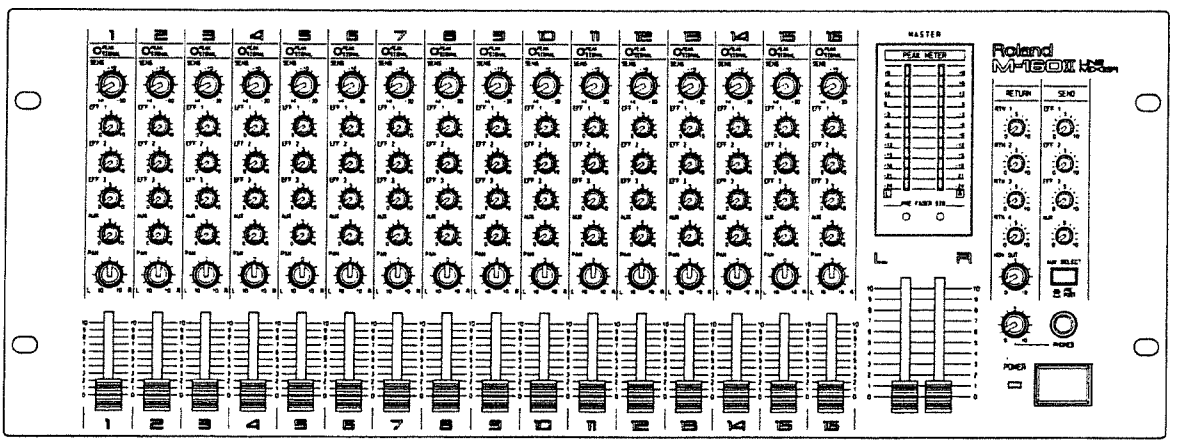
Roland

LINE MIXER

M-160II

OWNER'S MANUAL



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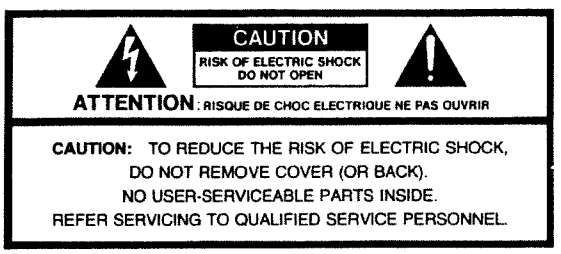


The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

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

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. Avoid using the product where it may be affected by dust.
8. The product should be connected to a power supply only of the type described in the operating instructions or as marked on the product.
9. The power-supply cord of the product should be unplugged from the outlet when left unused for a long period of time.
10. Do not tread on the power-supply cord.
11. Do not pull the cord but hold the plug when unplugging.
12. When setting up with any other instruments, the procedure should be followed in accordance with instruction manual.
13. Care should be taken so that objects do not fall and liquids are not spilled into the enclosure through openings.
14. 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 into 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.
15. 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.

SAVE THESE INSTRUCTIONS

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 indentifying 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 AC PLUG must be grounded.

Thank you for purchasing the Roland M-160II. The M-160II is a compact yet versatile and high-quality 16 channel line mixer.
To get the most out of your M-160II, please read this owner's manual carefully and keep it handy so you can refer to it as necessary.

■FEATURES

- 4U rack-mount 16-channel mixer with line inputs.
- Wide range of input levels: channels 1 and 2 are mic level (-50 dBm), and the others are adjustable in a range from -30dBm to professional line level (+4 dBm).
- Four independent SEND and stereo RETURN jacks, with switchable pre/post fader AUX jacks that can be used in effects loops or for monitoring.
- Separate MONITOR OUT and MASTER OUT jacks allowing independent volume control of these signals.
- A MONITOR IN jack lets you hear the tempo click from a sequencer through the MONITOR OUT jacks or headphone jack (PHONES).
- New signal routing design and components for optimum sound quality, in the tradition of Roland M-series mixers.
- Balanced XLR type connectors for professional use.
- Peak Signal Indicators for each channel, and a Peak Meter and Pre-Fader Indicator in the Master section for fast and accurate monitoring of levels.

TABLE OF CONTENTS

■Important Notes

In addition to the items listed under Safety Precautions on page 2, please read and adhere to the following:

[Power Supply]

- When making any connections with other devices, always turn off the power to all equipment first; this will help prevent damage or malfunction.
- Do not use this unit on the same power circuit with any device that will generate line noise, such as a motor or variable lighting system.

[Placement]

- Using the unit near power amplifiers (or other equipment containing large transformers) may induce hum.
- This unit may interfere with radio and television reception. Do not use this unit in the vicinity of such receivers.This unit may interfere with radio and television reception. Do not use this unit in the vicinity of such receivers.
- Do not expose this unit to temperature extremes (eg. direct sunlight in an enclosed vehicle can deform or discolor the unit) or install it near devices that radiate heat.

