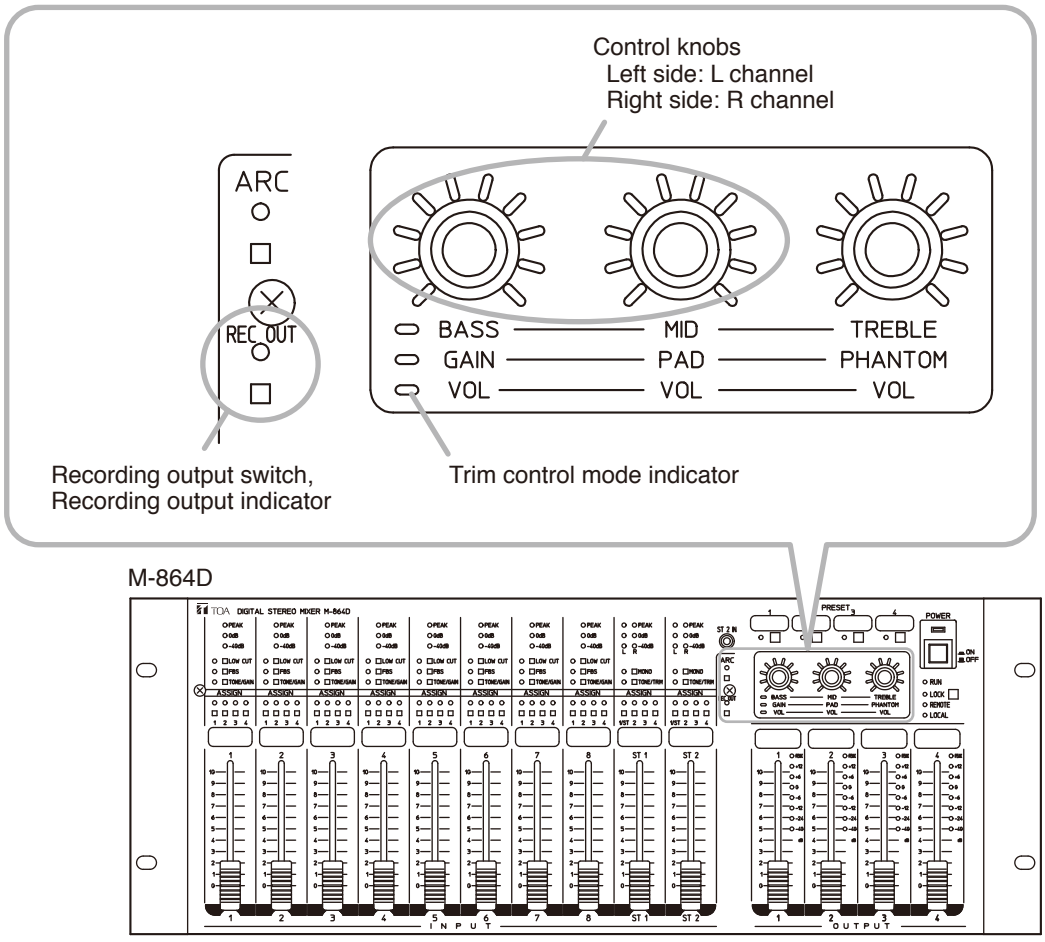
15.1.4. Adjustment by the external control device

The following 2 methods are available for adjusting volume level by the external control device.
- Control method by using no voltage contact signals directly applied through the connection to the M-864D unit's control input terminals.
- Control method via LAN

For the connection, read p. 42.
For the function settings, read the separate Software instructions.

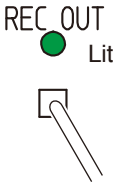
16. ADJUSTING THE RECORDING OUTPUT (REC OUT) VOLUME LEVEL

It is possible to adjust recording output volume level.

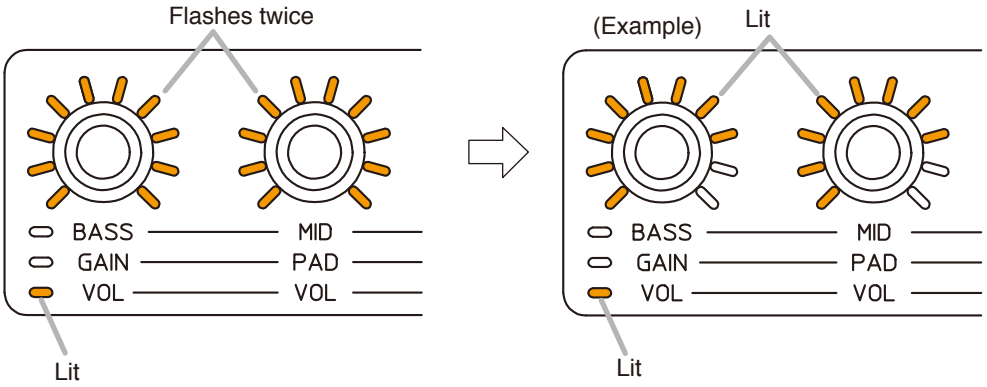


[Adjusting the volume level]

Step 1. Press the Recording output switch (REC OUT).
Note: Use a fine-tipped object to press in the switch.



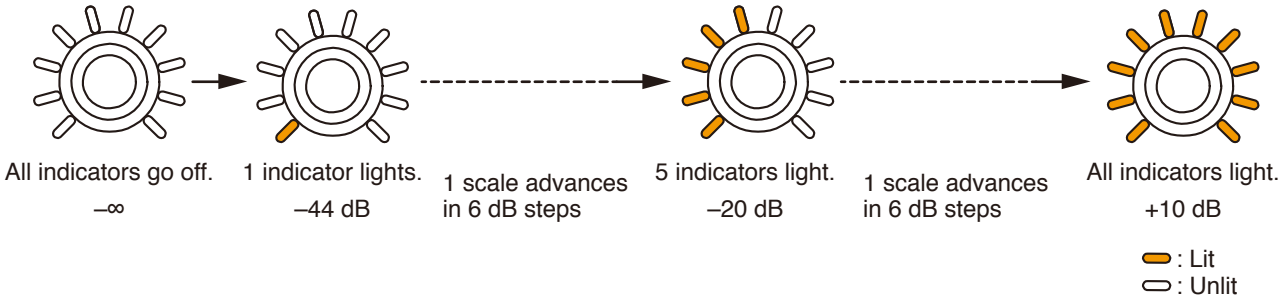
Each indicator status changes as follows.
• Recording output indicator: Lights green.
• Trim control mode indicator: Lights orange.
• Setting value indicators around the control knob:
All indicators flashes twice, then the indicators around the L and R channels knobs indicate each corresponding output level.



Step 2. Adjust the recording output volume level with the control knob.

Default value	0 dB
Setting range	–∞, –44 to +10 dB (in 1 dB steps)

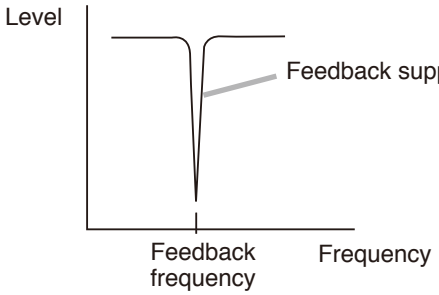
The figures below show the relationship between the setting value indicators around the control knob and the recording output level.



17. FBS FUNCTION SETTINGS

17.1. What is the Feedback Suppressor Function (FBS)?

FBS stands for Feed-Back Suppressor.
The feedback suppressor filter automatically operates to suppress acoustic feedback when the feedback occurs.



17.2. Enabling the FBS Function

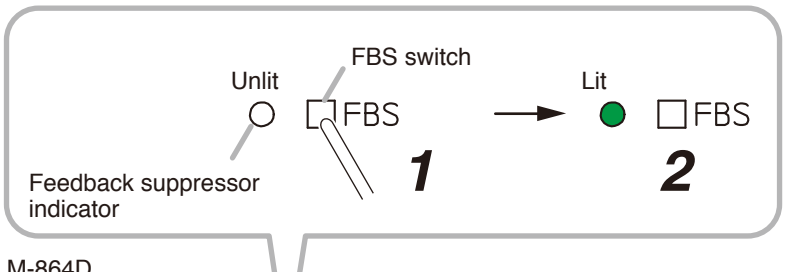
If acoustic feedback occurs when the FBS function is enabled, the feedback suppressor filter automatically operates to suppress the feedback.
The FBS function set to each channel of the MONO INPUTs 1 – 8 operates independently.

Note
The function can also be set using the M-864D PC Software.
For details, read the separate Software instructions.

Tips
- The feedback suppressor filter to which the guard setting is not assigned will be cleared when the unit is powered on.

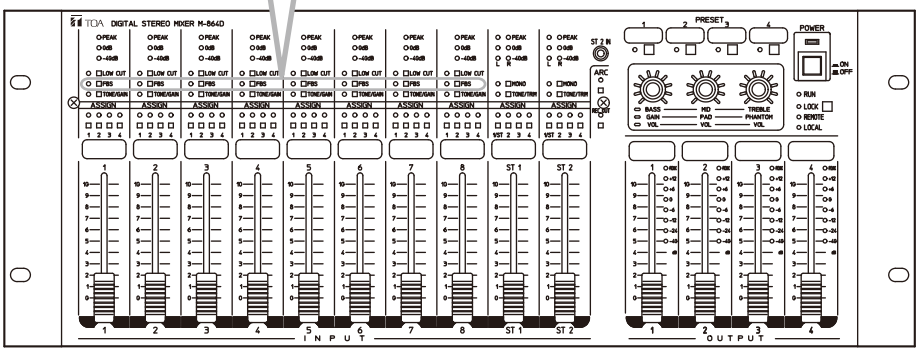
  For the guard setting, read the separate Software instructions.
- Even if you switch the Preset memory number during operation, the feedback suppressor filter currently in operation remains active and unchanged.

Step 1. Press the FBS switch when the Feedback suppressor indicator remains unlit.



Note
Use a fine-tipped object to press in the FBS switch.

M-864D

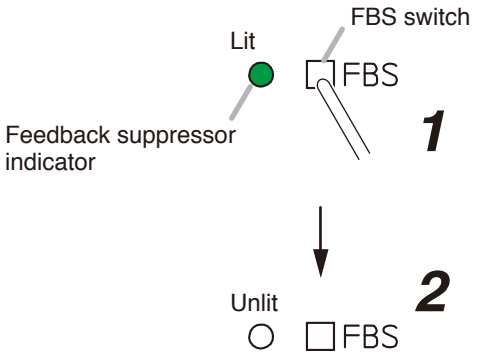


Note
Feedback may not be suppressed as the case may be. In this case, decrease the input level by moving down the input fader of the corresponding channel.

Step 2. Release the FBS switch when the Feedback suppressor indicator lights.
When the Feedback suppressor indicator lights, the FBS function is enabled.

17.3. Disabling the FBS Function

Step 1. Press the FBS switch while the Feedback suppressor indicator is lighting.



Step 2. Release the FBS switch when the Feedback suppressor indicator goes off.
When the Feedback suppressor indicator goes off, the FBS function is disabled.

18. ARC FUNCTION SETTING

18.1. What is the Automatic Resonance Control (ARC) Function?

ARC stands for Automatic Resonance Control.
It is a function that automatically creates a sound field compensation filter (ARC filter) to improve sound clarity by automatically measuring the inherent acoustic characteristics in architectural space.

18.2. Notes on ARC Function Setting

- Before operating the ARC function, check that sound is actually output from the speakers after installation and connection completion.
- The ARC filter is set to the output channels to which this filter was assigned at the time of ARC measurement.
- When the ARC filter has already been set, it is overwritten by the newly set filter after completion of ARC measurement.
- To reset the ARC filter, disable the ARC function. (See p. 35.) In this case, all the ARC filters assigned to the output channels are initialized. Individual filters cannot be reset.

18.3. Enabling the ARC function

The ARC function automatically creates an ARC filter, thereby reproducing highly clear output sound.
Perform the ARC measurement by making live microphone announcement in the environment under actual use.

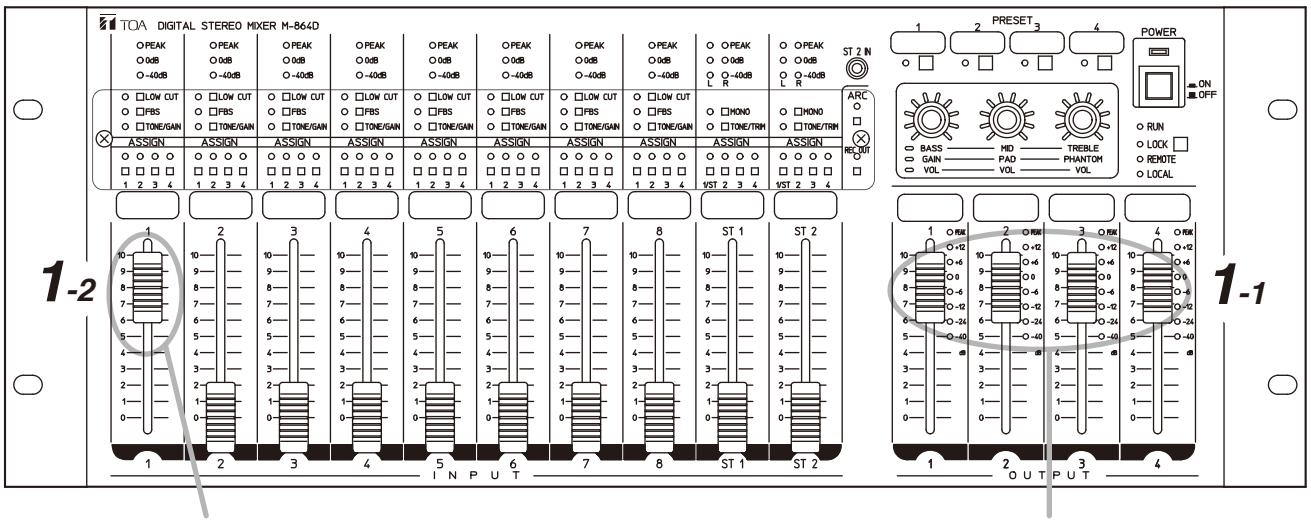
Step 1. Perform initial settings of the input and output levels.

1-1. Set all output faders at the “8” position.

1-2. Set the INPUT 1’s volume fader at the “8” position.

1-3. Set the volume knob of the connected output amplifier to the minimum position.

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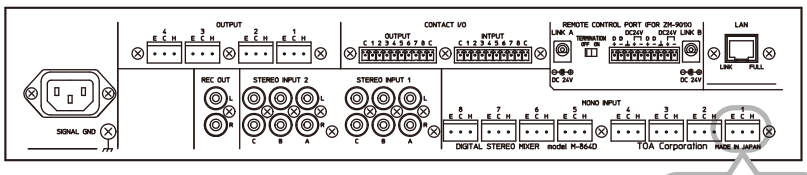
INPUT 1’s volume fader

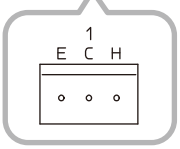
OUTPUTs 1 – 4’s volume faders

Step 2. Connect a measuring microphone.
The microphone usually used with the M-864D can be used.

2-1. Connect the measuring microphone to the MONO INPUT 1 located on the rear panel.

