

LIVE PERSONAL MIXER **M-48**

Owner's Manual



Before using this unit, carefully read the sections entitled: "USING THE UNIT SAFELY" and "IMPORTANT NOTES" (p. 5–6; p. 7). 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, Owner's Manual should be read in its entirety. The manual should be saved and kept on hand as a convenient reference.

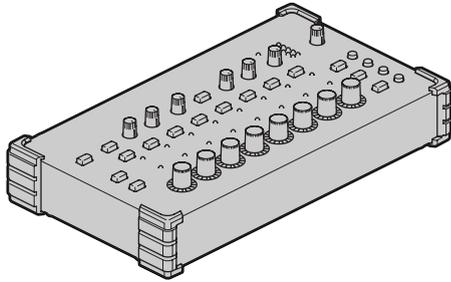
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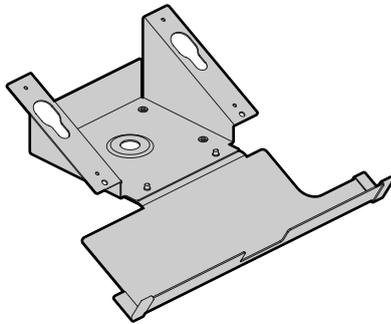
Check the included Items

The following items are included with the M-48. Make sure that all of these items are present. If anything is missing, please contact your dealer.

- M-48** (main unit)



- Mounting bracket/bracket tray** (1)



- Mounting bracket attachment kit**

- Rubber washer** (1)



- Wing nut: for 3/8 inch screw** (1)



- Washers: for 3/8 inch screw** (2)



- Nut: for 5/8 inch screw** (1)



- Screws for fastening the M-48** (2)



- Ferrite core** (1)



* Attach this to the REAC cable or Cat5e Ethernet cable (p. 15).

- Screws for attaching the APC-33 all purpose clamp** (4)



- REAC connector cover** (1)



- Owner's Manual** (this document)



Main Features

● The flexibility of 40-channel mixing with easy operation enabled by grouping

The M-48 allows you to mix up to 40 channels of digital audio sent via REAC.

You can individually adjust the level and pan of 40 source channels and then assign the 40 sources to 16 stereo groups for convenience.

Volume adjustments on the M-48 are performed on group mixes assigned to each knob, making adjustments extremely quick and easy.

- * Settings by the mixing engineer are done from the screen of the M-400 V-Mixer when the M-48 is part of a V-Mixing System. If the M-48 is connected an alternative mixing console, its settings can be edited from a computer connected to the S-4000 or S-1608 systems.
- * In order to edit the M-48's settings from the M-400, version 2.0 or later system software is required.
- * In order to edit from a computer connected to the S-4000 or S-1608 systems, the S-4000 system must have system software version 2.1 or later, and the S-1608 system must have system software 2.0 or later. Version 2.0 or later of the S-4000 RCS application software (Windows XP/Vista supported) is also required.
System software for each unit and the S-4000 RCS application software can be downloaded at no cost from the Roland Systems Group website (<http://www.rolandsystemsgroup.net>).

● Unique setups for each musician

Each M-48 on the stage or in the studio can have their own setup.

For example, the drummer's setup can have each drum mic assigned to its own group (knob), while the keyboard and vocalist audio is combined into a single group. Meanwhile, the vocalist's setup can combine the drum mics into a single group, while the keyboard and vocal mics each have their own groups.

Musicians do not need to make any compromise in their own monitor setup. Since grouping assignments are per M-48, there's also no need to use up multiple buses in the mixing console for stage sends, allowing the mixing console to now be used more flexibly.

● Superior sound to support the musician

In order to deliver natural-sounding and comfortable monitor sound, the M-48 provides reverb and 3-band EQ. Since these can be set individually for each group, the musician can obtain their own ideal personal mix.

A limiter is provided to address the problem of excessive volume that can cause discomfort particularly when using headphones. This could mitigate hearing damage that can be caused by sudden high volumes.

An ambient mic with volume control is also provided. This allows the audience's response to be audible even when wearing headphones. It also allows convenient communication between the musicians on stage or in the studio.

● Connections with external devices

The M-48 can be simultaneously connected to headphones and speakers. You can listen to the monitor sound through headphones while outputting just the low frequencies from a floor monitor so that they can be felt by the entire body.

The rear panel provides an AUX input jack and output jacks for recording. A rhythm machine or metronome can be connected to the AUX input jack so that the musician can conveniently perform start/stop operations or control the tempo. Additionally, by connecting a portable audio recorder (such as one from the EDIROL R-09 series) to the recording output jack, you can record the monitor sound you're hearing on stage. This lets you take home the recorded monitor sound and use it for practice.

- * After the power is turned on (p. 20), audio will not be output until the REAC connection is established.

● No need for AC power cord or AC adaptor

REAC EMBEDDED POWER means that power is supplied from the S-4000D via the REAC cable. No need for an AC power cord or AC adaptor means a less cluttered setup.

- * REAC EMBEDDED POWER is technology that uses a Cat5e cable to supply power as well as the REAC audio signals to a REAC device. REAC devices that support REAC EMBEDDED POWER do not require an AC adaptor or AC power cord for their power supply; simply connecting the REAC cable will allow REAC communication as well as supply the power.

● Connect with many types of systems for a variety of uses

In addition to using the M-48 with full-digital connections as part of the RSS V-Mixing System, you can also connect it to a conventional mixing console via the stage unit of a digital snake. From small-scale to large-scale, analog or digital, you can connect and use the M-48 with a wide range of sound mixing systems.

Using the M-48 as part of the V-Mixing System allows full-digital transmission via REAC (Roland Ethernet Audio Communication), delivering high-quality monitor sound to the musicians on stage or in the studio.

- * Connections with an alternate mixer require the S-4000 system or S-1608 system.

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USING THE UNIT SAFELY

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

About ⚠ WARNING and ⚠ CAUTION Notices

| | |
|------------------|--|
| ⚠ WARNING | Used for instructions intended to alert the user to the risk of death or severe injury should the unit be used improperly. |
| ⚠ CAUTION | 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

When used in combination with headphones, amps, or speakers, this device is capable of producing volume levels that may cause permanent hearing loss. Do not use this device at high volumes for an extended period of time. If you should experience any loss of hearing or ringing in your ears, you should immediately stop using this product, and consult a medical professional.



⚠ WARNING

- Do not open or perform any internal modifications on the unit.



- Do not attempt to repair the unit, or replace parts within it (except when this manual provides specific instructions directing you to do so). Refer all servicing to your retailer, the nearest Roland Service Center, or an authorized Roland distributor, as listed on the "Information" page.



⚠ WARNING

- Never install the unit in any of the following locations.
 - Subject to temperature extremes (e.g., direct sunlight in an enclosed vehicle, near a heating duct, on top of heat-generating equipment); or are
 - Damp (e.g., baths, washrooms, on wet floors); or are
 - Exposed to steam or smoke; or are
 - Subject to salt exposure; or are
 - Humid; or are
 - Exposed to rain; or are
 - Dusty or sandy; or are
 - Subject to high levels of vibration and shakiness.



⚠ WARNING

- When using the unit with a mic stand, the rack or stand must be carefully placed so it is level and sure to remain stable. If not using a mic stand, you still need to make sure that any location you choose for placing the unit provides a level surface that will properly support the unit, and keep it from wobbling. 

- Do not allow any objects (e.g., flammable material, coins, pins); or liquids of any kind (water, soft drinks, etc.) to penetrate the unit.  

- Immediately turn the power off, and request servicing by your retailer, the nearest Roland Service Center, or an authorized Roland distributor, as listed on the "Information" page when: 
 - If smoke or unusual odor occurs
 - Objects have fallen into, or liquid has been spilled onto the unit; or
 - The unit has been exposed to rain (or otherwise has become wet); or
 - The unit does not appear to operate normally or exhibits a marked change in performance.

- When using this device in an environment where children are present, 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!) 

⚠ CAUTION

- This device is designed so that it can be used with a microphone stand or with the APC-33 all-purpose clamp made by Roland. When using this device with a mic stand or the all-purpose clamp, placing it on an unstable location may cause the device to topple or fall, possibly damaging the device or causing personal injury. 

- Even if you observe the cautions listed in the owner's manual, certain modes of use may produce the potential for this device to fall from the mic stand, or for the mic stand to topple over. Please exercise caution before using this product. 

- When attaching or detaching the mounting bracket or bracket tray (p. 11–14), be careful not to injure yourself on the corners of the bracket or tray. 

- 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. 

- Disconnect all cords coming from external devices before moving the unit. 

- Keep small parts such as the following out of reach of children so that they cannot be accidentally swallowed. 
 - Removed parts:
Screws for fastening the bracket tray
 - Included items:
Ferrite core, REAC connector cover, Wing nut, Nut, Washers, Rubber washer, Screws for fastening the M-48, and Screws for attaching the APC-33 all purpose clamp

IMPORTANT NOTES

Power Supply

- 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 devices.

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.
- Noise may be produced if wireless communications devices, such as cell phones, are operated in the vicinity of this unit. Such noise could occur when receiving or initiating a call, or while conversing. Should you experience such problems, you should relocate such wireless devices so they are at a greater distance from this unit, or switch them off.
- Do not expose the unit to direct sunlight, place it near devices that radiate heat, leave it inside an enclosed vehicle, or otherwise subject it to temperature extremes. Excessive heat can deform or discolor the unit.
- When moved from one location to another where the temperature and/or humidity is very different, water droplets (condensation) may form inside the unit. Damage or malfunction may result if you attempt to use the unit in this condition. Therefore, before using the unit, you must allow it to stand for several hours, until the condensation has completely evaporated.
- Depending on the material and temperature of the surface on which you place the unit, its rubber feet may discolor or mar the surface. You can place a piece of felt or cloth under the rubber feet to prevent this from happening. If you do so, please make sure that the unit will not slip or move accidentally.

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 benzine, thinners, alcohol or solvents of any kind, to avoid the possibility of discoloration and/or deformation.

Repairs and Data

- Please be aware that all data contained in the unit's memory may be lost when the unit is sent for repairs. Please save important data as a file on the M-400 or on your computer. For details on how to save data, refer to the owner's manual of the M-400 (Ver. 2.0 or later) or the S-4000 RCS Ver. 2.0. During repairs, due care is taken to avoid the loss of data. However, in certain cases (such as when circuitry related to memory itself is out of order), we regret that it may not be possible to restore the data, and Roland assumes no liability concerning such loss of data.

Additional Precautions

- Please be aware that the contents of memory can be irretrievably lost as a result of a malfunction, or the improper operation of the unit. To avoid inconvenience in the event of data loss, save important data as a file on the M-400 or on your computer. For details on how to save data, refer to the owner's manual of the M-400 (Ver. 2.0 or later) or the S-4000 RCS Ver. 2.0.
- Unfortunately, it may be impossible to restore the contents of data that was stored on the unit, the M-400, and your computer once it has been lost. Roland Corporation assumes no liability concerning such loss of data.
- 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.
- 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.

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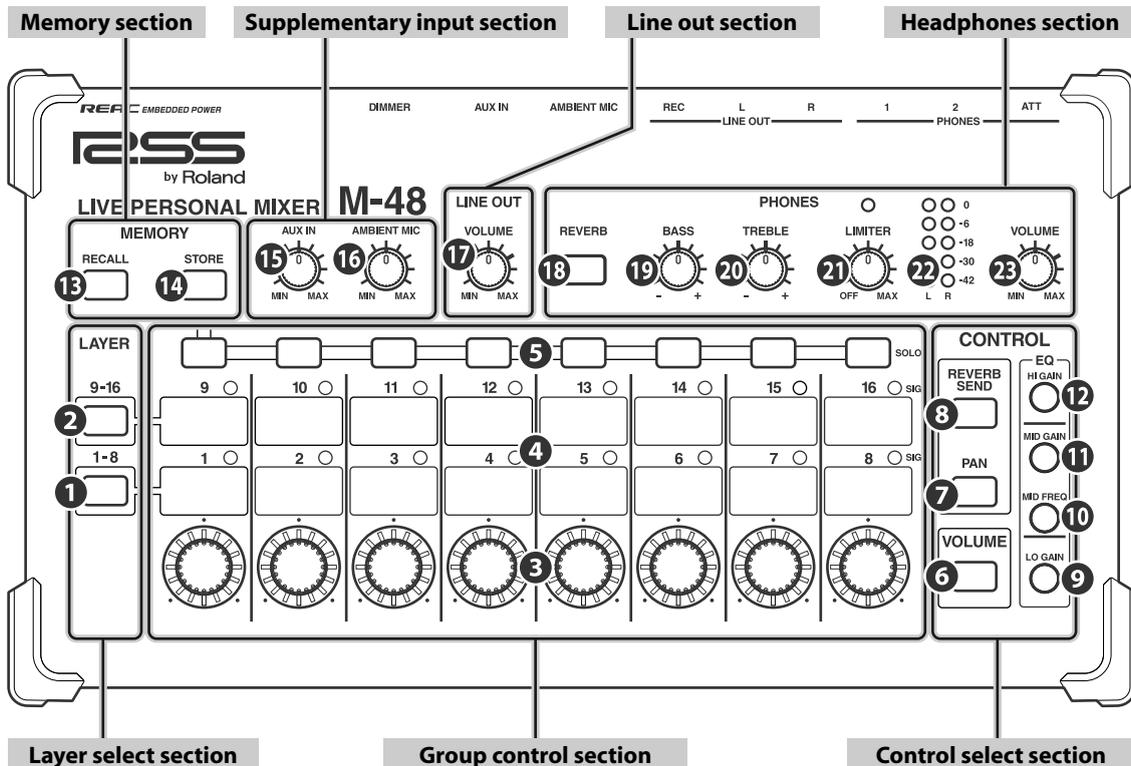
* Windows® is known officially as: "Microsoft® Windows® operating system."

* Neutrik and EtherCon are registered trademarks of Neutrik, Inc.

* MMP (Moore Microprocessor Portfolio) refers to a patent portfolio concerned with microprocessor architecture, which was developed by Technology Properties Limited (TPL). Roland has licensed this technology from the TPL Group.

Panel Descriptions

Top Panel



Layer select section

Here you can select the layer for the groups that you want to operate. The button corresponding to the currently shown layer will light.

1 [1-8] button

Selects groups 1–8.

2 [9-16] button

Selects groups 9–16.

* If the button of the layer not shown is blinking, this means that Solo is turned on for a group in that layer.

Group control section

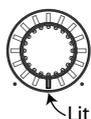
Here you can mix the groups.

