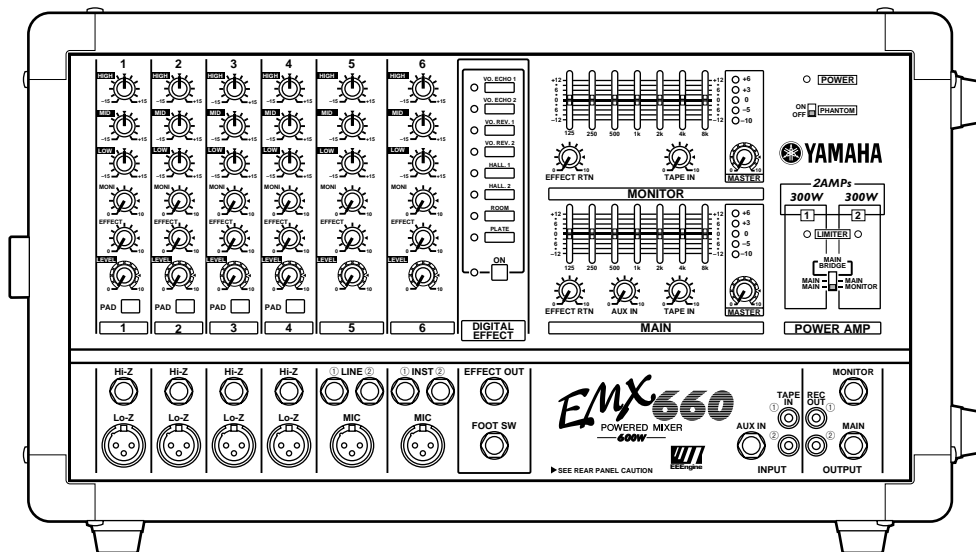




POWERED MIXER

EMX660

Owner's Manual



Precautions

- Do not allow water to enter this unit or allow the unit to become wet. Fire or electrical shock may result.
- Connect this unit's power cord only to an AC outlet of the type stated in this Owner's Manual or as marked on the unit. Failure to do so is a fire and electrical shock hazard.
- Do not scratch, bend, twist, pull, or heat the power cord. A damaged power cord is a fire and electrical shock hazard.
- Do not place heavy objects, including this unit, on top of the power cord. A damaged power cord is a fire and electrical shock hazard. In particular, be careful not to place heavy objects on a power cord covered by a carpet.
- If you notice any abnormality, such as smoke, odor, or noise, or if a foreign object or liquid gets inside the unit, turn it off immediately. Remove the power cord from the AC outlet. Consult your dealer for repair. Using the unit in this condition is a fire and electrical shock hazard.
- Should this unit be dropped or the cabinet be damaged, turn the power switch off, remove the power plug from the AC outlet, and contact your dealer. If you continue using the unit without heeding this instruction, fire or electrical shock may result.
- If the power cord is damaged (i.e., cut or a bare wire is exposed), ask your dealer for a replacement. Using the unit with a damaged power cord is a fire and electrical shock hazard.
- Do not remove the unit's cover. You could receive an electrical shock. If you think internal inspection, maintenance, or repair is necessary, contact your dealer.
- Do not modify the unit. Doing so is a fire and electrical shock hazard.
- When rack-mounting the unit, allow enough free space around the unit for normal ventilation. This should be: 30 cm at the sides, 30 cm behind, and 40 cm above.
For normal ventilation during use, remove the rear of the rack or open a ventilation hole.
If the airflow is not adequate, the unit will heat up inside and may cause a fire.
- This unit has ventilation holes at the rear to prevent the internal temperature rising too high. Do not block them. Blocked ventilation holes are a fire hazard.
- Clean the contacts of the phone plug before connecting it to the SPEAKERS jack of this unit. Dirty contacts may generate heat.
- Use only speaker cables when connecting speakers to amplifier outputs. Using other types of cables is a fire hazard.
Hold the power cord plug when disconnecting it from an AC outlet. Never pull the cord. A damaged power cord is a potential fire and electrical shock hazard.
- Do not touch the power plug with wet hands. Doing so is a potential electrical shock hazard.
- The digital circuits of this unit may induce a slight noise into nearby radios and TVs. If noise occurs, relocate the affected equipment.
- Using a mobile telephone near this unit may induce noise. If noise occurs, use the telephone away from the unit.
- XLR-type connectors are wired as follows: pin 1: ground, pin 2: hot (+), and pin 3: cold (-).
- Do not set all equalizer controls and faders to maximum. Doing so may cause oscillation depending on the condition of the connected unit and speakers, and may damage the speakers.
- The performance of components with moving contacts, such as switches, rotary controls, faders, and connectors, deteriorates over time. The rate of deterioration depends on the operating environment and is unavoidable. Consult your dealer about replacing defective components.

Introduction

Thank you for purchasing the Yamaha EMX660 Powered Mixer. The EMX660 has the following features.

In order to take full advantage of the EMX660 and enjoy long and trouble-free performance, please read this owner's manual carefully, and keep it in a safe place for future reference.

Features

- The EMX660 provides six input channels compatible with mic/line signals, including high-impedance input suitable for an electric-acoustic guitar. The EMX660 has ample power, with a maximum output of 300 W+300 W (600 W with bridge connection), and is suitable for a wide range of applications from installed systems to small-scale PA systems.
- A two-channel power amp is built-in. The input signals for the two channels can be selected as MAIN+MAIN, MAIN+MONITOR, or MAIN (bridge connection).
- Independent 7-band graphic EQ is provided for both the MONITOR section and the MAIN section. This allows the volume and frequency response to be adjusted separately for the main speakers and monitor speakers.
- The power amp section has a limiter circuit to prevent sound distortion and protect the speakers.
- A digital effect with eight selectable effect types is built-in.
A variety of effects can be applied to add reverberation or ambiance to vocals or instrumental sounds.

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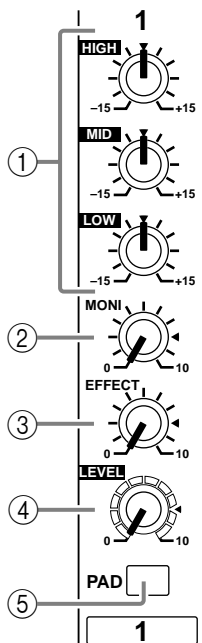
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Front and rear panel

Control panel

■ Channel section

In this section, you can adjust equalization (frequency response), volume level, effect and monitor output levels for the input signal of each channel.



① Equalizer controls (HIGH, MID, LOW)

This is a 3-band equalizer that adjusts the high frequency range, mid frequency range, and low frequency range of each channel. Response is flat when the knobs are in the ▼ position. Rotating it toward the right will boost the corresponding frequency band, and rotating it toward the left will cut it.

The base frequency (or center frequency), range of boost or cut, and equalizer type of each band are as follows.