M-864D (Rear panel terminal section)





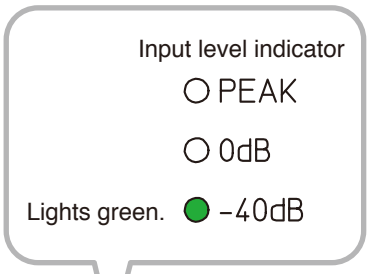
MONO INPUT 1

Note
Be sure to connect the measuring microphone to the MONO INPUT 1.

2-2. Set the input sensitivity.
Place the M-864D in Gain control mode, then perform settings to match the type of microphone to be used. (See p. 16.)

Dynamic microphone:	PAD OFF
Condenser microphone (power supply is required):	PHANTOM
Wireless tuner output (LINE level):	PAD ON

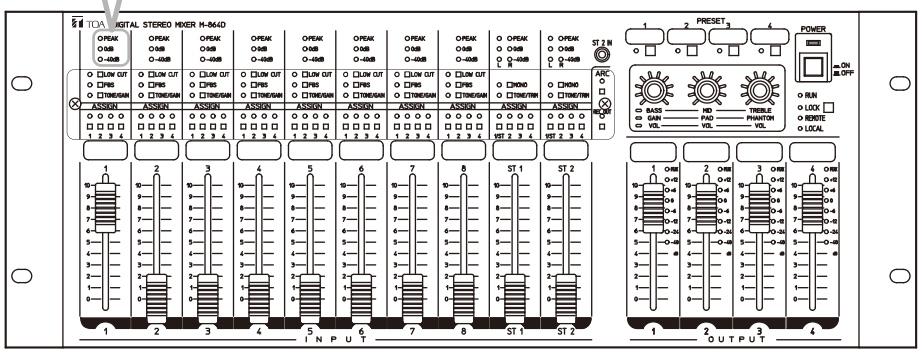
Step 3. Check to see if the microphone works correctly.
Speak into the microphone and confirm that the INPUT 1's level indicator lights green.



Notes

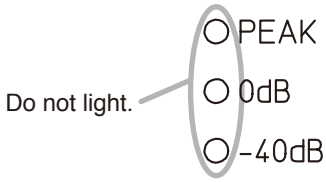
- Hold the microphone about 7 cm (3") from the mouth. Speak at a normal voice level.
- Sound is not output from the speakers at this stage as the output amplifier's volume knob is set to the minimum position.

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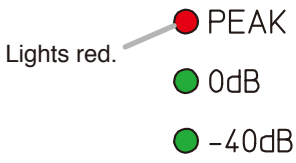




Adjust the MONO INPUT 1's gain if the indicators are in the status below. (See p. 24.)

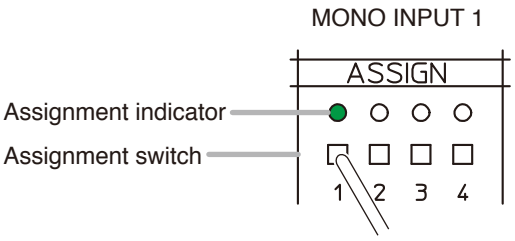


Input level is too low.



Input level is too high.

Step 4. Set the MONO INPUT 1's output destination.
Assign the MONO INPUT 1's output destination to the channel to which the ARC filter is assigned.
Press the MONO INPUT 1's Assignment switches 1 through 4.
It is also possible to select multiple output channels.



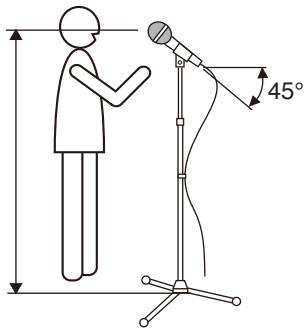
Note
Use a fine-tipped object to press in the Assignment switch.

Step 5. Adjust the volume level of the output amplifier.
Speaking into the connected measuring microphone, adjust the volume to the level of normal use with the volume control knob of the amplifier connected to the M-864D.

Step 6. Install the measuring microphone.
It is recommended to install the microphone as shown below as a guide.

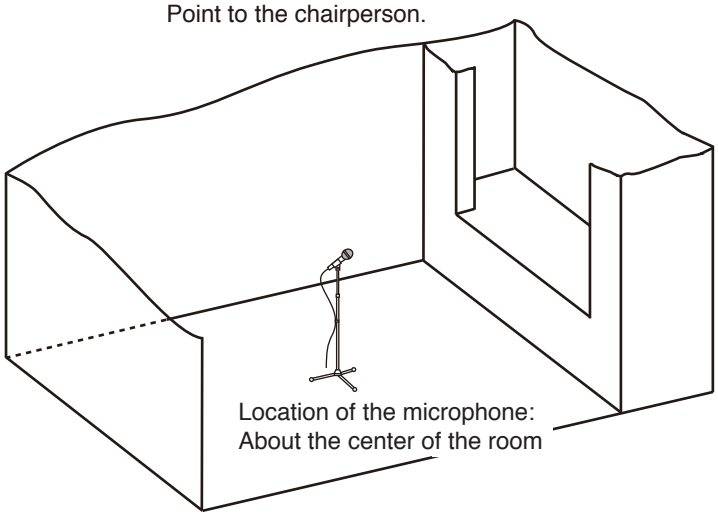
[Microphone setting example]

- Height of the microphone: At the listening position
- Angle of the microphone: 45° up
- Location of the microphone: About the center of the room (See the figure below.)
- Direction of the microphone: Point to the speaker. (See the figure below.)

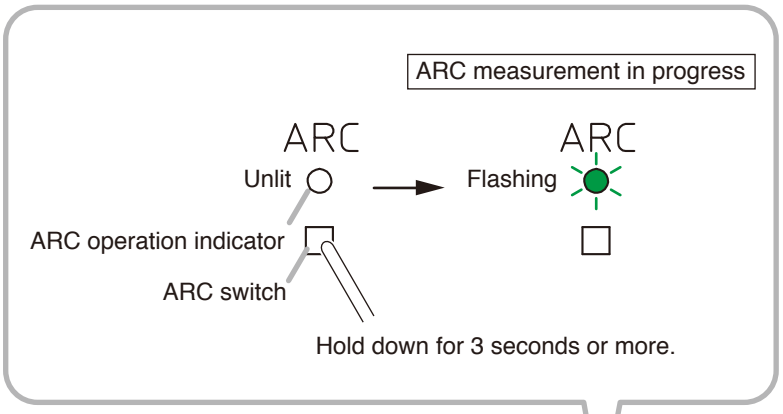


[Microphone setting location example]

School room: Point to a platform.
Gymnasium and multipurpose auditorium: Point to the center of the stage.
Conference room: Point to the chairperson.

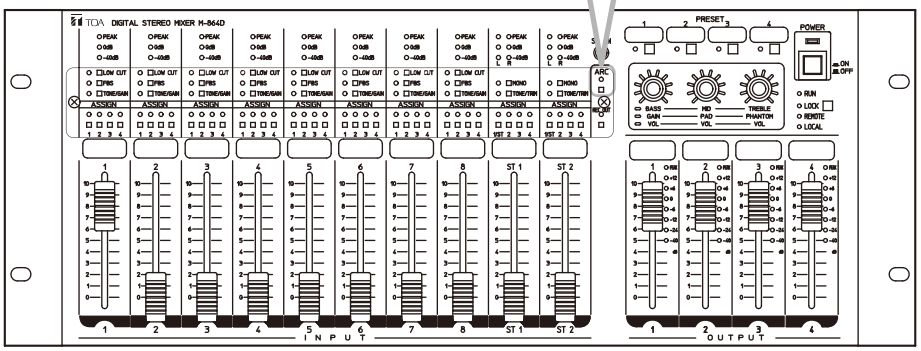


Step 7. Conduct the ARC measurement.
Hold down the ARC switch for 3 seconds or more, then release it when the ARC operation indicator begins to flash.



Note
Use a fine-tipped object to press in the ARC switch.

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Notes

- To stop the ARC measurement partway, press the ARC switch.
- Never operate the switches and knobs of the M-864D and the external equipment during the ARC measurement.

[ARC measurement operation]

A 3-stage operation shown below is performed during the ARC measurement.
Different tones sound in each operation stage.
The ARC operation indicator flashes slowly during normal measurement, but it begins to flash rapidly when a failure occurs.

	Measurement progresses normally	A failure occurs
ARC operation indicator status	 Flashing slowly	 Flashing rapidly

Measurement starts.

The signals input to the MONO INPUTs 2 through 8, and STEREO INPUTs 1 and 2 are muted during measurement. (Only the MONO INPUT1's signal is output.)
The FBS function and Automatic mute function are temporarily disabled.

When the ARC operation indicator flashes rapidly soon after measurement starts*

The MONO INPUT 1 is not assigned to any output.
Check the assignment setting. (See Step 4 on p. 30.)

Volume adjustment: Specific tone (hiss) sounds twice.

When the ARC operation indicator flashes rapidly*

Input level is too low.
- Speak into the microphone, and check that voice is output from the speaker.
- Increase the input level by moving up the MONO INPUT 1's input fader.

Distance measurement: Specific tone (snap) sounds twice.

When the ARC operation indicator flashes rapidly*

Large noise is detected.
Adjust the microphone direction. Also, check the presence of large ambient noise.

Sound field measurement: Specific tone (swish) sounds 3 times.

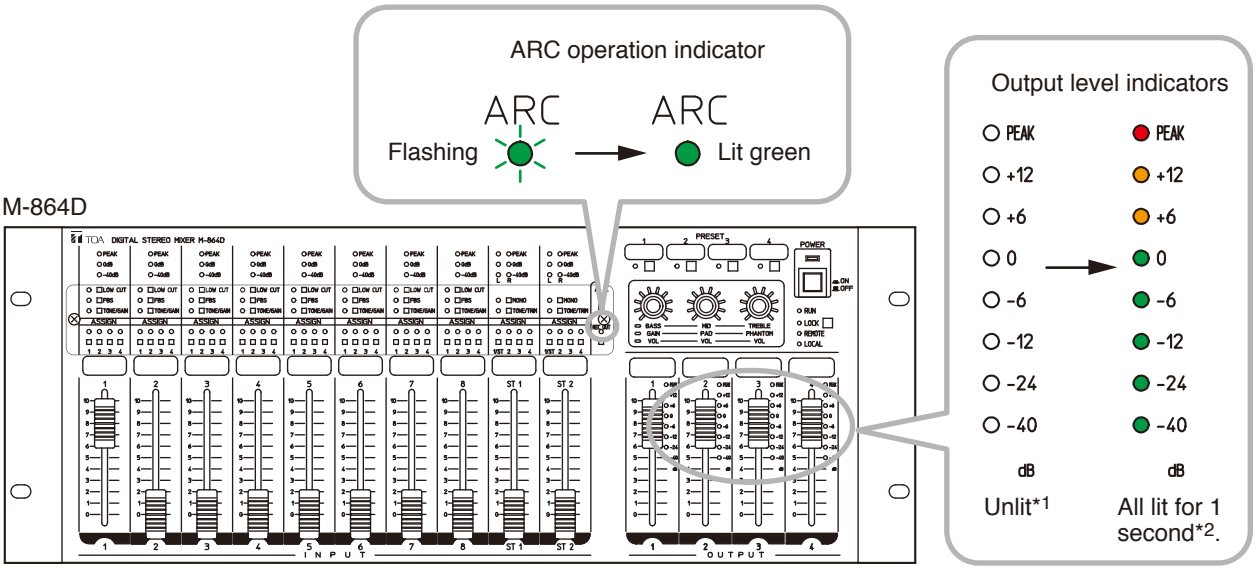
Measurement is complete.

* Perform the following reset operation if these errors occurred.

1. Stop the measurement by pressing the ARC switch.
   The ARC indicator stops flashing rapidly, then goes off or lights steady. (See p. 35.)
2. Remedy the cause of the failure, then restart the ARC measurement in Step 7.

Measurement is complete, and the ARC filter is set.

All the output level indicators of the ARC filter-enabled channel light for 1 second.
In this case, the ARC operation indicator changes from flashing to steady on (green).
The ARC filter data is saved, and remains effective even after power is cycled.



*1 The indicator may light depending on the input level of the microphone.

*2 All the output level indicators of the channels where the ARC filter has already been set light even when these channels were not assigned at the time of ARC measurement.

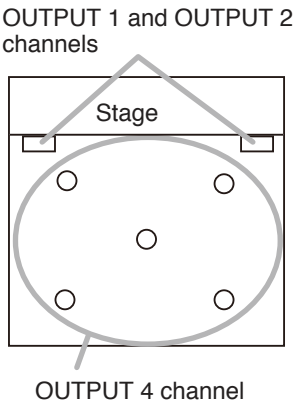
Note
After measurement completion, move the microphone to your desired location.

18.4. Example of the ARC Function Use to Make Fine Acoustic Adjustment

When wishing to make finer acoustic adjustment, it is possible to set the different ARC filters to the individual output channels.

[Setting example in a gymnasium where the M-864D's output channels are assigned as follows]

Cable wiring example
- OUTPUT 1 and 2 channels: Speakers installed at both sides of the stage
- OUTPUT 4 channel: Ceiling speakers



Set different ARC functions to the OUTPUT 1 and 2 channels and OUTPUT 4 channel.
Follow the procedures below to set the ARC function in this example.

Step 1. Set the ARC function to the OUTPUT 4 channel.

Step 2. Set the ARC function to both the OUTPUT 1 and 2 channels.
Different ARC filter settings are complete to OUTPUT 4 channel and each output of the OUTPUT1 and OUTPU 2 channels.

18.5. Confirming the ARC Function Setting Status

18.5.1. Confirming the setting status by the ARC operation indicator status

The ARC ON/OFF setting can be checked by the ARC operation indicator status.

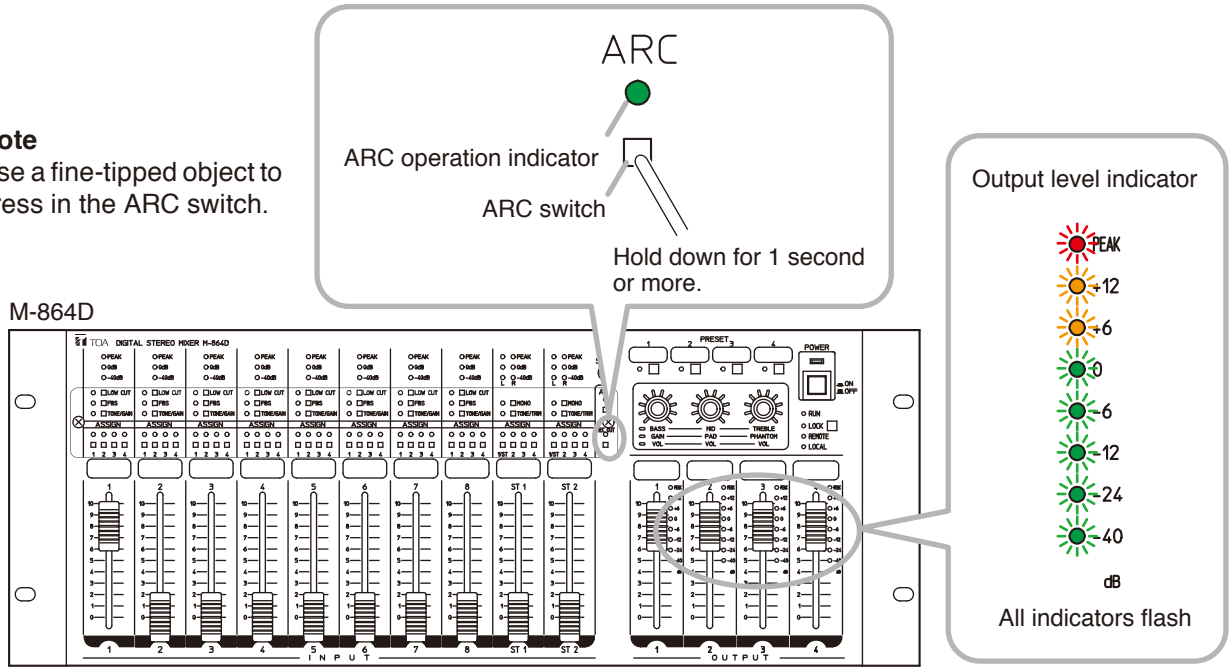
	ARC filter enabled	ARC filter disabled
Status of the ARC operation indicator	ARC ● Lit	ARC ○ Unlit

18.5.2. Confirming the setting status through the ARC switch operation

When the ARC operation indicator is lighting, the ARC filter-set output channel can be checked through the ARC switch operation.