* The [CONTROL] knobs, SIG indicators, and [SOLO] buttons of unused groups (no sources assigned) will not do anything.

3 [Control] knobs

These adjust the parameter selected in the control select section. The indicators around the circumference of the [Control] knobs indicate the approximate value of the parameter you're adjusting. When the indicator at the 6 o'clock position is lit, the following values are indicated.

- Volume/Reverb send/EQ gain: 0.0 dB
- Pan: center



Group control section (continued)

4 SIG (signal) indicators

These will light when the group contains a source whose level exceeds -40 dB. This indicates the level of the source immediately after the REAC input.

5 [SOLO] buttons

These turn Solo on/off for each group. The button will blink when Solo is on.

☞ "Listening to Each Group Individually (Solo)" (p. 26)

Control select section

Here you can select the parameter that will be adjusted by the [Control] knobs of the group control section.

The button of the selected parameter will light.

6 [VOLUME] button

This button allows you to adjust the volume. The volume can be adjusted in a range of -Inf dB – +20.0 dB. ☞ "Adjusting the Volume of Each Group" (p. 26)

7 [PAN] button

This allows you to adjust the pan. ☞ "Adjusting the Pan of Each Group" (p. 27)

8 [REVERB SEND] button

This button allows you to adjust the reverb send. The reverb send can be adjusted in a range of -Inf dB – +10.0 dB. ☞ "Applying Reverb to Each Group" (p. 28)

Control select section (continued)

9 [LO GAIN] button

This button allows you to adjust the EQ low gain.

The low gain (center frequency 120 Hz) can be boosted or cut by up to 15 dB.

🔊 “Applying EQ to Each Group” (p. 28)

10 [MID FREQ] button

This button allows you to adjust the EQ mid frequency

The center frequency of the mid frequency can be adjusted in a range of 20 Hz–20.0 kHz.

🔊 “Applying EQ to Each Group” (p. 28)

11 [MID GAIN] button

This button allows you to adjust the EQ mid gain.

The mid gain can be boosted or cut by up to 15 dB.

🔊 “Applying EQ to Each Group” (p. 28)

12 [HI GAIN] button

This button allows you to adjust the EQ high gain.

The high gain (center frequency 10 kHz) can be boosted or cut by up to 15 dB.

🔊 “Applying EQ to Each Group” (p. 28)

Memory section

Here you can perform memory operations.

13 [RECALL] button

This button turns memory Recall mode on/off.

When Recall mode is on, this button will light.

🔊 “Storing Mixer Settings to Memory (Store)” (p. 30)

14 [STORE] button

This button turns memory Store mode on/off.

When Store mode is on, this button will light.

🔊 “Recalling Mixer Settings from Memory (Recall)” (p. 31)

Supplementary input section

In this section you can adjust the input level of the AUX IN and the ambient mic.

15 [AUX IN] knob

This adjusts the input level of the AUX IN L/R jack.

🔊 “Adjusting the Input Level of AUX IN” (p. 27)

16 [AMBIENT MIC] mic

This adjusts the input level of the AMBIENT MIC.

🔊 “Using the Built-in Ambient Mic” (p. 27)

Line out section

In this section you can adjust the output level of the line out.

17 LINE OUT [VOLUME] knob

This knob adjusts the line out output level.

🔊 “Adjusting the Line Out Output Level” (p. 29)

Headphone section

In this section you can make adjustments for the headphone output.

18 [REVERB] button

This button turns reverb on/off.

When reverb is on, this button will light.

🔊 “Applying Reverb to Each Group” (p. 28)

19 [BASS] knob

This boosts/cuts the lower range (center frequency 120 Hz) by up to 15 dB.

🔊 “Adjusting the Headphones Output Tone” (p. 29)

20 [TREBLE] knob

This boosts/cuts the upper range (center frequency 10 kHz) by up to 15 dB.

🔊 “Adjusting the Headphones Output Tone” (p. 29)

21 [LIMITER] knob

This adjusts the limiter effect.

The limiter will be off if you turn the [LIMITER] knob to the OFF position (all the way counter-clockwise).

By turning the [LIMITER] knob clockwise from the OFF position, you can adjust the threshold level in a range of 0.0 dB – -40.0 dB.

The indicator above the [LIMITER] knob will light when the limiter operates.

🔊 “Applying a Limiter to the Headphones Output” (p. 29)

22 Level meter

This indicates the headphone output level.

About output muting

If only the -18 dB indicator is blinking, the M-48’s output has been muted by an operation from the M-400 or the computer.

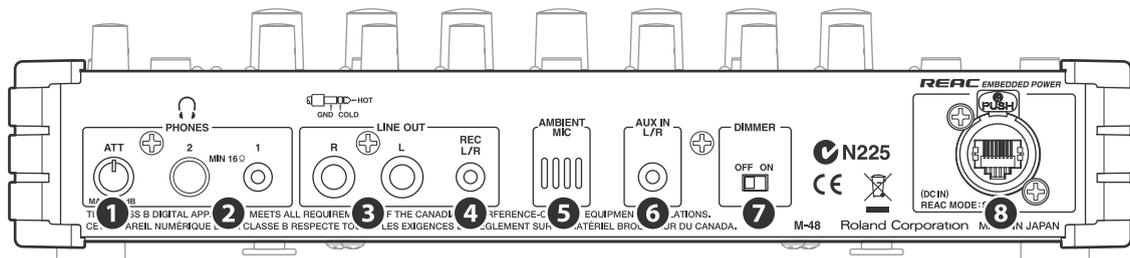
From the M-48, you can defeat muting by pressing any of the top panel buttons.

23 PHONES [VOLUME] knob

This adjusts the headphone output level.

🔊 “Adjusting the Headphones Output Level” (p. 29)

Rear Panel



1 [ATT] knob

This adjusts the final output level of the headphones.

Normally, you should use the top panel PHONES [VOLUME] knob to adjust the headphone output level.

Use the [ATT] knob to adjust the output level appropriately for the sensitivity of the headphones you're using.

☞ "Adjusting the Headphones Output Level" (p. 29)

2 PHONES jacks 1, 2

Connect headphones to these jacks.

- Jack 1: stereo mini type
- Jack 2: stereo phone type

The headphones you connect must have a minimum impedance of 16 ohms.

* If headphones are connected to both jack 1 and jack 2, make sure that the total impedance of the headphones is not less than 16 ohms.

3 LINE OUT L/R jacks

These are TRS type (balanced) line output jacks.

* The M-48's TRS phone jacks (balanced) are wired as follows. Verify the wiring for your equipment before you make connections.



4 LINE OUT REC L/R jack

This is a stereo mini jack that outputs a line out signal.

Use a stereo mini plug cable to connect this to a device such as one from the EDIROL R-09 series.

5 AMBIENT MIC

This is a built-in mic that is used as an ambient mic.

☞ "Using the Built-in Ambient Mic" (p. 27)

6 AUX IN L/R jack

This is a stereo mini jack that inputs an audio signal.

Use a stereo mini plug cable to connect this to one of the devices in the BOSS Dr. Rhythm series or the EDIROL R-09 series, for example.

7 [DIMMER] switch

This switches the brightness of the indicators.

| | |
|-----|-----------|
| ON | Darker. |
| OFF | Brighter. |

8 REAC port (supports REAC EMBEDDED POWER)

Connect a REAC cable to this port.

This port can input up to 40 channels of digital audio signals being output from the master REAC device.

* The M-48 operates as a split REAC device.

About the power supply

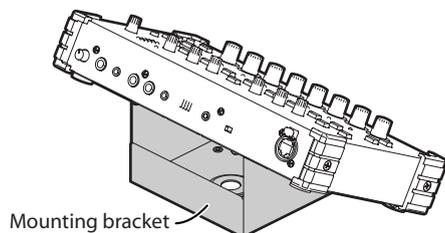
The M-48 supports REAC EMBEDDED POWER (p. 20). When it is connected via a REAC cable to the S-4000D, power will be supplied via the REAC cable.

Installation

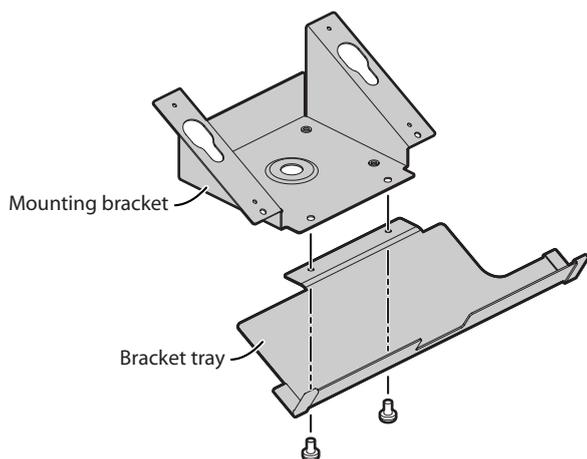
Placing the M-48 on a Desk at an Angle

By attaching the included mounting bracket to the M-48, you can place it on a desk at a convenient angle.

- * Spread a soft cloth or similar material under the mounting bracket so that the bracket does not scratch the surface on which it is placed.

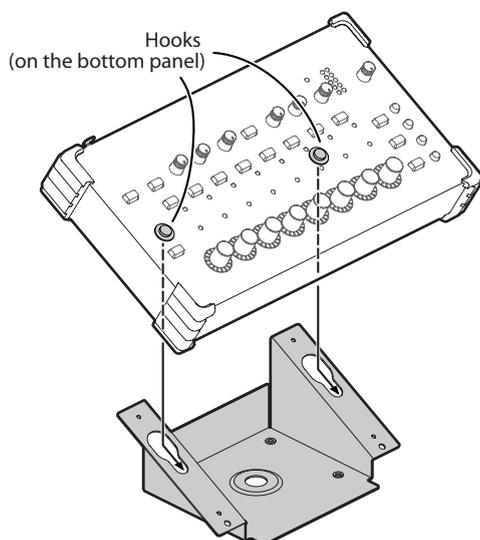


- 1 Remove the two fastening screws indicated in the illustration, and detach the bracket tray from the mounting bracket.**



- 2 Attach the mounting bracket to the M-48.**

Insert the hooks located on the M-48's bottom panel into the slots of the mounting bracket.



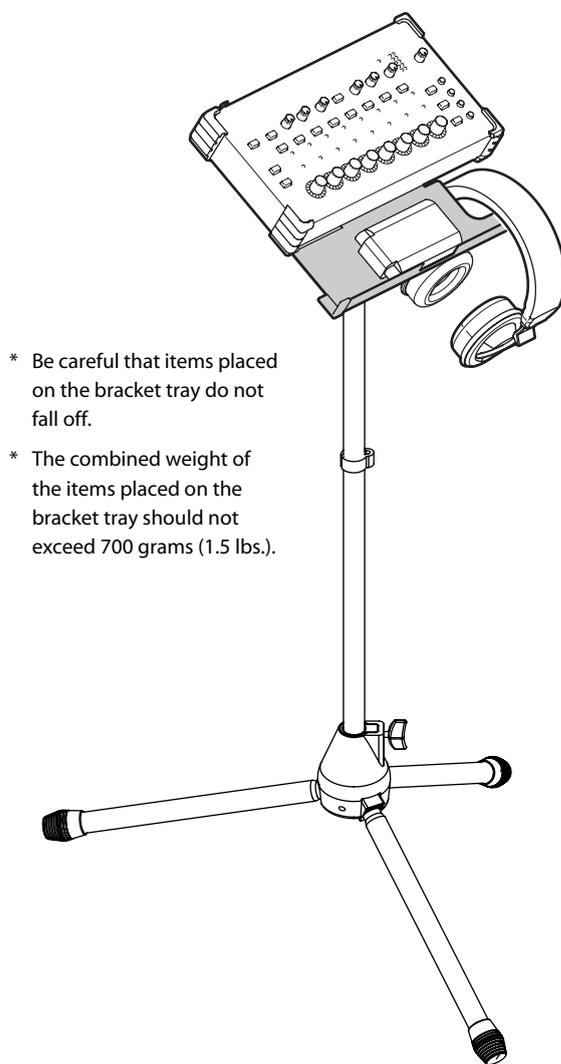
Attaching the M-48 to the Top of a Mic Stand

You can use the included mounting bracket to attach the M-48 to the top of a mic stand.

If the included bracket tray is attached to the mounting bracket, you can use it to hold small items such as an EDIROL R-09 series recorder, a mic, or headphones.

- * When shipped from the factory, the bracket tray is attached to the mounting bracket.

If you want to attach only the mounting bracket to your mic stand, remove the bracket tray before you continue. For details on how to remove the bracket tray, refer to step 1 of "Placing the M-48 on a Desk at an Angle" on this page.



About the diameter of the mic stand screw thread

If you're attaching the mounting bracket to your mic stand, the part you'll use for attachment will depend on the diameter (3/8 inch or 5/8 inch) of your mic stand's screw threads.

Use the part that's correct for the mic stand you're using.

NOTE

Be careful not to pinch your hand when attaching the M-48 to the mounting bracket. Doing so may cause personal injury.

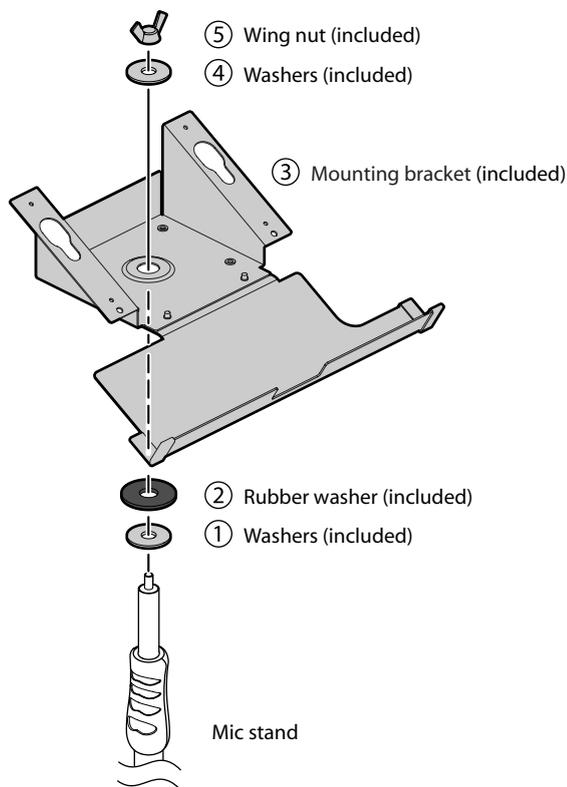
If Your Mic Stand has 3/8 inch Threads

Items to use

- Wing nut x 1 (included)
- Washers x 2 (included)
- Rubber washer x 1 (included)
- Screws for fastening the M-48 x 2 (included)

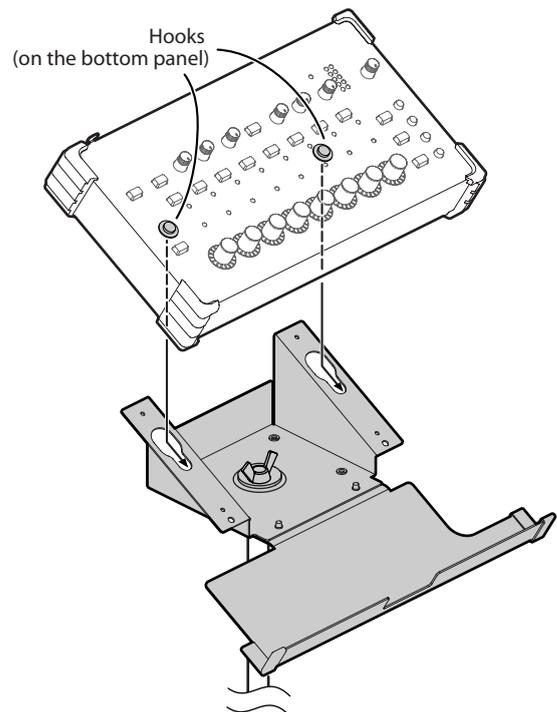
1 Attach the mounting bracket to the mic stand.

