

MOTIF-RACK ES

OWNER'S MANUAL

TONE GENERATOR MOTIF-RACK ES



SPECIAL MESSAGE SECTION

This product utilizes batteries or an external power supply (adapter). DO NOT connect this product to any power supply or adapter other than one described in the manual, on the name plate, or specifically recommended by Yamaha.

WARNING: Do not place this product in a position where anyone could walk on, trip over, or roll anything over power or connecting cords of any kind. The use of an extension cord is not recommended! If you must use an extension cord, the minimum wire size for a 25' cord (or less) is 18 AWG. NOTE: The smaller the AWG number, the larger the current handling capacity. For longer extension cords, consult a local electrician.

This product should be used only with the components supplied or; a cart, rack, or stand that is recommended by Yamaha. If a cart, etc., is used, please observe all safety markings and instructions that accompany the accessory product.

SPECIFICATIONS SUBJECT TO CHANGE:

The information contained in this manual is believed to be correct at the time of printing. However, Yamaha reserves the right to change or modify any of the specifications without notice or obligation to update existing units.

This product, either alone or in combination with an amplifier and headphones or speaker/s, may be capable of producing sound levels that could cause permanent hearing loss. DO NOT operate for long periods of time at a high volume level or at a level that is uncomfortable. If you experience any hearing loss or ringing in the ears, you should consult an audiologist.

IMPORTANT: The louder the sound, the shorter the time period before damage occurs.

Some Yamaha products may have benches and / or accessory mounting fixtures that are either supplied with the product or as optional accessories. Some of these items are designed to be dealer assembled or installed. Please make sure that benches are stable and any optional fixtures (where applicable) are well secured BEFORE using.

Benches supplied by Yamaha are designed for seating only. No other uses are recommended.

NOTICE:

Service charges incurred due to a lack of knowledge relating to how a function or effect works (when the unit is operating as designed) are not covered by the manufacturer's warranty, and are therefore the owners responsibility. Please study this manual carefully and consult your dealer before requesting service.

ENVIRONMENTAL ISSUES:

Yamaha strives to produce products that are both user safe and environmentally friendly. We sincerely believe that our products and the production methods used to produce them, meet these goals. In keeping with both the letter and the spirit of the law, we want you to be aware of the following:

Battery Notice:

This product MAY contain a small non-rechargeable battery which (if applicable) is soldered in place. The average life span of this type of battery is approximately five years. When replacement becomes necessary, contact a qualified service representative to perform the replacement.

This product may also use "household" type batteries. Some of these may be rechargeable. Make sure that the battery being charged is a rechargeable type and that the charger is intended for the battery being charged.

When installing batteries, do not mix batteries with new, or with batteries of a different type. Batteries MUST be installed correctly. Mismatches or incorrect installation may result in overheating and battery case rupture.

Warning:

Do not attempt to disassemble, or incinerate any battery. Keep all batteries away from children. Dispose of used batteries promptly and as regulated by the laws in your area. Note: Check with any retailer of household type batteries in your area for battery disposal information.

Disposal Notice:

Should this product become damaged beyond repair, or for some reason its useful life is considered to be at an end, please observe all local, state, and federal regulations that relate to the disposal of products that contain lead, batteries, plastics, etc. If your dealer is unable to assist you, please contact Yamaha directly.

NAME PLATE LOCATION:

The name plate is located on the rear of the product. The model number, serial number, power requirements, etc., are located on this plate. You should record the model number, serial number, and the date of purchase in the spaces provided below and retain this manual as a permanent record of your purchase.

Model

Serial No.

Purchase Date

PLEASE KEEP THIS MANUAL

FCC INFORMATION (U.S.A.)

1. IMPORTANT NOTICE: DO NOT MODIFY THIS UNIT!

This product, when installed as indicated in the instructions contained in this manual, meets FCC requirements. Modifications not expressly approved by Yamaha may void your authority, granted by the FCC, to use the product.

2. IMPORTANT:

When connecting this product to accessories and/or another product use only high quality shielded cables. Cable/s supplied with this product MUST be used. Follow all installation instructions. Failure to follow instructions could void your FCC authorization to use this product in the USA.

3. NOTE:

This product has been tested and found to comply with the requirements listed in FCC Regulations, Part 15 for Class "B" digital devices. Compliance with these requirements provides a reasonable level of assurance that your use of this product in a residential environment will not result in harmful interference with other electronic devices. This equipment generates/uses radio frequencies and, if not installed and used according to the instructions found in the users manual, may cause interference harmful to the operation of other electronic devices. Compliance with FCC regulations does not guarantee that interference will not occur in all installations. If this product is found to be the source of interference, which

can be determined by turning the unit "OFF" and "ON", please try to eliminate the problem by using one of the following measures:

Relocate either this product or the device that is being affected by the interference.

Utilize power outlets that are on different branch (circuit breaker or fuse) circuits or install AC line filter/s.

In the case of radio or TV interference, relocate/reorient the antenna. If the antenna lead-in is 300 ohm ribbon lead, change the lead-in to co-axial type cable.

If these corrective measures do not produce satisfactory results, please contact the local retailer authorized to distribute this type of product. If you can not locate the appropriate retailer, please contact Yamaha Corporation of America, Electronic Service Division, 6600 Orangethorpe Ave, Buena Park, CA90620

The above statements apply ONLY to those products distributed by Yamaha Corporation of America or its subsidiaries.

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

(class B)

OBSERVERA!

Apparaten kopplas inte ur växelströmskällan (nätet) så länge som den är ansluten till vägguttaget, även om själva apparaten har stängts av.

ADVARSEL: Netspændingen til dette apparat er IKKE afbrudt, så længe netledningen sidder i en stikkontakt, som er tændt — også selvom der er slukket på apparatets afbryder.

VAROITUS: Laitteen toisiopiiriin kytketty käyttökytkin ei irroita koko laitetta verkosta.

(standby)

PRECAUTIONS

PLEASE READ CAREFULLY BEFORE PROCEEDING

* Please keep this manual in a safe place for future reference.



WARNING

Always follow the basic precautions listed below to avoid the possibility of serious injury or even death from electrical shock, short-circuiting, damages, fire or other hazards. These precautions include, but are not limited to, the following:

Power supply/AC power adaptor

- Only use the voltage specified as correct for the instrument. The required voltage is printed on the name plate of the instrument.
- Use the specified adaptor (PA-300, PA-300B, PA-301, or an equivalent recommended by Yamaha). Using the wrong adaptor can result in damage to the instrument or overheating.
- Check the electric plug periodically and remove any dirt or dust which may have accumulated on it.
- Do not place the AC adaptor cord near heat sources such as heaters or radiators, and do not excessively bend or otherwise damage the cord, place heavy objects on it, or place it in a position where anyone could walk on, trip over, or roll anything over it.

Do not open

- Do not open the instrument or attempt to disassemble the internal parts or modify them in any way. The instrument contains no user-serviceable parts. If it should appear to be malfunctioning, discontinue use immediately and have it inspected by qualified Yamaha service personnel.

Water warning

- Do not expose the instrument to rain, use it near water or in damp or wet conditions, or place containers on it containing liquids which might spill into any openings.
- Never insert or remove an electric plug with wet hands.

Fire warning

- Do not put burning items, such as candles, on the unit. A burning item may fall over and cause a fire.

If you notice any abnormality

- If the AC adaptor cord or plug becomes frayed or damaged, or if there is a sudden loss of sound during use of the instrument, or if any unusual smells or smoke should appear to be caused by it, immediately turn off the power switch, disconnect the adaptor plug from the outlet, and have the instrument inspected by qualified Yamaha service personnel.



CAUTION

Always follow the basic precautions listed below to avoid the possibility of physical injury to you or others, or damage to the instrument or other property. These precautions include, but are not limited to, the following:

Power supply/AC power adaptor

- When removing the electric plug from the instrument or an outlet, always hold the plug itself and not the cord.
- Unplug the AC power adaptor when not using the instrument, or during electrical storms.
- Do not connect the instrument to an electrical outlet using a multiple-connector. Doing so can result in lower sound quality, or possibly cause overheating in the outlet.

Location

- Do not expose the instrument to excessive dust or vibrations, or extreme cold or heat (such as in direct sunlight, near a heater, or in a car during the day) to prevent the possibility of panel disfiguration or damage to the internal components.
- Do not use the instrument in the vicinity of a TV, radio, stereo equipment, mobile phone, or other electric devices. Otherwise, the instrument, TV, or radio may generate noise.
- Do not place the instrument in an unstable position where it might accidentally fall over.
- Before moving the instrument, remove all connected adaptor and other cables.
- Use only the rack specified for the instrument. When attaching the rack, use the provided screws only. Failure to do so could cause damage to the internal components or result in the instrument falling over.

Connections

- Before connecting the instrument to other electronic components, turn off the power for all components. Before turning the power on or off for all components, set all volume levels to minimum. Also, be sure to set the volumes of all components at their minimum levels and gradually raise the volume controls while playing the instrument to set the desired listening level.

Maintenance

- When cleaning the instrument, use a soft, dry cloth. Do not use paint thinners, solvents, cleaning fluids, or chemical-impregnated wiping cloths.

Handling caution

- Do not insert a finger or hand in any gaps on the instrument.
- Never insert or drop paper, metallic, or other objects into the gaps on the panel. If this happens, turn off the power immediately and unplug the power cord from the AC outlet. Then have the instrument inspected by qualified Yamaha service personnel.
- Do not place vinyl, plastic or rubber objects on the instrument, since this might discolor the panel.
- Do not rest your weight on, or place heavy objects on the instrument, and do not use excessive force on the buttons, switches or connectors.
- Do not operate the instrument for a long period of time at a high or uncomfortable volume level, since this can cause permanent hearing loss. If you experience any hearing loss or ringing in the ears, consult a physician.

Saving data

Saving and backing up your data

- Voice/Performance/Multi parameter settings are lost when you turn off the power to the instrument without saving. Make sure to save important data to internal (User) memory (see page 49).

Keep in mind that saved data may be lost due to malfunction or incorrect operation. Make sure to save your important data to external media for archive purposes (see page 48).

Never attempt to turn off the power while data is being written to internal memory (while an "Executing..." or "Please keep power on" message is shown). Turning the power off in this state results in loss of all user data.

When you exit from the Utility or Favorite Category function, the parameter you changed in the display is automatically stored. If you turn off the power without exiting from Utility, your custom settings will be lost.

Backing up the external media

- To protect against data loss through media damage, we recommend that you save your important data onto two external media.

Yamaha cannot be held responsible for damage caused by improper use or modifications to the instrument, or data that is lost or destroyed.

Always turn the power off when the instrument is not in use.

Even when the power switch is in the "STANDBY" position, electricity is still flowing to the instrument at the minimum level. When you are not using the instrument for a long time, make sure you unplug the AC power adaptor from the wall AC outlet.

Congratulations!

Thank you for purchasing the Yamaha MOTIF-RACK ES Tone Generator.

In order to get the best use out of your new MOTIF-RACK ES and fully take advantage of its many sophisticated features and functions, we urge you to read the manual carefully, and keep it in a safe, readily-accessible location for future reference.

Package Contents

- Power adaptor (PA-300, PA-300B, PA-301 or an equivalent)*
- Owner's Manual (this book)
- Data List
- Installation Guide
- CD-ROM

* May not be included in your area. Please check with your Yamaha dealer.

About the included CD-ROM

This CD-ROM contains special software for use with this instrument. It includes Voice Editor, which gives you comprehensive and intuitive sound editing tools and Multi Part Editor, for editing the Mixing parameters of Multis. Details are given in the separate Installation Guide or the online manuals included with the software.

Main Features

Wide range of dynamic and authentic Voices – in a 1U rack-mounted tone generator

- An enhanced new user bank, with the addition of 128 Normal Voices to the included wide range of dynamic and authentic Voices of the original top-of-the-line Yamaha MOTIF ES Synthesizer – to give you whatever sound you need, for any musical style.
- Comprehensive effect processing, including Insertion Effects for up to eight Parts, independent three-band Part Equalizers for each Part and high-quality Reverb Effects, provides pro-level sound enhancement for your music creation and performance.

Compatibility with Plug-in Boards, for wide-ranging sound expansion

- Thanks to the two Modular Synthesis Plug-in System connectors and the optional Plug-in Boards, you can upgrade the MOTIF-RACK ES with completely new sound-processing engines. These Plug-in Boards give you more Voices, more effects and more instrument Parts. Plus, special Plug-in Voices have already been programmed and stored to the MOTIF-RACK ES, ready to be played as soon as you install the proper board.

Simple, intuitive panel layout

- A detailed 160x64 dot graphic display provides comprehensive and easy-to-understand control over virtually all operations. Use the PAGE buttons, cursor buttons, and the data dial to quickly and easily edit any of the parameters.

Playing layered sounds – Performance Mode

- The MOTIF-RACK ES features 128 different Performances, which lets you use four different Voices together – in layers or in a keyboard split.

Large selection of versatile, instantly selectable multiple Voice setups – Multi Mode

- The MOTIF-RACK ES also features 32 different Multis, each specially programmed with its own effect, equalizer and other settings, and each designed particularly for a specific style of music or application – letting you quickly and easily call up the settings you need.

Wide variety of output terminals

- Four ASSIGNABLE OUTPUT jacks let you output different Parts of the MOTIF-RACK ES to external devices and processors. Moreover, two digital output jacks (DIGITAL and OPTICAL) ensure completely noise-free, distortion-free sound output (44.1kHz, 24 bit).
- Use the USB terminal to easily and directly connect the MOTIF-RACK ES to your computer. You can also conveniently edit the MOTIF-RACK ES's Voices or Multis from your computer with the Voice Editor or Multi Part Editor software for the MOTIF-RACK ES (included in the CD-ROM).

About This Manual

This manual consists of the following sections.

The Controls & Connectors (page 12)

Starting Up (page 14)

Quick Guide (page 20)

This section explains the basic functions of the MOTIF-RACK ES and shows you how to get started using it as quickly as possible.

Basic Structure (page 51)

This section provides an overview of the main functions and features of the MOTIF-RACK ES.

Reference (page 65)

Explains the parameters in the various modes of the MOTIF-RACK ES.

Appendix (page 92)

This section contains detailed information on the MOTIF-RACK ES, including MIDI, instructions for installing optional Plug-in Boards, Display Messages, Troubleshooting and Specifications.

Installation Guide (separate booklet)

Refer to this for instructions on installing the included software programs (on the CD-ROM) to your computer.

Data List (separate booklet)

This contains various important lists such as the Voice List, Wave List, Multi List, and MIDI Implementation Chart, for use in combination with the section "About MIDI (page 93)" in this manual.

- The illustrations and LCD screens as shown in this Owner's Manual are for instructional purposes only, and may appear somewhat different from those on your instrument.
- Copying of commercially available music sequence data and/or digital audio files for any purpose other than your own personal use is strictly prohibited.
- This product incorporates and bundles computer programs and contents in which Yamaha owns copyrights or with respect to which it has license to use others' copyrights. Such copyrighted materials include, without limitation, all computer software, styles files, MIDI files, WAVE data and sound recordings. Any unauthorized use of such programs and contents outside of personal use is not permitted under relevant laws. Any violation of copyright has legal consequences. DON'T MAKE, DISTRIBUTE OR USE ILLEGAL COPIES.
- The company names and product names in this Owner's Manual are the trademarks or registered trademarks of their respective companies.

Various pages and menus appear on the LCD display of this instrument depending the selected mode or function. Throughout this manual, arrows are used in the instructions, indicating in shorthand the process of calling up certain displays and functions. The example instructions below indicate to 1) press the [VOICE] button, 2) select a Normal Voice, 3) press the [EDIT] button, 4) press the [COMMON] ([3/7/11/15]) button while holding the [SHIFT] button, 5) select the General display by pressing the PAGE [◀][▶] buttons, and 6) select the "Category" parameter.

[VOICE] → select Normal Voice → [EDIT] → [SHIFT] + [COMMON] → select General display with PAGE [◀][▶] → "Category"

NOTE When a confirmation message (page 92) is shown in the display, press the [EXIT] button to exit from that condition, then execute the instructions as in the above example.

Restoring the factory-programmed settings of the MOTIF-RACK ES

The MOTIF-RACK ES has a Factory Set function for restoring your MOTIF-RACK ES's memory to the factory default settings. This lets you restore the synthesizer's default User Voices, Performances and Multis, as well as its System and other settings. Keep in mind that once you edit any settings, the corresponding factory defaults will be overwritten and lost. You can use the Factory Set job to restore these settings if needed.

For details about the Factory Set function, see page 49.

CAUTION

When you restore the factory default settings, all the current settings for the all the Performances, Multis and User Voices will be overwritten with the factory defaults. Make sure you are not overwriting any important data. You should back up any important data to your computer beforehand using the Bulk Dump function (page 48).

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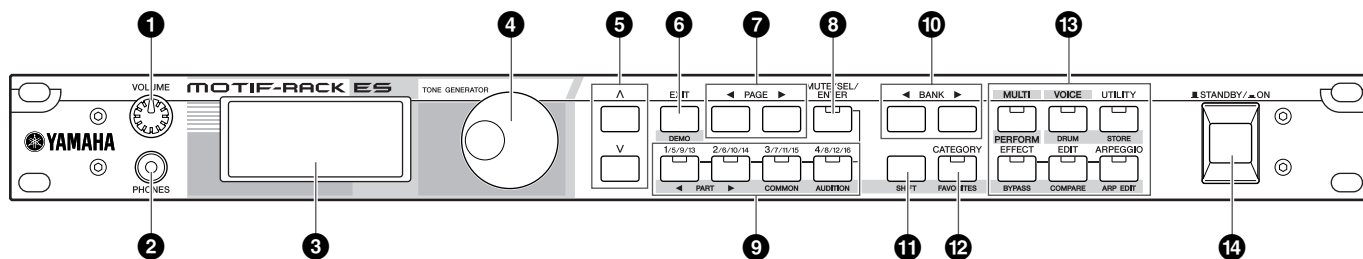
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The Controls & Connectors

Front panel



1 [VOLUME] knob (page 14)

2 PHONES jack (page 15)

3 LCD (Liquid Crystal Display)

The MOTIF-RACK ES's backlit LCD displays the parameters and values related to the currently selected operation or mode.

4 Data dial

For editing (changing the value of) the currently selected parameter. To increase the value, turn the dial right (clockwise); to decrease the value, turn the dial left (counter-clockwise). If a parameter with a wide value range is selected, you can change the value in broader strokes by quickly turning the dial.

5 Cursor [^][v] buttons

The cursor buttons move the "cursor" around the LCD display screen, highlighting and selecting the various parameters.

6 [EXIT] button

The menus and displays are organized according to a hierarchical structure. Press this button to exit from the current display and return to the previous level in the hierarchy.

7 PAGE [◀][▶] buttons

Press these buttons to switch the display and select other pages when available.

8 [MUTE/SEL/ENTER] button (pages 22, 26)

9 PART/ELEMENT buttons (pages 26, 33, 37, 39)

10 BANK [◀][▶] buttons (page 23)

11 [SHIFT] button (see right)

12 [CATEGORY] button (page 24)

13 MODE buttons (page 21)

Press these buttons to enter each mode or to set various parameters.

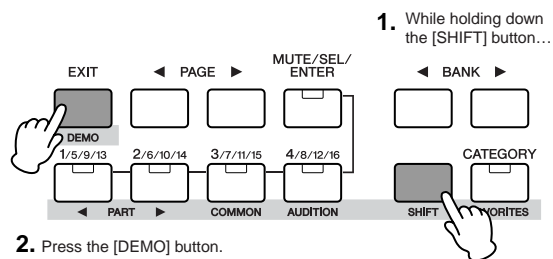
14 [STANDBY/ON] switch (page 14)

Dual-function buttons (Using the [SHIFT] button)

Some of the panel buttons have two functions. The primary one is printed above the button and the secondary one is printed below. Use the [SHIFT] button (11) to select the secondary function — by simultaneously holding down [SHIFT] and pressing the relevant button.

For example, the [EXIT] button (6) has two functions: **Exit** and **Demo**. To select the Exit function, press the [EXIT] button. To select the Demo function, hold down the [SHIFT] button and press the [EXIT] button.

Throughout this manual, the secondary name of a button is used when describing the secondary function. For example, a description of the Demo function may contain the sentence, "Hold down the [SHIFT] button and press the [DEMO] button."

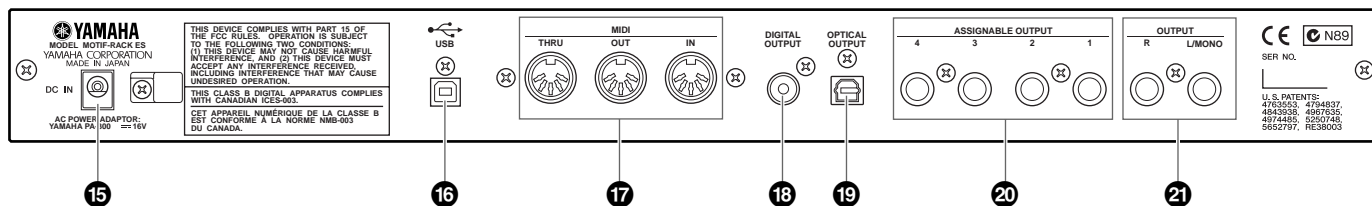


In this manual, instructions such as "Press the [SHIFT] + [***] button" indicate to hold down the [SHIFT] button and press the relevant button.

Dual-function buttons

- 6 [EXIT] button → [DEMO] button
- 9 [1/5/9/13] button → PART [◀] button
[2/6/10/14] button → PART [▶] button
[3/7/11/15] button → [COMMON] button
[4/8/12/16] button → [AUDITION] button
- 12 [CATEGORY] button → [FAVORITES] button
- 13 [MULTI] button → [LIBRARY] button
[VOICE] button → [DRUM] button
[UTILITY] button → [STORE] button
[EFFECT] button → [BYPASS] button
[EDIT] button → [COMPARE] button
[ARPEGGIO] button → [ARP EDIT] button

Rear panel



- 15** DC IN terminal (page 14)
- 16** USB terminal (page 18)
- 17** MIDI IN/OUT/THRU terminals (page 16)
- 18** DIGITAL OUTPUT jack (page 16)
- 19** OPTICAL OUTPUT jack (page 16)
- 20** ASSIGNABLE OUTPUT 1-4 jacks (page 15)
- 21** OUTPUT L/MONO & R jacks (page 15)

USB

USB is an abbreviation for Universal Serial Bus. It is a serial interface for connecting a computer with peripheral devices, and allows “hot swapping” (connecting peripheral devices while the power to the computer is on).

Note when PA-301 is included in this package

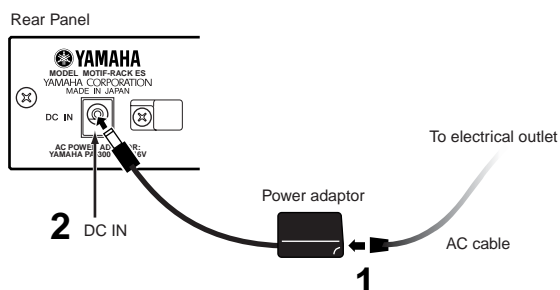
The adaptor PA-301 (different from the PA-300 printed on the rear panel of the MOTIF-RACK ES and described in the Owner's Manual) can be used for the MOTIF-RACK ES. Please do not use the PA-301 for other models that are compatible with the PA-300, such as the AW1600 and 01X.

Starting Up

Power supply

Before you connect the power adaptor, make sure that the [STANDBY/ON] switch is set to STANDBY (Off).

1. Connect one end of the AC cable to the power adaptor.
2. Connect the plug of the power adaptor to the DC IN connector on the rear panel of the MOTIF-RACK ES.
3. Plug in the AC cable to an appropriate AC outlet.



NOTE Follow this procedure in reverse order when disconnecting the power adaptor.

WARNING

Use the specified adaptor (PA-300, PA-300B, PA-301, or an equivalent recommended by Yamaha). Using the wrong adaptor can result in damage to the instrument or overheating.

CAUTION

Make sure your MOTIF-RACK ES is rated for the AC voltage supplied in the area in which it is to be used (as listed on the rear panel). Connecting the unit to the wrong AC supply can cause serious damage to the internal circuitry and may even pose a shock hazard!

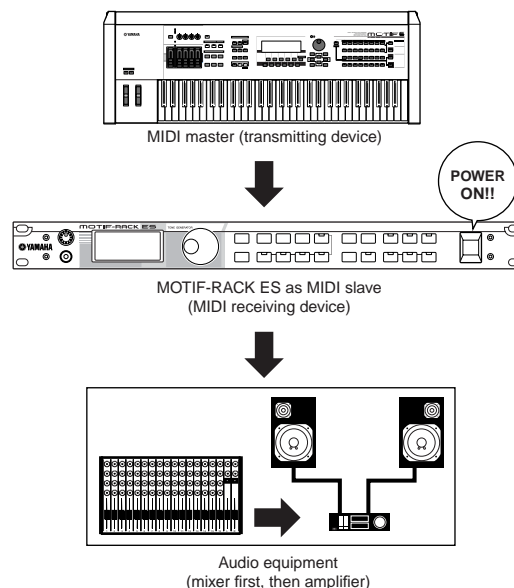
CAUTION

Even when the switch is in the "STANDBY" position, electricity is still flowing to the instrument at the minimum level. When not using the MOTIF-RACK ES for an extended period of time, be sure to unplug the AC power adaptor from the wall AC outlet.

Power-on procedure

Once you've made all the necessary connections (page 15) between your MOTIF-RACK ES and any other devices, make sure that all volume settings are turned down all the way to zero, then turn on each device in order: first, MIDI masters (senders), MIDI slaves (receivers), then audio equipment (mixers, amplifiers, speakers, etc.). This ensures smooth signal flow from the first device to the last (first MIDI, then audio).

NOTE To turn off the power to the devices, first lower the volume of the audio equipment, then turn off the power in the reverse sequence.

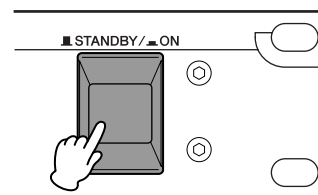


Turning the power of the MOTIF-RACK ES on/off

CAUTION

To protect your speakers, before you turn the power to the MOTIF-RACK ES on or off, lower the volume setting on the MOTIF-RACK ES and connected audio equipment.

1. Press the [STANDBY/ON] switch.



The opening message appears in the LCD. After a while, the default display appears.

NOTE You can set the default display in the "PowerOnMode" parameter ([UTILITY] → General display).

NOTE If the LCD is difficult to read, you may need to adjust the display contrast. To do this, simultaneously hold down the [UTILITY] button and turn the data dial.

2. Raise the sound system volume to a reasonable level.
3. Turn the [VOLUME] knob clockwise to set an appropriate volume level.
4. When turning the MOTIF-RACK ES off, first turn off all connected audio equipment or turn down the volume of the equipment.

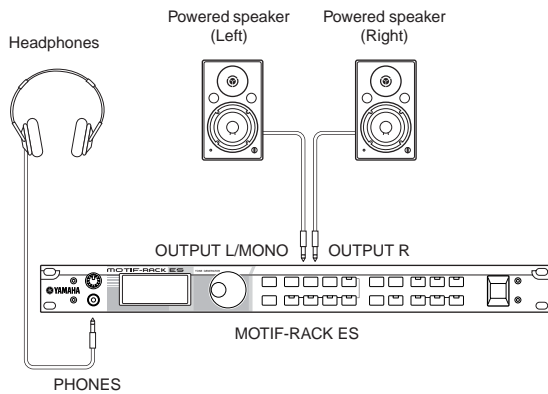
Connections

Connecting to external audio equipment

Since the MOTIF-RACK ES has no built-in speakers, you'll need an external audio system or a set of stereo headphones to properly monitor it. Alternatively, you could use a pair of headphones. There are several methods of connecting to external audio equipment, as described in the following illustrations. The following illustrations show various connection examples; use the one most similar to your intended setup.

Connecting stereo powered speakers

A pair of powered speakers can accurately produce the instrument's rich sounds with their own pan and effect settings. Connect your powered speakers to the OUTPUT L/MONO and R jacks on the rear panel.



NOTE When using just one powered speaker, connect it to the OUTPUT L/MONO jack on the rear panel.

Connecting to a mixer

The MOTIF-RACK ES features ASSIGNABLE OUTPUT 1-4 jacks in addition to the OUTPUT (L/MONO and R) jacks. Connect these outputs to a mixer for separately controlling the analog outputs of Drum keys or Parts (Performance and Multi). For details on how to set the Part/output jack assignments, refer to the chart below.

Outputting separate Parts of a Performance

Set this from the "OutSel" parameter (as selected below).

[SHIFT] + [PERFORM] → select Performance → [EDIT] (Performance Edit mode) → [MUTE/SEL/ENTER] (LED turns off) → select Part → Output display → "OutSel"

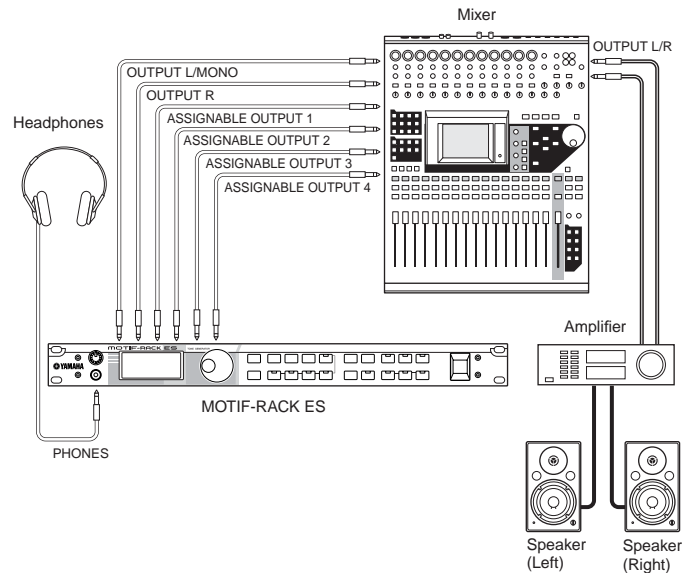
Outputting separate Parts of a Multi

Set this from the "OutSel" parameter (as selected below).

[MULTI] (LED lights in green) → select Multi → [EDIT] → [MUTE/SEL/ENTER] (LED turns off) → select Part → Output display → "OutSel"

The following settings can be made from the parameter pages listed above.

Display indication	Output jacks	Stereo/Mono
L&R	OUTPUT L and R	Stereo
as12	ASSIGNABLE OUTPUT 1 and 2	Stereo (1: L, 2: R)
as34	ASSIGNABLE OUTPUT 3 and 4	Stereo (3: L, 4: R)
as1	ASSIGNABLE OUTPUT 1	Mono
as2	ASSIGNABLE OUTPUT 2	Mono
as3	ASSIGNABLE OUTPUT 3	Mono
as4	ASSIGNABLE OUTPUT 4	Mono
drum (only Drum Voice)	The jack set in the "OutputSel" parameter in "Outputting separate notes (keys) of a Drum Voice" above.	Depends on the "OutputSel" value



NOTE About the main output jacks and the Assignable Output jacks

- Connecting a pair of headphones does not affect audio output from the OUTPUT (L/MONO and R) jacks. You can monitor the same sounds via headphones and at the OUTPUT jacks.
- Any Parts/Drum keys assigned to the ASSIGNABLE OUTPUT jacks will not be output through the OUTPUT L/MONO and R jacks or PHONES jack.
- The System Effects (Reverb, Chorus), the Master EQ, and the Master Effect are not applied to the sound output through the ASSIGNABLE OUTPUT jacks. (Only the Part EQ and the Insertion Effect are applied.)
- The output from the ASSIGNABLE OUTPUT jacks is not affected by the [VOLUME] knob.
- In Voice mode, the Normal Voice will not be output via the ASSIGNABLE OUTPUT jacks.

Outputting separate notes (keys) of a Drum Voice

Set this from the "OutputSel" parameter (as selected below) as Drum Voice data.

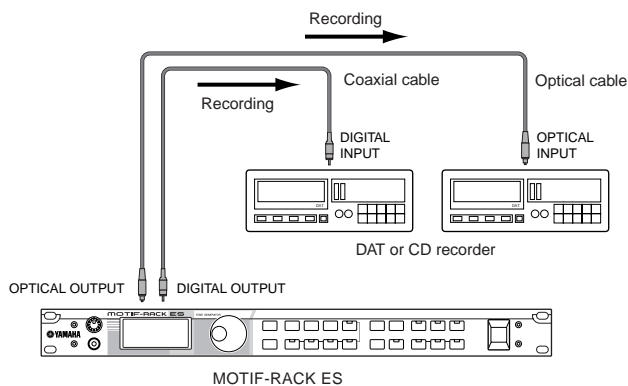
[SHIFT] + [DRUM] → select Drum Voice → [EDIT] → select key with [SHIFT] + PART [◀|▶] → OSC display → "OutputSel"

This setting is available for Parts for which the "OutputSel" parameter has been set to "drum."

NOTE The "OutputSel" parameter is available only when the "InsEFOut" parameter is set to "thru" in the OSC display.

Connecting a digital device

The sound output through the OUTPUT jacks via analog signal can also be output via digital through the OPTICAL OUTPUT jack and the DIGITAL OUTPUT jack. Using these digital output jacks, you can record the playback of this synthesizer to external media (e.g., an MD recorder) with exceptionally high-quality, noise-free sound.



NOTE The output from the DIGITAL OUTPUT jack or OPTICAL OUTPUT jack is not affected by the [VOLUME] knob.

Connecting external MIDI equipment

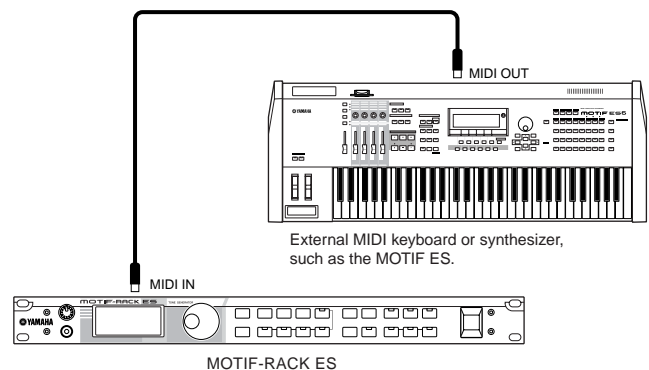
With a standard MIDI cable (available separately), you can connect an external MIDI device, and control it from the MOTIF-RACK ES. Likewise, you can use an external MIDI device (such as a keyboard or sequencer) to control the MOTIF-RACK ES sounds. Below are several different MIDI connection examples; use the one most similar to your intended setup.

NOTE When connecting as in the instructions below, set the "MIDI IN/OUT" parameter ([UTILITY] → MIDI display) to "MIDI."

NOTE For details about MIDI, refer to "About MIDI" on page 93.

Controlling from an external MIDI keyboard or a synthesizer

Use an external keyboard to remotely select and play Voices of the MOTIF-RACK ES.



MIDI Transmit Channel and Receive Channel

Make sure to match the MIDI Transmit Channel of the external MIDI instrument with the MIDI Receive Channel of the MOTIF-RACK ES.

For details on setting the MIDI Transmit Channel of the external MIDI instrument, refer to the owner's manual of your particular MIDI instrument. For details on setting the MIDI Receive Channel of the MOTIF-RACK ES, check the following points.

In the Voice mode/Performance mode (using the MOTIF-RACK ES as a single timbre tone generator; page 57)

Check the MIDI Basic Receive Channel with the following operation.

[UTILITY] → MIDI display → "BasicRcvCh"

If necessary, change this parameter to the same number as the MIDI Transmit Channel of the external MIDI instrument.

In the Multi mode (using the MOTIF-RACK ES as a multi-timbral tone generator; page 57)

Check the MIDI Receive Channel for each Part of the Multi with the following operation.

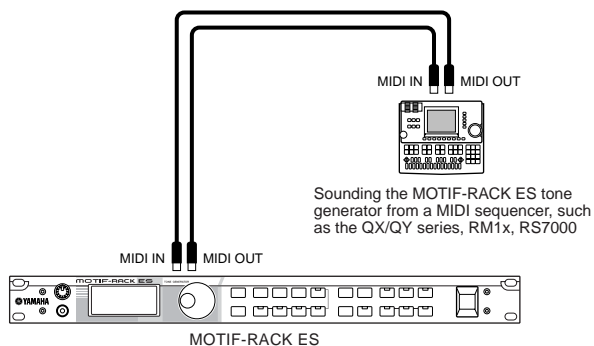
[MULTI] → [EDIT] → [MUTE/SEL/ENTER] (LED turns off) → select Part → Voice display → "RcvCh"

Change the settings of the desired Parts to match the MIDI Transmit Channel settings on the external MIDI instrument. Please note that all Parts whose MIDI Receive Channels match the MIDI Transmit Channel of the external MIDI instrument are sounded by your keyboard performance.

NOTE For details about the functions of the internal tone generator, see page 51.

Playback using an external MIDI sequencer

In this case, make sure that the MOTIF-RACK ES is set to the Multi mode. If the instrument is set to the Voice mode or to the Performance mode in which multi-channel MIDI messages are not recognized, the external sequence data (containing multi-channel data) will not play back properly on the MOTIF-RACK ES. In addition, when using the Arpeggio function (page 42), you may have to make certain MIDI synchronization settings (see below).



Synchronizing with an external MIDI instrument (Master and Slave)

When using multiple MIDI devices, the tempo settings of the MIDI devices must be synchronized by clock signal.

The device set to internal clock serves as a reference for all connected devices, and is referred to as the "master" instrument. The connected devices set to external clock are referred to as "slaves."

When using playback data of an external MIDI sequencer to trigger the Arpeggio function on the MOTIF-RACK ES, make sure to set the MIDI synchronization parameter in the Utility mode so that the external clock is used (as shown below).

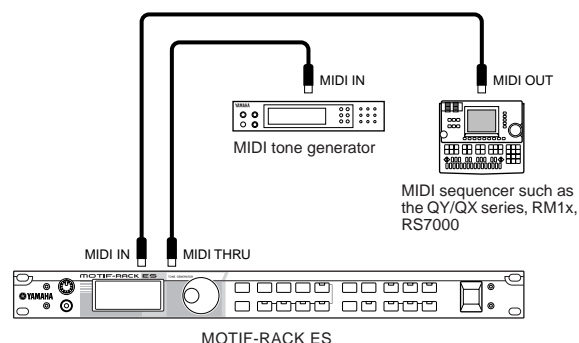
[UTILITY] → MIDI display → MIDI Sync = MIDI

In addition, make sure that the external MIDI sequencer is set to "master" or internal sync.

NOTE Certain sequencers may not send clock signals to an external device while playback is stopped. When "MIDI Sync" is set to "MIDI," the Arpeggio function is available only while the MOTIF-RACK ES receives clock signals from the master instrument.

Controlling another MIDI instrument via MIDI THRU

If you have more synthesizers and tone generators than MIDI ports, you can use the MIDI THRU jack to connect and control additional devices. Here, the playback data of an external MIDI sequencer is output via the MIDI THRU connector.



In this case, make sure that the MOTIF-RACK ES is set to the Multi mode. If the instrument is set to the Voice mode or to the Performance mode in which multi-channel MIDI messages are not recognized, the external sequence data (containing multi-channel data) will not play back properly on the MOTIF-RACK ES. Likewise, make sure to set the MIDI tone generator (connected to the MIDI THRU connector) to the multi-timbral mode.

In addition, you may have to make certain MIDI synchronization settings (see below). In addition, you will need to set the MIDI synchronization related parameters (so that the MOTIF-RACK ES slaves to external clock) from the following display.

[UTILITY] → MIDI display → "MIDI Sync" = MIDI

TIP Splitting the sound between the MOTIF-RACK ES and an external tone generator by MIDI channel

In this connection example shown above, you can split the sequence playback tracks between the MOTIF-RACK ES and another instrument connected to MIDI THRU and have them sound different Parts.

For example, on the MOTIF-RACK ES, assign the Multi Parts to MIDI Receive Channels 1 through 9 with the following operation, and set the rest of the Parts (not to be sounded) to off.

[MULTI] → [EDIT] → [MUTE/SEL/ENTER](LED turns off) → Selecting Part → Voice display → "RcvCh"

On the connected MIDI tone generator, assign the Parts to be sounded to MIDI Receive Channels 10 through 16, and set the rest of the Parts (not to be sounded) to off.

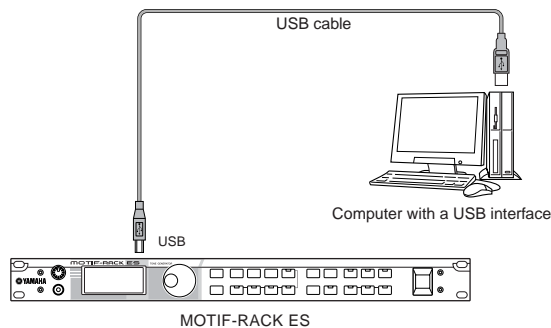
Connecting to a computer

Connecting this instrument to a computer via MIDI opens up a whole world of musical possibilities — such as using sequencer software to record and play back compositions with the MOTIF-RACK ES sounds or using the included Voice Editor software to create and edit your own custom Voices.

Using an USB connector

When connecting via this method, make sure to set the following parameter to “USB.”

[UTILITY] → MIDI display → “MIDI IN/OUT” = “USB”



NOTE When connecting to a computer (Windows/Macintosh) via USB, make sure to install the USB-MIDI driver to the computer as well as the desired software (sequence software, Voice Editor, etc.). For details, refer to the separate Installation Guide.

NOTE Audio data cannot be transmitted or received via USB on the MOTIF-RACK ES.

MIDI channels and MIDI ports

While a MIDI cable can transfer MIDI messages of up to 16 channels simultaneously, a USB cable can transfer MIDI messages of more than 16 channels simultaneously.

MIDI data is assigned to one of sixteen channels, and this synthesizer is capable of simultaneously playing sixteen separate Parts, via the sixteen MIDI channels. However, the sixteen-channel limit can be overcome by using separate MIDI “ports,” each supporting sixteen channels. A USB cable can handle MIDI data on up to eight ports, letting you use up to 128 channels (8 ports x 16 channels) on your computer.