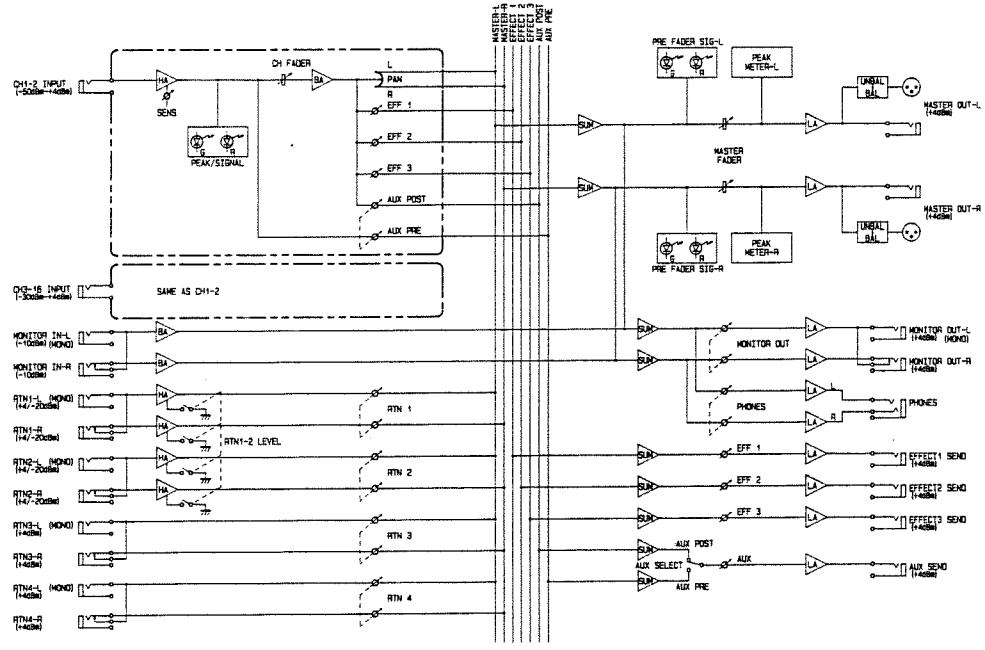
[Maintenance]

- 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 mild neutral 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 risk of discoloration and/or deformation.

[Additional Precautions]

- Protect the unit from strong impact.
- Never strike or apply strong pressure to the display.
- A small amount of heat will radiate from the unit, and thus should be considered normal.
- Before using the unit in a foreign country, consult with qualified service personnel.

1 Block Diagram and Signal Flow



1. Channel Section

The signal fed into each input jack will first be sent to the Head Amplifier. The input sensitivity is controlled with the SENS Control Knob. While a signal is present, the PEAK/SIGNAL Indicator will light (green). When the input level is excessive, the indicator will change to red. The signal from the Head Amplifier is sent to the Channel Volume control, and then sent to the Buffer Amplifier. The signal is split into L and R feeds at the Panpot, the split signal will then be sent to the Master section. The signal can then be taken before or after the channel fader. Then it will be sent to the Master Section after being sent to the Effect Volume control or AUX Volume control.

2. Master Section

[INPUT]

a. Return (RTN 1 – 4)

Signals from RETURN jacks 1 and 2 are sent to the Head Amplifier, with input sensitivity set using the Level Switch. The signal is then sent to the Return Volume control and finally to the MASTER OUT jack. Signals from RETURN jacks 3 and 4 are sent directly to the Return Volume control, then to the MASTER OUT jack.

b. Monitor In (MONITOR IN-L/R)

The signal from the MONITOR IN jacks is sent to the input pads first, mixed with the pre-Master Fader signal, then sent to the MONITOR OUT or PHONES jack.

[OUTPUT]

c. Master Out (MASTER OUT-L/R)

The signals from each channel and RETURN jack are mixed, then the level of the mixed signal is adjusted at the Master Fader and output through the MASTER OUT jacks. Before being sent to the Master Fader, part of the signal is split to the MONITOR OUT or PHONES jack.

d. Monitor Out (MONITOR OUT-L/R)

The pre-Master Fader signal and MONITOR IN signal are adjusted at Monitor Volume, then sent to the MONITOR OUT jacks. Before the Monitor Volume, some of the signal is split to the PHONES jack.

e. Effect Send (EFFECT 1 – 3 SEND)

The signal following the Effects Volume of each channel is mixed, level-adjusted at the Effects Send Volume, then output at the SEND jacks.

f. AUX Send (AUX SEND)

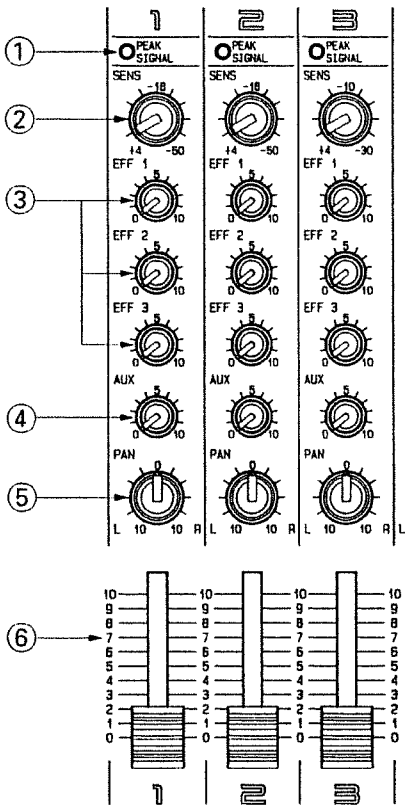
The signal following the AUX Volume control of each channel is mixed, then, depending on the select switch setting, either the Pre-Fader or Post-Fader signal (the signal before or after being sent to the Channel Fader) is sent to the AUX Send Volume control and output at the AUX SEND jack.

h. Phones (PHONES)

Part of the monitor signal is split prior to Monitor Volume, then level-adjusted at Phones Volume and output via the PHONES jack.

2 PANEL DESCRIPTIONS

1. Channel Section



① Peak Signal Indicator (PEAK/SIGNAL)

These indicators will be green when signals are fed into the CHANNEL INPUT jacks. The indicators become red if the signal level is excessive. In other words, indicators are green when the signal level is -24dB of nominal level after passing the input sensitivity circuits, and red at -6dB of the clipping level.

② SENS Knob

Use this knob to adjust the input sensitivity according to the level of the incoming signal. The appropriate position of this knob is the point at which the PEAK/SIGNAL Indicator is green, and red only on the highest input peaks. If the PEAK/SIGNAL Indicator does not light at all with a signal present, set the SENS Knob higher or increase the input level.

***Channels 1 and 2 have rated inputs of –50 to +4 dBm which are approprite input sensitivities for microphone level, while Channels 3 to 16 have -30 to +4 dBm rated input appropriate for line level.**

③ Effect Volume Knobs (EFF 1 – 3)

These knobs control the level of the signals being sent to the Effect Send jacks.

