

Roland®

POWERED MIXER

---

# PA-410

Owner's Manual



 <b>CAUTION</b> RISK OF ELECTRIC SHOCK DO NOT OPEN	
<b>ATTENTION:</b> RISQUE DE CHOC ELECTRIQUE NE PAS OUVRIE	
<b>CAUTION:</b> TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.	



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



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

**INSTRUCTIONS PERTAINING TO A RISK OF FIRE, ELECTRIC SHOCK, OR INJURY TO PERSONS.**

# IMPORTANT SAFETY INSTRUCTIONS

## SAVE THESE INSTRUCTIONS

**WARNING** - When using electric products, basic precautions should always be followed, including the following:

1. Read all the instructions before using the product.
2. Do not use this product near water — for example, near a bathtub, washbowl, kitchen sink, in a wet basement, or near a swimming pool, or the like.
3. This product should be used only with a cart or stand that is recommended by the manufacturer.
4. This product, either alone or in combination with an amplifier and headphones or speakers, may be capable of producing sound levels that could cause permanent hearing loss. Do not operate for a long period of time at a high volume level or at a level that is uncomfortable. If you experience any hearing loss or ringing in the ears, you should consult an audiologist.
5. The product should be located so that its location or position does not interfere with its proper ventilation.
6. The product should be located away from heat sources such as radiators, heat registers, or other products that produce heat.
7. The product should be connected to a power supply only of the type described in the operating instructions or as marked on the product.
8. The power-supply cord of the product should be unplugged from the outlet when left unused for a long period of time.
9. Care should be taken so that objects do not fall and liquids are not spilled into the enclosure through openings.
10. The product should be serviced by qualified service personnel when:
  - A. The power-supply cord or the plug has been damaged; or
  - B. Objects have fallen, or liquid has been spilled onto the product; or
  - C. The product has been exposed to rain; or
  - D. The product does not appear to operate normally or exhibits a marked change in performance; or
  - E. The product has been dropped, or the enclosure damaged.
11. Do not attempt to service the product beyond that described in the user-maintenance instructions. All other servicing should be referred to qualified service personnel.

For the USA

## GROUNDING INSTRUCTIONS

This product must be grounded. If it should malfunction or breakdown, grounding provides a path of least resistance for electric current to reduce the risk of electric shock.

This product is equipped with a cord having an equipment-grounding conductor and a grounding plug. The plug must be plugged into an appropriate outlet that is properly installed and grounded in accordance with all local codes and ordinances.

**DANGER:** Improper connection of the equipment-grounding conductor can result in a risk of electric shock. Check with a qualified electrician or serviceman if you are in doubt as to whether the product is properly grounded. Do not modify the plug provided with the product — if it will not fit the outlet, have a proper outlet installed by a qualified electrician.

For the U.K.

**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 or coloured GREEN or 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.

The product which is equipped with a THREE WIRE GROUNDING TYPE LINE PLUG must be grounded.




# USING THE UNIT SAFELY

## INSTRUCTIONS FOR THE PREVENTION OF FIRE, ELECTRIC SHOCK, OR INJURY TO PERSONS

### About ⚠ WARNING and ⚠ CAUTION Notices








<b>⚠ WARNING</b>	Used for instructions intended to alert the user to the risk of death or severe injury should the unit be used improperly.
<b>⚠ CAUTION</b>	Used for instructions intended to alert the user to the risk of injury or material damage should the unit be used improperly. * Material damage refers to damage or other adverse effects caused with respect to the home and all its furnishings, as well to domestic animals or pets.

### About the Symbols



	The ⚠ symbol alerts the user to important instructions or warnings. The specific meaning of the symbol is determined by the design contained within the triangle. In the case of the symbol at left, it is used for general cautions, warnings, or alerts to danger.
	The ⚡ symbol alerts the user to items that must never be carried out (are forbidden). The specific thing that must not be done is indicated by the design contained within the circle. In the case of the symbol at left, it means that the unit must never be disassembled.
	The ● symbol alerts the user to things that must be carried out. The specific thing that must be done is indicated by the design contained within the circle. In the case of the symbol at left, it means that the power-cord plug must be unplugged from the outlet.

### ALWAYS OBSERVE THE FOLLOWING


#### ⚠ WARNING

- Before using this unit, make sure to read the instructions below, and the Owner's Manual. 
- Do not open or perform any internal modifications on the unit. 
- Make sure you always have the unit placed so it is level and sure to remain stable. Never place it on stands that could wobble, or on inclined surfaces. 
- Avoid damaging the power cord. Do not bend it excessively, step on it, place heavy objects on it, etc. A damaged cord can easily become a shock or fire hazard. Never use a power cord after it has been damaged. 
- In households with small children, an adult should provide supervision until the child is capable of following all the rules essential for the safe operation of the unit. 
- Protect the unit from strong impact. (Do not drop it!) 
- Do not force the unit's power-supply cord to share an outlet with an unreasonable number of other devices. Be especially careful when using extension cords—the total power used by all devices you have connected to the extension cord's outlet must never exceed the power rating (watts/amperes) for the extension cord. Excessive loads can cause the insulation on the cord to heat up and eventually melt through. 


#### ⚠ WARNING

- Before using the unit in a foreign country, consult with your dealer, or qualified Roland service personnel. 
- When replacing the fuse(s), use only the specified type and size (10 A/250 V (117 V), T 6.3 AL/250 V (230 V); see p. 10). 


 **CAUTION**

• Always grasp only the plug on the power-supply cord when plugging into, or unplugging from an outlet. 


.....

• Try to prevent cords and cables from becoming entangled. Also, all cords and cables should be placed so they are out of the reach of children. 


.....

• Never climb on top of, nor place heavy objects on the unit. 


.....

• Never handle the power cord or its plug with wet hands when plugging into, or unplugging from, an outlet. 


.....

• Before moving the unit, disconnect the power plug from the outlet, and pull out all cords from external devices. 

.....

• Before cleaning the unit, turn off the power and unplug the power cord from the outlet (p. 11). 

.....

• Whenever you suspect the possibility of lightning in your area, pull the plug on the power cord out of the outlet. 

Thank you for purchasing the Roland PA-410 Powered Mixer.

*Before using this unit, carefully read the sections entitled: "IMPORTANT SAFETY INSTRUCTIONS" (p. 2), "USING THE UNIT SAFELY" (p. 3), and "IMPORTANT NOTES". These sections provide important information concerning the proper operation of the unit. Additionally, in order to feel assured that you have gained a good grasp of every feature provided by your new unit, this manual should be read in its entirety. The manual should be saved and kept on hand as a convenient reference.*

## Features

- Stringent selection of parts supports a low-noise design, thus assuring sound quality.
- Channel inputs equipped with 20 dB Pad Switch.
- In addition to standard phone jacks, XLR connectors are also provided for Normal Channels. Moreover, both balanced and unbalanced signals are accommodated.
- Equipped with 2 Stereo Channels. For each channel 3 types of input (total 6 types of input) can be connected. Also provided with RCA phono jacks, convenient when using audio equipment.
- Normal Channels are equipped with high-performance 3-band active equalization. Thus a wide range of creative control over sound is obtained.
- The Mixer Section is ready for most any application, being equipped with Effect Send.
- Incorporates enhanced four-mode digital reverb, offering a wide range of effect processing.
- Equipped with 7 band graphic equalizer capable of being turned on or off. Thus, overall corrections in the sound field, or in the sound quality can be accomplished.
- Superior levels of durability and operational reliability are assured thanks to adoption of 60 millimeter stroke smooth faders, and a high-performance protection circuit in the Power Amplifier Section.