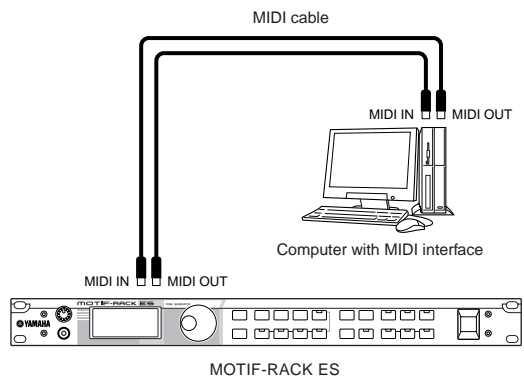
By installing one Multi-part Plug-in Board and one Single-part Plug-in Board in the MOTIF-RACK ES, you can use a maximum of 33 Parts via USB.

NOTE This synthesizer can recognize and use up to three ports at the same time (page 58).

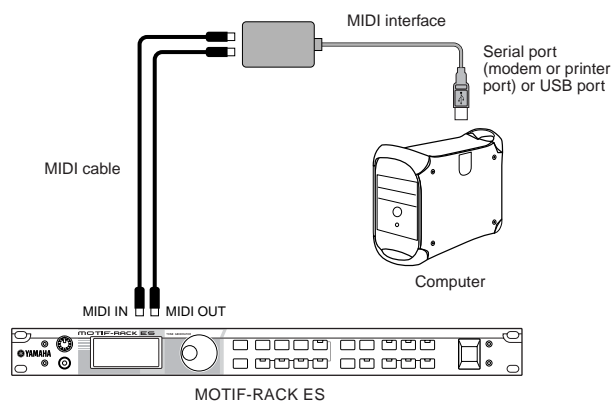
NOTE When using a USB connection, make sure to match the MIDI transmit port and the MIDI receive port as well as the MIDI transmit channel and the MIDI receive channel.

Using a MIDI interface

Using the computer’s MIDI interface



Using an external MIDI interface



NOTE Please use the appropriate MIDI interface for your computer.

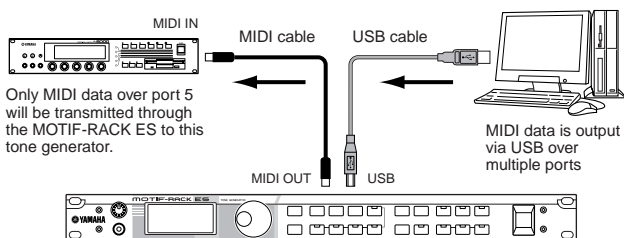
NOTE If you are using a computer that has a USB interface, make sure to connect the computer and this synthesizer by USB. (The data transfer rate is faster than MIDI and you'll have access to multiple MIDI ports.)

TIP About the Thru Port Setting

MIDI ports can be used to divide playback among multiple synthesizers, as well as expand the MIDI channel capacity beyond sixteen.

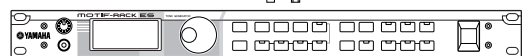
In the example below, a separate synthesizer connected to the MOTIF-RACK ES is played by MIDI data via port 5, as set in the "ThruPort" parameter with the following operation.

[UTILITY] → MIDI display → "ThruPort"



Only MIDI data over port 5 will be transmitted through the MOTIF-RACK ES to this tone generator.

MIDI data is output via USB over multiple ports



Only MIDI data over ports 1, 2, and 3 are recognized.
For details on the relationship between the MIDI port and the tone generator block, see page 58.

Precautions when using the USB connector**CAUTION**

When connecting the computer to the USB TO HOST connector, make sure to observe the following points.

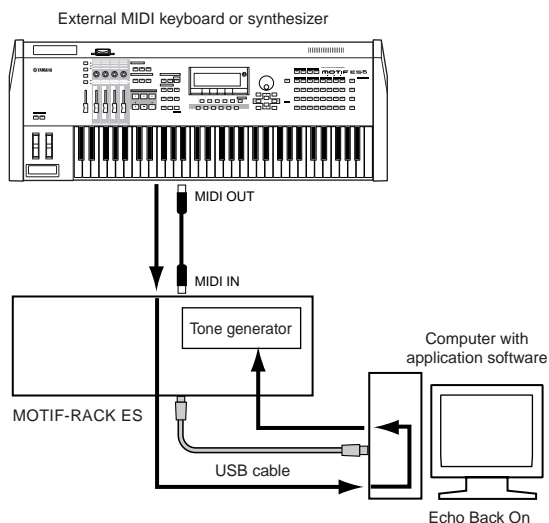
Failing to do so may result in the computer freezing or shutting down, as well as corruption or even loss of data. If the computer or the instrument freezes, turn the power to the instrument off or restart the computer.

- Before connecting the computer to the USB connector, exit from any power-saving mode (such as suspended, sleep, standby) of the computer.
- Before turning on the power to the instrument, connect the computer to the USB connector.
- Execute the following before turning the power to the instrument on/off or plugging/unplugging the USB cable to/from the USB connector.
 - Quit any open applications.
 - Make sure that data is not being transmitted from the instrument.
- While a USB device is connected to the instrument, you should wait for three seconds or more before executing these operations: Turning the power of the instrument off then on again, or alternately connecting/disconnecting the USB cable.

TIP Using a computer and an external MIDI keyboard together

If you are using a computer with sequencer to control the MOTIF-RACK ES, you can connect an external MIDI keyboard to record note and other data (and even play back recorded data). Use the setting suggestions below as a guideline; specific instructions may differ depending on your computer and the software used. In addition, set the "MIDI IN/OUT" parameter to "USB" with the following operation.

[UTILITY] → MIDI display → "MIDI IN/OUT" = "USB"



NOTE When using the USB connector ("MIDI IN/OUT" is set to "USB"), the MOTIF-RACK ES also receives and relays any data received via the MIDI IN connector, and then data will be output from the USB port 1.

MIDI "Echo" is a function on sequencers that takes any data received via the MIDI IN terminal and "echoes" it (or sends it as is) through MIDI OUT. In some software, this function is also called "MIDI Thru." Refer to the owner's manual of your particular software for specific instructions.

Quick Guide

Modes of MOTIF-RACK ES and basic operation

In this section, we'll take a look at the fundamental operating conventions of the MOTIF-RACK ES. Here, you'll learn the basics – how to select modes and call up the various functions. You can play the MOTIF-RACK ES in the three modes below. You can select the desired mode, to suit your particular playing style, music genre or production environment.

Voice mode (page 23)

The Voice mode lets you play a wide range of dynamic and authentic instrument sounds (Voices). Only one Voice can be played simultaneously. Use this mode when you want to play just a single Part.

There are three types of Voices as shown below.

- Normal Voices (instrument sounds)
- Drum Voices (percussion/drum sounds)
- Plug-in Board Voices (with Single-part Plug-in Board)

Performance mode (page 30)

The Performance mode lets you play a Performance by layering several Voices together, and by assigning different Voices to separate ranges of the keyboard. You can create rich, layered sounds or play two different Parts simultaneously – for example, piano and bass guitar. This mode is useful when performing solo.

Multi mode (page 36)

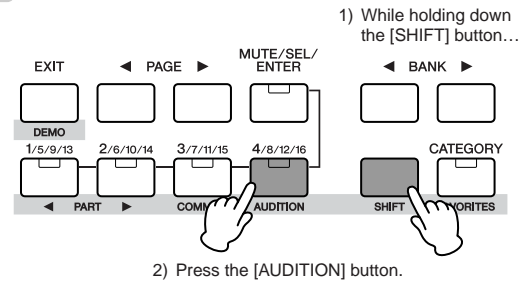
The Multi Mode lets you set up the MOTIF-RACK ES as a multi-timbral tone generator for use with computer-based music software or external sequencers. You can play various Voices (up to 33 Parts) simultaneously.

By assigning different Voices to each track in a song file of your sequencer, you can play back a complex band or ensemble performance with just a single MOTIF-RACK ES.

In addition, the MOTIF-RACK ES provides the following functions.

Arpeggio (page 42)	This function lets you trigger rhythm patterns, riffs and phrases using the current Voice by simply playing notes on the keyboard.
Control Set (page 45)	This function lets you control the various functions of the MOTIF-RACK ES with an external MIDI controller.
Job (page 47)	This function lets you reset the MOTIF-RACK ES to the initial factory settings (Factory Set), copy data, initialize data, and save data to an external device (Bulk Dump).
Store (page 49)	This lets you save the edited Voices and various settings to the MOTIF-RACK ES.
Utility (page 89)	This lets you set the overall system of the MOTIF-RACK ES.

TIP Audition function



This convenient function lets you hear an Audition phrase playing the selected Voice. To use this, simultaneously hold down the [SHIFT] button and press the [AUDITION] button. Make sure to keep holding down both buttons to continue playing the phrase.

Editing an Audition Phrase

[VOICE]/[SHIFT]+[DRUM] → select Voice → [EDIT] → [SHIFT]+[COMMON] → select General display with PAGE [◀|▶]

The phrase type and pitch can be changed in the Voice Edit mode. There are two parameters related to the audition phrase in the "General" display in Voice Common Edit (page 65).

A.PhraseNo. (Audition phrase number)

Selects the type of the Audition phrase.

A.PhrNtSft (Audition phrase note shift)

Determines the pitch settings of the Audition phrase in semitones.

A.PhrVelSft (Audition phrase velocity shift)

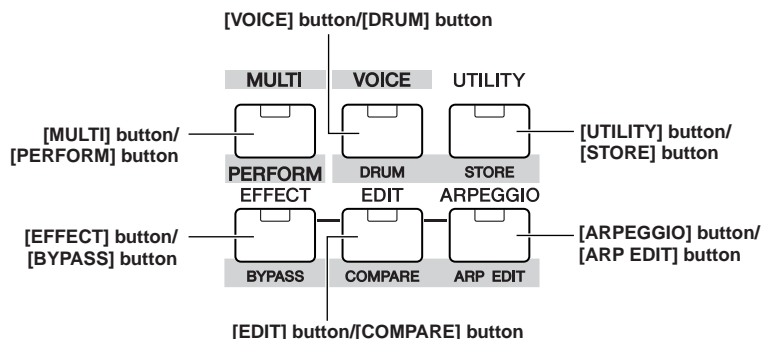
Selects the velocity of the Audition phrase.

NOTE The Audition phrase can be transmitted via MIDI. The transmit channel of the Audition phrase can be also changed (page 90).

NOTE Depending on the Audition phrase, the sound character may also be adjusted by using MIDI Control Change messages.

NOTE When an Arpeggio is used as the Audition phrase, the playback sound may differ between the Voice and Multi modes.

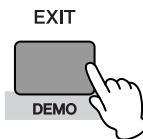
The functions of each mode and how to enter each are as follows:



Mode	Function	Selecting a mode
Voice/Performance mode		
Play	Playing a Voice/Performance	[VOICE]/[SHIFT]+[DRUM]/[SHIFT]+[PERFORM]
Edit	Editing/creating a Voice/Performance	[VOICE]/[SHIFT]+[DRUM]/[SHIFT]+[PERFORM]→[EDIT]
Effect Edit	Editing the effect settings	[VOICE]/[SHIFT]+[DRUM]/[SHIFT]+[PERFORM]→[EFFECT]
Arpeggio Edit	Editing the Arpeggio settings	[VOICE]/[SHIFT]+[DRUM]/[SHIFT]+[PERFORM]→[SHIFT]+[ARP EDIT]
Store	Saving a Voice/Performance	[VOICE]/[SHIFT]+[DRUM]/[SHIFT]+[PERFORM]→[SHIFT]+[STORE]
Utility (Voice mode only)	Edit the Master Equalizer settings, etc.	[VOICE]/[SHIFT]+[DRUM]→[UTILITY]
Multi mode		
Play	Playing a Multi	[MULTI]
Mixing Edit	Editing the Mixing settings	[MULTI]→[MULTI]
Edit	Editing/creating a Multi	[MULTI]→[EDIT]
Effect Edit	Editing the effect settings	[MULTI]→[EFFECT]
Arpeggio Edit	Editing the Arpeggio settings	[MULTI]→[SHIFT]+[ARP EDIT]
Store	Saving a Multi	[MULTI]→[SHIFT]+[STORE]
Other Functions		
Utility	Making overall system settings	[UTILITY] → select each display
Job	Executing various functions, such as Factory Set, Initialize, Copy, etc.	[UTILITY] → select Job display
Effect Bypass	Turning the effect on/off	[SHIFT]+[BYPASS]

How to leave the current display

If you want to return from the current display to the previous one, press the [EXIT] button. You can return back to any of the previously selected basic modes (Voice Play, Performance Play, and Multi Play) by pressing the [EXIT] button several times.



- NOTE**
- Parameters are divided into two basic groups: (1) functions that are related to each Voice, Performance and Multi, and (2) functions that affect all Voices, Performances and Multis. The former are set in the Voice/Performance/ Multi Edit mode and latter in the Utility.
 - The parameter settings in the Voice/Performance/Multi mode can be saved to User memory with the store function (page 49).

CAUTION

When you exit from the Utility or Favorite Category function, the parameter you changed in the display is automatically stored. Never attempt to turn off the power while an “Executing...” or “Please keep power on” message is shown. If you turn off the power without exiting from Utility, your custom settings will be lost.

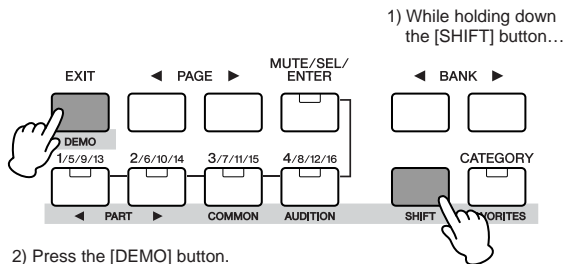
Demo playback

The MOTIF-RACK ES features a variety of demo songs, showcasing its dynamic sound and sophisticated functions. Here's how to play them back.

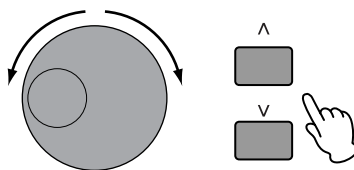
NOTE Make sure the MOTIF-RACK ES is ready for playback. Details are given in the section "Starting Up" on page 14.

How to play back the Demo Songs

1. Simultaneously hold the [SHIFT] button and press the [DEMO] button.



2. The DEMO screen is shown in the display. Select the song with the data dial or cursor [^][V] buttons.



3. Press the [MUTE/SEL/ENTER] button to start playback of the DEMO song.

You can stop the DEMO song anytime during playback by pressing the [MUTE/SEL/ENTER] button. You can also restart the stopped DEMO song by pressing the [MUTE/SEL/ENTER] button again.

4. To stop playback, press the [EXIT] button.

If you press the [EXIT] button while the DEMO song is stopped, the Demo Song display closes.

5. To close the Demo Song display, press the [EXIT] button again.

Voice mode

In this section, you'll learn about the Voice mode, the most basic mode of the MOTIF-RACK ES.

Playing the Voices

In the Voice Play mode, you can select and play a single Voice. The Voices of the MOTIF-RACK ES are divided into the following three types:

Normal Voices

Normal Voices are mainly pitched musical instrument-type sounds (piano, organ, guitar, etc.) that can be played over the range of the keyboard.

Drum Voices

Drum Voices are mainly percussion/drum sounds that are assigned to individual notes. These Voices are used to perform rhythm parts.

Single-part Plug-in Board Voice

Additional Board Voices and Plug-in Voices can also be played by installing an optional Plug-in Board. Board Voices are original Voices created on the Plug-in Board, while Plug-in Voices are Board Voices that have been specially programmed and processed for optimum use with the MOTIF-RACK ES (page 52).

NOTE The Multi-part Plug-in Board can be used in the Multi mode only.

In the Voice Play mode, you can select the desired Voice from various Voice Banks and play it.

Preset Banks

The Preset Banks contain a full set of specially programmed Voices. Voices you've edited yourself cannot be saved in the Preset Banks.

User Bank

The User Banks contain the Voices you have edited and stored.

GM Bank

The GM Banks contains the Voices allocated according to the GM standard (page 55).

Plug-in Bank

The Plug-in Bank is available only when a Plug-in Board has been installed (page 52).

About the User Banks

The User Banks contains various factory default Voices.

- User Bank 1, 3 (USR1, 3): These Banks contain original Voices for the MOTIF-RACK ES.
- User Bank 2 (USR2): This Bank contains Voices copied from the Preset Banks.

If a Voice in a User Bank (User Voice) is overwritten or replaced, that User Voice will be lost. When you save an edited Voice, be careful not to overwrite any important User Voices.

NOTE Details about Voices are given on page 53. For a list of available Voices, see the Voice List in the separate Data List.

NOTE Up to 384 Normal Voices and 32 Drum Voices can be stored to User Banks (page 49). The Voice settings can be changed in the Voice Edit mode (page 25).

Let's play some Voices here. The example below assumes that you have connected an external MIDI keyboard to the MOTIF-RACK ES.

NOTE Make sure that the MIDI Transmit Channel of the external MIDI keyboard matches the MIDI Receive Channel of the MOTIF-RACK ES (page 16).

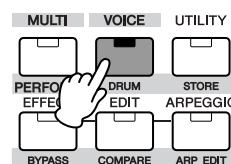
Selecting a Voice

1. Enter the Voice Play mode.

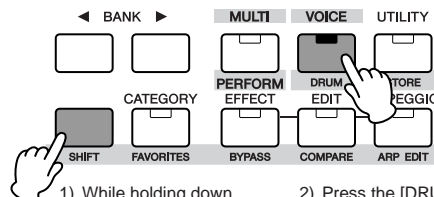
Press the [VOICE] button to enter the Voice Play mode. The [VOICE] button LED will light in green, indicating that the Voice Play Mode (Normal Voice) is selected.

When you select a Drum Voice, simultaneously hold down the [SHIFT] button and press the [DRUM] button. The LED will light in orange, indicating that the Voice Play Mode (Drum Voice) is selected.

- Normal Voices
- Plug-in Board Voices (PLG150-ANDX/PF/AP/VL)



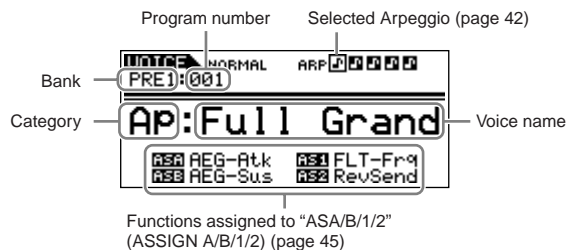
- Drum Voices
- Plug-in Board Voices (PLG150-DR/PC)



- 1) While holding down the [SHIFT] button...
- 2) Press the [DRUM] button.

2. Select a Voice Bank with the BANK [◀][▶] buttons.

In this condition, playing the external keyboard sounds the Voice indicated in the display. The parameters shown in the Voice Play mode are briefly explained below.



Normal Voice Banks

There are 10 different banks for the Normal Voices: PRE1-6 (Preset Banks), GM (GM Bank), USR1-3 (User Banks)

Drum Voices Banks

There are 3 different banks for the Normal Voices: PRE (Preset Bank), GM (GM Bank), USR (User Bank)

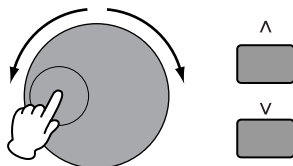
Plug-in Board Voice Banks

When installing Plug-in Boards, select the Plug-in Board (PLG1, PLG2) by the BANK [◀][▶] buttons, and then select the following Banks by the [SHIFT] + BANK [◀][▶] buttons.

- Plug-in Preset Voice Bank (PLGPRE)
- Plug-in User Voice Bank (PLGUSR)
- Board Voice Bank

NOTE When selecting a Board Voice Bank, the Bank Select MSB/LSB of the Board Voice is shown in the display. For details about the Bank Select MSB/LSB, refer to the owner's manual that came with your Plug-in Board.

3. Select a program number in the current Bank with the data dial or cursor [^][v] buttons.



TIP Selecting Voices from a computer

You can select Voices on this instrument from your computer software by specifying the following MIDI messages. To do this, the following three MIDI messages must be transmitted to the MOTIF-RACK ES.

- Bank Select MSB (Control #000)
- Bank Select LSB (Control #032)
- Program Change

For example, transmit the following MIDI messages to select "Or: Tiny (program number: 12)" in the PRE2.

1. Transmit a Bank Select MSB (Control #000) value of 63.
2. Transmit a Bank Select LSB (Control #032) value of 1.
3. Transmit a Program Change value of 12.

For details on what values are assigned to the Voice Bank/Number of this synthesizer, see the heading "(3-1-3) CONTROL CHANGE" in the "MIDI Data Format" section (page 97). For specific Program Change numbers and the corresponding Voices, refer to the separate Data List.

NOTE Set the MIDI Channel to the same channel as the "BasicRcvCh" parameter (page 91).

4. Play the connected keyboard.

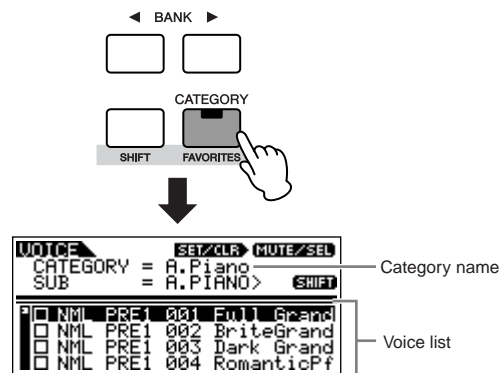
The selected Voice sounds in response to the incoming MIDI data.

NOTE Keep in mind there is also an Audition function (page 20) that lets you listen to and audition each Voice as you select it.

Using the Category Search function

The MOTIF-RACK ES features a powerful Category search function that gives you quick access to the sounds you want, irrespective of their bank locations.

1. Turn the Category Search function on by pressing the [CATEGORY] button.



NOTE To exit from the Category function, press the [CATEGORY] button again, or press the [EXIT] button.

2. Select a main category with the BANK [◀][▶] buttons.

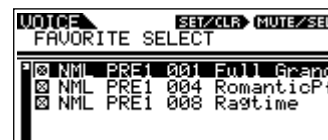
3. Select a sub category with the [SHIFT] + BANK [◀][▶] buttons.

4. Select the desired Voice by using the cursor [^][v] buttons or data dial, and press the [CATEGORY] button.

Favorite Category

Use this convenient function to store all your favorite, often-used Voices in a single, easy-to-access location — and call them up by simultaneously holding the [SHIFT] button and pressing the [FAVORITES] button (from within the Category Search function above). Select any Voice you want, from any desired category, and enter each to the Favorites Category. In this way, you can go directly to all the Voices you use the most, without having to jump around to other Categories — a great aid when playing live.

Select the desired Voice in the Voice list, and press the [MUTE/SEL/ENTER] button to checkmark the box next to the Voice name. (You can un-checkmark it by pressing the [MUTE/SEL/ENTER] button again.) Go on to other Categories and continue registering your favorites.



After you've checkmarked all the Voices you want to register, simultaneously hold the [SHIFT] button and press the [FAVORITES] button to store them to the Favorites Category. All the Voices you've checkmarked — and only those Voices — will be shown in the list. To exit from the Favorites Category, simply press the [CATEGORY] button. Press the [EXIT] button to return the Voice Play mode.

CAUTION

When you exit from the Favorite Category function, the parameter you changed in the display is automatically stored. However, this edited data is lost if you turn off the power without properly exiting from the display.

CAUTION

Never attempt to turn off the power while data is being stored (while a "Please keep power on" message is shown). Turning the power off in this state results in loss of all user data.

Voice Editing

The Voice Edit mode gives you comprehensive tools for creating your own original Voices, either from scratch by changing the basic sounds, or by tweaking the various Voice parameters. Create your custom sounds by calling up a preset Voice and editing as desired. The actual parameters available and the methods for editing differ depending on the Voice type.

Normal Voice Edit

A Normal Voice can consist of up to four Elements. There are two types of Voice Edit displays: Common Edit, for editing the settings common to all four Elements; and Element Edit, for editing individual Elements.

Drum Voice Edit

There are two types of Drum Voice Edit displays: Common Edit, for editing the settings that apply to all Drum keys in the Voice; and Element Edit, for editing individual keys (Elements).

Plug-in Voice Edit

This is basically the same as Normal Voice Edit. Unlike with Normal Voices, the Plug-in Voices only have one Element for editing.

About Elements

An Element is the basic and the smallest unit for a Voice, and is created by applying the several parameters (Effect, EG, etc.) to the wave of the instrument sound. Each Voice of the MOTIF-RACK ES consists of several Elements.

TIP Compare Function

When you're editing a Voice, Performance or Multi, this feature lets you quickly and easily hear the effect of the edits you make – allowing you to switch between the original, unedited Voice/Performance/Multi and the newly edited settings.

1. In the Edit mode (with the **EDIT** indicator shown in the display and the [EDIT] indicator lit), simultaneously hold down the [SHIFT] button and press the [COMPARE] button. The **COMPARE** indicator is shown at the top of the display (in place of the **EDIT** indicator), and the original, unedited Voice is restored for monitoring.



2. Hold down the [SHIFT] button and press the [COMPARE] button simultaneously again to disable the Compare function and restore the settings for your edited Voice. Compare the edited sound with the unedited sound as desired by repeating steps 1 and 2.

NOTE The Compare function is also available in the Performance/Multi Edit mode.

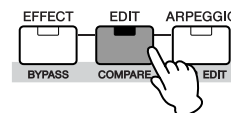
NOTE While Compare is active, you cannot make edits to the parameters.

Normal Voice Edit

1. Press the [VOICE] button to enter the Voice mode, then select a Normal Voice to be edited (page 23).

If you are creating a Voice from scratch, use the convenient Initialize function ([UTILITY] → JobSel display) to initialize a Voice in the User Banks (page 47).

2. Press the [EDIT] button to enter the Voice Edit mode.

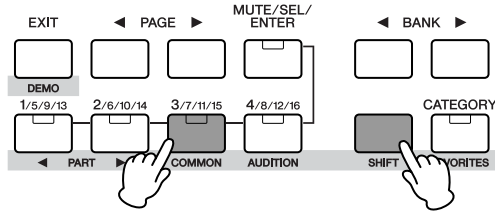


3. Call up the Common Edit display or Element Edit display.

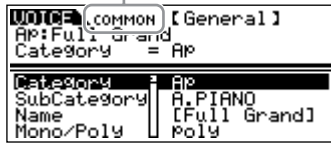
If you wish to edit more global parameters related to the overall Voice and how it's processed, such as Voice name, Volume, Pan, and Controller (page 45), call up the Common Edit display. If you wish to edit the sounds that make up a Voice and the basic parameters that determine the sound (page 51), such as Oscillator, Pitch, Filter, Amplitude, and EG (Envelope Generator), call up the Element Edit display.

Calling up the Common Edit display

Simultaneously hold down the [SHIFT] button and press the [COMMON] button to call up the Common Edit display.

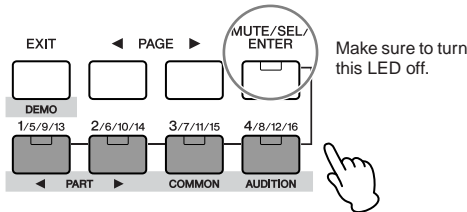


Indicates a Common Edit display

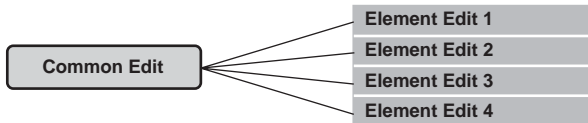
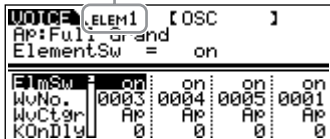


Calling up the Element Edit display

To call up the Element Edit display, make sure to turn the [MUTE/SEL/ENTER] button LED off, and then select the desired Element with the corresponding [1/5/9/13]-[4/8/12/16] buttons. If the [MUTE/SEL/ENTER] button is lit, press the [MUTE/SEL/ENTER] button again to turn it off.



Indicates the display for editing Element 1.



TIP Switching Elements On/Off (Mute) and selecting the Element

Each time you press the [MUTE/SEL/ENTER] button, the on/off status of the LED changes.

When the LEDs are lit (Mute)

You can mute any Element by pressing the corresponding Part/Element button [1/5/9/13] to [4/8/12/16]. You can check which Element is muted by checking the lamps of the Part/Element buttons. The LEDs of the muted Element buttons are turned off and the active Element buttons light.

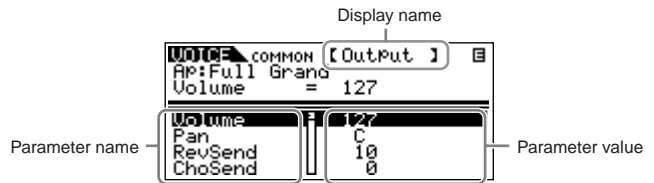
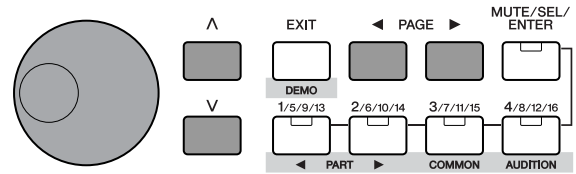
When the LEDs are turn off (Select)

You can select any desired Element by pressing the corresponding Part/Element button [1/5/9/13] to [4/8/12/16]. If you select the muted Element, the LED of the button flashes.

NOTE You can also switch the on/off status of each Part in the Performance/Multi mode.

4. Select the desired display with the PAGE [◀|▶] buttons and change the settings.

To change the display page, use the PAGE [◀|▶] buttons. Select the desired parameter with the cursor [▲|▼] buttons and change the settings by using the data dial.



The following briefly describes the main Performance parameters.

Common Edit

General	For setting general parameters, such as Voice Name, Monophonic/Polyphonic, Tuning, Portamento, Pitch Bend, Audition phrase, etc.
Output	For setting the Voice output parameters, such as Volume, Pan, Send Level of Reverb/Chorus Effect, etc.
EG/FLT (Envelope Generator/Filter)	For setting the time variance parameters such as Attack, Decay, Release and Sustain, and Filter parameters such as Cutoff and Resonance.
CtrlSet (Controller Set)	For setting the functions of the external MIDI controller.
LFO (Low Frequency Oscillator) (for Normal Voices)	For setting the LFO parameters. The LFO uses a low frequency waveform. For more information about the LFO, see page 57.
LFO USR (User LFO)	This display is available only when the "user" (User LFO wave) is selected in the LFO display above.

Element Edit

OSC (Oscillator)	For setting the various parameters controlling the waveforms on which the Voice is based. You can select the Wave used for the Element, the volume and note range of each Element and so on.
Pitch	For setting the basic pitch parameters for each Element. Also, by setting the PEG, you can control how the pitch changes over time.
PEG (Pitch Envelope Generator)	
Filter	For changing the tonal characteristics of each Element, by adjusting overtones included in the waveform of the Element. You can also set the FEG for time variance of how the filter works – in other words, dynamically change the tone and timbre of the sound over time.
FEG (Filter Envelope Generator)	
AMP (Amplitude)	For setting the volume of each Element after the OSC (Oscillator), PITCH and FILTER parameters have been applied, as well as the final overall volume of the signal sent to the outputs. Also, by setting the AEG, you can control how the volume changes over time.
AEG (Amplitude Envelope Generator)	
Native (Native Part Parameters: Plug-in Voices only)	For setting the Native Parameters. Refer to the owner's manual of the Plug-in Board.
LFO (Low Frequency Oscillator)	For setting the LFO parameters for the Normal Voices.
EQ (Equalizer)	For adjusting the tonal qualities of each Element.

5. Repeat steps 3 - 4 as desired.

6. Name the edited Normal Voice.

Select the General display in the Common Edit, and then input a name in the Name parameter.

For detailed instructions on naming, refer to page 50.



7. Store the edited Voice to the User Bank (USR1-3) for Normal Voice.

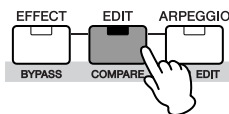
For details, see page 49.

Drum Voice Edit

1. Press the [SHIFT] + [DRUM] buttons to enter the Voice Play mode, then select a Drum Voice to be edited (page 23).

If you are creating a Voice from scratch, use the convenient Initialize function ([UTILITY] → JobSel display) to initialize a Voice in the User Banks (page 47).

2. Press the [EDIT] button to enter the Voice Edit mode.



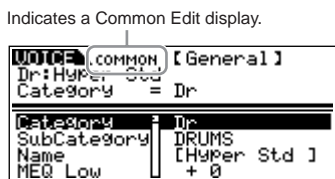
3. Call up the Common Edit display or Key Edit display.

If you wish to edit more global parameters related to the overall Voice and how it's processed, such as Voice Name, Volume, Pan, and Controller (page 45), call up the Common Edit display.

If you wish to edit the sounds that make up a Key and the basic parameters that determine the sound (page 51), such as Oscillator, Pitch, Filter, Amplitude, and EG (Envelope Generator), call up the Key Edit display.

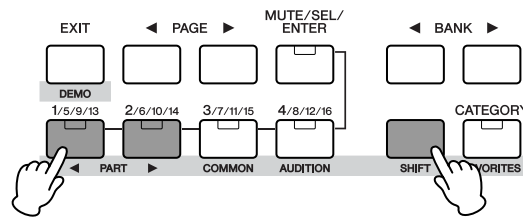
Calling up the Common Edit display

Simultaneously hold down the [SHIFT] button and press the [COMMON] button to call up the Common Edit display.

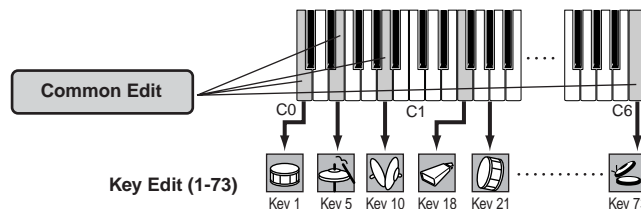


Calling up the Key Edit display

When calling up the Key Edit display, simultaneously hold down the [SHIFT] button and use the PART [◀][▶] buttons to select the desired key. You can also select the desired key by using a connected keyboard (via incoming Note On data). Simultaneously hold down the [SHIFT] button and press the appropriate key on the keyboard.



Indicates the display for editing the key C0.



4. Select the desired display with the PAGE [◀][▶] buttons and change the settings.

The main parameters available are basically the same as in the Normal Voice Edit (page 25). What is called Key Edit in a Drum Voice corresponds to Element Edit in a Normal Voice. Please keep in mind that the LFO parameters are not available for Drum Voices.

5. Repeat steps 3 - 4 as desired.

6. Name the edited Drum Voice.

Select the General display in the Common Edit, and then input a name in the Name parameter.

For detailed instructions on naming, refer to page 50.

7. Store the edited Voice to the User Bank (USR) for Drum Voice.

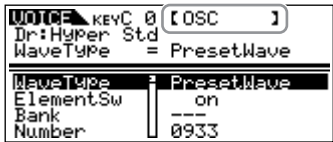
For details, see page 49.

TIP Assigning drum/percussion instruments to individual keys

[SHIFT] + [DRUM] → select Drum Voice → [EDIT] → select Key → select OSC display → "Number"

In the Drum Voice Edit mode, you can create your own original drum kits by assigning specific instrument sounds to individual keys (in any desired order) and edit detailed parameters for each key's sound.

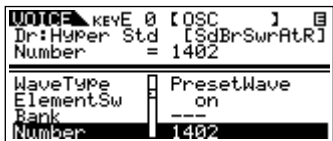
1. Call up the Key Edit display in the Voice Edit mode.
Refer to step 3 on page 27.
2. Select the OSC display with the PAGE [◀|▶] buttons.



3. Select the key to which you want to assign a sound with the [SHIFT] + PART [◀|▶] buttons.



4. Select the desired Waveform to be assigned.
Move the cursor to "Number" and change the value by using the data dial.



NOTE You can also select the desired wave from the desired category ("WaveCtyg" parameter). For a list of waves and their categories, refer to the "Waveform List" in the separate Data List.

5. Create your original drum kit by repeating steps 3 - 4.
6. Store the edited Voice to the User Bank (USR) for Drum Voice.
For details, see page 49.

TIP Setting the drum key for independent open and closed hi-hat sounds

[SHIFT] + [DRUM] → select Drum Voice → [EDIT] → select Key → select OSC display → "AltnateGrp" (Alternate Group)

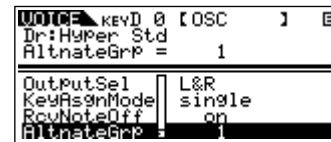
In a real drum kit, some drum sounds cannot physically be played simultaneously, such as open and closed hi-hats. You can prevent drum instruments from playing back simultaneously by assigning them to the same Alternate Group.

The preset Drum Voices have many such Alternate Group assignments to ensure the most authentic, natural sound. When creating a Voice from scratch, you can use this feature – either to ensure authentic sound, or to create special effects, where playing one sound cancels out a previous one.

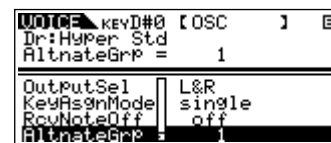
1. Call up the Key Edit display in the Voice Edit mode.
Refer to step 3 on page 27.
2. Select the OSC display with the PAGE [◀|▶] buttons.



3. Select the key which corresponds to "Hi-Hat Open" and set the "AltnateGrp (Alternate Group)" parameter to "1".



4. Select the key which corresponds to "Hi-Hat Close" and set it to the same Alternate Group (1) as in step 3.



5. Confirm whether the Alternate Group has been set properly.
Immediately after playing the "Hi-Hat Open" key, playing the "Hi-Hat Close" key. Playing the second key should cut off the sound of the first.

Since the settings above are included in the Drum Voice data, store them as a Drum Voice in the Voice Store mode.

TIP Determining how the Drum Voice responds when the key is released

[SHIFT] + [DRUM] → select Drum Voice → [EDIT] → select Key → select OSC display → "RcvNoteOff" (Receive Note Off)

You can determine whether or not the selected Drum key responds to MIDI Note Off messages. Setting the "RcvNoteOff" parameter to "off" can be useful for cymbal sounds and other sustaining sounds. This lets you have the selected sounds sustain to the length of their natural decay even if you release the note, or when a Note Off message is received. If this parameter is set to "on," the sound will stop immediately when a Note Off message is received.



TIP Setting the Output jack for each key

[SHIFT] + [DRUM] → select Drum Voice → [EDIT] → select Key → select OSC display → "OutputSel" (Output Select)

You can change the output jack on the rear panel for the individual Drum key signal. This function is useful when you wish to apply a connected external effect to a specific drum instrument. For details, see page 15.

The "OutputSel" parameter is available only when the "InsEFOut" parameter is set to "thru" in the OSC display.

Using Voice effects

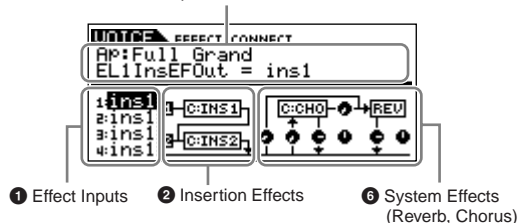
In the final stages of programming, you can set effects parameters to further change the sound's character. In the Voice Mode, you can set up and store effects with each Voice. For details on the structure of the effects, see page 59.

Here we'll show an example of editing effect settings.

1. Select the Voice you wish to edit (page 23).
2. Press the [EFFECT] button once or twice to enter the Effect Connection Edit mode.

The [EFFECT] button LED lights and the following display is shown.

The selected parameter name and value are shown.



1 Effect Inputs

When a Normal or Drum Voice is selected, this determines which effect (1 or 2) is used to process each individual Element or Key. When a Plug-in Voice is selected, this does not appear on the display since the Plug-in Voices only have one Element.

2 Insertion Effects (page 59)

Determines the types or routing for Insertion Effect 1 and 2.

3 System Effect (Reverb/Chorus) (page 59)

Determines the type and Send/Return Level of System Effect (Reverb/Chorus).

NOTE • The display above shows an example of the Normal Voice mode. When selecting the Drum Voice or Plug-in Voice, the display will differ.
• If this display is not shown, press the [EFFECT] button again.

3. Set the Insertion Effects. The settings here affect the Voices of the Performance/Multi Parts.

Select the parameters in (1) and (2) by the cursor [^][V] or PAGE [◀][▶] buttons, and then change the settings by the data dial. The following parameters are used to edit the Insertion Effect.

1 Effect Inputs

EL1InsEFOut - EL4InsEFOut (Insertion Effect Out)	Determines which effect (1 or 2) is used to process each individual Element. The "thru" setting lets you bypass the Insertion Effects for the specific Element/key.
--	---

NOTE • When editing the Drum Voice, first select the key with the "Key" parameter, then determine which effect (1 or 2) is used for the selected key with "InsEFOut" parameter.
• You can also select the desired key by using a connected keyboard (via incoming Note On data) simultaneously holding down the [SHIFT] button and pressing the appropriate key on the keyboard.

2 Insertion Effects

Ins1Ctgr, Ins2Ctgr (Insertion 1/2 Category)	These determine the effect type category for Insertion 1 and 2.
Ins1Type, Ins2Type (Insertion 1/2 Type)	These determine the effect type for Insertion 1 and 2.
InsEFCnct (Insertion Effect Connect Type)	Determines the effect routing for Insertion 1 and 2.

4. Set the System Effects (Reverb/Chorus). The settings here do not affect the Voices of the Performance/Multi Parts.

Make settings for the parameters in (3) below in the same manner as the Insertion Effects in step 3 above.

First select the Reverb/Chorus type, then set the Send Level and Panning. The following parameters are used to edit the System Effect.

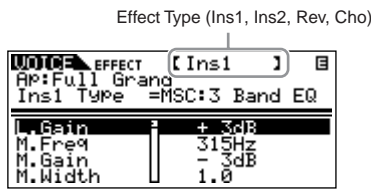
NOTE For information on the Reverb/Chorus types, refer to the separate Data List.

3 System Effects (Reverb, Chorus)

ReverbType (Reverb Type)	For setting the Reverb Effect Parameters.
RevSend (Reverb Send)	
ReverbRtn (Reverb Return)	
ReverbPan (Reverb Pan)	
ChoCtgr (Chorus Category)	For setting the Chorus Effect Parameters.
ChoType (Chorus Type)	
ChoSend (Chorus Send)	
ChoRtn (Chorus Return)	
ChoPan (Chorus Pan)	
ChoToRev (Chorus to Reverb)	For adjusting the Send Level from the Chorus Effect to Reverb Effect.

