Deutsch



## **MULTI EFFECTS SWITCHER**

**Owner's Manual** 

## Main features

### Pedalboard Integration Evolved

- Integrated system with versatile built-in effects plus three loops for your favorite pedals.
- Space-saving design enables you to create a compact pedalboard with sophisticated functionality.
- Advanced control and expandability delivers infinite creative possibilities.





Read this first. It explains the basic things you need to know in order to use the MS-3. For detailed information on how to operate the MS-3, please download and refer to "Parameter Guide" (PDF file).



# PDF Manual (download from the Web)

#### Parameter Guide

This explains all of the parameters of the MS-3. It also contains a list of the sounds that are built into the MS-3.

The Parameter Guide can also be viewed using the dedicated software.

#### Application Guide

This explains example setups for the MS-3 and how to make settings.

### • MIDI Implementation

This is detailed information about MIDI messages.



# To obtain the PDF manual

1. Enter the following URL on your computer.

http://www.boss.info/manuals/



2. Choose "MS-3" as the product name.

Before using this unit, carefully read "USING THE UNIT SAFELY" and "IMPORTANT NOTES" (the leaflet "USING THE UNIT SAFELY" and the Owner's Manual (p. 20)). After reading, keep the document(s) where it will be available for immediate reference.

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The power to this unit will be turned off automatically after a predetermined amount of time has passed since it was last used for playing music, or its buttons or controls were operated (Auto Off function).

If you do not want the power to be turned off automatically, disengage the Auto Off function (p. 16).

### NOTE

- Any settings that you are in the process of editing will be lost when the power is turned off. If you have any settings that you want to keep, you should save them beforehand.
- To restore power, turn the power on again (p. 8).

# **Getting Ready**

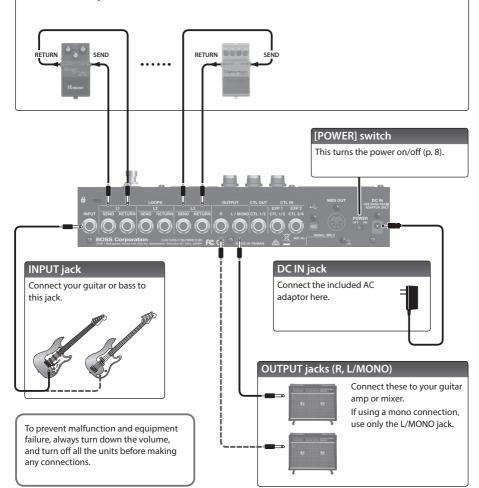
# Rear Panel (Connecting Your Equipment)

### LOOPS jacks (L1-3 SEND, L1-3 RETURN)

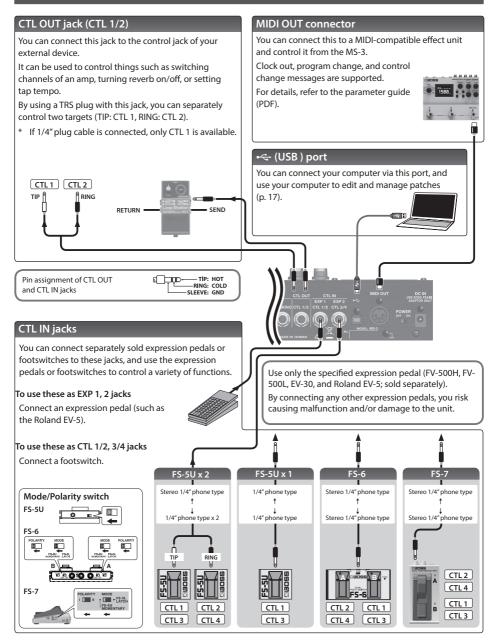
These jacks provide effect loops. The MS-3 is equipped with three loops: L1–3.

Signals are sent from L1-3 SEND jacks to each effect unit, and the signals from each effect unit are received at the L1-3 RETURN jacks.

Connect the L1-3 SEND jacks to the INPUT jack of each effect unit, and connect the OUTPUT jack of each effect unit to the L1-3 RETURN jacks.

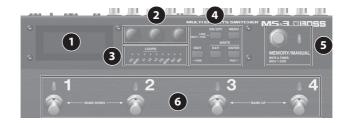


# Rear Panel (Connecting Your Equipment)



Português

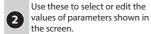
# Top Panel



### Display

The MS-3 shows various information here.