HIGH:	12 kHz	±15 dB	shelving type
MID:	2.5 kHz	±15 dB	peaking type
LOW:	80 Hz	±15 dB	shelving type

② Monitor controls (MONI)

For each channel, this controls the amount of signal that is sent to the MONITOR bus.

The signal of the MONITOR bus is sent to the speakers connected to the POWER AMP 2 A/B jacks (only if the power amp select switch is in the MAIN-MONITOR position) and to the MONITOR jacks (input/output panel ⑥).

Note: The signal is sent to the MONITOR bus from a location before the level control (④) of each channel. This means that it will not be affected by the setting of the LEVEL control.

③ Effect control (EFFECT)

For each channel, this controls the amount of signal that is sent to the EFFECT bus.

The signal of the EFFECT bus is sent to the built-in effect and to the EFFECT OUT jacks (input/output panel ③).

Note: The signal is sent to the EFFECT bus from a location after the level control (④) of each channel. This means that the amount of signal that is sent to the EFFECT bus will be affected not only by the setting of the effect control, but also by the setting of the level control.

④ Level control (LEVEL)

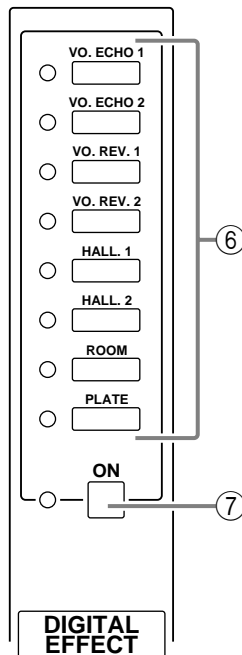
This adjusts the output level for each channel.

⑤ Pad switch (PAD) (Channel 1–4 only)

This switch attenuates the input signal by 30 dB. When connecting a line level device to channels 1–4, or if the mic input is distorted, turn this switch on (the pressed-in position).

■ DIGITAL EFFECT section

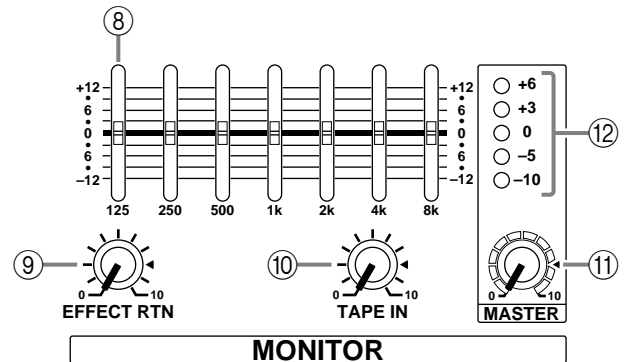
This section allows you to turn the built-in digital effect on/off and to select the effect type.



- ⑥ **Effect select switch and indicator**
Select the effect type for the built-in digital effect. The indicator of the selected effect type lights up.
- ⑦ **DIGITAL EFFECT ON switch and indicator**
When this switch is on (pressed), the indicator lights up and the built-in digital effect can be used. In that case, the signal processed by the digital effect will be sent to the MAIN/MONITOR bus. The mix level of the effect sound is adjusted by the EFFECT RTN control of the MAIN and MONITOR sections.

■ MONITOR section

This section allows you to adjust the tone and volume of the MONITOR bus, and specify the mix level of the built-in effect and the external input signals.

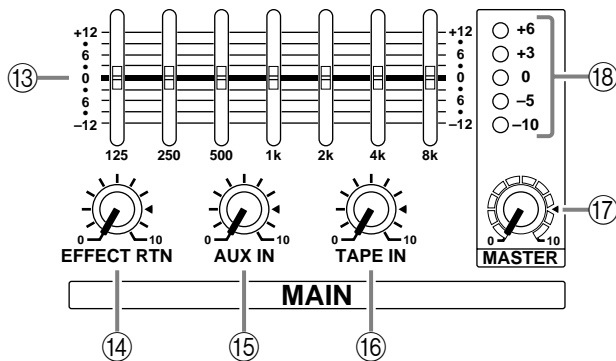


- ⑧ **Graphic equalizer**
This is a 7-band graphic equalizer that allows you to adjust the frequency response of the MONITOR bus signal, providing a maximum of ± 12 dB of cut/boost for each frequency band. You can use these sliders to reduce the level of frequency bands at which feedback easily occurs. Frequency response is flat when a slider is in the center position. Moving a slider in the positive direction will boost, and in the negative direction will cut.
This graphic equalizer affects both the MONITOR bus signal that is output to the speakers and the line level signal which is output from the MONITOR jack (input/output panel ⑥).
- ⑨ **EFFECT RTN control**
This controls the level of the effect sound which is returned from the built-in digital effect to the MONITOR bus.
- ⑩ **TAPE IN control**
This controls the level of the signal routed from the TAPE IN jack to the MONITOR bus.
- ⑪ **MASTER control**
This adjusts the final level of the MONITOR bus. It affects both the MONITOR bus signal which is output to the speakers and the line level signal which is output to the MONITOR jack (input/output panel ⑥).
- ⑫ **Peak level indicator**
This indicator allows you to monitor the level of the signal which is output from the MONITOR jack (input/output panel ⑥).

Note: To avoid distortion, adjust the MASTER control (⑪) so that the 0 indicator lights occasionally.

■ MAIN section

This section allows you to adjust the tone and volume of the MAIN bus, the mix level of the built-in effect, and the mix level of the external input.



⑬ Graphic equalizer

This is a 7-band graphic equalizer that allows you to adjust the frequency response of the MAIN bus signal, providing a maximum of ± 12 dB of cut/boost for each frequency band.

This graphic equalizer affects both the MAIN bus signal that is output to the speakers and the line level signal which is output from the MAIN jack (input/output panel ⑥).

⑭ EFFECT RTN control

This adjusts the level of the effect signal which is returned from the built-in digital effect to the MAIN bus.

⑮ AUX IN control

This adjusts the amount of signal that is sent from the AUX IN jack to the MAIN bus.

⑯ TAPE IN

This adjusts the amount of signal that is sent from the TAPE IN jacks to the MAIN bus.

⑰ MASTER control

This adjusts the final level of the MAIN bus. It affects both the MAIN bus signal which is output from the speakers, and the line level signal which is output from the MAIN jack (input/output panel ⑥).

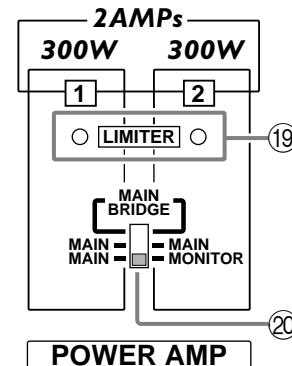
⑱ Peak level indicator

This indicator allows you to monitor the level of the signal which is output from the MAIN jack (input/output panel ⑥).

Note: To avoid distortion, adjust the MASTER control (⑰) so that the 0 indicator lights occasionally.