5. Set the detailed effect parameters as necessary.

Press the [EFFECT] button to call up the Effect Edit display. You can edit detailed parameters from this display.



The PAGE [◀][▶] buttons can be used to switch between Effect Types. Select the desired parameter for editing by using the cursor [^][v] buttons and change the settings with the data dial.

NOTE The available parameters differ depending on the selected Effect type. For information on the Effect Parameters, refer to the separate Data List.

NOTE If "thru" or "off" is selected for the effect type, none of the effect parameters can be edited.

6. As necessary, set the Master Effect or Master Equalizer in the MEF or MEQ display from the Voice mode → [UTILITY].

For details on the structure of the effects, see page 59.

NOTE When setting the Master Effect, make sure to turn Master Effect on. (Press the [SHIFT] + [BYPASS], then turn "Master" parameter to "effect on.")

7. Store the edited Voice.

If you wish to save the new settings, store the settings with the other Voice parameters as a single Voice before you leave the selected Voice (page 49).

CAUTION

If you call up another Voice or another mode without saving, the edited settings may be lost.

Performance mode

In this section, you'll learn how select and play Performances, edit them and set their effects.

Playing the Performances

As in the Voice Play mode, the Performance Play mode is where you select and play the instrument sounds of this tone generator. Here we'll show how to play in the Performance Play mode. Each Performance can contain up to four different Parts. You can create a Performance by layering several Voices together, and by assigning different Voices to separate ranges of the keyboard.

NOTE Make sure that the MIDI Transmit Channel of the external MIDI keyboard matches the MIDI Receive Channel of the MOTIF-RACK ES (page 16).

Selecting a Performance

When shipped from the factory, this tone generator contains a full set of specially programmed 128 User Performances in the User Bank. In the Performance Play mode, you can select and play individual User Performances. Since there is only one bank for Performances, you need not select a Performance Bank.

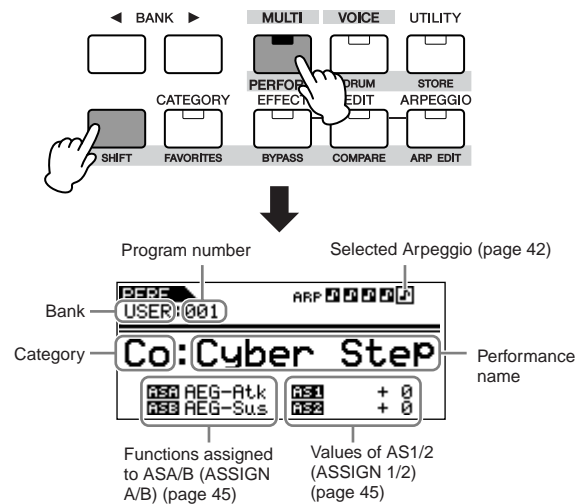
Performance User Bank

Keep in mind that if you overwrite a Performance in a User Bank, the User Performance will be lost. When you save the edited Performance, be careful not to overwrite any important User Performances.

1. Press the [SHIFT] + [PERFORM] buttons to enter the Performance Play mode.

The [PERFORM] button LED lights in orange. In this condition, playing the external keyboard sounds the Performance in the display.

The parameters shown in the Performance Play mode are briefly explained below.



2. Select a program number with the data dial or cursor [^][v] buttons.

Selecting Performances from a computer

As in the Voice mode, you can select Performances on this instrument from your computer software by specifying the following MIDI messages (page 24). The Bank Select MSB/LSB values for changing the Performance are following:

- Bank Select MSB (Control #000) = 63
- Bank Select LSB (Control #032) = 64

NOTE When switching the mode (e.g., changing the Voice mode to the Performance mode), transmit the proper Mode Change message (System Exclusive) before the Bank Select MSB to the MOTIF-RACK ES (page 95).

NOTE After the Bank Select MSB/LSB, transmit the proper Program Change message to select the Performance Program Number.

TIP Performance Part mute

[MUTE/SEL/ENTER] (LED lights) → select Part with [1/5/9/13] – [4/8/12/16]

Each Performance can contain a maximum of four Parts, each of which can be turned on or off independently. The operation for muting individual Parts is same as that of muting individual Elements of a Voice (page 26).

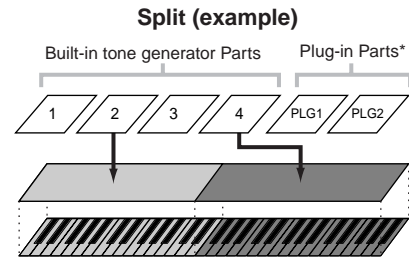
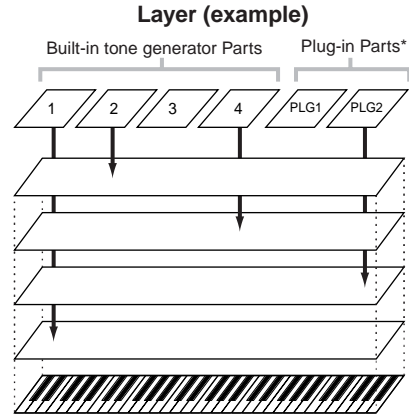
TIP Using the Category Search function

[CATEGORY] → select Main Category with BANK [◀|▶] → select Sub Category with [SHIFT] + BANK [◀|▶] → select Performance → [CATEGORY]

As in the Voice Play mode, you can use the Category Search and Favorite Category functions in the Performance Play mode (page 24).

Assigning desired Voices to each Part

Performances can be made up of a maximum of four Parts (Voices), selected from the internal tone generator Parts 1 - 4 and Plug-in Board Parts 1 - 2. You can create a Performance by layering several Voices together, and by assigning different Voices to separate ranges of the keyboard.



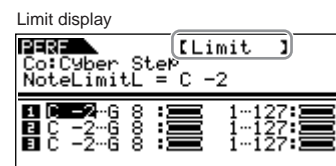
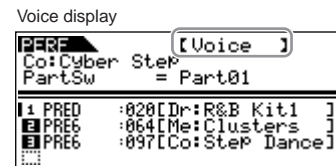
*Available when the Plug-in Board has been installed.

1. Press the [SHIFT] + [PERFORM] buttons to enter the Performance mode, then select a Performance to be edited (page 30).

If you are creating a Performance from scratch, use the convenient Initialize function (in the [UTILITY] → JobSel display) to initialize a Performance in the User Banks (page 47).

2. Press the [EDIT] button once or twice to call up the Performance Voice Assign mode.

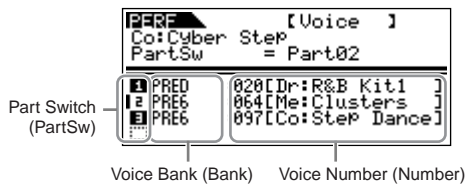
The following display appears.



3. Select the Voice display with the PAGE [◀][▶] buttons.

4. Assign the desired Voice to each Part.

Move the cursor to the desired setting with the cursor [^][V] buttons. Set the parameters with the data dial.



Part Switch (PartSw)	Determines whether the internal Voices or Plug-in Board Voices are used.
Voice Bank (Bank)	Select a Bank for the selected Part.
Voice Number (Number)	Select a Voice number in the selected Bank.

NOTE Voices of the Multi-part Plug-in Board PLG100-XG cannot be assigned to Performance Parts.

NOTE You can also assign Voices to a Performance in the Part Edit display (page 33).

When a Plug-in Board Voice is assigned to a Part, the available Voice Banks differ depending on the installed Plug-in Board. For details, refer to the Owner's Manual of the Plug-in Board.

TIP Using Category Search to assign Voices to the Parts

Performance Voice Assign mode → select Voice display with PAGE [◀][▶] → move cursor to "Bank" or "Number" → [CATEGORY]

If selecting "Bank" or "Number," you can select using the Category Search function as in the Voice mode (page 24).

5. Select the Limit display with the PAGE [◀][▶] buttons, then set the highest/lowest note of the range (NoteLimitH/NoteLimitL) and the maximum/minimum velocity (VelLimitH/VelLimitL) for each Part.

Move the cursor to the desired parameter with the cursor [^][V] buttons. Set the parameters with the data dial.

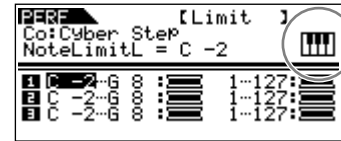


NoteLimitH	Determines the highest/lowest note for each Part.
NoteLimitL	
VelLimitH	Determines the maximum/minimum velocity for each Part.
VelLimitL	

TIP Set the note/velocity range with a Note On message

You can also set the note/velocity range directly from a connected MIDI keyboard by pressing the appropriate keys.

1. Select the Limit display, then press the [SHIFT] + [MUTE/SEL/ENTER] buttons.
2. The keyboard mark appears in the top right of the display.



3. Press the desired key on the keyboard to transmit the Note On message to the MOTIF-RACK ES.
4. When the cursor is set to "NoteLimitH" or "NoteLimitL," the parameter is set to the note of the pressed key (note number).
When the cursor is set to "VelLimitH" or "VelLimitL," the parameter is set to the volume of the pressed keyboard (Velocity).

6. Name the edited Performance.

Select the General display in the Common Edit, and then input a name in the Name parameter. For detailed instructions on naming, refer to page 50.

7. Store the edited Performance to the User Bank (USER) of the Performance.

For details, see page 49.

Performance Edit

The Performance Edit mode ([SHIFT] + [PERFORM] → [EDIT]) lets you create your own original Performances – containing up to four different Parts (Voices) – by editing the various parameters. The Voices can be selected from the internal tone generator or the installed Plug-in Boards. After assigning different Voices to separate ranges of the keyboard, edit the detailed parameters in the Performance Edit mode.

Compare Function

When you're editing a Voice, Performance or Multi, this feature lets you quickly and easily hear the effect of the edits you make – allowing you to switch between the original, unedited Voice/Performance/Multi and the newly edited settings.

1. While in the Edit mode, simultaneously hold down the [SHIFT] button and press the [COMPARE] button. The EDIT LED will flash and the settings prior to editing are temporarily called up for comparing. (The C indicator is shown at the top right of the display in place of the E indicator.)

2. Simultaneously hold down the [SHIFT] button and press the [COMPARE] button to disable the Compare function and restore your recently edited settings.

- NOTE**
- The Compare function is also available in the Voice/Multi Edit mode.
 - While Compare is active, you cannot make edits to the parameters.

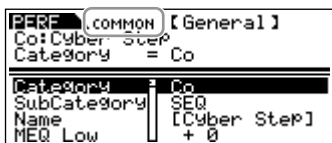
1. Press the [SHIFT] + [PERFORM] buttons to enter the Performance mode, then select a Performance to be edited (page 30).

If you are creating a Performance from scratch, use the convenient Initialize function (in the [UTILITY] → JobSel display) to initialize a Performance in the User Banks (page 47).

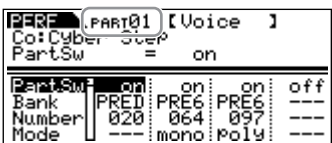
2. Press the [EFFECT] button once or twice to enter the Performance Edit mode.

The following display appears.

Common Edit display



Part Edit display



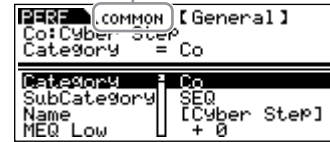
3. Call up the Common Edit display or Part Edit display.

Use Common Edit to edit parameters affecting all of the Parts. Use Part Edit to edit parameters for each Part.

Calling up the Common Edit display

Simultaneously hold down the [SHIFT] button and press the [COMMON] button to call up the Common Edit display.

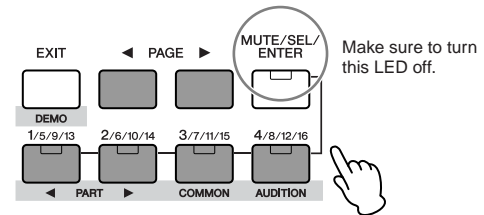
Indicates a Common Edit display.



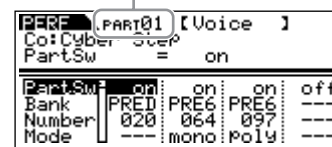
Calling up the Part Edit display

To call up the Part Edit display, first check that the [MUTE/SEL/ENTER] button LED is turned off, then select the desired Part with the corresponding the [1/5/9/13]-[4/8/12/16] buttons. You can also step through the Parts in order by simultaneously holding down the [SHIFT] button and using the PART [◀][▶] buttons. If the [MUTE/SEL/ENTER] button is lit, simply press the [MUTE/SEL/ENTER] button again to turn it off.

- NOTE** If a Plug-in Board (or Boards) has been installed, you can select Plug-in Part 1 or 2 by pressing the [1/5/9/13] or [2/6/10/14] button several times.

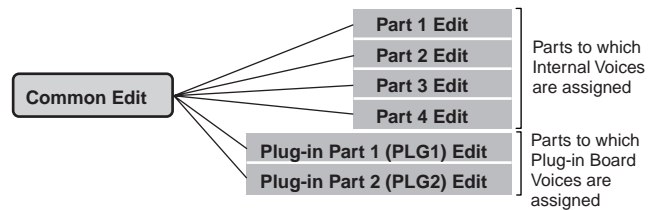


Indicates the display for editing Part 1.



You can create a Performance by selecting and turning on up to four Parts (using the "PartSw" parameters).

- NOTE** You can also assign the desired Voice to each Part in the Performance Assign mode (page 33).



TIP Switching Part On/Off (Mute) and selecting the Part

Each time you press the [MUTE/SEL/ENTER] button, the on/off status of the LED changes.

When the LEDs are lit (Mute)

You can mute any Part by pressing the corresponding Part/Element button [1/5/9/13] to [4/8/12/16]. You can check which Part is muted by checking the lamps of the Part/Element buttons. The LEDs of the muted Part buttons are turned off and the active Part buttons light.

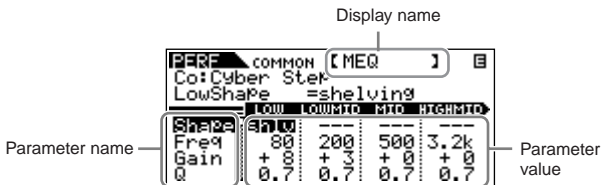
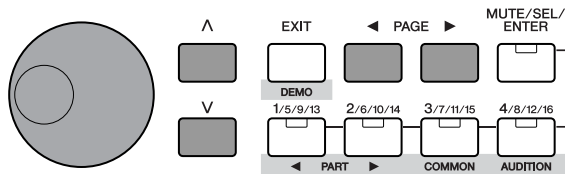
When the LEDs are off (Select)

You can select any desired Part by pressing the corresponding Part/Element button [1/5/9/13] to [4/8/12/16]. If you select the muted Part, the LED of the button flashes.

NOTE You can also switch the on/off status of each Part in the Multi mode.

4. Select the desired display with the PAGE [◀][▶] buttons and change the settings.

To change the display page, use the PAGE [◀][▶] buttons. Select the desired parameter with the cursor [▲][▼] buttons and change the settings by using the data dial.



The following briefly describes the main parameters.

Common Edit

General	For setting general parameters in Common Edit, such as Performance Name, Portamento, etc.
MEQ (Master EQ)	For setting the Master EQ for each Performance. Master EQ also features separate EQ shape parameters for the Low and High bands, as well as the Frequency, Gain and Q controls for each band.
MEF (Master Effect)	For setting the Master Effect type and other parameters.
CtrlAsn (Control Assign)	For setting the Control Numbers generated by using an external MIDI controller.

NOTE Functions assigned to the external controllers depend on the settings of each Part's Voice edited in the Voice Edit mode.

Output	For setting the Voice output parameters such as Volume, Pan, and Send Level of Reverb/Chorus Effect.
EG (Envelope Generator)	For setting time variance parameters such as Attack, Decay, Release and Sustain, or the filter parameters such as Cutoff and Resonance.

Part Edit

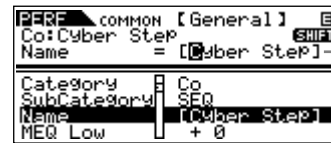
Voice	Determines the Voice parameters (Voices assigned to the Part, Note/Velocity Range, Arpeggio On/Off, Portamento setting, Pitch Bend setting, etc.) for each Part. You can also set the Voice for assigning to each Part and Note/Velocity Range of each Part in the Performance Voice Assign mode (page 31).
Output	Assigns each individual Part's Voice to be output from a specific output jack on the rear panel. You can also set the Voice output parameters such as Volume, Pan, and Send Level of Reverb/Chorus Effect.
Tone	For setting basic synthesizer parameters, such as Oscillator, Pitch, Filter, and Amplitude.
EQ (Equalizer)	For setting the Equalizer for each Part.
RcvSw (Receive Switch)	For setting whether Control Change, Pitch Bend, Modulation Wheel messages, etc. for each Part are recognized or not.

5. Repeat steps 3 - 4 as desired.

6. Name the edited Performance.

Select the General display in the Common Edit, and then input a name in the Name parameter.

For detailed instructions on naming, refer to page 50.



Enter the desired Performance name.

7. Store the edited Performance to the User Bank (USER) of the Performance.

For details, see page 49.

Using Performance effects

In the final stages of programming, you can set the effects parameters to further change the sound's character. In the Performance Mode, you can set up and store the effects with each Performance. For details on the structure of the effects, see page 59.

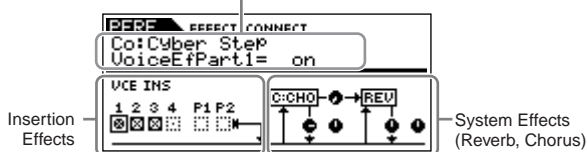
Here we'll show an example of editing effect settings in the Performance mode.

1. Select the Performance you wish to edit (page 30).

2. Press the [EFFECT] button once or twice to enter the Effect Connection Edit mode.

The [EFFECT] button LED lights and the following display is shown.

The selected parameter name and value are shown.



Insertion Effects	Selects the desired Part(s) to which the Insertion Effects are to be applied. The Insertion Effect settings depend on the settings of the Voice assigned to each Part (made in the Voice mode; page 29).
System Effects (Reverb, Chorus)	Determines the Type and Send/Return Level of System Effect (Reverb/Chorus).

3. Select the desired Part(s) to which the Insertion Effects are to be applied.

Set the checkbox(es) of desired Part(s) applied the Insertion Effects to on, and set the rest of the Part(s) to off in the above display. Move the cursor with the cursor [^][V] or PAGE [◀][▶] buttons to the desired check box, then set the parameter to "on" or "off."

4. Set the System Effects (Reverb/Chorus).

Select the parameters in System Effects above with the cursor [^][V] or PAGE [◀][▶] buttons, and then change the settings by the data dial.

First select the Reverb/Chorus Type, then set the Send Level and Panning. The following parameters are used to edit the System Effect.

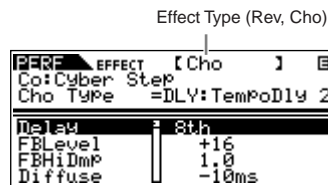
NOTE For information on the Reverb/Chorus Types, refer to the separate Data List.

NOTE The Insertion Effect settings depend on the settings of the Voice assigned to each Part (made in the Voice mode; page 29).

ReverbType (Reverb Type) ReverbRtn (Reverb Return) ReverbPan (Reverb Pan)	For setting the Reverb Effect Parameters.
ChoCtgr (Chorus Category) ChoType (Chorus Type) ChoRtn (Chorus Return) ChoPan (Chorus Pan)	For setting the Chorus Effect Parameters.
ChoToRev (Chorus to Reverb)	For adjusting the Send Level from the Chorus Effect to Reverb Effect.

5. Press the [EFFECT] button to enter the Effect Parameter Edit mode.

You can edit detailed parameters from this display.



The PAGE [◀][▶] buttons can be used to switch between Effect Types.

Select the desired parameter for editing by using the cursor [^][V] buttons and change the settings with the data dial.

NOTE The available parameters differ depending on the selected Effect Type. For details, refer to the separate Data List booklet.

NOTE If "off" is selected for the effect type, none of the effect parameters can be edited.

6. As necessary, set the Master Effect or Master Equalizer in the MEF or MEQ display.

[SHIFT] + [PERFORM] → select Performance → select Performance Edit mode by pressing [EDIT] once or twice → [SHIFT] + [COMMON] → MEF or MEQ display

For details on the structure of the effects, see page 59.

NOTE When setting the Master Effect, make sure to turn Master Effect on. (Press the [SHIFT] + [BYPASS], then turn "Master" parameter to "effect on")

7. Store the edited Performance.

If you wish to save the new settings, store the settings with the other Performance Edit parameters as a single Performance before you leave the selected Performance.

For details about storing Performances, see page 49.

CAUTION

If you call up another Performance or another mode without saving, the edited settings may be lost.

Multi mode

The Multi Mode lets you set up the MOTIF-RACK ES as a multi-timbral tone generator for use with computer-based music software or external sequencers. If each track in a song file uses a different MIDI channel, you can independently assign each of the Parts in a Multi to those MIDI channels. In this way, you can play back the song data on a sequencer with each track playing a different Voice. You can create a Multi containing up to 16 Parts using the internal tone generator. When installing the Plug-in Boards, you can also create a Multi containing up to 33 Parts (page 57). Since there is only one bank for Multi, you need not select a Multi Bank.

NOTE About the User Bank of Multis

When shipped from the factory, this tone generator contains a full set of specially programmed 32 User Multis in the User Bank. If a Multi in a User Bank (User Voice) is overwritten, the User Voice will be lost. When you save the edited Multi, be careful not to overwrite any important User Multis. Up to 128 Multis can be stored in the User Bank.

Playing the Multi

In the Multi Play mode, you can select and play any of the Multis. For more details about Multis, see page 53. Here, you'll learn how to play back song files of your computer sequencer software with the MOTIF-RACK ES.

Setting up for using a computer

1. Connect the computer to the instrument with a USB cable.

NOTE You can also use MIDI cables to connect the instrument to a computer.

For details about how to connect the instrument to a computer, see page 18.

2. Start the computer and insert the "Tools for MOTIF-RACK ES" CD-ROM into the CD drive of the computer.

3. Turn the power of the MOTIF-RACK ES on.

4. Install the USB MIDI driver to the computer.

For a computer running Windows, the Add New Hardware Wizard may appear on the computer display. In this case, install the driver following the on-screen instructions. Refer to the separate Installation Guide.

5. Set the "MIDI IN/OUT" parameter to "USB" (in [UTILITY] → select MIDI display with PAGE [◀][▶]), then press the [EXIT] button to save the settings.

CAUTION

Never attempt to turn off the power while data is being stored (while a "Please keep power on" message is shown). Turning the power off in this state results in loss of all user data.

Using the sounds of the MOTIF-RACK ES for song playback from a sequencer

1. Follow the instructions described in "Setting up for using a computer."

2. Start up the sequencer software on the computer, and then open the new song file of the sequencer.

Set the MIDI port and MIDI channel setting of each track in the sequencer song file.

MIDI Port settings

If you are using the internal tone generator of the MOTIF-RACK ES, set the MIDI port of each track of the sequencer to "1." If you are using the Plug-in Board Voice, set the MIDI port of the track(s) to the port number same as the "PortNo." parameter ([UTILITY] → PLG1/2Sys display) (page 38).

MIDI channel settings

Match the MIDI transmit channels of the sequencer with the receive channels of the Multi Parts (Step 6). The receive channels of the Multi can be set in the Voice display in the Multi Part Edit mode (page 84).

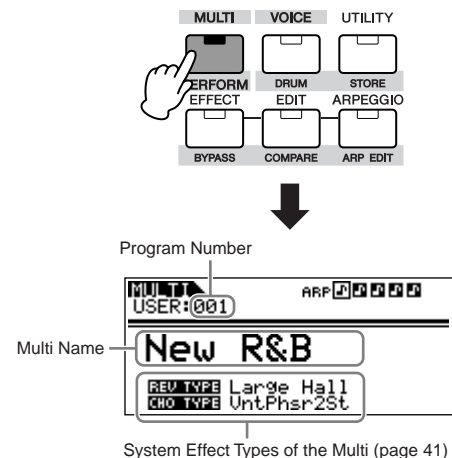
For more information, refer to the owner's manual of your sequencer.

NOTE The MIDI ports 1-8 of USB are shown as "YAMAHA USB IN/OUT 0-1" - "YAMAHA USB IN/OUT 0-8" in Windows and "YAMAHA MOTIF-RACK ES Port 1" - "YAMAHA MOTIF-RACK ES Port 8" in the Macintosh.

NOTE When using the Arpeggio function of the MOTIF-RACK ES, set the sequencer to "master" and set the MOTIF-RACK ES to "slave" (page 17).

3. Press the [MULTI] button once or twice to enter the Multi mode.

The [MULTI] button LED lights in green.



4. Select a Multi with the data dial or cursor [^][V] buttons.

Set the Voice for assigning to the each Multi Part, Receive Channels, and Effects for the desired song. For more information, refer to "Simple Mixer functions (Mixing Edit mode)" on page 37 and "Detailed Mixing functions (Multi Edit mode)" on page 39.

NOTE When shipped from the factory, this tone generator contains a full set of specially programmed 32 User Multis in the User Bank.

TIP Selecting Multis from a computer

As in the Voice mode, you can select a Multi on this instrument from your computer software by specifying the following MIDI messages (page 24). The Bank Select MSB/LSB values for changing the Multi are following:

- Bank Select MSB (Control #000) = 63
- Bank Select LSB (Control #032) = 65

NOTE • When switching the mode (e.g., changing the Voice mode to the Multi mode), transmit the proper Mode Change message (System Exclusive) before the Bank Select MSB to the MOTIF-RACK ES (page 95).
• After the Bank Select MSB/LSB, transmit the proper Program Change message to select the Multi Program Number.

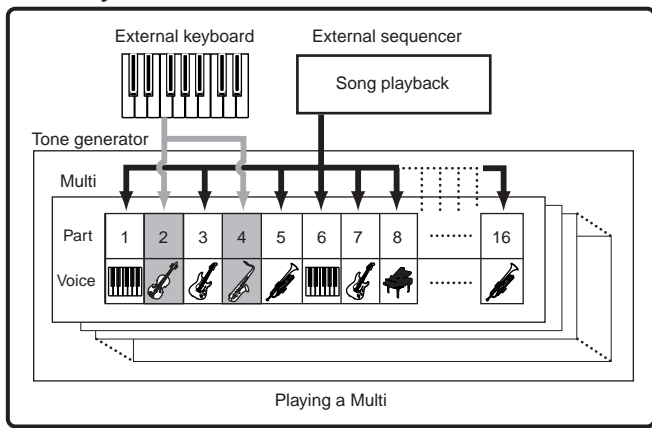
5. Record your song data to the sequencer song file.

For details, refer to the owner's manual of your sequencer.

6. Play back the sequencer song file using the sounds of the MOTIF-RACK ES.

When a Note On message is received, the corresponding Part is played. For example, when you play back tracks on the sequencer, the Part whose Receive Channel is same as the sequencer track's Transmit Channel is played. If two or more Parts have the same MIDI receive channel value, those Parts will play in unison. For details about the channel settings, see page 16.

Multi Play Mode



Simple Mixer functions (Mixing Edit mode)

The Mixing Edit mode gives you convenient editing functions over some basic parameters, and features a graphic mixer-like layout that allows you to easily check each Part's setting. This mode is useful for changing parameters for each Part even while song data is being played back from a connected sequencer.

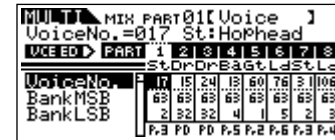
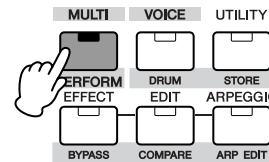
Simple mixing functions and basic parameters are provided in the mode, such as selecting Voices, changing effect settings and so on. If you want to edit a Multi in greater detail, see the Multi Edit mode (page 39).

1. Press the [MULTI] button once or twice, until the [MULTI] button LED lights in green. Then, select the Multi you wish to edit.

If you are creating a Multi from scratch, use the convenient Initialize function (in the [UTILITY] → JobSel display) to initialize a Multi in the User Banks (page 47).

2. Press the [MULTI] button to enter the Mixing Edit mode.

The [MULTI] button LED changes from green to red, indicating that the Mixing Edit mode is selected.



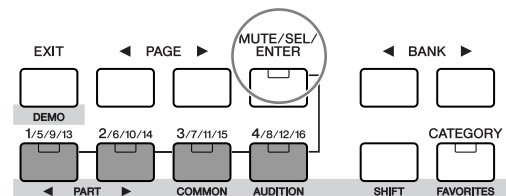
3. Press the [MUTE/SEL/ENTER] button to turn the LED off, then select the desired Part with Part/Element buttons.

Repeatedly pressing one of the buttons alternates among the Part numbers. For example, pressing the [1/5/9/13] button repeatedly calls up Parts 1, 5, 9 and 13 in order.

You can also step through the Parts in order by simultaneously holding down the [SHIFT] button and using the PART [◀][▶] buttons.

NOTE If a Plug-in Board (or Boards) has been installed, you can select Plug-in Part 1 or 2 by pressing the [1/5/9/13] or [2/6/10/14] button several times.

Make sure to turn this LED off.



4. Select the desired display, then edit the desired parameters.

The Mixing Edit mode has three edit displays: Voice, Output, and Effect. Select the desired display by using the PAGE [◀][▶] buttons.

Voice

From this display you can select a Voice for each Part. Select a Voice Bank with the "BankMSB/BankLSB" parameter and select the desired Voice with the "VoiceNo." parameter.



NOTE Bank

By pressing the BANK [◀][▶] buttons or selecting the "BankMSB/BankLSB" parameter with the cursor [▲][▼] buttons and using the data dial, you can call up the Voice Banks listed below.

Normal Voice	Drum Voice	Plug-in Voice
Pr1-6: Preset Banks	PD: Preset Drum Bank	Pp (Pp1-2): Plug-in Preset Bank(s)
GM: GM Bank	GD: GM Drum Bank	Pu1-2: Plug-in User Banks
Us1-3: User Voice Banks	UD: User Drum Bank	PB: Plug-in Board Voice Bank*

* For details about Plug-in Board Voices, refer to page 52.

TIP Using Category Search to assign Voices to the Parts

You can select Voices using the Category Search function, just as is done in the Voice Play mode (page 24).

TIP Assigning Voices to the Parts from a computer

You can use a computer to select Voices to be assigned to the Parts by specifying appropriate MIDI messages. If you transmit the relevant Bank Select MSB/LSB and Program Change messages to the MOTIF-RACK ES, the Part Voice corresponding to the MIDI channel of these messages can be changed (page 24).

NOTE Make sure that the MIDI Channel of the MIDI message is set to the same value as the receive channel of the desired Part.

Output

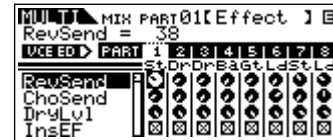
From this display you can set the Pan and Volume for each Part.



Select "Pan" or "Volume" with the cursor [▲][▼] buttons and use the data dial to change the settings.

Effect

From this display you can adjust the Reverb/Chorus Effect for each Part. You can also select the Parts to which the Insertion Effect is applied.



For an application example showing how to use effects, see page 40.

5. Store the edited Multi.

You can save up to 128 Multis to internal memory. For details about storing Multis, see page 49.

NOTE Press the [MULTI] button to return to the Multi Play mode.

NOTE Press the [EDIT] button to enter the Multi Edit mode.

Playing Plug-in Board Voices in the Multi mode

When playing a Plug-in Voice or Board Voice, be sure to make the following settings.

Assign the desired Board Voice or Plug-in Voice to the Plug-in Part. In the Voice display of the Mixing Edit mode or Multi Part Edit mode, select the appropriate bank and desired Voice number (pages 38, 39). For example, when you play a Plug-in Board Voice installed to PLG1, select PRE 1 (preset Plug-in Voice bank 1) or Pp1 (Board Voice bank 1) in the Bank parameter.

NOTE In the Mixing Edit/ Multi Part Edit mode, you can select Parts in succession by simultaneously holding the [SHIFT] button and using the PART [◀][▶] buttons. The Plug-in Parts can be selected following Part 16.

Set the Receive Channel of the Plug-in Part to the same value as the Transmit Channel of the track of the connected device (such as a sequencer) from which the data is to be played. This setting can be changed from the "ReceiveCh" parameter in the Voice display of the Multi Part Edit mode. The default settings are 1 for PLG1 Part, and 2 for PLG2.

NOTE When a Note On message is received, the internal Parts which are set to the same receive channel as that of the Plug-in Part are also played. To prevent this from happening, set the receive channels of the Parts that you wish not to play to "off," or set the MIDI port of the Plug-in Part(s) to "2" or "3" (page 58).

NOTE When the MOTIF-RACK ES is connected to a computer, the MIDI ports of Plug-in Part(s) can be changed. ([UTILITY] → PLG1Sys/PLG2Sys display → "PortNo.," page 91)

TIP Editing the Voice of each Part (Multi Voice Edit)

[MULTI] (LED lights in green) → select Multi → [MULTI] (LED lights in red) → Multi Mixing → select Part → [SHIFT] + [EDIT]

In the Multi mode, the Normal Voice assigned to each Part can also be edited. This is the same function as in both Common Edit (page 26) and Voice Element Edit (page 26) in the Voice mode.

NOTE Certain parameters cannot be edited in Multi Voice Edit.

NOTE Only Normal Voices can be edited.

NOTE A Voice edited with this function will be saved as a User Voice.

Detailed Mixing functions (Multi Edit mode)

The Multi Edit mode has a detailed mixing function that lets you change the Multi parameter settings in the same way as the Voice Edit mode. There are two types of Multi Edit displays: those for Common Edit, and those for editing individual Parts (Part Edit). Use Common Edit to edit the settings common to all Parts and Part Edit to edit the settings for individual Parts.

1. Press the [MULTI] button to enter the Multi mode, then select a Multi to be edited (page 36).

If you are creating a Multi from scratch, use the convenient Initialize function (in the [UTILITY] → JobSel display) to initialize a Multi in the User Banks (page 47).

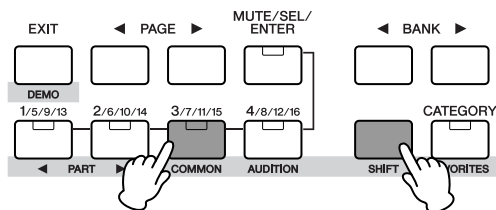
2. Press the [EDIT] button to enter the Multi Edit mode.

3. Call up the Common Edit display or Part Edit display.

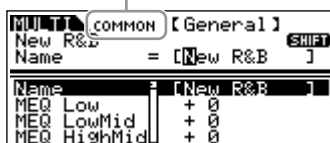
Use Common Edit to edit the parameters for all of the Parts. Use Part Edit to edit the parameters for each Part.

Calling up the Common Edit display

Simultaneously hold down the [SHIFT] button and press the [COMMON] button to call up the Common Edit display.



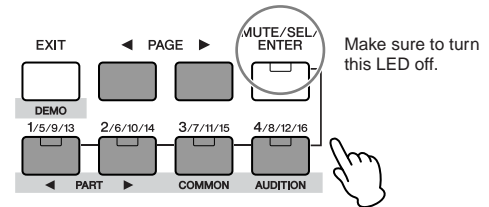
Indicates a Common Edit display.



Calling up the Part Edit display

To call up the Part Edit display, first check that [MUTE/SEL/ENTER] button LED is turned off, and then select the desired Part by pressing the corresponding the [1/5/9/13]-[4/8/12/16] buttons several times. You can also step through the Parts in order by simultaneously holding down the [SHIFT] button and using the PART [◀][▶] buttons. If the [MUTE/SEL/ENTER] button is lit, simply press the [MUTE/SEL/ENTER] button again to turn off.

NOTE If a Plug-in Board (or Boards) has been installed, you can select the Plug-in Part 1 or 2 by pressing the [1/5/9/13] or [2/6/10/14] button several times.



Indicates the display for editing Part 1.



4. Select the desired display with the PAGE [◀][▶] buttons and change the settings.

Select the desired parameter for editing by using the cursor [▲][▼] buttons and change the settings with the data dial.

Common Edit

General	For setting general parameters, such as the Voice Name, Offset values of Master EQ, etc.
MEQ (Master EQ)	For setting the Master EQ for each Multi.
MEF (Master Effect)	For setting the Master Effect type and parameters.
CtrlAsn (Control Assign)	For setting the Control Numbers generated by using an external MIDI controller.

NOTE Functions for assigning to the external controllers depend on the settings of each Part's Voice edited in the Voice Edit mode.

Part Edit

Voice	For setting the Voice parameters of each Part. Here you can set the Voice to be assigned to each Part, as well as Receive Channel, Note/Velocity Range, Arpeggio On/Off, Portamento, Pitch Bend Range, etc. The Voice assigned to each Part can be also set in the Mixing Edit mode (page 37).
Output	For setting the output jack corresponding to the individual Parts. This lets you to apply external effects to specific Parts. In addition, you can set the Voice output parameters such as Volume, Pan, Send Level of Reverb/Chorus Effect, etc.
Tone	For setting the parameters that determine the sound of the Voice, such as Pitch, Filter, and Amplitude.
EQ (Equalizer)	For setting the Master EQ for each Multi.
RcvSw (Receive Switch)	For setting whether certain MIDI messages (Bank Select, Program Change, Control Change, Pitch Bend, Modulation Wheel, etc.) are recognized for each Part or not.

TIP Using Category Search to assign Voices to the Parts

Part Edit display → select Voice display with PAGE [◀][▶] → select Part with [1/5/9/13] - [4/8/12/16] → move cursor to "Bank" or "Number" → [CATEGORY]

You can select Voices using the Category Search function, just as is done in the Voice Play mode (page 24)

5. Set the Effects.

For an application example showing how to use the effects, see below.

6. Store the edited Multi.

You can save up to 128 Multis to internal memory. For details about storing Multis, see page 57.

NOTE Please note that the Multi-part Plug-in Part (17-32) settings cannot be stored.

CAUTION

When you perform this, the settings for the destination data will be overwritten. You should always back up your important data to computer (page 48).

Using Multi effects

In the final stages of programming and creating sounds, you can use effects to further enhance and change the character of the sound — such as by applying a deep, ambient reverb, or by using chorus to make certain sounds richer and more animated.

When you edit Multi Effect parameters, keep in mind that there are two different types:

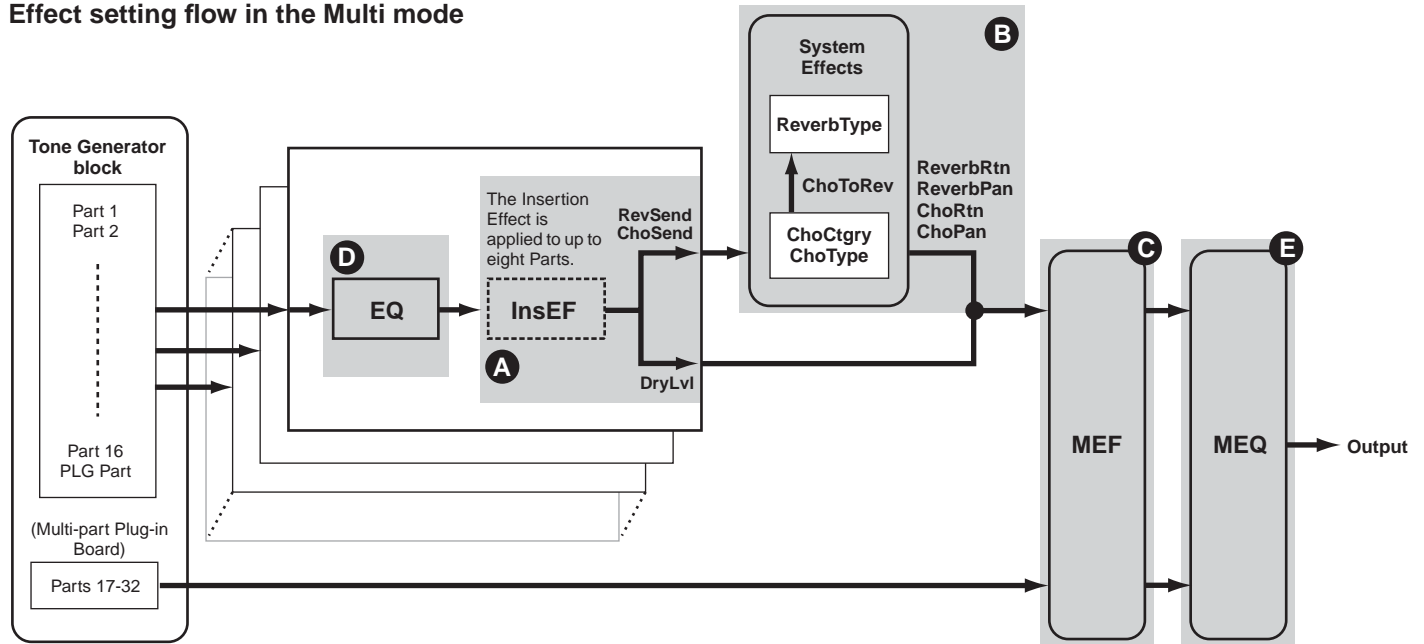
Parameters specific to individual Parts, which include:

- D** Part Equalizer settings edited in the Multi Part Edit mode
- A** On/off status of Insertion Effects and Send Level settings for System Effects edited in the Mixing Edit mode

Parameters common to all Parts, which include:

- B** System Effect settings edited in the Effect Edit mode
- E** Master Equalizer settings edited in the Multi Common Edit mode
- C** Master Effect in the Multi Common Edit mode

Effect setting flow in the Multi mode



NOTE The Insertion Effects and System Effect are not applied to the Parts of the Multi-part Plug-in Board.

NOTE The Part Equalizer is not applied to the Parts of Plug-in Board.

Here we'll show an example of editing effect settings in the Multi Mode.

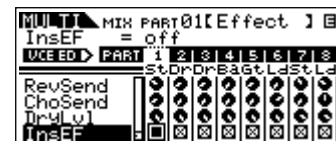
1. Select a Multi you wish to edit in the Multi mode (page 36).