***The signal to be sent to the Effect Send jacks is extracted after the Channel Fader (Post-fader).**

④ AUX Volume Knobs

These knobs adjusts the level of the signals to be sent to AUX Send.

***You can select the point at which the signals sent to AUX Send are extracted using the AUX Select Switch.**

⑤ Panpot Knob (PAN)

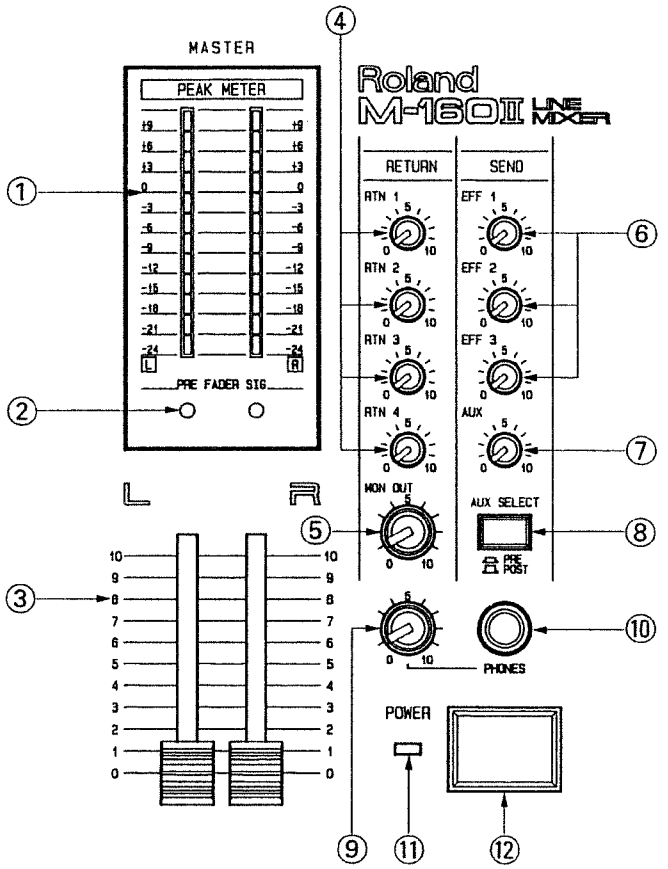
This sets the placing of the sound imaging in stereo sound field. At the center position, the volumes of L and R are equal.

⑥ Channel Fader

These knobs control the overall level of each channel's signal before being sent to the Master section.

***The nominal output of the Channel Fader is obtained when it is set to "10".**

2. Master Section



① Master Peak Meter (PEAK METER)

This is a peak-reading meter that indicates the output level from the MASTER OUT jacks. At 0dB, the standard level (+4 dBm) is output from the MASTER OUT jacks.

② Pre-fader Signal Indicators (PRE FADER SIG)

These can be used to observe the output levels of the amplifiers where signals from Channels are mixed. The position where the signals are read is Pre Master fader (before the Master fader). When it is equal to the rated level –20 dB, the indicator lights in green, and when it is clipping level –6dB, it lights in red.

③ Master Faders

These knobs adjusts the overall output level at the MASTER OUT jacks.

*** The nominal output level is obtained when the Master Fader Knob is set to "8".**

④ Return Volume Knobs (RTN 1 – 4)

These knobs adjusts the level of the signal fed into the RETURN jacks.

⑤ Monitor Out Volume Knob (MON OUT)

This knob adjusts the output level of the signal from the MONITOR OUT jacks. This signal is a mix of the Master signal (pre-Master Faders) and the signal from the MONITOR IN jack.

⑥ Effect Send Volume Knobs (EFF 1 – 3)

These knobs control the final output level of the effect signal of each channel. The signal is extracted after the Channel Fader Knob (Post-fader).

*** The nominal output of the Effect Send Volume is obtained when it is set to "8".**

⑦ AUX Send Volume

This knob controls the final output level of the AUX signal of each channel. The AUX Select Switch can be used to switch between Pre-fader or Post-fader signals (i.e., the signal before or after going through the Channel Fader).

*** The nominal output level is obtained when the AUX Send Volume is set to "8".**

⑧ AUX Select Switch

This switch selects the point at which the signal to be sent to the AUX Send is extracted from the signal path. In the PRE (pre-fader) position, the signal is extracted before the Channel Fader. In the POST (post-fader) position, the signal is taken after the Channel Fader.

⑨ Headphone Volume Knob (PHONES)

This knob controls the output level of the signal sent to the Headphone jack.

⑩ Headphone Jack (PHONES)

Connect stereo headphones to this jack.

*** The signal sent to the headphone jack is the same as that sent to the MONITOR OUT jacks.**

⑪ Power indicator

This lights (red) when the mixer is switched on.