## Important Notes

In addition to the items listed under "IMPORTANT SAFETY INSTRUCTIONS" and "USING THE UNIT SAFELY" on pages 2 and 3, please read and observe the following:

### Power Supply

- Do not use this unit on the same power circuit with any device that will generate line noise (such as an electric motor or variable lighting system).
- Before connecting this unit to other devices, turn off the power to all units. This will help prevent malfunctions and/or damage to speakers or other device

### Placement

- Using the unit near power amplifiers (or other equipment containing large power transformers) may induce hum. To alleviate the problem, change the orientation of this unit; or move it farther away from the source of interference.
- This device may interfere with radio and television reception. Do not use this device in the vicinity of such receivers.

### Maintenance

- For everyday cleaning wipe the unit with a soft, dry cloth or one that has been slightly dampened with water. To remove stubborn dirt, use a cloth impregnated with a mild, non-abrasive detergent. Afterwards, be sure to wipe the unit thoroughly with a soft, dry cloth.
- Never use benzene, thinners, alcohol or solvents of any kind, to avoid the possibility of discoloration and/or deformation.

### Additional Precautions

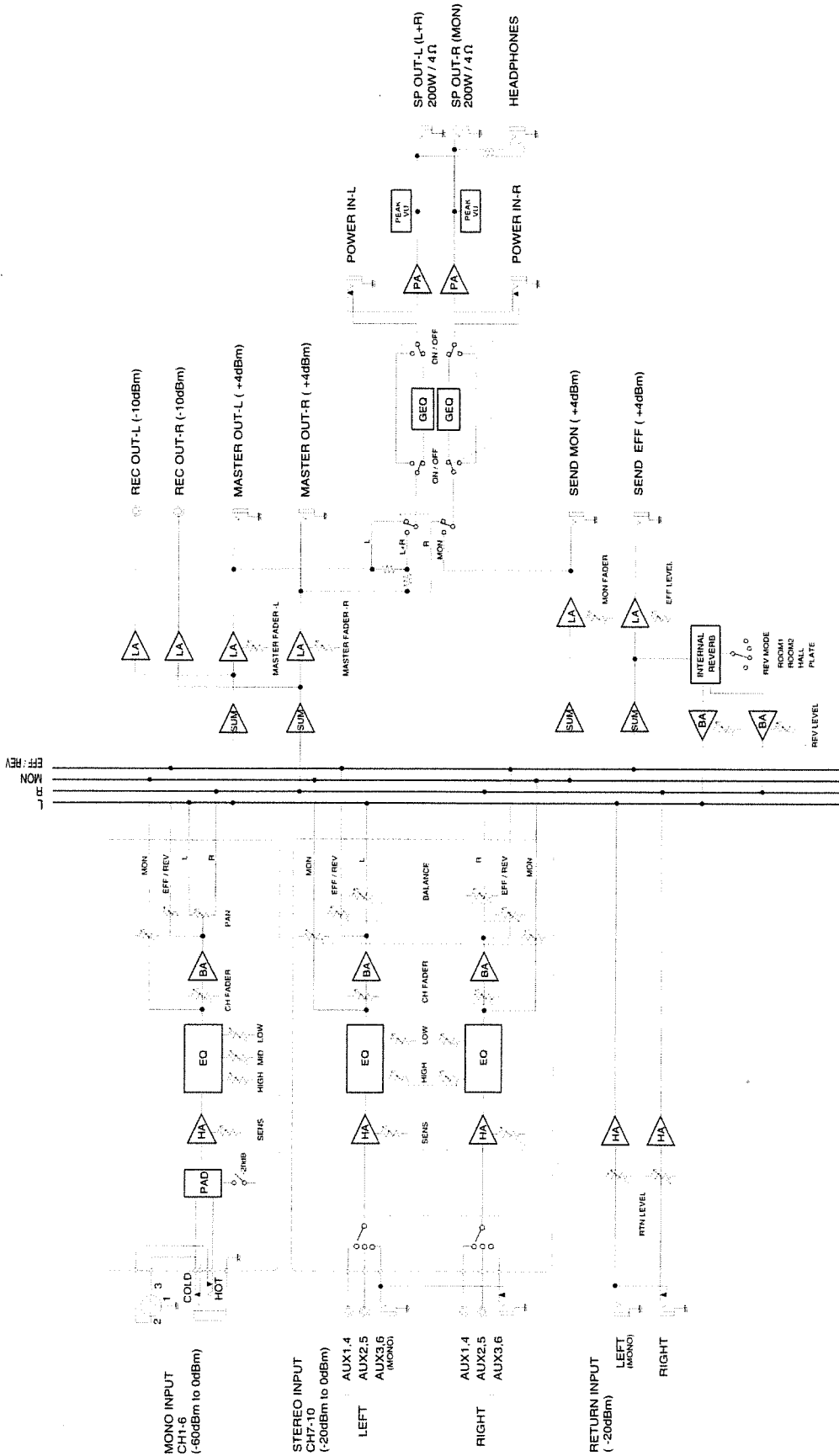
- Use a reasonable amount of care when using the unit's buttons, sliders, or other controls; and when using its jacks and Connectors. Rough handling can lead to malfunctions.
- When connecting / disconnecting all cables, grasp the connector itself—never pull on the cable. This way you will avoid causing shorts, or damage to the cable's internal elements.
- A small amount of heat will radiate from the unit during normal operation.
- To avoid disturbing your neighbors, try to keep the unit's volume at reasonable levels. You may prefer to use headphones, so you do not need to be concerned about those around you (especially when it is late at night).
- When you need to transport the unit, package it in the box (including padding) that it came in, if possible. Otherwise, you will need to use equivalent packaging materials.