2. Press the [MULTI] button once or twice to enter the Mixing Edit mode.

The [MULTI] button LED lights in red.

3. Select the desired Part(s) (up to eight) to which the Insertion Effects are to be applied (A).

Use the PAGE [◀][▶] buttons to select the Effect display and select the "InsEF" parameter using the cursor [^][v] buttons.



Use the Part/Element buttons ([1/5/9/13]-[4/8/12/16]) to select the desired Part for the Insertion Effects and checkmark the box using the data dial.

NOTE The parameter settings of each Insertion Effect are determined in the Voice Effect Edit of the assigned Voice.

4. Set the Reverb/Chorus Effect Level for each Part (A).

There are three parameters: "RevSend" (Reverb Send), "ChoSend" (Chorus Send), and "DryLevel."



Select the desired parameter using the cursor [^][V] buttons and select the Part you wish to edit by using the Part/Element buttons ([1/5/9/13]-[4/8/12/16]). Then use the data dial to set the Effect Send Level for each Part.

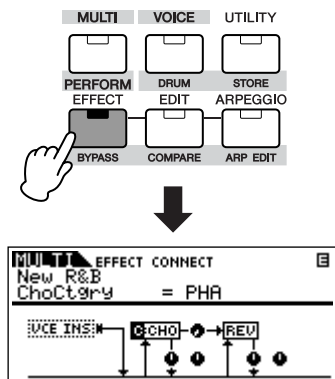
For example, in the instructions below, we'll increase the depth of the Reverb Effect for Part 7.

1. Select "RevSend" with the cursor [^][V] buttons.
2. Check that the [MUTE/SEL/ENTER] button LED is turned off.
If the [MUTE/SEL/ENTER] button is lit, simply press it again to turn it off.
3. Use the [3/7/11/15] button to select Part 7.
4. Turn the data dial clockwise to increase the Reverb Send Level.

NOTE The Reverb/Chorus Effect is not applied to any Part for which "RevSend" or "ChoSend" is set to "0".

5. Enter the Effect Edit Mode.

Enter the Effect Edit mode by pressing the [EFFECT] button. The [EFFECT] button LED lights and the following display is shown.



In this display, the System Effect settings can be edited.

NOTE If this display is not shown, press the [EFFECT] button again.

6. Set the System Effects (Reverb/Chorus) (page 40, B).

The following parameters are used to edit the System Effects. First select the Reverb/Chorus type, then set the Return Level and Panning.

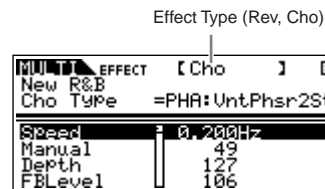
NOTE For information on the Reverb/Chorus types, refer to the separate Data List.

ReverbType (Reverb Type)	For setting the Reverb Effect parameters.
ReverbRtn (Reverb Return)	
ReverbPan (Reverb Pan)	
ChoCtgr (Chorus Category)	For setting the Chorus Effect parameters.
ChoType (Chorus Type)	
ChoRtn (Chorus Return)	
ChoPan (Chorus Pan)	
ChoToRev (Chorus to Reverb)	For adjusting the Send Level from the Chorus Effect to Reverb Effect.

Select the desired parameter for editing by using the cursor [^][V] buttons and change the settings with the data dial.

7. Set the detailed effect parameters as necessary.

Press the [EFFECT] button to call up the Effect Edit display.



The PAGE [◀][▶] buttons can be used to switch between Effect types.

Select the desired parameter for editing by using the cursor [^][V] buttons and change the settings with the data dial.

NOTE The available parameters differ depending on the selected Effect type. For details, refer to the separate Data List booklet.

NOTE If "off" is selected for the Effect type, none of the Effect parameters can be edited.

8. Set the Master Effect parameters (page 40, C).

The Master Effect common to all Parts can be edited in the Multi Common Edit mode (page 39).

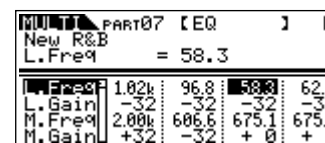
NOTE When setting the Master Effect, make sure to turn Master Effect on. (Press the [SHIFT] + [BYPASS], then turn "Master" parameter to "effect on")

9. Set the Equalizer parameters (page 40, D and E).

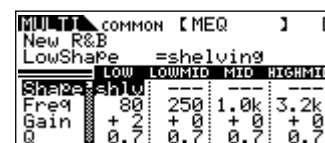
The MOTIF-RACK-ES has two types of Equalization: independent three-band Equalizers for each Part and a five-band Equalizer that is applied to all Parts. These are edited in the Multi Edit mode (page 39).

NOTE For details about the equalizers, see page 60.

First, set the Part Equalizer settings in the EQ display in the Multi Part Edit mode (page 39).



Then, set the Master Equalizer settings in the MEQ display in the Multi Common Edit mode (page 39).



NOTE For details about each parameter, refer to the reference section.

10. Store the edited Multi.

If you wish to save the new settings, store the settings with the other Multi parameters as a single Multi before you leave the selected Multi. For details about storing Multis, see page 49.

CAUTION

If you call up another Multi or another mode without saving, the edited settings may be lost.

Using the Arpeggio function

What is the Arpeggio function?

This function automatically triggers preset arpeggio phrases, riffs, and rhythmic patterns according to the notes you play. It is particularly useful in playing dance, pop, and techno music styles. You can assign the desired five Arpeggio Types to each Voice. You can also set the Arpeggio playback method, Velocity range and Play Effects to create your own original grooves. What's more, Arpeggio playback can be transmitted through the MIDI Out, letting you record the Arpeggio data to a sequencer.

TIP **Transmitting Arpeggio playback as MIDI data (via MIDI Out)**

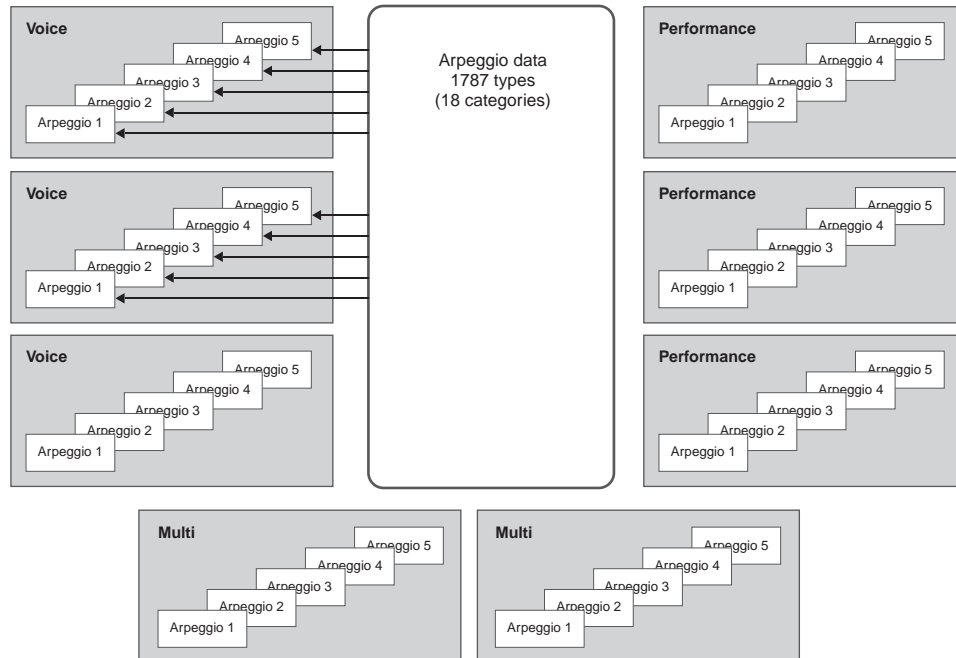
If you want to use the Arpeggios to trigger other MIDI tone generators or record the MIDI data of Arpeggios to a sequencer for further editing, you can have the Arpeggio playback data transmitted as MIDI data via the USB/MIDI OUT terminal. This is done by setting the following switch parameters to "on":

Voice Arpeggio: Voice mode → [UTILITY] → select Voice display → "ArpOutSw"

Performance/Multi Arpeggio: select Performance/Multi → [SHIFT] + [ARP EDIT] → "OutputSw"

Arpeggio structure

Each Voice/Performance/Multi can have up to five different Arpeggio types



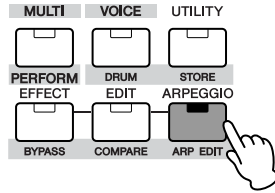
Arpeggio types

The MOTIF-RACK ES features 1787 Arpeggio types (in 18 categories) including Synthesizer, Piano, Guitar, Guitar bass, Strings, Drum, etc. For details, see page 63.

Arpeggio playback

1. Select a Voice/Performance/Multi.

2. To turn the Arpeggio function on, press the [ARPEGGIO] button.

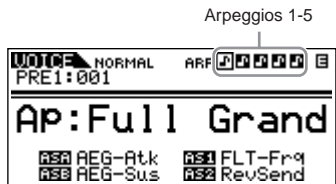


NOTE If Arpeggio is switched on and ready for use, the [ARPEGGIO] button LED will light when you select the Voice, Performance, or Multi.

3. Select the desired Arpeggio from the available five types while playing back.

The Preset Voices/Performances/Multis includes up to five Arpeggio types. The PAGE [◀][▶] buttons can be used to switch the Arpeggio types (Arpeggios 1-5). The selected Arpeggio will be highlighted.

- : Indicates that this Arpeggio has been stored.
- : Indicates that this Arpeggio has not been stored yet.
- : Indicates that the Arpeggio will change at the next measure.



TIP Switching Arpeggio types using Control Change messages

The Arpeggios 1-5 can be also switched from an external device using Control Change messages.

- Select the "ArpAsgn" parameter (in the [UTILITY] → CtrlAsn display), and then set the Control Number to switch among Arpeggios 1-5.
- Set the "ArpAsgnMode" parameter to either of the following parameters.

inc: Each time the MOTIF-RACK ES receives a Control Change message set in Step1, Arpeggios 1-5 can be switched. The actual Control Change value does not matter.

direct: You can select the Arpeggio corresponding to the value of the Control Change message that is set in Step1. For details, see page 90.

- Transmit the Control Change message to the MOTIF-RACK ES from an external device.

4. Play the MOTIF-RACK ES using the Arpeggio function.

Hold down a key or keys on the connected keyboard (or use note data from a sequencer) to play back the Arpeggio. The Arpeggio plays back according to the Note Number, Arpeggio type, Tempo, Note Limit settings, and so on.

NOTE In the Voice Mode, the Arpeggio is played back via the selected Voice.

NOTE In the Performance/Multi Mode, the Arpeggio is played back via the Voice(s) assigned to the Part(s) for which the "ArpSwitch" parameter (page 44) is set to on.

NOTE Keep in mind that when you play back the Arpeggio and the data includes Control Change messages, the Voice may inadvertently be changed and the edit indicator may appear in the top right of the display.

Change the Arpeggio settings

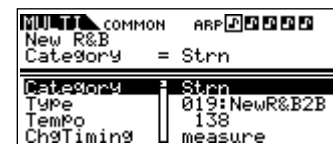
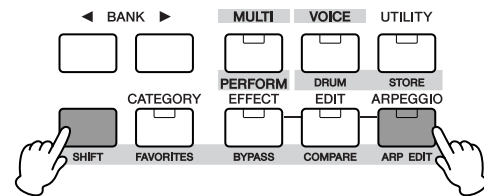
The basic Arpeggio settings are made in the Arpeggio Edit mode. The Arpeggio Edit mode is available in the Voice, Performance and Multi modes.

The explanation below applies to the Multi mode.

1. Select a desired Voice/Performance/Multi.

2. Select the Arpeggio Edit display.

Simultaneously hold down the [SHIFT] button and press the [ARP EDIT] button.



3. Select a category and type of the Arpeggio.

Move the cursor to the "Category" parameter (use the cursor [^][V] buttons) and select the category with the data dial. Then, move the cursor to the "Type" parameter (use the cursor [^][V] buttons) and select the Arpeggio type with the data dial.



4. Store the type selected in Step 3 to Arpeggios 1-5.

Simultaneously hold down the [SHIFT] button and press the [MUTE/SEL/ENTER] button to enter the Arpeggio Store display. In this display, you can store the type selected in Step 3 to any of the Arpeggios 1-5 or delete any types stored in Arpeggios 1-5.



Storing the Arpeggio

1. Select one of the Arpeggios 1-5 with the data dial.
2. Press the [ARPEGGIO] button so that the LED lights.
3. Press the [SHIFT] + [MUTE/SEL/ENTER] buttons to store the Arpeggio.

Deleting the Arpeggio

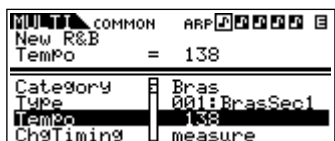
1. Select one of the Arpeggios 1-5 with the data dial.
2. Press the [ARPEGGIO] button to turn the LED off.
3. Press the [SHIFT] + [MUTE/SEL/ENTER] buttons to delete the Arpeggio.

NOTE Pressing the [ARPEGGIO] button alternately turns the LED on/off.

5. Press the [EXIT] button once to return the Arpeggio Edit display.

6. Set the Tempo.

Move the cursor to the "Tempo" parameter (use the cursor [^][V] buttons) and set the Arpeggio tempo with the data dial.



NOTE If the "MIDI Sync" parameter is set to "MIDI" ([UTILITY] → MIDI display), the tempo cannot be changed.

7. Make other settings for the Arpeggio as desired.

Use the cursor [^][V] buttons to move to the desired parameter (Note limit, Velocity limit, and so on) and set it. For details about each parameter, refer to the Reference section.

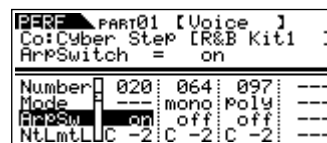
8. Store the Arpeggio settings.

The Arpeggio settings can be stored with each Voice/Performance/Multi. For details about storing Voices/Performances/Multis, see page 49.

TIP Using Arpeggios in the Performance/Multi mode

[SHIFT] + [PERFORM] or [MULTI] → [EDIT] → Select Part (page 33 and 39) → Select Voice display with PAGE [◀][▶] → "ArpSw"

In the Performance/Multi mode, you can set Arpeggio playback on or off for each Part by setting the "ArpSw" parameter from the Voice display in the Part Edit mode. A useful application of this would be to assign a Drum Voice to one Part and use Arpeggio playback on only that Part — so that you can have a rhythm pattern accompaniment playing while you play another Voice.



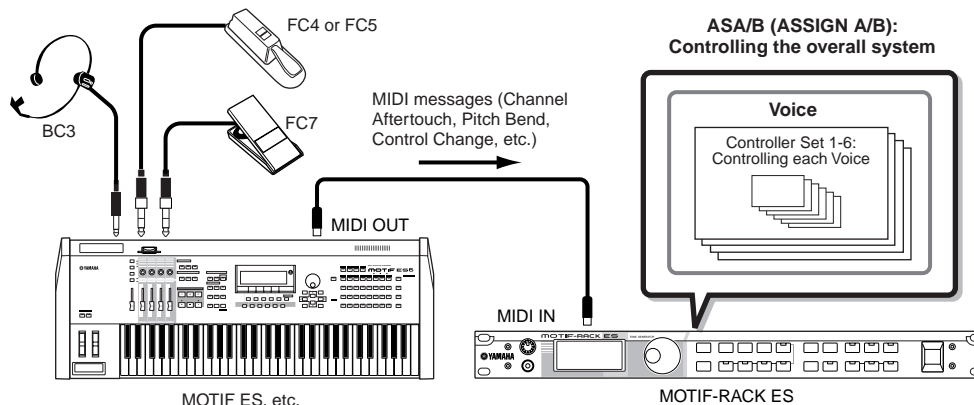
NOTE In the Performance mode, you can set the "ArpSw" parameters of several Parts to "on" simultaneously. In the Multi mode, only those Parts that have the same receive channel can be set to "on" simultaneously.

Controlling from an external MIDI keyboard

To use the MOTIF-RACK ES, you'll need an external keyboard (with various controllers, such as a pitch bend wheel, modulation wheel, etc.). The synthesizer's tone generator block produces the sound according to the MIDI messages received from the keyboard and sequencer.

External controllers supported by the MOTIF-RACK ES

The MOTIF-RACK ES can be played by connecting an external MIDI keyboard or synthesizer, and can be controlled by the MIDI controllers on the keyboard – pitch bend wheel, modulation wheel, ribbon controller, knobs, sliders, etc. In addition, you can also control the MOTIF-RACK ES using an optional Yamaha BC3 Breath Controller, FC4/5 Footswitch, FC7 Foot Controller, etc. by connecting these controllers to the external device.

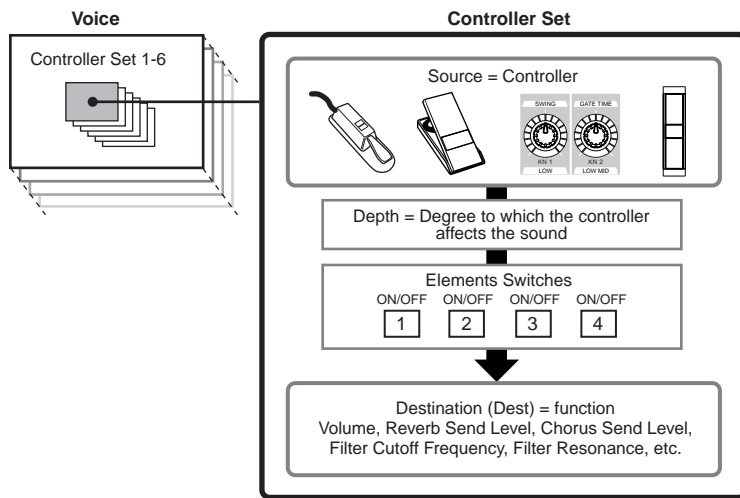


Quick Guide

Controlling a Voice with Controller Set

[VOICE] → select Voice → [EDIT] → [SHIFT]+[COMMON] → CtrlSet display (page 66)

You can freely assign a variety of different functions to the external controllers. For example, you could assign Resonance to the Modulation Wheel and set aftertouch to apply vibrato. These settings for all external controllers are referred to as a "Controller Set," and up to six Controller Sets can be created for each Voice.



NOTE You can set whether the controller affects each Element by setting the Element Switch on or off as desired. Note that this applies only to Normal Voices.

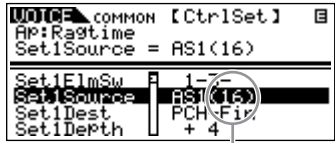
NOTE The Element Switch parameters are not available when a function unrelated to Elements is set as the destination.

TIP Source and Destination

The term "source" refers to the hardware controller and "destination" refers to the parameter or function being controlled. An extensive variety of destination parameters are available, far more than those listed above. For a complete list of destination parameters, see the separate Data List.

For example, in the instructions below, we'll control panning with an external assignable controller.

1. Select the "Set1Source" parameter to "AS1" (ASSIGN 1) in the CtrlSet display, then confirm the Control Number of the "AS1."



Control Number

NOTE For the source parameters, refer to "Set1-6Source" on page 66.

NOTE You can change the Control Number corresponding to the source controller (see right).

2. On the external controller device, make sure that the "AS1" setting matches the Control Number generated by operating the relevant controller.

For details on how to do this, refer to the owner's manual of your particular device.

3. Set the "Set1Dest" parameter to "ELM-Pan (Element Pan)."

NOTE For details on the available Dest parameter settings, refer to the Control List in the separate Data List booklet.

4. Set the depth of control by changing the "Set1Depth" parameter setting.

5. Repeat Steps 1 and 3 above to assign the remaining Control Sets 2 through 6.

6. The assigned functions (Destinations) are operated by operating the external controller.

Using one source to control several destinations

For example, set the Source parameter of Control Set 1 to MW (Modulation Wheel) and the Destination parameter to ELFO-PM (Element LFO Pitch Modulation Depth). Then set the Source parameter of Control Set 2 also to MW, but set the Destination parameter to ELM PAN (Element Pan). In this example, when you move the Modulation Wheel upward, the amount of Pitch Modulation increases accordingly, and the Element is panned from left to right. In this way, you can have the sound change in several different ways, simply by adjusting a single controller.

Using several sources to control one destination

For example, set the Source parameter of Control Set 1 to MW (Modulation Wheel) and the Destination parameter to ELFO-PM (Element LFO Pitch Modulation Depth). Then set the Source parameter of Control Set 2 to FC (Foot Controller) and set the Destination parameter also to ELFO-PM (Element LFO Pitch Modulation Depth). Now, Pitch Modulation is assigned to both the Modulation Wheel and Foot Controller. This can be useful in live performance situations, letting you use any one of several controllers depending on which is convenient at the time. In this way, you can have several different controllers affect the same aspect of the sound.

NOTE The Controller Set edited in the Voice Edit mode is available when the corresponding Voice is selected in the Performance mode and Multi mode.

NOTE In the Performance mode, controls the Voice assigned to each Part depending on the Controller sets made in the Voice mode. In Multi mode, controls the Part(s) assigned the same channel as the channel of the MIDI message generated by operating an external controller.

Controlling the overall system with ASSIGN A and B

Voice mode → [UTILITY] → CtrlAsn display → "ASA/B Asgn," "ASA/B Dest"

The ASSIGN A and B (ASA and ASB) settings let you control the functions that affect all Voices, Performances, and Multis.

1. Move the cursor to "ASA Asgn" and "ASB Asgn" parameters, then confirm the Control Numbers.

NOTE You can change the Control Number corresponding to the source controller (see below).

2. Select the destinations of the ASA and ASB controllers with the "ASA Dest" and "ASB Dest" parameters.

3. Assign each Control Number of "ASA Asgn" and "ASB Asgn" to an external controller device.

4. The assigned functions (Destinations) can be controlled in all modes by operating the external controller.

Assigning Control numbers

Each external controller has a pre-assigned Control Change number. When operating the external controller, each Control Change message assigned to each controller is transmitted to the MOTIF-RACK ES. Then, the Destination (function) corresponding to the Control Number is operated.

For example, if you assign the same Control Number as the AS1 to one external controller, you can operate the Destination (function) of the AS1 by the controller.

The following list indicates how to assign the Control Numbers to the controller (source) of the MOTIF-RACK ES.

Controller	Generated MIDI message	Display
Aftertouch (AT)	Channel Aftertouch (DnH)	—
Pitch Bend Wheel (PB)	Pitch Bend (EnH)	—
Modulation Wheel (MW)	Control Change (BnH, 01H)	—
Assignable Controller (ASA, ASB)*	Control Change (BnH)	[UTILITY] → CtrlSet display → ASA Asgn, ASB Asgn
Footswitch (FS)	Control Change (BnH)	[UTILITY] → CtrlSet display → FS Asgn
Ribbon Controller (RB)	Control Change (BnH)	Voice mode (Settings affecting all Voices): [VOICE] → [UTILITY] → Voice display
Assignable Controller (AS1, AS2)		Performance/Multi mode (Settings affecting each Performance/Multi): [SHIFT] + [PERFORMANCE]/[MULTI] → select Performance/Multi → [EDIT] → [SHIFT]+[COMMON] → CtrlAsn display
Foot Controller (FC1, FC2)		
Breath Controller (BC)		

* This controller is not used in the Controller Set function

NOTE The actual MIDI message may differ depending on the external controller settings.

Using the Jobs

There are six data-related operations (Jobs) in the Utility mode: Initialize, Copy, Bulk Dump, Plug-in Save, Plug-in Load and Factory Set. Here for example, you can initialize Voices/Performance/Multis to their original settings (including those currently being edited) or copy Elements/Parts.

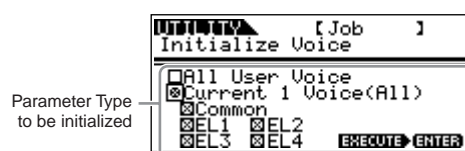
Performing a Job

1. In each mode, select the Voice/Performance/Multi you wish to perform the Job on.
 2. Press the [UTILITY] button to enter the Utility.
 3. Use the PAGE [◀][▶] buttons to select the “JobSel” display (the last page), then select the desired Job with the cursor [^][V] buttons.
 4. Press the [MUTE/SEL/ENTER] button.
The selected Job is displayed.
 5. If “Initialize”, “Copy”, “Bulk Dump” or “Plug-in Save” is selected, change the settings with the cursor [^][V] buttons and the data dial.
 6. Press the [MUTE/SEL/ENTER] button.
At the prompt, press [MUTE/SEL/ENTER] again to execute the Job, or press the [EXIT] button to cancel.
 7. Press the [MUTE/SEL/ENTER] button to execute the Job.
A “Completed” Message appears when the Job has been completed.
- CAUTION**
For Jobs that take longer to process, an “Executing...” message appears during processing. Never attempt to turn off the power while data is being written to internal memory (while an “Executing...” or “Please keep power on” message is shown). Turning the power off in this state results in loss of all user data.
8. Press the [EXIT] button to return to the Utility mode.
To exit back to the previous mode, press the [EXIT] button again.

Initialize (resetting parameters of a Voice/Multi to their default settings)

This is useful for setting up a “blank slate” when you want to build a completely new Voice/Performance/Multi from scratch. Keep in mind that this does not return the Voice/Multi to its original state prior to editing.

Select the target data (you wish to initialize) with the cursor [^][V] buttons and turn the data dial to checkmark the box next to the data.



Parameter Type to be initialized

Voice Mode

All User Voice	All Voices in the User Banks
Current 1 Voice (All)	Currently selected Voice (all parameters)
Common	Common data for currently selected Voice
EL 1-4	(Normal Voice) Element data for currently selected Voice
EL C0-C6	(Drum Voice) Key data for currently selected Voice

NOTE When a Plug-in Voice is selected, only one Element appears in the display (page 25).

Performance mode

All User Performance	All Performances
Current 1 Perf (All)	Currently selected Performance (all parameters)
Common	Common data for currently selected Performance
P1-4	Part 1-4 data for currently selected Performance
PLG1-2	Plug-in Part data for currently selected Performance

Multi Mode

All User Multi	All Multis
Current 1 Multi (All)	Currently selected Multi (all parameters)
Common	Common data for currently selected Multi
P1-16	Part 1-16 data for currently selected Multi
PLG1-2	Plug-in Part data for currently selected Multi

NOTE You can also use the Part/Element buttons ([1/5/9/13]-[4/8/12/16]) to select the Part or Element.

CAUTION

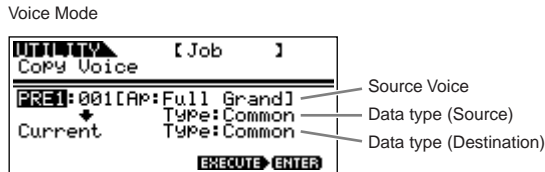
When “All User Voice,” “All User Performance,” or “All User Multi” is checkmarked, executing the initialize operation results in loss of all user Voice/Performance/ Multi data. Be careful not to initialize any important data.

Copy

From this display you can copy the Element/Key/Part parameter settings from any Voice/Performance/Multi to the Voice/Performance/Multi you are editing. In the Performance/Multi mode, you can also copy the effect settings.

NOTE If you wish to copy an entire Voice/Performance/Multi, use the Store function (page 49).

Move the cursor to Data type (Source) with the cursor [Λ][V] buttons, then select the type by the data dial. Also, select the Data type (Destination) by the data dial.



Data type to be copied

Voice Mode

- Common: Copies the Common Edit settings
- Elem1-4 (Key C0-C6): Copies each Element/Key Edit settings

NOTE When a Plug-in Voice is selected, only one Element appears in the display (page 25).

Performance/Multi mode

- Part01-04 (Performance), Part01-16 (Multi), Part P1, Part P2: Copies each Part/Plug-in Part settings

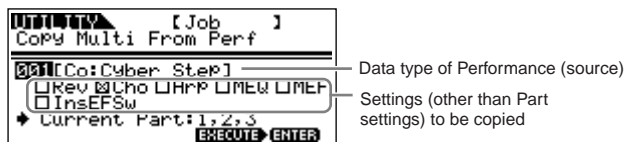
NOTE In the Performance/Multi mode, you can also select "Effect" and "Arp" in Data type (Destination).

- Effect: This lets you copy the System Effect (Reverb/Chorus) settings of the Part's Voice selected in Data type (Source) to the System Effect of the current Performance/Multi.
- Arp: This lets you copy the Arpeggio settings of the Part's Voice in Data type (Source) to the Arpeggio of the current Performance/Multi.

Copying the Performance settings to the Multi

In the Multi mode, you can also select the "Copy Multi from Perf" display with the PAGE [▶] button.

This display lets you to copy each Performance setting to the current Multi.



Setting to be copied

- All Part settings of a Performance
- Rev (Reverb), Cho (Chorus), Arp (Arpeggio), MEQ (Master EQ), MEF (Master Effect), or InsEFSw (Insertion Effect Switch) settings

For example, if "001: Cyber Step" is selected in "Data type of Performance" and the check box "Cho" is checked as shown above, Parts 01-03 of the Performance can be copied to the Parts 01-03 of the current Multi. In addition, the Chorus Effect settings of the Performance can be also copied to the Chorus Effect of the current Multi.

NOTE All Parts of the Performance are copied at once. Please note that a specific Part or Parts cannot be copied.

Saving data to an external device (Bulk Dump)

You can archive or back up your custom MOTIF-RACK ES settings by using the Bulk Dump function to transmit the data to your external sequencer software. Select the target data (the data to be transmitted) with the cursor [Λ][V] buttons and turn the dial to checkmark the box next to the data.

Data Type to be transmitted

All Bulk Dump: Saves the data of all the following items via Bulk Dump.

Voice	Nrml (All User Normal Voices), Drum (All User Drum Voices), or PLG (All User Plug-in Voices)
Perf	All Performances
Multi	All Multis
System	Overall system settings

Current 1 Voice/Performance/Multi: Saves the current Voice/Performance/Multi using the Bulk Dump.

Saving Data

1. Start the real time recording function in the external sequencer software.
2. Transmit the desired bulk data from the MOTIF-RACK ES to the sequencer.

The bulk data will be recorded in the song file of sequencer.

Loading Data

1. From your sequencer, play back the song file containing the bulk data.
2. The bulk data is transmitted to the MOTIF-RACK ES and the settings are restored.

CAUTION

When the MOTIF-RACK ES receives the bulk data, the settings are overwritten and replaced with the settings from the bulk data. Be careful not to overwrite any important data.

NOTE

- In order to properly use Bulk Dump, the appropriate MIDI Device Number must be set. For details, see page 91.
- When bulk data transmission does not work properly, try increasing the transmit interval value ("BulkIntrval" parameter). See page 90.

NOTE

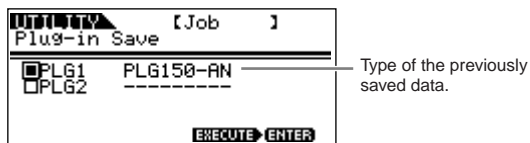
- For details about how to connect the instrument to a computer, see pages 18 and 36.
- For details about the sequencer settings, refer to the owner's manual of your sequencer.

Saving Board Voices (Plug-in Save)

This lets you save the Board Voices edited with the Editor for a Plug-in Board on computer – called Board Custom Voices – to the MOTIF-RACK ES. Because the Plug-in Boards do not have user memory and the edited Voice data will be lost when turning the power off, the edited Board Custom Voice data should be saved with this operation.

NOTE Please note that the parameters of a Board Voice cannot be edited on the MOTIF-RACK ES. Use the Editor for each Plug-in Board. For details about Board Voices, refer to page 52.

1. Select the destination (to which you wish to save the settings) with the cursor [^][V] buttons and turn the dial to checkmark the box next to the data. PLG1 and/or PLG2 can be selected.



2. Press the [MUTE/SEL/ENTER] button to save the Board Voice.

Saving the settings (Store)

You can store (save) your original parameter settings to User memory, as shown below.

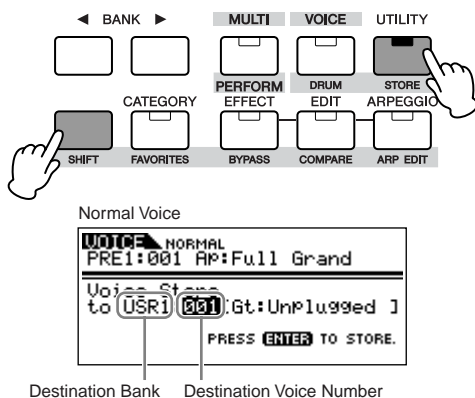
CAUTION

When you perform this, the settings for the destination data will be overwritten. Important data should always be backed up to computer or some other storage device (page 48).

When changing the name, refer to page 50.

1. Enter the Store mode.

Once you've edited a Voice, Performance, or Multi, simultaneously hold down the [SHIFT] button and press the [STORE] button. The Store display appears.



2. Select the destination Bank with the BANK [◀][▶] buttons (Normal Voice only).

Plug-in Load (loading Board Voices)

This lets you load the Plug-in Board parameter settings saved with the Plug-in Save operation to the installed board. The saved data type is shown in the display.

NOTE This operation is available only when the saved data type matches that of the installed board. If the two do not match, the data type is shown in parentheses.

Factory Set (restore factory defaults)

This lets you restore the synthesizer's default Internal Voices (User Voices), Performance and Multis, as well as its System and other settings.

Once you edit any settings, the corresponding factory defaults will be overwritten and lost. Use the Factory Set job to restore the factory default settings.

CAUTION

When you restore the factory default settings, all the current settings for the all the Multis and User Voices will be overwritten with the factory defaults. Make sure you are not overwriting any important data. You should back up any important data to your computer beforehand.

3. Select the destination Voice/Performance/Multi number by using the data dial.

4. Execute the Store operation.

Press the [MUTE/SEL/ENTER] button. The display prompts you for confirmation.




Press the [MUTE/SEL/ENTER] button to execute the Store. A "Completed" message appears when the data has been stored, and operation returns to the original display.

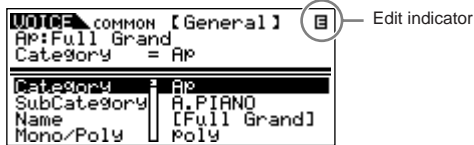
NOTE You can press the [EXIT] button to cancel the Store operation and return to the original screen.

CAUTION

Never attempt to turn off the power while data is being stored (while an "Executing..." or "Please keep power on" message is shown). Turning the power off in this state results in loss of all user data.

Edit Indicator

If you alter any parameters, the  indicator will appear in the top right of the display. This indicates that the current Voice/Multi has been modified but not yet stored.



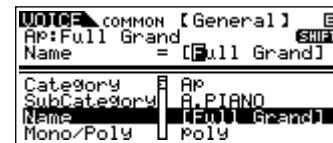
CAUTION

When you select another program number or another mode, the Edit indicator will disappear and all edited data will be lost. You should always save your edited data with the Store function.

Voice/Performance/Multi Name settings (Entering Characters)

In the General display of the Voice/Performance/Multi Common Edit mode is a Name parameter that allows you to assign names to your data. In this section, you'll see how to enter characters in the Name display (Voice/Performance/Multi Edit mode).

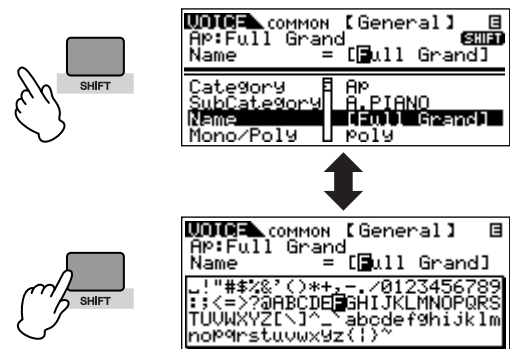
1. Select the "Name" parameter in the Voice/Performance/Multi Common Edit mode (pages 27, 34).



2. Use the BANK [][] buttons to move the cursor to the position of the first character.
3. Use the data dial to enter the desired character.
4. Use the BANK [][] buttons to move the cursor to the position of the next character.
5. Repeat Steps 2 and 4 until the desired name is entered.

Using the Character list

When entering characters, you can call up a special pop-up Character list by pressing and holding down the [SHIFT] button. To return back to the original display, release the [SHIFT] button.



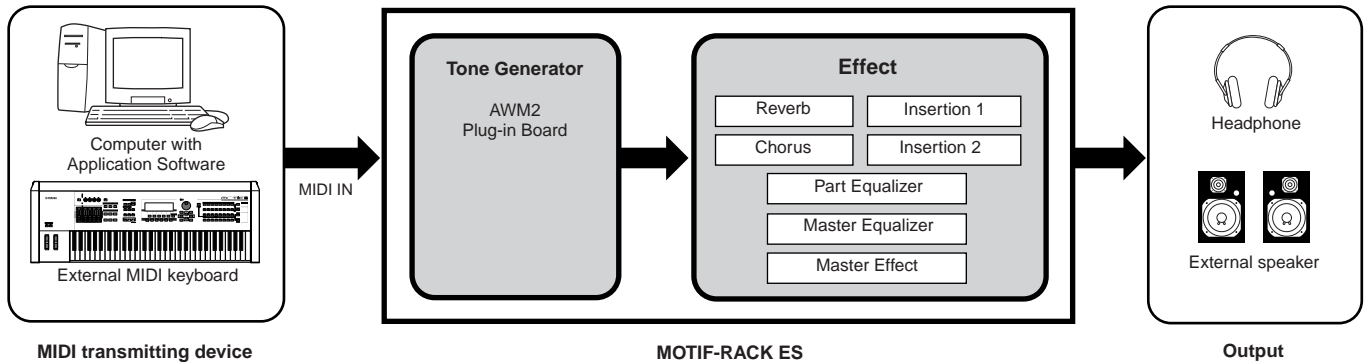
To select characters from the Character list, simultaneously hold down the [SHIFT] button and use the BANK [][] buttons or the data dial.

Basic Structure

This section gives you an easy-to-understand overview of the MOTIF-RACK ES — its wide range of sophisticated features, its MIDI control and performance functions.

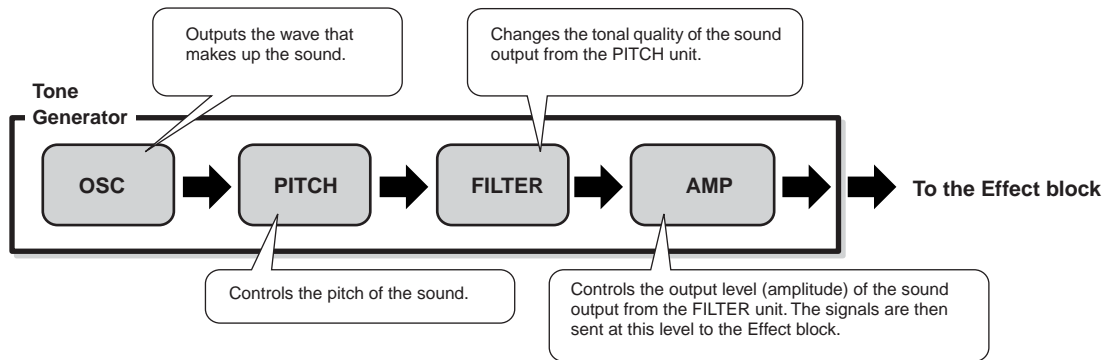
System overview

This synthesizer is made up of several blocks, as shown here.



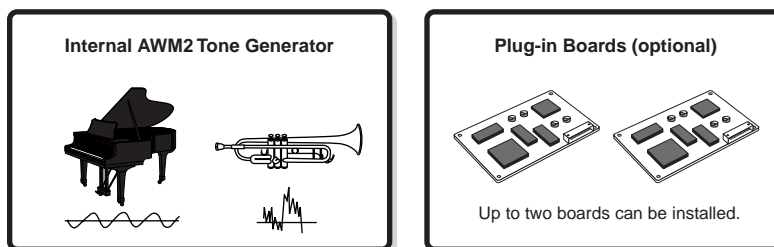
Tone generator block

The tone generator block is what actually produces sound in response to the MIDI messages generated by playing the external keyboard, using the external controllers, and the playback of the sequencer.



Internal AWM2 tone generator and optional Plug-in Boards

The tone generator block in this synthesizer consists of the built-in AWM2 sound source and optional Plug-in Board(s).



AWM2 (Advanced Wave Memory 2)

AWM2 (Advanced Wave Memory 2) is a synthesis system based on sampled waves (sound material), and is used in many Yamaha synthesizers. For extra realism, each AWM2 Voice uses multiple samples of a real instrument's waveform. Furthermore, a wide variety of parameters – envelope generator, filter, modulation, and others – can be applied.

Plug-in Board

Installing an optional Plug-in Board to this instrument lets you greatly expand the sonic palette of the instrument. Up to two boards can be installed to the MOTIF-RACK ES (see the box below for available boards). These boards are not simply a source of more Voices; they are also full-featured, editable tone generators in their own right and extend the system-level specifications such as maximum polyphony. You can play Plug-in Voices just like ordinary internal Voices and use them as Parts in a Performance/Multi.

The MOTIF-RACK ES is compatible with the Modular Synthesis Plug-in System. Two types of Modular Synthesis Plug-in System-compatible Plug-in Boards can be installed to the MOTIF-RACK ES: Single-part and Multi-part Plug-in Board. Using these, you can build your own system based on the sounds you want or need.

NOTE The Effect Plug-in Board cannot be used with the MOTIF-RACK ES.

NOTE The Multi-part Plug-in Board can be use in the Multi mode only.

Available Plug-in Boards

● Single-part Plug-in Boards

Analog Physical Modeling Plug-in Board (PLG150-AN)

Using Analog Physical Modeling (AN) synthesis, the very latest digital technology is used to accurately reproduce the sound of analog synthesizers. With this board installed, you have real-time control over the playback of vintage synthesizer sounds as well as the very latest sounds heard in today's club-oriented music.

Piano Plug-in Board (PLG150-PF/PLG150-AP)

These boards have the AWM2 tone generators mounted a massive waveform memory (16MB), which is dedicated to the reproduction of piano sounds. The PLG150-PF offers 136 stereo sounds, including a number of acoustic and electric pianos. The PLG150-AP offers 32 stereo sounds, including a wide variety of exceptionally high-quality, authentic acoustic piano sounds, as well as an assortment of unusual effect-processed piano sounds. Each board enables you to expand the polyphony of the instrument by up to 64 notes. You can even install two of these boards to double the polyphony to 128 notes.