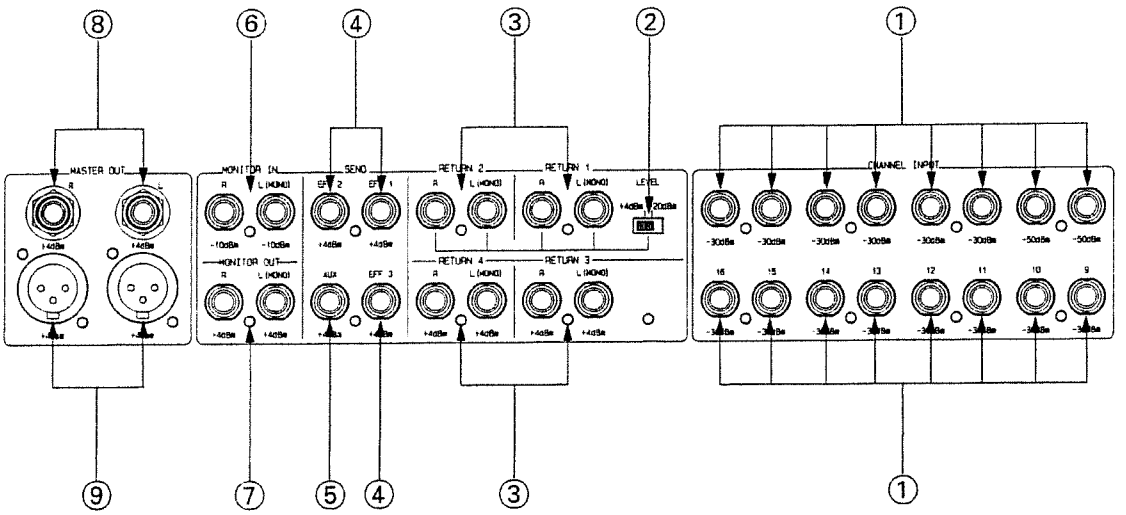
⑫ Power Switch

Press this switch to turn the unit on and off.

*** Before switching the mixer on or off, set the Master Fader to "0".**

*** After the mixer is switched on, the muting circuits work for approx. 4 seconds and therefore no sound will be heard.**

3. Rear Panel



① CHANNEL INPUT Jacks

Channels 1 and 2 are for connecting microphones, musical instruments, etc. Channels 3 to 16 are for devices with line level and musical instruments.

***This mixer uses an unbalanced input system.**

② Return Level Switch (LEVEL)

These switches controls the input level (+4 dBm or -20 dBm) of the return 1, 2 signal depending on the unit or device used.

③ RETURN Jacks 1 – 4

These jacks receive the return signal from an effects device. They can also be used as auxiliary inputs. The RETURN jacks consist of stereo pairs but can be used in mono by using the L (MONO) side only.

④ Effect Send Jacks (EFF 1 – 3)

Signals to be processed are sent to the desired effects device from these jacks.

⑤ AUX Send Jacks

Signals to be sent to an effects device or monitor are output from these jacks.

⑥ MONITOR IN Jacks

These are the jacks for a signal (e.g. click sound of a sequencer) which is to be output only to the MONITOR OUT jacks or PHONES jack. There are two MONITOR IN jacks for stereo signals; mono signals can be input by using only the L jack.

***The MONITOR IN signal is not sent to the MASTER OUT jacks.**

⑦ MONITOR OUT Jacks

These jacks output pre-fader signals from MASTER OUT or the signals from MONITOR IN. This output consists of a stereo pair, but can be used in mono by using the L (MONO) side only.

⑧ MASTER OUT Jacks

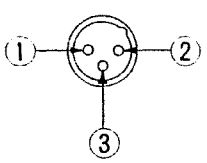
These jacks are for connection to a power amplifier which ultimately drive the house speaker systems (or stage monitors, etc.). The jacks output the combined (mixed) signal from Channel inputs, RETURN jacks.

⑨ MASTER OUT Connector

This is an XLR type (balanced type) connector for connection to a power amplifier, etc.

*** The MASTER OUT jacks (standard 1/4" phone jack) and MASTER OUT connectors (XLR type) can be used simultaneously.**

*** There are two types of pin assignments for XLR type connectors; American and European. This mixer adopts the American system; 1st: ground, 2nd: cold, 3rd: hot. Before connecting the mixer to another unit, confirm compatibility of pin assignments.**



1: GND
2: COLD
3: HOT

3 Connections and Operation

■ Basic Procedure

① Make sure that the mixer is switched off, then connect the power cord to an AC outlet.

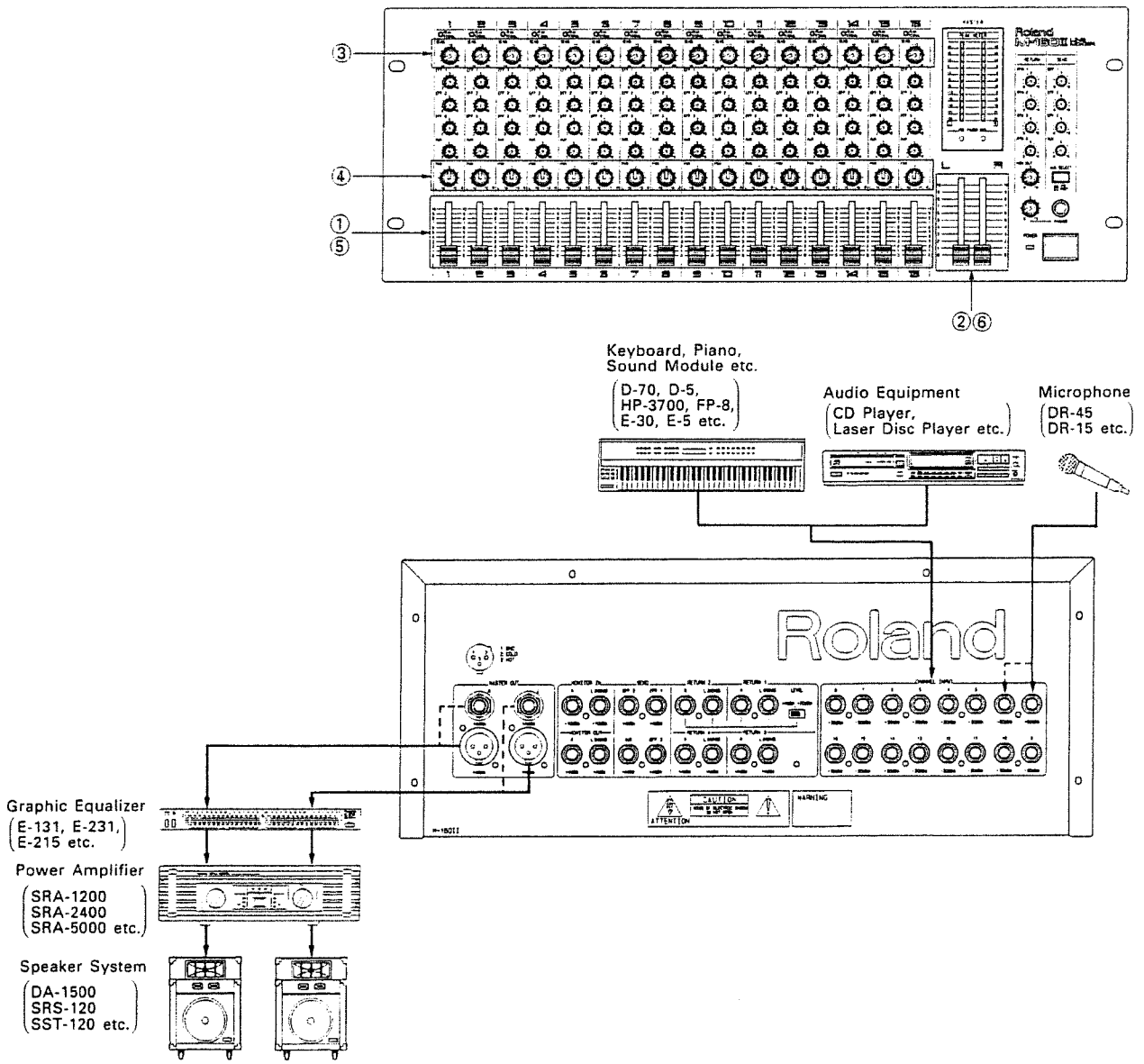
② Connect all of the desired instruments and equipment to the M-160II (Refer to connections diagram).