#### [1]-[3] knobs





\* Refer to "Operation of the [1]-[3] Knobs" (p. 7).

#### On/Off indicators

Show the status of each effect.

On: lit, Off: unlit

In MUTE & TUNER mode, these indicators operate as TUNER indicators.

#### [ON/OFF] button

When editing, press this to turn the selected effect on/off.

#### Lock function

In the play screen, long-press the [ON/OFF] button for two seconds or more to turn the lock function on, so that all buttons and the [1]–[3] knobs are disabled. This lets you prevent the settings from being changed inadvertently.

Long-press the button once again to turn the lock

#### [MENU] button

function off.

Press this to make system settings.

#### [EDIT] ([< PAGE] button

Press this to make patch settings.

• In screens that show page tabs, this operates as the [< PAGE] button to switch pages.

#### [EXIT] button

Press this to cancel an operation, or to return to the previous screen.

### [ENTER] ([PAGE >])button

4 Press this to confirm an operation.

- In screens that show page tabs, this operates as the [PAGE >] button to switch pages.
- In the play screen, use this to switch the display.

#### [MEMORY/MANUAL] switch

Switches between memory mode (indicator lit blue) and manual mode (lit red).

Hold down the switch for two seconds or longer to enter MUTE & TUNER mode.

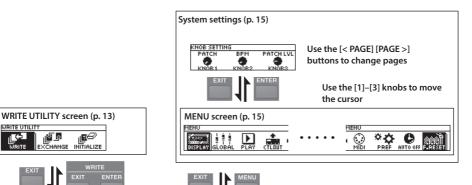
#### Number switch [1]-[4]

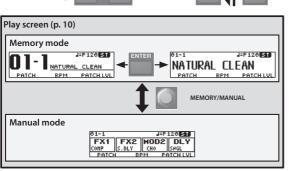
In memory mode, use these to select patches. In manual mode, use these to operate the assigned function.

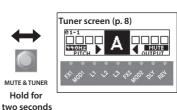
# When pressed simultaneously in memory mode

- \* This does nothing in manual mode.
  - If you press [1] and [2] simultaneously, the bank number goes down each time you press the switches. (Bank down)
  - If you press [3] and [4] simultaneously, the bank number goes up each time you press the switches. (Bank up)

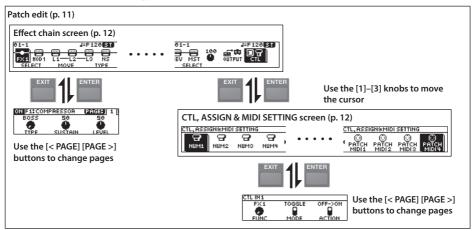
## Screen Structure





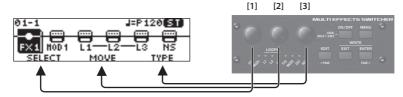




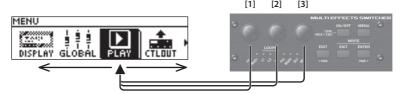


# Operation of the [1]-[3] Knobs

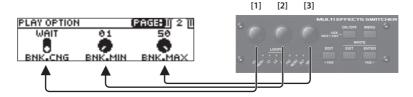
• When function names or parameters are shown in the lower line of the display, the [1]–[3] knobs correspond to those functions or parameters.



• In the CTL, ASSIGN & MIDI SETTING screen (p. 12), the WRITE UTILITY screen (p. 13), and the MENU screen (p. 15), you can operate any knob to move the cursor and select an icon.

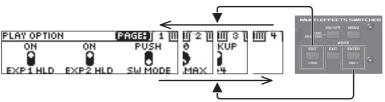


• In screens where knob or switch icons are shown, the [1]–[3] knobs correspond to those icons.



## **Switching Pages**

 When page tabs are displayed on the screen, you can switch pages by pressing the [< PAGE] [PAGE >] buttons.



## Turning On/Off the Power

\* Before turning the unit on/off, always be sure to turn the volume down. Even with the volume turned down, you might hear some sound when switching the unit on/off. However, this is normal and does not indicate a malfunction.

#### When powering up

Turn on the power in the following order: this unit ([POWER] switch: ON)  $\rightarrow$  connected equipment  $\rightarrow$  guitar amp.

#### (When powering down)

Turn off the power in the following order: guitar amp  $\rightarrow$  connected equipment  $\rightarrow$  this unit ([POWER] switch: OFF).

