

**POWERED MIXER****EMX640****Owner's Manual****Introduction**

Thank you for purchasing the Yamaha EMX640 Powered Mixer. The EMX640 has the following features. In order to take full advantage of the EMX640 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**

- Six input channels compatible with mic/line signals are provided. The EMX640 has ample power, with a maximum output of 200 W+200 W (400 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.
- Two limiter circuits are built-in to prevent excessive input levels to the amp.
- A digital effect with three selectable effect types is built-in. A variety of effects can be applied to add reverberation or ambiance to vocals or instrumental sounds.

**Precautions**

- 1. Avoid excessive heat, humidity, dust and vibration**  
Keep the unit away from locations where it is likely to be exposed to high temperatures or humidity — such as near radiators, stoves, etc. Also avoid locations which are subject to excessive dust accumulation or vibration which could cause mechanical damage.
- 2. Ventilation**  
Allow a distance of 30 cm between the unit and the wall so that heat generated from the unit will be released effectively. Also, allow enough space between the unit and other devices. If you mount the unit in an audio rack, keep a space of 40 cm on the top panel, and a space of 15 cm to the side panel. Remove the rear panel of the rack or open a vent hole. If heat release is inadequate, the unit will retain heat inside the unit, which may cause a fire.
- 3. Avoid physical shocks**  
Strong physical shocks to the unit can cause damage. Handle it with care.
- 4. Do not open the case or attempt repairs or modifications yourself**  
This product contains no user-serviceable parts. Refer all

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maintenance to qualified Yamaha service personnel. Opening the case and/or tampering with the internal circuitry voids the warranty.

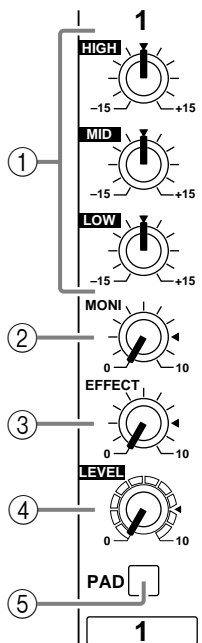
- 5. Always power off before making connections**  
Always turn the power OFF before connecting or disconnecting cables. This is important to prevent damage to the unit itself as well as other connected equipment.
- 6. Handle cables carefully**  
Always plug and unplug cables — including the AC power cord — by gripping the connector, not the cord.
- 7. Clean with a soft dry cloth**  
Never use solvents such as benzine or thinner to clean the unit. Wipe clean with a soft, dry cloth.
- 8. Always use the correct power supply**  
Make sure that the power supply voltage specified on the rear panel matches your local AC mains supply. Also make sure that the AC mains supply can deliver more than enough current to handle all equipment used in your system.
- 9. Do not touch the heatsink when the EMX640 is in use. It can get very hot.**

# 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 passes through the EFFECT section and the built-in effect, and is sent to the external effect device connected 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)

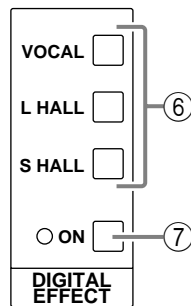
This adjusts the output level for each channel.

#### ⑤ Pad switch (PAD) (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

Select the effect type for the built-in digital effect.

### ⑦ DIGITAL EFFECT ON switch

When this switch is on (pressed), the digital effect built into the EMX640 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.

## ■ EFFECT section

This section allows you to adjust the level of the signal sent from the EFFECT bus to an external effect device.



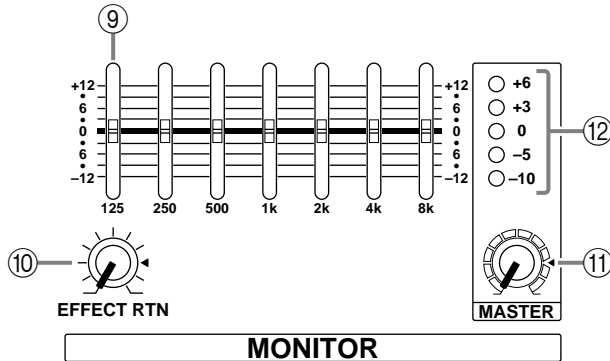
### ⑧ EFFECT OUT control

This adjusts the effect send level for an external effect device connected to the EFFECT OUT jack (input/output panel ③).

*Note:* The EFFECT OUT control does not affect the send level to the built-in effect.

## 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.



### 9 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  $\pm 12$  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).

### 10 EFFECT RTN control

This controls the level of the effect sound which is returned from the built-in digital effect 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).