③ For each input channel used, set the PAN knob to the "center" position, the SENS knob to "+4" and all the other knobs to the "0" positions.

④ Ensure that all the connections are correctly and securely made. Switch on all the connected equipment first, then the M-160II, and finally the power amplifier. (Power down in the reverse order.)

1. Basic Setup With a Microphone, Electronic Musical Instrument, Audio Equipment, etc.

■Mixing a microphone, electronic musical instrument, audio equipment, etc:



① While the connected device is playing, set the Channel Fader to about "7."

② Raise the Master Fader to an appropriate level.

③ Adjust the volume of each connected device using the SENS Knob in each channel.

*** "Appropriate level" means the Peak Signal Indicator stays green most of the time, with occasional red flashes indicating peaks.**

④ Position the sound of each instrument within the stereo sound field by using the PAN knob of each channel.

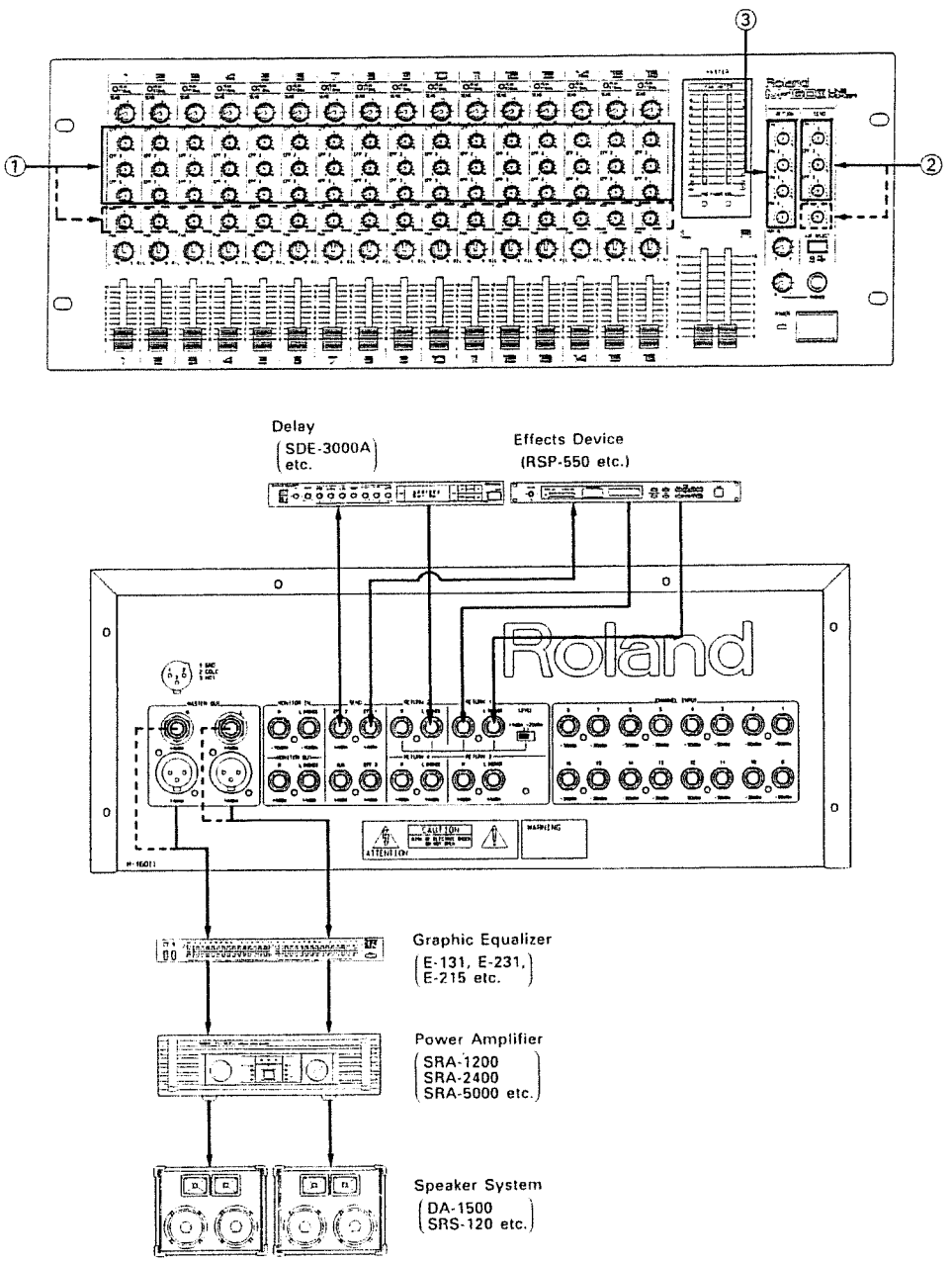
⑤ Adjust the relative volume of each instrument by using the Channel Fader knob of each channel.