Hold down the ARC switch for 1 second or more.
All the output level indicators of the ARC filter-set output channel flash.

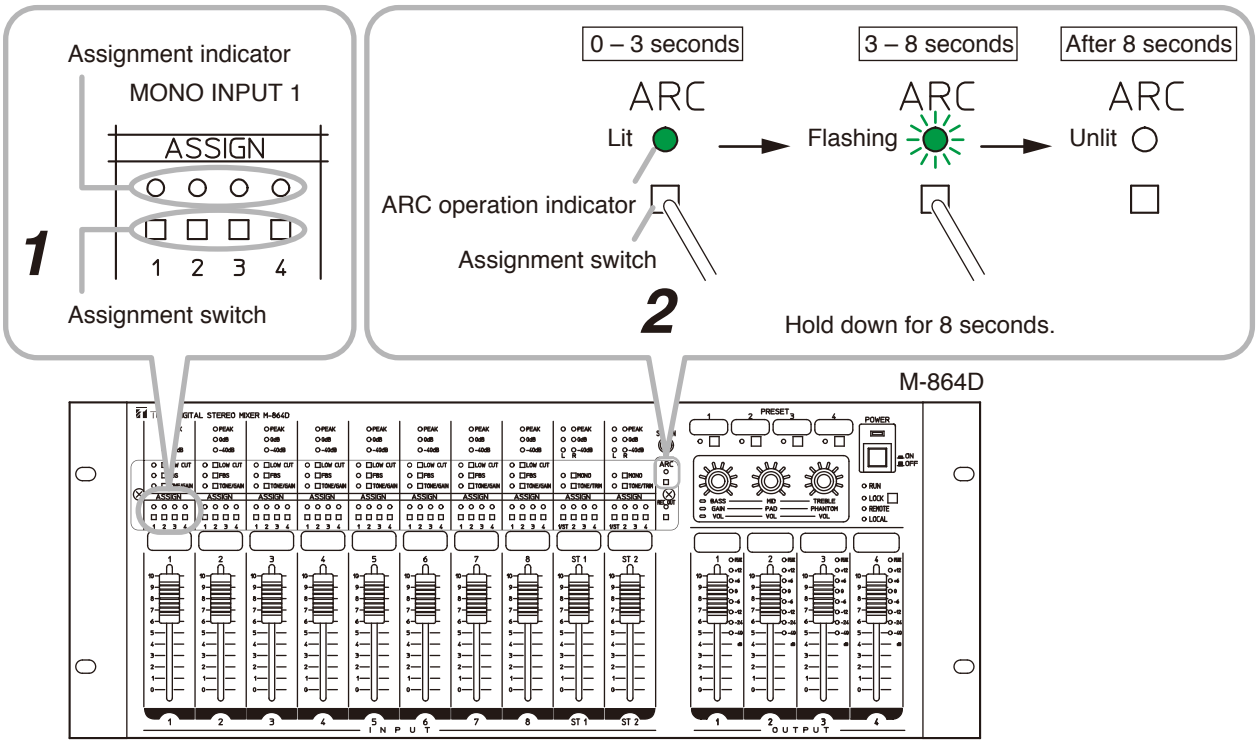
Note
Use a fine-tipped object to press in the ARC switch.



18.6. Disabling the ARC Function

It is possible to reset the assigned ARC filter.

Note
All the ARC filters assigned to output channels are reset through the operation below
The ARC filter cannot be reset for each output channel.



Note: Use a fine-tipped object to press in the Assignment switch and the ARC switch.

Step 1. Turn off all the Assignment switches 1 – 4 of MONO INPUT 1 (assignment indicators go off).

Step 2. Hold down the ARC switch for 8 seconds.
The ARC operation indicator flashes rapidly after 3 seconds.
Continue to hold it down for 5 seconds.
The ARC operation indicator goes off and the ARC function is disabled.

19. AUTOMATIC MUTE SETTING

This function can only be set using the M-864D PC Software.
For details, read the separate Software instructions.

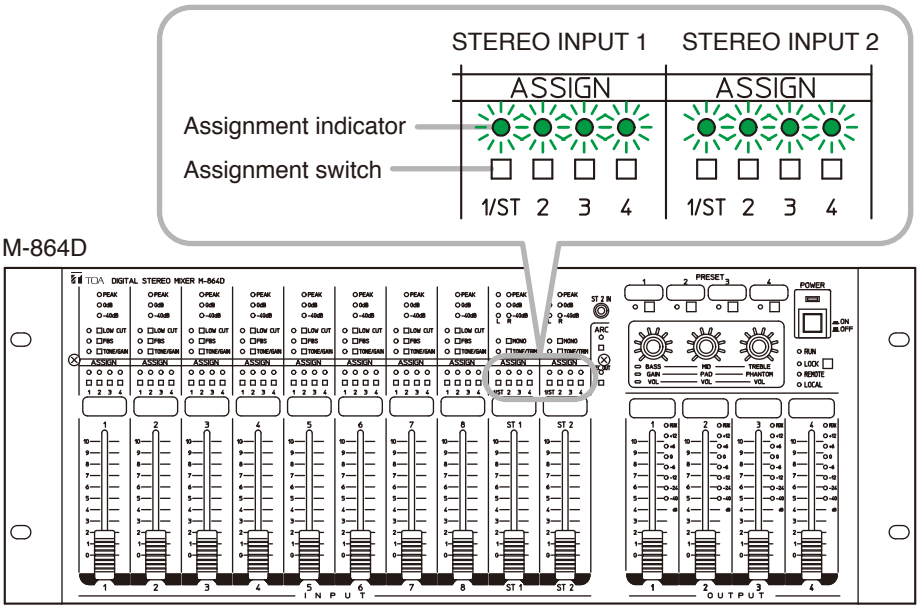
19.1. What is the Automatic Mute Function?

It is a function that automatically attenuates the volume level of the signal input to the STEREO INPUTs 1 and 2 by detecting signals input from the MONO INPUTs 1 through 8.
The Automatic Mute ON or OFF can be individually set to each output 1 through 4.

19.2. Indicators Status during Automatic Mute Operation

The Assignment indicators of the Stereo Inputs 1 and 2 of which volume levels are attenuated flash during Automatic Mute operation.

[Example when signals applied to the Stereo Inputs 1 and 2 are assigned to the outputs 1 through 4 and mixed]



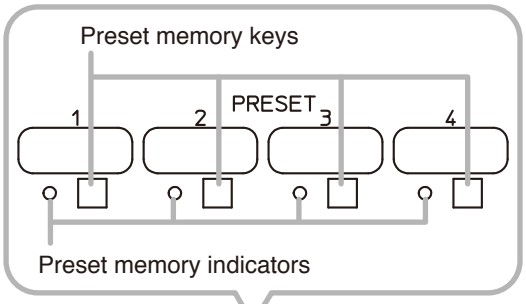
20. PRESET MEMORY SETTINGS

The various setting data stored in advance can be recalled by pressing the button.
The stored setting data is referred to as “Preset memory.”

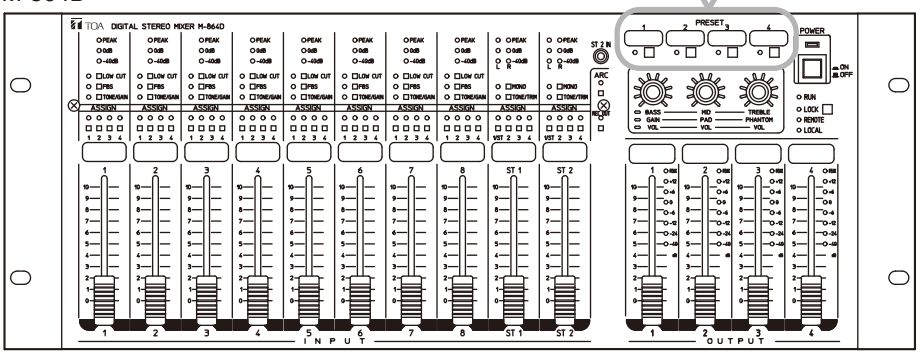
20.1. Preset Memory Settings

Four patterns*1 of Preset memories can be stored and recalled by the front panel mounted Preset memory key.

*1 Using the M-864D PC Software allows up to 16 patterns to be stored and recalled through PC operation.
For details, read the separate Software instructions.



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The number at which the preset memory indicator is lighting shows the currently recalled Preset memory.
The lighting pattern of the preset memory indicators differs depending on the setting of Primary Reference Preset No. (Preset memory number at power-on).

		Setting contents of the Primary Reference Preset No.	
		Resume*2	Memory 1 through 16
Preset memory number currently being recalled	1 through 4	The corresponding indicator lights. However, it remains unlit when in edit status*3.	The corresponding indicator lights. It also lights when in edit status*3. (The indicator remains unlit when the M-864D's firmware version is 2.1.0 or earlier.)
	5 through 16	All indicators remain unlit.	

*2 Automatically stores the operated contents after the activation, which can be active after rebooting the M-864D.
Preset memory contents remain unchanged. Fader values are not stored.

*3 A state that parameters in the Preset memory is currently being changed.

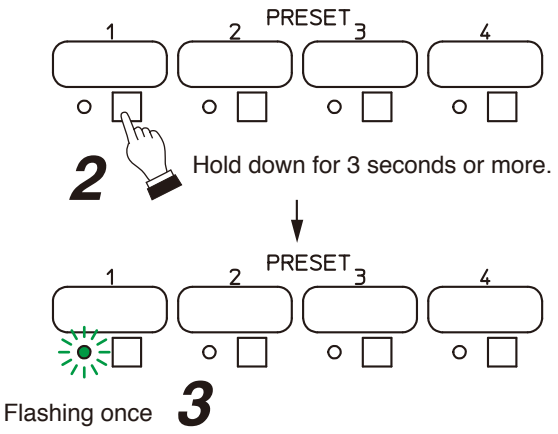
Tip: Primary Reference Preset No. can be set using the M-864D PC Software.

20.2. Preset Memory Storing

Step 1. Perform necessary settings such as the Tone/ Gain/Trim adjustments and Assignment switch settings.

Step 2. Hold down for 3 seconds or more the Preset memory key corresponding to the Preset memory number where to store the setting data.
The figure at right shows an example to store the setting data in the Preset memory 1.

Step 3. Check that the Preset memory indicator flashes once, then release the Preset memory key.



Setting data to be stored are as follows.

- ON/OFF of the Low cut switch
- ON/OFF of the Feedback suppressor (FBS) switch
- Tone control settings
- Gain control settings
- Trim control settings
- ON/OFF of the Assignment switch
- ON/OFF of the Monaural summing switch
- ARC filter settings
- PC VOL*
- EXT VOL*
- Automatic mute settings*

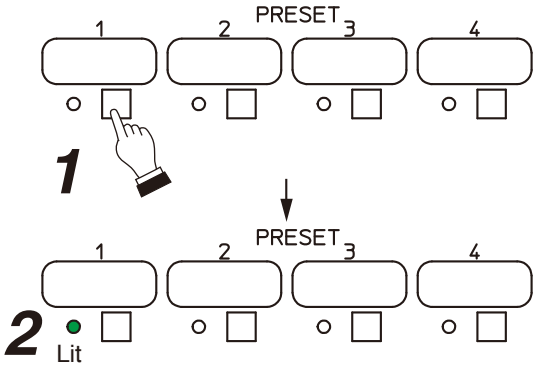
* Settings available only using the M-864D PC Software.

Tip: The front panel-mounted fader values are not stored.

20.3. Recalling the Preset Memory

Step 1. Press the Preset memory key corresponding to the desired Preset memory number.
The figure at right shows an example when the Preset memory 1 is called.

Step 2. Release the Preset memory key when the Preset memory indicator lights.



21. SYSTEM LOCK SETTING

Incorrect operation can be prevented by prohibiting (locking) the M-864D's front panel operation.
Use the M-864D PC Software to set the System lock function.

21.1. Enabling the System Lock Function

Step 1. Set the functions to be locked using the M-864D PC Software.

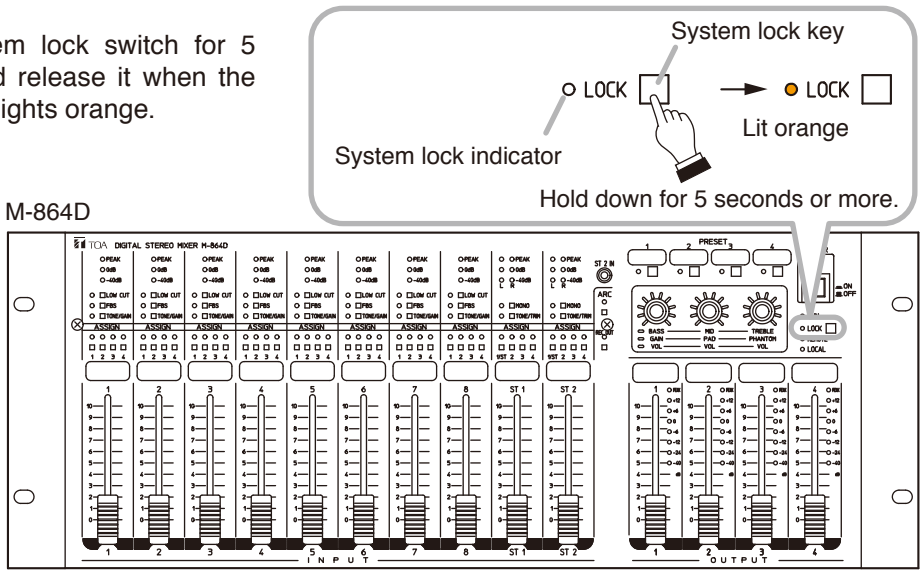
Note

All the functions below can be locked by default.
For details, read the separate Software instructions.

Functions that can be locked are as follows:

- Low cut switch ON/OFF
- Feedback suppressor (FBS) switch ON/OFF
- Tone control setting
- Gain control setting
- Trim control setting
- Monaural summing switch ON/OFF
- Assignment switch ON/OFF
- Preset memory store and recall
- Front panel mounted input/output volume faders
- ARC filter settings
- Recording output volume control

Step 2. Hold down the System lock switch for 5 seconds or more, and release it when the System lock indicator lights orange.