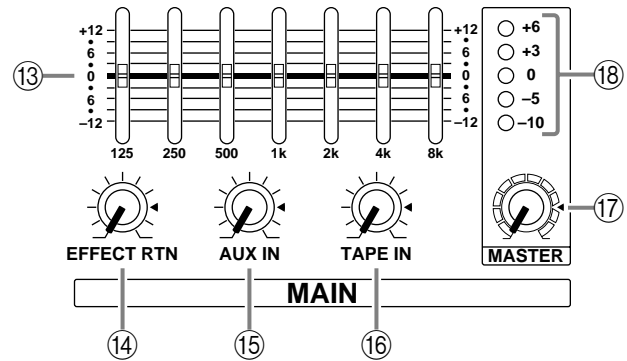
### 12 Peak level indicator

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  $\pm 12$  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).

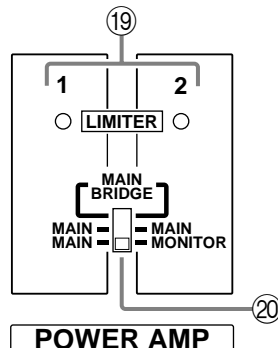
### 18 Peak level indicator

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.



### ①⑨ 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.

### ②⑩ 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-MONITOR

With this setting, the MAIN and MONITOR sections can be used independently. The MAIN bus signal will be output from the POWER AMP 1 A/B jacks, and the MONITOR bus signal will be output from the POWER AMP 2 A/B jacks.

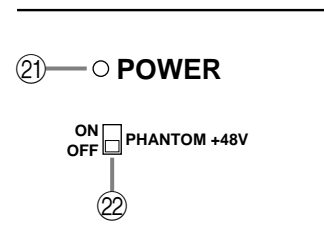
#### • MAIN-MAIN

With this setting, the two power amp channels can be used independently. The MAIN bus signal will be output from the POWER AMP 1 A/B jacks and from the POWER AMP 2 A/B jacks.

#### • MAIN BRIDGE

With this setting, the two power amp channels (A and B) will be bridge connected. Only the MAIN bus signal will be output from the BRIDGE jack, though.

## ■ POWER indicator & PHANTOM switch



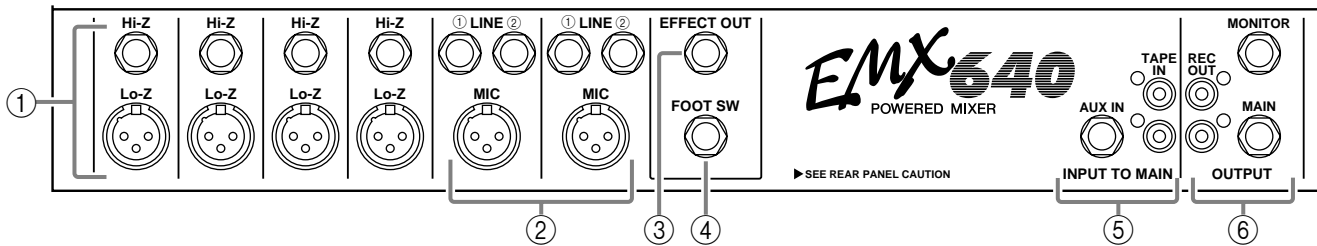
### ②① POWER indicator

This indicator will light when the power of the EMX640 is turned on.

### ②② PHANTOM +48 V 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.

## Input/output panel



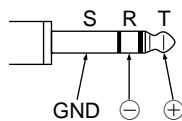
### ① Channel input jacks (Hi-Z, Lo-Z) 1~4

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 +48 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 channels 1~6. For this reason, devices which do not require phantom power must be connected to the Hi-Z or LINE jacks if the PHANTOM +48 V switch (control panel ②) is on.

### ② Channel input jacks (MIC/LINE) 5~6

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 jacks are unbalanced, and are compatible with line level devices of 600Ω output impedance. Nominal input level is -50 dB for the MIC jacks and -20 dB for the LINE jacks.

*Note:* It is possible to simultaneously use both the MIC and LINE inputs for a given channel.

### 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, its level adjusted by the EFFECT OUT control, 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. The Digital Effect ON switch on the front panel must be set to ON in order to use a foot switch.

### 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 dB/600 $\Omega$  for the AUX IN jack, and –10 dBV/600 $\Omega$  for the TAPE IN jacks.

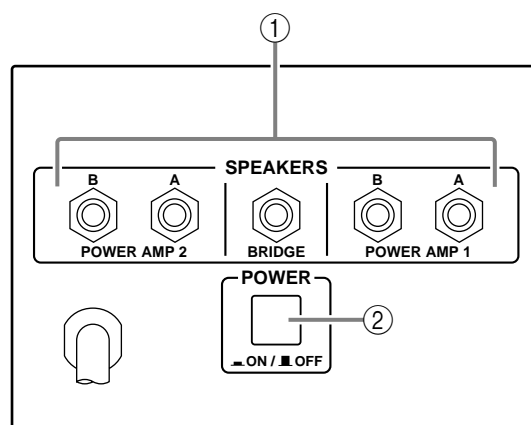
### ⑥ External output jacks (REC OUT/MONITOR/MAIN)

These are output jacks which send line level signals from the EMX640 to external devices. A stereo recording device such as a cassette recorder 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 dBV/10 k $\Omega$  for the REC OUT jacks, and +4 dB/10 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 EMX640 contains a two-channel power amp, and the two channels can be used independently (maximum output 200 W+200 W) or in bridge connection (maximum output 400 W).