⑥ If necessary, readjust the overall volume with the Master Fader knob.

*** If the Peak Signal Indicator or Pre-Fader Signal Indicator flashes red too frequently, lower the SENS Knob by rotating it counterclockwise.**

2. Setup Example With Effects Device

■Effect Processing with a Delay, Reverb, etc.



① Raise the Effect Volume Knob (1 - 3) of the desired channel (s) to an appropriate level.

② adjust the overall output level with the Effect Send Volume Knob in the Master Section.

③ Adjust the level of the signal returned from the effect device using the Return Volume Knob (1 - 4).

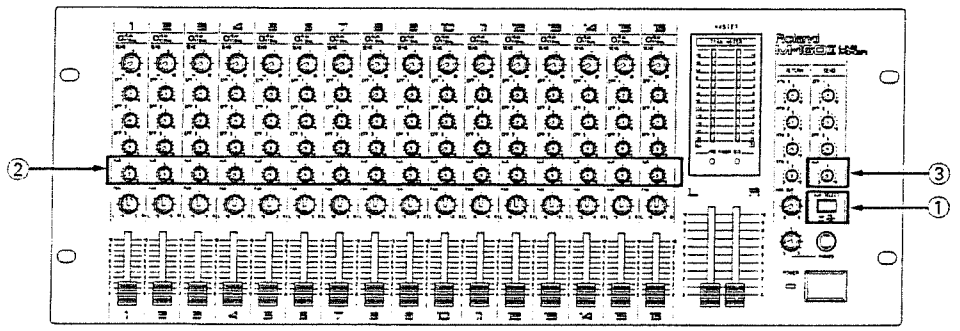
*** The direct sound is processed within the mixer, so return only the processed signal to the mixer.**

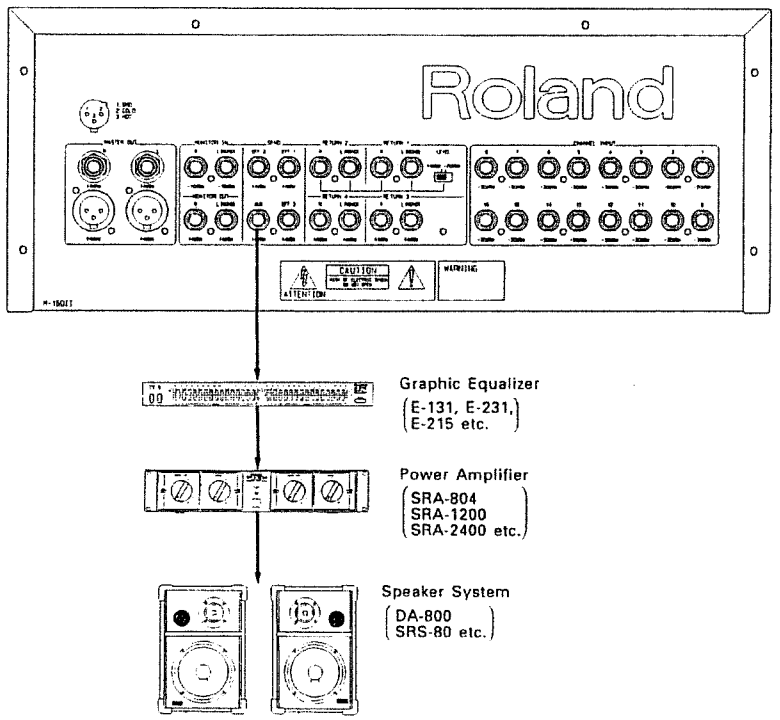
*** The signal for the Effect Send will be taken after passing the Channel Fader.**

*** To connect more effect units, set the AUX Select Switch to the "POST" position, making the AUX Send Volume work just like an Effects Send Volume.**

*** If you insert an equalizer between the mixer and a power amplifier, you can control the overall tone quality of the mixer's output.**

3. Monitoring (Foldback) with AUX outputs





① Press the AUX Select Switch in the Master section (set it to "PRE").