## Tuning the Guitar (TUNER)

1. Hold down the [MEMORY/MANUAL] switch for two seconds or longer.



The tuner screen appears.

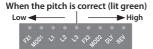


2. Play an open string, and tune it so that only the center indicator in the screen is lit.



#### MEMO

You can also tune while watching the On/Off indicators.



3. When you finish tuning, press once again the [MEMORY/MANUAL] switch.

## Setting the standard pitch

In Tuner mode, you can turn the [1] knob to change the standard pitch of the tuner.

PITCH	
PHICH	
435–445 Hz (default: 440 Hz)	

# Output setting

In the tuner screen, you can also change the output setting for when the tuner is in use by turning [3] knob.

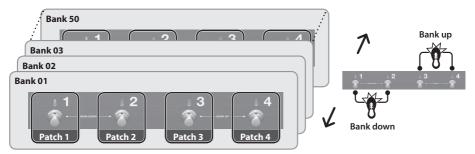
OUTPUT	Explanation
MUTE	Sound will not be output while tuning.
BYPASS	While tuning, the sound of the guitar being input to the MS-3 will be output without change. All effects will be off.
THRU	Allows you to tune while hearing the current effect sound.

# **Playing**

## **Patch Structure**

A "patch" consists of a combination of settings for the MS-3's built-in effects and the effect loops (L1-3). A set of four patches is called a "bank."

Patches are managed by their bank (1–50) and number (1–4); the MS-3 can store 200 patches.



# Switching Between Memory and Manual Modes

# Memory mode (MEMORY/MANUAL indicator: lit blue)

This is the mode in which you recall and use the patches that are stored in the MS-3. Use number switches [1]–[4] to change patches.

# Manual mode (MEMORY/MANUAL indicator: lit red)

This is the mode in which you operate the functions that are assigned by each patch to number switches [1]–[4].

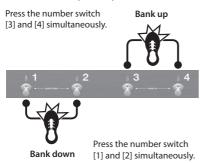
### 1. Press the [MEMORY/MANUAL] switch.



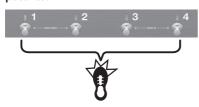
Each time you press this switch, you alternate between memory mode and manual mode.

## Switching Banks/Patches

#### 1. Switch banks (01-50).



# **2.** Press a number switch [1]–[4] to switch patches.



You can also change patches consecutively by turning the [1] knob.



When you select a patch, the On/Off indicator that are turned on for that patch are lit.

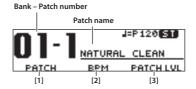


\* You can't switch patches unless you're in the Play screen (next item). Press the [EXIT] button to return to the Play screen, and then switch patches.

# About the Play Screen

The screen that appears after you turn on the power is called the "Play screen."

## In memory mode



Parameters that can be adjusted using the [1]-[3] knobs

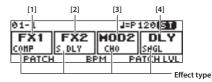
You can press the [ENTER] button to switch the screen.



lcon	Explanation
J=P120	Master BPM
	Output only OUTPUT L (mono output)
<b>(3</b> )	Output only OUTPUT R (mono output)
00	Output the same signal from OUTPUT L and R
<b>ST</b>	Stereo output
£	Lock function is on

### In manual mode

Parameters assigned to number switches [1]-[4]



\* If multiple parameters are assigned to one switch, a "+" symbol is shown at the lower right.

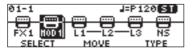
# Editing the Settings of a Patch

## **Basic Operation**

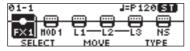
- 1. Recall the patch that you want to edit (p. 10).
- 2. Press the [EDIT] button.



The effect chain screen appears.



**3.** Use the [1] knob to choose the effect you're going to edit.



You can press the [ON/OFF] button to turn on/off the effect where the cursor is located (shown highlighted).



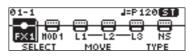
Effects that are turned on are indicated with icons. Effects that are turned off are indicated with "•."