If the two channels are used independently, two 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. If the two channels are used in a bridge connection, only one speaker can be connected to the BRIDGE jack.

If you wish to use the two channels independently, but only connect a speaker to the A jack or B jack, use a 4~8 $\Omega$  speaker. When using the A and B jacks simultaneously, connect 8~16 $\Omega$  speakers. In this case, be careful not to connect a speaker to the BRIDGE jack.

If you are connecting a speaker to the BRIDGE jack, use a 8~16 $\Omega$  speaker. In this case, be careful not to connect a speaker to the POWER AMP 1/2 A/B jacks.

*Note:* Use the power amp select switch (control panel ⑳) to select the signal which is sent to the jacks, or to activate the bridge connection.

#### 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 EMX640 on/off.

*Note:* Before turning the EMX640 on/off, turn down the MASTER controls of the MONITOR and MAIN section.

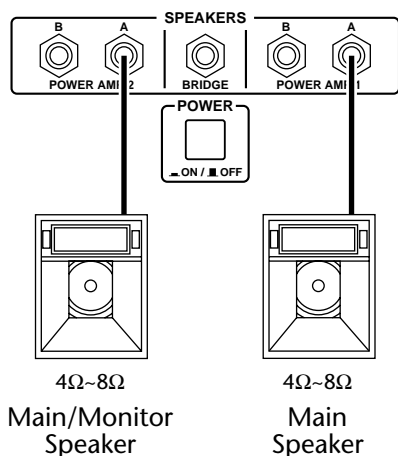
# Connections

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

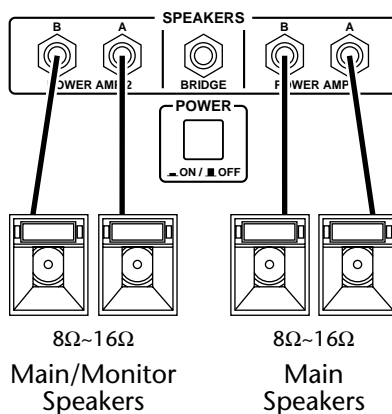
## ■ Speaker connection

There are three ways in which speakers can be connected to the EMX640; a single speaker each can be connected to either the A or the B jack of POWER AMP 1 and of POWER AMP 2, two speakers can be connected in parallel to both the A and B jacks of POWER AMP 1 and of POWER AMP 2, or a single speaker can be connected to the BRIDGE jack (bridge connection). 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.

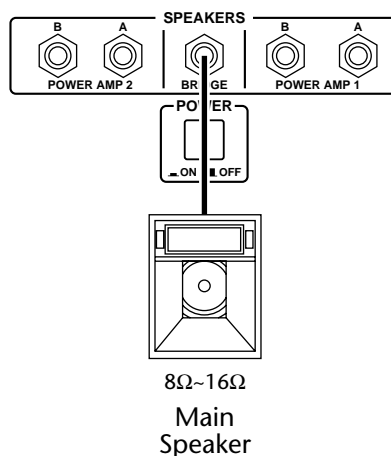
Connecting speakers to either the A or B jacks of POWER AMP 1/2