---

Copyright © 1996 ROLAND CORPORATION

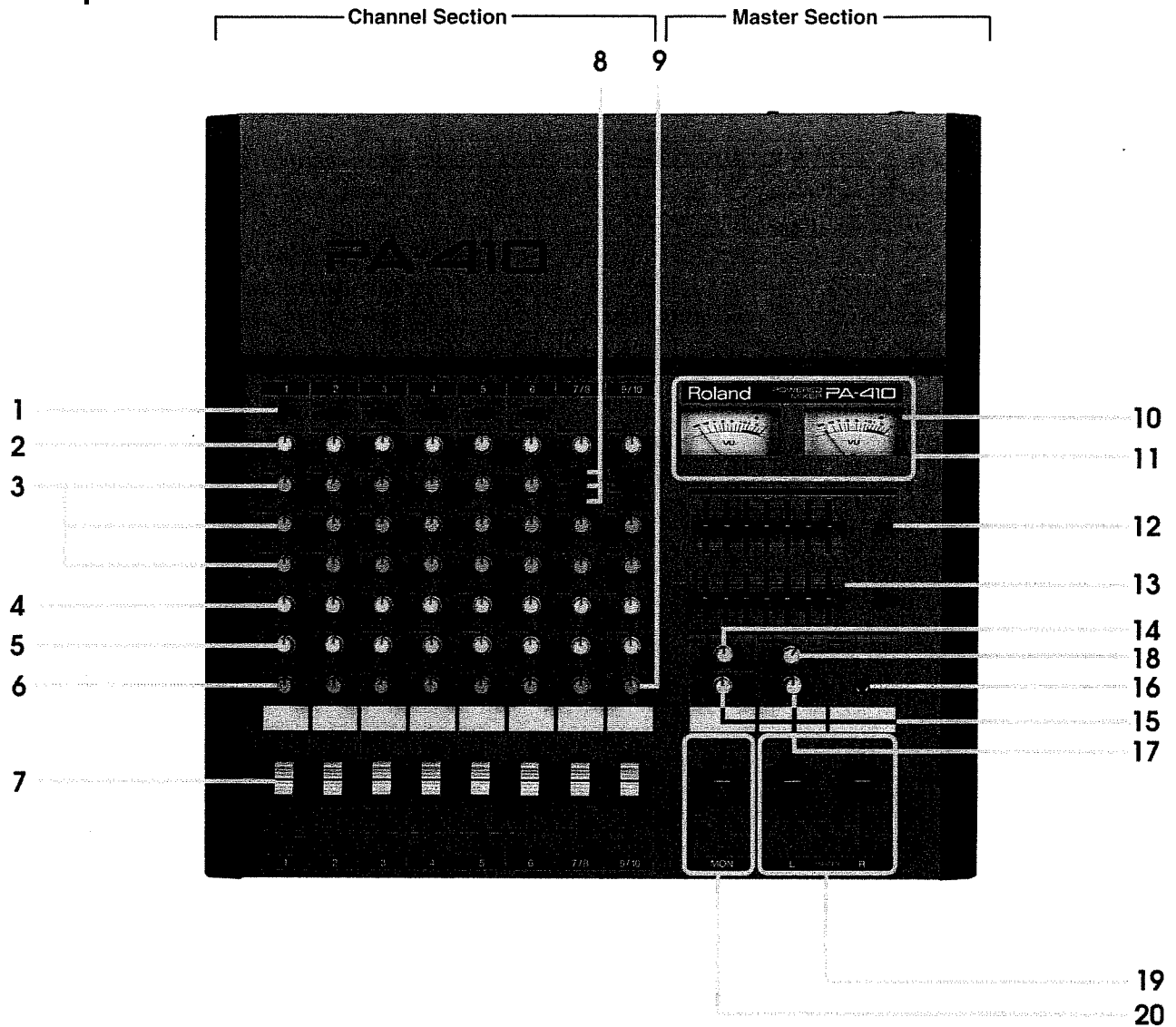
All rights reserved. No part of this publication may be reproduced in any form without the written permission of ROLAND CORPORATION.

# (1) Block Diagram



## (2) Panel Descriptions

### 1. Top Panel



#### 1. PAD: Pad Switch

Used when the signal being input is too high. When pressed, 20 dB attenuation is obtained.

#### 2. SENS: Sens Knob

Provides for adjustment of the input sensitivity to suit the level of signals being input.

#### 3. Channel Equalizer Knobs

Provide for adjustment of the sound quality of signals that are input. At the "0" position a flat response is obtained.

- HIGH: Adjusts the upper range. With 10 kHz as the center frequency, adjustment can be made within the range of  $\pm 15$  dB.
- MID: Adjusts the middle range. With a center frequency of 2 kHz; adjustment can be made over range of  $\pm 15$  dB.

- LOW: Adjusts the lower range. With 100 Hz as the center frequency, adjustment can be made within the range of  $\pm 15$  dB.

#### 4. MON: Monitor Knob

Adjusts the level of what is output to Send Monitor.

*\* The point from which the signals are sent to Send Monitor is located before the Channel Faders (pre-fader).*

#### 5. EFF/REV: Send Effect / Reverb Knob

This knob controls the level of the signals to be sent to the EFF jack and internal reverb.

*\* The point from which the signals are sent to Send Effect / Reverb is located after the Channel Faders (post-fader).*

## 6. PAN: Panpot Knob

Determine the positioning of the sound image in the stereo field. At center, L and R will have the same volume.

## 7. Channel Fader

Adjust the level of what is output on the channel.

*\*With a channel fader at "-10" the rated output is obtained.*

## 8. AUX 1, 2, 3 / AUX 4, 5, 6: AUX Select Buttons

Selects the signal input on the Stereo Channel.

*\*Do not press more than one button at a time.*

## 9. BAL: Balance Knob

Determine the positioning of the sound image in the stereo field. At center, L and R will have the same volume.

## 10. PEAK: Peak Indicator

This lights up when the output signal level of each channel (L, R) is too high.

## 11. VU: VU Meter

This indicate the level of the output signals.

*\*When the mixer is turned on, this meter lights up.*

## 12. Equalizer Button

This button is used to switch the Graphic Equalizer "ON" and "OFF."

## 13. Graphic Equalizer

A 7-band graphic equalizer that provides for a  $\pm 12$  dB alteration for each octave, from 60 Hz to 12 kHz.

*\*The correction provided by the Graphic Equalizer is available only for Speaker Out and Headphones.*

## 14. RTN: Return Knob

Adjusts the level of the signals input at the Return Jacks.

## 15. SEND EFF: Send Effect Knob

Provides for the final adjustment in output level for the effects signals which have had their level adjusted by Send Effect / Reverb on each channel.

## 16. PHONES: Headphones Jack

Accepts connection of stereo headphones.

*\*The point from which the signal for the headphones is taken is located after the Master Faders (post fader).*

## 17. REV LEVEL: Reverb Level Knob

Adjusts the level of what is sent from internal Reverb.

This control is equivalent to the Return Level using the external effects device.

## 18. REV MODE: Reverb Mode Knob

Switch providing selection of the mode used by the internal Reverb.

- ROOM 1 : A conventional room reverb.
- ROOM 2 : A room reverb with a softer tone than "ROOM 1."
- HALL : A conventional hall reverb.
- PLATE : A simulation of a plate reverb device.

## 19. MASTER (L, R): Master Faders (L, R)

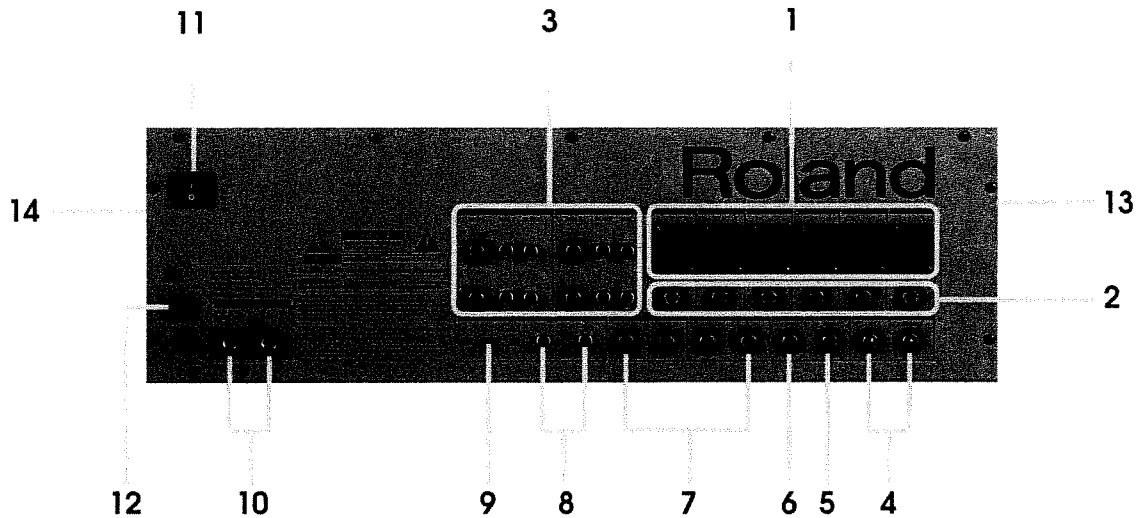
Provide adjustment of the final output level for the mixed signals.