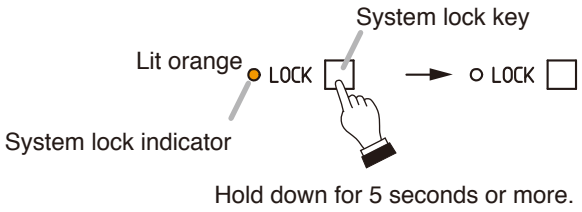


21.2. Disabling the System Lock Function

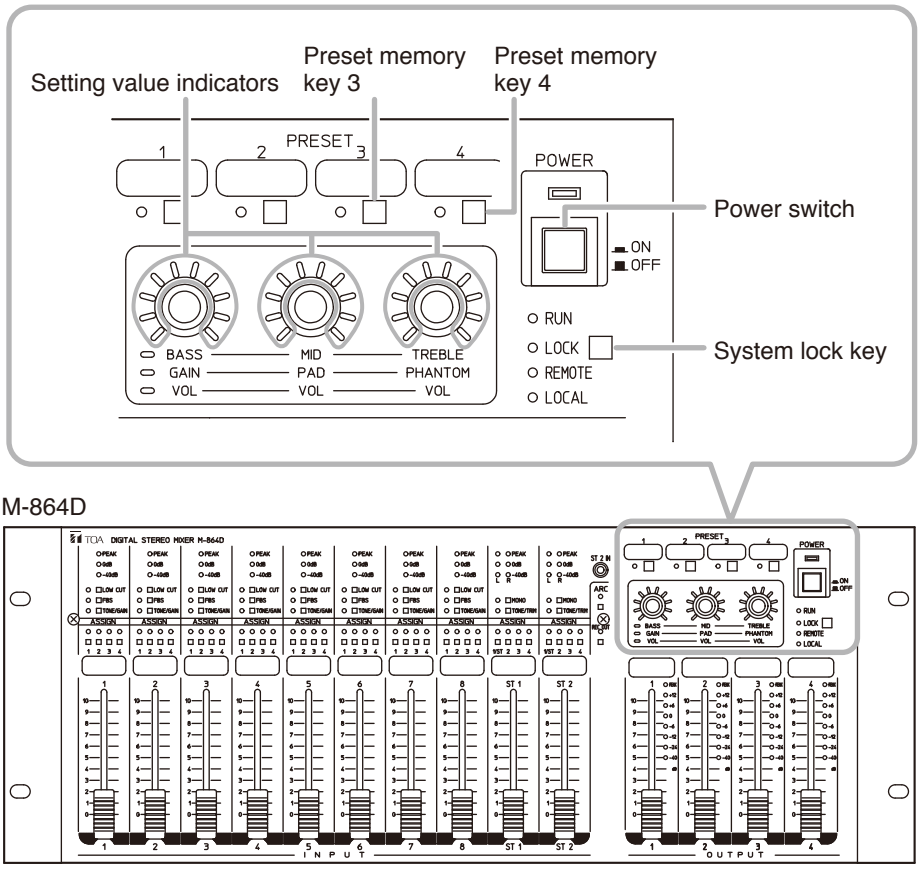
Hold down the System lock switch for 5 seconds or more, and release it when the System lock indicator goes off.

Tip

The System lock indicator lights orange while the System lock function is activated.



22. INITIALIZING THE M-864D

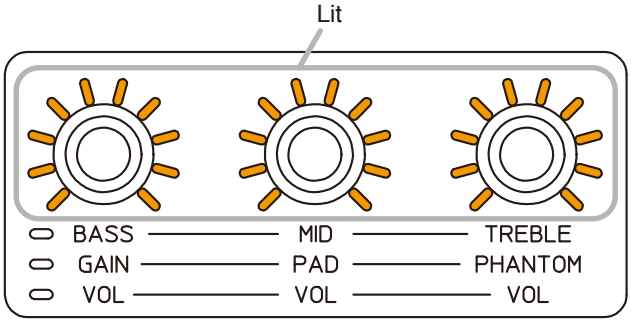


Step 1. Turn off the power switch.

Step 2. Turn on the power switch while holding down the Preset memory keys 3 and 4 and the System lock key.

Step 3. All the front panel-mounted indicators light up briefly, and go off. Then, release the keys after only the setting value indicators light up.
The setting value indicators go off one by one in order. All of them go off in 30 seconds.

Step 4. Before all the setting value indicators go off, hold down the Preset memory keys 3 and 4 and the System lock key again.
All the setting value indicators remain lit as long as the keys are held down.

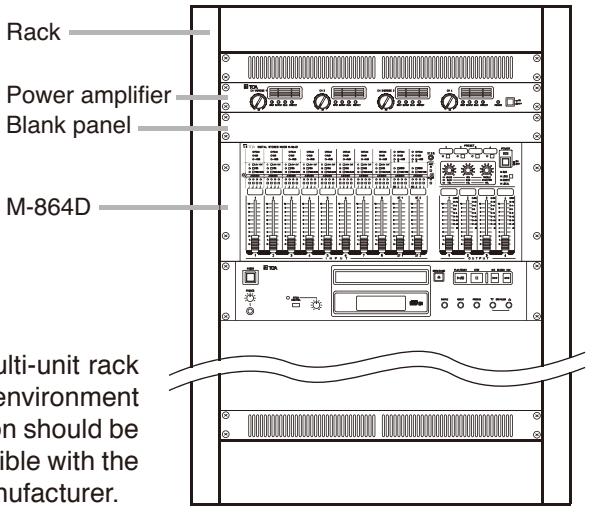


Step 5. Release the keys.
All the front panel-mounted indicators go off, and the initialization process starts.
The setting value indicators light up one by one in order during initialization.
The M-864D restarts after initialization is complete.

23. INSTALLATION

23.1. Installation Precautions

Be sure to leave the installation work (rack mounting) to a qualified installer.



⚠ CAUTION

When installing the unit in an equipment rack, do not block the ventilation slots on the unit's both sides and rear side. Doing so may cause heat to build up inside the unit and result in fire.

- Elevated Operating Ambient - If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature (Tma) specified by the manufacturer.
- Reduced Air Flow - Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.
- Mechanical Loading - Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.
- Circuit Overloading - Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.
- Reliable Earthing - Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g. use of power strips)."

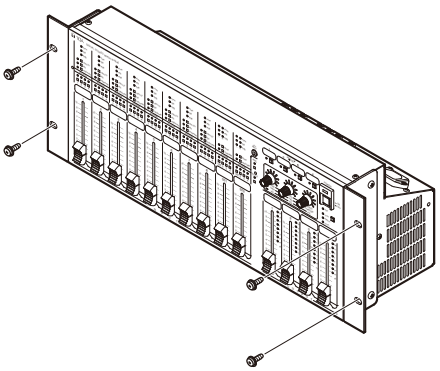
- Température ambiante élevée - si l'appareil est installé dans un bâti fermé ou en même temps que d'autres appareils, la température à l'intérieur risque de devenir supérieure à la température ambiante. Par conséquent, veiller à installer l'équipement dans un environnement compatible à la température ambiante maximum spécifiée par le fabricant.
- Débit d'air réduit - L'installation de l'équipement en bâti ne doit pas compromettre le débit d'air nécessaire à une utilisation sûre de l'équipement.
- Charge mécanique - Le montage de l'équipement en bâti ne doit pas entraîner de danger dû à une surcharge mécanique inégale.
- Surcharge du circuit - rester vigilant lors de la connexion de l'équipement au circuit d'alimentation et aux conséquences d'une surcharge des circuits sur la protection contre les surintensités et les câbles d'alimentation.
  Tenir compte des indications de la plaque nominale de l'appareil.
- Sécurité de la mise à la terre. Veiller à toujours garantir l'intégrité de la prise de mise à la terre. Faire particulièrement attention aux connexions d'alimentation en dehors des branchements directs au circuit de dérivation (par exemple à l'aide de multiprises).

23.2. Rack Mounting

⚠ CAUTION

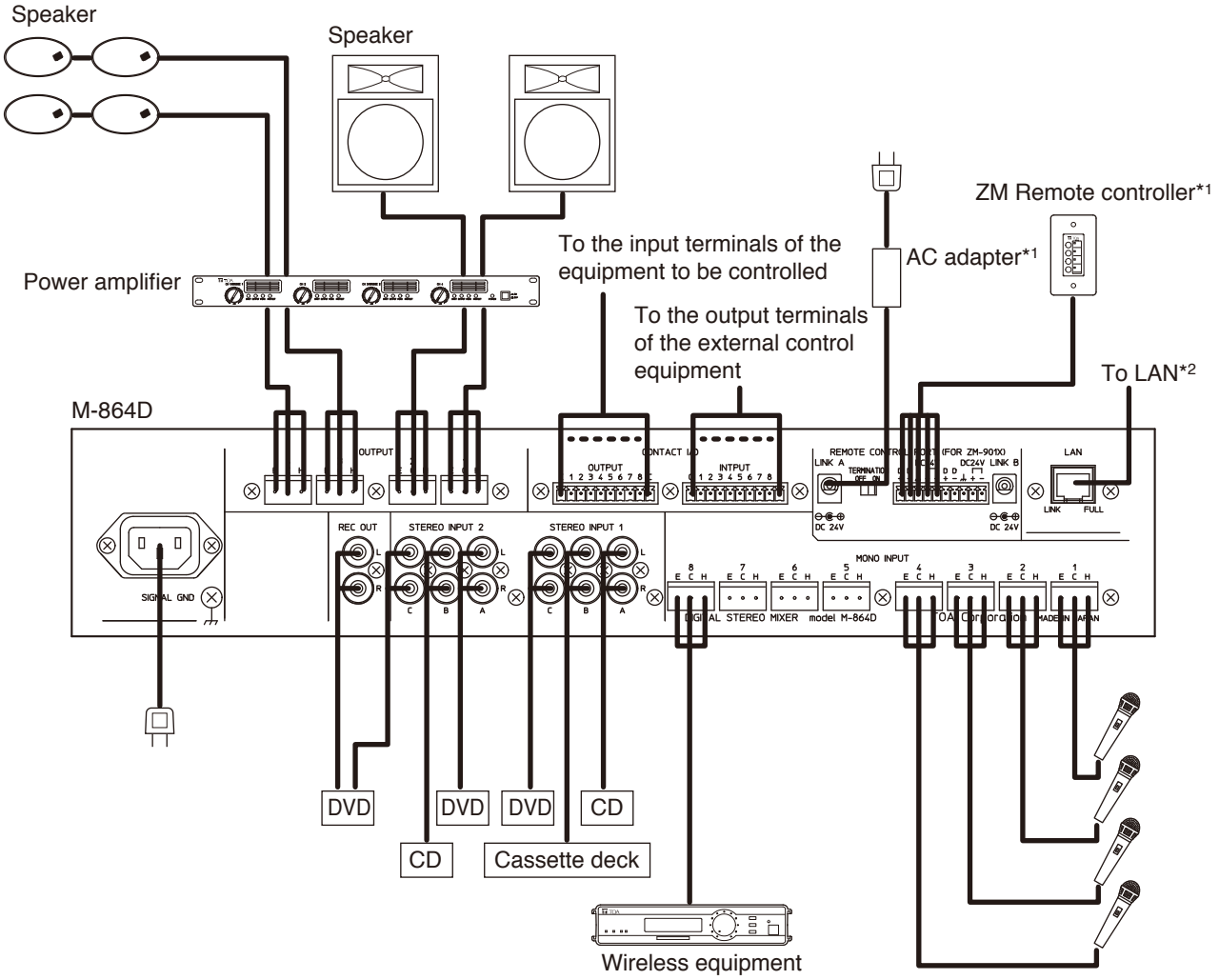
(When rack mounting screws are supplied)
The supplied rack-mounting screws can be used for the TOA equipment rack only. Do not use them for other racks.
When installing the unit in a rack other than that of TOA, be sure to use the screws with a diameter of over 5 mm (0.2") and length of over 12 mm (0.47") to mount the unit.
Failure to do so may cause the unit to fall, resulting in personal injury.

(When rack mounting screws are not supplied)
Rack mounting screws are not supplied with the unit.
Be sure to use the screws with a diameter of over 5 mm (0.2") and length of over 12 mm (0.47") to mount the unit.
Failure to do so may cause the unit to fall, resulting in personal injury.



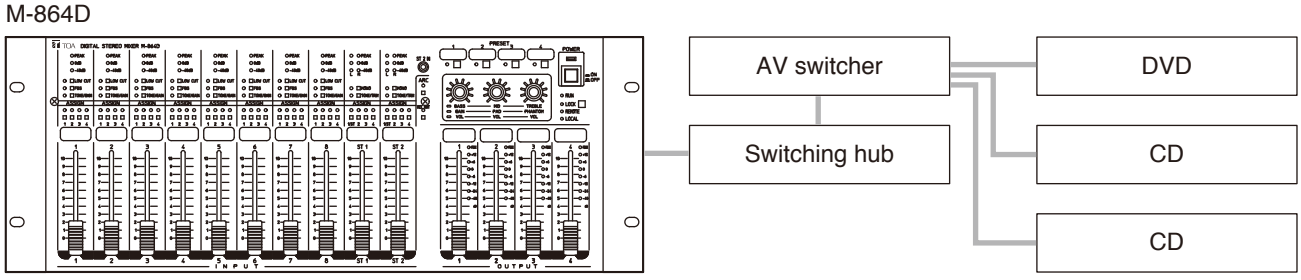
24. CONNECTIONS

24.1. Connection Example



*1 Connections when using the ZM Remote controller (See p. 50.)
Use the AD-246 AC adapter (optional) or its equivalent. As for the usable adapter, consult your TOA dealer.

*2 The M-864D can communicate with the external equipment via LAN.
As the M-864D has a function to send the control command to the AV switcher, it can control the AV switcher without using control devices such as the AMX.
Use the M-864D PC Software to perform function settings.



24.2. Removable Terminal Plug Connection

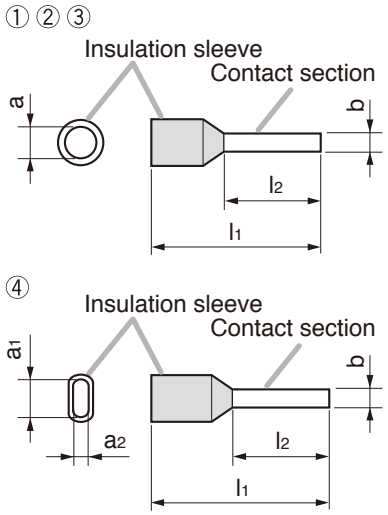
Notes

- Avoid soldering stranded or shielded cable, as contact resistance may increase when the cable is tightened and the solder is crushed, possibly resulting in an excessive rise in joint temperatures.
- When connecting 2 cables or a shielded cable to a single terminal, use a ferrule terminal with an insulation sleeve to crimp the cables because such cable conductors could become loose.