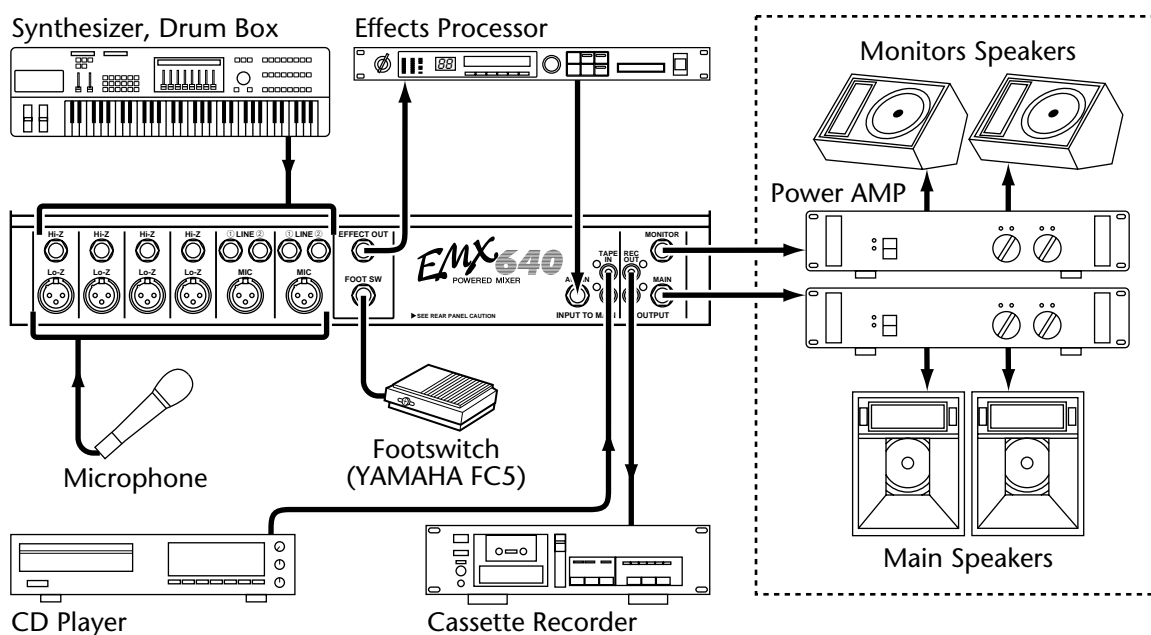
Connecting speakers to both the A and B jacks of POWER AMP 1/2



Connecting a single speaker to the BRIDGE jack (bridge connection)



## ■ Example connections



- Additional, or alternative amplifiers can be connected to the MAIN and MONITOR jacks on the front panel.



# Basic Operation

This section explains basic operation of the EMX640.

## 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 EMX640 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/LINE jack (channels 5~6).
 

*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, however, can be used at the same time.
- ③ Turn the power on in the order of peripheral devices → EMX640.
 

*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.
- ⑥ If you wish to adjust the tone of each channel, rotate the equalizer controls as desired.
- ⑦ Use the MAIN section graphic equalizer and MASTER control to adjust the overall volume and tone.

## Using the digital effect

The EMX640 has a built-in digital effect, allowing reverberation or ambiance to be added to vocals or instrumental sounds.

- ① Connect a mic or instrument to the desired channels, and adjust the volume and tone.
- ② Press the DIGITAL EFFECT ON switch of the DIGITAL EFFECT section.
- ③ Use the effect select switches of the DIGITAL EFFECT section to select the effect type.
  - VOCAL..... Reverb appropriate for vocals.
  - L. HALL..... Reverb typical of a large hall.
  - S. HALL..... Reverb typical of a small hall.
- 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.
 

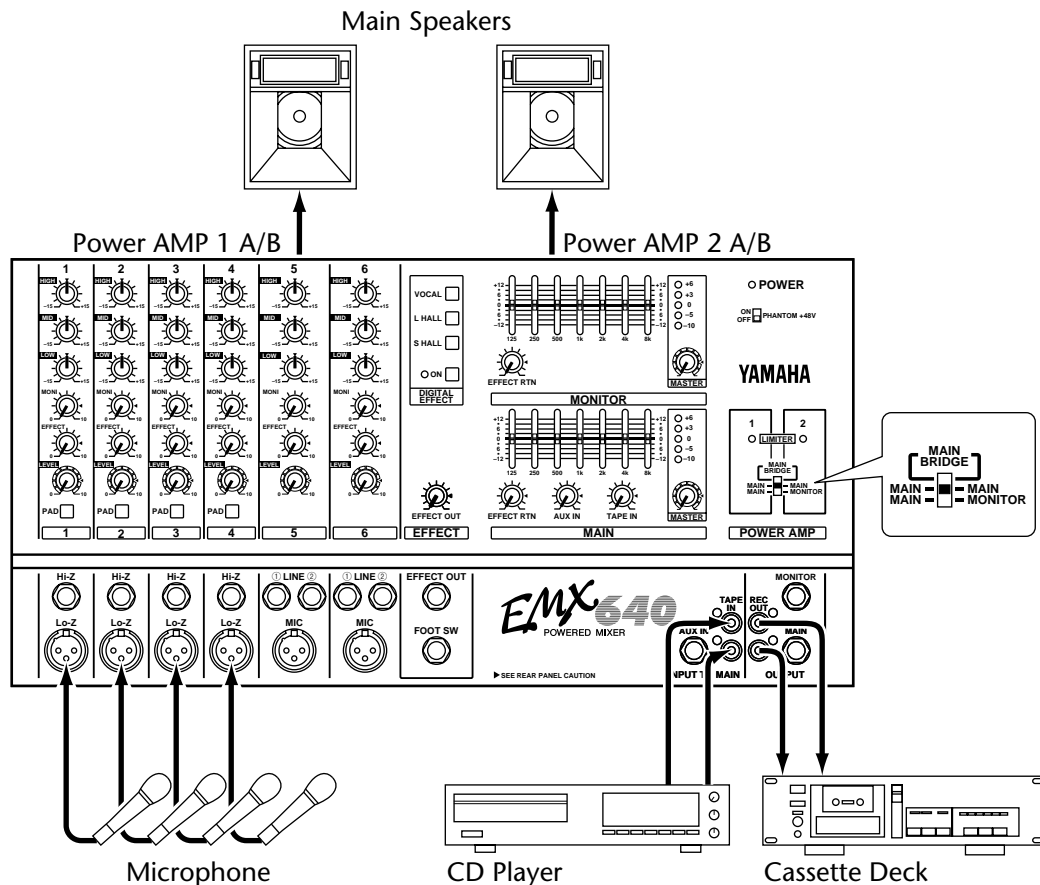
*Note:* If the effect sound is distorted even if the EFFECT RTN turned all the way down, lower the EFFECT controls of each channel.