## 20. MON: Monitor Fader

Provides for the final adjustment in output level for the signals which have had their level adjusted by Send Monitor on each channel.



## 2. Rear Panel



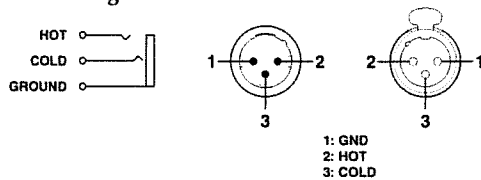
### 1. Input Connectors

XLR (balanced) type input connectors, used for connecting microphones or electronic musical instruments.

### 2. Input Jacks

Input Jacks used for connecting microphones or electronic musical instruments. Since stereo standard phone jacks are employed, balanced input is made possible. The input will be unbalanced if standard phone plugs are used.

*\* The pin configuration of the inputs is as follows. Before making connections, make sure of the pin configuration for the devices being connected.*



### 3. Stereo Input Jacks (L(MONO), R)

Jacks used to input to the Stereo Channels. AUX 1, 2, 4, 5 are RCA phono jacks. AUX 3 and 6 are 1/4" standard phone jacks. Note that with AUX 3 and 6, mono input is accomplished if only the one marked L of the pair is used.

*\* The Stereo Input Jack provides unbalanced input.*

### 4. RTN: Return Jacks (L(MONO), R)

Jacks used to input the signals that are returned from an effects device. Can also be used for auxiliary input. The Return Jacks are stereo compatible. Note that mono input can be accomplished if only the one marked L of the pair is used.

### 5. SEND MON: Send Monitor Jack

Jack providing output of the monitor signal.

### 6. SEND EFF: Send Effect Jack

Jack used to send signals to an external effects device.

### 7. MASTER OUT: Master Out Jacks (L, R) / POWER IN: Power In Jacks (L, R)

Used when wishing to connect devices such as an equalizer or limiter, and thus make alterations in the sound field.

*\* The Master Out Jack can be used when wishing to use solely the mixing capabilities of this unit; or when adding on a power amplifier.*

*\* The Power In Jack can also be used when wishing to use solely the Power Amplifier Section of this unit.*

### 8. REC OUT: Rec Out Jack (L, R)

Jacks providing output to a tape recorder or other device connected here.

*\* Monitored playback cannot be accomplished while recording takes place.*

*\* When using a tape recorder to perform recording, oscillation may be produced if the sound of the tape recorder's playback is fed back to mixer. Either put the Channel Fader for the channel to which the tape recorder is connected to "0", or disconnect it.*

*\* The point from which the signals are taken is located before the Master Faders (pre-fader).*

### 9. POWER AMP: Power Amp Switch

Selects which of the two operational modes for the Power Amplifier will be used. Affects the output from Speakers Out. In case this switch is slid to "L/R", the signals of L&R of "SPEAKER OUT" separately". In case this switch is slid to "L+R/MON", the signal of "L+R" is output from Lch of "SPEAKER OUT", and the signal of "MON" is output from Rch of "SPEAKER OUT".

### 10. SPEAKER OUT: Speakers Out Jack

Provide for output to speakers.

*\* Do not connect speakers with an impedance lower than that specified, for both SPEAKER OUT. Avoid causing short circuits.*

## 11. POWER: Power Switch

When turned on, the unit is turned on and readied for operation.

*\* When the mixer is turned on, VU meter lights up.*

*\* Always set the Master Faders to "– ∞" whenever the Power Switch is turned on or off.*

## 12. FUSE: Fuse Holder

*\* When replacing the fuse, use only the specified type and size (10 A/250 V (117 V), T 6.3 AL/250 V (230 V)). And always turn the unit off and unplug the power cord before replacing fuse.*



## 13. Cooling fan/Air intake

This is the forced air fan that cools the interior of the unit, and the air intake. The rotational speed of the cooling fan will vary depending on the internal temperature.

*\* Never insert your fingers or any other objects into the air intake, since this is extremely dangerous.*

## 14. Air vent

The cooling air flows out of this vent.

## Cautions regarding cooling

This device uses forced air cooling. It pulls cool air in through the air intake, and blows warm air out through the air vent. When installing this device, please pay attention to the following points to ensure efficient cooling.

*\* Select a location with good air circulation, and make provision for heat dissipation.*

*\* Do not place the unit where the air intake or air vent would be obstructed, since this will impair the cooling capacity.*

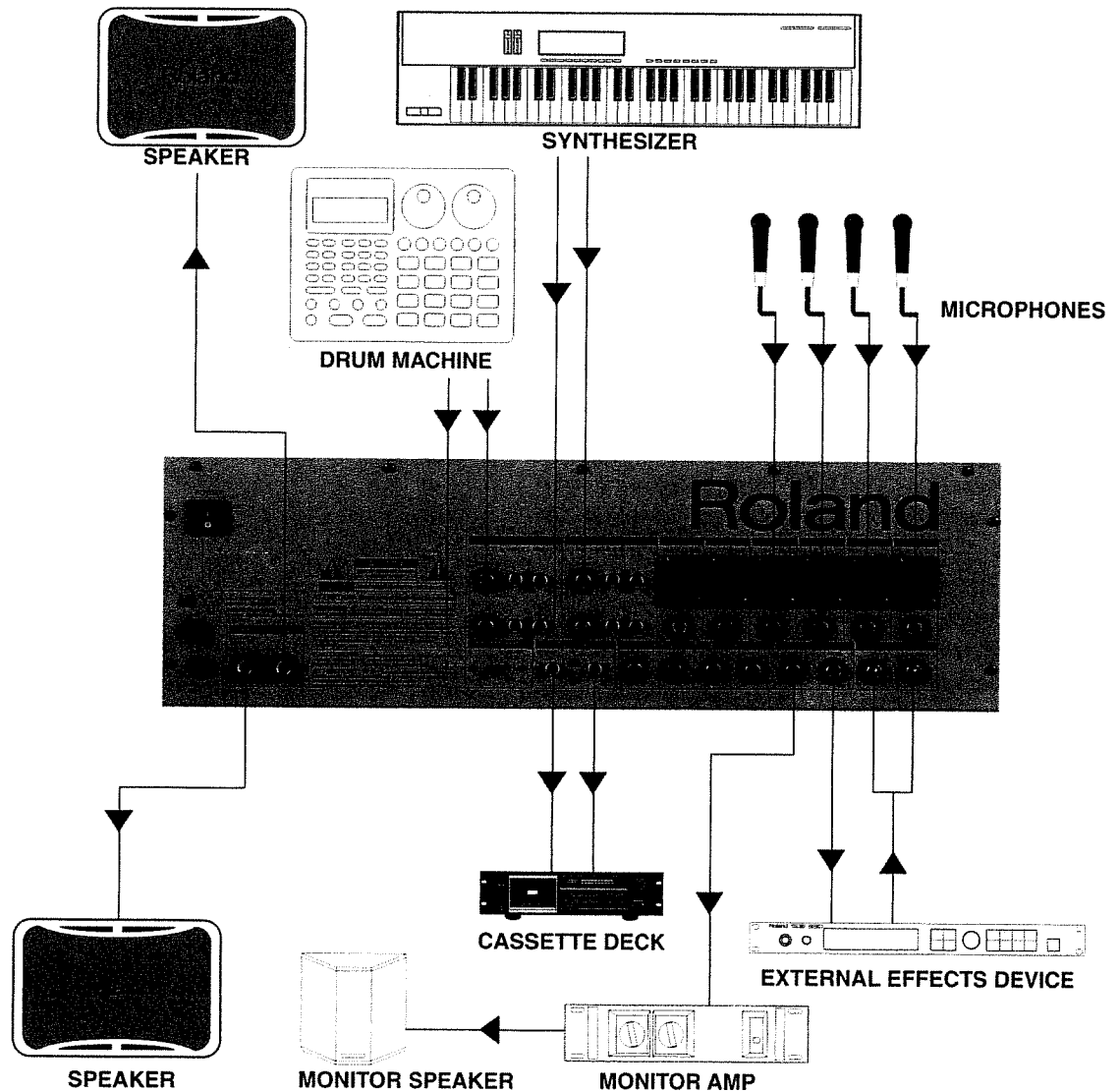
*\* If the temperature inside the unit rises, a thermal protection circuit will operate, turning the power off. If the protection circuit has operated, set the master fader to the "– ∞" position and turn the power switch off. Then wait for the internal temperature to cool sufficiently before turning the power on again.*