For details on the parameter, refer to the "Parameter Guide" (PDF file).

lcon	Explanation
FX1 FX2	Choose from a variety of effect types. You can also choose the same effect for FX1 and FX2.
MOD1 MOD2	Choose from various types of modulation effect. You can also choose the same effect for MOD1 and MOD2.
	Turn loop effects on/off.
ELY DLY	Choose from various types of delay.
REV	Choose from various types of reverb.
ms Ns	Noise suppressor
∑ FV	Control the volume.  * This cannot be turned off.
⊞ MST	Adjust the tonal character of patches, and make other settings.
100 (PATCH LVL)	Specify the patch level (the volume of the patch). When the cursor is moved here, the [3] knob adjusts this.
OUTPUT	Specify how sound is output from the OUTPUT jacks.
20G CTL	Refer to "Changing the CTL/ASSIGN/ MIDI Settings" (p. 12).

### MEMO

If you've selected FX1, FX2, MOD1, MOD2, DLY, or REV, you can use the [3] knob to choose its effect type.





**4.** Press the [ENTER] button to enter the edit screen.



## Editing the Settings of a Patch

### MEMO

Pressing the [ON/OFF] button in the edit screen switches the effect's on/off status. This lets you hear what the effect is doing.

When tabs are displayed on the screen, you can switch pages by pressing the [< PAGE] [PAGE >] buttons.



5. Use the [1]–[3] knobs to edit the value of the parameters shown in the screen.



Press the [EXIT] button a number of times to return to the play screen.

# Changing the Effect Connection Order

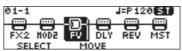
 In the effect chain screen, use the [1] knob to select the effect that you want to move.



#### NOTE

- You can't move L1-3. However, FX1, FX2, MOD1, MOD2, DLY, REV, NS, and FV can be freely moved before or after L1-3.
- MST, PATCH LVL, OUTPUT, and CTL cannot be moved.

2. Use the [2] knob to move the selected effect.

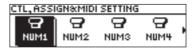


## Changing the CTL/ASSIGN/MIDI Settings

For each patch, you can make CTL, ASSIGN, and MIDI settings to operate a variety of parameters.

 In the effect chain screen, choose "CTL" with the [1] knob, and press the [ENTER] button.

The CTL, ASSIGN & MIDI SETTING screen appears.



2. Use the [1]–[3] knobs to choose the controller that you want to edit.

Controllers that are turned on are indicated with icons. When controllers are turned off, "OFF" is indicated.

Icon	Explanation
GP_GP	Specify the parameters that are controlled by number switches [1]–[4] in manual mode.
	* This works only in manual mode.
MEMORY MANUAL	Use the [MEMORY/MANUAL] switch to specify the parameter that you want to control.
CURRENT NUMBER	Specify the parameter that is controlled when you operate the number switch of the currently selected patch in memory mode.  (Example)  01-1 → number switch [1]  * This works only in memory mode.
EXP1EXP2	Specify the parameters that are controlled by expression pedals (EXP 1, 2) connected to the CTL IN lacks.

lcon	Explanation
CTLIN1	Specify the parameters that are controlled by footswitches (CTL 1–4) connected to the CTL IN jacks.
ASSIGN 1 1 1 ASSIGN	ASSIGN lets you make more detailed settings. For example, use ASSIGN if you want another parameter to also be operated at the same time in addition to the parameter operation of number switch [1]. You can make eight settings for each patch.
PATCH MIDI1 - - - - - - - - - - - - - - - - - - -	Specify the MIDI messages that are transmitted when you switch patches. You can make four settings for each patch.

Press the [ENTER] button to enter the edit screen.

CTL IN1		
F×1	TOGGLE	OFF->ON
	•	•
FUNC	MODE	ACTION .

When page tabs are displayed on the screen, you can switch pages by pressing the [< PAGE] [PAGE >] buttons.

**4.** Use the [1]–[3] knobs to edit the value of the parameters shown in the screen.



**5.** Press the [EXIT] button a number of times to return to the play screen.

# Saving a Patch

If you want to save the patch that you created, execute the Write operation.

\* You can use dedicated software to save, exchange, initialize, or back up patches (p. 17).

### NOTE

- If you do not save the patch, the edited settings will be lost when you turn off the power or switch to another patch.
- When you save, the patch that had been in the save-destination is overwritten.
- Press the [EXIT] button and [ENTER] button simultaneously.



The WRITE UTILITY screen appears.



- 2. Choose "WRITE" with the [1]-[3] knobs, and press the [ENTER] button.
- 3. Choose the patch write destination (01-1-50-4) with the [1] knob, and press the [ENTER] button.

PATCH WRITE	NAT	URAL CLEAN
01-1	ENTE	R: EXECUTE
NATURAL	CLEAN	
TARGET		

Here you can edit the name.