■ POWER AMP section

This section allows you to select the signals that will be output from the built-in two-channel power amplifier, and to select the BRIDGE mode.



⑱ LIMITER indicator

This indicator lights up when the level of the signal output from the power amp section reaches the maximum and the limiter is activated. Adjust appropriate control so that the indicator lights up for only a short while when the signal reaches the maximum level.

Note: The indicator lights up or flashes for a longer duration if the power amp section is significantly overloaded, which could result in malfunction. Avoid such a situation.

⑳ Power amp select switch

Select one of the following three settings to specify the signals that will be output from power amp 1/2.

• MAIN BRIDGE

With this setting, the MAIN bus signal will be output from the BRIDGE jack. The two power amp channels (A and B) will be bridge connected. Only the MASTER control ⑰ in the MAIN section becomes effective.

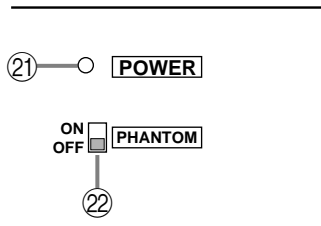
• MAIN-MAIN

With this setting, the MAIN bus signal will be output from the POWER AMP 1 A/B jacks and from the POWER AMP 2 A/B jacks. Only the MASTER control ⑰ in the MAIN section becomes effective.

• MAIN-MONITOR

With this setting, the MAIN bus signal will be output from the POWER AMP 1 A/B jacks and the MONITOR bus signal is output from the POWER AMP 2 A/B jacks. Only the MASTER controls in the MAIN and MONITOR sections ⑰, ⑪ are both effective.

■ POWER indicator & PHANTOM switch



②1 POWER indicator

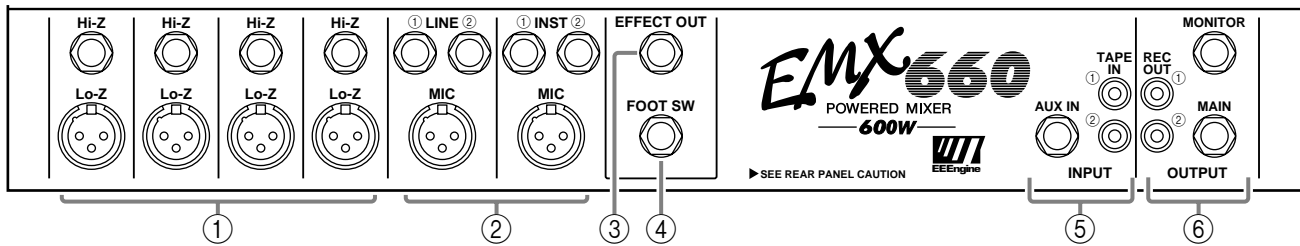
This indicator will light when the power of the EMX660 is turned on.

②2 PHANTOM switch

This switch turns the phantom power supply on/off for the Lo-Z input jacks of channels 1–4 and MIC input jacks of channels 5–6.

Turn this switch off if you do not use it.

Input/output panel



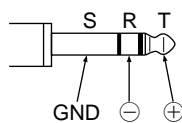
① Hi-Z, Lo-Z input jacks

These are the input jacks for channels 1–4. By using the PAD switches (control panel ⑤) you can connect any of the jacks to a wide range of sources from mics to line level devices (synthesizers or rhythm boxes etc.). The Lo-Z jacks can provide +15 V phantom power, allowing you to use condenser microphones.

Both Hi-Z and Lo-Z are balanced, and are compatible with microphones of output impedance 50–600Ω or line level devices of 600Ω. The nominal input level is –40 dB – –10 dB for the Hi-Z jacks, and –50 dB – –20 dB for the Lo-Z jacks.

Pin connections for the Hi-Z and Lo-Z jacks are as follows.

Lo-Z jacks (XLR type)	Hi-Z jacks (TRS phone jacks)
Pin 1: ground	Sleeve: ground
Pin 2: hot (+)	Tip: hot (+)
Pin 3: cold (–)	Ring: cold (–)



Note: It is not possible to simultaneously use both the Hi-Z and Lo-Z inputs of a given channel. For each channel, use only one of the inputs as appropriate for the input source.

Phantom power is switched on/off in simultaneously for the Lo-Z jacks of channels 1–4 and the MIC jacks of channels 5–6. For this reason, any devices other than condenser microphones must be connected to the Hi-Z or LINE jacks if the PHANTOM switch (control panel ②) is on.

② MIC, LINE, INST input jacks

These are the input jacks for channels 5–6. Microphones can be connected to the MIC jacks, and stereo line level devices (such as synthesizers or rhythm boxes) can be connected to the LINE jacks.

The MIC jacks are balanced, and are compatible with microphones of output impedance 50–600Ω.

The LINE ① & ② jacks are unbalanced, and are compatible with line level devices of 600Ω output impedance. These two input jacks can be used simultaneously.

Nominal input level is –50 dB for the MIC jacks and –10 dB for the LINE jacks.

INST ① & ② jacks are unbalanced, can be used simultaneously, and their high input impedance makes them ideal for use with instruments such as electric-acoustic guitar and electric bass. They can also be used with line-level sources, such as synthesizers and drum machines. Nominal input level is –30 dB.

Note: It is possible to simultaneously use both the MIC and LINE inputs for channel 5, and the MIC and INST inputs for channel 6.

③ Effect output jack (EFFECT OUT)

The input of an external effect such as a delay or echo can be connected to this jack.

The signal adjusted by the EFFECT control of each channel will be sent to the EFFECT bus, and output from this jack.

The nominal output level and impedance are +4 dB/10 kΩ.

④ Foot switch jack (FOOT SW)

A separately sold Yamaha FC5 foot switch can be connected to this jack. If a foot switch is connected to this jack, you can use your foot to switch the built-in digital effect on/off.

⑤ **External input jacks (AUX IN/TAPE IN)**

These are input jacks that allow the signal from an external device to be added to the MAIN output. Monaural output devices such as external effects can be connected to the AUX IN jack, and stereo output devices such as cassette recorder or CD players can be connected to the TAPE IN jacks.

The nominal input level and impedance are $-10\text{ dB}/600\Omega$ for the AUX IN jack, and $-10\text{ dBV}/600\Omega$ for the TAPE IN jacks.