## (3) Setup and Operation

### Starting Up

- (1) After confirming that the Power Switch is off, Plug the unit in.
- (2) Connect all the equipment (mics, instruments etc.) that you are going to use. (Refer to the illustrations)
- (3) Set all knobs to "0" and fader to "-∞".
- (4) After all connections have been double checked, turn on all the input sources and then power up the mixer itself. (When powering down, turn off mixer first and then all input sources.)  
**\* This unit is equipped with a protection circuit. A brief interval (a few seconds) after power up is required before the unit will operate normally.**

### Basic Setup : Microphones Electronic Instruments, etc.



**\* To prevent malfunction and/or damage to speakers or other devices, always turn down the volume, and turn off the power on all devices before making any connections.**

**\* Once the connections have been completed, turn on power to your various devices in the order specified. By turning on devices in the wrong order, you risk causing malfunction and/or damage to speakers and other devices.**

**Sound Source – External Effects Devices – PA-410**

**\* Howling could be produced depending on the location of microphones relative to speakers. This can be remedied by:**

1. Changing the orientation of the microphone(s).
2. Relocating microphone(s) at a greater distance from speakers.
3. Lowering volume levels.

### •Mixing Using Microphones, Electronic Musical Instruments, etc.

- (1) Set the Channel Faders to around "-10". While a performance is produced, adjust the Sens Knobs for each channel.
- (2) Adjust overall volume using the Master Faders.
- (3) Adjust sound quality using the Channel Equalizer Knobs.
- (4) Determine the position of the sound image, respective to L and R, using the Panpot Knob and the Balance Knob.
- (5) Adjust the balance of sound volume for each channel using the Channel Faders.
- (6) Finally, apply any corrections as desired to the sound field using the Graphic Equalizer.

### < Reference >

Suppression of howling using the Graphic Equalizer

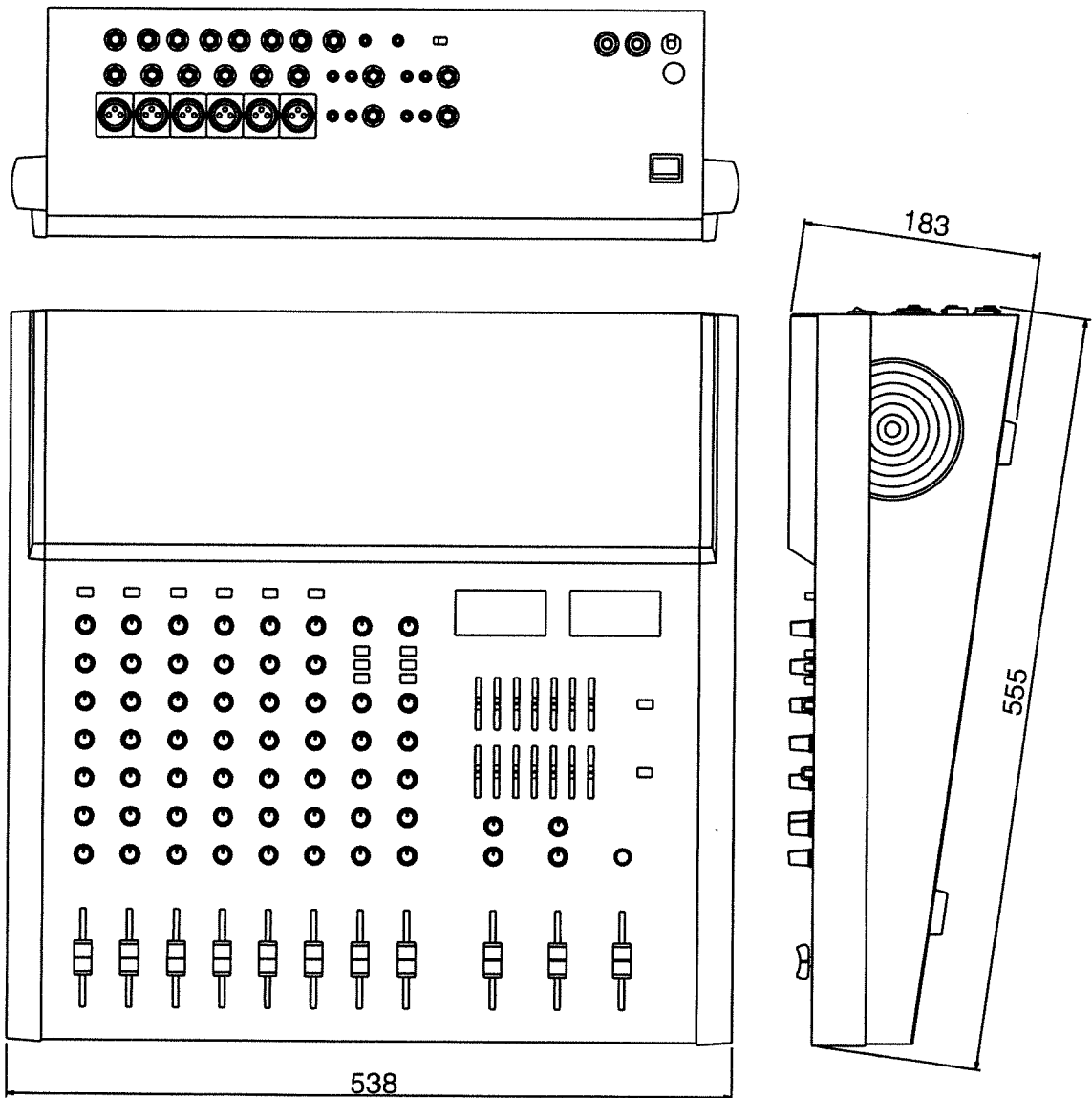
While using microphones with the volume turned up high, you may at times suddenly hear a high-pitched tone being produced. This is what is referred to as howling, and is caused by the microphone repeatedly picking up sound from the speakers. One solution is to simply turn down the volume, but then it may not be loud enough for your needs. A better remedy is to use the PA-410's built-in graphic equalizer to suppress howling, without sacrificing any sound volume.