# Example setups

This section provides some ways in which the EMX640 can be used, and explains connections and operation.

## As a conference PA system/installed sound system

Here is an example of using the EMX640 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 EMX640.
- If you wish to record the audio from the mics to a cassette deck, connect the REC OUT jacks of the EMX640 to the input jacks of the cassette deck.

*Note:* A CD player/cassette deck can also be connected to the LINE jacks of channels 5~6.

### Playing back a CD player

- ① Turn the power on in the order of peripheral devices → EMX640.
- 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

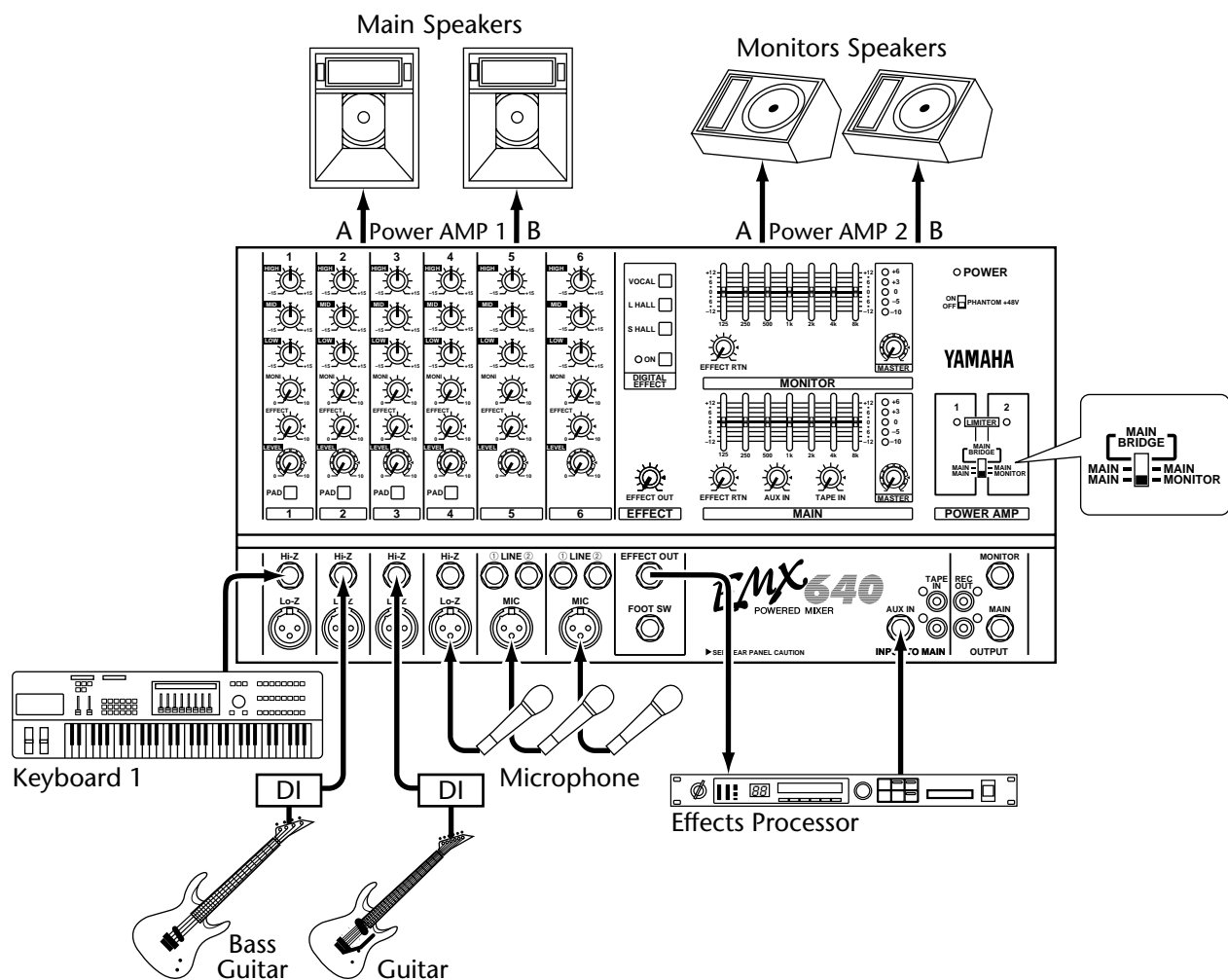
Here is an example of using the EMX640 as a small PA for a band. In this example, the monitor speakers are being sent a mix that is independent of the MAIN speaker mix. An external effect such as delay or reverb is also being used.