⑥ **External output jacks (REC OUT/MONITOR/MAIN)**

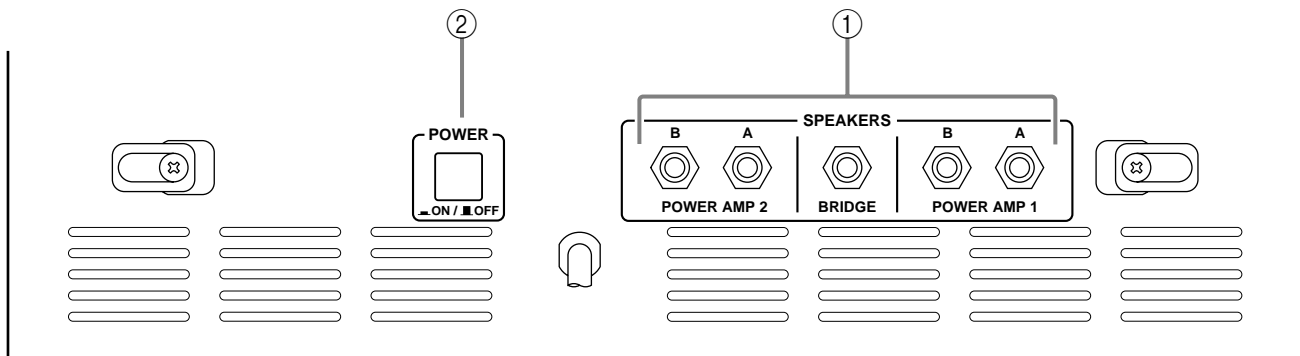
These are output jacks which send line level signals from the EMX660 to external devices.

A stereo recording device such as a cassette deck, DAT or MD recorder can be connected to the REC OUT jacks, and a playback device such a power amp can be connected to the MONITOR and MAIN jacks. The signals sent from each jack are as follows.

- **REC OUT jacks:** The MAIN bus signal before it has passed through the MASTER control and graphic equalizer
- **MONITOR jack:** The MONITOR bus signal which has passed through the Monitor MASTER control and graphic equalizer
- **MAIN jack:** The MAIN bus signal which has passed through the Main MASTER control and graphic equalizer

The nominal output level and impedance are $-10\text{ dBV}/10\text{ k}\Omega$ for the REC OUT jacks, and $+4\text{ dB}/10\text{ k}\Omega$ for the MONITOR/MAIN jacks.

Rear panel



① Speaker output jacks (POWER AMP 1 A/B, POWER AMP 2 A/B, BRIDGE)

Speakers can be connected to these jacks. The EMX660 contains a two-channel power amp, and there are three ways in which the speakers can be connected to the EMX660.

At this time, use the power amp select switch ② on the control panel to select a signal sent to the correct jacks.

■ When the power amp select switch is set to MAIN-MONITOR or MAIN-MAIN:

• Two-channel connection

Two 4–8Ω speakers can be connected to the A jack or B jack of the POWER AMP 1/2 (maximum output 300W+300W).

• Two-channel parallel connection

Two 8–16Ω speakers can be connected to the POWER AMP 1 A/B jacks and two more to the POWER AMP 2 A/B jacks, for a total of four speakers (maximum output 300 W+300 W).

■ When the power amp select switch is set to MAIN-BRIDGE (Bridge connection)

- One 8–16Ω speaker can be connected to the BRIDGE jack (maximum output 600 W).

Caution:

When using a bridge connection, do not connect anything to the POWER AMP 1 and POWER AMP 2 jacks. Likewise, **when using the POWER AMP 1 and/or POWER AMP 2 jacks**, do not connect anything to the BRIDGE jack.

② Power switch

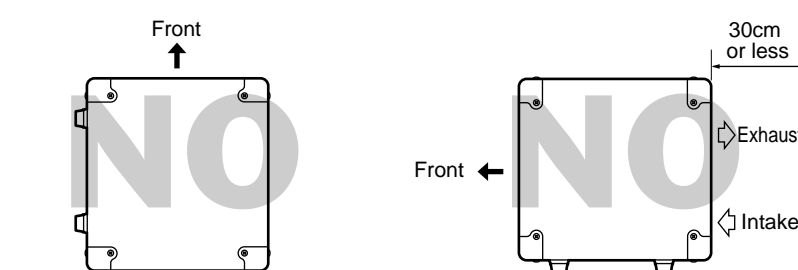
This switch turns the power of the EMX660 on/off.

Note: Before turning the EMX660 on/off, turn down the MASTER controls of the MONITOR and MAIN section.

Installation/Connection

Installation

The EMX660 uses a forced cooling system with intake on the bottom of the rear panel and exhaust on the top of the rear panel to avoid blocking the heated air flow.



Connection

When connecting various devices, be sure to use cables and plugs of the appropriate standard.

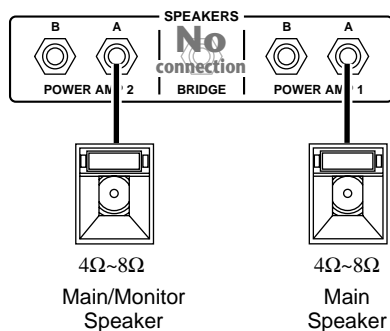
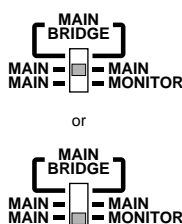
■ Speaker connection

There are three ways in which speakers can be connected to the EMX660.

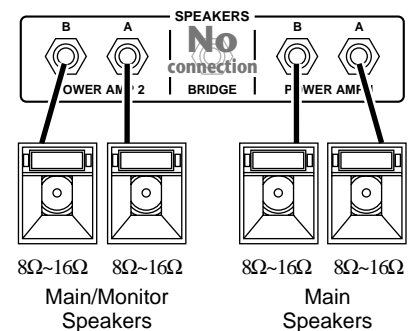
- ① **Two-channel connection** — A single speaker each can be connected to either the A or the B jack of POWER AMP 1 and of POWER AMP 2.
- ② **Two-channel parallel connection** — Two speakers can be connected in parallel to both the A and B jacks of POWER AMP 1 and of POWER AMP 2.
- ③ **Bridge connection** — A single speaker can be connected to the BRIDGE jack.

For each of these, the required speaker impedance will differ. Refer to the following diagram, and make sure that the speaker impedance is not less than the specified value.

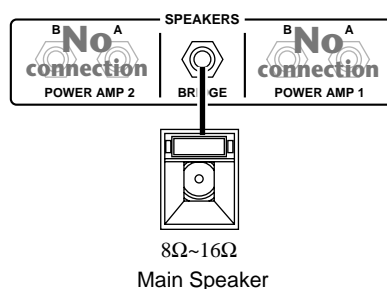
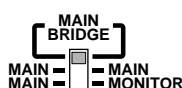
Two-channel connection