The howling can be kept to a minimum by an appropriate amount of lowering of the frequency range in which the problem occurs. (For example, 2 or 4 kHz for a high-pitched tone that is still barely musical; and 8 or 16 kHz for a piercingly high tone.) Also remember that if speakers and microphones are too close together, or non-directional microphones are used there is more chance that howling will occur, The setup could be changed so there is more distance between microphones and speakers, or uni-directional microphones could be used.

### •Effects Processing Using Internal Reverb

- (1) Select which reverb mode is to be used.
- (2) Raise, to appropriate level, the Effect / Reverb Volume for the channel to which reverb is to be applied.
- (3) Adjust the level of reverb using the Reverb Level Knob in the master section.

## (4) Dimensions



# (5) Input / Output Standards

## PA-410 : Powered Mixer

### Input Standard

#### 1. Mixer Section

Input Socket		Input Sensitivity	Nominal Input Level	Input Impedance	Recommended Source Impedance	Type of Connectors
CHANNEL INPUT (SENS = MAX) (PAD = 0 dB)	CH1 to CH6 (XLR-BAL)	-60 dBm (0.78 mV)	-60 dBm (0.78 mV)	10 kΩ	1 kΩ or less	XLR Connector
	CH1 to CH6 (PHONE-BAL)	-60 dBm (0.78 mV)	-60 dBm (0.78 mV)	10 kΩ	1 kΩ or less	STEREO PHONE
	CH1 to CH6 (PHONE-UNBAL)	-60 dBm (0.78 mV)	-60 dBm (0.78 mV)	5 kΩ	1 kΩ or less	STEREO PHONE
STEREO CHANNEL INPUT (SENS = MAX)	AUX 1, 2, 4, 5	-20 dBm (77.5 mV)	-20 dBm (77.5 mV)	30 kΩ	3 kΩ or less	RCA Phono
	AUX 3, 6	-20 dBm (77.5 mV)	-20 dBm (77.5 mV)	30 kΩ (ST) 15 kΩ (MON)	3 kΩ or less 2 kΩ or less	PHONE
RETURN (MAX)	RTN	-20 dBm (77.5 mV)	-20 dBm (77.5 mV)	25 kΩ (ST) 12.5 kΩ (MON)	3 kΩ or less 2 kΩ or less	PHONE

(0 dBm = 0.775 Vrms)

#### 2. Power Amplifier Section

Input Socket	Input Sensitivity	Rated Input Level	Input Impedance	Recommended Source Impedance	Type of Connectors
POWER IN L, R	+4 dBm (1.23 V)	+4 dBm (1.23 V)	10 kΩ	1 kΩ or less	PHONE

### Output Standard

#### 1. Mixer Section

Output Socket		Nominal Output	Non-Clip Max, Output	Output Impedance	Recommended Load Impedance	Type of Connectors
MASTER OUT	L, R UNBALANCED	+4 dBm (1.23 V)	+20 dBm (7.75 V)	2 kΩ	10 kΩ or greater	PHONE
SEND	MON, EFF	+4 dBm (1.23 V)	+20 dBm (7.75 V)	2 kΩ	10 kΩ or greater	PHONE
REC	L, R	-10 dBm (0.245 V)	+10 dBm (2.45 V)	2 kΩ	10 kΩ or greater	RCA Phono
PHONES	L + R	—	250mW+250mW	100 Ω (Both ch)	8 Ω or greater	STEREO PHONE

(0 dBm = 0.775 Vrms)

#### 2. Power Amplifier Section

Output Socket	Rated Output	Recommended Load Impedance	Type of Connectors
SPEAKER OUT L, R	200 W + 200 W (4 Ω) *1 120 W + 120 W (8 Ω)	4 Ω or greater	PHONE

\*1 Both channel 4 Ω loaded

## (6) Specifications

### PA-410: Powered Mixer

#### Mixer Section

---

##### Frequency Response

20 Hz to 20 kHz +1 / -3 dB (SENS: min)

##### Total Harmonic Distortion

0.05 % or less (SENS: min, 20 Hz to 20 kHz at nominal output)

##### Noise Level (input terminated with 150 $\Omega$ , IHF-A, typ.)

Equivalent Input Noise Level

-125 dBm

Residual Noise Level

-85 dBm [all fader: min]

-75 dBm [all fader: max]

[all channel fader: min]

-55 dBm [master fader: max]

[all channel fader: max]

[all SENS: min]

-50 dBm [master fader: max]

[all channel fader: max]

[all SENS: max]

##### Crosstalk

-65 dB or less (1 kHz Between channels)

-60 dB or less (1 kHz Between L and R)

##### Equalizer

Normal Channel

HIGH EQ:  $\pm 15$  dB (10 kHz shelving type)

MID EQ:  $\pm 15$  dB (2 kHz peaking type)

LOW EQ:  $\pm 15$  dB (100 Hz shelving type)

Stereo Channel

HIGH EQ:  $\pm 15$  dB (10 kHz shelving type)

LOW EQ:  $\pm 15$  dB (100 Hz shelving type)

##### Graphic Equalizer

Center frequency: 60, 120, 360, 1 k, 2.5 k, 6.3 k, 12 k [Hz]

Variable Range:  $\pm 12$  dB

##### Digital Reverb

Sampling Frequency: 32 kHz

Signal Processing:

A/D Conversion; 16 bit linear,  
128 times oversampling,  
 $\Delta\Sigma$  modulation, AF method

D/A Conversion; 16 bit linear

#### Power Amplifier Section

---

##### Rated Power Output

200 W x 2 (stereo, 4  $\Omega$  load, 1 kHz, 0.2 % or less THD)

120 W x 2 (stereo, 8  $\Omega$  load, 1 kHz, 0.2 % or less THD)

##### Recommended Load Impedance

4  $\Omega$  or greater (stereo)

##### Frequency Response

10 Hz to 40 kHz ( $\pm 1$  dB, 1 W / 8  $\Omega$ )

##### Total Harmonic Distortion

0.2 % or less (stereo, 8  $\Omega$  load, 1 kHz at rated output)

##### SN Ratio

110 dB or greater (power in shorted, IHF-A)

## Others

---

### Controls

#### Normal Channel

PAD Switches	x 6
SENS Knobs	x 6
HIGH Knobs	x 6
MID Knobs	x 6
LOW Knobs	x 6
MON Knobs	x 6
EFF / REV Knobs	x 6
PAN Knobs	x 6
Channel Faders	x 6

#### Stereo Channel

SENS Knobs	x 2
AUX Switches	x 2
HIGH Knobs	x 2
LOW Knobs	x 2
MON Knobs	x 2
EFF / REV Knobs	x 2
BALANCE Knobs	x 2
Channel Faders	x 2