Attach the washers, mounting bracket, and other parts to your mic stand in the order ① – ⑤ shown in the illustration.

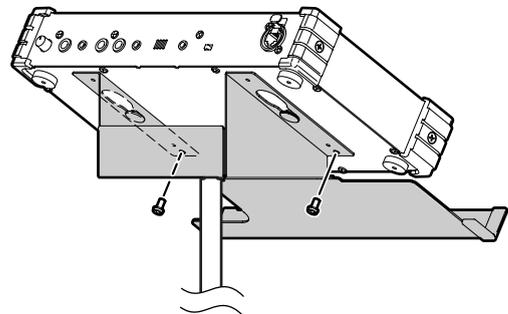


2 Tighten the wing nut to fasten the mounting bracket.

3 Insert the hooks located on the M-48's bottom panel into the slits of the mounting bracket.



4 To more permanently secure the M-48 to the mounting bracket, fasten with the two included screws as shown below.



NOTE

Be careful not to pinch your hand when attaching the M-48 to the mounting bracket. Doing so may cause personal injury.

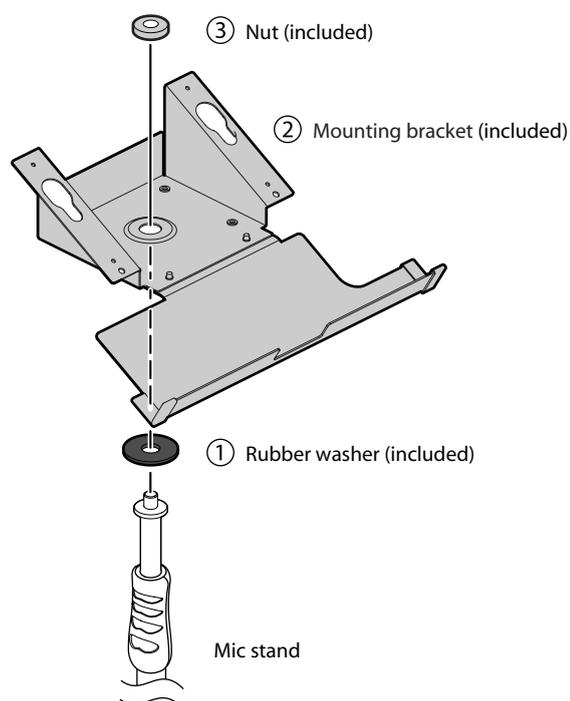
If Your Mic Stand has 5/8 inch Threads

Items to use

- Nut x 1 (included)
- Rubber washer x 1 (included)
- Screws for fastening the M-48 x 2 (included)

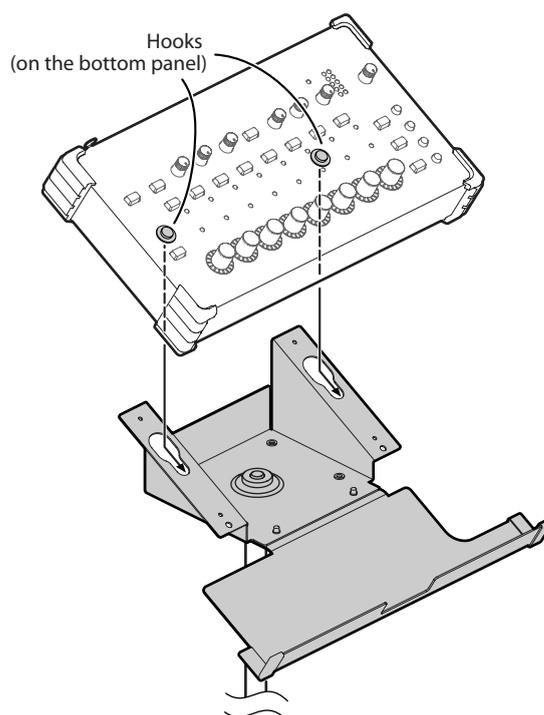
1 Attach the mounting bracket to the mic stand.

Attach the rubber washer, mounting bracket, and other parts to your mic stand in the order ① – ③ shown in the illustration.

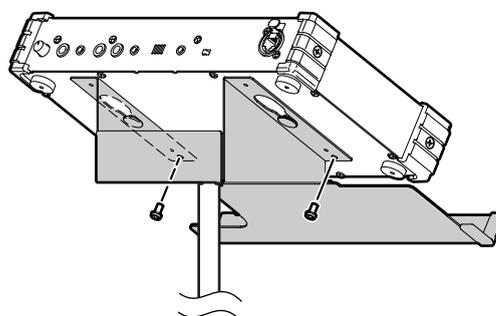


2 Tighten the nut to fasten the mounting bracket.

3 Insert the hooks located on the M-48's bottom panel into the slits of the mounting bracket.



4 To more permanently secure the M-48 to the mounting bracket, fasten with the two included screws as shown below.



Attaching the M-48 to Any Part of a Mic Stand

By using the Roland APC-33 all-purpose clamp (sold separately) in conjunction with the included mounting bracket, you can freely attach the M-48 to any part of a mic stand.

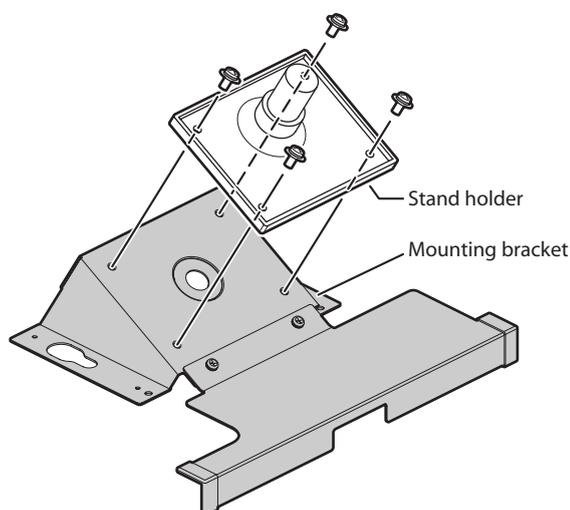
Items to use

- APC-33 attachment screws x 4 (included)
- Screws for fastening the M-48 x 2 (included)

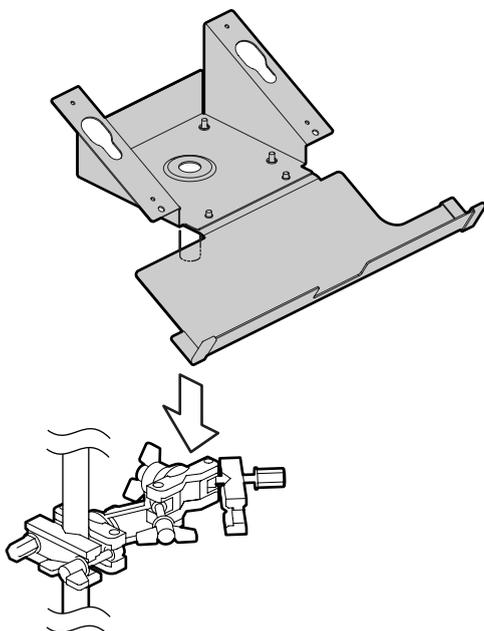
- 1 Using the four included APC-33 attachment screws, attach the APC-33 stand holder to the mounting bracket.**

NOTE

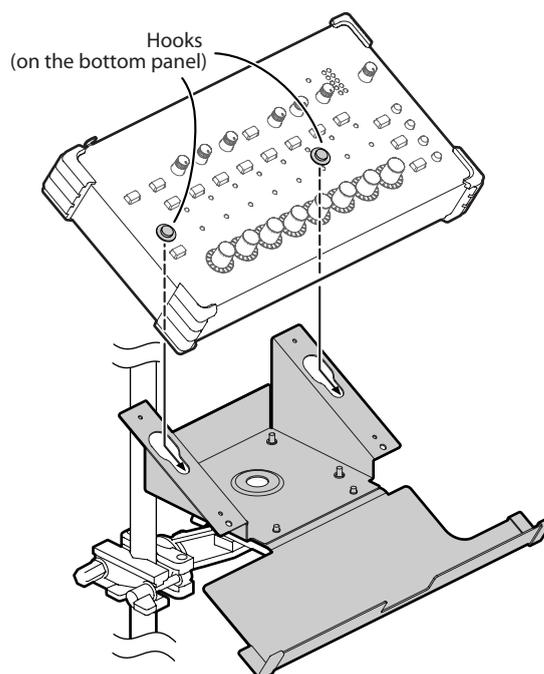
You must use the APC-33 attachment screws that were included with the M-48. The M-48 may be damaged if you use the screws included with the APC-33.



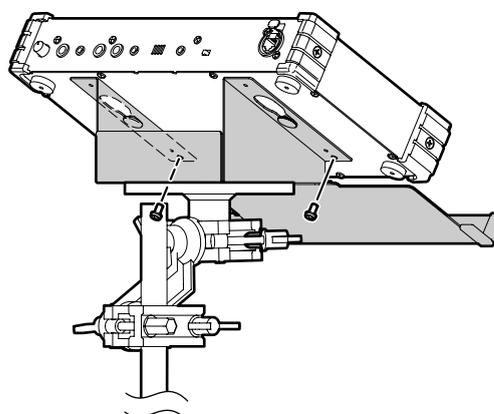
- 2 Attach the APC-33 to your mic stand or drum, and fasten the mounting bracket.**



- 3 Insert the hooks located on the M-48's bottom panel into the slits of the mounting bracket.**



- 4 To more permanently secure the M-48 to the mounting bracket, fasten with the two included screws as shown below.**



NOTE

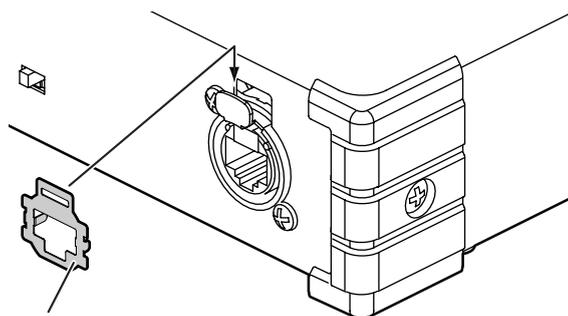
Be careful not to pinch your hand when attaching the M-48 to the mounting bracket. Doing so may cause personal injury.

Attaching the REAC Connector Cover

If you're using a commercially available Cat5e Ethernet cable, attach the included REAC connector cover to the REAC port.

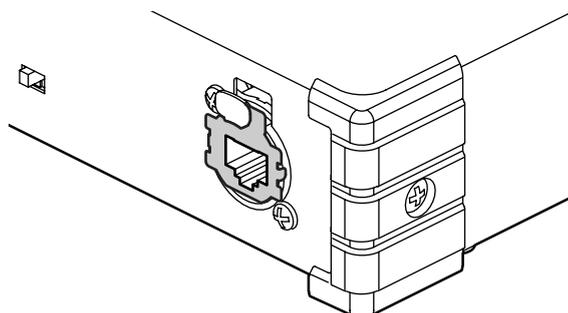
The REAC connector cover must be attached in order to minimize electromagnetic noise.

- 1 Hook the included REAC connector cover over the tab of the REAC port.



REAC connector cover (included)

- 2 Press the REAC connector cover straight in to fix it in place.



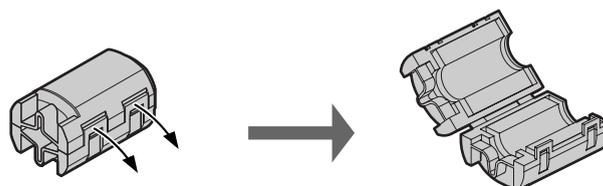
- * Remove the REAC connector cover if you'll be using an EtherCon type REAC cable. Be careful not to lose the REAC connector cover that you removed.

Attaching the Ferrite Core

When making a REAC connection, you must attach the included ferrite core to the REAC cable.

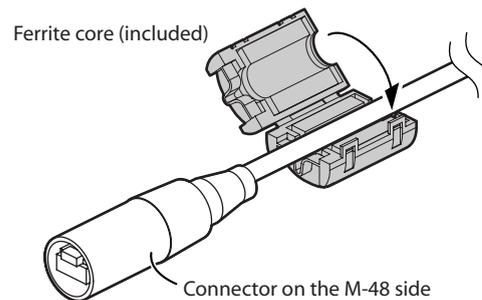
The ferrite core must be installed in order to prevent electromagnetic noise.

- 1 Spread the two tabs and open the ferrite core.



- 2 Attach the ferrite core to the SC-W20F/SC-W100S/W100S-R REAC cable (sold separately) or the Cat5e Ethernet cable at a location near the connector (near the M-48).