Recommended ferrule terminals for signal cables
(made by Phoenix Contact)

Unit: mm (in)

	Model Number	a	b	l_1	l_2
①	AI 0,34-8 TQ	2 (0.08)	0.8 (0.03)	12.5 (0.49)	8 (0.31)
②	AI 0,5-8 WH	2.5 (0.1)	1.1 (0.04)	14 (0.55)	8 (0.31)



Recommended ferrule terminals for power supply cables (made by Phoenix Contact)

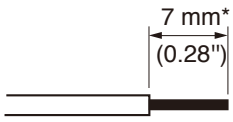
Unit: mm (in)

	Model Number	a	a_1	a_2	b	l_1	l_2
③	AI 1,5-8 BK	3.4 (0.31)	—	—	1.8 (0.07)	14 (0.55)	8 (0.31)
④	AI-TWIN 2 x 1,5-8 BK	—	6.6 (0.26)	3.6 (0.14)	2.3 (0.09)	16 (0.63)	8 (0.31)

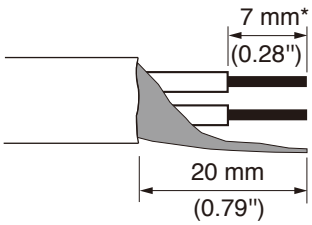
Crimping tool: CRIMPFOX UD6-4 (made by Phoenix Contact)

Cable sheath to trim

Solid cable and stranded cable



Shielded cable



* Expose 8 mm (0.31") or more when using the above ferrule terminal, and cut off an extra conductor protruding from the sleeve.

Wiring procedures

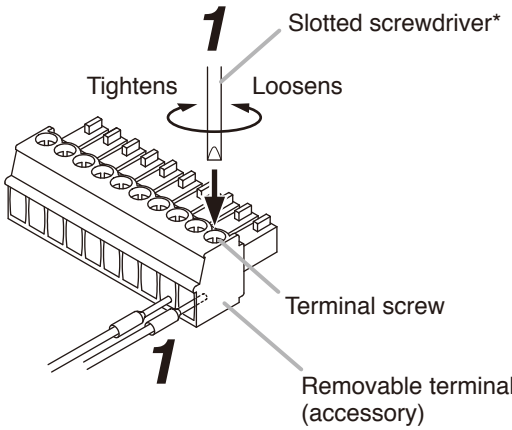
Step 1. Wiring the supplied removable terminal plug.

1-1. Loosen the terminal screws to insert the wire.

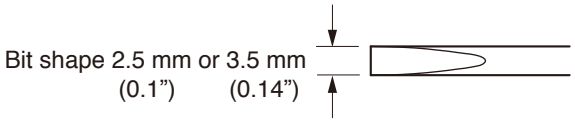
1-2. Tighten the terminal screws.
Ensure that the wire does not break free when pulled. If the wire does pull free, repeat the connection procedure from the start.

Step 2. Insert the wired terminal plug into the corresponding terminal block in the unit's rear panel.

[Terminal plug without fixing screws]



* Recommended type of screwdriver with the following blade width:
For terminal plug except 3P type: About 2.5mm (0.1") wide blade
For 3P terminal plug: About 3.5mm (0.14") wide blade

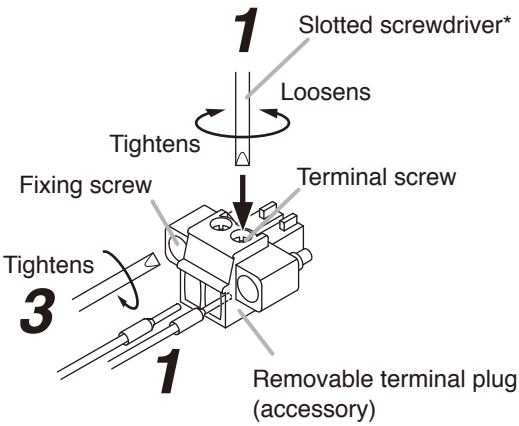


Note

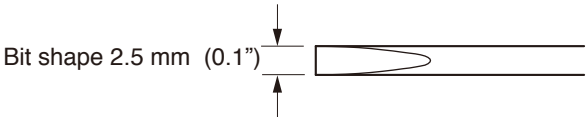
Do not reverse Steps 1 and 2 above. Force is applied to the connected receptacle pins while tightening the terminal screw and they may be damaged, resulting in bad connector contact.

Step 3. In the case of the terminal plug with fixing screws, tighten the fixing screws.

[Terminal plug with fixing screws]



* Recommended type of screwdriver with the following blade width:
About 2.5mm (0.1”) wide blade



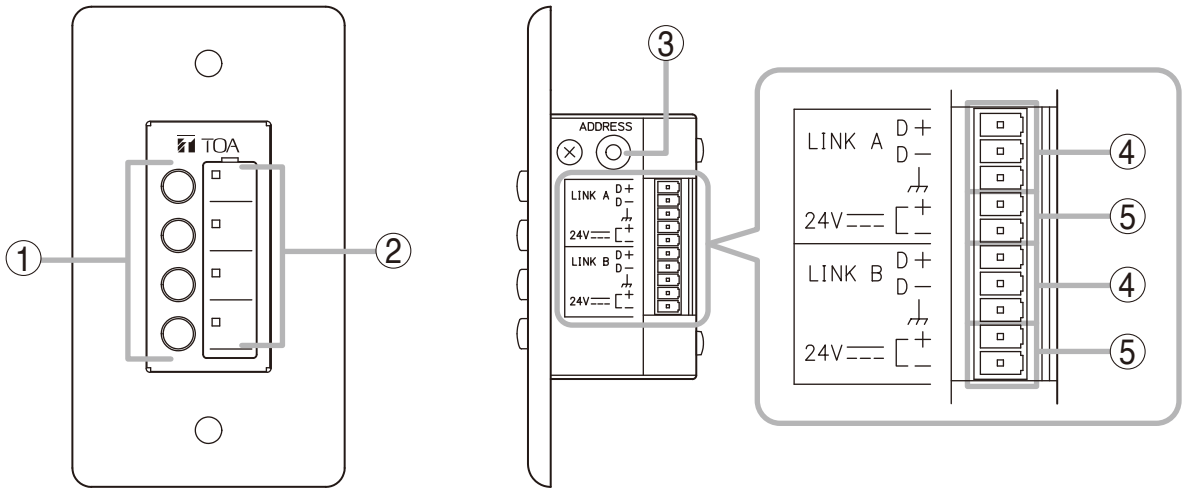
25. WHEN USING THE ZM REMOTE CONTROLLER

25.1. General Description of the ZM Remote Controller

25.1.1. ZM-9011 Remote Control Panel

The ZM-9011 performs various controls with the 4 buttons in connection to the M-864D.
Communication is executed between the M-864D and ZM-9011, and the indicator status changes depending on the M-864D’s operation.
It can be mounted in one-gang electrical box.

[Front] **[Side]**



1. Function buttons
Press this button to activate the function assigned to this button.
Following functions can be assigned:
- Channel On/Off
- EXT VOL. Gain
- ST Line Source Select
- Matrix Crosspoint Assign
- Matrix Crosspoint Gain
- Preset Memory Load
- Remote Switched Out
- Remote Command

Function assignment is performed by the M-864D PC Software installed. For details, read the separate Software instructions.

2. Operation indicators
Light if the assigned function is enabled when the Function button is pressed.

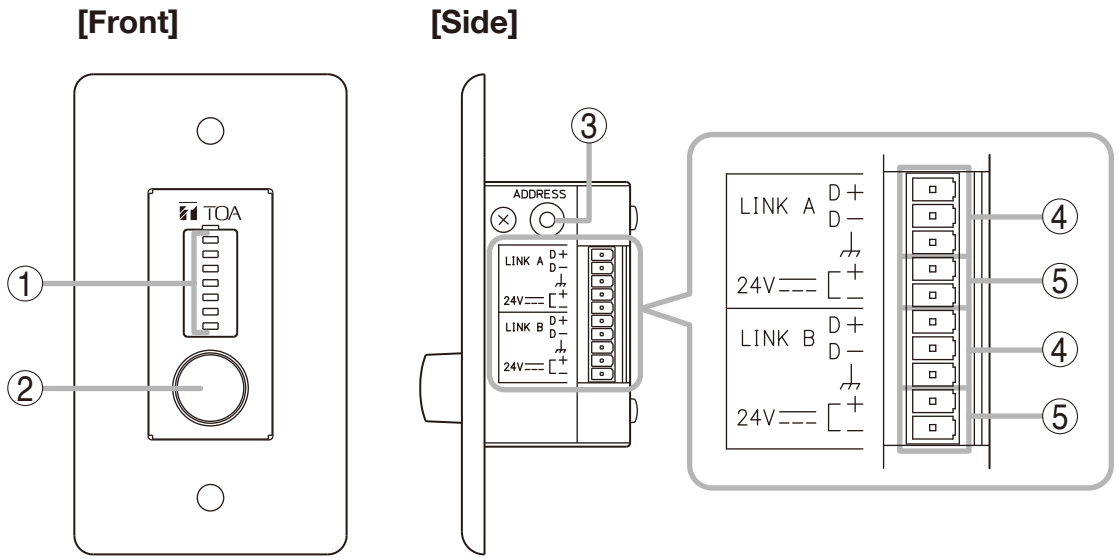
3. Address selector [ADDRESS]
Used to set the ZM-9011 address (0 – F).
Set the address value not overlapping with the value assigned to other ZM Remote controller.
The address number ranges from 0 to 9, and A to F in numerical and alphabetical order.

4. Data line connection terminals [LINK A, LINK B]
Connect the communication line from the M-864D. The communication line has polarities. Match the polarities of data line connection terminals to those of the D-864D's data line connection terminals. As 2 sets of these terminals are internally connected in parallel, either can be used to connect to other ZM Remote controller.

5. 24 V DC terminals
Connect the power cable from the M-864D.

25.1.2. ZM-9012 Remote Control Panel

The ZM-9012 performs volume control of the assigned input/output channel with the volume control knob in connection to the M-864D, and also indicates the volume set position of the assigned channel.
It can be mounted in one-gang electrical box.



1. Volume set position indicator
Indicates the volume level set with the volume control knob.
The set level is indicated with 7-point LED.

2. Volume control knob
Adjusts the volume level of the EXT VOL or Cross point gain.
Channel assignment for which volume level is to be controlled is performed by the M-864D PC Software installed. For details, read the separate Software instructions.

3. Address selector [ADDRESS]
Used to set the ZM-9012 address (0 – F).
Set the address value not overlapping with the value assigned to other ZM Remote controller. The address number ranges from 0 to 9, and A to F in numerical and alphabetical order.

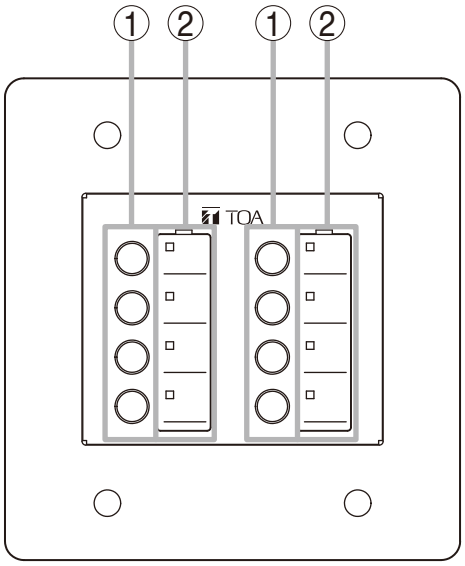
4. Data line connection terminals [LINK A, LINK B]
Connect the communication line from the M-864D. The communication line has polarities. Match the polarities of data line connection terminals to those of the D-864D's data line connection terminals. As 2 sets of these terminals are internally connected in parallel, either can be used to connect to other ZM Remote controller.

5. 24 V DC terminals
Connect the power cable from the M-864D.

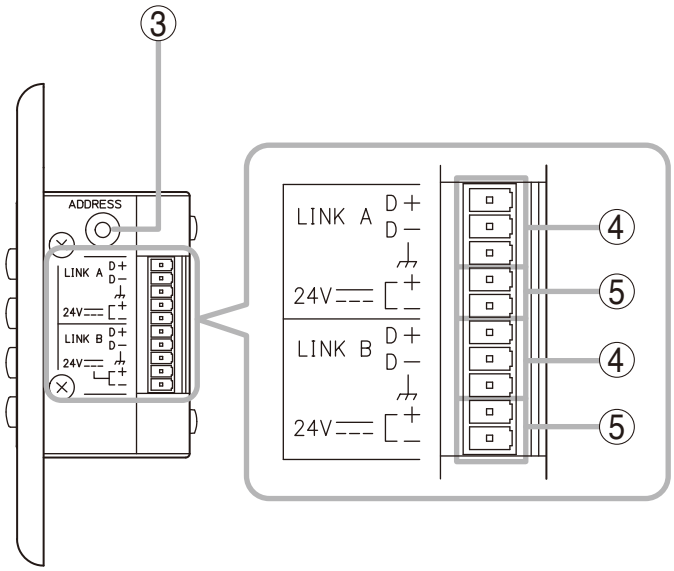
25.1.3. ZM-9013 Remote Control Panel

The ZM-9013 performs various controls with the 8 buttons in connection to the M-864D.
Communication is executed between the M-864D and ZM-9013, and the indicator status changes depending on the M-864D's operation.
It can be mounted in two-gang electrical box.

[Front]



[Side]



1. Function buttons
Press this button to activate the function assigned to this button.
Following functions can be assigned:
- Channel On/Off
- EXT VOL. Gain
- ST Line Source Select
- Matrix Crosspoint Assign
- Matrix Crosspoint Gain
- Preset Memory Load
- Remote Switched Out
- Remote Command

Function assignment is performed by the M-864D PC Software installed. For details, read the separate Software instructions.

2. Operation indicators
Light if the assigned function is enabled when the Function button is pressed.

3. Address selector [ADDRESS]
Used to set the ZM-9013's address (0 – F).
Set the address value not overlapping with the value assigned to other ZM Remote controller.
The address number ranges from 0 to 9, and A to F in numerical and alphabetical order.

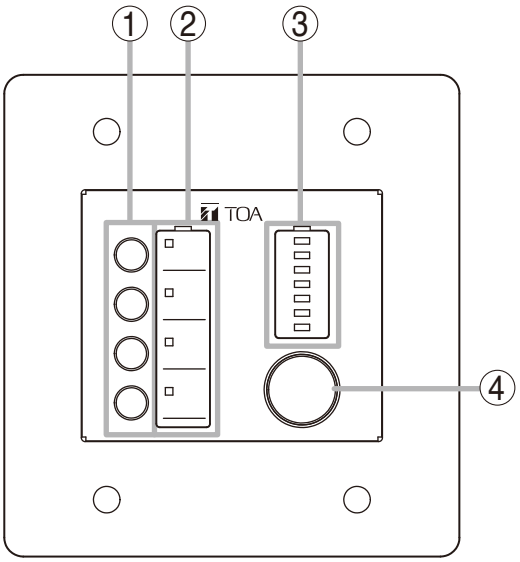
4. Data line connection terminals [LINK A, LINK B]
Connect the communication line from the M-864D. The communication line has polarities. Match the polarities of data line connection terminals to those of the D-864D's data line connection terminals. As 2 sets of these terminals are internally connected in parallel, either can be used to connect to other ZM Remote controller.

5. 24 V DC terminals
Connect the power cable from the M-864D.