#### RTN Knob

#### SEND EFF Knob

#### MON Fader

#### REVERB MODE Knob

#### REVERB LEVEL Knob

Equalizer (7 band) x 2

EQ Buttons x 2 (L,R)

Master Volume Faders x 2 (L,R)

#### Power Amplifier Switch

#### Power Switch

### Indicators

PEAK Indicators x 2 (L,R)

### Meter

VU Meters x 2 (L,R)

### Connectors

Input Connectors (XLR type) x 6

Input Jacks (stereo 1/4 inch phone type) x 6

Input Jacks (1/4 inch phone type) x 4 (L(mono), R)

Input Jacks (RCA phono type) x 8 (L, R)

Return Jacks (1/4 inch phone type) x 2 (L(mono), R)

Send Monitor Jack (1/4 inch phone type)

Send Effect Jack (1/4 inch phone type)

Master Output Jacks (1/4 inch phone type) x 2 (L, R)

Power In Jacks (1/4 inch phone type) x 2 (L, R)

Rec Output Jacks (RCA phono type) x 2 (L, R)

Speaker Output Jacks (1/4 inch phone type) x 2 (L, R)

Headphones Jack (stereo 1/4 inch phone type)

### Power Supply

AC 117 V, AC 230 V

### Power Consumption

450 W (117V)

480 W (230V)

### Dimensions

538 (W) x 555 (D) x 183 (H) mm

21-3/16 (W) x 21-7/8 (D) x 7-1/4 (H) inches

### Weight

24.7 kg / 54 lbs 8 oz

### Accessories

Owner's Manual

*\*0 dBm = 0.775 Vrms*

*\*In the interest of product improvement, the specifications and/or appearance of this unit are subject to change without prior notice.*



**(MEMO)**

# Information

When you need repair service, call your local Roland Service Station or the authorized Roland distributor in your country as shown below.

## ARGENTINA

**Instrumentos Musicales S.A.**  
Florida 638  
(1005) Buenos Aires  
ARGENTINA  
TEL: (01) 394 4029

## BRAZIL

**Roland Brasil Ltda.**  
R. Coronel Octaviano da Silveira  
203 05522-010  
Sao Paulo BRAZIL  
TEL: (011) 843 9377

## CANADA

**Roland Canada Music Ltd.**  
(Head Office)  
5480 Parkwood Way Richmond  
B. C., V6V 2M4 CANADA  
TEL: (604) 270 6626

## Roland Canada Music Ltd.

(Toronto Office)  
Unit 2, 109 Woodbine Downs  
Blvd, Etobicoke, ON  
M9W 6Y1 CANADA  
TEL: (416) 213 9707

## MEXICO

**Casa Veerkamp, s.a. de c.v.**  
Av. Toluca No. 323 Col. Olivar de  
los Padres 01780 Mexico D.F.  
MEXICO  
TEL: (525) 668 04 80

**La Casa Wagner de  
Guadalajara s.a. de c.v.**  
Av. Corona No. 202 S.J.  
Guadalajara, Jalisco Mexico  
C.P.44100 MEXICO  
TEL: (03) 613 1414

## PANAMA

**Productos Superiores, S.A.**  
Apartado 655 - Panama 1  
REP. DE PANAMA  
TEL: 26 3322

## U. S. A.

**Roland Corporation U.S.**  
7200 Dominion Circle  
Los Angeles, CA. 90040-3696,  
U. S. A.  
TEL: (0213) 685 5141

## VENEZUELA

**Musiland Digital C.A.**  
Av. Francisco de Miranda,  
Centro Parque de Cristal, Nivel  
C2 Local 20 Caracas  
VENEZUELA  
TEL: (02) 285 9218

## AUSTRALIA

**Roland Corporation  
Australia Pty. Ltd.**  
38 Campbell Avenue  
Dee Why West. NSW 2099  
AUSTRALIA  
TEL: (02) 982 8266

## NEW ZEALAND

**Roland Corporation (NZ) Ltd.**  
97 Mt. Eden Road, Mt. Eden,  
Auckland 3, NEW ZEALAND  
TEL: (09) 3098 715

## HONG KONG

**Tom Lee Music Co., Ltd.**  
Service Division  
22-32 Pan Shan Street, Tsuen  
Wan, New Territories,  
HONG KONG  
TEL: 2415 0911

## INDONESIA

**PT CITRARAMA  
BELANTIKA**  
Kompleks Perkantoran Duta  
Merlin Blok E No.6—7  
Jl. Gajah Mada No.3—5, Jakarta  
10130,  
INDONESIA  
TEL: (021) 3850073

## KOREA

**Cosmos Corporation  
Service Station**  
261 2nd Floor Nak-Won Arcade  
Jong-Ro ku, Seoul, KOREA  
TEL: (02) 742 8844

## MALAYSIA

**Bentley Music SDN BHD**  
No.142, Jalan Bukit Bintang 55100  
Kuala Lumpur, MALAYSIA  
TEL: (03) 2443333

## PHILIPPINES

**G.A. Yupangco & Co. Inc.**  
339 Gil J. Puyat Avenue  
Makati, Metro Manila 1200,  
PHILIPPINES  
TEL: (02) 899 9801

## SINGAPORE

**Swee Lee Company**  
BLOCK 231, Bain Street #03-23  
Bras Basah Complex,  
SINGAPORE 0718  
TEL: 3367886

## CRISTOFORI MUSIC PTE LTD

335, Joo Chiat Road SINGAPORE  
1542  
TEL: 3450435

## TAIWAN

**Siruba Enterprise (Taiwan)  
Co., LTD.**  
Room. 5, 9fl. No. 112 Chung Shan  
N. Road Sec.2 Taipei, TAIWAN,  
R.O.C.  
TEL: (02) 561 3339

## THAILAND

**Theera Music Co., Ltd.**  
330 Vergn Nakorn Kasem, Soi 2,  
Bangkok 10100, THAILAND  
TEL: (02) 2248821

## BAHRAIN

**Moon Stores**  
Bad Al Bahrain Road,  
P.O.Box 20077  
State of BAHRAIN  
TEL: 211 005

## IRAN

**TARADIS**  
Mir Enad Ave. No. 15, 10th street  
P. O. Box 15875/4171 Teheran,  
IRAN  
TEL: (021) 875 6524

## ISRAEL

**Halilit P. Greenspoon &  
Sons Ltd.**  
8 Retzif HaAliya Hashnva St.  
Tel-Aviv-Yafa ISRAEL  
TEL: (03) 6823666

## JORDAN

**AMMAN Trading Agency**  
Prince Mohammed St. P. O. Box  
825 Amman 11118 JORDAN  
TEL: (06) 641200

## KUWAIT

**Easa Husain Al-Yousifi**  
P.O. Box 126 Safat 13002  
KUWAIT  
TEL: 5719499

## LEBANON

**A. Chahine & Fils**  
P.O. Box 16-5857 Gergi Zeidan St.  
Chahine Building, Achrafieh  
Beirut, LEBANON  
TEL: (01) 335799