Controller	Operation
[1] knob	Changes the character
[2] knob	Moves the cursor
[3] knob	Selects the type of characters
[EDIT] button	Delete the character at the cursor
	location
[MENU] button	Insert a space at the cursor location

## Editing the Settings of a Patch

- **4.** To save the patch, press the [ENTER] button.
- \* If you decide to cancel, press the [EXIT] button.

Once the patch has been saved, you are returned to the Play screen.

## **Exchanging Patches**

Here's how to exchange the currently selected patch with a patch that you specify.

- 1. In the WRITE UTILITY screen, choose "EXCHANGE" with the [1]–[3] knobs, and press the [ENTER] button.
- 2. Choose the exchange-destination patch with the [1] knob.



- 3. To exchange the patches, press the [ENTER] button.
- \* If you decide to cancel, press the [EXIT] button.

Once the patches has been exchanged, you are returned to the Play screen.

# Initializing a Patch

Here's how to return the selected patch to the default values.

- In the WRITE UTILITY screen, choose "INITIALIZE" with the [1]–[3] knobs, and press the [ENTER] button.
- **2.** Choose the initialize-destination patch with the [1] knob.



- **3.** To initialize the patch, press the [ENTER] button.
- \* If you decide to cancel, press the [EXIT] button.

Once the patch has been initialized, you are returned to the Play screen.

# System Settings (MENU)

Settings that are shared by the entire MS-3 are called "system settings."

For details on the parameter, refer to the "Parameter Guide" (PDF file).

## **Basic Operation**

1. Press the [MENU] button.



The MENU screen appears.

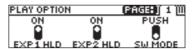


2. Use the [1]–[3] knobs to choose the item that you want to edit.

,		
lcon	Explanation	
DISPLAY	Adjust the contrast of the display.	
ELOBAL	Adjust the tonal character of each frequency region.	
PLAY	Make settings for the option functions during performance.	
CTLOUT	Specify how the CTL OUT CTL 1/2 jack operates.	
<b>₩</b> ₩ KNOB	Specify the functions of knobs [1]–[3] operated in the play screen.	
MIDI	Specify whether MIDI clock messages are transmitted.	
PREF	Specify whether the MS-3's switches, external pedals, and other settings will have independent settings for each patch or will share the same settings for all patches.	

lcon	Explanation
AUTO OFF	Refer to "Enabling/Disabling the Auto- Off Function" (p. 16).
e RESET	Refer to "Restoring the Factory Default Settings (Factory Reset)" (p. 16).

Press the [ENTER] button to enter the edit screen.



When page tabs are displayed on the screen, you can switch pages by pressing the [<PAGE] [PAGE>] buttons.

**3.** Use the [1]–[3] knobs to edit the value of the parameters shown in the screen.



- **4.** Press the [EXIT] button a number of times to return to the play screen.
- There is no Write function for the system settings. When you specify a parameter setting, the change is saved and applied automatically.

## Adjusting the Display Contrast

You can adjust the brightness of the display.

- 1. In the MENU screen, choose "DISPLAY" with the [1]–[3] knobs, and press the [ENTER] button.
- 2. Adjust the contrast with the [1] knob.



## Enabling/Disabling the Auto-Off Function

If you set the auto-off function to "On," the power will turn off automatically when 10 hours have passed since you last played or operated the unit. The display will show a message approximately 15 minutes before the power turns off.

\* With the factory settings, this function is turned "On."

If you want to have the power remain on all the time. turn it "OFF."

- In the MENU screen, choose "AUTO OFF" with the [1]-[3] knobs, and press the [ENTER] button.
- 2. Set the On (AUTO OFF) or OFF with the [1] knob.



# Restoring the Factory Default Settings (Factory Reset)

Restoring the MS-3's settings to their original factory default settings is referred to as "Factory Reset." Not only can you return all of the settings to the values in effect when the MS-3 was shipped from the factory, you can also specify the items to be reset.

- \* When you execute "Factory Reset," the settings you made will be lost. Save the data you need to your computer using the dedicated software.
- In the MENU screen, choose "F. RST" with the [1]-[3] knobs, and press the [ENTER] button.
- Choose the type of settings to be restored to the factory default settings with knobs [1] and [3].