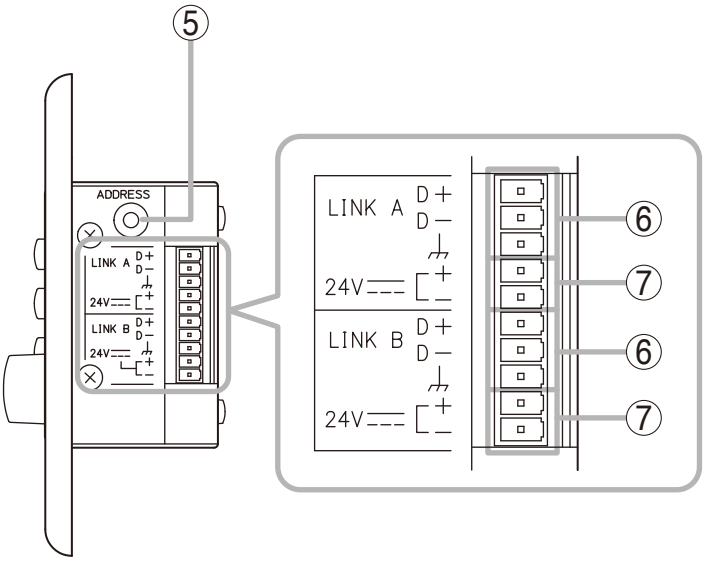
25.1.4. ZM-9014 Remote Control Panel

The ZM-9014 performs various controls with the 4 buttons in connection to the M-864D.
It also performs volume control of the assigned input/output channel with the volume control knob in connection to the M-864D, and also indicates the volume set position of the assigned channel.
It can be mounted in two-gang electrical box.

[Front]



[Side]



1. Function buttons
Press this button to activate the function assigned to this button.
Following functions can be assigned:
• Channel On/Off
• EXT VOL. Gain
• ST Line Source Select
• Matrix Crosspoint Assign
• Matrix Crosspoint Gain
• Preset Memory Load
• Remote Switched Out
• Remote Command
• EXT VOL. GainCS (Channel Select)
• Matrix Crosspoint GainCS (Crosspoint Select)
Function assignment is performed by the M-864D PC Software installed. For details, read the separate Software instructions.

2. Operation indicators
Light if the assigned function is enabled when the Function button is pressed.

3. Volume set position indicator
Indicates the volume level set with the volume control knob.
The set level is indicated with 7-point LED.

4. Volume control knob
Adjusts the volume level of the EXT VOL, Crosspoint gain, or REC OUT VOL.
Channel assignment for which volume level is to be controlled is performed by the M-864D PC Software installed. For details, read the separate Software instructions.

5. Address selector [ADDRESS]
Used to set the ZM-9014's address (0 – F).
Set the address value not overlapping with the value assigned to other ZM Remote controller.
The address number ranges from 0 to 9, and A to F in numerical and alphabetical order.

6. Data line connection terminals [LINK A, LINK B]
Connect the communication line from the M-864D. The communication line has polarities. Match the polarities of data line connection terminals to those of the D-864D's data line connection terminals. As 2 sets of these terminals are internally connected in parallel, either can be used to connect to other ZM Remote controller.

7. 24 V DC terminals
Connect the power cable from the M-864D.

25.2. Operation

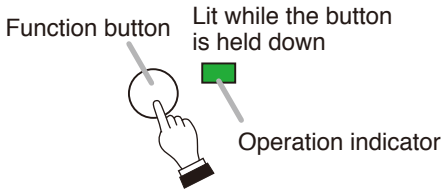
Operations of the Function buttons and the Volume control knob on the ZM Remote controller differ depending on the functions assigned using the M-864D PC Software.

25.2.1. Function button operation

[When the Volume control function is assigned to the Function button]

It is possible to increase or decrease the Crosspoint gain and the external volume levels of the Monaural inputs 1 through 8, Stereo inputs 1 and 2, Monaural output 1 through 4, and Recording output.

Press the Function button several times while hearing the sound volume.
The volume level changes by 1 dB each time the button is pressed.

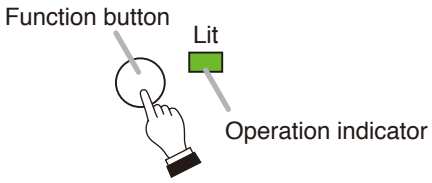


[When a function other than the Volume control is assigned to the Function button]

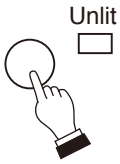
Following are assignable functions:

- Channel On/Off
- ST Line Source Select
- Matrix Crosspoint Assign
- Matrix Crosspoint Gain
- Preset Memory Load
- Remote Switched Out
- Remote Command
- EXT VOL. GainCS (Channel Select) } ZM-9014 only
- Matrix Crosspoint GainCS (Crosspoint Select) } ZM-9014 only

Step 1. Press the Function button.
The function assigned to the button is enabled.



Step 2. Press the Function button again.
The function assigned to the button is disabled.



Tip

When the status of the function assigned to the Function button changes by other device's operation, the Operation indicator corresponding to the Function button reflects its change.
For example, when the recall function of Preset memory No. 1 has been assigned to the Function button, if the Present memory No. 2 is recalled through the M-864D's front key operation, the indicator at the Function button goes off.

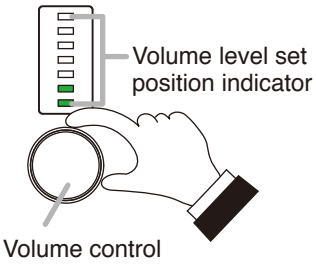
25.2.2. Volume Control Operation

It is possible to increase or decrease the Crosspoint gain and the external volume levels of the Monaural inputs 1 through 8, Stereo inputs 1 and 2, Monaural output 1 through 4, and Recording output.

[Operating the ZM-9012]

The channel for which volume is to be controlled is assigned in advance.

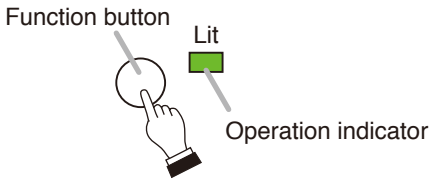
Rotate the volume control while hearing the sound volume.
Turn the control knob clockwise to increase the volume and counterclockwise to decrease it.
The volume set position indicator lights in 7 steps depending on the volume level.



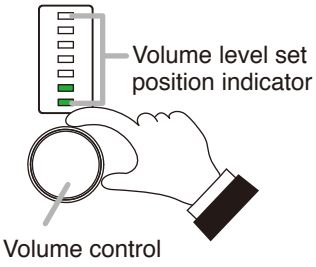
Tips
The volume set positions show different indications depending on the assigned channel.
- When the Monaural input/output, Stereo input, or EXT VOL of the REC OUT is assigned:
  –36 dB (Only the bottommost indicator lights.) to +10 dB (All indicators light.)
- When the Crosspoint gain is assigned:
  –36 dB (Only the bottommost indicator lights.) to 0 dB (All indicators light.)

[Operating the ZM-9014]

Step 1. Press the Function button to select the channel for which the volume level is to be set.
The selected channel is enabled.



Step 2. Rotate the volume control while hearing the sound volume.
Turn the control knob clockwise to increase the volume and counterclockwise to decrease it.
The volume set position indicator lights in 7 steps depending on the volume level.

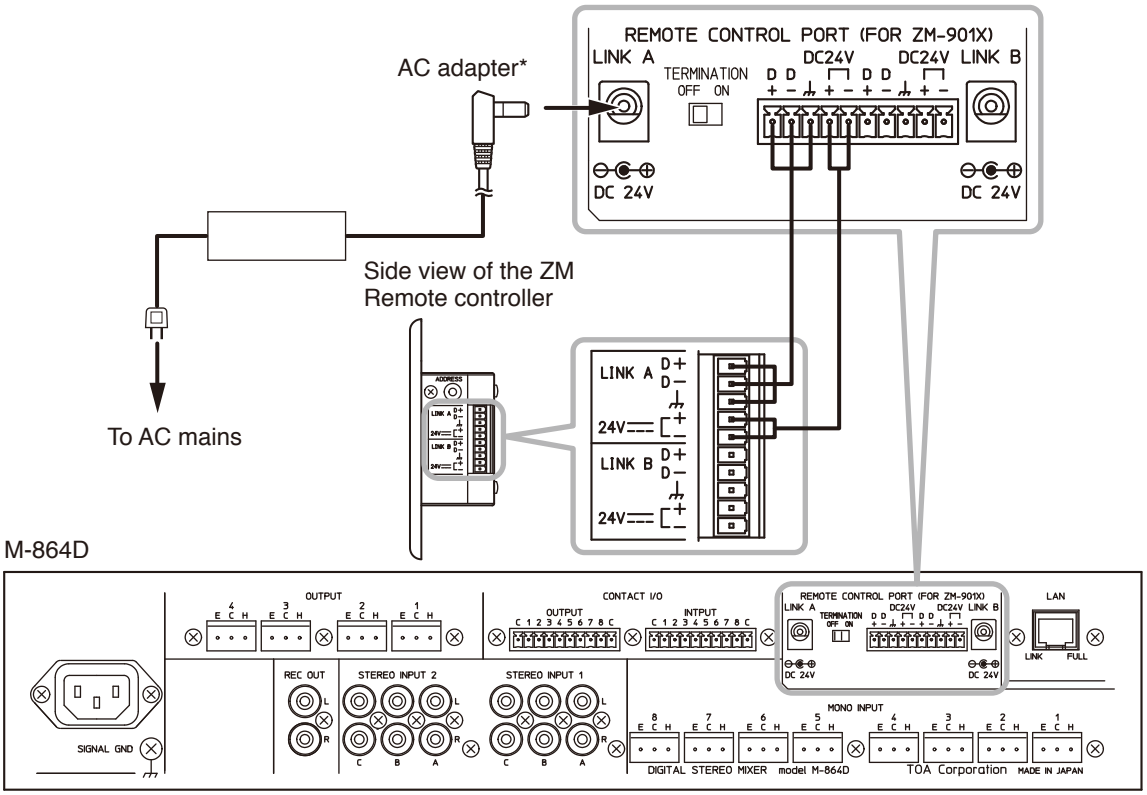


Tips
The volume set positions show different indications depending on the assigned channel.
- When the Monaural input/output, Stereo input, or EXT VOL of the REC OUT is assigned:
  –36 dB (Only the bottommost indicator lights.) to +10 dB (All indicators light.)
- When the Crosspoint gain is assigned:
  –36 dB (Only the bottommost indicator lights.) to 0 dB (All indicators light.)

25.3. Connection

- When connecting the ZM Remote controller, connect the data bus and power line for the RS-485 communication. Use the removable terminal plug for connection. (See p. 43, "Removable Terminal Plug Connection.")
- Connect the dedicated AC adapter or its equivalent* to the M-864D to supply power to the ZM Remote controller. Each one AC adapter is required for the LINK A and LINK B separately.
- Up to 8 ZM Remote controllers can be connected to each channel.

⚠ CAUTION Be sure to use the dedicated AC Adapter or its equivalent*. Using other AC adapter may cause a fire.



* Use the AD-246 AC adapter (optional) or its equivalent.
As for the usable adapter, consult your TOA dealer.

25.3.1. Cable length for wiring

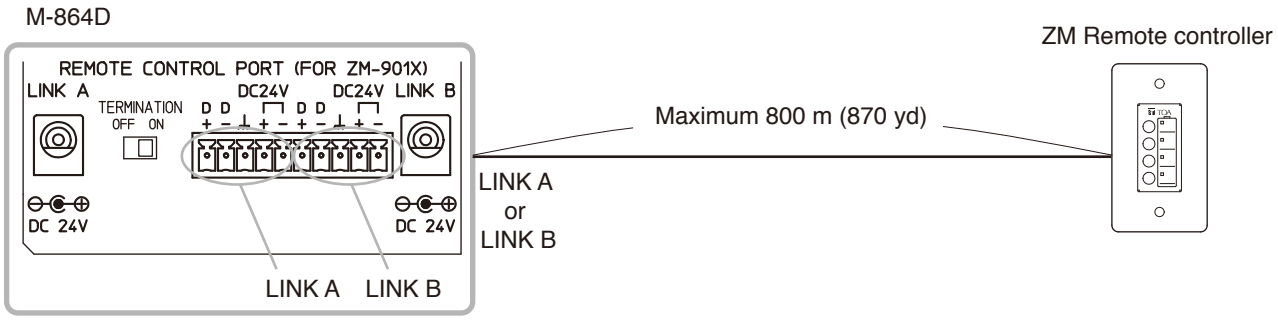
Cable length and the number of the connectable ZM Remote controllers differ depending on the wiring method.

[Star wiring]

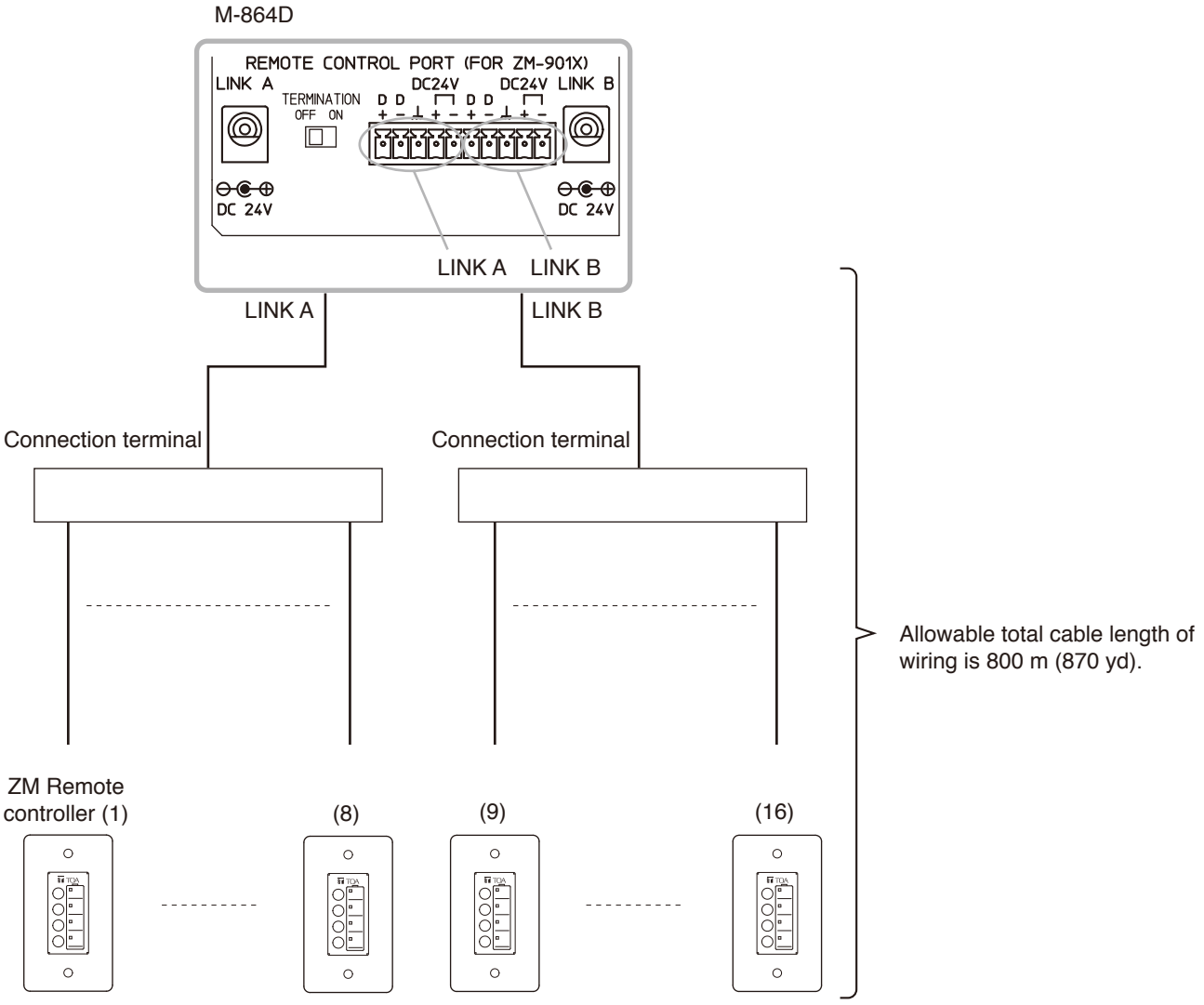
This is a method to directly connect each ZM Remote controller to the M-864D.
Perform wiring installation so that the total cable length between the M-864D and each ZM Remote controller does not exceed 800 m (870 yd).