## OMAN

**OHI Electronics & Trading  
Co. LLC**  
P. O. Box 889 Muscat  
Sultanate of OMAN  
TEL: 706 010

## QATAR

**Badie Studio & Stores**  
P.O.Box 62  
DOHA QATAR  
TEL: 423554

## SAUDI ARABIA

**SAF Music Center**  
AL-Khobar 31952, P. O. Box 1366  
SAUDIARABIA  
TEL: (03) 898 3311

## Abdul Latif S. Al-Ghamdi

**Trading Establishment**  
Middle East Commercial Center  
Al-Khobar Dharan Highway  
W/hamood st.  
P. O. Box 3631 Al-Khobar  
31952 SAUDIARABIA  
TEL: (03) 898 2332

## SYRIA

**Technical Light & Sound  
Center**  
Khaled Ebn Al Walid St  
P.O.Box 13520  
Damascus - SYRIA  
TEL: (011) 2235 384

## TURKEY

**Barkat Sanayi ve Ticaret**  
Siraselvler Cad. Guney Ishani No.  
86/6 Taksim, Istanbul TURKEY  
TEL: (0212) 2499324

## U.A.E

**Zak Electronics & Musical  
Instruments Co.**  
Zabeel Road, Al Sherouq Bldg.,  
No. 14, Grand Floor DUBAI  
U.A.E.  
P.O. Box 8050 DUBAI, U.A.E  
TEL: (04) 360715

## EGYPT

**Al Fanny Trading Office**  
9, Ebn Hagar Al Askalani Street,  
Ard El Golf, Heliopolis, Cairo,  
11341 EGYPT  
TEL: (02) 4171828  
(02) 4185531

## MAURITIUS

**Philanne Music Center**  
4th. Floor Noll, Happy World  
House Sir William Newton Street  
Port Luis MAURITIUS  
TEL: 242 2986

## REUNION

**FO - YAM Marcel**  
25 Rue Jules Merman ZI  
Chaudron - BP79 97491  
Ste Clotilde REUNION  
TEL: 28 29 16

## SOUTH AFRICA

**That Other Music Shop  
(PTY) Ltd.**  
11 Melle Street (Cnr Melle and  
Juta Street)  
Braamfontein 2001  
Republic of SOUTH AFRICA  
TEL: (011) 403 4105

**Paul Bothner (PTY) Ltd.**  
17 Werdmuller Centre Claremont  
7700  
Republic of SOUTH AFRICA  
TEL: (021) 64 4030

## AUSTRIA

**E. Dematte & Co.**  
Neu-Rum Siemens-Strasse 4  
A-6040 Innsbruck P.O.Box 83  
AUSTRIA  
TEL: (0512) 26 44 260

## BELGIUM/HOLLAND/ LUXEMBOURG

**Roland Benelux N. V.**  
Houtstraat 1 B-2260 Oevel-  
Westerlo BELGIUM  
TEL: (014) 575811

## BELOUSSIA

**TUSHE**  
UL. Mogilovskaja 4/4/145  
220001 MINSK  
TEL: (0172) 252-059

## CYPRUS

**Radex Sound Equipment Ltd.**  
17 Diagorou St., P.O.Box 2046,  
Nicosia CYPRUS  
TEL: (02) 453 426  
(02) 466 423

## DENMARK

**Roland Scandinavia A/S**  
Langebrogade 6 Post Box 1937  
DK-1023 Copenhagen K,  
DENMARK  
TEL: 32 95 3111

## FRANCE

**Guillard Musiques Roland**  
ZAC de Rosage Les Echets 01700  
MIRIBEL FRANCE  
TEL: 7226 5060

## Guillard Musiques Roland (Paris Office)

1923 rue Léon Geoffroy 94400  
VITRY-SUR-SEINE FRANCE  
TEL: (1) 4680 86 62

## FINLAND

**Roland Scandinavia As,  
Filial Finland**  
Lautasaarentie 54 B  
Fin-00201 Helsinki, FINLAND  
P. O. Box No. 109  
TEL: (0) 682 4020

## GERMANY

**Roland Elektronische  
Musikinstrumente  
Handelsgesellschaft mbH.**  
Oststrasse 96, 22844 Norderstedt,  
GERMANY  
TEL: (040) 52 60090

## GREECE

**V. Dimitriadis & Co. Ltd.**  
20, Alexandras St. & Boubotlinas  
54 St. 106 82 Athens, GREECE  
TEL: (01) 8232415

## HUNGARY

**Intermusica Ltd.**  
Warehouse Area 'DEPO' PL83  
H-2046 Torokbalint, HUNGARY  
TEL: (23) 338 041

## IRELAND

**The Dublin Service Centre  
Audio Maintenance Limited**  
11 Brunswick Place Dublin 2  
Republic of IRELAND  
TEL: (01) 677322

## ITALY

**Roland Italy S. p. A.**  
Viale delle Industrie, 8  
20020 Aresse Milano, ITALY  
TEL: (02) 93581311

## NORWAY

**Roland Scandinavia Avd.  
Kontor Norge**  
Lilleakerveien 2 Postboks 95  
Lilleaker N-0216 Oslo  
NORWAY  
TEL: 273 0074

## POLAND

**P. P. H. Brzostowicz Marian**  
UL. Blokowa 32, 03624 Warszawa  
POLAND  
TEL: (022) 679 44 19

## PORTUGAL

**Caius - Tecnologias Audio e  
Musica, Lda.**  
Rue de Catarina 131  
4000 Porto, PORTUGAL  
TEL: (02) 38 4456

## RUSSIA

**PETROSHOP Ltd.**  
11 Sayanskaya Street Moscow  
11531, RUSSIA  
TEL: 095 901 0892

## SPAIN

**Roland Electronics  
de España, S. A.**  
Calle Bolivia 239 08020 Barcelona,  
SPAIN  
TEL: (93) 308 1000

## SWEDEN

**Roland Scandinavia A/S**  
Danvik Center 28 A, 2 tr.  
S-131 30 Nacka SWEDEN  
TEL: (08) 702 0020

## SWITZERLAND

**Roland (Switzerland) AG  
Musitronic AG**  
Gerberstrasse 5, CH-4410 Liestal,  
SWITZERLAND  
TEL: (061) 921 1615

## UKRAINE

**TIC-TAC**  
Mira Str. 19/108  
P.O.Box 180  
295400 Munkachevo, UKRAINE  
TEL: (03131) 414-40

## UNITED KINGDOM

**Roland (U.K.) Ltd., Swansea  
Office**  
Atlantic Close, Swansea  
Enterprise Park SWANSEA  
West Glamorgan SA7 9FJ,  
UNITED KINGDOM  
TEL: (01792) 702701



This product complies with the requirements of European Directive 89/336/EEC.

For Europe

## FEDERAL COMMUNICATIONS COMMISSION RADIO FREQUENCY INTERFERENCE STATEMENT

For the USA

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Unauthorized changes or modification to this system can void the users authority to operate this equipment.  
This equipment requires shielded interface cables in order to meet FCC class B Limit.

For Canada

### CLASS B NOTICE

This digital apparatus does not exceed the Class B limits for radio noise emissions set out in the Radio Interference Regulations of the Canadian Department of Communications.

### CLASSE B AVIS

Cet appareil numérique ne dépasse pas les limites de la classe B au niveau des émissions de bruits radioélectriques fixés dans le Règlement des signaux parasites par le ministère canadien des Communications.

 Roland®

SH000172

UPC

SH000172



18981

  
PA-410