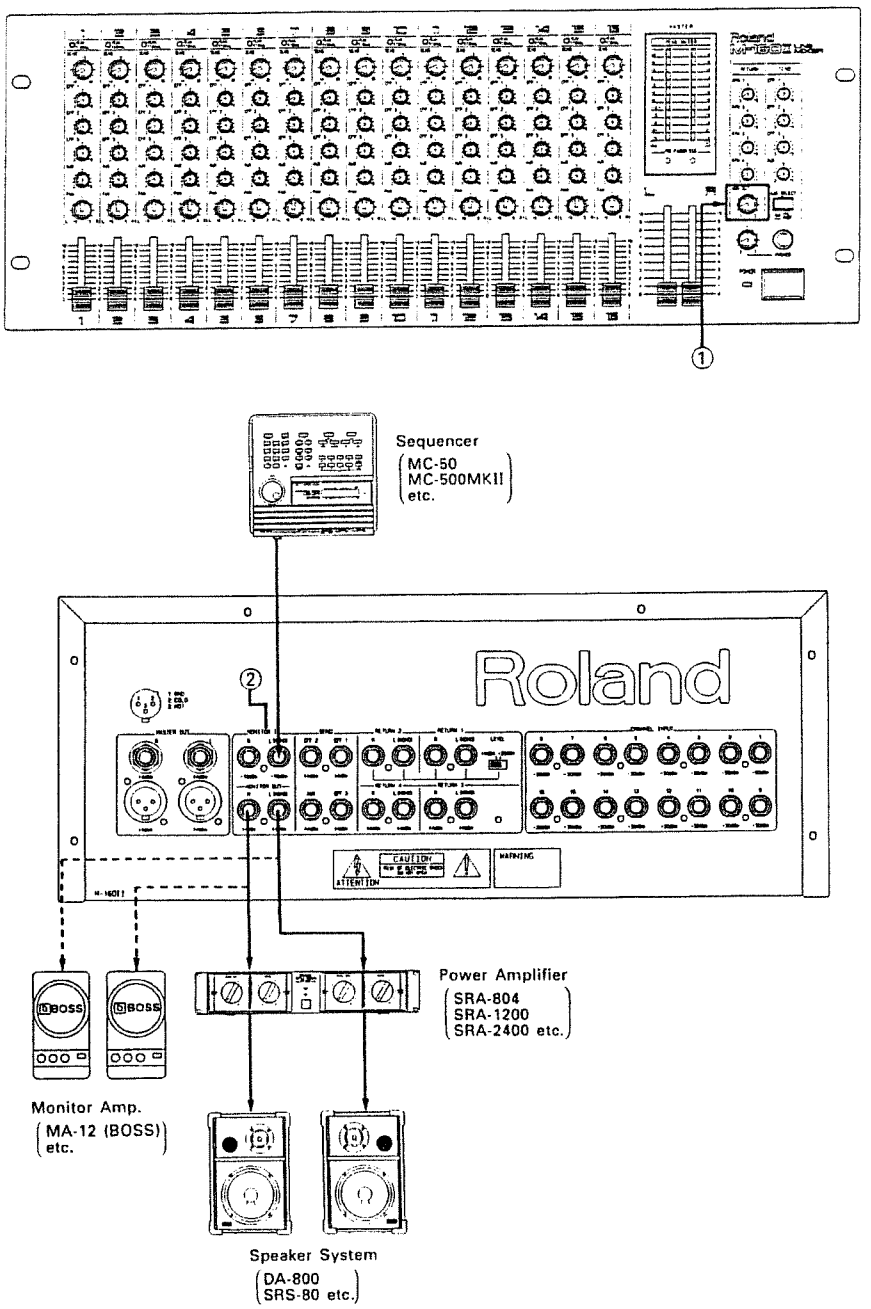
② Rotate the AUX Volume Knob of each channel to adjust the volume of the monitor signal.

③ Adjust the overall volume with the AUX Send Volume Knob in the Master section.

***Regardless of the position of the Channel Fader and Master Fader Knobs, you can adjust the balance of the monitor signal.**

***By inserting an equalizer or a limiter (etc.) between the mixer and power amplifier, you can obtain additional control over the mixer's output.**

4. Monitoring using the MONITOR OUT



① Adjust the volume of each channel, then adjust the monitor volume with the Monitor Out Volume Knob (MON OUT).

② To connect a device (e.g. the Metronome Output jack on a sequencer) to the MONITOR IN jack, adjust the output level on the connected device to control the volume balance with the signals sent from each channel.

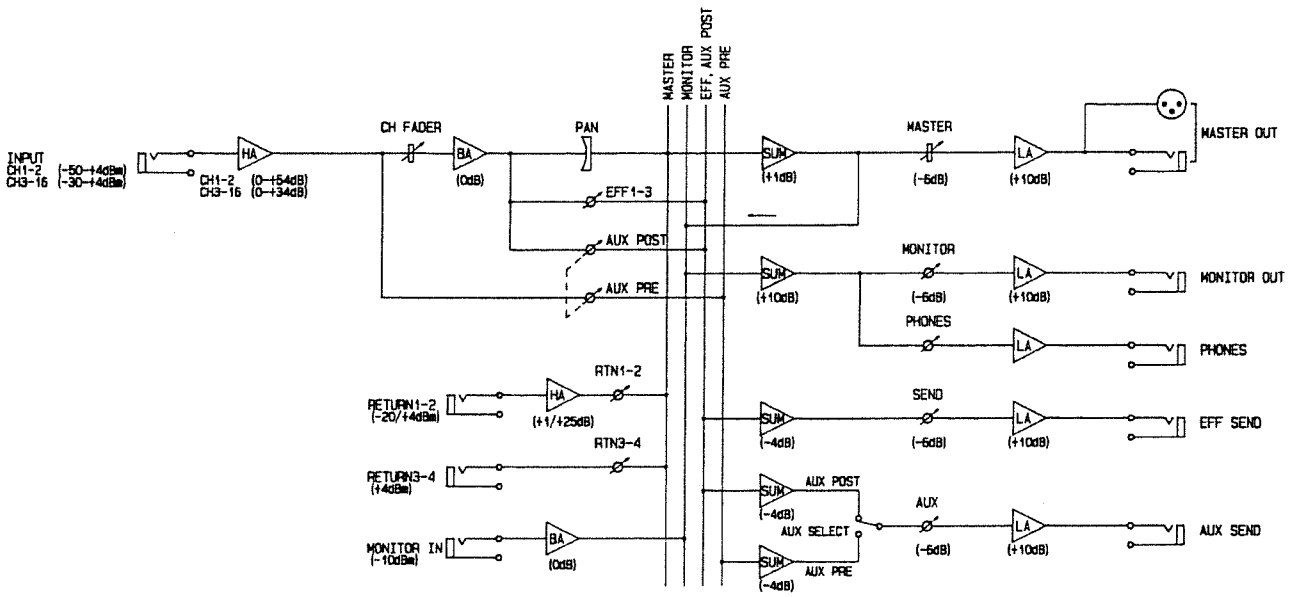
*** Signals fed through the MONITOR IN jacks are not sent to the MASTER OUT jacks.**