Example: Up to 16 ZM Remote controllers can be connected if the total cable length between the M-864D and each ZM Remote controller is within 800 m (870 yd).
Perform wiring installation so that the total cable length between the M-864D and each ZM Remote controller does not exceed 800 m (870 yd).

(When connecting a single ZM Remote controller)



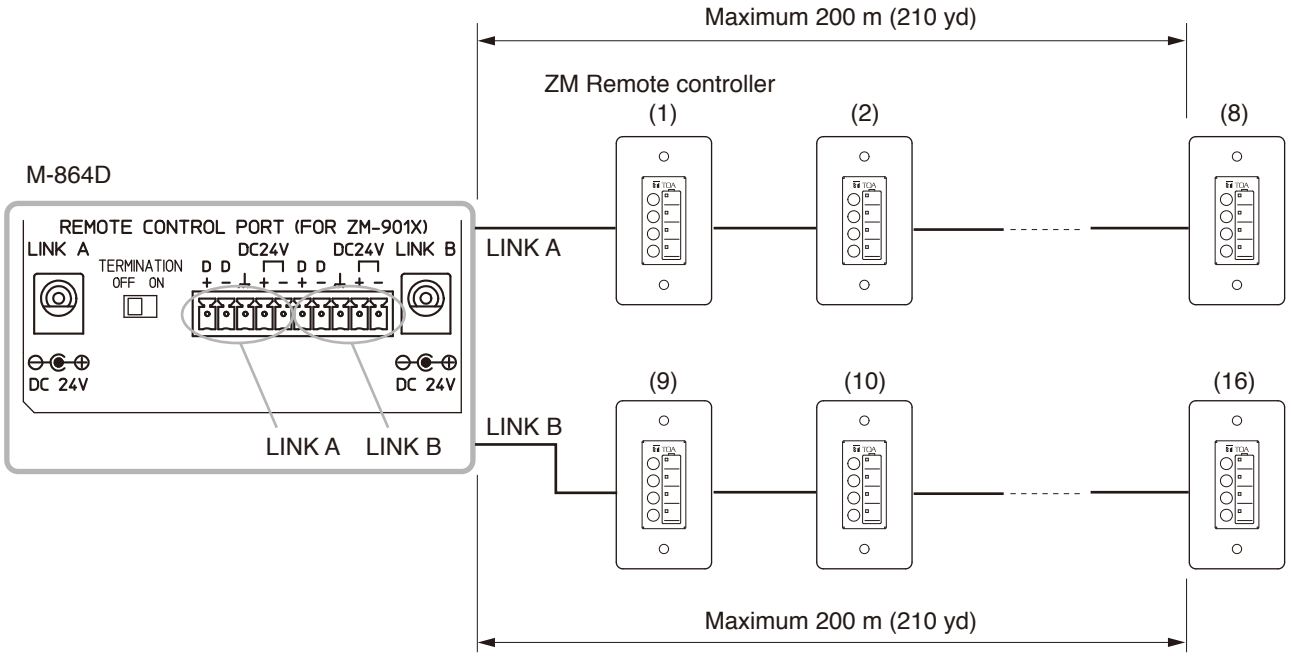
(When connecting 16 ZM Remote controllers)



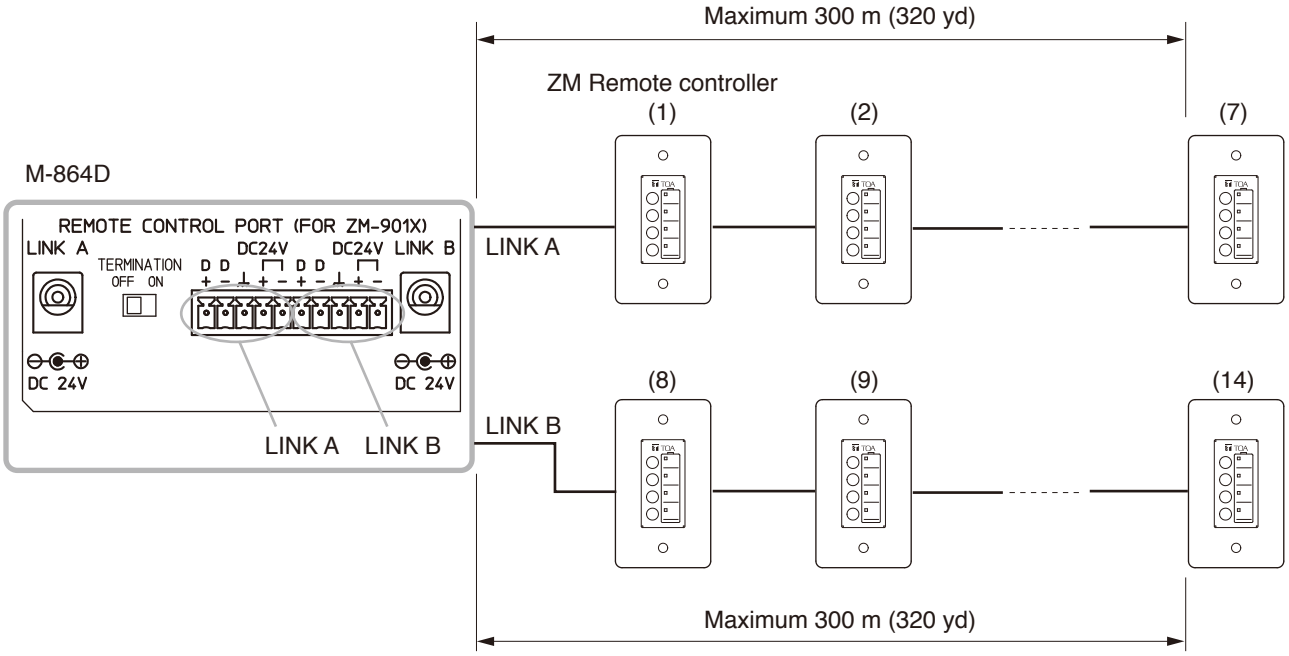
[Daisy chain wiring]

This is a method to connect multiple ZM Remote controllers on a single line.
The number of connectable units differs depending on the cable length.

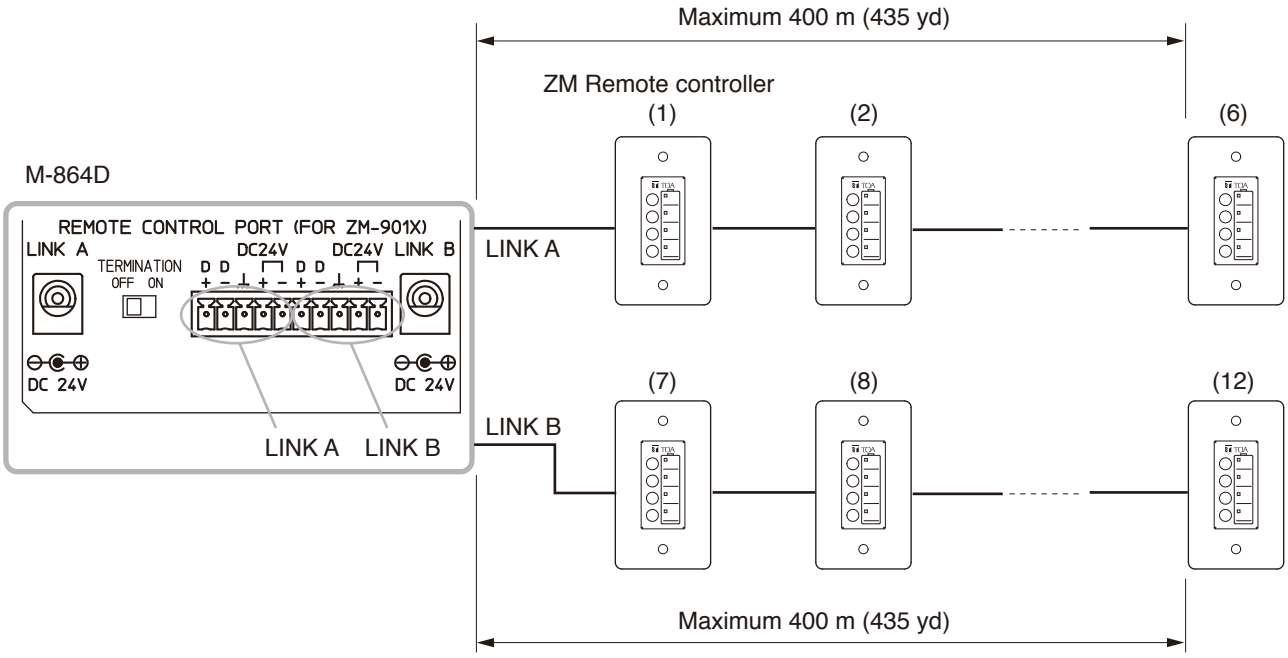
Example 1: When the cable length of each channel is 200 m (210 yd) regardless of the distance between the M-864D and ZM Remote controller and also between individual ZM Remote controllers, up to 16 ZM Remote controllers can be connected. (Total cable length: 400 m or 435 yd)



Example 2: When the cable length of each channel is 300 m (320 yd) regardless of the distance between the M-864D and ZM Remote controller and also between individual ZM Remote controllers, up to 14 ZM Remote controllers can be connected. (Total cable length: 600 m or 650 yd)



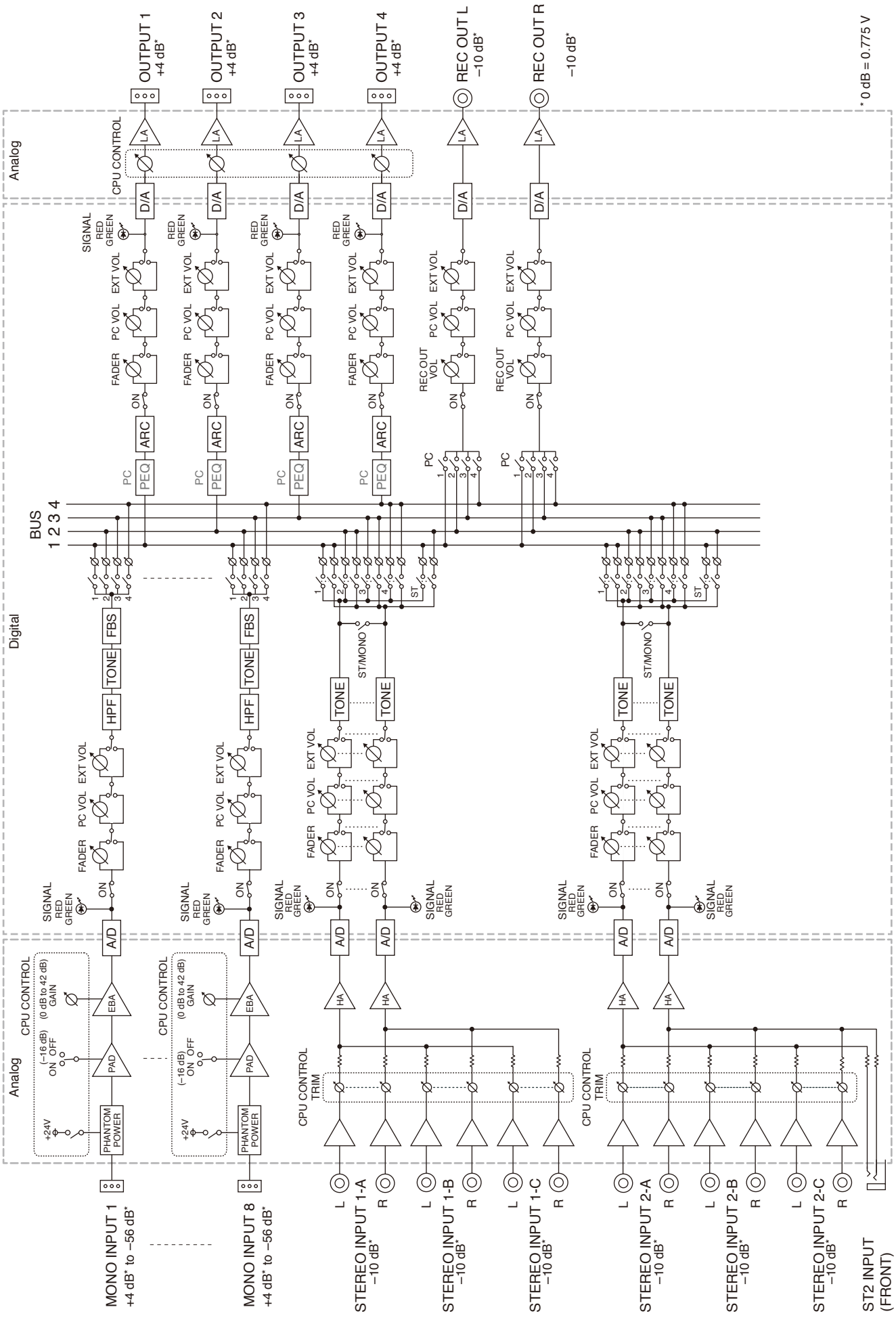
Example 3: When the cable length of each channel is 400 m (435 yd) regardless of the distance between the M-864D and ZM Remote controller and also between individual ZM Remote controllers, up to 12 ZM Remote controllers can be connected. (Total cable length: 800 m or 870 yd)



Notes

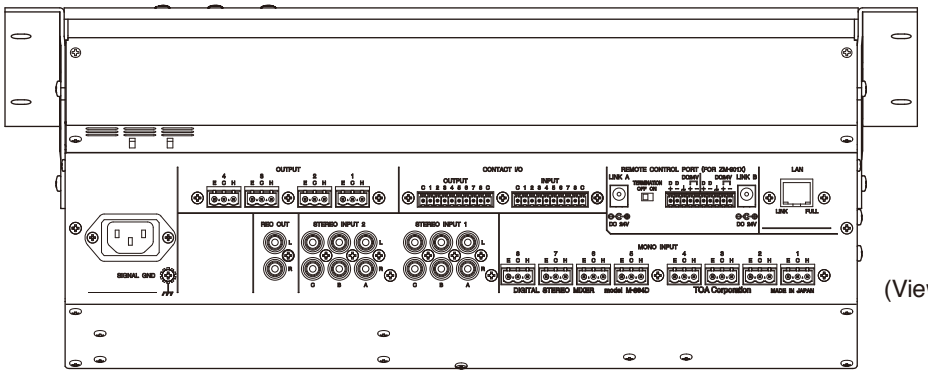
- In the daisy chain wiring, the cable length should be within 400 m (435 yd) per channel. Exceeding this length may cause the ZM Remote controllers not to operate.
- Never combine Star wiring and Daisy chain wiring within the system. Doing so may cause the ZM Remote controllers not to operate.