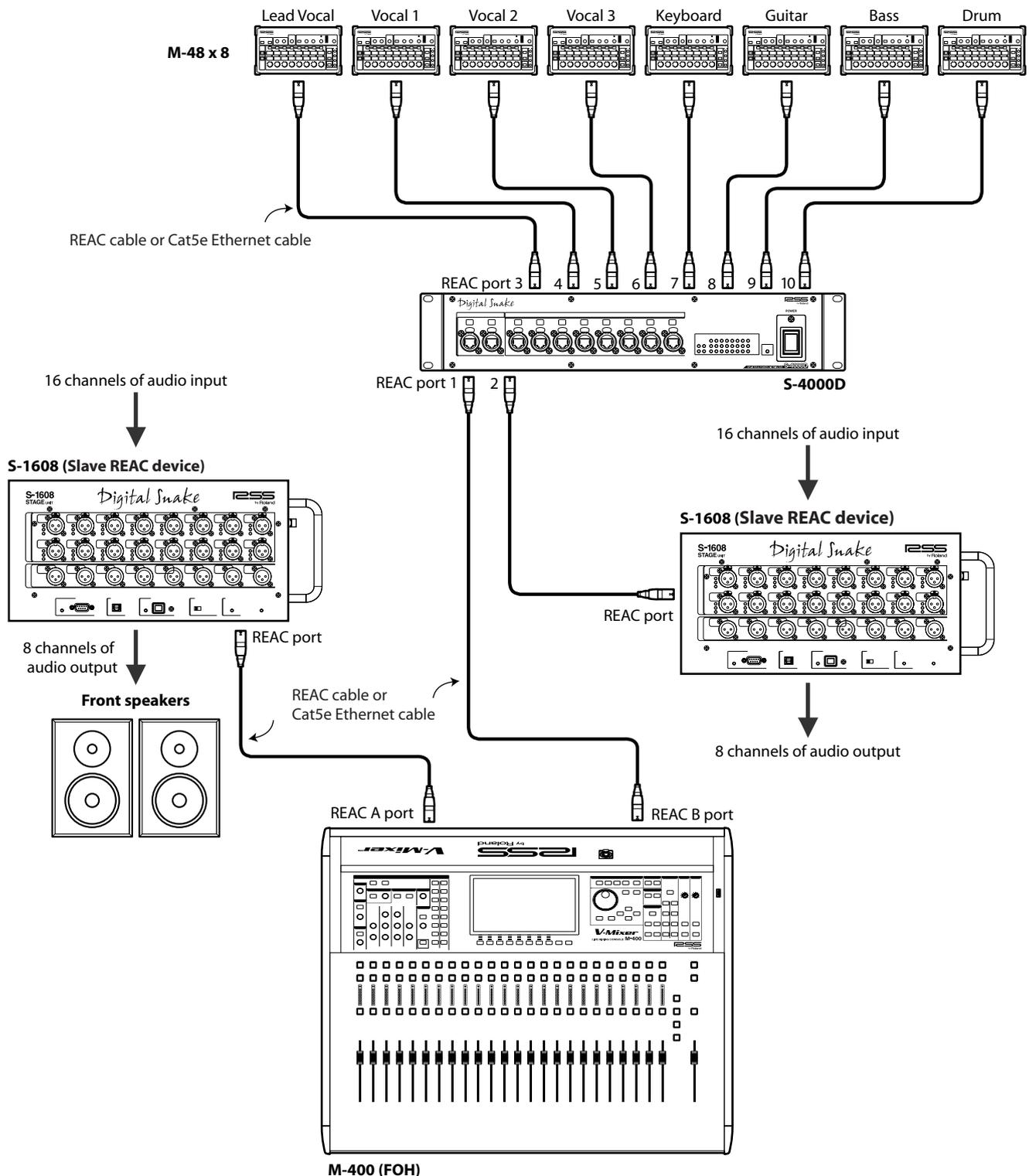
Close the ferrite core around the cable, and press it shut until you hear the click.



- * Attach the ferrite core near the base of the RJ45 connector.

Connecting External Devices

Connecting the M-48 to a V-Mixing System

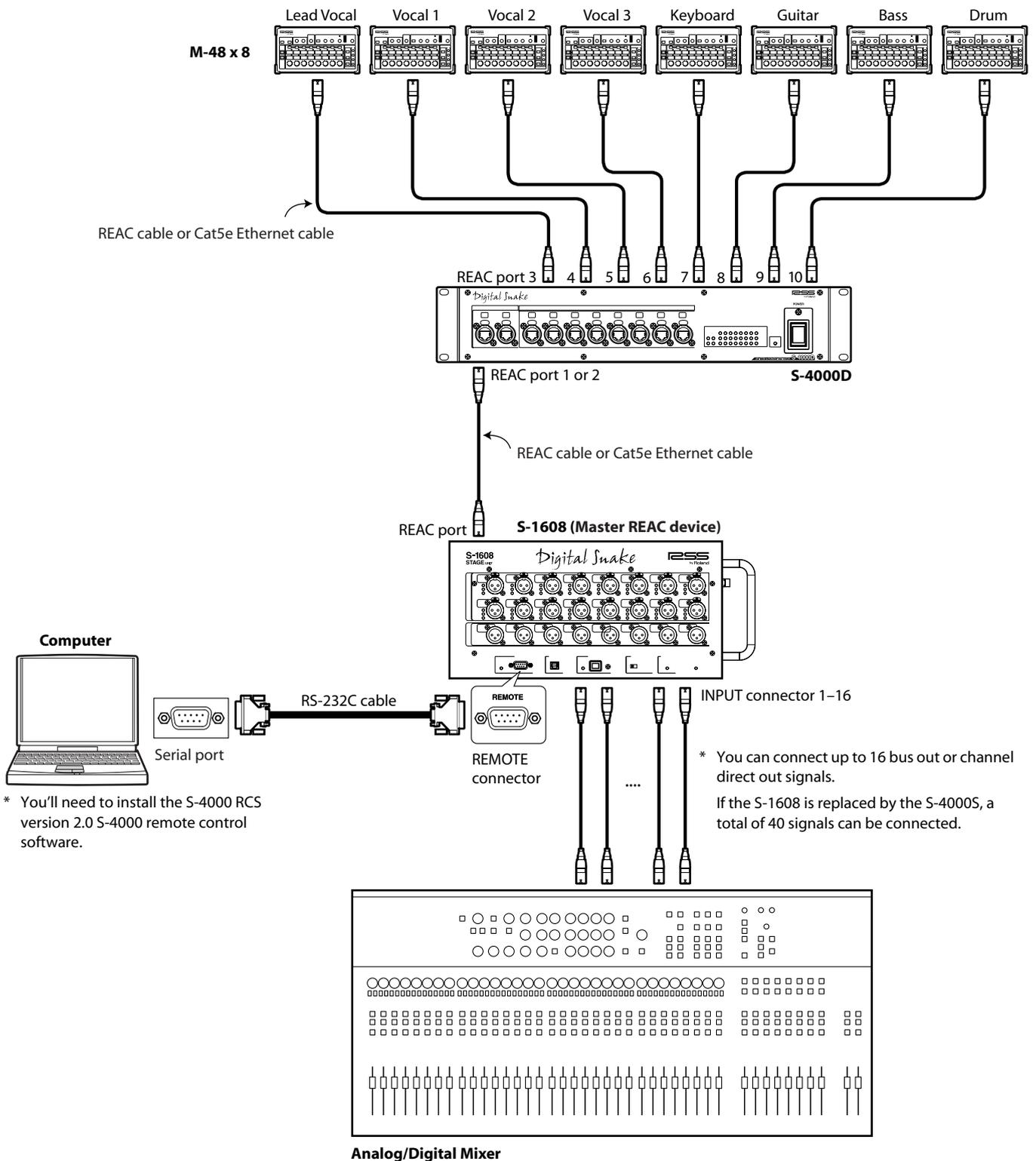


* The M-400 must be running system software version 2.0 or later.

* The M-48 can be set and managed from the M-400 only if the M-48 is connected to the M-400's REAC B port via the S-4000D.

* In order to maintain the transmission quality of the digital REAC signal, use fully approved Cat5e Ethernet cable such as the 20 meter or 100 meter REAC cables (SC-W20F/SC-W100S/W100S-R; sold separately).

Connecting the M-48 to an Analog Mixer System



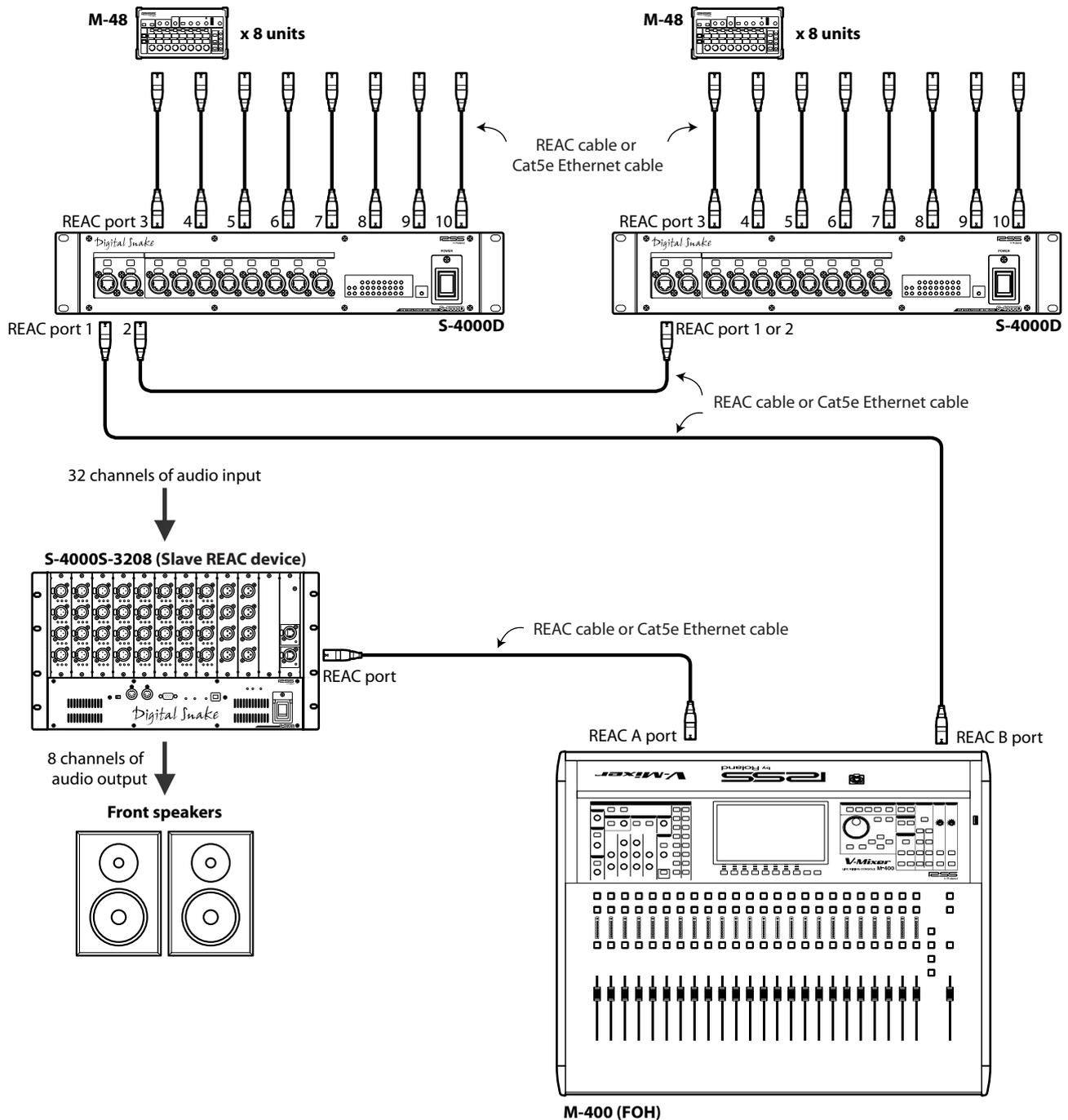
* You'll need to install the S-4000 RCS version 2.0 S-4000 remote control software.

* You can connect up to 16 bus out or channel direct out signals. If the S-1608 is replaced by the S-4000S, a total of 40 signals can be connected.

* The S-1608 system must be running system software version 2.0 or later. If you're using the S-4000 system, the S-4000 system must be running system software 2.1 or later.

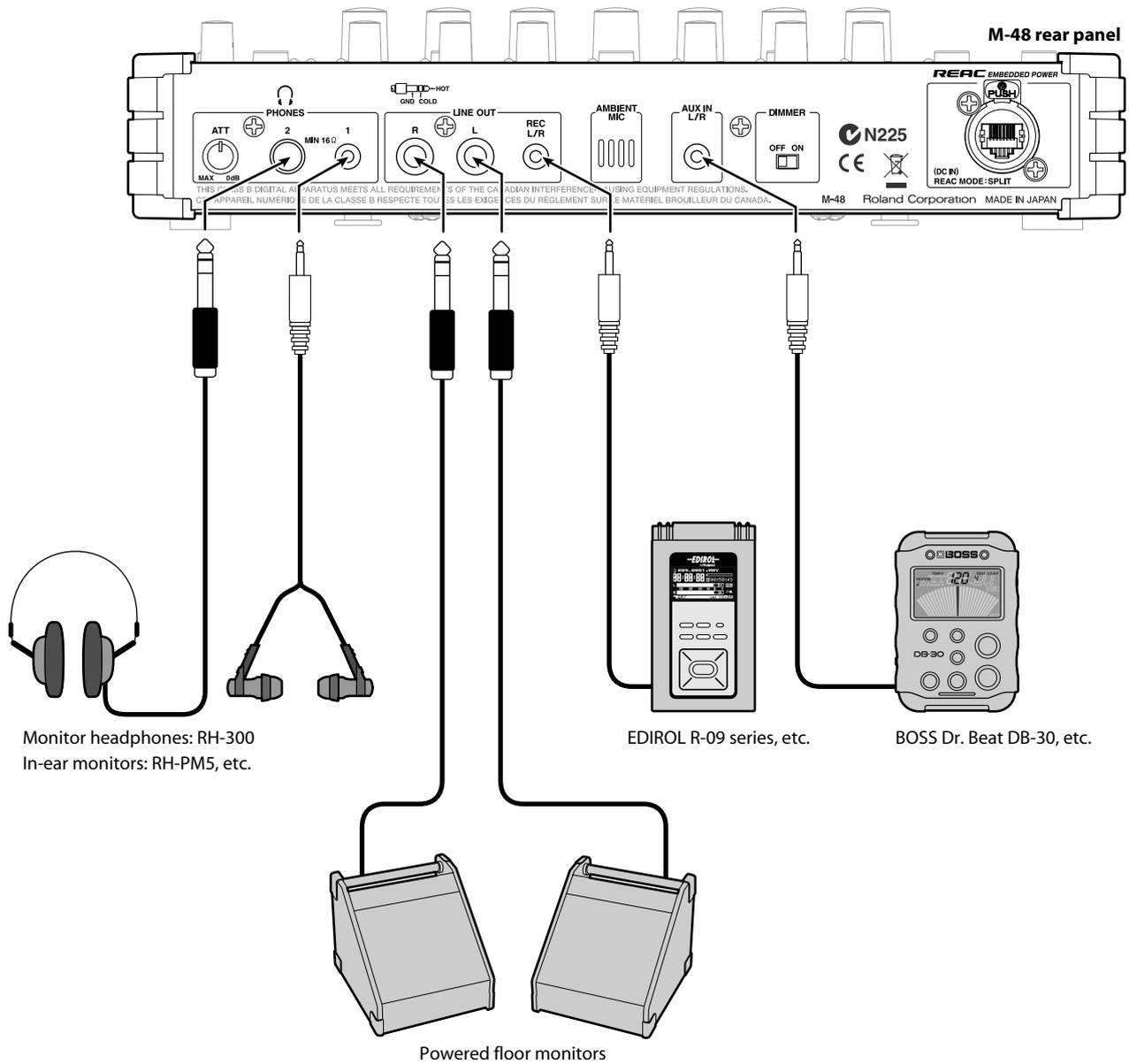
* In order to maintain the transmission quality of the digital REAC signal, use fully approved Cat5e Ethernet cable such as the 20 meter or 100 meter REAC cables (SC-W20F/SC-W100S/W100S-R; sold separately).