### 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 EMX640's EFFECT OUT jack to the input jack of the external effect, and connect the output jack of the external effect to the EMX640'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 5~6. 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 Set the EFFECT section EFFECT OUT control to the ◀ position.
- ② Raise the EFFECT controls for the channels to which you want the external effect to be applied.
- ③ Adjust the input level of the external effect so that the sound is not distorted at the input of the external effect.
- ④ Use the MAIN section AUX IN control to adjust the level of the sound processed by the effect.

# Specifications

## ■ General specifications

<b>Maximum output power</b>	200 W/4Ω @0.5% THD at 1 kHz	
<b>Frequency response</b>	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)	
<b>Total harmonic distortion</b>	Less than 0.5% @20 Hz~20 kHz, 100 W output into 4Ω (POWER AMP OUT) Less than 0.2% @20 Hz~20 kHz, +14 dB output into 10 kΩ (MAIN OUT, MONITOR OUT, EFFECT SEND)	
<b>Hum &amp; noise</b> (Average, Rs=150Ω) (with 20 Hz~20 kHz BPF)	-123 dB equivalent input noise, -65 dB residual output noise (POWER AMP OUT)	
	-88 dB residual output noise (MAIN OUT, MONITOR OUT, EFFECT SEND)	
	-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.
<b>Maximum voltage gain</b> (PAD: OFF)	86 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 22 dB TAPE IN to MAIN OUT 66 dB MIC IN to MAIN OUT, MONITOR OUT (CH5•6) 24 dB LINE IN to MAIN OUT, MONITOR OUT (CH5•6)	
<b>Crosstalk at 1 kHz</b>	65 dB adjacent input, 65 dB input to output	
<b>Input channel equalization</b>	±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.	
<b>Meters</b>	5 POINTS LED METER (-10, -5, 0, +3, +6 dB)	
<b>Graphic equalizer</b>	7 bands (125, 250, 500, 1k, 2k, 4k, 8k Hz) ±12 dB Maximum	
<b>Internal digital effect</b>	3 types (Vocal, L Hall, S Hall)	
<b>Phantom power</b>	+48 V is supplied to electrically balanced inputs for powering condenser microphones via 6.8 kΩ current limiting/isolation resistors.	
<b>Limiter</b>	Comp. : THD≥0.5%	
<b>LIMIT indicators</b>	Turns on. : THD≥0.5%	
<b>Foot switch</b>	DIGITAL EFFECT MUTE : on/off	
<b>Power requirement</b>	USA and Canada	120 V AC 60 Hz
	Europe	230 V AC 50 Hz
	Other	240 V AC 50 Hz
<b>Power consumption</b>	200 W	
<b>Dimensions (WxHxD)</b>	480×275×275 mm	
<b>Weight</b>	15 kg	

## Input specifications

Input connectors	PAD	Actual load impedance	Nominal impedance	Input level			Connector type
				Sensitivity <sup>1</sup>	Nominal level	Max. before clipping	
CH INPUT (Lo-Z) (CH1-4)	OFF	3 kΩ	50-600Ω Mics	-62 dB (616 μV)	-50 dB (2.45 mV)	-20 dB (77.5 mV)	XLR-3-31 type
	ON		600Ω Lines	-32 dB (19.5 mV)	-20 dB (77.5 mV)	+10 dB (2.45 V)	
CH INPUT (Hi-Z) (CH1-4)	OFF	10 kΩ	50-600Ω Mics	-52 dB (1.95 mV)	-40 dB (7.75 mV)	-10 dB (245 mV)	Phone jack (TRS)
	ON		600Ω Lines	-22 dB (61.6 mV)	-10 dB (245 mV)	+20 dB (7.75 V)	
MIC INPUT (CH5•6)		3 kΩ	50-600Ω Mics	-62 dB (616 μV)	-50 dB (2.45 mV)	-20 dB (77.5 mV)	XLR-3-31 type
LINE INPUT (CH5•6) (1, 2)		10 kΩ	600Ω Line	-22 dB (61.6 mV)	-10 dB (245 mV)	+20 dB (7.75 V)	Phone jack
TAPE IN (1, 2)		10 kΩ	600Ω Line	-20 dBV (100 mV)	-10 dBV (316 mV)	+17.8 dBV (7.75 V)	Phono jack
AUX IN		10 kΩ	600Ω Line	-22 dB (61.6 mV)	-10 dB (245 mV)	+20 dB (7.75 V)	Phone jack

1. 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.)
- CH INPUT and MIC INPUT connectors are balanced and others are unbalanced.
  - 0 dB=0.775 Vrms, 0 dBV=1 Vrms.