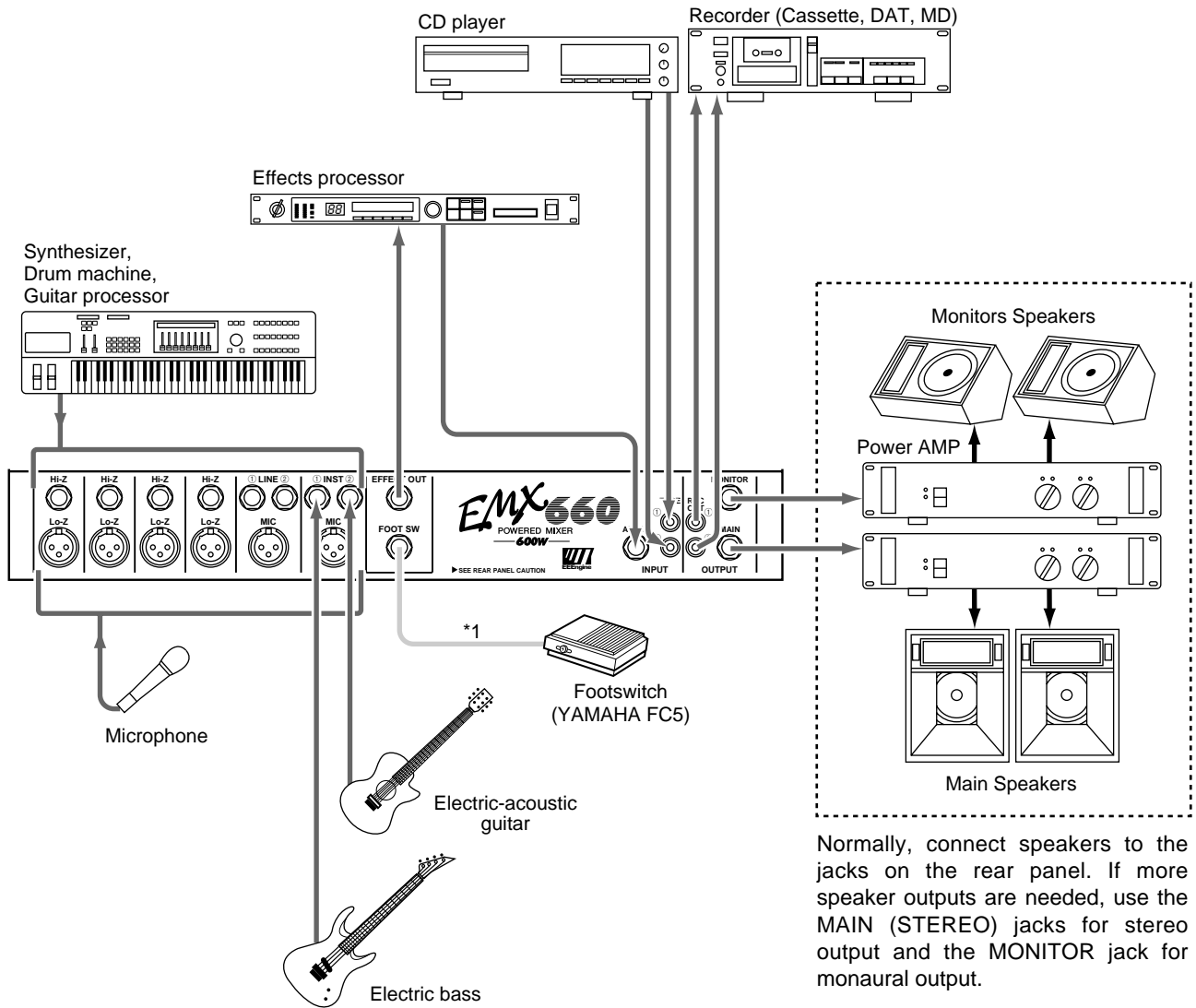
Two-channel parallel connection



Bridge connection



■ Example connections



Normally, connect speakers to the jacks on the rear panel. If more speaker outputs are needed, use the MAIN (STEREO) jacks for stereo output and the MONITOR jack for monaural output.

The figure above shows appropriate jacks to connect each instrument.

- * The Lo-Z and Hi-Z input of each channel cannot be used simultaneously.
- *1. Although this example shows an external effects processor and footswitch, which is used to turn on and off the built-in digital effects processor, connected to the EMX660, in practice, only one effects processor, internal or external, will be used at a time, so the footswitch is not required when using external effects.

Basic Operation

This section explains basic operation of the EMX660.

Connecting microphones and instruments

- ① Before connecting mics or instruments, make sure that the power of all equipment (where applicable) is turned off. Also make sure that the level controls of each channel of the EMX660 and the MASTER control of the MAIN section are turned down.
- ② Connect cables to your mics and instruments, and insert the other end of the cable firmly into the appropriate Lo-Z/Hi-Z jack (channels 1–4) or the MIC jack (channels 5–6), LINE jack (channels 5), INST jack (channels 6).

Note: When connecting a line level device to channels 1–4, turn on the PAD switch.

You cannot use a channel's Lo-Z and Hi-Z jacks at the same time. The MIC and LINE jacks, or the MIC and INST jacks, however, can be used at the same time.

- ③ Turn the power on in the order of peripheral devices → EMX660.

Note: When turning the power off, reverse this sequence.

- ④ Set the MAIN section MASTER control to the ◀ position.
- ⑤ While speaking into the mic (while playing the instrument), adjust the channel LEVEL control so that the 0 LED of the MAIN section peak level meter lights occasionally. Repeat this step for each channel.
- ⑥ If you wish to adjust the tone of each channel, rotate the equalizer controls as desired.
- ⑦ Use the MAIN section graphic equalizer to adjust the tone.
- ⑧ Use the MAIN MASTER control to adjust the overall volume.

Monitoring

By connecting a powered monitor speaker to the MONITOR OUTPUT, you can create a monitor mix independent of the MAIN mix, since the input channel MONI controls are not affected by the LEVEL controls.

- ① Set the MONI MASTER control to the ◀ position.
- ② While speaking into a connected mic, or playing a connected instrument, adjust the MONI control of the input channel that you want to monitor. Repeat this procedure for each channel.
- ③ Use the MONI MASTER control to set the overall level of the monitor mix.

Using the digital effect

The EMX660 has a built-in digital effect, allowing reverberation or ambiance to be added to vocals or instrumental sounds.

- ① Press the DIGITAL EFFECT ON switch of the DIGITAL EFFECT section.
- ② Use the effect select switches of the DIGITAL EFFECT section to select the effect type.
 - VO.ECHO 1, 2Echo appropriate for vocals.
 - VO.REV. 1, 2.....Reverb appropriate for vocals.
 - HALL 1, 2Reverb typical of a hall.
 - ROOM.....Reverb typical of a room.
 - PLATEPlate echo-like reverberation
- ③ Set the MAIN EFFECT RTN control to the ◀ position.
- ④ Raise the EFFECT control of the channels to which you wish to apply the digital effect.
- ⑤ Use the MAIN/MONITOR section EFFECT RTN control to adjust the level of the sound processed by the effect.