Connecting Nine or More M-48 Units



- * Up to four S-4000D can be connected in series. Approximately 200 microseconds of transmission delay will occur for each unit.
- * Up to twenty-four M-48 units can be connected. For more advanced configurations, call your local Roland Systems Group representative.
- * The M-400 must be running system software version 2.0 or later.
- * The M-48 can be set and managed from the M-400 only if the M-48 is connected to the M-400's REAC B port via the S-4000D.
- * In order to maintain the transmission quality of the digital REAC signal, use fully approved Cat5e Ethernet cable such as the 20 meter or 100 meter REAC cables (SC-W20F/SC-W100S/W100S-R; sold separately).

Connecting Input/Output Devices to the M-48



* If headphones are connected to both the PHONES jack 1 and jack 2, make sure that the combined impedance of the headphones is not less than 16 ohms.

* The LINE OUT L/R jacks are balanced TRS type jacks, and are wired as follows. Before you make connections, check the wiring of the equipment to be connected.



* After the power is turned on (p. 20), audio will not be output until the REAC connection is established.

Turning the Power On/Off (REAC EMBEDDED POWER Supported)

The M-48 supports REAC EMBEDDED POWER. When the M-48 is connected to the S-4000D via a REAC cable, power will be supplied via the REAC cable.

REAC EMBEDDED POWER

REAC EMBEDDED POWER is technology that uses a Cat5e cable to supply not only REAC audio signals but also power to a REAC device. REAC devices that support REAC EMBEDDED POWER do not require an AC adaptor or AC power cord to provide power; simply connecting the REAC cable will provide REAC communications as well as power supply.

Turning the Power On

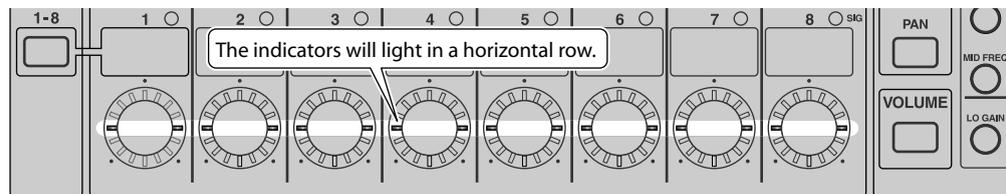
Once the connections have been completed, turn on power to your various devices in the order specified. By turning on devices in the wrong order, you risk causing malfunction and/or damage to speakers and other devices.

- * 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.
- * Always make sure to have the volume level turned down before switching on power. Even with the volume all the way down, you may still hear some sound when the power is switched on, but this is normal and does not indicate a malfunction.

- 1 Connect your peripheral equipment.**
- 2 On the front panel of the S-4000D, turn on the [POWER] switch; the power will turn on.**
When the S-4000D is powered up, the M-48 unit(s) connected to the S-4000D will also be powered up.
- 3 Switch on the power to your peripheral equipment.**

If the REAC connection is not established

If the REAC connection is not established when you turn on the power, the indicators around the edge of the [Control] knobs will light in a horizontal row, and the M-48 will not operate. In this case, it is possible that the REAC system has malfunctioned. Check whether there might be a problem with the REAC cables or connections.



Turning the Power Off

- 1 Switch off the power to your peripheral equipment.**
- 2 On the front panel of the S-4000D, turn off the [POWER] switch; the power will turn off.**
When the S-4000D is powered down, the power to the M-48 unit(s) connected to the S-4000D will also be turned off.

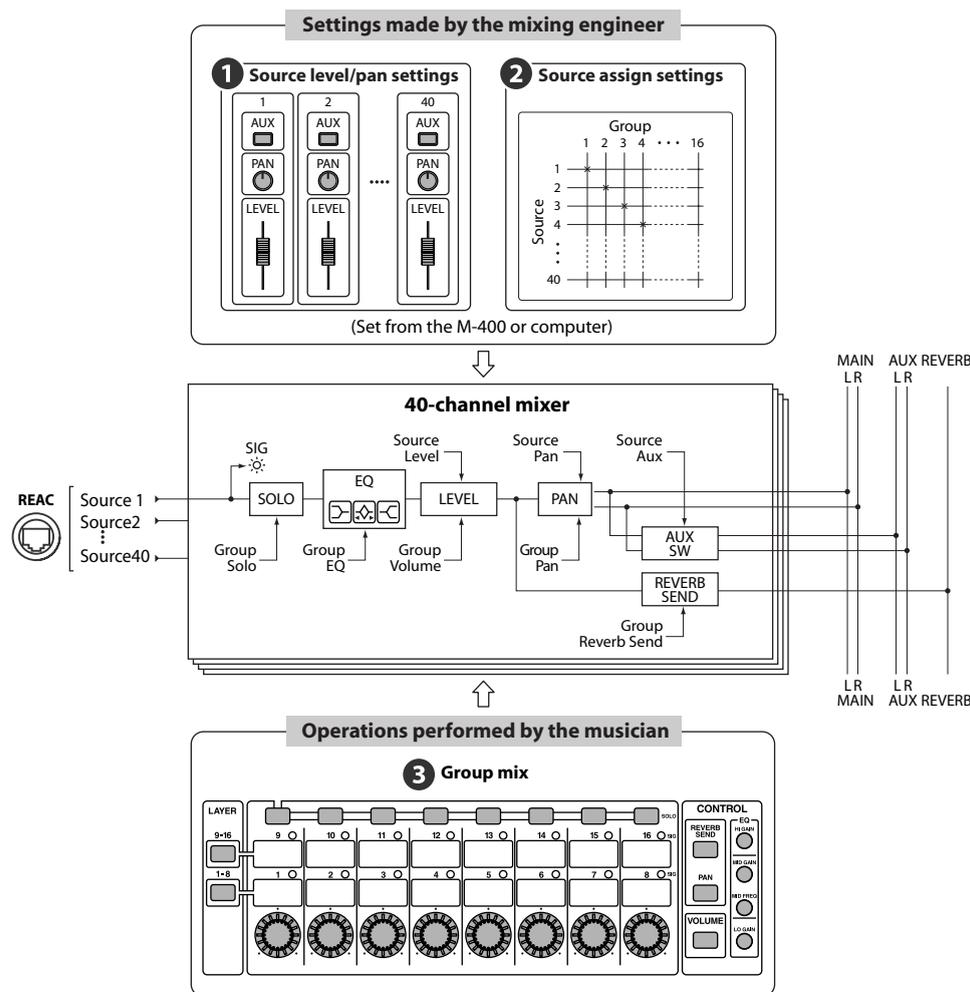
Making Settings for the M-48

In order to take full advantage of the M-48, you must correctly understand the M-48's settings and operation as a 40-channel mixer, and make the appropriate settings.

40-channel Mixer Settings and Operation

The sources 1–40 that are input via REAC are mixed by the M-48's 40-channel mixer. Settings and operation of the 40-channel mixer are typically shared between the mixing engineer and the musician.

The forty channels of digital audio sources being input to the M-48 via REAC are called "sources 1–40."



Settings made by the mixing engineer

These settings are made by the mixing engineer from the M-400 or computer. These can be set per M-48.

- * Settings by the mixing engineer are done from the screen of the M-400 V-Mixer when the M-48 is part of a V-Mixing System. If the M-48 is connected an alternative mixing console, its settings can be edited from a computer connected to the S-4000 or S-1608 systems.
- * For details on how to make these settings, refer to the owner's manual of the M-400 (Ver. 2.0 or later) or the S-4000 RCS Ver. 2.0.

1 Source level/pan settings

These settings specify the level, pan, and AUX switches for sources 1–40.

2 Source assign settings

These settings assign sources 1–40 to upto sixteen groups that can be controlled from the M-48.

Operations performed by the musician

These operations are performed by the musician on the M-48 itself.

3 Group mix

Volume, pan, reverb send, EQ, and solo settings can be made for each stereo group created by the source assign settings.

- * Group mix settings can also be viewed and edited from the M-400 or computer.

Other settings (settings made by the mixing engineer)

In addition to setting the source level, pan, and source assign settings, the mixing engineer can also make the following settings.

* For details on how to make these settings, refer to the owner's manual of the M-400 (Ver. 2.0 or later) or the S-4000 RCS Ver. 2.0.

Unit name assignment

In order to manage multiple M-48 units, a unit name (up to eight alphanumeric characters) can be assigned to each M-48 unit.

Preference settings

● Solo setting

Solo mode setting

This specifies the solo mode.

| Mode | Operation |
|--------|--|
| ADD ON | Multiple groups can be selected. The selected groups will be mixed for monitoring. |
| LAST | Only the last-selected group will be monitored. |

Operation when switching layers

When the group layer is switched, you can specify whether Solo will automatically be defeated for the layer that is no longer shown.

● [MEMORY] button setting

You can specify whether to disable the M-48's [STORE] button or [RECALL] button.

Preference settings (continued)

● Line out setting

Source selection

This selects the line out source.

| Setting | Operation |
|----------|--|
| MAIN BUS | The MAIN bus will be monitored. |
| AUX BUS | The signals mixed to the AUX bus by the AUX switches of the source level/pan settings (p. 21) will be monitored. |
| PHONES | Headphone output (before PHONES LEVEL) will be monitored. |

Low pass filter setting

This allows you to specify that only the low frequencies will be output from your floor monitor.

| Setting | Operation |
|---------|--|
| OFF | The low pass filter will not be used. |
| 80Hz | The frequencies below 80 Hz will be passed. |
| 120Hz | The frequencies below 120 Hz will be passed. |

MONO switch setting

If this is on, a monaural mix will be output.

Default Values of the Settings

Source level/pan settings

| Source | Level | Pan | AUX switch |
|--------------|---------|------------|------------|
| Source 1-16 | 0.0 dB | C (center) | ON |
| Course 17-40 | -Inf dB | | |

Source assign settings

| Group | Assigned source | Group | Assigned source |
|---------|-----------------|----------|-----------------|
| Group 1 | Source 1 | Group 9 | Source 9 |
| Group 2 | Source 2 | Group 10 | Source 10 |
| Group 3 | Source 3 | Group 11 | Source 11 |
| Group 4 | Source 4 | Group 12 | Source 13 |
| Group 5 | Source 5 | Group 13 | Source 13 |
| Group 6 | Source 6 | Group 14 | Source 14 |
| Group 7 | Source 7 | Group 15 | Source 15 |
| Group 8 | Source 8 | Group 16 | Source 16 |

Group mix

| Group | Volume | Pan | Reverb send | High gain | Mid gain | Mid frequency | Low gain | Solo |
|------------|--------|------------|-------------|-----------|----------|---------------|----------|------|
| Group 1-16 | 0.0 dB | C (center) | -Inf dB | 0.0 dB | 0.0 dB | 1.00 kHz | 0.0 dB | Off |

Unit name

NO NAME

Preference settings

● SOLO

| | |
|--------------------------|--------|
| MODE | ADD ON |
| LAYER select clears SOLO | No |

● MEMORY

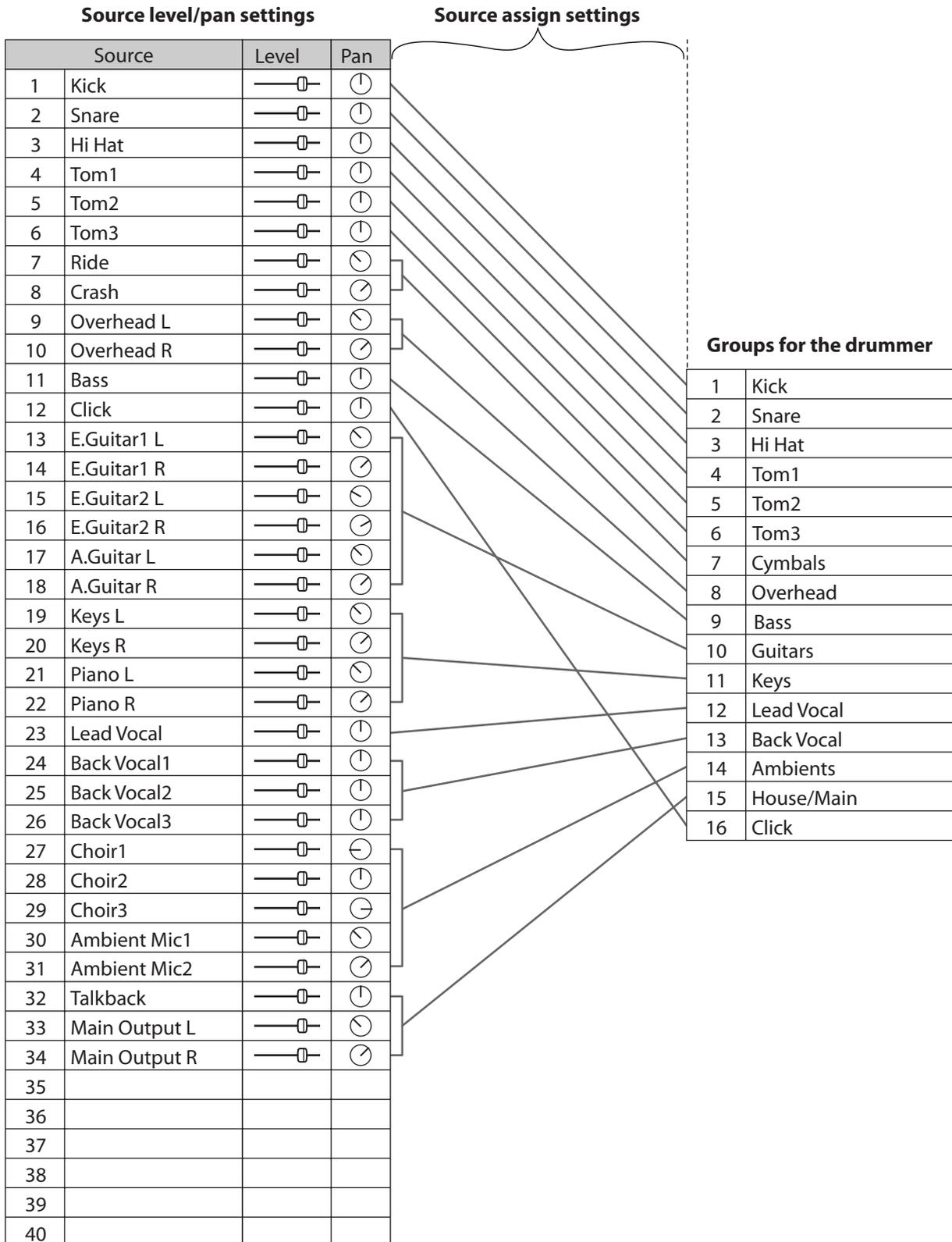
| | |
|-----------------------|----|
| Disable RECALL button | No |
| Disable STORE button | No |