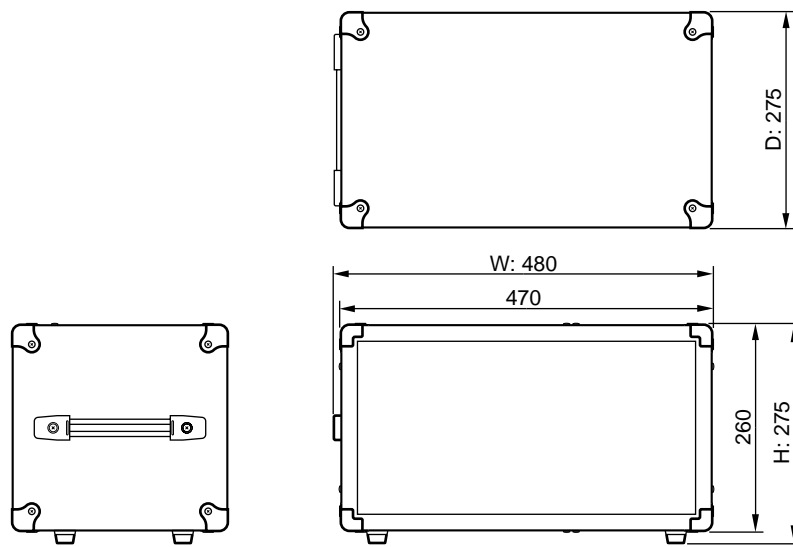
## Output specifications

Output connectors	Actual source impedance	Nominal impedance	Output level		Connector type
			Nominal	Max. before clipping	
POWER AMP OUT (1•2) (A, B)	0.1Ω	4/8Ω Speaker	37.7 W/4Ω	(200 W/4Ω)	Phone jack
BRIDGE OUT	0.1Ω	8Ω Speaker	75.4 W/8Ω	(400 W/8Ω)	Phone jack
MAIN OUT	600Ω	10 kΩ Lines	+4 dB (1.23 V)	+20 dB (7.75 V)	Phone jack
MONITOR OUT	600Ω	10 kΩ Lines	+4 dB (1.23 V)	+20 dB (7.75 V)	Phone jack
EFFECT OUT	600Ω	10 kΩ Lines	+4 dB (1.23 V)	+20 dB (7.75 V)	Phone jack
REC OUT (1, 2)	600Ω	10 kΩ Lines	-10 dBV (316 mV)	+10 dBV (3.16 V)	Phono jack