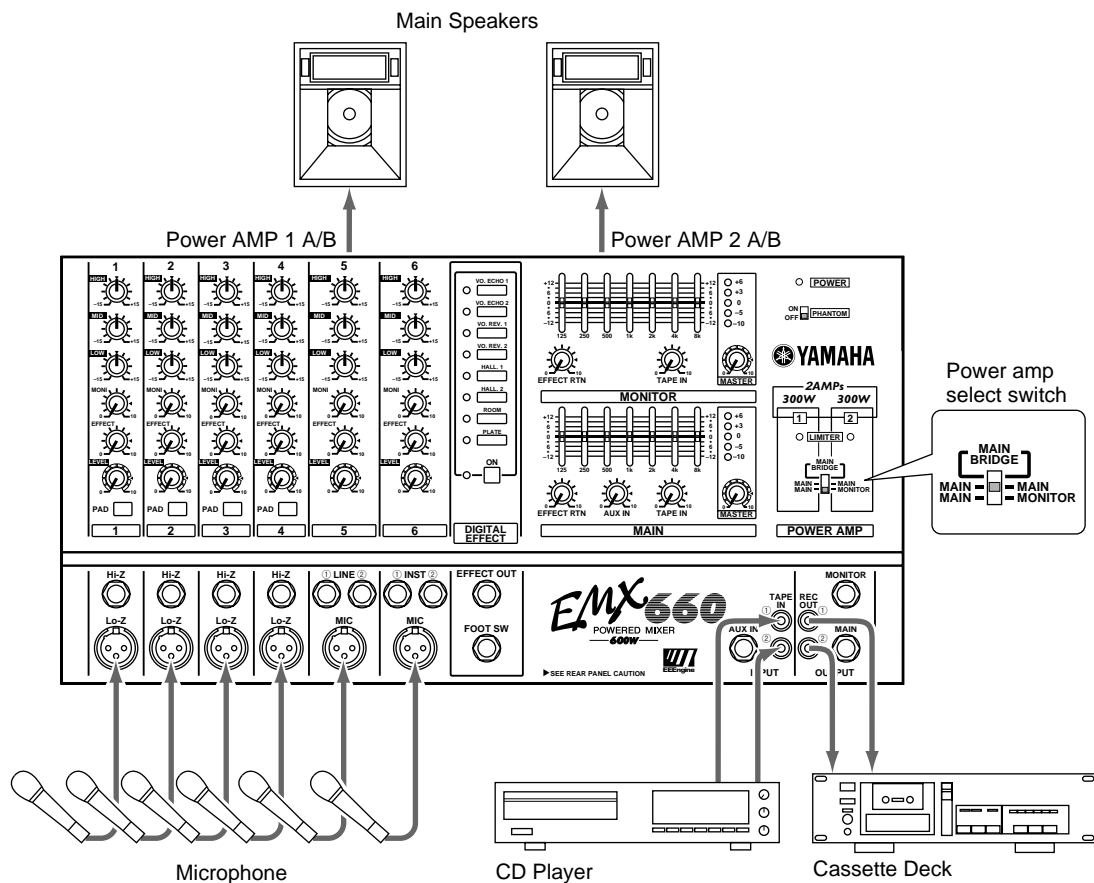
Note: If the effect sound is distorted even if the EFFECT RTN turned all the way down, lower the EFFECT controls of each channel.

Example setups

This section provides some ways in which the EMX660 can be used, and explains connections and operation.

As a conference PA system/installed sound system

Here is an example of using the EMX660 as a conference PA system or as an installed sound system.



Connections

- Connect mics to channel inputs 1–6.
- If you wish to use an external device such as a CD player or LD player, connect the outputs of the device to the TAPE IN jacks of the EMX660.

Note: A CD/LD player or cassette deck can also be connected to the LINE jacks of channel 5.

- If you wish to record the audio to a cassette deck, connect the REC OUT jacks of the EMX660 to the input jacks of the cassette deck.
- Connect the main speakers to the A/B jacks of the POWER AMP 1/2, and set the power amp select switch to "MAIN-MAIN."

Playing back a CD player

- ① Turn the power on in the order of peripheral devices → EMX660.
- ② Adjust the MASTER control of the MAIN section to the ◀ position.
- ③ Start playback on the CD player, and use the MAIN section TAPE IN control to adjust the level so that the 0 LED of the MAIN section peak level meter does not light.

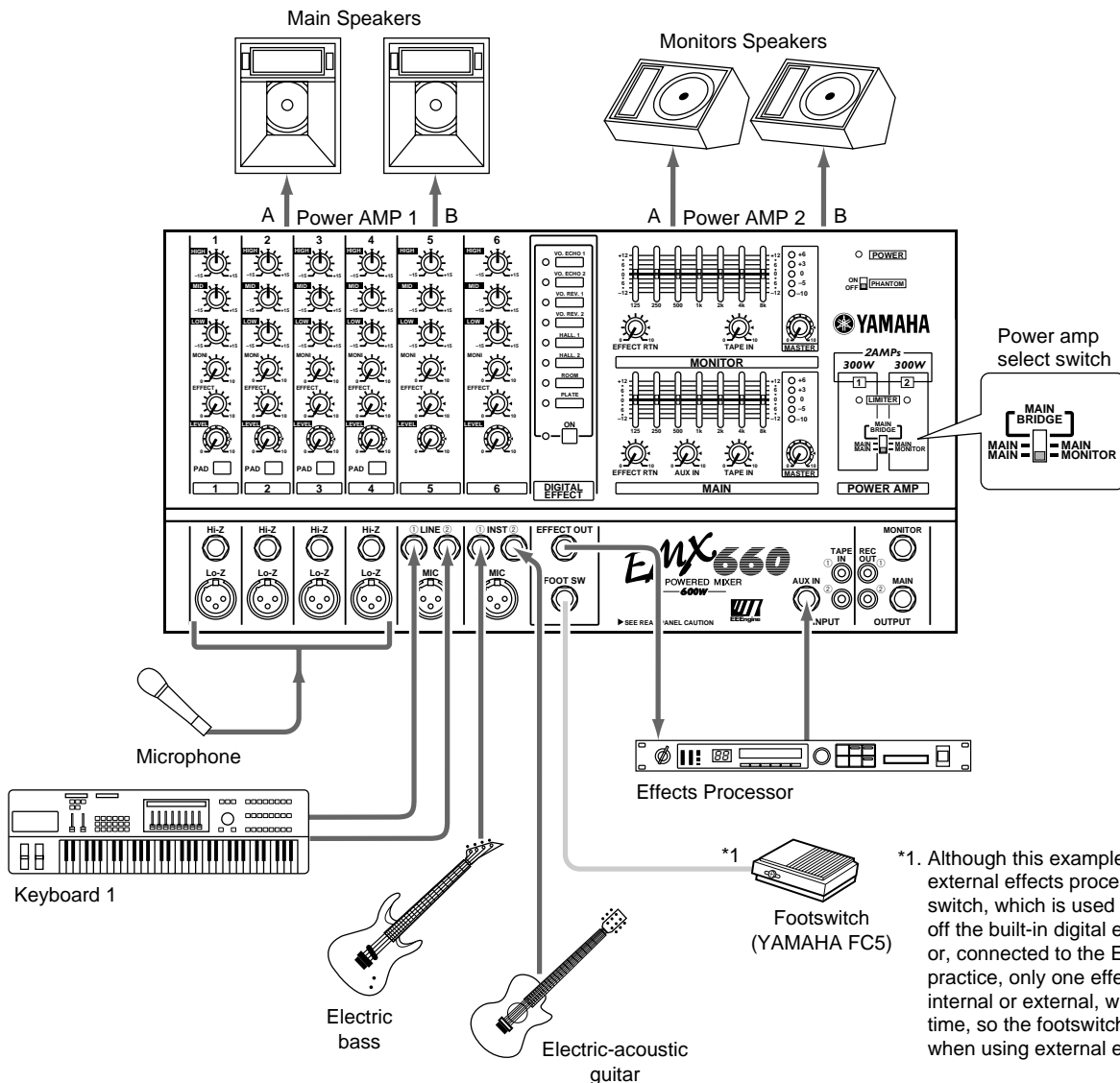
As a band PA

Here is an example of using the EMX660 as a small PA for a band. In this example, the monitor speakers are being sent a mix that is independent of the MAIN speaker mix. An external effect such as delay or reverb is also being used.