● LINE OUT

| | |
|-----------------------|----------|
| SOURCE | MAIN BUS |
| LPF (Low pass filter) | OFF |
| MONO | OFF |

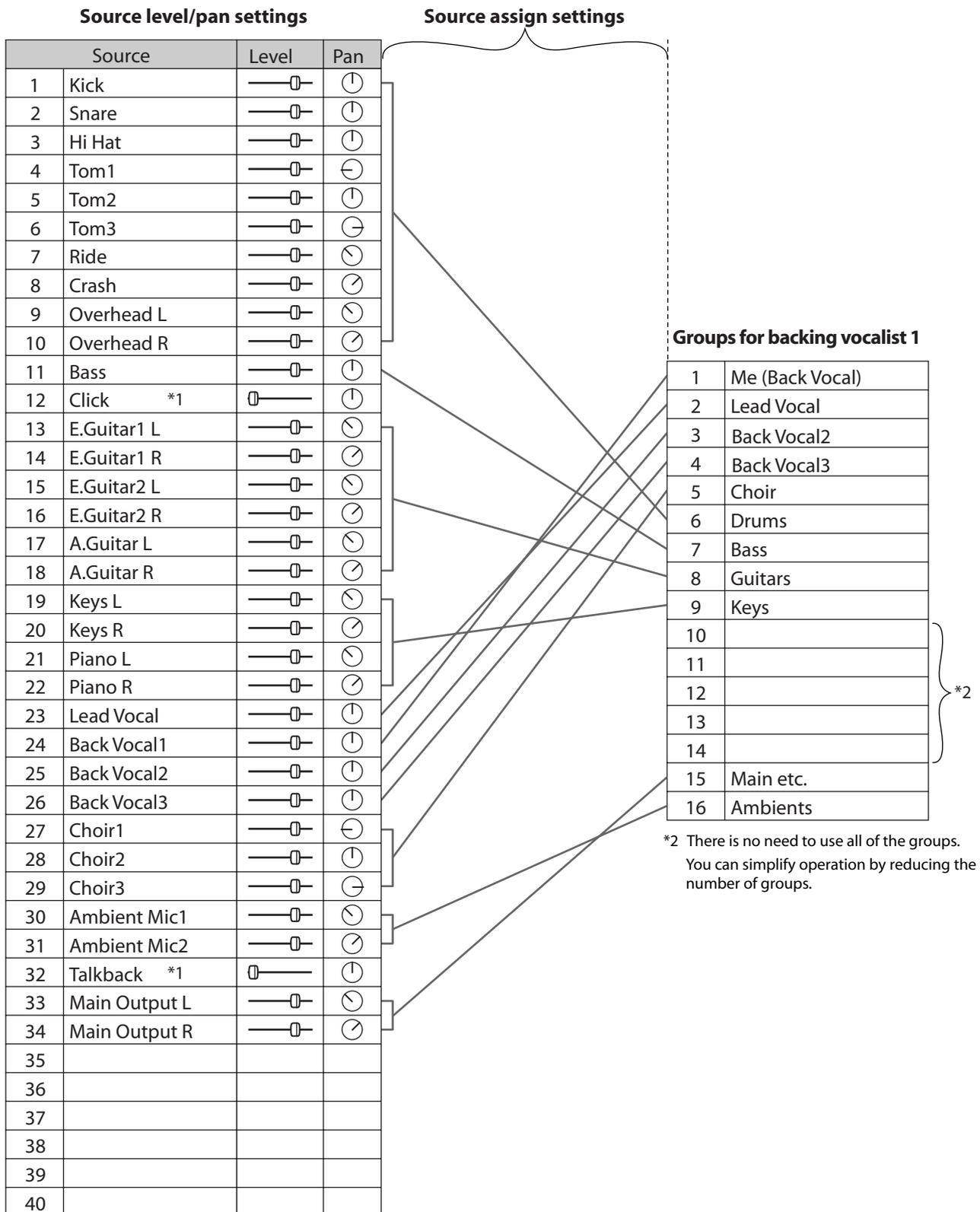
Example Setups

Example setup for the Drummer



* Level/pan settings shown are approximate.

Example setup for backing vocalists



* Level/pan settings shown are approximate.

*1 The level should be turned down for unused sources.

Adjusting the Mix

Adjusting the Volume of Each Group

Adjust the volume of each group to obtain an appropriate monitoring balance.

1 Press the [1-8] or [9-16] button to select the layer of the groups that you want to control.

The button of the displayed layer will light.

2 Press the [VOLUME] button.

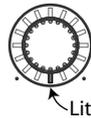
The [VOLUME] button will light; now you can use the [Control] knobs to adjust the volume.

3 Turn the [Control] knob of the group whose volume you want to adjust.

| Value | -Inf dB – +20.0 dB |
|-------|--------------------|
|-------|--------------------|

* The indicators around the edge of the [Control] knob indicate the approximate volume.

When the 6 o'clock indicator is lit, this means that the volume is "0.0 dB."



* The volume adjustment on the M-48 is a relative adjustment to the level specified by the M-400 or computer for each of that group's sources.

This means that the level of the M-48's 40-channel mixer may reach the maximum/minimum value before the volume setting reaches the maximum/minimum.

Returning the volume settings to their initial value

1 Press the [VOLUME] button.

2 While holding down the [VOLUME] button, press the button for the group (see table below) whose value you want to return to its initial setting.

The volume of the selected group will return to its initial value, and will be set to "0.0 dB."

| Group | Button |
|------------------|----------------------------|
| Individual group | That group's [SOLO] button |
| All groups 1-8 | [1-8] button |
| All groups 9-16 | [9-16] button |

* This operation cannot be executed if Store mode (p. 30) or Recall mode (p. 31) are on.

Listening to Each Group Individually (Solo)

Here's how to monitor just the audio of a specific group.

1 Press the [1-8] or [9-16] button to select the layer that includes the group you want to Solo.

The buttons for the displayed layer will light.

2 Press the [SOLO] button for the group that you want to monitor.

The [SOLO] button will blink, and Solo will turn on for the selected group.

* Press the [SOLO] button once again to turn Solo off.

* If a button in the layer not shown is blinking, this means that Solo is on for a group in that layer.

Adjusting the Pan of Each Group

Here's how to adjust the pan of each group.

1 Press the [1-8] or [9-16] button to select the layer that includes the group whose pan you want to adjust.

The buttons for the displayed layer will light.

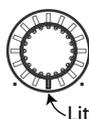
2 Press the [PAN] button.

The [PAN] button will light; now you can use the [Control] knobs to adjust the pan.

3 Turn the [Control] knob for the group whose pan you want to adjust.

* The indicators around the [Control] knobs indicate the approximate pan value.

When the 6 o'clock indicator is lit, the pan is in the "center" position.



* The pan adjustment on the M-48 is a relative adjustment to the pan specified by the M-400 or computer for each of that group's sources.

This means that the pan of the M-48's 40-channel mixer may reach the maximum/minimum value before the pan setting reaches the maximum/minimum.

Returning the pan setting to its initial value

1 Press the [PAN] button.

2 While holding down the [PAN] button, press the button for the group (see table below) whose value you want to return to its initial setting.

The pan of the selected group will return to its initial value, and will be set to "center."

| Group | Button |
|------------------|----------------------------|
| Individual group | That group's [SOLO] button |
| All groups 1-8 | [1-8] button |
| All groups 9-16 | [9-16] button |

* This operation cannot be executed if Store mode (p. 30) or Recall mode (p. 31) are on.

Adjusting the Input Level of AUX IN

Here's how to adjust the input level of the AUX IN L/R jack.

You can use this to adjust the input level when a device such as the BOSS Dr. Rhythm series or EDIROL R-09 series is connected to the AUX IN L/R jack.

1 Turn the [AUX IN] knob to adjust the AUX IN input level.

| [AUX IN] knob position | Value |
|------------------------|-----------------|
| MIN-MAX | -Inf dB -0.0 dB |

* When connection cables with resistors are used, the volume level of equipment connected to the input (AUX IN) may be low. If this happens, use connection cables that do not contain resistors.

Using the Built-in Ambient Mic

An ambient mic is built into the M-48. This allows you to hear the sounds of your surroundings even while monitoring the audio.

1 Turn the [AMBIENT MIC] knob to adjust the input level of the ambient mic.

| [AMBIENT MIC] knob position | Value |
|-----------------------------|--------------------|
| MIN-MAX | -Inf dB - +10.0 dB |

* Acoustic feedback may occur depending on the position of the ambient mic relative to the speakers. If so, take the following actions.

1. Turn down the ambient mic level.
2. Adjust the M-48 to move the ambient mic away from the speakers.
3. Lower the volume of the speakers.

Using Effects

Applying Reverb to Each Group

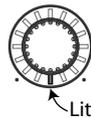
Here's how to apply reverb to the sound of each group.

- 1 Press the [1-8] or [9-16] button to select the layer whose reverb you want to adjust.
- 2 Press the [REVERB] button.
The [REVERB] button will light, and reverb will turn on.
* Reverb will turn off if you press the [REVERB] button once again.
- 3 Press the [REVERB SEND] button.
The [REVERB SEND] button will light; now you can use the [Control] knobs to adjust the reverb send.
- 4 Turn the [Control] knobs of the groups to which you want to apply reverb, adjusting their reverb send.

| Parameter | Value |
|-------------|--------------------|
| Reverb send | -Inf dB – +10.0 dB |

* The indicators around the [Control] knobs indicate the approximate reverb send value.

When the 6 o'clock indicator is lit, the reverb send is at the "0.0 dB" setting.



Returning the reverb send setting to its initial value

- 1 Press the [REVERB SEND] button.
- 2 While holding down the [REVERB SEND] button, press the button for the group (see table below) whose reverb send you want to return to its initial setting.

The reverb send of the selected group will be set to its initial setting, and will be set to "-Inf dB."

| Group | Button |
|------------------|----------------------------|
| Individual group | That group's [SOLO] button |
| All groups 1–8 | [1-8] button |
| All groups 9–16 | [9-16] button |

* This operation cannot be executed if Store mode (p. 30) or Recall mode (p. 31) are on.

Applying EQ to Each Group

Here's how to apply EQ to the sound of each group.

- 1 Press the [1-8] or [9-16] button to select the layer whose EQ you want to adjust.
- 2 Press the button for the EQ setting that you want to adjust (see table below).

The selected button will light; now you can use the [Control] knobs to adjust the EQ parameters.

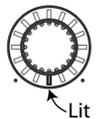
| Button | Parameter to adjust |
|-------------------|---------------------|
| [HI GAIN] button | High gain |
| [MID GAIN] button | Mid gain |
| [MID FREQ] button | Mid frequency |
| [LO GAIN] button | Low gain |

- 3 Turn the [Control] knob of the desired group to adjust its EQ parameter.

| Parameter | Range | EQ type |
|---------------|---|----------|
| High gain | -15.0 dB – +15.0 dB * Center frequency: 10 kHz | Shelving |
| Mid gain | -15.0 dB – +15.0 dB | Peaking |
| Mid frequency | 20 Hz – 20.0 kHz | |
| Low gain | -15.0 dB – +15.0 dB * Center frequency: 120 Hz | Shelving |

* The indicators around the [Control] knobs indicate the approximate value of the EQ parameter.

When the 6 o'clock indicator is lit, the gain is at "0.0 dB."



Returning an EQ parameter to its initial value

- 1 Press the button of the EQ parameter that you want to reset to its initial value (see table below).

The following table shows the button for each EQ parameter and its initial value.

| Parameter | Button | Initial value |
|---------------|-------------------|---------------|
| High gain | [HI GAIN] button | 0.0 dB |
| Mid gain | [MID GAIN] button | 0.0 dB |
| Mid frequency | [MID FREQ] button | 1.00 kHz |
| Low gain | [LO GAIN] button | 0.0 dB |

- 2 While holding down the button you selected in step 1, press the button for the group(s) whose setting you want to return to the initial value (see table below).

The EQ parameter of the selected group will return to its initial value.

| Group | Button |
|------------------|----------------------------|
| Individual group | That group's [SOLO] button |
| All groups 1–8 | [1-8] button |
| All groups 9–16 | [9-16] button |

* This operation cannot be executed if Store mode (p. 30) or Recall mode (p. 31) are on.

Headphones Output and Line Out Adjustments

Adjusting the Headphones Output Level

Here's how to adjust the output level of the sound being monitored through headphones.

- 1 Turn the PHONES [VOLUME] knob to adjust the headphone output level.

| [VOLUME] knob position | Range |
|------------------------|--------------------|
| MIN-MAX | -Inf dB – +10.0 dB |

- 2 Turn the rear panel [ATT] knob to obtain the most suitable output level.

Adjust the output level as appropriate for the characteristics of the headphones you're using.

| [ATT] knob position | Range |
|---------------------|-------------|
| MAX-0 dB | -50 dB-0 dB |

Adjusting the Headphones Output Tone

Here's how to adjust the tone of the headphone's lower and upper ranges to achieve comfortable listening.