Parameter	Value	Explanation
[1] knob		
	SYSTEM	System parameter settings
FROM	01-1-50-4	Settings for Patch
		Numbers 01-1-50-4
[3] knob		
	SYSTEM	System parameter settings
то	01-1-50-4	Settings for Patch
		Numbers 01-1-50-4

- **3.** Press the [ENTER] button.
- To execute the factory reset, use the [1] knob to select "OK," and press the [ENTER] button.
- \* If you decide not to execute the factory reset, select "CANCEL" and press the [ENTER] button.

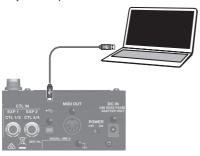
Once the Factory Reset is complete, you are returned to the Play screen.

Portuguê

# Using a Computer to Edit/Back up Patches

By connecting the MS-3 to a computer via USB, using the dedicated software allows you to do the following:

- Edit patch settings
- Name patches
- Organize patches in order and switch them around
- Back up patches and system settings, and return to the backed up settings
- Display the "Parameter Guide," "Application Guide," and "MIDI Implementation" (PDF file) on your computer



\* Use a commercially available USB 2.0 cable to make this connection.

# Installing the USB Driver

# You must install the USB driver before connecting to a computer.

Please download the USB driver from the BOSS website.

Install this special driver before making a USB connection.

For further details, refer to the Readme.htm file that comes with the download.

→ https://www.boss.info/support/

The program you need to use, and the steps you need to take to install the USB driver will differ depending on your computer setup, so please carefully read and refer to the Readme.htm file that comes with the download.

# Installing the Dedicated Software

You can easily download dedicated software from the BOSS website.

→ https://www.boss.info/support/

For details on how to use the software, refer to the Readme.htm file that comes with the download.

# **Appendix**

# **Error Messages**

Display	Problem	Action
USB OFFLINE!	Transmissions from the connected device have been interrupted. This message also appears when the power to the connected device has been turned off. It does not indicate damage.	Check to make sure no cable is disconnected and that there are no shorts.
DATA WRITE ERROR!	Writing to the memory for storage of user data failed.	The unit may be damaged. Consult the nearest Roland service center.
LOCKED!	The [1]–[3] knobs and buttons are locked.	Turn "Lock function" off (p. 5).

# Attaching the Rubber Feet

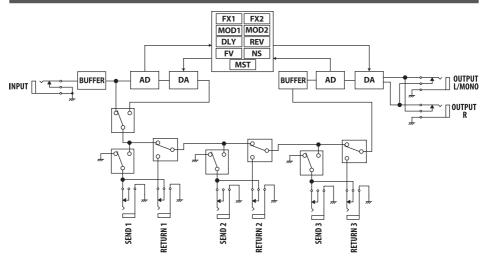
You can attach the rubber feet (included) if necessary.

1. Attach the rubber feet in alignment with the marks on the bottom of the unit.



- \* When turning the unit over, be careful so as to protect the buttons and switches from damage. Also, handle the unit carefully; do not drop it.
- Attach the rubber feet correctly. If they are not attached correctly, they could deform or malfunction.

# Block Diagram



# Main Specifications

#### BOSS MS-3: Multi Effects Switcher

Memory mode/Manual mode  3  24 bits + AF method		
-		
24 hits + AF method		
2 · Sito · / ii · iiietiiou		
AF method (Adaptive Focus method)		
This is a proprietary method from Roland & BOSS that vastly improves the signal-to-noise (SN) ratio of the AD and DA converters.		
24 bits		
44.1 kHz		
112 types		
200		
INPUT: -10 dBu		
LOOPS L1–3 RETURN: -10 dBu		
INPUT: +7 dBu		
LOOPS L1–3 RETURN: +7 dBu		
INPUT: 1 MΩ		
OUTPUT L/MONO, R: -10 dBu		
LOOPS L1–3 SEND: -10 dBu		
OUTPUT L/MONO, R: 1 kΩ		
OUTPUT L/MONO, R: 10 kΩ or greater		
LOOPS L1–3 SEND: 10 kΩ or greater		
Number switch 1–4, MEMORY/MANUAL switch		
ON/OFF button, MENU button, EDIT button, EXIT button, ENTER button		
1–3 knobs		
POWER switch		
Graphic LCD (132 x 32 dots, backlit LCD)		
Number indicator 1–4, MEMORY/MANUAL indicator		
On/Off indicators (MOD1, L1–3, FX2, MOD2, DLY, REV)		
INPUT jack: 1/4-inch phone type		
LOOPS L1–3 SEND jacks: 1/4-inch phone type		
LOOPS L1–3 RETURN jacks: 1/4-inch phone type		
OUTPUT (L/MONO, R) jacks: 1/4-inch phone type		
CTL OUT CTL1/2 jack: 1/4-inch TRS phone type		
CTL IN EXP1 CTL1/2 jack, CTL IN EXP2 CTL3/4 jack: 1/4-inch TRS phone type		
USB COMPUTER port: USB type B		
MIDI OUT connector		
DC IN jack		
AC adaptor		
280 mA		
246 (W) x 97 (D) x 68 (H) mm		
9-11/16 (W) x 3-7/8 (D) x 2-11/16 (H) inches		
1.1 kg		
2 lbs 7 oz		
AC adaptor, Rubber feet x 4, Owner's manual, Leaflet "USING THE UNIT SAFELY"		
Footswitch: FS-5U, FS-5L, FS-6, FS-7		
Expression pedal: EV-30, FV-500L, FV-500H, Roland EV-5		