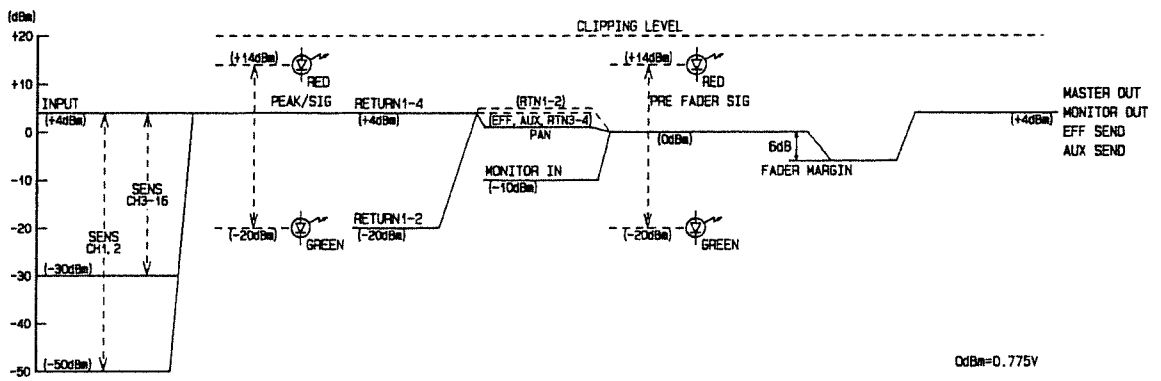
*** The Peak Meter does not monitor the signals sent from the MONITOR OUT jacks.**

*** You can adjust the monitor volume regardless of the position of the master fader.**

*** By inserting an equalizer or a limiter (etc.)**

4 Level Diagram





5 Input/Output Standard

■ Input Standard

Input Jack		Input Sensitivity	Nominal Input Level	Input Impedance	Recommended Source Impedance	Type of Connector
CHANNEL INPUT (SENS=MAX)	CH1, 2	–56 dBm (1.23 mV)	–50 dBm (2.45 mV)	10 kΩ	1 kΩ or Less	PHONE
	CH3 to 16	–36 dBm (12.3 mV)	–30 dBm (24.5 mV)	20 kΩ	2 kΩ or Less	PHONE
RETURN	RTN 1, 2 (LEVEL=–20 dBm)	–26 dBm (38.8 mV)	–20 dBm (77.5 mV)	20 kΩ (STEREO) 10 kΩ (MONO)	2 kΩ or Less (STEREO) 1 kΩ or Less (MONO)	PHONE
	RTN 3, 4	–2 dBm (615 mV)	+4 dBm (1.23 V)	7 kΩ (STEREO) 3.5 kΩ (MONO)	1 kΩ or Less (STEREO) 1 kΩ or Less (MONO)	PHONE
MON INPUT		–16 dBm (123 mV)	–10 dBm (245 mV)	10 kΩ (STEREO) 5 kΩ (MONO)	1 kΩ or Less (STEREO) 1 kΩ or Less (MONO)	PHONE

■ Output Standard

Output Jack	Nominal Output Level	Non-Clip Max. Output	Output Impedance	Recommended Load Impedance	Type of Connector
MASTER OUT (BALANCED)	+4 dBm*1 (1.23V)	+20 dBm*1 (7.75V)	600 Ω	600 Ω or greater	XLR Type (XLR-3-32 Type)
MASTER OUT (UNBALANCED)	+4 dBm (1.23 V)	+20 dBm (7.75 V)	300 Ω	3 kΩ or greater	PHONE
MON OUT	+4 dBm (1.23 V)	+20 dBm (7.75 V)	1 kΩ (STEREO) 500 Ω (MONO)	10 kΩ or greater (STEREO) 5 kΩ or greater (MONO)	PHONE
SEND (EFF1 to 3, AUX)	+4 dBm (1.23 V)	+20 dBm (7.75 V)	300 Ω	3 kΩ or greater	PHONE
PHONES		100 W+100m W*2	100 Ω	8 Ω or greater	STEREO PHONE

@ 0 dBm=0.775 Vrms
*1: 600 Ω Loaded
*2: Both Channel 100 Ω Loaded

6 Specifications

Frequency Response:	10 Hz to 60 kHz $^{+1}_{-2}$ dB (SENS = MIN)
Total Harmonic Distortion:	0.06% or less (20 Hz to 20 kHz at nominal output)
Noise Level (Typical):	(Input terminated with 150 Ω, IHF-A, Typ.)
Equivalent Input Noise Level:	–123 dBm
Residual Noise Level:	–103 dBm [All Volume :min]
	–88 dBm [Master Volume :max] [All Channel Volume :min]
	–87 dBm [Master Volume :max] [All Channel Volume :max] [All SENS. :min]
	–59 dBm [Master Volume :max] [All Channel Volume :max] [All SENS. :max]
Crosstalk	–75 dB or less (1 kHz between channels) –70 dB or less (1 kHz between L and R)
Power Supply	AC 117 V, 230 V or 240 V (50/60 Hz)
Power Consumption	27 W (117 V), 34 W (230 V, 240 V)
Dimensions	482 (W) × 250 (D) × 180 (H) mm 19 (W) × 9-7/8 (D) × 7-1/8(H) inches
Weight	5.6 kg/12 lbs 6 oz
Accessory	Owner's Manual

*The specifications for this product are subject to change without prior notice.

Information

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

U. S. A.
Roland Corporation US
7200 Dominion Circle
Los Angeles, CA.
90040-3647, U. S. A.
☎ (213)685 - 5141

CANADA
Roland Canada Music Ltd.
(Head Office)
5480 Parkwood
Richmond B. C., V6V 2M4
CANADA
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CANADA
☎ (514)335 - 2009

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South Yarra, Victoria 3141
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☎ (03)241 - 1254

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