Advanced DX/TX Plug-in Board (PLG150-DX)

The sounds of the DX7 are available on this Plug-in Board. Unlike PCM-based tone generators, this board uses the powerful FM Synthesis system – the same as found on DX-series synthesizers – for extraordinarily versatile and dynamic sound shaping potential. Sounds are compatible with those of the DX7, and the board can even receive DX7 data via MIDI bulk dump.

Virtual Acoustic Plug-in Board (PLG150-VL)

With Virtual Acoustic (VA) synthesis, the sounds of real instruments are modeled (simulated) in real time, giving a degree of realism that cannot be achieved using conventional PCM-based synthesis techniques. When playing these sounds using an optional MIDI Wind Controller (WX5), you can even capture some of the physical feel of woodwind instruments.

Drum Plug-in Board (PLG150-DR)/Percussion Plug-in Board (PLG150-PC)

Once connected and installed, the PLG150-DR/PLG150-PC becomes a seamless additional sound source of AWM2 for the host tone generator or synthesizer – providing a total of 88 drum/ percussion Voices. Thanks to the built-in effect processing power, the PLG150-DR/PLG150-PC has two separate effect blocks – Insertion and Reverb – that can be applied to each kit.

● Multi-part Plug-in Board

Multi-part Plug-in Boards let you expand the Voice polyphony of the MOTIF-RACK ES by providing an additional sixteen independent instrument Parts. This is an ideal way to play back song data from a sequencer (from the Multi-part board), yet have full polyphony left over on the MOTIF-RACK ES for your live performance Parts.

XG Plug-in Board (PLG100-XG)

This Plug-in Board is a 16-part XG sound generator. You can play back XG/GM song files using the rich variety of sounds and effects on this board.

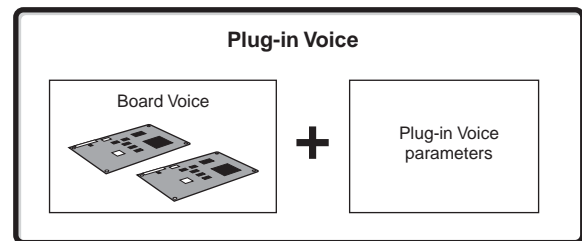
MODULAR SYNTHESIS PLUG-IN SYSTEM

MODULAR SYNTHESIS PLUG-IN SYSTEM

The Yamaha Modular Synthesis Plug-in System (MSPS) offers powerful expansion and upgrade capabilities for MSPS-compatible synthesizers, tone generators and sound cards. This enables you to easily and effectively take advantage of the latest and most sophisticated synthesizer and effects technology, allowing you to keep pace with the rapid and multi-faceted advances in modern music production.

Plug-in Voices and Board Voices

The Voices of a Single-part Plug-in Board installed to this synthesizer can be divided into two types: Board Voices and Plug-in Voices. Board Voices are unprocessed, unaltered Voices of the Plug-in Board – the “raw material” used for the Plug-in Voices. Plug-in Voices, on the other hand, are edited Board Voices – Voices that have been specially programmed and processed for optimum use with the host synthesizer.



Since the MOTIF-RACK ES includes preset Plug-in Voices for all the Plug-in Boards, you can call up and play appropriate Voices for each board immediately after installing it.

NOTE Plug-in Voices can be edited in the Voice Edit mode.

NOTE Board Voices can be edited using the computer software supplied for each Plug-in Board. You can save the Board Voices edited on a computer to the MOTIF-RACK ES by the Plug-in Save function (page 49).

Voice, Performance, and Multi

This instrument features three different types of programs that form the basis for creating and playing sounds.

Voice

A program that contains the sonic Elements for generating a specific musical instrument sound is referred to as a "Voice." Each Voice consists of up to four Elements (Normal Voice) or up to 73 keys (Drum Voice). Each Voice is created by editing parameters unique to each Element/key and parameters common to all the Elements/keys in the Voice mode (page 25) or in the Multi Voice Edit mode (page 83).

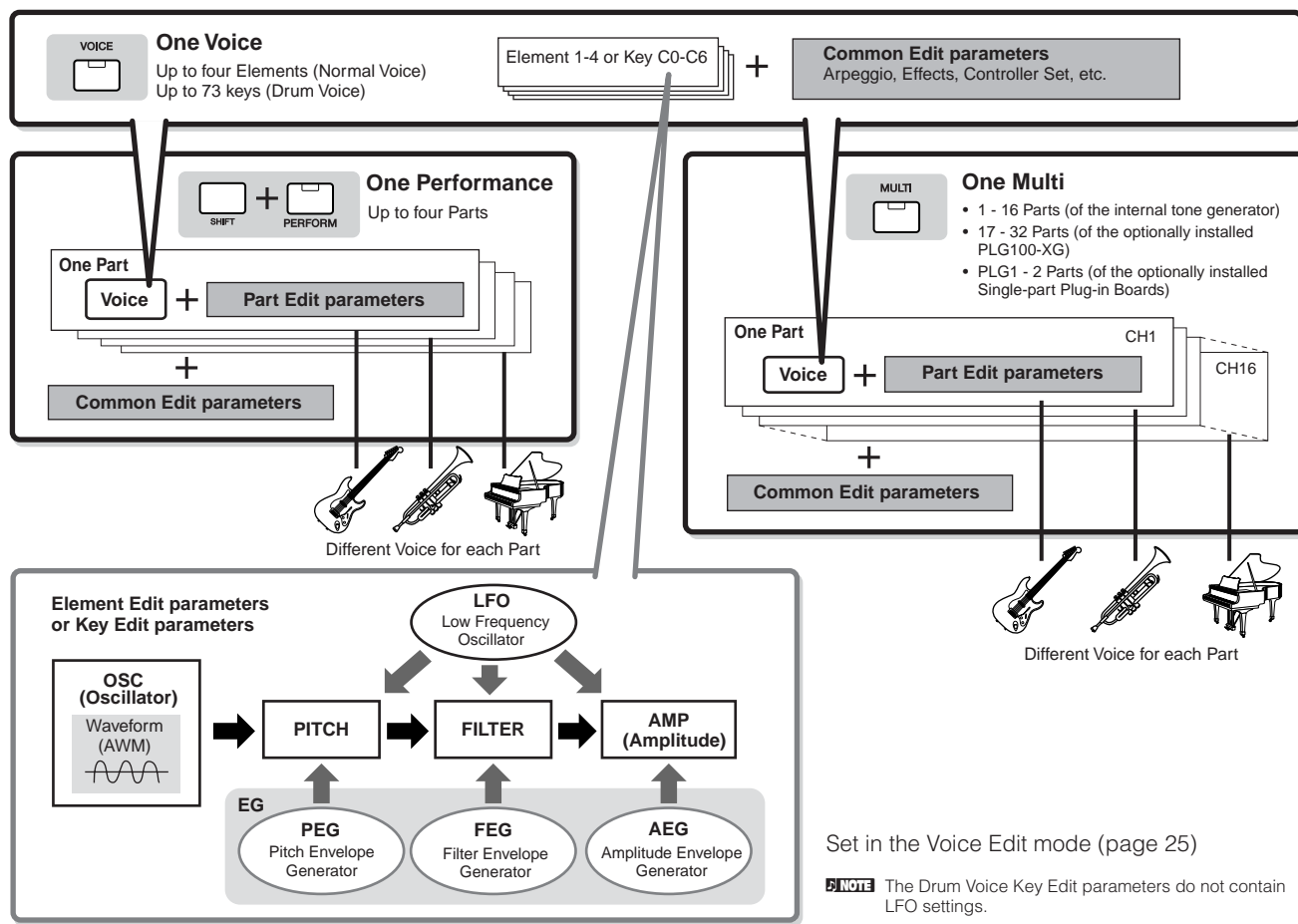
Performance

A program in which multiple Voices (Parts) are combined in a layer, or in other configurations is referred to as a "Performance." Each Performance can contain up to four different Parts (Voices). Each Performance can be created by editing parameters unique to each Part and parameters common to all the Parts in the Performance mode (page 33).

Multi

A program in which multiple Voices are assigned to Parts for multi-timbral play in the Multi mode is referred to as a "Multi." Each Multi can contain up to 33 Parts (page 58). Each Multi can be created by editing parameters unique to each Part and parameters common to all the Parts in the Multi mode (page 39).

The illustration below shows the structure and interrelationship of the Voices, Performances, and Multis.



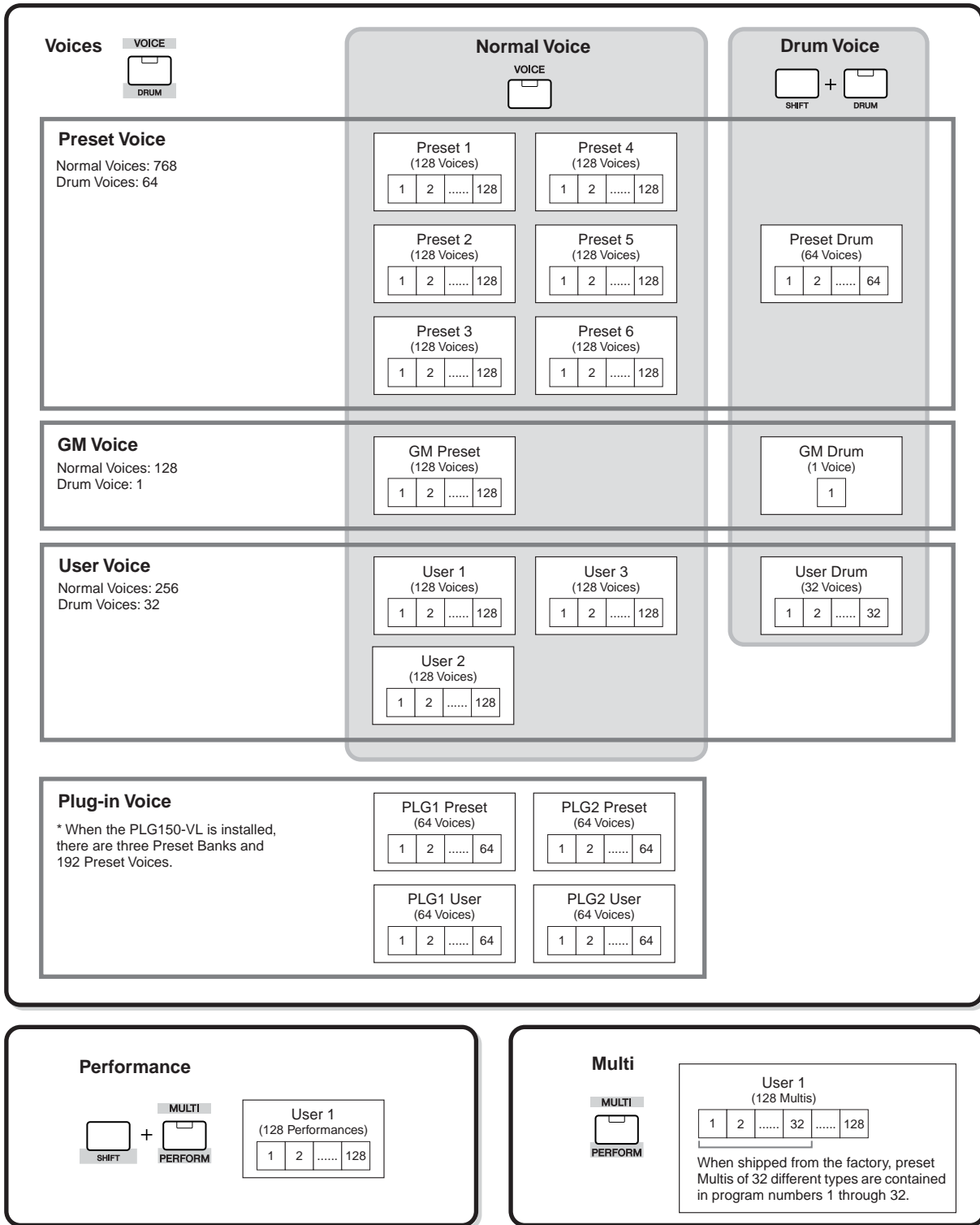
Basic Structure

Keyboard Mega Voices

Normal Voices use velocity switching to make the sound quality and/or level of a Voice change according to how strongly or softly you play it. This makes the Voices sound authentic and natural. However, with Keyboard Mega Voices, each velocity range (the measure of your playing strength) has a completely different sound. For example, a guitar Voice includes the sounds of various performance techniques. In conventional instruments, different Voices having those sounds would be called up via MIDI and played in combination to achieve the desired effect. However, now with Keyboard Mega Voices, a convincing guitar Part can be played with just a single Voice, using specific velocity values to play the desired sounds.

NOTE The Keyboard Mega Voice names are indicated as "Mega ***" in the display.

The following illustrations may help in understanding the memory structure of the Voices, Performances, and Multis.



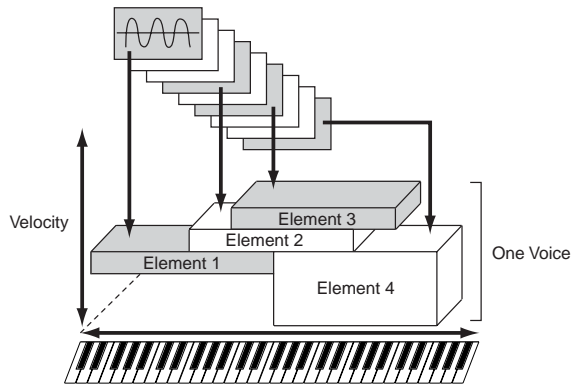
Basic Structure

Normal Voices & Drum Voices

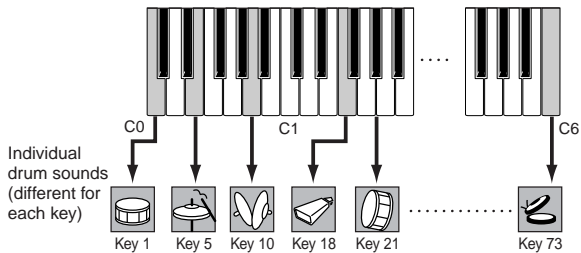
Internally, there are two Voice Types: Normal Voices and Drum Voices. Normal Voices are mainly pitched musical instrument-type sounds that can be played over the range of the keyboard. Drum Voices are mainly percussion/drum sounds that are assigned to individual notes on the keyboard. A collection of assigned percussion/drum waves or Normal Voices is known as a Drum Kit.

Normal Voice

Waveform (Preset 1-1859, User 1-1024)



Drum Voice



GM Voices

GM (General MIDI) is a worldwide standard for Voice organization and MIDI functions of synthesizers and tone generators. It was designed primarily to ensure that any song data created with a specific GM device would sound virtually the same on any other GM device – no matter the manufacturer or the model. The GM Voice bank on this synthesizer is designed to appropriately play back GM song data. However, keep in mind that the sound may not be exactly the same as played by the original tone generator.

Tone generator parameters that produce the Voice sound

Among the various parameters that make up a single Voice, the basic parameters for producing the Voice sound are Oscillator, Pitch, Filter, Amplitude, LFO and three Envelope Generators (PEG, FEG, AEG), as shown in the illustration on pages 55-57.

The Oscillator, Pitch, Filter and Amplitude parameters determine the three basic elements of the sound: Pitch (how low or high it is), Tone (or its overall sound quality), and Volume (how loud its volume level is) of the Voice. Parameters such as LFO and EG (Envelope Generator) determine the transition in these three basic elements of the sound from the moment the sound starts to the moment the sound stops.

In the sections that follow, we'll explain in detail about the sound-related parameters and provide an introduction to the basics of electronic synthesis.

Oscillator

[VOICE] → select Voice → [EDIT] → [MUTE/SEL/ENTER] (LED turns off) → select Element/Key → OSC display

This unit outputs the sound wave, which determines the basic pitch. You can assign the wave (or basic sound material) to each Element of the Normal Voice or each Key of the Drum Voice. In the case of the Normal Voice, you can set the note range for the Element (the range of notes on the keyboard over which the Element will sound) as well as the velocity response (the range of note velocities within which the Element will sound). For example, you could set one Element to sound in an upper range of the keyboard, and another Element to sound in a lower range. Thus, even within the same Voice, you can have two different sounds for different areas of the keyboard, or you can make the two Element ranges overlap so that their sounds are layered over a set range. Furthermore, you can set each Element to respond to different velocity ranges so that one Element sounds for lower note velocities, whereas another Element sounds for higher note velocities. See the illustration at left of this page.

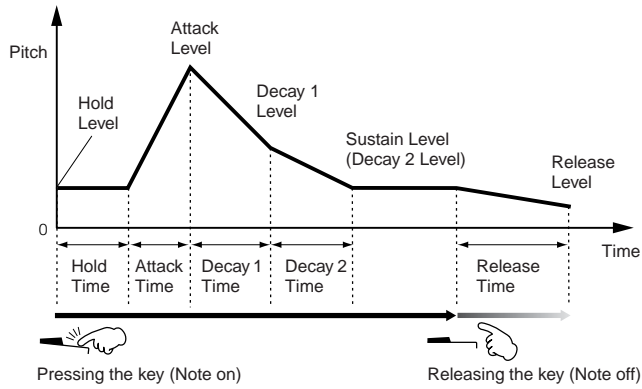
Pitch

[VOICE] → select Voice → [EDIT] → [MUTE/SEL/ENTER] (LED turns off) → select Element/Key → Pitch display, PEG display

This unit controls the pitch of the sound (wave) output from the Oscillator. In the case of the Normal Voice, you can detune separate Elements, apply Pitch Scaling and so on. Also, by setting the PEG (Pitch Envelope Generator), you can control how the pitch changes over time.

PEG (Pitch Envelope Generator)

Using the PEG, you can control the transition in pitch from the moment the sound starts to the moment the sound stops. You can create the PEG by setting parameters as illustrated below. When the instrument receives the Note On message, the pitch of the Voice will change according to these envelope settings. This is useful for creating automatic changes in pitch — effective on synth brass sounds, for example. Furthermore, different PEG parameters can be set for each Element or each Key.



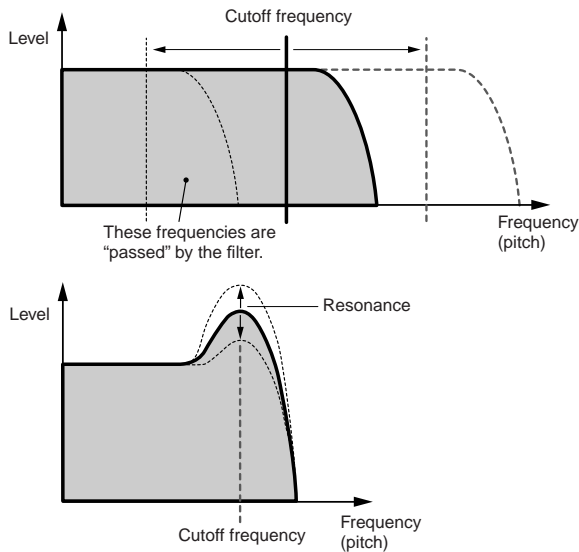
Filter

[VOICE] → select Voice → [EDIT] → [MUTE/SEL/ENTER] (LED turns off) → select Element/Key → Filter display, FEG display

This unit modifies the tone of the sound output from Pitch by cutting (or filtering) the output of a specific frequency portion of the sound.

Cutoff Frequency and Resonance

In the example below (a low pass filter), a portion of the signal lower than a given frequency is allowed to pass, and signals above that frequency are cut. This frequency is referred to as the cutoff frequency. You can produce a relatively bright or darker sound by setting the cutoff appropriately. Resonance is a parameter that boosts the level of the signal in the area of the cutoff frequency. By emphasizing the overtones in this area, this can produce a distinctive “peaky” tone, making the sound brighter and harder.



About the main Filter types

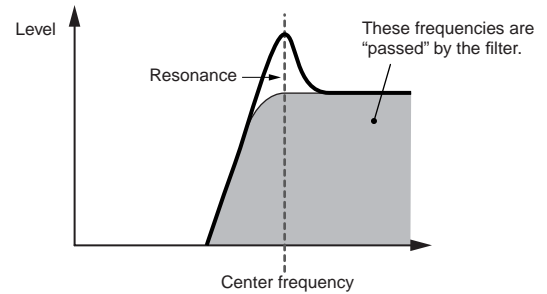
The Low Pass Filter is shown in the illustration above – however, this synthesizer features other Filter types (four total) as shown below.

• Low Pass Filter (above)

This passes only those signals below the Cutoff frequency. You can then use the Reso (Resonance) parameter to add further character to the sound.

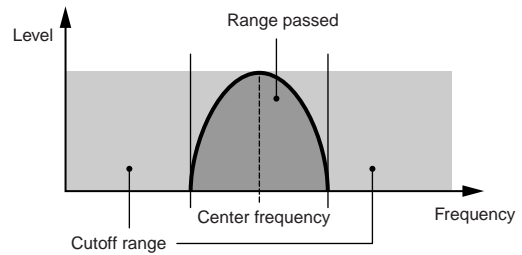
• High Pass Filter

This passes only those signals above the Cutoff frequency. You can then use the Reso (Resonance) parameter to add further character to the sound.



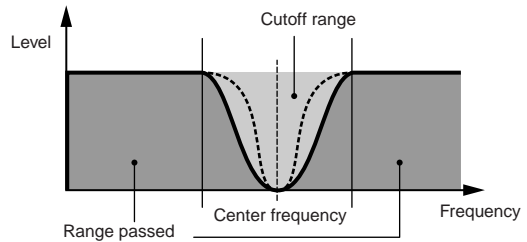
• Band Pass Filter

This passes only those a band of signals around the Cutoff frequency. The width of this band can be varied.



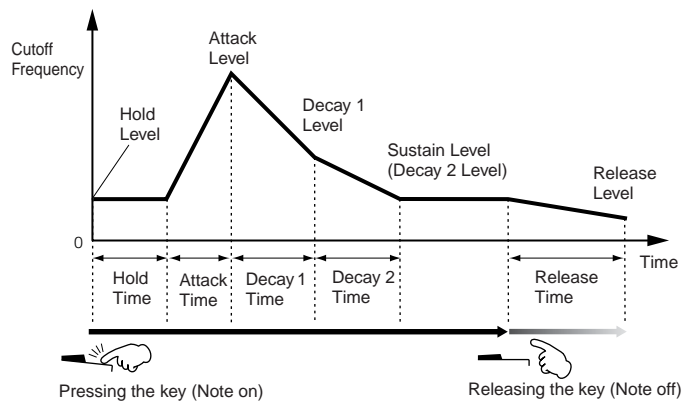
• Band Elimination Filter

This attenuates a band of signals around the Cutoff frequency, but passes everything else.



FEG (Filter Envelope Generator)

Using the FEG, you can control the transition in tone from the moment the sound starts to the moment it stops. You can create the FEG by setting parameters as illustrated below. When the instrument receives a Note On message, the cutoff frequency of the Voice will change according to these envelope settings. This is useful for creating automatic wah or filter sweep effects, for example. Furthermore, different FEG parameters can be set for each Element or Key.



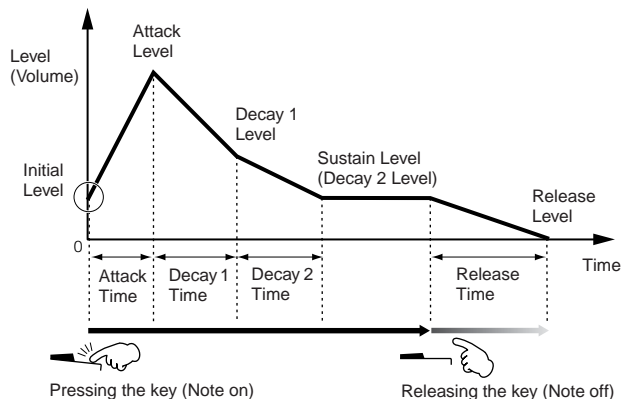
Amplitude

[VOICE] → select Voice → [EDIT] → [MUTE/SEL/ENTER] (LED turns off) → select Element/Key → AMP display, AEG display

This unit controls the output level (amplitude) of the sound output from Filter. The signals are then sent at this level to the Effect block. Also, by setting the AEG (Amplitude Envelope Generator), you can control how the volume changes over time.

AEG (Amplitude Envelope Generator)

Using the AEG, you can control the transition in volume from the moment the sound starts to the moment it stops. You can create the AEG by setting parameters as illustrated below. When the instrument receives a Note On message, the volume of the Voice will change according to these envelope settings. Furthermore, different AEG parameters can be set for each Element Key.



LFO (Low Frequency Oscillator)

[VOICE] → select Voice → [EDIT] → [MUTE/SEL/ENTER] (LED turns off) → select Element/Key → LFO display

[VOICE] → select Voice → [EDIT] → [SHIFT]+[COMMON] → LFO display

As its name suggests, the LFO produces a low frequency wave. These waves can be used to vary the pitch, filter or amplitude of each Element to create effects such as vibrato, wah and tremolo.

Single timbre tone generator (Voice/Performance mode) and multi-timbral tone generator (Multi mode)

The internal tone generator block operates in two different ways (single timbre and multi-timbral) depending on the selected mode. The difference between the two is whether they can handle multiple MIDI channels at the same time or not.

Single Timbre Tone Generator (Voice/Performance mode)

A MIDI tone generator that receives over a single MIDI channel and plays a single instrument Part is referred to as a “single timbre” tone generator. This is the operating status of the internal tone generator in the Voice and Performance modes.

NOTE To set the MIDI receive channel for single timbre operation (Voice and Performance modes), use the following operation in the Utility mode. [UTILITY] → MIDI display → BasicRcvCh

Multi-timbral Tone Generator (Multi mode)

A MIDI tone generator that simultaneously receives over multiple MIDI channels and plays multiple instrument Parts is referred to as a “multi-timbral” tone generator. This allows playback of multi-channel MIDI song data – such as on a MIDI sequencer or computer – with each internal Part being assigned to and played by a different track or channel. This is the operating status of the internal tone generator in the Multi mode.

NOTE To set the MIDI receive channel for multi-timbre operation (Multi mode), use the following operation in the Multi mode. [MULTI] → select Multi → [EDIT] → [MUTE/SEL/ENTER] (LED turns off) → select Part → Voice display → RcvCh

Maximum Polyphony

Maximum polyphony refers to the highest number of notes that can be sounded simultaneously from the internal tone generator of the instrument.

The maximum polyphony of this synthesizer is 128. When the internal tone generator block receives a number of notes exceeding the maximum polyphony, previously played notes are cut off. Keep in mind this may be especially noticeable with Voices that have a long decay or sustain.

Furthermore, the maximum polyphony applies to the number of Voice Elements used, not the number of Voices. When the Normal Voices that include up to four Elements are used, the maximum number of simultaneous notes may be less than 128.

NOTE When a Plug-in Board is installed, playing Plug-in Board Voices does not affect the maximum polyphony of the MOTIF-RACK ES. For details on maximum polyphony for the Plug-in Boards, refer to the owner’s manual of the particular board.

Part structure of the tone generator block

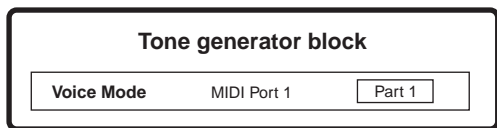
The MOTIF-RACK ES plays the sounds in its tone generator block in response to MIDI messages received from external controllers or sequencer. The MIDI messages are assigned to sixteen independent channels, and the instrument is capable of simultaneously playing sixteen separate Parts, via the sixteen MIDI channels. However, the sixteen-channel limit can be overcome by using separate MIDI "ports," each supporting sixteen channels. The multiple sound sources of this synthesizer (internal tone generator and Plug-in Boards) take advantage of the three MIDI ports included on the instrument.

NOTE The USB cable supports up to eight separate MIDI ports. However, the MOTIF-RACK ES supports up to three MIDI ports.

NOTE A single MIDI cable/connection cannot handle data over multiple MIDI ports.

Part structure of the tone generator block in the Voice mode

In this mode, a Voice is played using a single Part. This Part is used also when the Plug-in Voice is selected. The tone generator block in the Voice mode receives MIDI data over a single channel. For this reason, song data on an external sequencer consisting of multiple MIDI channels will not play back properly in this mode. If you are using an external MIDI sequencer or computer to play the instrument, make sure to use the Multi mode.

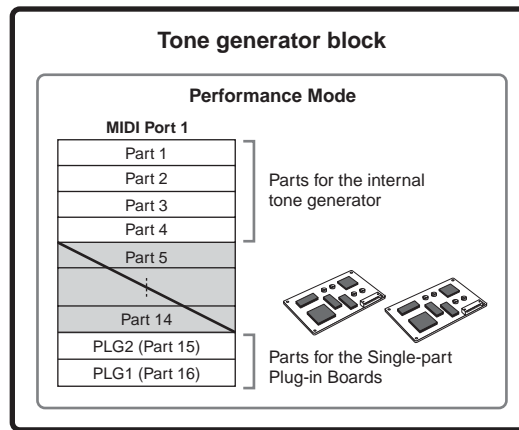


NOTE • To set the MIDI receive channel for single timbre operation (Voice and Performance modes), use the following operation in the Utility mode. [UTILITY] → MIDI display → BasicRcvCh
• In the Voice mode, the instrument recognizes only data over MIDI Port 1.

NOTE The Multi-part Plug-in Board (PLG100-XG) cannot be used in the Voice mode.

Part structure of the tone generator block in the Performance mode

This mode lets you play a Performance (in which multiple Voices or Parts are combined – in a layer, or in other configurations). While a total of six Parts are available in this mode (as shown below), a maximum of four Parts can be used simultaneously. Although this mode lets you play several Parts at the same time, all are set to receive over the same single MIDI channel, as in the Voice mode. For this reason, song data on an external sequencer consisting of multiple MIDI channels will not play back properly in this mode. If you are using an external MIDI sequencer or computer to play the instrument, make sure to use the Multi mode.



Parts 5-14 are not used.

These six Parts (1, 2, 3, 4, PLG1, PLG2) are reserved for use in the Performance mode; however, only up to four of them can be used at the same time. The Parts selected with the "PartSw" parameter (in the [SHIFT]+[PERFORM] → select Performance → [EDIT] → Voice display) are played.

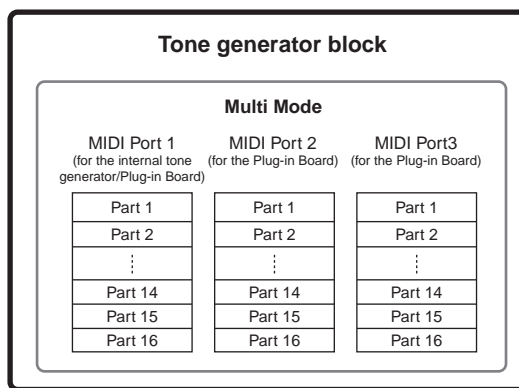
NOTE • To set the MIDI receive channel for single timbre operation (Voice and Performance modes), use the following operation in the Utility mode. [UTILITY] → MIDI display → BasicRcvCh
• In the Voice mode, the instrument recognizes only data over MIDI Port 1.

NOTE The Multi-part Plug-in Board (PLG100-XG) cannot be used in the Performance mode.

Part structure of the tone generator block in the Multi mode

This mode lets you use multiple Parts and assign different Voices to be played back for each Part. Since different MIDI channels can be set for each Part of the tone generator block, you can use an external MIDI sequencer to play the sounds. As illustrated below, the sequence data of each track plays the corresponding Parts (those having the same MIDI channel assignment) in the tone generator block.

Up to 48 Parts are provided for the Multi mode. However, the number of Parts that are actually used is a maximum of 33, as we will see later in the example.



This example applies when installing one Multi-part Plug-in Board and one Single-part Plug-in Board, and assigning the Multi-part Plug-in Board to "Port 1" and the Single-part Plug-in Board to "Port 3."

When using the internal tone generator of the MOTIF-RACK ES, set the MIDI port of each track on the sequencer to "1." Keep in mind that data received over Ports 2 or 3 cannot sound the internal tone generator block. The tone generator of the installed Plug-in Board can be sounded via any of the MIDI ports 1 - 3.

To set the MIDI receive channel for multi-timbre operation (Multi mode), use the following operation in the Multi mode.

[MULTI] → select Multi → [EDIT] → [MUTE/SEL/ENTER] (LED turns off) → select Part → Voice display → "RcvCh"

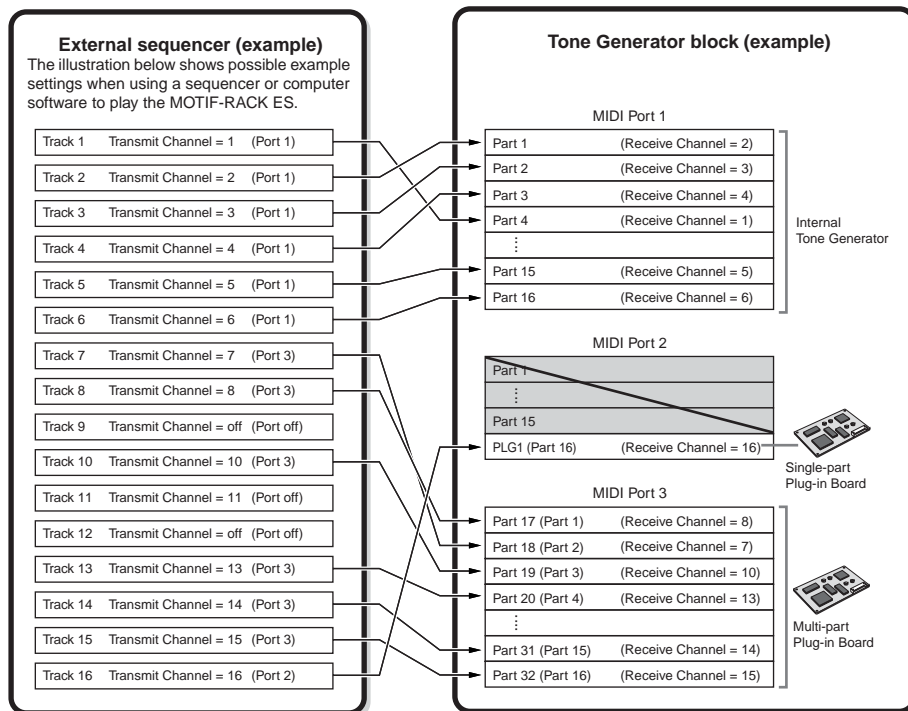
To set the port number assignment for the Plug-in Board, use the following operation.

[UTILITY] → PLG1Sys/PLG2Sys display → "PortNo."

NOTE The Plug-in Board lets you use only a single Voice at the same time. Please note that you cannot assign multiple Voices of the Plug-in Board to multiple Parts at the same time.

NOTE The Multi-part Plug-in Board can only be installed to slot 2 (PLG2).

NOTE The Voice and related settings (volume, pan, etc.) are sounded according to the Part parameters of the current Part. Other settings such as Controllers and Effect types correspond to the Common parameters of the current Multi.



Effect block

This block applies effects to the output of the tone generator block – processing and enhancing the sound using sophisticated DSP (digital signal processing) technology. Effects are applied in the final stages of editing, letting you change the sound of the created Voice as desired.

NOTE The Effect Plug-in Board cannot be used with the MOTIF-RACK ES.

Effect structure

The effect processing of this synthesizer features the System Effects, Insertion Effects, Master Effect, Part EQ (Equalizer), and Master EQ (Equalizer). For details on the effect related displays in each mode, see pages 61 and 62.

System Effects (Reverb, Chorus)

System Effects are applied to the overall sound, whether it be that of a Voice, an entire Performance, or an entire Multi. With System Effects, the sound of each Part is sent to the effect according to the Effect Send Level for each Part. The processed sound (referred to as "wet") is sent back to the mixer, according to the Return Level, and output – after being mixed with the unprocessed "dry" sound. This arrangement lets you prepare an optimum balance of the effect sound and the original sound of the Parts.

Reverb

The Reverb Effects add a warm ambience to the sound, simulating the complex reflections of actual performance spaces, such as a

concert hall or a small club. A total of 20 different Reverb types are available.

Chorus

The Chorus Effects use various types of modulation processing, including flanger and phaser, to enhance the sound in a variety of ways. A total of 49 types are available, including reverb and delay effects.

Insertion Effects 1, 2

Insertion Effects can be applied individually to each Part. Insertion Effects are mainly used to directly process a single Part. Since an Insertion Effect can only be applied to one particular Part, it should be used for sounds you want to drastically change or for sounds that use an effect unintended for other sounds.

The depth of the effect is adjusted by setting the Dry/Wet balance. You can also set the balance so that only the effect sound is heard, by setting Wet to 100%.

The MOTIF-RACK ES features eight sets of Insertion Effects (one set has 1 and 2 units). They can be applied to all Parts of the Performance, and applied to eight Parts (maximum) of the Multi. A total of 116 different types are available.

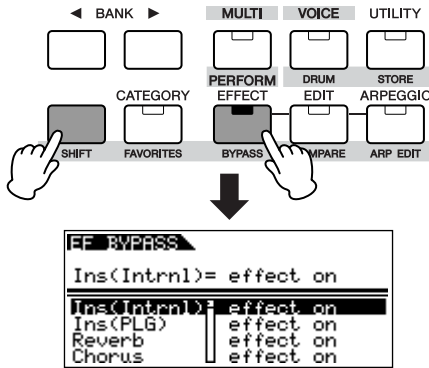
NOTE In the Voice mode, only one set of the Insertion Effects is available.

Master Effect

This block applies effects to the final stereo output signal of the entire sound. A total of 8 different Master Effect types are available.

Bypassing the Effects (Effect Off)

From the display which is shown by pressing the [SHIFT]+[BYPASS] buttons, you can select the specific effect(s) to be bypassed.



The Effect bypass settings are applied to all Voices/Performances/Multis. For details about each parameter, see 87.

Equalizer (EQ)

Usually an equalizer is used to correct the sound output from amps or speakers to match the special character of the room, or to change the tonal character of the sound. The sound is divided into several frequency bands, and adjustments are made to the sound by raising or lowering the level of each band.

By adjusting the sound according to the genre – classical music being more refined, pop music more crisp, and rock music more dynamic – you can draw out the special characteristics of the music and make your performance more enjoyable.

Three separate EQ sections are available on the instrument: Element EQ, Part EQ, and Master EQ.

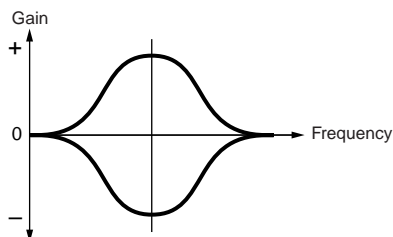
Element EQ

[VOICE] → select Voice → [EDIT] → [MUTE/SEL/ENTER] (LED turns off) → select Element/Key → EQ display

The Element EQ is applied to each Element of the Normal Voice and each key of the Drum Voice. You can specify which shape is used (from the two shapes described below) and set the related parameters.

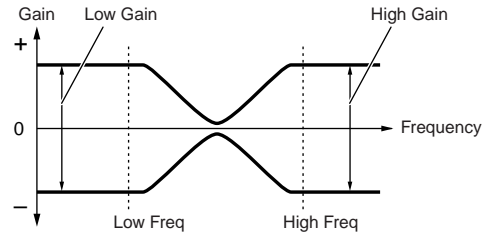
Peaking type

This type of EQ shape lets you attenuate/boost the signal at the specified Frequency setting.



Shelving type

This type of EQ shape lets you attenuate/boost the signal at frequencies above or below the specified Frequency setting.



NOTE In addition to the individual gain controls, there is also an overall level parameter that attenuates/boosts the entire frequency range.

Part EQ

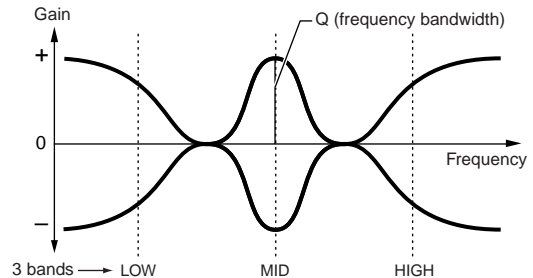
Performance

[SHIFT]+[PERFORM] → select Performance → select Performance Edit by pressing [EDIT] once or twice → [MUTE/SEL/ENTER] (LED turns off) → select Part → EQ display

Multi

[MULTI] → select Multi → [EDIT] → [MUTE/SEL/ENTER] (LED turns off) → select Part → EQ display

This 3-band EQ is applied to each Part of the Performance/Multi. The high band and low band are the shelving type. The middle band is the peaking type.



NOTE The Part EQ is not available in the Voice mode.

Master EQ

Master EQ is applied to the final (post-effect), overall sound of the instrument. In this EQ, all bands can be set to peaking, or the lowest and highest bands can be set to shelving (as shown below).