Connections

- Connect mics or instruments, such as keyboards, to the channel input jacks 1–6.
- Connect the main speakers to the POWER AMP 1 A/B jacks, and connect the monitor speakers to the POWER AMP 2 A/B jacks.
- If you will be using an external effect such as delay or reverb, connect the EMX660's EFFECT OUT jack to the input jack of the external effect, and connect the output jack of the external effect to the EMX660's AUX IN jack.

Note: Set the power amp select switch of the POWER AMP section to the “MAIN MONITOR” position. If you are using an external effect, we recommend that you turn down the EFFECT RTN controls of the MAIN and MONITOR sections. If the external effect has a stereo output, it is possible to connect its output jacks to the LINE jacks of channels 5. However in this case, be sure that the EFFECT controls are turned all the way down for the channels into which the effect sound is being input. If the EFFECT controls are raised, feedback will occur, and your speakers may be damaged.



Sending an independent mix to the monitor speakers

- ① Set the MONITOR section MASTER control to the ◀ position.
- ② Raise the MONI controls for the channels that you wish to hear from the monitor speakers.

Note: The MONI controls are not affected by the level settings of each channel. This allows you to create a mix that is independent of the MAIN section.

- ③ Use the graphic equalizers and MASTER controls of the MAIN/MONITOR sections to adjust the overall volume and tone.

Using an external effect

- ① Raise the EFFECT controls for the channels to which you want the external effect to be applied.
- ② Adjust the input level of the external effect so that the sound is not distorted at the input of the external effect.
- ③ Use the MAIN section AUX IN control to adjust the level of the sound processed by the effect.

Troubleshooting

The following table describes the possible malfunctions of this device, and the appropriate actions to be taken in each case.

Problem		Cause	Action	
Sound is no longer output from the speakers.	The POWER indicator is dark.	The load on this device was too great, and the protection circuit for the internal transformer has operated . Possible reasons for the excessive load are an excessive input to the device, or inappropriate ventilation.	Please wait. When the device cools off, normal operation will resume automatically. However, please check the following two points to prevent the problem from recurring. If the input to this device is greater than the nominal level, lower the input to the nominal level. If the device is not ventilated sufficiently, refer to the cautions given at the beginning of this manual and take appropriate measures to insure adequate ventilation.	
	The POWER indicator is lit.	The load on the amplifier of this device was too great, and the protection circuit for the amplifier has operated . Possible reasons for the excessive load are an excessive level setting in the channel control section or main section, insufficient ventilation, or insufficient load impedance of the connected speakers.	Please wait. When the device cools off, normal operation will resume automatically. However, please check the following three points to prevent the problem from recurring. If the level setting is excessive, lower it to the nominal level. You can refer to the peak level indicators of the main section when doing so. If the device is not ventilated sufficiently, refer to the cautions given at the beginning of this manual and take appropriate measures to insure adequate ventilation. If the load impedance (including a short) is too low, refer to the chapter on connections (page 11) and change the connections so that the impedance is correct.	
	Other	Connections between devices have come loose.		Inspect the connections, and correct any faulty connections.
		Other		The device may have malfunctioned. Please contact your dealer.

Specifications

■ General specifications

Maximum output power	300 W + 300 W/4Ω @0.5% THD at 1 kHz (POWER AMP OUT 1, 2) 215 W + 215 W/8Ω @0.5% THD at 1 kHz (POWER AMP OUT 1, 2) 600 W/8Ω @0.5% THD at 1 kHz (BRIDGE)	
Frequency response	20 Hz~20 kHz +1 dB, -3 dB @1 W output into 8Ω (POWER AMP OUT) 20 Hz~20 kHz +1 dB, -3 dB @+4 dB output into 10 kΩ (MAIN OUT, MONITOR OUT, EFFECT SEND)	
Total harmonic distortion	Less than 0.5% @20 Hz~20 kHz, 150 W output into 4Ω (POWER AMP OUT 1, 2) Less than 0.3% @20 Hz~20 kHz, +14 dB output into 10 kΩ (MAIN OUT, MONITOR OUT, EFFECT OUT)	
Hum & noise (Average, Rs=150Ω) (with 20 Hz~20 kHz BPF)	-124 dB equivalent input noise, -65 dB residual output noise (POWER AMP OUT)	
	-88 dB residual output noise (MAIN OUT, MONITOR OUT)	
	-79 dB (83 dB S/N) MAIN OUT, MONITOR OUT	Master level control at nominal level and all channel level controls at minimum.
	-69 dB (73 dB S/N) MAIN OUT, MONITOR OUT	Master level control at nominal level and 1 channel level control at nominal level.
	-75 dB (79 dB S/N) EFFECT SEND	Master level control at nominal level and all channel level controls at minimum.
	-69 dB (73 dB S/N) EFFECT SEND	Master level control at nominal level and 1 channel level control at nominal level.
Maximum voltage gain (PAD: OFF)	88 dB CH IN (Lo-Z) to POWER AMP OUT (CH1~4) 66 dB CH IN (Lo-Z) to MAIN OUT, MONITOR OUT (CH1~4) 72 dB CH IN (Lo-Z) to EFFECT OUT (CH1~4) 48 dB CH IN (Lo-Z) to REC OUT (CH1~4) 56 dB CH IN (Hi-Z) to MAIN OUT, MONITOR OUT (CH1~4) 26 dB AUX IN to MAIN OUT 24 dB TAPE IN to MAIN OUT 66 dB MIC IN to MAIN OUT, MONITOR OUT (CH5•6) 26 dB LINE IN to MAIN OUT, MONITOR OUT (CH5) 46 dB INST IN to MAIN OUT, MONITOR OUT (CH6)	
Crosstalk at 1 kHz	65 dB adjacent input, 65 dB input to output	
Input channel equalization	±15 dB Maximum HIGH 12 kHz shelving* MID 2.5 kHz peaking LOW 80 Hz shelving* * Turn over/roll-off frequency of shelving: 3 dB below maximum variable level.	
Meters	5 POINTS LED METER (-10, -5, 0, +3, +6 dB) (MAIN OUT, MONITOR OUT)	
Graphic equalizer	7 bands (125, 250, 500, 1 k, 2 k, 4 k, 8 kHz), ±12 dB Maximum (MAIN OUT, MONITOR OUT)	
Internal digital effect	8 types (VO.ECHO 1, VO.ECHO 2, VO.REV. 1, VO.REV. 2, HALL 1, HALL 2, ROOM, PLATE)	
Phantom power	+15 V is supplied to electrically balanced inputs for powering condenser microphones via 2.4 kΩ current limiting/isolation resistors.	
Limiter	Comp. : THD≥0.5% (POWER AMP OUT)	
LIMIT indicators	Turns on. : THD≥0.5% (POWER AMP OUT)	
Protection Circuit (Power Amp.)	POWER Switch on/off Mute, DC Detection, Temp (Heatsink Temp≥90°C)	
Foot switch (FC-5)	DIGITAL EFFECT MUTE : on/off	
Power requirement	USA and Canada	120 V AC 60 Hz
	Europe	230 V AC 50 Hz
	Other	240 V AC 50 Hz
Power consumption	250 W	
Dimensions (WxHxD)	497×275×275 mm	
Weight	17 kg	