- 1 Turn the [BASS] or [TREBLE] knob to adjust the tone of the lower range or upper range.

| Knob (function) | Range |
|--|---|
| [BASS] knob (adjusts the lower range) | -15.0 dB – +15.0 dB * Center frequency: 120 Hz |
| [TREBLE] knob (adjusts the upper range) | -15.0 dB – +15.0 dB * Center frequency: 10kHz |

Applying a Limiter to the Headphones Output

When monitoring through headphones, you can protect your hearing by applying a limiter to instantly lower the volume when an unexpectedly loud sound occurs.

- 1 Turn the [LIMITER] knob to adjust the limiter effect (threshold level).

Adjust this so that the indicator above the [LIMITER] knob lights occasionally during the performance.

| [LIMITER] knob position | Range |
|-------------------------|-------------------|
| OFF | Off |
| OFF-MAX | 0.0 dB – -40.0 dB |

- * The indicator above the [LIMITER] knob will light when the limiter operates.
- * When the limiter is off, clipping noise may occur if the signal sent to the headphones is too great. If this occurs, take the following actions.
 - Lower the volume of each group.
 - Adjust the [BASS] and [TREBLE] knobs so that their settings are not excessive.
- * When the limiter is operating, clipping noise may occur in the headphones, depending on the audio sources being mixed by the M-48. If this occurs, make the following adjustments to minimize the noise.
 - Lower the volume of each group.
 - Adjust the threshold level.

Adjusting the Line Out Output Level

Here's how to adjust the output level of the LINE OUT L/R jack. This allows you to adjust the output level when a floor monitor is connected to the LINE OUT L/R jack.

- 1 Turn the LINE OUT [VOLUME] knob to adjust the output level of the line out.

| [VOLUME] knob position | Range |
|------------------------|--------------------|
| MIN-MAX | -Inf dB – +10.0 dB |

WARNING

- The limiter acts upon the input signal so as to prevent unexpected surges in the level. However, the actual volume at the final stage is determined by the settings of the PHONES [VOLUME] knob, [ATT] knob, and LINE OUT [VOLUME] knob.
- With certain settings for the output level, the resulting sound could be of a volume level capable of causing permanent hearing difficulties. Do not use this device at high volumes for an extended period of time. If you should experience any loss of hearing or ringing in your ears, you should immediately stop using this product, and consult a medical professional.



Using the Memory Functions

About Memory

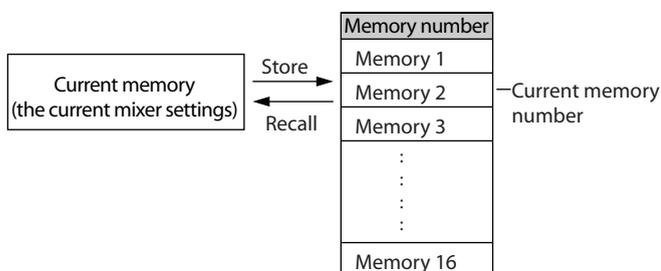
The current mixer settings are held in “current memory.”

Current memory contains the following settings.

- Source level/pan settings
- Source assignment settings
- Group mix
(volume, pan, reverb send, EQ, and solo for each group)
- Reverb on/off

The M-48 provides 16 memory locations to which the current memory can be stored and from which a desired memory can be recalled.

The most-recently stored or recalled memory number is called the “current memory number.”



Store/recall operations can be performed from the M-48 itself, the M-400, or a computer.

- * With the factory settings, memory locations 1–16 contains the default mixer settings.

Backing up the current memory

The current memory is backed up to the M-48's internal flash memory approximately every 30 seconds. The next time the M-48 is started up, the backed up settings will be reproduced.

If you want to immediately back up the current memory, perform the following step.

1 Hold down the [STORE] button for approximately two seconds.

The current memory will be backed up.

- * This operation does not provide storage to memory numbers 1–16. If you want to carry out storage, proceed as described in “Storing Mixer Settings to Memory” on this page.

Storing Mixer Settings to Memory (Store)

Here's how to store the current memory.

- * You cannot execute this operation if the [STORE] button has been disabled in the preference settings (p. 22).

1 Press the [STORE] button.

The [STORE] button will light, and Store mode will be on.

At the same time, all [SOLO] buttons will start blinking. The [SOLO] button of the current memory number will be lit.

- * Store mode will turn off if you press the [STORE] button once again.
- * The [1-8] or [9-16] button will blink to indicate the range of memory numbers shown.

| Button | Range of memory numbers |
|---------------|-------------------------|
| [1-8] button | 1–8 |
| [9-16] button | 9–16 |

2 Press the [1-8] or [9-16] button to select the desired range of memory numbers.

3 Press the [SOLO] button of the memory number into which you want to store the current settings.

The [STORE] button and the [SOLO] button you selected as the storage destination will blink.

4 Press the [STORE] button to execute the Store operation.

You can also execute the Store operation by pressing the blinking [SOLO] button.

When the Store operation has been completed, the [STORE] button will go out and Store mode will turn off.

- * If you decide to cancel without storing, press any button that's not blinking.
- * Storing will take approximately two seconds. During this time, the M-48 will not be operable.

Recalling Mixer Settings from Memory (Recall)

Here's how to recall mixer settings into current memory.

- * You cannot execute this operation if the [RECALL] button has been disabled in the preference settings (p. 22).

1 Press the [RECALL] button.

The [RECALL] button will light, and Recall mode will be on.

At the same time, all [SOLO] buttons will start blinking. The [SOLO] button of the current memory number will be lit.

- * Recall mode will turn off if you press the [RECALL] button once again.
- * The [1-8] or [9-16] button will blink to indicate the range of memory numbers shown.

| Button | Range of memory numbers |
|---------------|-------------------------|
| [1-8] button | 1-8 |
| [9-16] button | 9-16 |

2 Press the [1-8] or [9-16] button to select the desired range of memory numbers.

3 Press the [SOLO] button of the memory number that you want to recall.

The [RECALL] button and the [SOLO] button you selected as the target of the recall will blink.

4 Press the [RECALL] button to execute the Recall operation.

You can also execute the Recall operation by pressing the blinking [SOLO] button.

When the recall has been completed, the [RECALL] button will go out and Recall mode will turn off.

- * If you decide to cancel without recalling, press any button that's not blinking.

Returning to the Factory Settings (Factory Reset)

Here's how to return all data in the M-48 to the factory-set condition (Factory Reset).

- * If the M-48 contains important data, perform the appropriate operations on the M-400 or computer to save the M-48's settings to USB memory or to your computer before you perform the factory reset.

For details on how to save data, refer to the owner's manual of the M-400 (Ver. 2.0 or later) or the S-4000 RCS Ver. 2.0.

1 Turn on the power (Connect the Cat5e cable) while holding down the [STORE] button and the group 1 [SOLO] button (p. 20).

The factory reset will be executed. When it is completed, all indicators of the top panel will blink.

The factory reset will require approximately 30 seconds.

2 Turn off the power (p. 20).

Main Specifications

| | |
|---|---|
| Number of Input Channels | 43 (40 in, STEREO AUX in, 1 AMBIENT MIC in) |
| Number of Output Channels | 4 (STEREO LINE out, STEREO PHONES out) |
| AD/DA Conversion | Sample Rate: 96.0kHz or 48.0 kHz or 44.1 kHz Signal Processing: 24 bits * The sampling frequency of M-48 to be set automatically according to it of the REAC Master device. |
| Frequency Response | PHONES jack (1,2): -4 dB / +0 dB (40 ohms load, PHONES ATT max, 150 mW) LINE OUT L/R jacks: -2 dB / +0 dB (20k ohms load, -6 dBu) * Sample Rate: 96.0 kHz * Input: S-1608 Input (Input sens: +4 dBu, 20 Hz to 20 kHz) |
| Residual Noise Level (PHONES ATT: Center, IHF-A, typ.) | -88 dBu (All Knobs: Min) -87 dBu (PHONES Vol: Unity, AUX IN Vol: Max, Group control knob 1 to 16: Min) -86 dBu (PHONES Vol: Unity, AUX IN Vol: Min, Group control knob 1 to 16: Unity) -72 dBu (PHONES Vol: Max, AUX IN Vol: Max, Group control knob 1 to 16: Max) * Input 150 ohms terminate * Output Connector: PHONES jack * Sample Rate: 96.0 kHz * S-1608 Input Sens: +4 dBu |
| Nominal Input Level | AUX IN L/R jack: -16 dBu (Vol: Max) |
| Input Impedance | AUX IN L/R jack: 10 K ohms |
| Non Clip Maximum Input level | AUX IN L/R jack: +2 dBu |
| Nominal Output Level | LINE OUT L/R jacks: -6 dBu (LINE OUT Vol: Unity, Load impedance: 10 k ohms) LINE OUT REC L/R jack: -12 dBu (LINE OUT Vol: Unity, Load impedance: 10 k ohms) |
| Output Impedance | PHONES jacks (1, 2): 10 ohms LINE OUT L/R jacks: 600 ohms LINE OUT REC L/R jack: 1 k ohms |
| Recommended Load Impedance | PHONES jacks (1, 2): 16 ohms or greater (Composition impedance of 1 and 2) LINE OUT L/R jacks: 10 k ohms or greater LINE OUT REC L/R jack: 10 k ohms or greater |
| Non Clip Maximum Output level | PHONES jacks (1, 2): 250 mW + 250 mW (1 or 2, 1 kHz, 40 ohms load) LINE OUT L/R jacks: +12 dBu (1 kHz, 10 k ohms load) LINE OUT REC L/R jack: +6 dBu (1 kHz, 10 k ohms load) |
| Connectors | REAC port: RJ-45 EtherCon type AUX IN L/R jack: Stereo miniature phone type LINE OUT L/R jacks: 1/4 inch TRS phone type LINE OUT REC L/R jack: Stereo miniature phone type PHONES jacks: Stereo miniature phone type and Stereo 1/4 inch phone type |
| Power Supply | DC +48 V (It is supplied by S-4000D.) |
| Power Consumption | 13 W |
| Dimensions | 297.0 (W) x 171.0 (D) x 67.0 (H) mm 11-3/4 (W) x 6-3/4 (D) x 2-11/16 (H) inches |
| Weight | 1.5kg / 3 lbs 5 oz (M-48) 0.6kg / 1 lb 6 oz (Mounting bracket and bracket tray) |
| Operation Temperature | 0 to +40 degrees Celsius +32 to +104 degrees Fahrenheit |
| Accessories (Included) | Mounting bracket/bracket tray x 1, Mounting bracket attachment kit (Wing nut: for 3/8 inch screw x 1, Washers: for 3/8 inch screw x 2, Nut: for 5/8 inch screw x 1, Rubber washer x 1, Screws for fastening the M-48 x 2), Screws for attaching the APC-33 all purpose clamp x 4, Ferrite core x 1, REAC connector cover x 1, Owner's Manual |
| Options | Live mixing console: M-400, Stage unit: S-1608, Stage unit: S-4000S, FOH unit: S-0816, FOH unit: S-4000H, Splitter & power distributor: S-4000D, Cat5e Ethernet crossover cable with Neutrik® EtherCon® plug: SC-W20F (20 m), Cat5e Ethernet crossover cable with Neutrik® EtherCon® plug: SC-W100S (100 m), Cat5e Ethernet crossover cable with Neutrik® EtherCon® plug and reel: W100S-R (100 m), In-Ear monitor: RH-PM5, All purpose clamp: APC-33 |

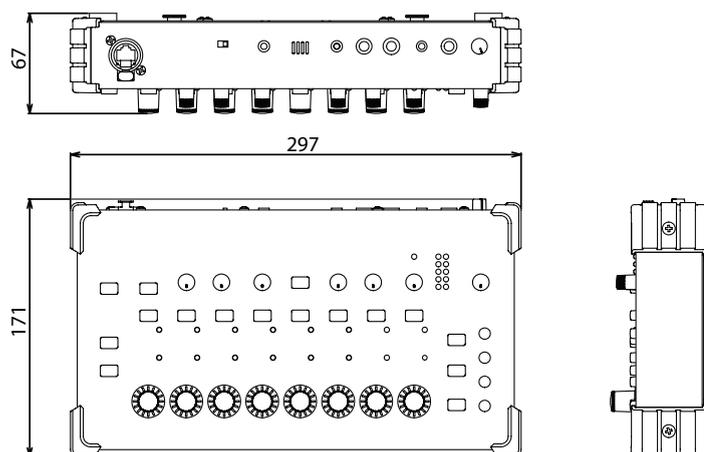
* 0dBu: 0.775Vrms * In the interest of product improvement, the specifications and/or appearance of this unit are subject to change without prior notice.

* The M-48's specifications were measured in connection with below mentioned devices.