Voice

[VOICE] → [UTILITY] → MEQ display

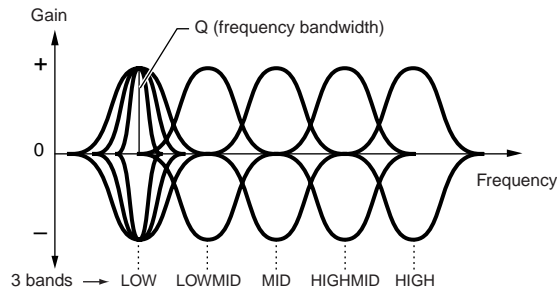
Performance

[SHIFT]+[PERFORM] → select Performance → select Performance Edit by pressing [EDIT] once or twice → [SHIFT] + [COMMON] → EQ display

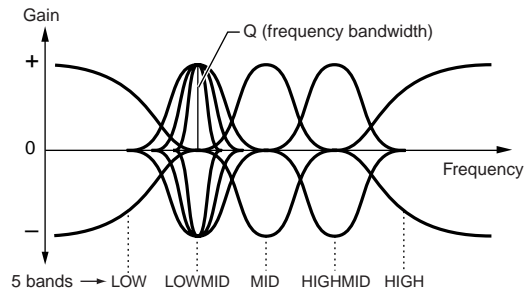
Multi

[MULTI] → select Multi → [EDIT] → [SHIFT]+[COMMON] → EQ display

EQ for which all bands are set to peaking type



EQ for which LOW and HIGH are set to shelving type



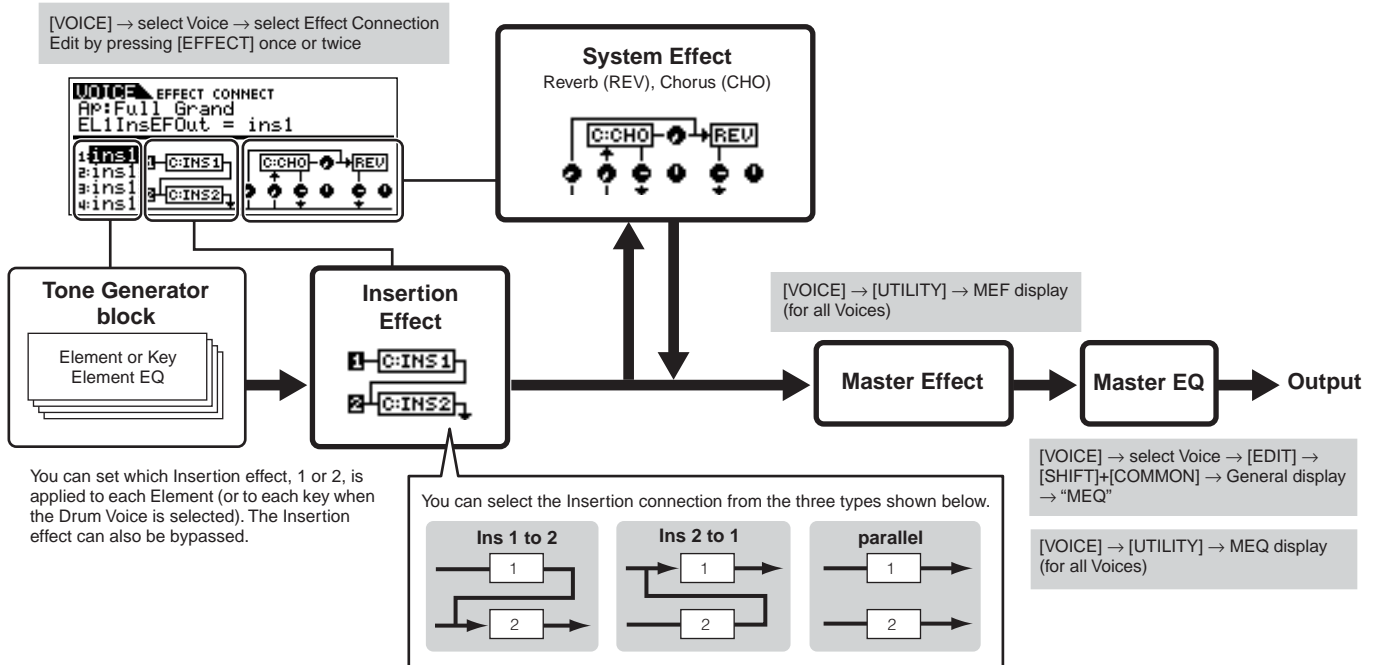
- NOTE**
- Voice mode: You can set one Master EQ, applied in common to all Voices.
 - Performance/Multi mode: You can make independent Master EQ settings for each individual Performance/Multi.

Effect connection in each mode (Effect Connection Edit)

Select the desired parameter for editing by using the cursor [^][V] buttons and change the settings with the data dial.

Voice mode

The Effect parameters in the Voice mode are set for each Voice and the settings are stored as a User Voice. Note that the Master Effect and Master EQ parameters are set for all the Voices in the Utility mode. Once the Master Effect and EQ settings have been made, they can be stored as System settings by pressing the [EXIT] button.

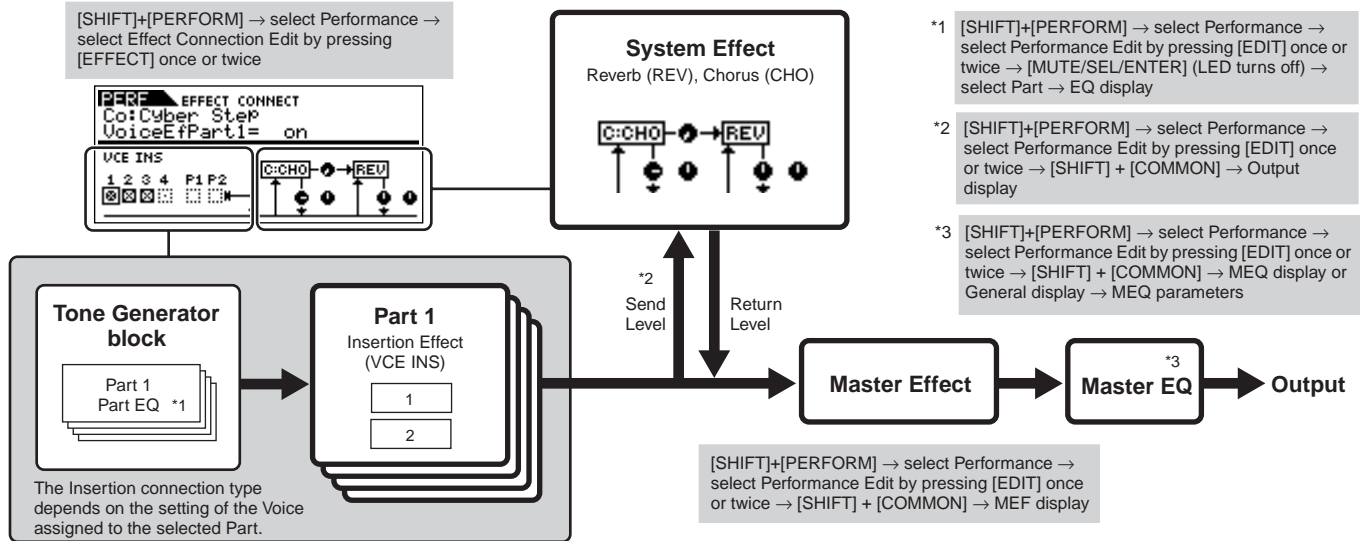


NOTE The parallel connection is not available for Plug-in Voices.

Basic Structure

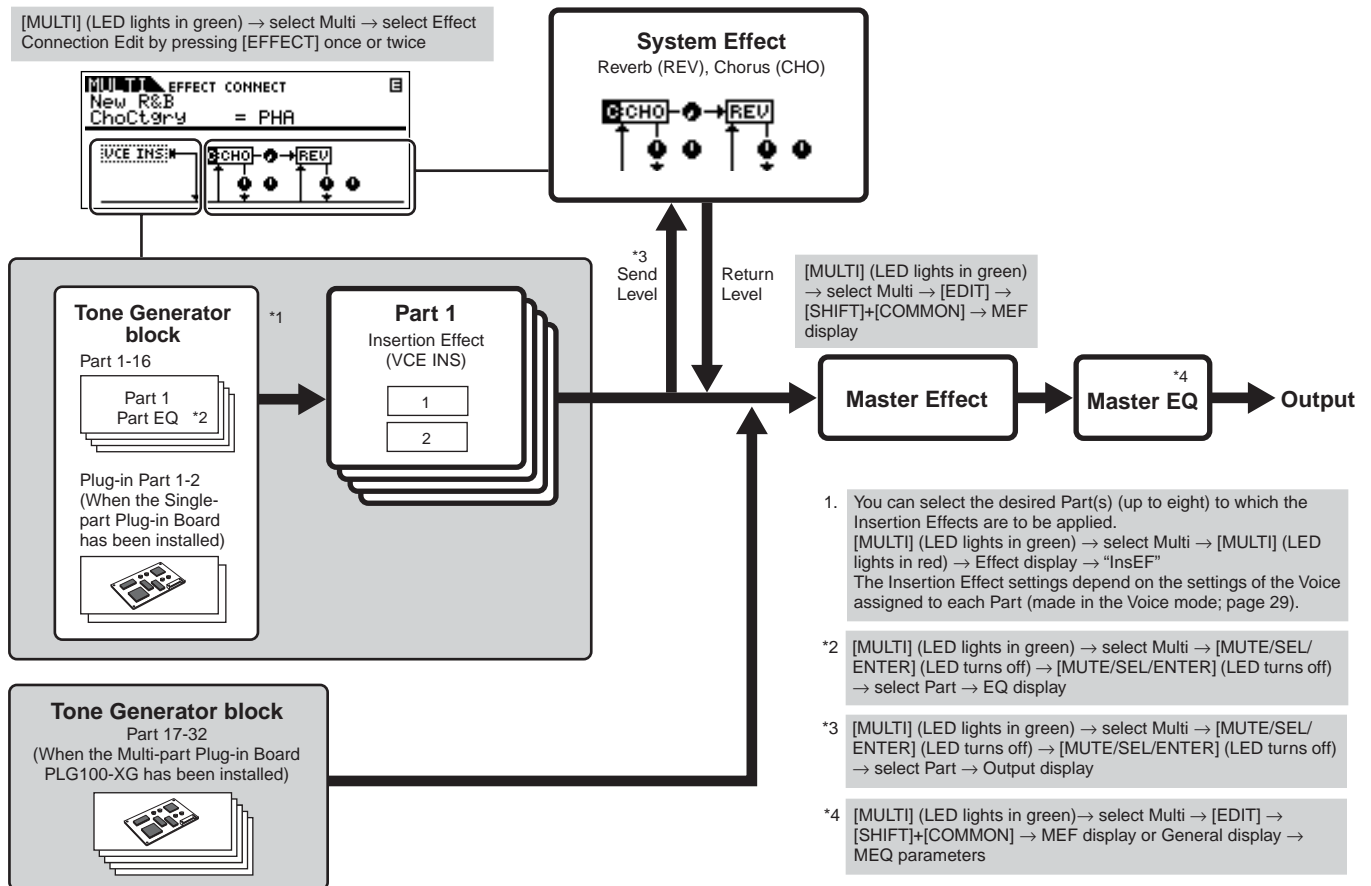
Performance mode

The Effect parameters in the Performance mode are set for each Performance and the settings are stored as a User Performance.



Multi mode

The Effect parameters in the Multi mode are set for each Multi and the settings are stored as a User Multi.



NOTE The Insertion Effect, Plug-in Insertion Effect, and the System Effect cannot be applied to Parts 17-32 (when using the Multi-part Plug-in Board PLG100-XG).

NOTE The Part EQ cannot be applied to Parts of the Plug-in Board.

NOTE The System Effects (Reverb, Chorus), the Master EQ, and the Master Effect are not applied to the sound output through the ASSIGNABLE OUTPUT jacks. (Only the Part EQ and the Insertion Effect are applied.)

Arpeggio

This function lets you automatically trigger musical and rhythmic phrases using the current Voice by simply pressing a note or notes on the keyboard. The Arpeggio sequence also changes in response to the actual notes or chords you play, giving you a wide variety of inspiring musical phrases and ideas – both in composing and performing.

NOTE Keep in mind that only one Arpeggio type can be used/played at a time, no matter what mode is active.

Category of the Arpeggio type

The Arpeggio types are divided into 18 categories as listed below.

LCD	Category Name	Description
Seq	Synth Sequence	Various arpeggio phrases suited for synth Voices.
ChSq	Synth Chord Sequence	Various rhythmic chord phrases or synth Voices.
HySq	Synth Hybrid Sequence	Various arpeggio types programmed so that bass phrases are played with the lower keys and chords or melodies are played with the midrange and higher keys. These arpeggio types are useful for split Voice combinations. In addition, there are also Hybrid Velocity ("HybVel...") types that feature different phrases for different velocity ranges, letting you change the arpeggio phrase depending on how strongly you play the keyboard.
APKb	Acoustic Piano & Keyboard	Various arpeggio types suited for piano and other keyboard Voices, such as electric piano and clav.
Orgn	Organ	Various arpeggio types suited for organ Voices.
GtPl	Guitar & Plucked	Various arpeggio types suited for guitar and harp Voices.
GtKM	Guitar - Keyboard Mega Voice	Various arpeggio types suited for guitar Keyboard Mega Voices (see note on page 53).
Bass	Bass	Various arpeggio types suited for bass or synth bass Voices.
BaKM	Bass - Keyboard Mega Voice	Various arpeggio types suited for bass Keyboard Mega Voices (see note on page 53).
Strn	Strings	Various arpeggio types suited for strings and pizzicato Voices.
Bras	Brass	Various arpeggio types suited for brass Voices.
RdPp	Reed & Pipe	Various arpeggio types suited for saxophone and flute Voices.
Lead	Synth Lead	Various arpeggio types suited for synth lead Voices.
PdMe	Synth Pad & Musical FX	Various arpeggio types suited for synth pad Voices and special musical effects Voices, including percussive sounds.
CPrc	Chromatic Percussion	Various arpeggio types suited for chromatic percussion Voices.
DrPc	Drum & Percussion	Various arpeggio types suited for drum and percussion Voices (drum kits).
Comb	Combination	These are combination arpeggios, with separate phrases suitable for drum Voices, bass Voices, and chord/melody instruments. Various arpeggio types suited for Performances.
Cntr	Control	Various arpeggio types programmed primarily with Control Change and Pitch Bend data. These arpeggio types change the tone or pitch of the sound, rather than play specific notes. In fact, some types contain no note data at all. When using a type of this category, set the KeyMode parameter to "direct" in each mode.

Arpeggio playback types

The MOTIF-RACK ES features a total of 1787 Arpeggio types divided into 18 categories, each with its own playback type designed for use with particular types of Voices, as described below. The explanations here apply when an external keyboard is connected to the MOTIF-RACK ES.

Arpeggios for Normal Voices

Arpeggio types (belonging to the categories except for the DrPC and Cntr) created for use of Normal Voices have the following two playback types.

Playback only of the played notes

The Arpeggio is played back using only the played note and its octave notes.

Playback of a programmed sequence according to the played chord

These Arpeggio types have the several sequences each of which is suited for a certain chord type. Even if you press only one note, the Arpeggio is played back using the programmed sequence – meaning that notes other than the ones you play may be sounded. Adding notes to those already held changes the sequence accordingly – in other words, the arpeggio plays back according to the chord you play.

NOTE The two playback types above are not distinguished by the category name or type name. You'll have to actually play the types and hear the difference.

NOTE Since these types are programmed for Normal Voices, using them with Drum Voices may not give musically appropriate results.

Arpeggios for Drum/Percussion Voices – Category: DrPc

These arpeggio types are programmed specifically for use with Drum Voices, giving you instant access to various rhythm patterns. Three different playback types are available.

Playback of a drum pattern

Pressing any note(s) will trigger the same rhythm pattern.

Playback of a drum pattern, plus additional played notes (assigned drum instruments).

Pressing any note will trigger the same rhythm pattern. Adding notes to the one already held produces additional sounds (assigned drum instruments) for the drum pattern.

Playback only of the played notes (assigned drum instruments)

Playing a note or notes will trigger a rhythm pattern using only the notes played (assigned drum instruments). Keep in mind that even if you play the same notes, the triggered rhythm pattern differs depending on the order of the notes played. This gives you access to different rhythm patterns using the same instruments simply by changing the order in which you play the notes.

NOTE The three playback types above are not distinguished by the category name or type name. You'll have to actually play the types and hear the difference.

NOTE Since these types are programmed for Drum Voices, using them with Normal Voices may not give musically appropriate results.

Arpeggios for Performances – Category: Comb

The Arpeggio types belonging to the category “Comb” are programmed so that different arpeggios are triggered – an arpeggio for a Normal Voice and an arpeggio for a Drum Voice – depending on the played note. These types are useful in the Performance mode in which multiple Voices (Drum Voice and Normal Voice) are combined in a layer since these types enable you trigger the arpeggio for the Normal Voice and the Drum Voice at the same time.

Arpeggios containing mainly non-note events – Category: Cntr

These arpeggio types are programmed primarily with Control Change and Pitch Bend data. They are used to change the tone or pitch of the sound, rather than play specific notes. In fact, some types contain no note data at all. When using a type of this category, set the “KeyMode” parameter to “direct” with the following operations.

Voice mode	[VOICE] → select Voice → [SHIFT] + [ARP EDIT] → “KeyMode”
Performance mode	[SHIFT] + [PERFORM] → select Performance → [SHIFT] + [ARP EDIT] → “KeyMode”
Multi mode	[MULTI] → select Multi → [SHIFT] + [ARP EDIT] → “KeyMode”

Arpeggio related parameters

The Arpeggio related parameters can be set from the following displays, depending on the selected mode.

Voice mode

Arpeggio type parameters called up when selecting a Voice

[VOICE] → select Voice → [SHIFT] + [ARP EDIT] (pages 43, 88)

MIDI output parameters for Arpeggio playback for all the Voices

[VOICE] → [UTILITY] → Voice display (page 90)

NOTE MIDI output parameters for Arpeggio playback are set for all the Voices in the Voice mode. In the other modes, however, they can be set for each Performance and Multi.

Performance mode

Arpeggio type parameters called up when selecting a Performance (including MIDI output parameters for Arpeggio playback)

[SHIFT]+[PERFORM] → select Performance → [SHIFT] + [ARP EDIT] (pages 43, 88)

Arpeggio on/off (for each Part)

[SHIFT]+[PERFORM] → select Performance → select Performance Edit by pressing [EDIT] once or twice → [MUTE/SEL/ENTER] (LED turns off) → select Part → Voice display → ArpSwitch (ArpSw) (pages 44, 80)

Multi mode

Parameters related to Arpeggio type that are called up when selecting a Multi (including MIDI output parameters for Arpeggio playback)

[MULTI] → select Multi → [SHIFT] + [ARP EDIT] (pages 43, 88)

Arpeggio on/off (for only one Part)

[MULTI] (LED lights in green) → select Multi → [SHIFT] + [ARP EDIT] → [MUTE/SEL/ENTER] (LED turns off) → select Part → Voice display → ArpSwitch (ArpSw) (pages 44, 80)

NOTE During playback, you can select the desired Arpeggio from Arpeggios 1-5 (stored in each Voice/Performance/Multi) with the PAGE [◀][▶] buttons (page 43).

Reference

This section of the manual covers in detail all of the parameters and settings available on the MOTIF-RACK ES.

Voice mode

Voice Edit (for Normal Voice)

When a Normal Voice is selected, the Voice Edit parameters are divided into Common Edit (parameters common to all four Elements), and Element Edit (parameters of individual Elements).

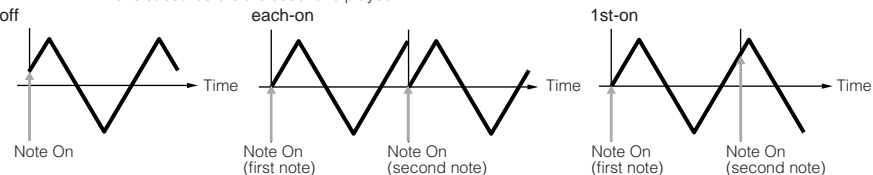
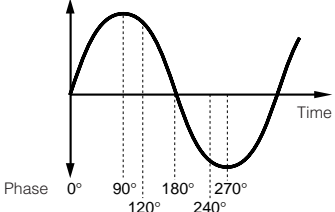
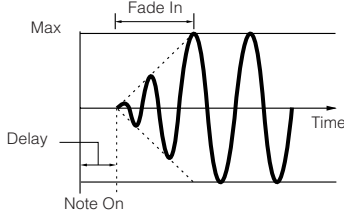
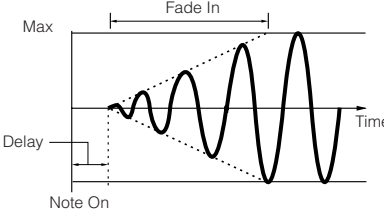
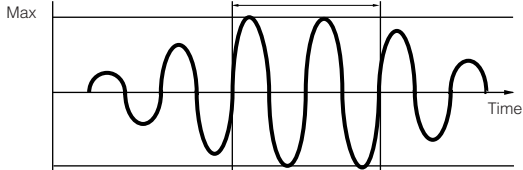
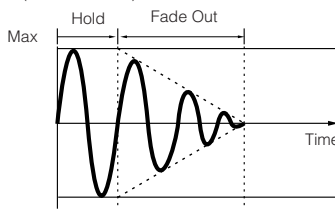
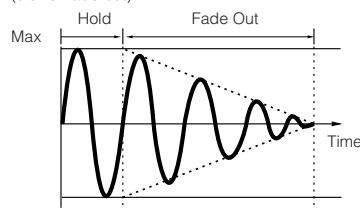
Common Edit

[VOICE] → select Normal Voice → [EDIT] → [SHIFT]+[COMMON] → select each display with PAGE [◀][▶]

These parameters are for making global (or common) edits to all four Elements of the selected Normal Voice.

General		
Category	Category	From this display you can assign the category (sub and main) of the selected Voice, and create a name for the Voice. The Voice name can contain up to 10 characters. For detailed instructions on naming, see page 50.
SubCategory	Sub Category	
Name	Name	
Mono/Poly	Mono/Poly	Selects whether the Voice is played monophonically (only one note at a time) or polyphonically (multiple notes sounding simultaneously). Select whether each Part is played back monophonically (single notes only) or polyphonically (multiple simultaneous notes). Settings: mono, poly
KeyAsgnMode	Key Assign Mode	Selects single or multi Key Assign. When this is set to "single," double playback of the same note is prevented. To allow playback of each instance of the same note, set this to "multi." Settings: single, multi
M.TuningNo.	Micro Tuning Number	Determines the tuning system for the Voice. Thirteen additional tuning systems are available for a variety of tuning applications and effects. Settings: See the Micro Tuning List on page 77.
M.TunRoot	Micro Tuning Root	Determines the root note of the Micro Tuning set above. Settings: C ~ B
MEQ Low/LowMid/HighMid/High	Master EQ Offset	Adjusts the master (global) EQ settings for the entire Voice. The settings made here are applied as offsets to the EQ settings (with the exception of "MID") from the Utility mode, with the following operation: [VOICE] → [UTILITY] → MEQ display. Settings: -64 ~ +63
PortaSwitch	Portamento Switch	Turns the Portamento function on or off. Portamento is used to create a smooth transition in pitch from the first note played to the next. Settings: off, on
PortaTime	Portamento Time	Determines the pitch transition time. Higher values result in a longer pitch change time. Settings: 0 ~ 127
PortaMode	Portamento Mode	Determines how the Portamento is applied to your keyboard performance. Settings: fingered, fulltime fingered Portamento is only applied when you play legato (playing the next note before releasing the previous one). fulltime Portamento is always applied.
PortaT.Mode	Portamento Time Mode	This determines how the Time parameter above affects the Portamento effect. Settings: rate1, time1, rate2, time2 rate1 Pitch changes at the specified rate. time1 Pitch changes in the specified time. rate2 Pitch changes at the specified rate within an octave. time2 Pitch changes in the specified time within an octave.
PortaLgtSlp	Legato Slope	Determines the speed of the attack of legato notes, when Portamento Switch above is set to on and Mono/Poly is set to mono. (Legato notes "overlap" each other, the next being played before the previous is released.) The higher the value, the slower the attack rate. Settings: 0 ~ 7
PB Upper/Lower	Pitch Bend Range Upper/Lower	These two parameters determine the pitch change range of the Pitch Bend wheel. Settings: -48 ~ +24
A.PhraseNo.	Audition Phrase Number	Selects the type of the Audition phrase. Settings: 000 ~ 285
A.PhrNtSft	Audition Phrase Note Shift	Adjusts the pitch in semitone increments. Settings: -24 ~ +24
A.PhrVelSft	Audition Phrase Velocity Shift	Selects the velocity of the Audition phrase. Settings: -64 ~ +63
AssignA/B/1/2	Assign A/B/1/2	This parameter offsets the value of each Dest (Destination) parameter. Please note that the certain Destinations of Assign A/B change the absolute value.

Output		
Volume	Volume	Determines the output level of the Voice. Settings: 0 ~ 127
Pan	Pan	Determines the stereo pan position of the Voice. Settings: L63 (far left) ~ C (center) ~ R63 (far right) NOTE When a stereo Voice is selected, this parameter setting may not be effective. Voices with Elements set to opposite Pan settings (in the Element Edit → AMP display) – i.e., one at L63 and another at R63 – are considered stereo Voices.
RevSend	Reverb Send	Determines the Send level of the signal sent from Insertion Effect 1/2 (or the bypassed signal) to the Reverb Effect. Settings: 0 ~ 127
ChoSend	Chorus Send	Determines the Send level of the signal sent from Insertion Effect 1/2 (or the bypassed signal) to the Chorus Effect. Settings: 0 ~ 127
EG/FLT (Envelope Generator/Filter)		
AEG Attack/Decay/Sustain/Release	AEG Attack Time/Decay Time/Sustain Level/Release Time	This display contains the basic EG settings, both volume and filter, for the Voice, as well as the filter's cutoff frequency and resonance settings. The settings made here are applied as offsets to the AEG and FEG settings in the Element Edit mode. Settings: -64 ~ 0 ~ +63
FEG Attack/Decay/Release/Depth	FEG Attack Time/Decay Time/Release Time/Depth	
Cutoff/Resonance	Cutoff/Resonance	
CtrlSet (Controller Set)		
Set1-6ElmSw	Controller Set Element Switch	Selects whether the controller will affect each individual Element. You can step through the Elements with the BANK [◀ ▶] buttons. Settings: Elements 1 to 4 enabled ("1" to "4") or disabled ("-") NOTE This parameter is disabled when the Dest (Destination) described below is set to a parameter unrelated to the Voice Elements.
Set1-6Source	Controller Set Source	Determines which controller is to be assigned and used for the selected Set. This controller then is used to control the parameter set in Destination below. Settings: PB (Pitch Bend wheel), MW (Modulation wheel), AT (Aftertouch), FC1/FC2 (Foot controller 1/2), FS (Foot Switch), BC (Breath controller), AS1/AS2 (Assign 1/2) NOTE Keep in mind that unlike the other controllers, Assign A and B can each be assigned to one common function for the entire system of this synthesizer, and not to different functions for each individual Voice. Also see the Utility section (page 90).
Set1-6Dest	Controller Set Destination	Determines the parameter that is controlled by the Source controller (above). Settings: Refer to the Controls List in the separate Data List.
Set1-6Depth	Controller Set Depth	Determines the degree to which the Source controller affects the Destination parameter. For negative values, the controller operation is reversed; maximum controller settings produce minimum parameter changes. Settings: -64 ~ 0 ~ +63
LFO (Low Frequency Oscillator)		
Wave	LFO Wave	Determines the LFO waveform used to vary the sound. Settings: tri, tri+, sawup, sawdown, squ1/4, squ1/3, squ, squ2/3, squ3/4, trpzp, S/H 1, S/H 2, user
Speed	Speed	Sets the speed of the LFO waveform. A larger setting means a faster speed. Settings: 0 ~ 63
TempoSync	Tempo Synchronization	Determines whether or not the LFO is synchronized to the tempo of the Arpeggio. Settings: off (not synchronized), on (synchronized)
TempoSpeed	Tempo Speed	This parameter is available only when TempoSync above has been set to "on." It allows you to make detailed note value settings that determine how the LFO pulses in sync with the Arpeggio. Settings: 16th, 8th/3 (eighth-note triplets), 16th. (dotted sixteenth notes), 8th, 4th/3 (quarter-note triplets), 8th. (dotted eighth notes), 4th (quarter notes), 2nd/3 (half-note triplets), 4th. (dotted quarter notes), 2nd (half notes), whole/3 (whole-note triplets), 2nd. (dotted half notes), 4th x 4 (quarter-note quadruplets; four quarter notes to the beat), 4th x 5 (quarter-note quintuplets; five quarter notes to the beat), 4th x 6 (quarter-note sextuplets; six quarter notes to the beat), 4th x 7 (quarter-note septuplets; seven quarter notes to the beat), 4th x 8 (quarter-note octuplets; eight quarter notes to the beat) NOTE The actual length of the note depends on the internal or external MIDI tempo setting.
RndSpdDpt	Random Speed	Determines the degree to which the LFO speed changes at random. A setting of "0" results in the original speed. Higher values result in a larger degree of speed change. Settings: 0-127

<p>KeyReset</p>	<p>Key On Reset</p>	<p>Determines whether or not the LFO is reset each time a Note On message is received. The following three settings are available. Settings: off, each-on, 1st-on off..... The LFO cycles freely with no note synchronization. Receiving a Note On message starts the LFO wave at whatever phase the LFO happens to be at that point. each-on The LFO resets with each Note On message and starts a waveform at the phase specified by the Phase parameter (below). 1st-on The LFO resets with every note you play and starts the waveform at the phase specified by the Phase parameter (below). However, if you play a second note while the first is being held, the LFO continues cycling according to the same phase as triggered by the first note. In other words, the LFO only resets if the first note is released before the second is played.</p> 
<p>Phase</p>	<p>Phase</p>	<p>Determines the starting phase point for the LFO Wave when it is reset. Settings: 0, 90, 120, 180, 240, 270</p> 
<p>Delay</p>	<p>Delay</p>	<p>Determines the delay time between the moment that a Note On message is received and the moment the LFO comes into effect. A higher value means a longer delay time. Settings: 0 ~ 127</p>
<p>FadeIn</p>	<p>Fade In</p>	<p>Determines the amount of time for the LFO effect to fade in (after the Delay time has elapsed). A higher value means a slower fade-in. Settings: 0 ~ 127</p> <p>Low Fade In value (faster fade-in)</p>  <p>High Fade In value (slower fade-in)</p> 
<p>Hold</p>	<p>Hold</p>	<p>Determines the length of time during which the LFO is held at its maximum level. A higher value means a longer Hold time. When sets to "127," the wave cannot be faded out (below). Settings: 0 ~ 127</p> 
<p>FadeOut</p>	<p>Fade Out</p>	<p>Determines the time taken for the LFO effect to be faded out (after the Hold time has elapsed). A higher value means a slower fade-out. Settings: 0 ~ 127</p> <p>Low Fade Out value (faster fade-out)</p>  <p>High Fade Out value (slower fade-out)</p> 
<p>Dest1-3ElmSw</p>	<p>LFO Destination Element Switch</p>	<p>Determines whether to allow variations in the LFO Wave for each Element. The Element number (1- 4) is shown when the LFO is enabled; a dash (-) indicates the LFO is disabled for that Element.</p>
<p>Dest1-3Dest</p>	<p>LFO Destination</p>	<p>Determines the parameters which will be controlled. Settings: amd, pmd, fmd, reso (resonance), pan, ELFOSpd (Element LFO Speed)</p>
<p>Dest1-3Depth</p>	<p>LFO Depth</p>	<p>Determines the LFO Wave Depth. Settings: 0 ~ 127</p>

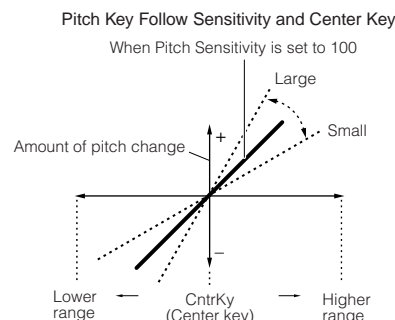
LFO USR (User LFO)		
This menu is available only when the User LFO wave is selected. You can create a custom LFO wave consisting of up to sixteen steps. NOTE Pressing the [SHIFT] button displays the current wave condition. You can also edit the settings while viewing the current condition. Move the cursor to the desired step by holding the [SHIFT] button and pressing the BANK [◀][▶] button, then set the parameters with the data dial.		
Template	User Wave Template	Selects a pre-programmed template for the LFO wave. Settings: all0 Values of all the steps are set to 0. all64 Values of all the steps are set to 64. all127 Values of all the steps are set to 127. saw up Creates a saw shaped upward wave. saw down Creates a saw shaped downward wave. even step Values of all even steps are set to 0, and values of all odd steps are set to 127. odd step Values of all odd steps are set to 0, and values of all even steps are set to 127.
TotalStep	User Wave Total Step	Determines the number of steps of the LFO wave. Settings: 2, 3, 4, 6, 8, 12, 16
Slope	User Wave Slope	Determines the slope or ramp characteristics of the LFO wave. Settings: off (no slope), up, down, up&down
Step1-16Val	User Wave Step Value	Edits the value for each step. The number of steps is set in the "TotalStep" parameter. Settings: 0 ~ 127

Element Edit [VOICE] → select Normal Voice → [EDIT] → [MUTE/SEL/ENTER] (LED turns off) → select Element with [1/5/9/13]-[4/8/12/16] → select each display with PAGE [◀][▶]

These parameters are for editing the individual Elements that make up a Normal Voice.

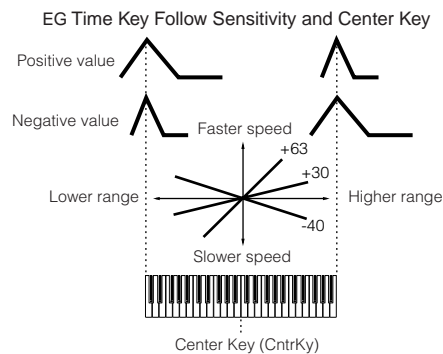
OSC (Oscillator)		
ElementSw (ElmSw)	Element Switch	Determines whether the currently selected Element is on or off. Settings: off (inactive), on (active)
WaveNo. (WvNo.) WaveCtgr (WvCtgr)	Waveform Number Category	Determines the Waveform for the selected Element. See the Waveform list in the separate Data List.
KeyOnDelay (KONdly)	Key On Delay	Determines the time (delay) between the moment that a Note On message is received and the point at which the sound is played. You can set different delay times for each Element. Settings: 0 ~ 127
KONdlyTpSyn (TmpSyn)	Key On Delay Tempo Sync	Determines whether or not the "KeyOnDelay" parameter is synchronized to the tempo of the Arpeggio. Settings: off (not synchronized), on (synchronized)
KONdlyTempo (Tempo)	Key On Delay Tempo	Determines the timing of the Key On Delay when the "KONdlyTpSyn" is set to on. Settings: 16th, 8th/3 (eighth-note triplets), 16th. (dotted sixteenth notes), 8th, 4th/3 (quarter-note triplets), 8th. (dotted eighth notes), 4th (quarter notes), 2nd/3 (half-note triplets), 4th. (dotted quarter notes), 2nd (half notes), whole/3 (whole-note triplets), 2nd. (dotted half notes), 4th x 4 (quarter-note quadruplets; four quarter notes to the beat), 4th x 5 (quarter-note quintuplets; five quarter notes to the beat), 4th x 6 (quarter-note sextuplets; six quarter notes to the beat), 4th x 7 (quarter-note septuplets; seven quarter notes to the beat), 4th x 8 (quarter-note octuplets; eight quarter notes to the beat)
InsEFOut (InsEF)	Insertion Effect Output	Determines which Insertion Effect (1 or 2) is used to process each individual Element. The Insertion Effect is bypassed if you select "thru." The parameter is connected to the "EL1-4InsEFOut" parameters in the Effect Connection Edit mode: ([VOICE] → Select Voice → select Effect Connection Edit by pressing [EFFECT] once or twice). Settings: thru, ins1 (Insertion Effect 1), ins2 (Insertion Effect 2)
NoteLmtLow/High (NtLmtL/H)	Note Limit Low/High	Determines the lowest and highest notes of the note range for each Element. The selected Element will sound only when you play notes within this range. Settings: C-2 ~ G8 NOTE If you specify the highest note first and the lowest note second, for example "C5 to C4," then the note range covered will be "C-2 to C4" and "C5 to G8."
VelLmtLow/High (VILmtL/H)	Velocity Limit Low/High	Sets the minimum and maximum values of the velocity range within which each Element will respond. Each Element will only sound for notes played within its specified velocity range. For example, this lets you have one Element sound when you play softly and have a different one sound when you play strongly. Settings: 1 ~ 127 NOTE If you specify the maximum value first and the minimum value second, for example "93 to 34," then the velocity range covered will be "1 to 34" and "93 to 127."
VelCrsFade (CrsFd)	Velocity Cross Fade	This determines how gradually the sound of an Element decreases in volume in proportion to the distance of velocity changes outside the Velocity Limit setting (above). The higher the value, the more gradual the level change. Settings: 0 ~ 127
Pitch		
CoarseTune (Coarse)	Coarse	Determines the pitch of each Element in semitones. Settings: -48 ~ 0 ~ +48
FineTune (Fine)	Fine	Determines the fine tuning for the pitch of each Element. Settings: -64 ~ 0 ~ +63
FineScalSns (ScI Sns)	Fine Scaling Sensitivity	Determines the degree to which the notes (specifically, their position or octave range) affect the pitch in fine tuning (set above) of the selected Element, regarding C3 as the basic pitch. A positive setting will cause the pitch of lower notes to change lower and that of higher notes to change higher. A negative setting will have the opposite effect. Settings: -64 ~ +63

RandomTune (Random)	Random	This lets you randomly vary the pitch of the Element for each note you play. The higher the value, the greater the pitch variation. A value of "0" results in no pitch change. Settings: 0 ~ 127
PitchVelSns (VelSns)	Pitch Velocity Sensitivity	Determines the velocity sensitivity of the Pitch. Extreme values produce greater variation in PEG Depth. Settings: -64 ~ 0 ~ +63
FlwPchSns (FlwSns)	Pitch Key Follow Sensitivity	Determines the sensitivity of the Key Follow effect (the pitch interval of adjacent notes). The CntrKy (Center Key; next parameter) is used as the basic pitch for this parameter. At +100 (the normal setting), adjacent notes are pitched one semitone (100 cents) apart. At 0, all notes are the same pitch. At +50, one octave is stretched out over twenty-four notes. For negative values, the settings are reversed. Settings: -200 ~ 0 ~ +200 NOTE This parameter is useful for creating alternate tunings, or for use with sounds that do not need to be spaced in semitones, such as pitched drum sounds in a Normal Voice.
FlwCntrKey (CntrKy)	Pitch Key Follow Sensitivity Center Key	Determines the basic note for the "FlwSns" parameter above. The note number set here is the same pitch as normal, regardless of the "FlwSns" setting. Settings: C -2 ~ G8



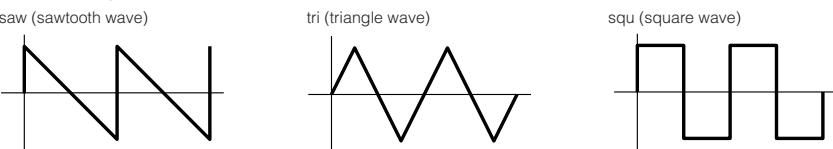
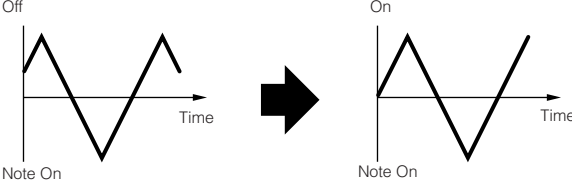
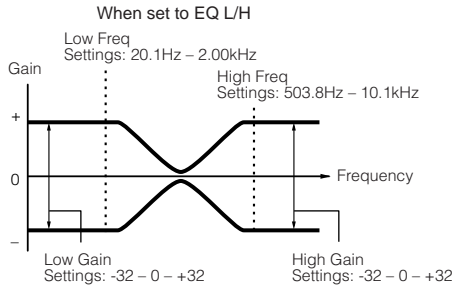
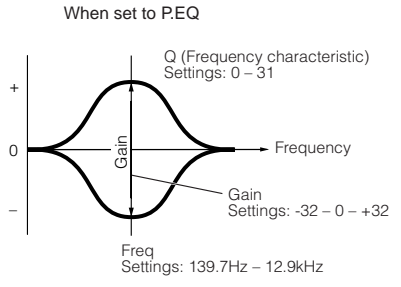
PEG (Pitch Envelope Generator)

Hold Time (HoldTm)	PEG Hold Time	Makes all the time and level settings for the Pitch EG, which determine how the pitch of the sound changes over time. You can control the transition in pitch from the moment the sound starts to the moment the sound stops. Settings: HoldTm, AtkTm, Dcy1Tm, Dcy2Tm, RelTm: 0 ~ 127 HoldLv, AtkLv, Dcy1Lv, Dcy2Lv, RelLv: -128 ~ 0 ~ +127 Depth: -64 ~ 0 ~ +63 NOTE For details about the PEG, see page 55.
AttackTime (AtkTm)	PEG Attack Time	
Decay1/2Time (Dcy1/2Tm)	PEG Decay Time	
ReleaseTime (RelTm)	PEG Release Time	
HoldLvl (HoldLv)	PEG Hold Level	
AttackLvl (AtkLv)	PEG Attack Level	
Decay1/2Lvl (Dcy1/2Lv)	PEG Decay Level	
ReleaseLvl (RelLv)	PEG Release Level	
Depth (Depth)	PEG Depth	
EGTmVelSns (TmVel)	PEG Time Velocity Sensitivity	Determines the velocity sensitivity of the PEG's Time parameters. Select the "Segmnt" (Segment) parameter, then set its "TmVel" parameter. Positive "TmVel" settings will play back the specified Segment faster and negative values will play it back slower. A negative setting will have the opposite effect. Settings: TmVel: -64 ~ 0 ~ +63 Settings: Segmnt: atk, atk+dcy, dcy, atk+rls, all atk (attack) "TmVel" parameter affects Attack time. atk+dcy (attack + decay)..... "TmVel" parameter affects Attack/Decay 1 time. dcy (decay)..... "TmVel" parameter affects Decay time. atk+rls (attack + release) "TmVel" parameter affects Attack/Release time. all..... "TmVel" affects all PEG Time parameters.
SgmtVelSns (Segmnt)	PEG Time Velocity Sensitivity Segment	
EGLvVelSns (LvlVel)	PEG Velocity Level Sensitivity	Determines the velocity sensitivity of the PEG Level. Positive settings will cause the pitch change to rise the harder you play the note, and negative values will cause it to fall. The "CrvVel" parameter lets you select from five different preset velocity curves, that determine how velocity affects the "LvlVel". Settings: LvlVel: -64 ~ 0 ~ +63 Settings: CrvVel: 0 ~ 4
CurvVelSns (CrvVel)	PEG Velocity Sensitivity Curve	
FlwEGTmSns (FlwSns)	PEG Time Key Follow Sensitivity	Determines the degree to which the notes (specifically, their position or octave range) affect the Pitch EG times of the selected Element. The "CntrKy" (Center Key, next parameter) is used as the basic pitch for this parameter. A positive setting will cause the amplitude of lower notes to change slower and that of higher notes to change faster. A negative setting will have the opposite effect. Settings: -64 ~ 0 ~ +63
FlwCntrKey (CntrKy)	PEG Time Key Follow Sensitivity Center Key	Determines the central note for the "FlwSns" parameter above. When the Center Key note is played, the PEG behaves according to its actual settings. The pitch change characteristics for other notes will vary in proportion to the "TmVel" parameter settings. Settings: C -2 ~ G8