- 0 dB=0.775 Vrms

Input specifications

Input connectors	PAD	Actual load impedance	Nominal impedance	Input level			Connector type
				Sensitivity ¹	Nominal level	Max. before clipping	
CH INPUT (Lo-Z) (CH1~4)	OFF	3 k Ω	50~600 Ω Mics	-62 dB (0.616 mV)	-50 dB (2.45 mV)	-20 dB (77.5 mV)	XLR-3-31 type ²
	ON		600 Ω Lines	-32 dB (19.5 mV)	-20 dB (77.5 mV)	+10 dB (2.45 V)	
CH INPUT (Hi-Z) (CH1~4)	OFF	10 k Ω	50~600 Ω Mics	-52 dB (1.95 mV)	-40 dB (7.75 mV)	-10 dB (245 mV)	Phone jack (TRS) ²
	ON		600 Ω Lines	-22 dB (61.6 mV)	-10 dB (245 mV)	+20 dB (7.75 V)	
MIC INPUT (CH5•6)		3 k Ω	50~600 Ω Mics	-62 dB (0.616 mV)	-50 dB (2.45 mV)	-20 dB (77.5 mV)	XLR-3-31 type ²
LINE INPUT (CH5) (1, 2)		10 k Ω	600 Ω Lines	-22 dB (61.6 mV)	-10 dB (245 mV)	+20 dB (7.75 V)	Phone jack ³
INST INPUT (CH6) (1, 2)		470 k Ω	1 k Ω	-42 dB (6.16 mV)	-30 dB (24.5 mV)	0 dB (0.775 V)	Phone jack ³
AUX IN		10 k Ω	600 Ω Lines	-22 dB (61.6 mV)	-10 dB (245 mV)	+20 dB (7.75 V)	Phone jack ³
TAPE IN (1, 2)		10 k Ω	600 Ω Lines	-22 dBV (79.4 mV)	-10 dBV (316 mV)	+17.8 dBV (7.76 V)	RCA phono jack ³

- Sensitivity is the lowest level that can produce an output of +4 dB (1.23 V) or the nominal output level when the unit is set at maximum gain.
(All level controls are at maximum position.)
- Balanced (T=Hot, R=Cold, S=Gnd)
- Unbalanced
 - 0 dB=0.775 Vrms, 0 dBV=1 Vrms.

Output specifications

Output connectors	Actual source impedance	Nominal impedance	Output level		Connector type
			Nominal	Max. before clipping	
POWER AMP OUT (1•2) (A, B)	0.1 Ω	4/8 Ω Speaker	60 W/4 Ω	(300 W/4 Ω)	Phone jack
BRIDGE OUT	0.1 Ω	8 Ω Speaker	120 W/8 Ω	(600 W/8 Ω)	Phone jack
MAIN OUT	600 Ω	10 k Ω Lines	+4 dB (1.23 V)	+20 dB (7.75 V)	Phone jack
MONITOR OUT	600 Ω	10 k Ω Lines	+4 dB (1.23 V)	+20 dB (7.75 V)	Phone jack
EFFECT OUT	600 Ω	10 k Ω Lines	+4 dB (1.23 V)	+20 dB (7.75 V)	Phone jack
REC OUT (1, 2)	600 Ω	10 k Ω Lines	-10 dBV (316 mV)	+10 dBV (3.16 V)	RCA phono jack

- All output jacks are unbalanced.
- 0 dB=0.775 Vrms, 0 dBV=1 Vrms.

Specifications are subject to change without prior notice.

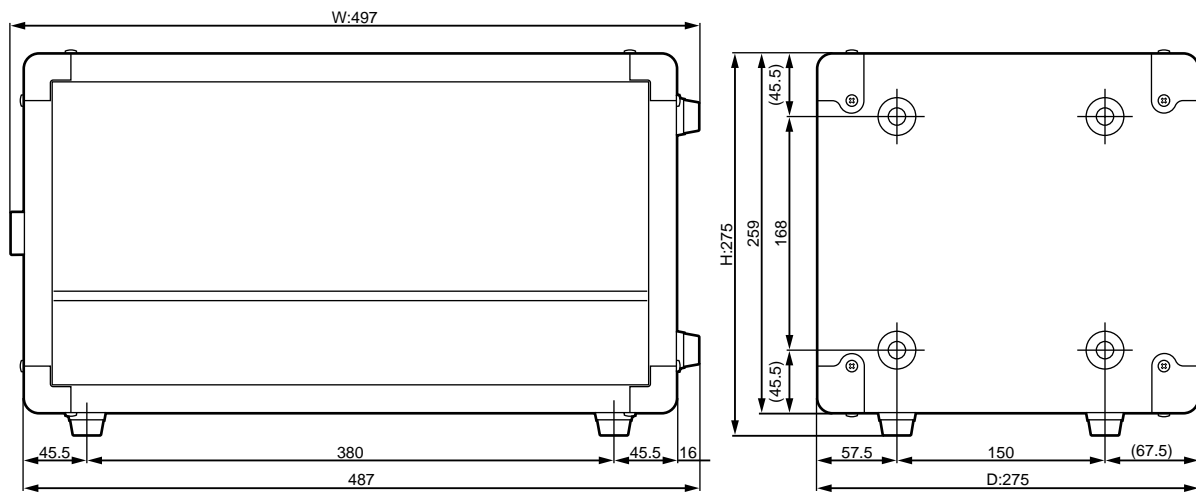
For European Model

Purchaser/User Information specified in EN55103-1 and EN55103-2.

Inrush Current: 56A

Conformed Environment: E1, E2, E3 and E4

■ Dimensions



Unit : mm

Block and Level diagram