26. BLOCK DIAGRAM

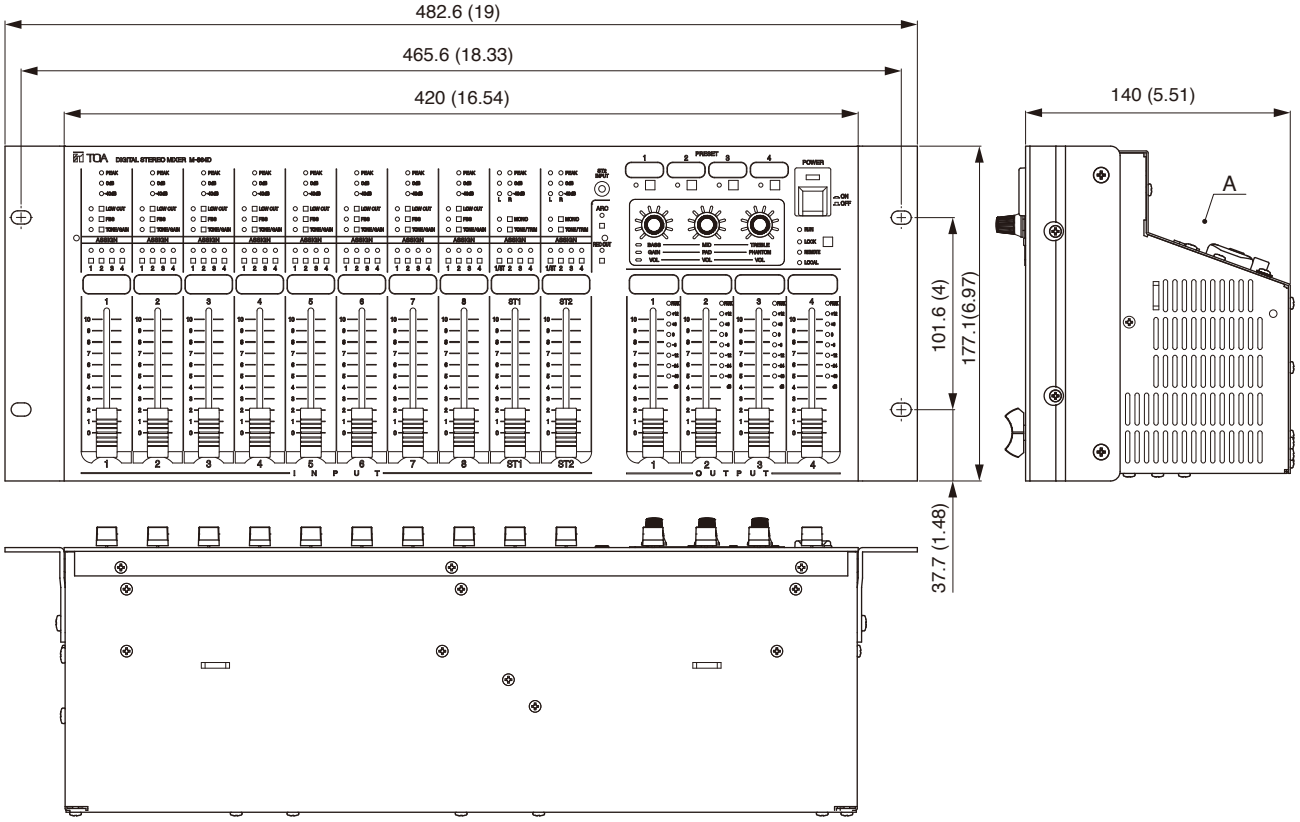


27. DIMENSIONAL DIAGRAM

Unit: mm (in)



(Viewed from the direction “A”)



28. SPECIFICATIONS

28.1. M-864D

Version	CE/CE-GB	CE-AU	CU
Power Source	220 – 240 V AC, 50/60 Hz	220 – 240 V AC, 50 Hz	100 – 120 V AC, 60 Hz
Power Consumption	30 W		
Frequency Response	20 Hz – 20 kHz, ±1 dB		
Sampling Frequency	48 kHz		
Dynamic Range	100 dB or more		
Distortion	0.03 % or less, 1 kHz, +4 dB* input/output, 20 Hz – 20 kHz BPF		
Crosstalk	–80 dB or less, 1 kHz		
Input	Monaural input, 8 channels, removable terminal block (3 P) Phantom power (+24 V DC, 10 mA, ON/OFF switchable for each channel) Gain setting (settable for each channel) : PAD ON Gain min., +4 dB* (max. +24 dB*), 10 kΩ, electronically-balanced Gain max., –14 dB* (max. +6 dB*), 10 kΩ, electronically-balanced : PAD OFF Gain min., –10 dB* (max. +10 dB*), 7 kΩ, electronically-balanced Gain max., –56 dB* (max. –36 dB*), 7 kΩ, electronically-balanced Stereo Input (L, R), 7 channels (1-A, 1-B, 1-C, 2-A, 2-B, 2-C, front-mounted input), RCA jack (stereo mini jack provided on the front panel) : –10 dB* (max. +10 dB*), 10 kΩ, Trim gain for each individual channel: –∞ to 0 dB (except front-mounted input) • 1-A (L), 1-B (L), and 1-C (L) are mixed after passing through each trim gain circuit (the same applies to R channel) • 2-A (L), 2-B (L), and 2-C (L) are mixed with front-mounted input after passing through each trim gain circuit (the same applies to R channel)		
Output	4 channels, +4 dB* (max. +24 dB*), applicable load 600 Ω or more, electronically-balanced, removable terminal block (3 P) REC OUT (L, R): –10 dB* (max. +10 dB*), applicable load 1 kΩ or more, RCA jack Gain is adjustable.		
AD Converter	24 bits		
DA Converter	24 bits		
Preset Memory	16		
Signal Processing Section			
Automatic Resonance Control (ARC) Function	Automatic EQ curve creation by ARC, 4 channels (each output channel), settable independently on each channel		
Feedback Suppressor (FBS) Function	Feedback suppressor filter creation, 8 channels (each monaural input channel), settable independently on each channel		
Filter	8 channels (each monaural input channel), settable independently on each channel, high-pass filter: 20 Hz – 20 kHz		
Tone Controller	BASS, Low-shelving filter: 20 – 500 Hz, ±15 dB MID, parametric equalizer: 20 Hz – 20 kHz, ±15 dB Q: 0.267 – 69.249 TREABLE, high-shelving filter: 6 – 20 kHz, ±15 dB 10 channels (each monaural input channel, each stereo mixing input channel), settable independently on each channel		
Equalizer	Parametric equalizer: 20 Hz – 20 kHz, ±15 dB, Q: 0.267 – 69.249 4 channels (each output channel)		
Matrix	12 x 4		
Crosspoint Gain	–∞ to 0 dB in 1 dB steps		
Automatic Mute Function	Stereo input section matrix, independent control		

* 0 dB = 0.775 V

Function	Input PAD (–16 dB) control, low cut (cutoff frequency: 100 Hz) control, analog output attenuator (–6 dB, –12 dB, –18 dB, –24 dB, –36 dB, –42 dB) control, system lock function, stereo summing function, Control knobs (3 rotary encoders)
Front Panel Section	
Input Level Indicator	3-point LED, 12 channels (each monaural input channel, stereo 1L, 1R, 2L, 2R)
Output Level Indicator	8-point LED, 4 channels (each output channel)
Auto Resonance Control (ARC) Measurement	ARC switch x 1, ARC operation indicator x 1
Feedback Suppressor (FBS) Function	Feedback Suppressor switch x 8, Feedback suppressor indicator x 8
Low Cut Filter	Low cut switch x 8, Low cut indicator x 8
Summing Output	Monaural summing switch x 2, Monaural summing indicator x 2
Tone Control	BASS, MID, TREBLE/Settable with control knobs, 10 channels (each monaural input channel, stereo 1L, 1R, 2L, 2R)
Monaural Input, Analog Setting	Gain setting, PAD ON/OFF, Phantom power ON/OFF Settable with control knobs, 8 channels (each monaural input channel)
Stereo Input, Analog Setting	Trim setting Settable with control knobs, 6 channels (1-A, 1-B, 1-C), (2-A, 2-B, 2-C)
REC OUT, Gain Setting	Gain setting Settable with control knobs, 2 channels (REC OUT L, REC OUT R)
Preset Memory Switching	Preset memory key x 4, Preset memory indicator x 4
System Lock	System lock key x 1, System lock indicator x 1
Operation Status Indication	Operation status indicator x 3
Function Setting Section	Control knob x 3, 10-point position indication LED x 3, Tone control mode indicator x 1, Gain control mode indicator x 1, Trim control mode indicator x 1
Analog Volume Fader	Input volume fader x 10, Output volume fader x 4, 2 faders linkable with supplied gang bar
Control Section	
Contact Input	8 channels, open voltage: 24 V DC, short-circuit current: 5 mA, removable terminal block (10 P)
Contact output	8 channels, no-voltage make contact, contact capacity: 24 V DC/100 mA, removable terminal block (10 P)
Remote Control Panel	2 channels, Maximum number of units: 8 units per channel 24 V DC input x 2, termination switch x 1, removable terminal block (10 P) Maximum total cable length (star wiring): 800 m or 870 yd (total for 2 channels) Maximum cable length (daisy chain wiring): 400 m or 435 yd per channel **Note:** In daisy chain wiring, the number of units differs depending on the cable length. Star wiring and daisy chain wiring cannot be used together. Type of cable: Shielded CPEV cable (a pair of data cable and a pair of power supply cable) or shielded Cat 5 twisted pair cable for LAN (CAT5-STP)
Network	Network I/F: 1 channel of 10BASE-T/100BASE-TX (auto-negotiation) RJ45 connector, connection via switching hub Network protocol: TCP/IP Connection cable: Shielded Cat. 5 or higher twisted pair cable for LAN (Cat. 5-STP or better) Maximum cable length: 100 m or 110 yd (between M-864D and switching hub)
Operating Temperature	0 to 40 ºC (32 to 104 ºF)
Operating Humidity	90 %RH (no condensation)
Finish	Panel: Aluminum, hairline, black, Case: Surface-treated steel plate
Dimensions	482.6 (w) x 177.1 (h) x 157.2 (d) mm (19” x 6.97” x 6.19”)
Weight	5.1 kg (11.24 lb)

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

• **Accessories**

[CE/CE-AU/CE-GB version]
Power supply cord (2 m or 6.56 ft) 1
Removable terminal plug (3 P) 12
Large type removable terminal plug (10 P) 2
Small type removable terminal plug (10 P) 1
Fader gang bar*1 4
Rack mounting screw 4
Protective cover 1

[CU version]
Power supply cord (2 m or 6.56 ft) 1
Removable terminal plug (3 P) 12
Large type removable terminal plug (10 P) 2
Small type removable terminal plug (10 P) 1
Fader gang bar*1 4
Protective cover 1

*1 Allows side-by-side two fader knobs to be linked and operated together as one fader.

• **Optional products**

Remote control panel: ZM-9011/9012/9013/9014
AC adapter: AD-246*2

*2 Consult your TOA dealer when using an equivalent adapter.

28.2. ZM-9011

Power Source	24 V DC (supplied from M-864D)
Current Consumption	50 mA or less
Terminal	Removable terminal block (10 pins)
Connection Cable	Shielded CPEV cable (paired data line and paired power line) or Category 5 twisted pair cable for LAN (CAT5-STP)
Operating Section	4 function buttons
Indicator	4 operation indicators (green LEDs)
Operating Temperature	0 to 40°C (32 to 104°F)
Operating Humidity	35 to 80%RH (no condensation)
Finish	Surface-treated steel panel, white, paint
Dimensions	72 (w) x 127 (h) x 49.5 (d) mm (2.83” x 5” x 1.95”)
Weight	208 g (0.46 lb)

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

• **Accessories**

Box mounting screw (No. 6-32UNC x 30) 2
Box mounting screw (M4 x 30) 2
Panel mounting screw 2
Removable terminal plug (10 pins) 1

Note: Since no electrical box is supplied with the unit, prepare it separately.

28.3. ZM-9012

Power Source	24 V DC (supplied from M-864D)
Current Consumption	50 mA or less
Terminal	Removable terminal block (10 pins)
Connection Cable	Shielded CPEV cable (paired data line and paired power line) or Category 5 twisted pair cable for LAN (CAT5-STP)
Operating Section	1 volume control knob
Indicator	Volume set position indicator (7-point green LED)
Operating Temperature	0 to 40°C (32 to 104°F)
Operating Humidity	35 to 80%RH (no condensation)
Finish	Surface-treated steel panel, white, paint
Dimensions	72 (w) x 127 (h) x 57.5 (d) mm (2.83” x 5” x 2.26”)
Weight	208 g (0.46 lb)

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

• **Accessories**

Box mounting screw (No. 6-32UNC x 30) 2
Box mounting screw (M4 x 30) 2
Panel mounting screw 2
Removable terminal plug (10 pins) 1

Note: Since no electrical box is supplied with the unit, prepare it separately.

28.4. ZM-9013

Power Source	24 V DC (supplied from M-864D)
Current Consumption	50 mA or less
Terminal	Removable terminal block (10 pins)
Connection Cable	Shielded CPEV cable (paired data line and paired power line) or Category 5 twisted pair cable for LAN (CAT5-STP)
Operating Section	8 function buttons
Indicator	8 operation indicators (green LEDs)
Operating Temperature	0 to 40°C (32 to 104°F)
Operating Humidity	35 to 80%RH (no condensation)
Finish	Surface-treated steel panel, white, paint
Dimensions	120 (w) x 127 (h) x 50.5 (d) mm (4.72” x 5” x 1.99”)
Weight	374 g (0.82 lb)

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

• **Accessories**

Box mounting screw (No. 6-32UNC x 30) 4
Box mounting screw (M4 x 30) 4
Panel mounting screw 4
Removable terminal plug (10 pins) 1

Note: Since no electrical box is supplied with the unit, prepare it separately.

28.5. ZM-9014

Power Source	24 V DC (supplied from M-864D)
Current Consumption	50 mA or less
Terminal	Removable terminal block (10 pins)
Connection Cable	Shielded CPEV cable (paired data line and paired power line) or Category 5 twisted pair cable for LAN (CAT5-STP)
Operating Section	4 function buttons 1 volume control knob
Indicator	4 operation indicators (green LEDs) Volume set position indicator (7-point green LED)
Operating Temperature	0 to 40°C (32 to 104°F)
Operating Humidity	35 to 80%RH (no condensation)
Finish	Surface-treated steel panel, white, paint
Dimensions	120 (w) x 127 (h) x 58.5 (d) mm (4.72” x 5” x 2.3”)
Weight	374 g (0.82 lb)

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

• **Accessories**

Box mounting screw (No. 6-32UNC x 30) 4
Box mounting screw (M4 x 30) 4
Panel mounting screw 4
Removable terminal plug (10 pins) 1

Note: Since no electrical box is supplied with the unit, prepare it separately.

FCC REQUIREMENTS

Note
This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.
Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Modifications
Any modifications made to this device that are not approved by TOA Corporation may void the authority granted to the user by the FCC to operate this equipment.

This Class A digital apparatus complies with Canadian ICES-003.
Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

Warning
This equipment is compliant with Class A of CISPR 32. In a residential environment this equipment may cause radio interference.