Filter		
Type	Filter Type	Makes comprehensive settings for the Filter unit. Parameters will vary according to the Type. Basically, there are four different filters: an LPF (Low Pass Filter), an HPF (High Pass Filter), a BPF (Band Pass Filter) and a BEF (Band Elimination Filter). Each available filter has a different frequency response. There are also combinations of LPF and HPF. Settings: See page 77.
Gain	Filter Gain	Sets the Gain (the amount of boost applied to the signal sent to the Filter Unit). Settings: 0 ~ 255
Cutoff	Filter Cutoff	Sets the cutoff frequency. This is used as the basic frequency for the selected Filter Type. Settings: 0 ~ 255
Resonance (Reso)	Filter Resonance	This parameter's function varies according to the selected Filter Type. If the selected filter is an LPF, HPF, BPF (excluding the BPFw), or BEF, this parameter affects the amount of resonance. This can be used in combination with the "Cutoff" parameter to add further character to the sound. With the BPFw, the parameter is used to adjust the width of the band of signal frequencies passed by the filter. Settings: 0 ~ 127
Distance (Dstnce)	Filter Distance	Determines the distance between the Cutoff Frequencies, for the Dual Filter types (two filters connected in parallel fashion) and the LPF12+BPF6 filter. Settings: 0 ~ 255
CutoffVelSns (CtofVI)	Filter Cutoff Velocity Sensitivity	Determines the degree to which velocity affects the Cutoff Frequency of the Filter EG. Positive settings will cause the Cutoff Frequency to become higher when you play the notes harder (for a large Velocity value), resulting in a drastic change in tones. A negative setting will have the opposite effect. Settings: -64 ~ 0 ~ +63
ResoVelSns (ResoVI)	Filter Resonance Velocity Sensitivity	Determines the degree to which velocity affects the Resonance of the Filter EG. For positive values, the harder you play the notes, the greater the Resonance change. A negative setting will have the opposite effect. Settings: -64 ~ 0 ~ +63
FlwFitSns (FlwSns)	Filter Cutoff Key Follow Sensitivity	Determines the degree to which the notes (specifically, their position or octave range) affect the Filter of the selected Element. A Cutoff setting of C3 is used as the basic setting. A positive setting will lower the Cutoff Frequency for lower notes and raise it for higher notes. A negative setting will have the opposite effect. Settings: -200 ~ 0 ~ +200
ScaleBP1-4 (BP1-4)	Filter Cutoff Scaling Break Point	Filter Scaling controls the Filter Cutoff Frequency according to the note numbers. You can divide the entire keyboard by four break points, and assign different offset values of Cutoff Frequency to them respectively. Refer to the setting example on 78. Settings: BP (Break Point) 1-4: C-2 ~ G8 Settings: Offset (Offset) 1-4: -128 ~ 0 ~ +127
ScaleOfst1-4 (Ofst1-4)	Filter Cutoff Scaling Offset	
HPF Cutoff (HPCtof)	HPF Cutoff	Determines the central frequency for the "HPF FlwSns" parameter below. When one of the filter types "LPF12" or "LPF6" is selected, this parameter is available. Settings: 0 ~ 255
HPF FlwSns (HP Flw)	HPF Cutoff Key Follow Sensitivity	Sets the Key Follow for the frequency of the "HPF Cutoff" parameter. This parameter varies the center frequency according to the note numbers. A positive setting will raise the center frequency for higher notes and lower it for lower notes. A negative setting will have the opposite effect. When a filter type "LPF12" or "LPF6" is selected, this parameter is available. Settings: -200 ~ 0 ~ +200
FEG (Filter Envelope Generator)		
HoldTime (HoldTm)	FEG Hold Time	Makes all the time and level settings for the Filter EG, which determine how the tonal quality of the sound changes over time. These can be used to control the change in Cutoff Frequency from the moment a Note On message is received to the moment the sound stops. Settings: HoldTm, AtkTm, Dcy1Tm, Dcy2Tm, RelTm: 0 ~ 127 HoldLv, AtkLv, Dcy1Lv, Dcy2Lv, RelLv: -128 ~ 0 ~ +127 Depth -64 ~ 0 ~ +63 NOTE For more information on the FEG, see page 56.
AttackTime (AtkTm)	FEG Attack Time	
Decay1/2Time (Dcy1/2Tm)	FEG Decay Time	
ReleaseTime (RelTm)	FEG Release Time	
HoldLvl (HoldLv)	FEG Hold Level	
AttackLvl (AtkLv)	FEG Attack Level	
Decay1/2Lvl (Dcy1/2Lv)	FEG Decay Level	
ReleaseLvl (RelLv)	FEG Release Level	
Depth	FEG Depth	
EGTmVelSns (TmVel)	FEG Time Velocity Sensitivity	
SgmntVelSns (Segmnt)	FEG Time Velocity Sensitivity Segment	
EGLvVelSns (LvIVel)	FEG Velocity Level Sensitivity	
CurvVelSns (CrvVel)	FEG Velocity Sensitivity Curve	Determines the velocity sensitivity of the FEG Level. Positive settings will cause the level to rise the harder you play the note, and negative values will cause it to fall. The "CrvVel" parameter lets you select from five different preset velocity curves (graphically indicated in the display), that determine how velocity affects the "LvIVel." Settings: LvIVel: -64 ~ 0 ~ +63 Settings: CrvVel: 0 ~ 4

FlwEGTmSns (FlwSns)	FEG Time Key Follow Sensitivity	Determines the degree to which the notes (specifically, their position or octave range) affect the Filter EG times of the selected Element. The basic speed of change for the FEG is at the note specified in the "CntrKy" (Center Key; see next parameter below). A positive setting will cause the amplitude of lower notes to change slower and that of higher notes to change faster. A negative setting will have the opposite effect. Settings: -64 ~ 0 ~ +63
FlwCntrKey (CntrKy)	FEG Time Key Follow Sensitivity Center Key	Determines the central note for the "FlwSns" parameter above. When the Center Key note is played, the FEG behaves according to its actual settings. The Filter change characteristics for other notes will vary in proportion to the "TmVel" parameter settings. Settings: C-2 ~ G8 NOTE For details on the relationship between the EG Time Key Follow Sensitivity and the Center Key, see page 69.
AMP (Amplitude)		
Level	Level	Determines the output level for the selected Element. Settings: 0 ~ 127
Pan	Pan	Determines the stereo Pan position for the selected Element. This will also be used as the basic Pan position for the Alternate, Random and Scale settings. Settings: L63 (far left) ~ C (center) ~ R63 (far right)
AltnatePan (AltPan)	Alternate Pan	Determines the amount by which the sound is panned alternately left and right for each received Note On message. The Pan setting is used as the basic Pan position. Settings: L64 ~ -0 ~ R63
RandomPan (RdmPan)	Random Pan	Determines the amount by which the sound of the selected Drum key is panned randomly left and right for each received Note On message. The Pan setting (above) is used as the Center Pan position. Settings: 0 ~ 127
ScalingPan (ScIPan)	Scaling Pan	Determines the amount by which the sound is panned alternately left and right for the Note Number of each Note On message. At note C3, the main Pan setting (above) is used for the basic Pan position. Settings: -64 ~ 0 ~ +63
LvlFlwSns (FlwSns)	Level Key Follow Sensitivity	Determines the degree to which the notes (specifically, their position or octave range) affect the volume of the selected Element. The level at C3 is used as the basic setting. A positive setting will lower the level for lower notes and raise it for higher notes. A negative setting will have the opposite effect. Settings: -200 ~ 0 ~ +200
ScaleBP1-4 (BP1-4)	Level Scaling Break Point	Controls the Level above according to the Note Numbers. You can divide the entire keyboard by four break points, and assign different offset values of amplitude to them respectively. For more details, see page 78. Settings: BP (Break Point) 1-4: C-2 ~ G8 Settings: Ofst (Offset)1-4: -128 ~ 0 ~ +127
ScaleOfst1-4 (Ofst1-4)	Level Scaling Offset	
AEG (Amplitude Envelope Generator)		
AttackTime (AtkTm)	AEG Attack Time	Makes all the time and level settings for the Amplitude EG, which determine how the volume of the sound changes over time. These can be used to control the change in volume from the moment a note is played to the moment the sound stops. Settings: 0 ~ 127 NOTE For details about the AEG, refer to page 57.
Decay1/2Time (Dcy1/2Tm)	AEG Decay Time	
ReleaseTime (RelTm)	AEG Release Time	
InitLvl (InitLv)	AEG Initial Level	
AttackLvl (AtkLv)	AEG Attack Level	
Decay1/2Lvl (Dcy1/2Lv)	AEG Decay Level	
EGTmVelSns (TmVel)	AEG Time Velocity Sensitivity	Determines the velocity sensitivity of the AEG's Time parameters. First select the "Segmnt" (Segment), then set its "TmVel" parameter. Positive "TmVel" parameter settings will play back the specified Segment parameter faster in proportion to the played velocity. A negative setting will have the opposite effect. Settings: TmVel: -64 ~ 0 ~ +63 Settings: Segmnt: atk, atk+dcy, dcy, atk+rIs, all atk (attack) "TmVel" parameter affects Attack time. atk+dcy (attack + decay)..... "TmVel" parameter affects Attack/Decay1 time. dcy (decay) "TmVel" parameter affects Decay Time atk+rIs (attack + release) "TmVel" parameter affects Attack/Release time. all..... "TmVel" affects all AEG Time parameters.
SgmntVelSns (Segmnt)	AEG Time Velocity Sensitivity Segment	
EGLvVelSns (LvVel)	AEG Velocity Level Sensitivity	
CurvVelSns (CrvVel)	AEG Velocity Sensitivity Curve	Determines the velocity sensitivity of the Amplitude EG Level. For positive settings, the more strongly you play the note, the more the volume changes. Negative settings do the opposite; the more softly you play, the more the volume changes. The "CrvVel" parameter lets you select from five different preset velocity curves (graphically indicated in the display), that determine how velocity affects the Amplitude EG. Settings: LvVel: -64 ~ 0 ~ +63 Settings: CrvVel: 0 ~ 4
FlwEGTmSns (FlwSns)	AEG Time Key Follow Sensitivity	Determines the degree to which the notes (specifically, their position or octave range) affect the Amplitude EG times of the selected Element. The "CntrKy" (Center Key, next parameter) is used as the basic amplitude for this parameter. A positive setting will cause the amplitude of lower notes to change slower and that of higher notes to change faster. A negative setting will have the opposite effect. Settings: -64 ~ 0 ~ +63
FlwCntrKey (CntrKy)	AEG Time Key Follow Sensitivity Center Key	Determines the central note for the "FlwSns" parameter above. When the Center Key is played, the AEG behaves according to its actual settings. The amplitude change characteristics for other notes will vary in proportion to the "FlwSns" parameter settings. Settings: C-2 ~ G8 NOTE For details on the relationship between the EG Time Key Follow Sensitivity and the Center Key, see page 69.

LFO (Low Frequency Oscillator)		
Wave	LFO Wave	<p>Determines the LFO waveform used to vary the sound. Settings: saw, tri, squ</p> <p>saw (sawtooth wave) tri (triangle wave) squ (square wave)</p> 
Speed	LFO Speed	<p>Set the speed of the LFO waveform. A larger setting means a faster speed. Settings: 0 ~ 63</p>
KeyOnSync (KOnSyn)	LFO Key On Sync	<p>When this is set to on, the LFO waveform is reset every time a note is played. Settings: off, on</p> 
KeyOnDelay (KOnDly)	LFO Key On Delay Time	<p>Determines the delay time between the moment a Note On message is received to the moment the LFO comes into effect. A higher value results in a longer delay time. Settings: 0 ~ 127</p>
Pmod	LFO Pitch Modulation Depth	<p>Determines the amount (depth) by which the LFO waveform varies (modulates) the pitch of the sound. The higher the setting, the greater the depth of control. Settings: 0 ~ 127</p>
Fmod	LFO Filter Modulation Depth	<p>Determines the amount (depth) by which the LFO waveform varies (modulates) the Filter Cutoff frequency. The larger the setting, the greater the depth of control. Settings: 0 ~ 127</p>
Amod	LFO Amplitude Modulation Depth	<p>Determines the amount (depth) by which the LFO waveform varies (modulates) the amplitude or volume of the sound. The larger the setting, the greater the depth of control. Settings: 0 ~ 127</p>
FadeIn	LFO Fade In Time	<p>Determines the amount of time for the LFO effect to fade in (after the "KeyOnDelay" time has elapsed). A higher value means a slower fade-in. Settings: 0 ~ 127</p>
PhaseOffset (Offset)	LFO Phase Offset	<p>Determines the offset values of the "Phase" parameter (in the [VOICE] → Common Edit → LFO display) for the respective Elements. Settings: +0, +90, +120, +180, +240, +270</p>
Dest1-3Ratio (D1-3Rtio)	LFO Destination Ratio	<p>Determines the LFO Wave Depth. Settings: 0 ~ 127</p>
EQ (Equalizer)		
Type	EQ Type	<p>Determines the Equalizer Type. This synthesizer features a wide selection of various Equalizer Types, which can be used not only to enhance the original sound, but even completely change the character of the sound. The particular parameters and settings available depend on the specific Equalizer Type that is selected.</p> <p>Settings: EQ L/H (L/H), P.EQ, Boost6 (B6), Boost12 (B12), Boost18 (B18), thru</p> <p>EQ L/H (Low/High) This is a "shelving" equalizer, which combines separate high and low frequency bands.</p> <p>P.EQ (Parametric EQ) The Parametric EQ is used to attenuate or boost signal levels (gain) around the Frequency. This type features 32 different "Q" settings, which determine the frequency band width of the equalizer.</p> <p>Boost6 (Boost 6dB)/Boost12 (Boost 12dB)/Boost18 (Boost 18dB) These can be used to boost the level of the entire signal by 6dB, 12dB and 18dB, respectively.</p> <p>thru If you select this, the equalizers are bypassed and the entire signal is unaffected.</p> <p>NOTE The available parameters differ depending on which Filter type is selected here.</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>When set to EQ L/H</p>  </div> <div style="text-align: center;"> <p>When set to P.EQ</p>  </div> </div>

Voice Edit (for Drum Voice)

When a Drum Voice is selected, Voice Edit parameters are divided into Common Edit (parameters common to all keys, up to 73), and Key Edit (parameters of individual keys).

Common Edit

[SHIFT]+[DRUM] → select Drum Voice → [EDIT] → [SHIFT]+[COMMON] → select each display with PAGE [◀][▶]

These parameters are for making global (or common) edits to all keys of the selected Drum Voice.

General

Same as the General display in Normal Voice Common Edit. See page 65.
The following parameters are not available for Drum Voice: Mono/Poly settings, Key Assign mode settings, Portamento settings, Micro tuning settings

Output

Same as the Output display in Normal Voice Common Edit. See page 66.
In addition, the following two parameters are also available.

InsRevSend	Insertion Reverb Send	Determines the Send level for the entire Drum Voice (all keys), sent from Insertion Effect 1/2 to the Reverb Effect. Settings: 0 -127
InsChoSend	Insertion Chorus Send	Determines the Send level for the entire Drum Voice (all keys), sent from Insertion Effect 1/2 to the Chorus Effect. Settings: 0 -127

NOTE Send level (to Reverb and Chorus) cannot be set independently for each Drum key.
NOTE The value for each Normal Voice is fixed at 127 (maximum).

EG/FLT (Envelope Generator/Filter)

Same as the EG/FLT display in Normal Voice Common Edit. See page 66.
The following parameters are only available for Drum Voice: AEG Attack, AEG Decay, Cutoff, Resonance
AEG Attack, AEG Decay, Cutoff, Resonance

CtrlSet (Controller Set)

Same as the CtrlSet display in Normal Voice Common Edit. See page 66. Please note that the Element Switch parameter is not available in Drum Voice Common edit.

Key Edit

[SHIFT]+[DRUM] → select Drum Voice → [EDIT] → select Key with [SHIFT]+[PART] [◀][▶] → select each display with PAGE [◀][▶]

These parameters are for editing the individual keys that make up a Drum Voice.

OSC (Oscillator)

WaveType	Wave Type	Determines whether a Wave or a Normal Voice is to be used for the selected key. Also, use the Bank, Number and Category parameters below to specify the desired Wave or Normal Voice. Settings: PresetWave, Voice NOTE Depending on the settings here, some of the parameters may not be available.
ElementSw	Element Switch	This parameter is available when "WaveType" is set to "PresetWave." This determines whether the currently selected key is on or off, or in other words, whether the wave for the key is active or inactive. Settings: on, off
Bank	Bank	This parameter is available when "WaveType" is set to "Voice." Any of the Normal Voice banks can be selected. NOTE You cannot select Plug-in Voices.
Number	Number	Selects a Wave/Normal Voice Number. The number differs depending on the selected Wave Type. Details about each Wave/Voice are given in the separate Data List. Settings: When "WaveType" is set to "PresetWave": off, 0001 ~ 1859 When "WaveType" is set to "Voice": 001 ~ 128
WaveCtgy	Wave Category	Determines the Category of the Wave/Voice. If you switch to another Category, the first Wave/Voice in that Category will be selected. Settings: For more information on the Categories, refer to the separate Data List.
InsEFOut	Insertion Effect Output	Determines which Insertion Effect (1 or 2) is used to process each individual Drum key. The Insertion Effect is bypassed if "thru" is selected. Settings: thru, ins1 (Insertion Effect 1), ins2 (Insertion Effect 2)
RevSend/ChoSend	Reverb Send/Chorus Send	Determines the level of the Drum key sound (the bypassed signal) that is sent to Reverb/Chorus Effect. This is available only when "InsEFOut" parameter above is set to "thru." Settings: 0 -127
OutputSel	Output Select	Assigns each Drum Key to an output. You can assign each individual Drum key sound to be output from a specific hardware output jack on the rear panel. This is available only when "InsEFOut" parameter above is set to "thru." Settings: See page 29.
KeyAsgnMode	Key Assign Mode	Selects single or multi Key Assign. When this is set to "single," double playback of the same note is prevented. To allow playback of each instance of the same note, set this to "multi." Settings: single, multi

RcvNoteOff	Receive Note Off	Selects whether MIDI Note Off messages are received by each Drum Key. Settings: off, on NOTE This parameter is only available if the "WaveType" parameter in the OSC display is set to "PresetWave."
AltnateGrp	Alternate Group	Sets the Alternate Group to which the Wave is assigned. In a real drum kit, some drum sounds cannot physically be played simultaneously, such as open and closed hi-hats. You can prevent Waves from playing back simultaneously by assigning them to the same Alternate Group. Up to 127 Alternate Groups can be defined. You can also select "off" here if you wish to allow the simultaneous playback of sounds. Settings: off, 1 ~ 127 NOTE This parameter is only available if the "WaveType" parameter in the OSC display is set to "PresetWave."
Pitch		
CoarseTune	Coarse	Determines the pitch of each Drum Key Wave (or Normal Voice) in semitones. Settings: -48 ~ +48 NOTE For a Normal Voice, this parameter adjusts the position of its note (not its pitch) relative to note C3.
FineTune	Fine	Determines the fine tuning for the pitch of each Drum Key Wave (or Normal Voice). Settings: -64 ~ +63
PitchVelSns	Pitch Velocity Sensitivity	From this display you can determine how the pitch of the Drum key responds to velocity. For positive values, the more strongly you play the note, the higher the pitch becomes. For negative values, the more strongly you play the note, the lower the pitch. Settings: -64 ~ +63 NOTE This parameter is only available if the "WaveType" parameter in the OSC display is set to "PresetWave."
Filter		
You can apply filter settings to the Drum Voice. The MOTIF-RACK ES lets you apply a low pass filter and high pass filter to each individual Drum key. NOTE This parameter is only available if the "WaveType" parameter in the OSC display is set to "PresetWave."		
Cutoff	LPF Cutoff	Sets the Cutoff Frequency of the Low Pass Filter. Settings: 0 ~ 255
Resonance	LPF Resonance	Determines the amount of Resonance (harmonic emphasis) applied to the signal at the Cutoff Frequency. Settings: 0 ~ 127
CutoffVelSns	LPF Cutoff Velocity Sensitivity	Determines the velocity sensitivity of the Low Pass Filter Cutoff Frequency. Positive settings will cause the Cutoff Frequency to rise the harder you play the note. A negative setting will have the opposite effect. Settings: -64 ~ 0 ~ +63
HPF Cutoff	HPF Cutoff	Determines the Cutoff Frequency of the High Pass Filter. Settings: 0 ~ 255
AMP (Amplitude)		
NOTE The "AltnatePan," "RandomPan," "AttackTime," "Decay1Time," "Decay1Lvl," "Decay2Time," and "LvVelSns" parameters are only available if the "WaveType" parameter in the OSC display is set to "PresetWave."		
Level	Level	Sets the output level of each Key. This lets you make detailed balance adjustments among the various sounds of the Drum Voice. Settings: 0 ~ 127
Pan	Pan	Sets the Pan position for each sound in a Drum Voice (Drum Kit). This will also be used as the basic Pan position for the Alternate and Random settings. Settings: L63 (far left) ~ C (center) ~ R63 (far right)
AltnatePan	Alternate Pan	Sets the amount by which the sound is panned alternately left and right for each received Note On message. The Pan setting is used as the basic Pan position. Settings: L64 ~ 0 ~ R63
RandomPan	Random Pan	Determines the amount by which the sound of the selected Drum key is panned randomly left and right for each received Note On message. The Pan setting (above) is used as the Center Pan position. Settings: 0 ~ 127
AttackTime	AMP Attack Time	Settings: 0 ~ 127
Decay1Time	AMP Decay1 Time	Settings: 0 ~ 127
Decay1Lvl	AMP Decay1 Level	Settings: 0 ~ 127
Decay2Time	AMP Decay2 Time	Settings: 0 ~ 126, hold <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>Decay 2 Time = 0 ~ 126</p> </div> <div style="text-align: center;"> <p>Decay 2 Time = hold</p> </div> </div>
LvVelSns	Level Velocity Sensitivity	Determines the velocity sensitivity of the Amplitude Envelope Generator's output level. For positive settings, the more strongly you play the note, the more the volume changes. A negative setting will have the opposite effect. Settings: -64 ~ 0 ~ +63
EQ (Equalizer)		
Same as in Normal Element Edit. See page 72. NOTE This parameter is only available if the "WaveType" parameter in the OSC display is set to "PresetWave."		

Voice Edit (for Plug-in Voice)

These parameters are basically the same as in Normal Voice Edit. Unlike with Normal Voices, the Plug-in Voices only have one Element for editing.

NOTE Depending on the particular Plug-in Board you are using, some of the parameters described here may not be available.

NOTE For details on the current lineup of available Plug-in Boards, see page 52.

Common Edit

[VOICE] → select Plug-in Voice → [Edit] → [SHIFT]+[COMMON] → select each display with PAGE [◀][▶]

General		Same as the General display in Normal Voice Common Edit. See page 65. The following parameters are not available for Plug-in Voice: <ul style="list-style-type: none"> • Portamento Mode, Time Mode, and Legato Slope settings • Micro Tuning settings Unlike with Normal Voice Edit, the Upper and Lower ranges cannot be independently set here.
Output		Same as the Output display in Normal Voice Common Edit. See page 66.
EG/FLT (Envelope Generator/Filter)		Same as the EG/FLT display in Normal Voice Common Edit. See page 66. The following parameters are only available for Plug-in Voice: AEG Attack, AEG Decay, AEG Release, Cutoff, Resonance
CtrlSet (Controller Set)		Same as the CtrlSet display in Normal Voice Common Edit. See page 66. Please note that the Element Switch parameter is not available in the Plug-in Voice Common Edit mode.
Set1/2Source	Controller Set Source	Same as the CtrlSet display in Normal Voice Common Edit. See page 66. Please note that the Element Switch parameter is not available in the Plug-in Voice Common Edit mode.
Set1/2Dest	Controller Set Destination	
Set1/2Depth	Controller Set Depth	
MW Filter	Modulation Wheel Filter	Determines the depth of control of the Modulation Wheel over the filter cutoff frequency. Settings: -64 ~ 0 ~ +63
MW PMod	MW Wheel Pitch Modulation Depth	Determines the depth of control the Modulation Wheel has over pitch modulation. The higher the setting, the greater the depth of control. Settings: 0 ~ 127
MW FMod	Modulation Wheel Filter Modulation Depth	Determines the depth of control the Modulation Wheel has over filter cutoff modulation. The larger the setting, the greater the depth of control. Settings: 0 ~ 127
MW AMod	Modulation Wheel Amplitude Modulation Depth	Determines the depth of control the Modulation Wheel has over amplitude modulation. The larger the setting, the greater the depth of control. Settings: 0 ~ 127
AT Pitch	Aftertouch Pitch	Determines the depth of control of keyboard aftertouch over pitch. You can set a value (in semitones) of up to two octaves. Settings: -24 ~ 0 ~ +24
AT Filter	Aftertouch Filter	Determines the depth of control of keyboard aftertouch over the Filter Cutoff Frequency. Settings: -64 ~ 0 ~ +63
AT PMod	Aftertouch Pitch Modulation Depth	Determines the depth of control that keyboard aftertouch has over pitch modulation. The higher the setting, the greater the depth of control. Settings: 0 ~ 127
AT FMod	Aftertouch Filter Modulation Depth	Determines the depth of control that keyboard aftertouch has over the filter cutoff modulation. The larger the setting, the greater the depth of control. Settings: 0 ~ 127
AT AMod	Aftertouch Amplitude Modulation Depth	Determines the depth of control that keyboard aftertouch has over the amplitude modulation. The larger the setting, the greater the depth of control. Settings: 0 ~ 127
AC Source	Assignable Control Source	Determines the MIDI Control Number used to control the filter, PMod, FMod, and AMod. Settings: 0 ~ 95
AC Filter	Assignable Control Filter	Determines the depth of the filter cutoff frequency controlled by the Control Change set in the "AC Source" parameter above. Settings: -64 ~ 0 ~ +63
AC PMod	Assignable Control Pitch Modulation Depth	Determines the depth of control the Control Change messages (selected in the "AC Source" parameter) have over the pitch modulation. The larger the setting, the greater the depth of control. Settings: 0 ~ 127
AC FMod	Assignable Control Filter Modulation Depth	Determines the depth of control the Control Change messages (selected in the "AC Source" parameter) have over the filter cutoff modulation. The larger the setting, the greater the depth of control. Settings: 0 ~ 127
AC AMod	Assignable Control Amplitude Modulation Depth	Determines the depth of control the Control Change messages (selected in the "AC Source" parameter) have over amplitude modulation. The larger the setting, the greater the depth of control. Settings: 0 ~ 127

Element Edit

[VOICE] → select Plug-in Voice → [EDIT] → [1/5/9/13] → select each display with PAGE [◀][▶]

NOTE Unlike with Normal Voices, the Plug-in Voices only have one Element for editing.

OSC (Oscillator)

Bank Number	Bank Number	First select the Board Voice Bank, then select the Board Voice Number. Settings: These depend on the particular Plug-in Board; refer to the owner's manual of the relevant Plug-in Board.
VelSensDpt	Velocity Sensitivity Depth	Determines the velocity sensitivity of the Plug-in Voice. For higher values, the harder you play the note, the louder the Voice becomes. Settings: 0 ~ 127
VelSensOfst	Velocity Sensitivity Offset	This lets you specify an offset value for Velocity Sensitivity Depth. In other words, you can increase the relative velocity (or level) of the Voice by a set amount – so that all the notes you play have the added velocity. Settings: 0 ~ 127
NoteShift	Note Shift	Determines the transpose setting for the Plug-in Voice, or the amount (in semitones) by which the pitch is raised or lowered. You can set a value of up to 2 octaves. Settings: -24 ~ 0 ~ +24

PEG (Pitch Envelope Generator)

AttackTime	PEG Attack Time	Makes various time and level settings for the Pitch EG. Using the PEG, you can control the transition in pitch from the moment the sound starts to the moment the sound stops.	
ReleaseTime	PEG Release Time		
InitLvl	PEG Initial Level		
ReleaseLvl	PEG Release Level		

Filter

HPF Cutoff	HPF Cutoff	Determines the Cutoff Frequency for the High Pass Filter. Settings: -64 ~ 0 ~ +63
Native (Native Parameter)		With a Plug-in Board installed to the MOTIF-RACK ES, you can create a Board Voice by editing both native parameters (those parameters exclusive to the particular board) and unique parameters (related specifically to the MOTIF-RACK ES). The parameters will vary depending on the Plug-in Board. For details about each parameter and its functions, refer to the owner's manual or the on-line help that came with your Plug-in Board.

LFO (Low Frequency Oscillator)

		This display gives you a comprehensive set of controls over the LFO. The LFO can be used to create vibrato, wah, tremolo and other special effects, by applying it to the pitch, filter and amplitude parameters.
Speed	LFO Speed	Sets the speed of the LFO waveform. A positive setting will increase the speed and a negative setting will reduce it. Settings: -64 ~ 0 ~ +63
KeyOnDelay	LFO Key On Delay	Determines the delay time between the moment that a Note On message is received and the moment the LFO comes into effect. As shown in the illustration, a positive setting will lengthen the delay and a negative setting will shorten it. Settings: -64 ~ 0 ~ +63
PMod	LFO Pitch Modulation Depth	Determines the amount by which the LFO waveform controls the pitch. A positive setting will increase the amount and a negative value will decrease it. Settings: -64 ~ 0 ~ +63

EQ (Equalizer)

		From this display you can apply equalizer settings to the Plug-in Voice. This is a shelving equalizer with two bands; one for high frequencies and the other for low frequencies. NOTE For details about Equalizer, see page 60.	
LowFreq	EQ Low Frequency	Determines the shelving point for the low frequencies. The levels of signals below this frequency will be boosted/attenuated by the amount set in the "LowGain" parameter. Settings: 32Hz ~ 2.0kHz	
LowGain	EQ Low Gain	Sets the amount by which the frequencies below the "LowFreq" parameter setting are attenuated or boosted. Settings: -64 ~ 0 ~ +63	
HighFreq	EQ High Frequency	Determines the shelving point for the high frequencies. The levels of signals above this frequency will be boosted/attenuated by the amount set in the "HighGain" parameter. Settings: 500Hz ~ 16kHz	
HighGain	EQ High Gain	Sets the amount by which the frequencies above the "HighFreq" parameter setting are attenuated or boosted. Settings: -64 ~ 0 ~ +63	

Voice mode

Performance mode

Multi mode

Reference

Effect

Arpeggio

Utility

Supplementary information

Micro Tuning List

[VOICE] → select Normal Voice → [EDIT] → [SHIFT]+[COMMON] → General display → "M.TuningNo./" "M.TunRoot" (page 65)

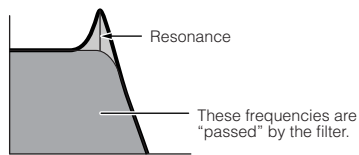
M.TuningNo.	Type	M.TuningRoot	Comments
00	Equal Temp (Equal temperament)	--	The "compromise" tuning used for most of the last 200 years of Western music, and found on most electronic keyboards. Each half step is exactly 1/12 of an octave, and music can be played in any key with identical results. However, none of the intervals are perfectly in tune.
01	PureMaj (Pure major)	C ~ B	This tuning is designed so that most of the intervals (especially the major third and perfect fifth) in the major scale are pure. This means that other intervals will be correspondingly out of tune. You need to specify the key (C~B) you will be playing in.
02	PureMin (Pure minor)	C ~ B	The same as Pure Major, but designed for the minor scale.
03	Werckmeist (Werckmeister)	C ~ B	Andreas Werckmeister, a contemporary of Bach, designed this tuning so that keyboard instruments could be played in any key. Each key has a unique character.
04	Kirnberger	C ~ B	Johann Philipp Kirnberger, an 18th century composer, created this tempered scale to allow performances in any key.
05	Vallot&Yng (Vallotti & Young)	C ~ B	Francescatonio Vallotti and Thomas Young (both mid-1700s) devised this adjustment to the Pythagorean tuning, in which the first six fifths are lower by the same amount.
06	1/4 Shift (1/4 shifted)	--	This is the normal equal tempered scale shifted up 50 cents.
07	1/4 tone	--	Twenty-four equally spaced notes per octave. (Play twenty-four notes to move one octave.)
08	1/8 tone	--	Forty-eight equally spaced notes per octave. (Play forty-eight notes to move one octave.)
09	Indian	--	Usually observed in Indian music (white keys only).
10	Arabic 1	C ~ B	Usually observed in Arabic music.
11	Arabic 2		
12	Arabic 3		

Filter Type List

[VOICE] → select Normal Voice → [EDIT] → [MUTE/SEL/ENTER] (LED turns off) → select Element with [1/5/9/13]-[4/8/12/16] → Filter display → "Type" (page 70)

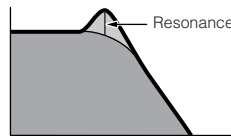
LPF24D (24dB/oct Digital Low Pass Filter)

A dynamic 24dB/oct low-pass filter with a characteristic digital sound. Compared to the LPF24A type (below), this filter can produce a more pronounced resonance effect.



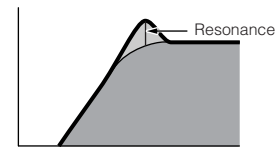
LPF12 (12dB/oct Low Pass Filter)

12dB/oct low-pass filter. This filter is designed to be used in conjunction with a high-pass filter.



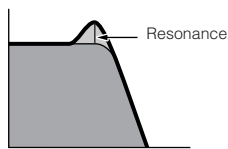
HPF12 (12dB/oct High Pass Filter)

12dB/oct dynamic high-pass filter.



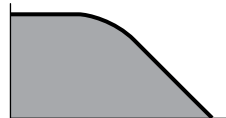
LPF24A (24dB/oct Analog Low Pass Filter)

A digital dynamic low-pass filter with characteristics similar to a 4-pole analog synth filter.

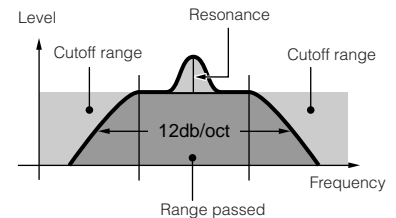


LPF6 (6dB/oct low-pass Filter)

1-pole 6dB/oct low-pass filter. No resonance. This filter is designed to be used in conjunction with a high-pass filter.



BPF12D (12dB/oct Digital Band Pass Filter)

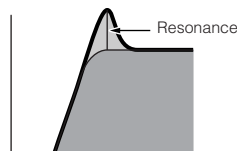


LPF18 (18dB/oct Low Pass Filter)

3-pole 18dB/oct low-pass filter.

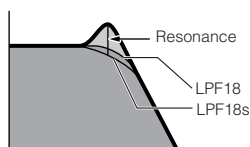
HPF24D (24dB/oct Digital High Pass Filter)

A dynamic 24dB/oct high-pass filter with a characteristic digital sound. This filter can produce a pronounced resonance effect.



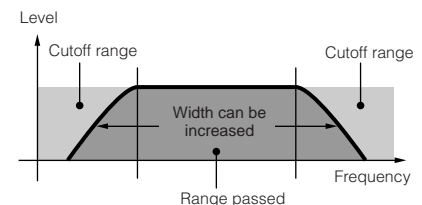
LPF18s (18dB/oct Staggered Low Pass Filter)

3-pole 18dB/oct low-pass filter. This filter has a smoother cutoff slope than the LPF18 type.



BPFw (Wide Band Pass Filter)

A 12dB/oct BPF that combines HPF and LPF filters to allow wider bandwidth settings.



Voice mode

Performance mode

Multi mode

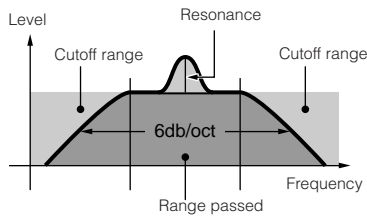
Effect

Arpeggio

Utility

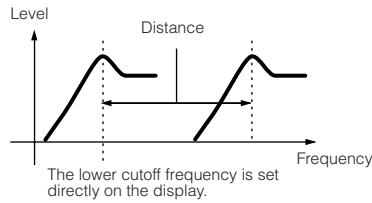
Reference

BPF6 (6dB/oct Band Pass Filter)



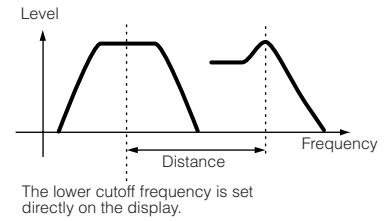
Dual HPF (Dual High Pass Filter)

Two 12dB/oct high-pass filters connected in parallel.

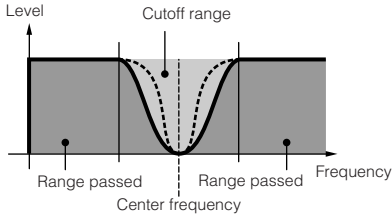


LPF12 + BPF6 (12dB/oct Low Pass Filter + 6dB/oct Band Pass Filter)

A combined low-pass and high-pass filter.

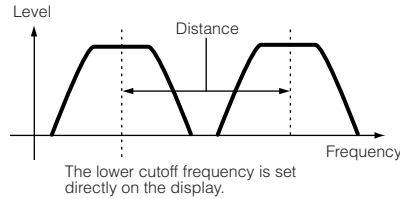


**BEF12 (12dB/oct Band Elimination Filter)
BEF6 (6dB/oct Band Elimination Filter)**



Dual BPF (Dual Band Pass Filter)

Two 6dB/oct band-pass filters connected in parallel.

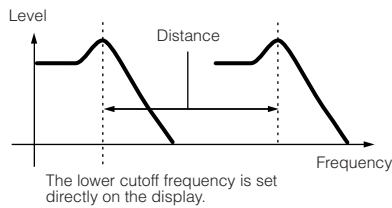


thru

The filters are bypassed and the entire signal is unaffected.

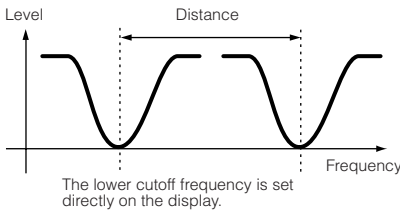
Dual LPF (Dual Low Pass Filter)

Two 12dB/oct low-pass filters connected in parallel.



Dual BEF (Dual Band Elimination Filter)

Two 6dB/oct band-elimination filters connected in serial.



Setting example of Filter Scaling

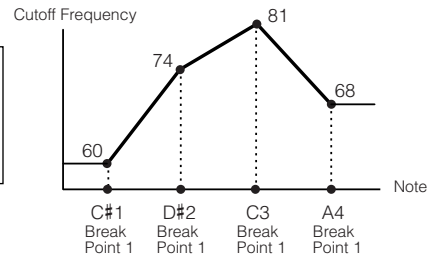
[VOICE] → select Normal Voice → [EDIT] → [MUTE/SEL/ENTER] (LED turns off) → select Element with [1/5/9/13]-[4/8/12/16] → Filter display → "ScaleBP1-4 (7BP1-4)," "ScaleOfst1-4 (Ofst1-4)" (page 70)

ScaleBP1-4

VOICE ELEM2 [Filter]			
AP:Full Grand			
ScaleBP1 = C#1			
BP1	D#0	C#1	C#1
BP2	C#2	D#2	C#1
BP3	C#4	C#3	C#2
BP4	C#4	C#4	C#1

ScaleOfst1-4

VOICE ELEM2 [Filter]			
AP:Full Grand			
ScaleOfst1 = - 4			
Ofst1	- 4	+	0
Ofst2	+ 10	+	0
Ofst3	+ 17	+	3
Ofst4	+ 4	+	0



Setting example of Amplitude Scaling

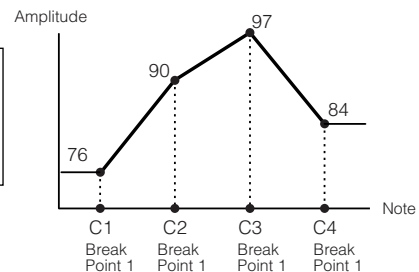
[VOICE] → select Normal Voice → [EDIT] → [MUTE/SEL/ENTER] (LED turns off) → select Element with [1/5/9/13]-[4/8/12/16] → AMP display → "ScaleBP1-4 (BP1-4)," "ScaleOfst1-4 (Ofst1-4)" (page 71)

ScaleBP1-4

VOICE ELEM2 [AMP]			
AP:Full Grand			
ScaleBP1 = C 1			
BP1	C#3	C#1	C#1
BP2	F#3	C#2	C#3
BP3	F#4	C#3	F#4
BP4	G#5	C#4	G#5

ScaleOfst1-4

VOICE ELEM2 [AMP]				
AP:Full Grand				
ScaleOfst1 = - 4				
Ofst1	+ 0	- 4	+	0
Ofst2	+ 10	+ 10	+	0
Ofst3	+ 10	+ 17	+	0
Ofst4	- 25	+ 4	- 25	- 27



Performance mode

Performance Voice Assign

[SHIFT]+[PERFORM] → select Performance → select Performance Edit by pressing [EDIT] once or twice → select each display with PAGE [◀|▶]

From this mode you can select a Voice for each Part and determine the note range it can be played from. The display shown at right appears.

Voice display

```

PERF [Voice ]
Co: Cyber Step
PartSw = Part01
-----
1 PRE0 :020[Dr:R&B Kit1 ]
2 PRE6 :064[Me:Clusters ]
3 PRE6 :097[Co:Step Dance]
  
```

Limit display

```

PERF [Limit ]
Co: Cyber Step
NoteLimitL = C -2
-----
1 C -2-G 8 : 1-127:
2 C -2-G 8 : 1-127:
3 C -2-G 8 : 1-127:
  
```

Voice (Voice Assign)

PartSw	Part Switch	Determines whether the internal Voices or Plug-in Board Voices are assigned to the Parts of the Performance (up to four Parts). "Part01-04" indicate that the internal Voices are used. "PartP1" and "PartP2" indicate that the Plug-in Voices are used. Settings: 1 ~ 4 (Part01 ~ Part04), P1 (PartP1), P2 (PartP2), off
Bank Number	Bank Number	Determines the Bank and Number which are assigned to the Part selected in the "PartSw" parameter.
Limit (Voice Limit)		You can also determine the Limit settings using a Note On message from an external device. See page 32.
NoteLimitL/H	Note Limit Low/High	Use these to set the note range, low and high, for the Part's Voice.
VelLimitL/H	Velocity Limit Low/High	Use these to set the velocity range, low and high, for the Part's Voice.