Input Unit: S-1608, Splitter & Power Distributor: S-4000D, S-1608 Input Sens: +4 dBu,

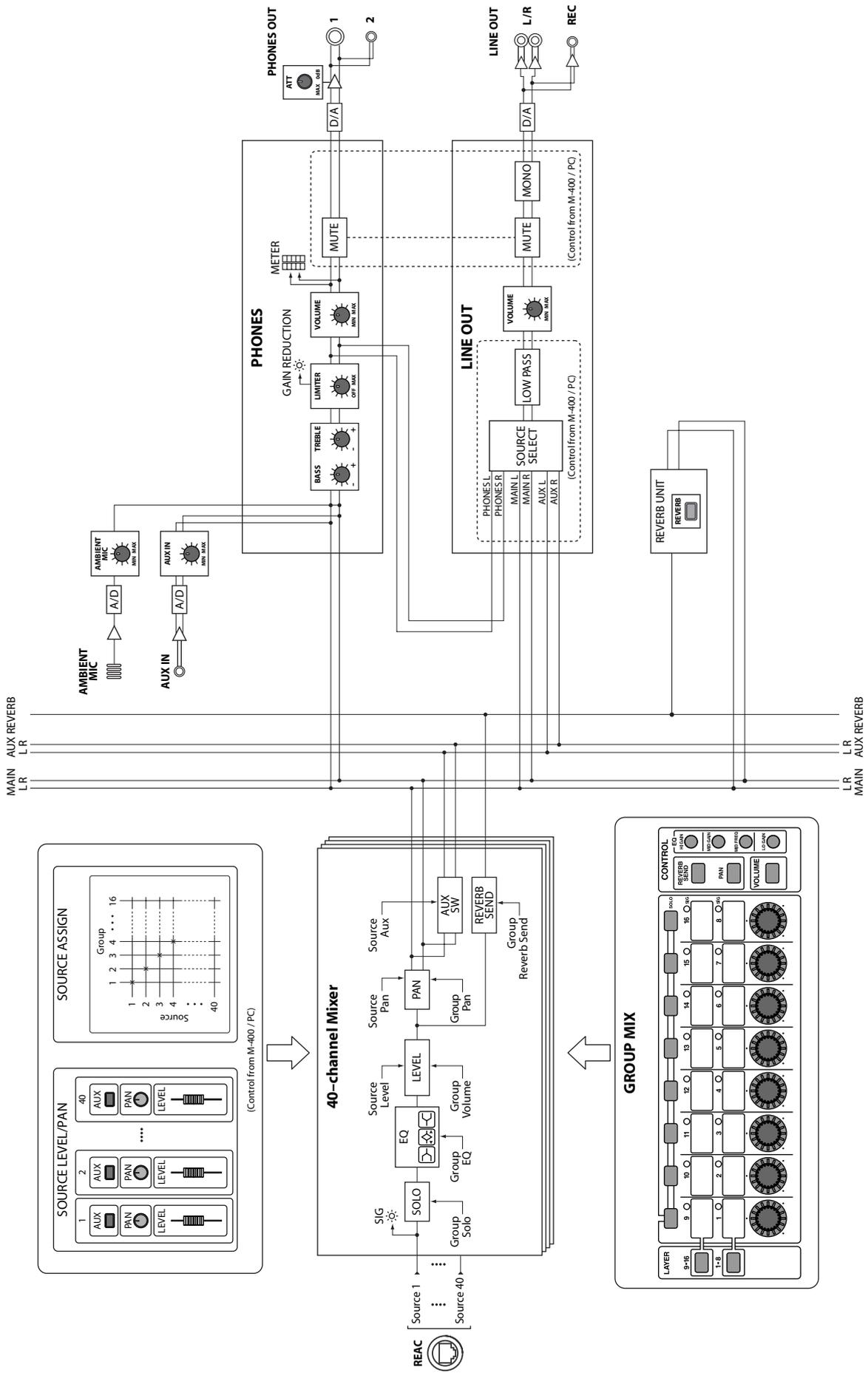
The specifications were measured when Ch1 to Ch16 of S-1608 were assigned as group 1 to 16 of M-48.

Dimensions



* Dimensions are shown in millimeters.

Block Diagram



Troubleshooting

| Symptom | Cause |
|---|--|
| No sound. | <ul style="list-style-type: none"> The M-48's output has been muted by an operation from the M-400 or computer. To cancel the mute using the M-48, press any of the top panel buttons. The REAC connection has not been established (p. 20). Check whether there might be a problem with the REAC cable or connections. The settings for the source/level or Source Assign, made on either the M-400 or on a computer, are inappropriate (p. 21–25). In situations where an M-400 or a computer is unavailable, the settings for the source/level or Source Assign can be modified by means of a Recall from memory (p. 31) or a Factory Reset (p. 31). |
| Can't adjust the audio that you want to monitor. | <ul style="list-style-type: none"> The source you're trying to adjust is not assigned to a group. |
| Pressing the [SOLO] button does not do what you expect. | <ul style="list-style-type: none"> The Solo mode setting has been changed from the M-400 or computer (p. 22). |
| Can't perform recall/store operations. | <ul style="list-style-type: none"> Recall/store operations on the M-48 have been disabled from the M-400 or computer. |
| The volume level of the instrument connected to the AUX IN L/R jack is too low. | <ul style="list-style-type: none"> You are using a connection cable that contains a built-in resistor. Use a connection cable that does not contain a resistor. |

For EU Countries



- UK** This symbol indicates that in EU countries, this product must be collected separately from household waste, as defined in each region. Products bearing this symbol must not be discarded together with household waste.
- DE** Dieses Symbol bedeutet, dass dieses Produkt in EU-Ländern getrennt vom Hausmüll gesammelt werden muss gemäß den regionalen Bestimmungen. Mit diesem Symbol gekennzeichnete Produkte dürfen nicht zusammen mit dem Hausmüll entsorgt werden.
- FR** Ce symbole indique que dans les pays de l'Union européenne, ce produit doit être collecté séparément des ordures ménagères selon les directives en vigueur dans chacun de ces pays. Les produits portant ce symbole ne doivent pas être mis au rebut avec les ordures ménagères.
- IT** Questo simbolo indica che nei paesi della Comunità europea questo prodotto deve essere smaltito separatamente dai normali rifiuti domestici, secondo la legislazione in vigore in ciascun paese. I prodotti che riportano questo simbolo non devono essere smaltiti insieme ai rifiuti domestici. Ai sensi dell'art. 13 del D.Lgs. 25 luglio 2005 n. 151.
- ES** Este símbolo indica que en los países de la Unión Europea este producto debe recogerse aparte de los residuos domésticos, tal como este regulado en cada zona. Los productos con este símbolo no se deben depositar con los residuos domésticos.
- PT** Este símbolo indica que nos países da UE, a recolha deste produto deverá ser feita separadamente do lixo doméstico, de acordo com os regulamentos de cada região. Os produtos que apresentem este símbolo não deverão ser eliminados juntamente com o lixo doméstico.
- NL** Dit symbool geeft aan dat in landen van de EU dit product gescheiden van huishoudelijk afval moet worden aangeboden, zoals bepaald per gemeente of regio. Producten die van dit symbool zijn voorzien, mogen niet samen met huishoudelijk afval worden verwijderd.
- DK** Dette symbol angiver, at i EU-lande skal dette produkt opsamlles adskilt fra husholdningsaffald, som defineret i hver enkelt region. Produkter med dette symbol må ikke smides ud sammen med husholdningsaffald.
- NO** Dette symbolet indikerer at produktet må behandles som spesialavfall i EU-land, iht. til retningslinjer for den enkelte regionen, og ikke kastes sammen med vanlig husholdningsavfall. Produkter som er merket med dette symbolet, må ikke kastes sammen med vanlig husholdningsavfall.

- SE** Symbolen anger att i EU-länder måste den här produkten kasserars separat från hushållsavfall, i enlighet med varje regions bestämmelser. Produkter med den här symbolen får inte kasserars tillsammans med hushållsavfall.
- FI** Tämä merkintä ilmaisee, että tuote on EU-maissa kerättävä erillään kotitalousjätteistä kunkin alueen voimassa olevien määräysten mukaisesti. Tällä merkinnällä varustettuja tuotteita ei saa hävittää kotitalousjätteiden mukana.
- HU** Ez a szimbólum azt jelenti, hogy az Európai Unióban ezt a terméket a háztartási hulladéktól elkülönítve, az adott régióban érvényes szabályozás szerint kell gyűjteni. Az ezzel a szimbólummal ellátott termékeket nem szabad a háztartási hulladék közé dobni.
- PL** Symbol oznacza, że zgodnie z regulacjami w odpowiednim regionie, w krajach UE produktu nie należy wyrzucać z odpadami domowymi. Produktów opatrzonych tym symbolem nie można utylizować razem z odpadami domowymi.
- CZ** Tento symbol udává, že v zemích EU musí být tento výrobek sbíráán odděleně od domácího odpadu, jak je určeno pro každý region. Výrobky nesoucí tento symbol se nesmí vyhazovat spolu s domácím odpadem.
- SK** Tento symbol vyjadruje, že v krajinách EÚ sa musí zber tohto produktu vykonávať oddelene od domového odpadu, podľa nariadení platných v konkrétnej krajine. Produkty s týmto symbolom sa nesmú vyhazovať spolu s domovým odpadom.
- EE** See sümbol näitab, et EL-i maades tuleb see toode olemprügist eraldi koguda, nii nagu on igas piirkonnas määratletud. Selle sümboliga märgitud tooteid ei tohi ära visata koos olmeprügiga.
- LT** Šis simbolis rodo, kad ES šalyse šis produktas turi būti surenkamas atskirai nuo buitinių atliekų, kaip nustatyta kiekviename regione. Šiuo simboliu paženklinėti produktai neturi būti išmetami kartu su buitiniems atliekomis.
- LV** Šis simbols norāda, ka ES valstīs šo produktu jāievāc atsevišķi no mājsaimniecības atkritumiem, kā noteikts katrā reģionā. Produkts ar šo simbolu nedrīkst izmest kopā ar mājsaimniecības atkritumiem.
- SI** Ta simbol označuje, da je treba proizvod v državah EU zbirati ločeno od gospodinskih odpadkov, tako kot je določeno v vsaki regiji. Proizvoda s tem znakom ni dovoljeno odlagati skupaj z gospodinskimi odpadki.
- GR** Το σύμβολο αυτό υποδηλώνει ότι στις χώρες της Ε.Ε. το συγκεκριμένο προϊόν πρέπει να συλλέγεται χωριστά από τα υπόλοιπα οικιακά απορρίμματα. Συμφωνα με όσα προβλέπονται σε κάθε περιοχή. Τα προϊόντα που φέρουν το συγκεκριμένο σύμβολο δεν πρέπει να απορρίπτονται μαζί με τα οικιακά απορρίμματα.



For EU Countries

This product complies with the requirements of EMC Directive 2004/108/EC.

For the USA

FEDERAL COMMUNICATIONS COMMISSION RADIO FREQUENCY INTERFERENCE STATEMENT

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.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) this device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

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

NOTICE

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

AVIS

Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

For C.A. US (Proposition 65)

WARNING

This product contains chemicals known to cause cancer, birth defects and other reproductive harm, including lead.

For China

有关产品中所含有害物质的说明

本资料就本公司产品中所含的特定有害物质及其安全性予以说明。

本资料适用于 2007 年 3 月 1 日以后本公司所制造的产品。

环保使用期限



此标志适用于在中国国内销售的电子信息产品，表示环保使用期限的年数。所谓环保使用期限是指在自制造日起的规定的期限内，产品中所含的有害物质不致引起环境污染，不会对人体、财产造成严重的不良影响。环保使用期限仅在遵照产品使用说明书，正确使用产品的条件下才有效。不当的使用，将会导致有害物质泄漏的危险。

产品中有毒有害物质或元素的名称及含量

| 部件名称 | 有毒有害物质或元素 | | | | | |
|----------------|-----------|-------|-------|-------------|-----------|-------------|
| | 铅(Pb) | 汞(Hg) | 镉(Cd) | 六价铬(Cr(VI)) | 多溴联苯(PBB) | 多溴二苯醚(PBDE) |
| 外壳(壳体) | × | ○ | ○ | ○ | ○ | ○ |
| 电子部件(印刷电路板等) | × | ○ | × | ○ | ○ | ○ |
| 附件(电源线、交流适配器等) | × | ○ | ○ | ○ | ○ | ○ |

○：表示该有毒有害物质在该部件所有均质材料中的含量均在 SJ/T11363-2006 标准规定的限量要求以下。

×：表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T11363-2006 标准规定的限量要求。

因根据现有的技术水平，还没有什么物质能够代替它。

Information

When you need repair service, call your nearest Roland Service Center or authorized Roland distributor in your country as shown below.

ASIA

INDONESIA

PT. Citra Inti Rama
JL. Cideng Timur No. 15J-15O
Jakarta Pusat
INDONESIA
TEL: (021) 632-4170

CHINA

Roland Shanghai Electronics Co., Ltd.
5F. No.1500 Pingliang Road
Shanghai 200090, CHINA
TEL: (021) 5580-0800

Roland Shanghai Electronics Co., Ltd.
(BEIJING OFFICE)
10F. No.18 3 Section Anhuaxili
Chaoyang District Beijing
100011 CHINA
TEL: (010) 6426-5050

KOREA

KOREA AVICS CO., LTD.
Unit B-2208, Woolimblue9,
#240-21, Yeomchang-dong,
Gangseo-gu, Seoul, Korea
Tel: 02-322-3264

TAIWAN

ROLAND TAIWAN
ENTERPRISE CO., LTD.
Room 5, 9fl. No. 112 Chung Shan
N.Road Sec.2, Taipei, TAIWAN,
R.O.C.
TEL: (02) 2561 3339

SINGAPORE/ MALAYSIA

Roland Asia Pacific Sdn.
Bhd.
45-1, Block C2, Jalan PJU 1/39,
Dataran Prima, 47301 Petaling
Jaya, Selangor, MALAYSIA
TEL: 3-7805-3263

CENTRAL/LATIN AMERICA

BRAZIL

Roland Brasil Ltda.
Rua San Jose, 211
Parque Industrial San Jose
Cotia - Sao Paulo - SP, BRAZIL
TEL: (011) 4615 5666

Other CENTRAL/ LATIN AMERICA

Roland Systems Group U.S.
425 Sequoia Drive Suite 114,
Bellingham, Washington,
98226 USA
TEL: 360-594-4282

EUROPE

AUSTRIA/BELGIUM/ FRANCE/GERMANY/ HOLLAND/ LUXEMBOURG/ PORTUGAL/SPAIN/ SWITZERLAND

Roland Iberia, S.L.
Paseo García Faria, 33-35
08005 Barcelona SPAIN
TEL: 93 493 91 00

CROATIA

ART-CENTAR
Degenova 3.
HR - 10000 Zagreb
TEL: (1) 466 8493

CZECH REP.

CZECH REPUBLIC
DISTRIBUTOR s.r.o
Voctárova 247/16
CZ - 180 00 PRAHA 8,
CZECH REP.
TEL: (2) 830 20270

DENMARK

Roland Scandinavia A/S
Nordhavnsvej 7, Postbox 880,
DK-2100 Copenhagen
DENMARK
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FINLAND

Roland Scandinavia As,
Filial Finland
Elannontie 5
FIN-01510 Vantaa, FINLAND
TEL: (09) 68 24 020

HUNGARY

Roland East Europe Ltd.
Warehouse Area 'DEPO' Pf.83
H-2046 Torokbalint, HUNGARY
TEL: (23) 511011

NORWAY

Roland Scandinavia Avd.
Kontor Norge
Lilleakerveien 2 Postboks 95
Lilleaker N-0216 Oslo
NORWAY
TEL: 2273 0074

POLAND

ROLAND POLSKA SP. Z O.O.
ul. Kty Grodziskie 16B
03-289 Warszawa, POLAND
TEL: (022) 678 9512

ROMANIA

FBS LINES
Piata Libertatii 1,
535500 Gheorgheni, ROMANIA
TEL: (266) 364 609

RUSSIA

MuTek
Dorozhnaya ul.3.korp.6
117 545 Moscow, RUSSIA
TEL: (095) 981-4967

SLOVAKIA

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Povazská 18.
SK - 940 01 Nové Zámky
TEL: (035) 6424 330

SWEDEN

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S-131 30 Nacka SWEDEN
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Enterprise Park, Swansea
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TEL: (02) 9982 8266
For New Zealand
TEL: (09) 3098 715

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