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

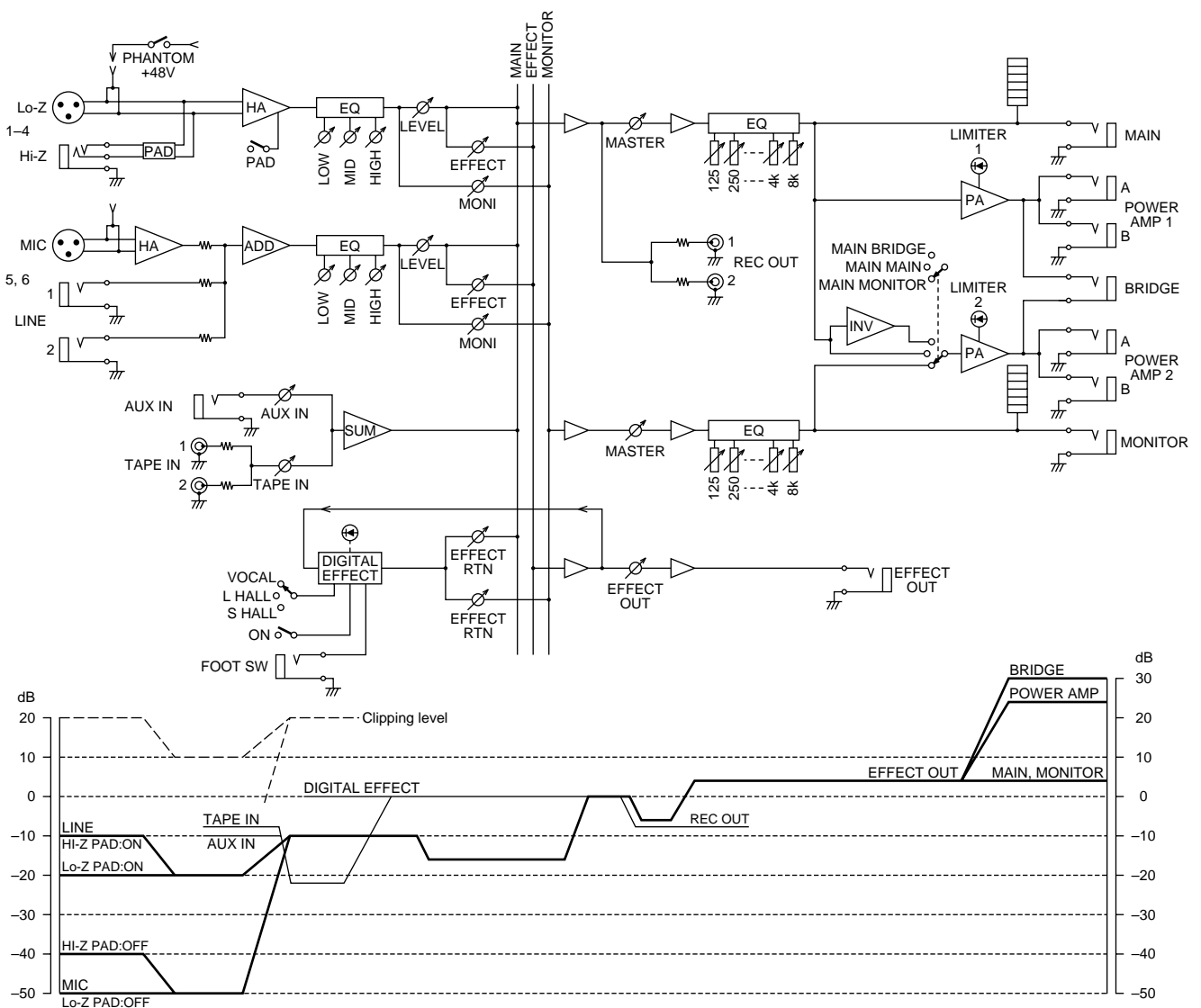
Specifications are subject to change without prior notice.

## ■ Dimensions



Unit: mm

## ■ Block and Level diagram



### FCC INFORMATION (U.S.A.)

1. **IMPORTANT NOTICE: DO NOT MODIFY THIS UNIT!** This product, when installed as indicated in the instructions contained in this manual, meets FCC requirements. Modifications not expressly approved by Yamaha may void your authority, granted by the FCC, to use the product.
2. **IMPORTANT:** When connecting this product to accessories and/or another product use only high quality shielded cables. Cable/s supplied with this product **MUST** be used. Follow all installation instructions. Failure to follow instructions could void your FCC authorization to use this product in the USA.
3. **NOTE:** This product has been tested and found to comply with the requirements listed in FCC Regulations, Part 15 for Class "B" digital devices. Compliance with these requirements provides a reasonable level of assurance that your use of this product in a residential environment will not result in harmful interference with other electronic devices. This equipment generates/uses radio frequencies and, if not installed and used according to the instructions found in the users manual, may cause interference harmful to the operation of other electronic devices. Compliance with FCC regulations does not guarantee that interference will not occur in all installations. If this product is found to be the source of interference, which can be determined by turning the unit "OFF" and "ON", please try to eliminate the problem by using one of the following measures: Relocate either this product or the device that is being affected by the interference. Utilize power outlets that are on different branch (circuit breaker or fuse) circuits or install AC line filter/s. In the case of radio or TV interference, relocate/reorient the antenna. If the antenna lead-in is 300 ohm ribbon lead, change the lead-in to coaxial type cable. If these corrective measures do not produce satisfactory results, please contact the local retailer authorized to distribute this type of product. If you can not locate the appropriate retailer, please contact Yamaha Corporation of America, Electronic Service Division, 6600 Orangethorpe Ave, Buena Park, CA 90620

This applies only to products distributed by YAMAHA CORPORATION OF AMERICA.

WARNING: THIS APPARATUS MUST BE EARTHED

### IMPORTANT

THE WIRES IN THIS MAINS LEAD ARE COLOURED IN ACCORDANCE WITH THE FOLLOWING CODE:

GREEN-AND-YELLOW :	EARTH
BLUE :	NEUTRAL
BROWN :	LIVE

As the colours of the wires in the mains lead of this apparatus may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:

The wire which is coloured GREEN and YELLOW must be connected to the terminal in the plug which is marked by the letter E or by the safety earth symbol  $\equiv$  or coloured GREEN and YELLOW.

The wire which is coloured BLUE must be connected to the terminal which is marked with the letter N or coloured BLACK.

The wire which is coloured BROWN must be connected to the terminal which is marked with the letter L or coloured RED.

\* This applies only to products distributed by YAMAHA KEMBLE MUSIC (U.K.) LTD.