<sup>\* 0</sup> dBu = 0.775 Vrms

<sup>\*</sup> This document explains the specifications of the product at the time that the document was issued. For the latest information, refer to the Roland website.

# **USING THE UNIT SAFELY**

## ♠ WARNING

#### Concerning the Auto Off function

The power to this unit will be turned off automatically after a predetermined amount of time has passed since it was last used for playing music, or its buttons or controls were operated (Auto Off function). If you do not want the power to be turned off automatically, disengage the Auto Off function (p. 16).

## **!** WARNING

# Use only the supplied AC adaptor and the correct voltage

Be sure to use only the AC adaptor supplied with the unit. Also, make sure the line voltage at the installation matches the input voltage specified on the AC adaptor's body. Other AC adaptors may use a different polarity, or be designed for a different voltage, so their use could result in damage, malfunction, or electric shock.

## 

#### Keep small items out of the reach of children

To prevent accidental ingestion of the parts listed below, always keep them out of the reach of small children.



Included Parts
 Rubber feet (p. 18)

#### Handle the ground terminal carefully

If you remove the screw from the ground terminal, be sure to replace it; don't leave it lying around where it could accidentally be swallowed by small children. When refastening the screw, make that it is firmly fastened, so it won't come loose.

# **IMPORTANT NOTES**

#### **Placement**

 Depending on the material and temperature of the surface on which you place the unit, its rubber feet may discolor or mar the surface.

#### Repairs and Data

 Before sending the unit away for repairs, be sure to make a backup of the data stored within it; or you may prefer to write down the needed information. Although we will do our utmost to preserve the data stored in your unit when we carry out repairs, in some cases, such as when the memory section is physically damaged, restoration of the stored content may be impossible. Roland assumes no liability concerning the restoration of any stored content that has been lost.

#### **Additional Precautions**

- Any data stored within the unit can be lost as the result of equipment failure, incorrect operation, etc. To protect yourself against the irretrievable loss of data, try to make a habit of creating regular backups of the data you've stored in the unit.
- Roland assumes no liability concerning the restoration of any stored content that has been lost.
- Never strike or apply strong pressure to the display.
- Use only the specified expression pedal (FV-500H, FV-500L, EV-30, and Roland EV-5; sold separately). By connecting any other expression pedals, you risk causing malfunction and/or damage to the unit.

- Do not use connection cables that contain a built-in resistor.
- Depending on the circumstances of a particular setup, you may experience a discomforting sensation, or perceive that the surface feels gritty to the touch when you touch this device, the metal portions of other objects, such as guitars. This is due to an infinitesimal electrical charge, which is absolutely harmless. However, if you are concerned about this, connect the ground terminal (see figure) with an external ground. When the unit is grounded, a slight hum may occur, depending on the particulars of your installation. If you are unsure of the connection method, contact the nearest Roland Service Center, or an authorized Roland distributor, as listed on the "Information."



Unsuitable places for connection

- Water pipes (may result in shock or electrocution)
- Gas pipes (may result in fire or explosion)
- Telephone-line ground or lightning rod (may be dangerous in the event of lightning)

### Intellectual Property Right

- It is forbidden by law to make an audio recording, video recording, copy or revision of a third party's copyrighted work (musical work, video work, broadcast, live performance, or other work), whether in whole or in part, and distribute, sell, lease, perform or broadcast it without the permission of the copyright owner.
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