Performance Edit

When a Performance is selected, the Performance Edit parameters are divided into Common Edit (parameters common to all four Parts), and Part Edit (parameters of individual Part). The display shown at right appears.

Common Edit display

```

PERF COMMON [General]
Co: Cyber Step
Category = Co
-----
Category Co
SubCategory SEQ
Name [Cyber Step]
MEQ Low + 0
  
```

Part Edit display

```

PERF PART01 [Voice ]
Co: Cyber Step
PartSw = on
-----
PartSw on on on off
Bank PRE0 PRE6 PRE6 ---
Number 020 064 097 ---
Mode --- mono Poly ---
  
```

Common Edit

[SHIFT]+[PERFORM] → select Performance → select Performance Edit by pressing [EDIT] once or twice → [SHIFT]+[COMMON] → select each display with PAGE [◀|▶]

These parameters are for making global (or common) edits to all four Parts of the selected Performance.

General

Category	Category	From this display you can assign the category (sub and main) of the selected Performance, and create a name for the Performance. The Performance name can contain up to 10 characters. For detailed instructions on naming, see page 50.
SubCategory	Sub Category	
Name	Name	
MEQ Low/LowMid/HighMid/High	Master EQ Offset	Adjust the master (global) EQ settings for the entire Performance. The settings made here are applied as offsets to the EQ settings (with the exception of "MID") from the MEQ display below. Settings: -64 ~ +63
PortaSwitch	Portamento Switch	Determines whether Portamento is on or off. Portamento is used to create a smooth transition in pitch from the first note played to the next. Settings: off, on
PortaTime	Portamento Time	Determines the pitch transition time. Higher values result in a longer pitch change time. Settings: 0 ~ 127
AssignA/B/1/2	Assign A/B/1/2	This parameter offsets the value of each Dest (Destination) parameter. Please note that certain Destinations of Assign A/B change the absolute value. Settings: -64 ~ +63 NOTE Determines the Control Numbers corresponding to Assign A and Assign B in the CtrlAsn display in the Utility mode (page 90). Determines the Control Numbers corresponding to Assign 1 and Assign 2 in the CtrlAsn display in the Performance Common Edit mode.
MEQ (Master Equalizer)		From this display you can apply five-band equalization (LOW, LOWMID, MID, HIGHMID, HIGH) to all Parts of the selected Performance. For details about Equalizer, see page 60.
Low/High Shape	Shape	Determines whether the equalizer type used is Shelving or Peaking. The Peaking type attenuates/boosts the signal at the specified Frequency setting, whereas the Shelving type attenuates/boosts the signal at frequencies above or below the specified Frequency setting. This parameter is available only for the LOW and HIGH frequency bands. Settings: shelv (Shelving type), peak (Peaking type)

Low/LowMid/Mid/HighMid/High Freq	Frequency	Determines the center frequency. Frequencies around this point are attenuated/boosted by the Gain setting. Settings: LOW: Shelving 32Hz ~ 2.0kHz, Peaking 63Hz ~ 2.0kHz LOWMID, MID, HIGHMID: 100Hz ~ 10.0kHz HIGH: 500 Hz ~ 16.0 kHz
Low/LowMid/Mid/HighMid/High Gain	Gain	Determines the level gain for the Frequency (set above), or the amount the selected frequency band is attenuated or boosted. Settings: -12dB ~ 0dB ~ +12dB
Low/LowMid/Mid/HighMid/High Q	Frequency Characteristic	This varies the signal level at the Frequency setting to create various frequency curve characteristics. Settings: 0.1 ~ 12.0
MEF (Master Effect)		
Determines the Master Effect of each Performance. With the exception of the two below, the available parameters differ depending on the currently selected effect type. Refer to the separate Data List for details.		
Switch	Switch	Turns the Master Effect on/off. Settings: on, off
Type	Type	Determines the Master Effect type. Settings: Refer to the separate Data List booklet.
CtrlAsn (Control Assign)		
Determines the Control Numbers corresponding to the external controllers. For details, see page 46.		
BC	Breath Controller	Determines the Control Number corresponding to the Breath Controller.
RB	Ribbon Controller	Determines the Control Number corresponding to the Ribbon Controller.
AS1/AS2	Assign	Determines the Control Number corresponding to Assign 1/2.
FC1/FC2	Foot Controller	Determines the Control Number corresponding to the Foot Controller.
Output		
Volume	Volume	Determines the output level of the selected Performance. You can adjust the overall volume, keeping the balance between all Parts. Settings: 0 ~ 127
Pan	Pan	Determines the stereo pan position of the selected Performance. This parameter offsets the same parameter in the Part edit setting. A setting of "C" (center) maintains the individual Pan settings of each Part. Settings: L63 (far left) ~ C (center) ~ R63 (far right)
RevSend/ChoSend	Reverb Send/Chorus Send	Determines the Send level of the signal sent from Insertion Effect 1/2 (or the bypassed signal) to the Reverb/Chorus Effect. Settings: 0 ~ 127
EG (Envelope Generator)		
AEG Attack/Decay/Sustain/Release	AEG Attack Time/Decay Time/Sustain Level/Release Time	This display contains the basic EG settings, both volume and filter, as well as the filter's Cutoff Frequency and Resonance settings. The settings made here are applied as offsets to the AEG and FEG settings in the Part Edit mode. Settings: -64 ~ 0 ~ +63
FEG Attack/Decay/Release/Depth	FEG Attack Time/Decay Time/Release Time/Depth	
Cutoff/Resonance	Cutoff/Resonance	
<div style="background-color: black; color: white; padding: 5px; display: inline-block;">Part Edit</div> [SHIFT]+[PERFORM] → select Performance → select Performance Edit by pressing [EDIT] once or twice → [MUTE/SEL/ENTER] (LED turns off) → select Part with [1/5/9/13]-[4/8/12/16] → select each display with PAGE [◀][▶]		
<p>These parameters are for editing the individual Parts that make up a Performance.</p> <p>NOTE You can switch between Part 1 and Plug-in Part 1 with the [1/5/9/13] button, and between Part 2 and Plug-in Part 2 with the [2/6/10/14] button.</p>		
Voice You can select a Voice for each Part.		
PartSw	Part Switch	Determines each Part to on or off. Since a Performance can consist of up to four Parts, you can select four Parts from Parts 1 - 4 and the Plug-in Parts 1 - 2. Please note that "(on)" is displayed if selecting more than four Parts. "(on)" indicates no available Part. Settings: on, off
Bank Number	Bank Number	Determines the Voice Bank and Voice Number for each Part. For details about the Plug-in Voice, refer to the owner's manual for your Plug-in Board.
Mono/Poly (Mode)	Mono/Poly	Selects monophonic or polyphonic playback for each Part. Select whether each Part is played back monophonically (single notes only) or polyphonically (multiple simultaneous notes). Settings: mono, poly NOTE This parameter is not available for the Part to which the Drum Voice is assigned.
ArpSwitch (ArpSw)	Arpeggio Switch	Determines whether Arpeggio is on or off for the currently selected Part. Settings: on, off

Voice mode

Performance mode

Multi mode

Effect

Arpeggio

Utility

NoteLimitL/H (NtLmtL/H)	Note Limit Low/High	Determines note ranges and velocity limits for each Part. Same as the Limit display in the Performance Voice Assign mode (page 79).	
VelLimitL/H (VlLmtL/H)	Velocity Limit Low/High	NOTE If you specify the highest note first and the lowest note second, for example "C5 to C4," then the note range covered will be "C-2 to C4" and "C5 to G8" (except for the Plug-in Parts). If you specify the maximum value first and the minimum value second, for example "93 to 34," then the velocity range covered will be "1 to 34" and "93 to 127" (except for the Plug-in Parts).	
PortaSwitch (PrtSw)	Portamento Switch	Determines the Portamento parameters for each Part. Portamento is used to create a smooth transition in pitch from the first note played on the keyboard to the next. Determines whether Portamento is on or off. Settings: off, on	
PortaTime (PrtTm)	Portamento Time	Determines the pitch transition time. Higher values result in a longer pitch change time. Settings: 0 ~ 127	
PortaMode (PrtMd)	Portamento Mode	Determines the Portamento mode. Settings: fingr (fingered), full (full time) fingr (fingered)..... Portamento is only applied when you play legato (playing the next note before releasing the previous one). full (full time)..... Portamento is always applied. NOTE The Mode setting is not available for the Plug-in Part. NOTE These Portamento parameters above are not available for the Part to which the Drum Voice is assigned.	
PB Upper/Lower (PB Up/Low)	Pitch Bend Upper/Lower	These two parameters are available for Parts 1 - 4 to which the internal Normal Voices are assigned. These determine the pitch change range (in semitones) of the Pitch Bend wheel for the Part's Voice. For example, a Lower setting of -12 would result in the pitch being lowered up to a maximum of one octave (12 semitones) when the Pitch Bend wheel is moved downwards. Similarly, setting the Upper parameter to +12 would result in a maximum pitch rise of one octave when the wheel is moved upwards. Settings: -48 ~ 0 ~ +24	
VelSensDpt (VelDpt)	Velocity Sensitivity Depth	Determines the degree to which the resulting volume of the tone generator responds to your playing strength. The higher the value, the more the volume changes in response to your playing strength (as shown at right). Settings: 0 ~ 127	<p>When Offset (below) is set to 64:</p> <p>The graph shows four linear functions starting from the origin (0,0). The x-axis is 'Velocity at which a note is played' (0 to 127) and the y-axis is 'Actual resulting velocity (affecting the tone generator)' (0 to 127). The lines represent Depth = 0, 32, 64, and 127. The line for Depth = 127 is the steepest, reaching a resulting velocity of 127 at a played velocity of 64. The line for Depth = 64 reaches a resulting velocity of 127 at a played velocity of 127. The line for Depth = 32 reaches a resulting velocity of 64 at a played velocity of 127. The line for Depth = 0 is a horizontal line at a resulting velocity of 0.</p>
VelSensOfs (VelOfs)	Velocity Sensitivity Offset	Determines the amount by which played velocities are adjusted for the actual resulting velocity effect. This lets you raise or lower all velocities by the same amount. Settings: 0 ~ 127	<p>The three graphs show the resulting velocity curve for different combinations of Depth and Offset. The x-axis is 'Velocity at which a note is played' (0 to 127) and the y-axis is 'Actual resulting velocity (affecting the tone generator)' (0 to 127). 1. When Depth (above) = 64 and Offset = 32: The curve starts at (64, 0) and reaches (127, 64). 2. When Depth (above) = 64 and Offset = 64: The curve starts at (0, 64) and reaches (127, 127). 3. When Depth (above) = 64 and Offset = 96: The curve starts at (0, 96) and reaches (64, 127), then remains constant at 127 for higher velocities.</p>
Output			
Volume	Volume	Determines the volume for each Part, allowing you to set the optimum level balance of all the Parts. Settings: 0 ~ 127	
Pan	Pan	Determines the stereo pan position for each Part. Settings: L63 (far left) ~ C (center) ~ R63 (far right)	
VoiceELPan (ELPan)	Voice Element Pan	Determines whether the individual pan settings for each Voice (made in the AMP display (page 71) from the Voice Element Edit mode) are applied or not. When this is set to "off," the basic pan position for the selected Part is set to center. Settings: on, off NOTE The "VoiceELPan" is not available for the Plug-in Part.	
RevSend (RevSnd)/ChoSend (ChoSnd)	Reverb Send/Chorus Send	Determines the send level for the Reverb/Chorus Effect of the selected Part, giving you detailed control over the Reverb/Chorus balance among the Parts. Settings: 0 ~ 127	
DryLevel (DryLvl)	Dry Level	Determines the level of the unprocessed (dry) sound of the selected Part, letting you control the overall effect balance among the Parts. Settings: 0 ~ 127	
OutputSel (OutSel)	Output Select	Determines the specific output(s) for the individual Part. You can assign each individual Part's Voice to be output from a specific hardware output jack on the rear panel. Settings: See page 15.	

Tone		You can set parameters related to the pitch and tone for each Part. Keep in mind that the settings made here are applied as offsets to the Voice Edit settings.
NoteShift (NTShft)	Note Shift	Determines the pitch (key transpose) setting for each Part in semitones. Settings: -24 ~ 0 ~ +24
Detune (Detune)	Detune	Determines the fine tuning for each Part. Settings: -12.8Hz ~ +12.7Hz
Cutoff (Cutoff)	Cutoff	Determines the Cutoff Frequency for each Part. If you are using LPF (Low Pass Filter) and HPF (High Pass Filter) combined together, the parameters in the QED Filter page only affects LPF. Settings: -64 ~ 0 ~ +63
Resonance (Reso)	Resonance	Determines the amount of filter resonance. The setting here attenuates/boosts the resonance applied to the Element of the Voice assigned to each Part. Settings: -64 ~ 0 ~ +63
FEG Depth (FEGDpt)	FEG Depth	Determines the Filter Envelope Generator depth (amount of Cutoff Frequency) for each Part. Settings: -64 ~ 0 ~ +63 NOTE The FEG Depth setting is not available for the Plug-in Parts. NOTE For details about Filter, see page 56.
FEG Attack (FEGAtk)	FEG Attack	Determines each parameter of the FEG for each Part. For details about FEG, see page 70. Settings: -64 ~ 0 ~ +63
FEG Decay (FEGDcy)	FEG Decay	NOTE The FEG setting is not available for the Plug-in Parts.
FEG Sustain (FEGSus)	FEG Sustain	NOTE The FEG settings (except for the FEG Depth) are not available for the Drum Voice Parts.
FEG Release (FEGRel)	FEG Release	
AEG Attack (AEGAtk)	AEG Attack	Determines each parameter of the AEG for each Part. Please note that Sustain Level is not available for the Plug-in Part. For details about AEG, see page 71.
AEG Decay (AEGDcy)	AEG Decay	NOTE The AEG Sustain/Release settings are not available for the Drum Voice Parts.
AEG Sustain (AEGSus)	AEG Sustain	Settings: -64 ~ 0 ~ +63
AEG Release (AEGRel)	AEG Release	
EQ (Equalizer)		From this display you can adjust the EQ settings for each Part. For details about the Effect connection including the EQ in the Performance mode, see page 62. NOTE These parameters are not available for Plug-in Voices.
L.Freq	Low Frequency	Determines the center frequency of the low EQ band that is attenuated/boosted. Settings: 50.1 ~ 2.00k
L.Gain	Low Gain	Determines the amount of boost or attenuation applied to the low EQ band. Settings: -32 ~ +32
M.Freq	Mid Frequency	Determines the center frequency of the middle EQ band that is attenuated/boosted. Settings: 139.7 ~ 10.1k
M.Gain	Mid Gain	Determines the amount of boost or attenuation applied to the middle EQ band. Settings: -32 ~ +32
M.Q	Mid Frequency Characteristic	Determines the center frequency characteristic applied to the middle EQ band. Settings: 0 ~ 31
H.Freq	High Frequency	Determines the center frequency of the high EQ band that is attenuated/boosted. Settings: 503.8 ~ 14.0k
H.Gain	High Gain	Determines the amount of boost or attenuation applied to the high EQ band. Settings: -32 ~ +32
RcvSw (Receive Switch)		From this display you can set how each individual Part responds to various MIDI data, such as Control Change and Program Change messages. When the relevant parameter is set to "on," the corresponding Part responds to the appropriate MIDI data. Determines the Control Change messages corresponding to the external controllers in the CtrlAsn display from the Performance Common Edit. Settings: on, off (***) indicates that the parameters are not available for the Plug-in Parts.)
CtrlChange (CC)	Control Change	Indicates all the Control Change messages.
PB (PB)	Pitch Bend	MIDI messages generated by using the Pitch Bend Wheel.
MW (MW)	Modulation Wheel	MIDI messages generated by using the Modulation Wheel.
RB*	Ribbon Controller	MIDI messages generated by using the Ribbon Controller.
ChAT (ChAT)	Channel Aftertouch	MIDI messages generated by pressing and holding a note on the keyboard.
BC (BC)*	Breath Controller	MIDI messages generated by using the Breath Controller.
AS1 (AS1)/AS2 (AS2)*	Assign	MIDI messages generated by using the Assignable Controllers corresponding to Assign 1 and Assign 2.
FC1 (FC1)/FC2 (FC2)*	Foot Controller	MIDI messages generated by using the Foot Controller.
Exp (Exp)	Expression	MIDI messages (Expression) generated by using the Foot Controller.
Sustain (Sus)	Sustain	MIDI messages (Sustain) generated by using the Footswitch. NOTE The Sustain setting is not available for the Drum Voice Parts.
FS (FS)*	Foot Switch	MIDI messages generated by using the Footswitch.

Multi mode

Multi Mixing

[MULTI] (LED lights in green) → select Multi → [MULTI] (LED lights in red) → select each display with PAGE [◀][▶]

Voice		Determines the Voices for assigning to each Part.
VoiceNo.	Voice Number	Determines the Voice Bank and Voice Number for each Part.
Bank MSB/Bank LSB	Bank Select MSB/LSB	NOTE The Category Search function can also be used to select Voices here, except for Voices of the MultiPart Plug-in Parts 17 - 32 (when the PLG100-XG has been installed).
Output		From this display you can set the Pan and Volume for each Part.
Pan	Pan	Determines the stereo pan position for each Part. Settings: L63 (far left) ~ C (center) ~ R63 (far right)
Volume	Volume	Determines the volume for each Part, allowing you to set the optimum level balance of all the Parts. Settings: 0 ~ 127
Effect		From this display you can make basic effect settings for each Part – on/off status of Insertion Effects and Send Level for the System Effect (Reverb, Chorus).
RevSend/ChoSend	Reverb Send/Chorus Send	Sets the Send Level for each Part to the System Effect (Reverb, Chorus). Settings: 0 ~ 127
DryLvl	Dry Level	Sets the Dry Level sent for the Insertion Effects for each Part. Settings: 0 ~ 127
InsEF	Insertion Effect Switch	Select the Parts to which the Insertion Effects are applied. The Insertion Effects can be applied to up to eight Parts. Settings: on, off
(VarSend)	Variation Send	This parameter is shown only when the PLG100-XG Plug-in Board is installed and any one of Parts 17-32 is selected. This determines the Send Level sent to the Variation effects for each Part. Settings: 0 ~ 127

Multi Voice Edit

[MULTI] (LED lights in green) → select Multi → [MULTI] (LED lights in red) → Multi Mixing → [MUTE/SEL/ENTER] (LED turns off) → select Part → [SHIFT]+[EDIT]

From Multi Voice Edit, you can edit the detailed settings of the Normal Voice assigned to each Part. These are the same as in the Voice Common Edit mode (page 65) and the Voice Element Edit mode (page 68). Please note that certain parameters cannot be edited in the Multi Voice Edit.

NOTE Only Normal Voices can be edited.

Common Edit Multi Voice Edit → [SHIFT]+[COMMON] → select each display with PAGE [◀][▶]

Element Edit Multi Voice Edit → [MUTE/SEL/ENTER] (LED turns off) → select Element with [1/5/9/13]-[4/8/12/16] → select each display with PAGE [◀][▶]

Multi Voice Effect Edit

From Multi Voice Effect Edit, you can edit the Insertion Effects of the Voice assigned to each Part. Same function as the Voice Effect Edit (page 85). Please note that the System Effects cannot be edited in the Multi Voice Edit mode.

Effect Connection Edit Multi Voice Edit → press [EFFECT] once or twice

Effect Parameter Edit Multi Voice Edit → press [EFFECT] once or twice → select each display with PAGE [◀][▶]

Multi Edit

Common Edit

[MULTI] (LED lights in green) → select Multi → [EDIT] → [SHIFT]+[COMMON] → select each display with PAGE [◀][▶]

Use Common Edit to edit the settings common to all Parts.

NOTE Common Edit operations cannot be performed on the Multi-part Plug-in Parts 17 - 32.

General

Name	Name	Determines the name of the current edited Multi. The Multi name can contain up to 10 characters. For detailed instructions on naming, see page 50.
MEQ Low/LowMid/HighMid/High	Master EQ Offset	Adjusts the master (global) EQ settings for the entire Multi. The settings made here are applied as offsets to the EQ settings (with the exception of "MID") from the MEQ display below. Settings: -64 ~ +63
AssignA/B/1/2	Assign A/B/1/2	This parameter offsets the value of each Dest (Destination) parameter. Please note that certain Destinations of Assign A/B change the absolute value. Settings: -64 ~ +63 NOTE Determines the Control Numbers corresponding to the Assign A and Assign B in the CtrlAsn display from the Utility (page 90). Determines the Control Numbers corresponding to Assign 1 and Assign 2 in the CtrlAsn display in the Multi Common Edit mode.

MEQ (Master Equalizer)

From this display you can set parameters related to the Master Equalizer (page 60). You can assign any of five different Equalizer bands to the entire Multi. The parameters are the same as in Performance Common Edit. See page 79.

MEF (Master Effect)

From this display you can set parameters related to the Master Effect (page 60). The parameters are the same as in Performance Common Edit. See page 80.

CtrlAsn (Control Assign)

Determines the Control Numbers corresponding to the external controllers. The parameters are the same as in Performance Common Edit (page 80). For details, see page 46.

Part Edit

[MULTI] (LED lights in green) → select Multi → [EDIT] → [MUTE/SEL/ENTER] (LED turns off) → select Part with [1/5/9/13]-[4/8/12/16] → select each display

These parameters are for editing the individual Parts that make up a Multi.

NOTE You can switch the internal Parts and Plug-in Part 1 with the [1/5/9/13] button, and can switch the internal Parts and Plug-in Part 2 with [2/6/10/14] button.

Voice

You can select a Voice for each Part.

Bank Number	Bank Number	Determines the Voice Bank and Voice Number for each Part. For details about Plug-in Voices, refer to the owner's manual of your Plug-in Board.
Mono/Poly (Mode)	Mono/Poly	Selects whether each Part is played back monophonically (single notes only) or polyphonically (multiple simultaneous notes). Settings: mono, poly NOTE This parameter is not available for the Part to which the Drum Voice is assigned.
ArpSwitch (ArpSw)	Arpeggio Switch	Determines whether Arpeggio is on or off for the currently selected Part. Settings: on, off NOTE <ul style="list-style-type: none"> Arpeggio Switch is applied to only one Part at the same time. It cannot be applied to multiple Parts simultaneously. However, the only Parts of same receive channel can be applied simultaneously. The "ArpSwitch" parameter is not available for the Multi-part Plug-in Parts 17~32.
ReceiveCh (RcvCh)	Receive Channel	Determines the MIDI receive channel for the selected Part. Since MIDI data may be coming from many channels at once, you should set this to match the particular channel over which the desired controlling data is being sent. Settings: 01 ~ 16, off
NoteLimitL/H (NtLmtL/H)	Note Limit Low/High	Determines the note range and velocity range for each Part. The parameters are the same as in Performance Part Edit. See page 81.
VelLimitL/H (VILmtL/H)	Velocity Limit Low/High	Determines the Portamento parameters for each Part.
PortaSwitch (PrtSw)	Portamento Switch	The parameters are the same as in Performance Part Edit. See page 81.
PortaTime (PrtTm)	Portamento Time	NOTE <ul style="list-style-type: none"> The "PortaMode" parameter setting is not available for Plug-in Voice Parts. These parameters are not available for the Drum Voice Parts.
PortaMode (PrtMd)	Portamento Mode	
PB Upper/Lower (PB Up/Low)	Pitch Bend Upper/Lower	The parameters are the same as in Performance Part Edit. See page 81. NOTE For all Multi Plug-in Parts 1-17 and all Plug-in Voice Parts 1-2, Pitch Bend Upper and Lower become a single parameter: PB Range. Upper and Lower values cannot be set independently for Plug-in Parts.
VelSensDpt (VelDpt)	Velocity Sensitivity Depth	
VelSensOfs (VelOfs)	Velocity Sensitivity Offset	

Output

The parameters are the same as in the Output display in the Performance Part Edit mode. See page 81.
NOTE The "VoiceELPan" parameter setting is not available for Multi-part Plug-in Parts 17 - 32 and Plug-in Parts 1 - 2.

Tone

You can set parameters related to the pitch and tone for each Part. Keep in mind that the settings made here are applied as offsets to the Voice Edit settings.
 The parameters are the same as in the Tone display in the Performance Part Edit mode. See page 82.
NOTE

- The FEG settings are not available for Multi-part Plug-in Parts 17 - 32 and Plug-in Parts 1 - 2.
- In the FEG settings, only FEG Depth setting is available for the Drum Voice Parts.
- The AEG Sustain setting is not available for Plug-in Parts or Parts to which Drum Voices have been assigned.
- The AEG Release Time setting is not available for the Parts to which Drum Voices have been assigned.

EQ (Equalizer)

From this display you can set parameters related to the Part EQ. The parameters are the same as in the EQ display in the Performance Part Edit mode (page 82).
NOTE These parameters are not available for Plug-in Parts or Multi Plug-in Parts.

RcvSw (Receive Switch)

From this display you can set how each individual Part responds to various MIDI data, such as Control Change and Program Change messages. When the relevant parameter is set to "on," the corresponding Part responds to the appropriate MIDI data.
 Determines the Control Change messages corresponding to the external controllers in the CtrlAsn display in the Multi Common Edit mode (page 84).
 Available parameters: BnkSel (BankSel) (Bank Select), Pgm (Pgm Change) (Program Change), Volume, Pan
NOTE

- For the other parameters, see the RcvSw display in the Performance Part Edit (page 82).
- When the "Volume" parameter is turned off, the Expression message also cannot be received.

Effect

From this mode you can edit the effect settings for the Voice, Performance, and Multi modes. The display shown at right appears.

For details about effect connections, see page 61.

NOTE These displays are shown in the Voice mode (Normal Voice). When selecting the other Voices or other modes, the shown displays may differ.

NOTE About Master Effect

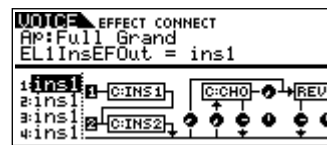
- Voice Mode**

You can set one Master Effect common to all Voices. The Master Effect can be set in the MEF display from the Utility (page 90).

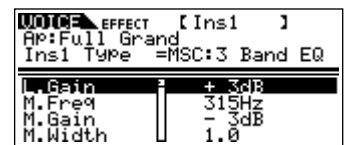
- Performance/Multi mode**

You can set each Master Effect for each Performance/Multi. The Master Effect can be set in the MEF display from the Performance/Multi Common Edit (pages 80, 84).

Effect Connection Edit display



Effect Parameter Edit display



Voice Effect Edit (for Normal Voice)

You can switch between Voice Effect Connection Edit and Voice Effect Parameter Edit.

The Voice effect settings are common to all Elements.

Effect Connection Edit [VOICE] → select Normal Voice → press [EFFECT] once or twice

For details about effect connections, see page 61. For details on the effect types, refer to the Effect Type list in the separate Data List booklet.

EL1-4InsEFOut	Element 1-4 Effect Output	Determines which Insertion Effect (1 or 2) is used to process each individual Element. The "thru" setting lets you bypass the Insertion Effects for the specific Element. Settings: ins1, ins2, thru
Ins1Ctgr/Ins1Type	Insertion1 Category/Type	Determines the effect category and type for Insertion 1.
InsEFCnt	Insertion Effect Connection	Determines the connection between Insertion Effects 1 and 2. The setting changes are shown on the diagram in the display, giving you a clear picture of how the signal is routed. Settings: Para, Ins1to2, Ins2to1 (see page 61)
Ins2Ctgr/Ins2Type	Insertion2 Category/Type	Determines the effect category and type for Insertion 2.
ReverbSend	Reverb Send	Determines the Send level of the signal sent from Insertion Effect 1/2 (or the bypassed signal) to the Reverb Effect. Settings: 0 ~ 127
ChoCtgr/ChoType	Chorus Category/Type	Determines the Chorus Effect category and type.
ChoSend	Chorus Send	Determines the Send level of the signal sent from Insertion Effect 1/2 (or the bypassed signal) to the Chorus Effect. Settings: 0 ~ 127
ChoRtn	Chorus Return	Determines the Return level of the Chorus Effect. Settings: 0 ~ 127

ChoToRev	Chorus to Reverb	Determines the Send level of the signal sent from the Chorus Effect to the Reverb Effect. Settings: 0 ~ 127
ChoPan	Chorus Pan	Determines the pan position of the Chorus Effect sound. Settings: L63 (far left) ~ C (center) ~ R63 (far right)
ReverbType	Reverb Type	Sets the Reverb Effect type.
ReverbRtn	Reverb Return	Determines the Return level of the Reverb Effect. Settings: 0 ~ 127
ReverbPan	Reverb Pan	Determines the pan position of the Reverb Effect sound. Settings: L63 (far left) ~ C (center) ~ R63 (far right)

Effect Parameter Edit [VOICE] → select Normal Voice → press [EFFECT] once or twice → select each display with PAGE [◀][▶]

Ins1, Ins2 (Insertion Effect 1, 2)	From these displays you can set the detailed settings for the Insertion, Chorus, and Reverb Effects selected in Effect Connection Edit above. For details on the parameters, refer to the separate Data List booklet.
Cho (Chorus)	
Rev (Reverb)	

Voice Effect Edit (for Drum Voice)

Same as in Effect Edit for the Normal Voice. See page 85.

The only difference here is that “Key” and “InsEFOut” parameters appear in the Drum Voice Effect Connection Edit instead of “EL1-4InsEFOut” (in the Normal Voice Effect Connection Edit).

Voice Effect Edit (for Plug-in Voice)

Same as in Effect Edit for the Normal Voice. See page 85.

The only difference here is that Element effect output settings are not available, and the parallel setting (Insertion Connection) is not available in the Effect Connection Edit.

Performance Effect Edit

The Performance effect settings are common to all Parts.

Effect Connection Edit [SHIFT]+[PERFORM] → select Performance → press [EFFECT] once or twice

For details about the effect connection in the Performance mode, see page 62. For details on the effect types, refer to the separate Data List.

VoiceEfPart1/2/3/4/ PLG1/PLG2	Insertion Switch	This display lets you set to which Parts the Insertion Effects are applied.
ChoCtgr/ChoType	Category/Type	Same functions as Effect Connection Edit in the Voice mode.
ChoRtn	Chorus Return	
ChoToRev	Chorus to Reverb	
ChoPan	Chorus Pan	
ReverbType	Reverb Type	
ReverbRtn	Reverb Return	
ReverbPan	Reverb Pan	

Effect Parameter Edit [SHIFT]+[PERFORM] → select Performance → press [EFFECT] once or twice → select each display with PAGE [◀][▶]

Cho (Chorus)	From these displays you can set the detailed settings for the Chorus/Reverb Effects selected in the Effect Connection Edit above. For details on the parameters, refer to the separate Data List.
Rev (Reverb)	

Multi Effect Edit

The Multi effect settings are common to all Parts.

Effect Connection Edit [MULTI] → select Multi → press [EFFECT] once or twice

For details about the effect connection in the Multi mode, see page 62. For details on the effect types, refer to the separate Data List.

ChoCtgr/ChoType	Category/Type	Same functions as the Effect Connection Edit for the Voice mode.
ChoRtn	Chorus Return	
ChoToRev	Chorus to Reverb	
ChoPan	Chorus Pan	
ReverbType	Reverb Type	
ReverbRtn	Reverb Return	
ReverbPan	Reverb Pan	

Effect Parameter Edit [MULTI] → select Multi → press [EFFECT] once or twice → select each display with PAGE [◀][▶]

Cho (Chorus)	From these displays you can set the detailed settings for the Chorus/Reverb Effects selected in the Effect Connection Edit above. For details on the parameters, refer to the separate Data List.
Rev (Reverb)	

Effect bypass

Voice/Performance/Multi mode → [SHIFT]+[BYPASS]

Selects the effect(s) which have not been processed. These settings here can be applied to all Voices, Performances, and Multis. For details about effect, see page 59.

Settings: effect on, effect off

Ins (Intrnl)	Insertion Effect	Determines whether or not the Insertion Effects can be used.
Ins (PLG)	Plug-in Insertion Effect	Determines whether or not the Insertion Effects on the Plug-in Board can be used. NOTE This parameter does not affect certain Plug-in Boards.
Reverb	Reverb	Determines whether or not the Reverb Effect can be used.
Chorus	Chorus	Determines whether or not the Chorus Effect can be used.
Master	Master Effect	Determines whether or not the Master Effect can be used.

Arpeggio

You can store up to five Arpeggio types to each Voice/Performance/Multi. For more information on Arpeggio, refer to page 42.

Arpeggio Edit

Voice/Performance/Multi mode → [SHIFT] + [ARP EDIT]

Determines the Arpeggio settings for each Voice, Performance, and Arpeggio. Parameters other than “Category” and “Type” are common to the five Arpeggios assigned to each Voice/Performance/Multi.

Category	Category	Determines the Arpeggio type, then stores the selected type to each Voice/Performance/Multi. For details about storing the Arpeggios, see the Arpeggio Store section (page 89). Settings: Refer to the separate Data List booklet.
Type	Type	
Tempo	Tempo	Determines the tempo for the Arpeggio. Please note that Tempo setting cannot be changed when “MIDI Sync” parameter is set to “MIDI” ([UTILITY] → MIDI display → “MIDI Sync”). Settings: 1 ~ 300
ChgTiming	Change Timing	Determines the actual timing at which the Arpeggio type is switched when you select another type during Arpeggio playback. Settings: realtime, measure realtime..... The Arpeggio type is switched immediately when you select another type. measure..... The Arpeggio type is switched at the top of the next measure after you select another type.
Switch	Switch	Determines whether Arpeggio is on or off. You can also turn this on or off from the front panel with the [ARPEGGIO] button. Settings: off, on
Hold	Hold	When this is set to “on,” the Arpeggio cycles automatically, even if you release your fingers from the keys, and it continues to cycle until the next key is pressed. Determines whether the Arpeggio playback is “held” or not. Settings: sync-off (see below), off, on sync-off..... When set to “sync-off,” the Arpeggio playback continues to run silently, even when you release the keys of an external keyboard. Pressing any key turns the Arpeggio playback on again. In other words, you can use the key to “un-mute” or “mute” (not start or stop) the Arpeggio playback by, respectively, holding it down or releasing it.
KeyMode	Key Mode	Determines how the Arpeggio plays back when playing the keyboard. Settings: sort, thru, direct, sortdirect, thruirect sort When you play specific notes (for example, the notes of a chord), the same sequence plays, no matter what order you play the notes. thru When you play specific notes (for example, the notes of a chord), the resulting sequence differs depending on the order of the notes. direct Note events of the Arpeggio sequence do not play; only the notes you play on the keyboard are heard. This setting is for use with non-note Arpeggio data, such as Control Change or Pitch Bend. When the Arpeggio plays back, these events are applied to the sound of your keyboard performance. Use this setting when the Arpeggio types includes non-note data or when the Category type “Cntr” is selected. sortdirect The Arpeggio is played back according to the “sort” setting here, and the note pressed is also sounded. thruirect The Arpeggio is played back according to the “thru” setting here, and the note pressed is also sounded. NOTE <ul style="list-style-type: none"> Some Arpeggio types belonging to the “Cntr” Category may not have note events (page 64). When such an Arpeggio type is selected and the Key Mode is set to “sort” or “thru,” no sound is produced even if you press the note on the keyboard. With the “sort” and “thru” settings, the order in which notes are played back will depend on the Arpeggio sequence data.
VelMode	Velocity Mode	This determines the playback velocity of the Arpeggio, or how it responds to your own playing strength. Settings: original, thru original..... The Arpeggio plays back at the preset velocities. thru The Arpeggio plays back according to the velocity of your playing. For example, if you play the notes strongly, the playback volume of the Arpeggio increases.
NoteLimit	Note Limit	Determines the lowest and highest notes in the Arpeggio’s note range. Notes played in this range trigger the Arpeggio. Settings: C-2 ~ G8 NOTE <ul style="list-style-type: none"> For example, setting a Note Limit of “C5 -C4” lets you trigger the Arpeggio by playing notes in the two ranges of C-2 to C4 and C5 to G8; notes played between C4 and C5 have no effect on the Arpeggio. Please keep in mind that no sound is produced when the Key Mode is set to “sort” or “thru” and notes are played outside the Note Limit setting here.
VelLimit	Velocity Limit	Determines the minimum and maximum velocity in the Arpeggio’s velocity range. Notes played in this range trigger the Arpeggio. Settings: 1~127 NOTE You can also create separate low and high trigger ranges for the Arpeggio playback, with a velocity “hole” in the middle, by specifying the maximum value first. For example, setting a Velocity Limit of 93 - 34 lets you play the Arpeggio from two separate velocity ranges: soft (1 - 34) and hard (93 - 127). Notes played at middle velocities between 35 and 92 do not play the Arpeggio.
UnitMltply	Unit Multiply	Determines the Arpeggio playback time. For example, if you set a value of 200%, the playback time will be doubled and the tempo halved. Alternatively, if you set a value of 50%, the playback time will be halved and the tempo doubled. Normal playback time is 100%. Settings: 50%, 66%, 75%, 100%, 133%, 150%, 200%
Swing	Swing	Delays notes on even-numbered beats (backbeats) to produce a swing feel. Settings: -120 ~ +120
QuntValue	Quantize Value	Determines to what beats the note data in the Arpeggio sequence data will be aligned, or determines to what beats in the Arpeggio sequence data the swing is applied. Settings: 60 (32nd note), 80 (16th note triplet), 120 (16th note), 160 (8th note triplet), 240 (8th note), 320 (1/4 note triplet), 480 (1/4 note)

QuntStrngth	Quantize Strength	The Strength value sets the “strength” by which note events are pulled toward the nearest quantize beats. A setting of 100% produces exact timing set via the QuntValue parameter above. A setting of 0% results in no quantization. Settings: 0%~100%
VelocityRt	Velocity Rate	Sets the velocity rate value. This determines how the original Velocities are increased or decreased during Arpeggio playback. A setting of 100% means the original values are used. Settings below 100% will reduce the velocity of the Arpeggio notes, whereas settings above 100% will increase the velocities. Settings: 0% ~ 200% NOTE The Velocity cannot be decreased or increased beyond its normal range of 1 to 127; any values outside that range will automatically be limited to the minimum or maximum.
GateTimeRt	Gate Time Rate	Determines how much the Gate Time (length) of the Arpeggio notes is offset from the original value. This determines how the original Gate Times are increased or decreased during Arpeggio playback. A setting of 100% means the original values are used. Settings below 100% will shorten the gate times of the Arpeggio notes, whereas settings above 100% will lengthen them. Settings: 0% ~ 200% NOTE The Gate Time cannot be decreased beyond its normal minimum of 1; any values outside that range will automatically be limited to the minimum.
OutputSw	Output Switch	This enables or disables MIDI data output for the Arpeggio function. When this is set to “on,” Arpeggio data is sent via MIDI — allowing you to send the Arpeggio data to an external sequencer or play back the Arpeggios on connected MIDI tone generators. This parameter is only available in the Performance or Multi mode. In the Voice mode, you can set this in the “ArpOutSw” parameter (in the [UTILITY] → Voice display) (page 90). Settings: off, on
TransmitCh	Transmit Channel	Determines the MIDI transmit channel for Arpeggio playback data. This parameter is only available in the Performance or Multi mode. In the Voice mode, you can set this in the “ArpOutSw” parameter (in the [UTILITY] → Voice display) (page 90). Settings: 1-16, System TCh NOTE When selecting “System TCh,” the Arpeggio data will be transmitted via the channel which is set in the “TransmitCh” parameter from the Utility.

Arpeggio Store

Voice/Performance/Multi mode → [SHIFT]+[ARP EDIT] → select Arpeggio type (Category, Type) → [SHIFT]+[MUTE/SEL/ENTER]

You can store up to five Arpeggio types to each Voice/Performance/Multi. You can select the desired Arpeggio from the Arpeggios stored in each Voice/Performance/Multi with the PAGE [◀][▶] buttons while playing back. Also, you can delete the stored Arpeggios.

Storing	Arpeggio Edit → select desired “Type” → [SHIFT]+[MUTE/SEL/ENTER] → select desired number with data dial → [ARPEGGIO] (LED lights) → [SHIFT]+[MUTE/SEL/ENTER]
Deleting	Arpeggio Edit → [SHIFT]+[MUTE/SEL/ENTER] → select desired number with data dial → [ARPEGGIO] (LED turns off) → [SHIFT]+[MUTE/SEL/ENTER]

Utility

Voice/Performance/Multi mode → [UTILITY] → select each display with PAGE [◀][▶]

In this mode, you can set parameters that apply to the entire system. This mode is actually a sub-mode of the Voice/Performance/Multi mode. Press the [UTILITY] button in each mode to enter the Utility mode, and press the [EXIT] button after making settings to go back to the previous mode.

General		
Volume	Volume	Determines the overall volume of the instrument. Settings: 0 ~ 127
NoteShift	Note Shift	Determines the amount (in semitones) by which the pitch of all notes is shifted. Settings: -24 ~ 0 ~ +24
Tune	Tune	Determines the tuning of the MOTIF-RACK ES's overall sound. Adjust the tuning (in 0.1 cent steps). Settings: -102.4 ~ +102.3
PowerOnMode	Power On Mode	This determines the default power-on mode (and memory bank) – letting you select which condition is automatically called up when you turn the power on. Settings: multi, voice (USR1), voice (PRE1), GM, Performance multi.....When turning the power on next time, the Multi Play mode is entered and the first program number (001) is selected automatically. voice (USR1) ...When turning the power on next time, the Voice Play mode is entered and the first program number of the User Voices (USR1: 001) is selected automatically. voice (PRE1)....When turning the power on next time, the Voice Play mode is entered and the first program number of the Preset Voices (PRE1: 001) is selected automatically. GM.....When turning the power on next time, the Voice Play mode is entered and the first program number of the GM Voices (GM: 001) is selected automatically. performance....When turning the power on next time, the Performance Play mode is entered and the first program number (USR: 001) is selected automatically.

CtrlReset	Controller Reset	Determines the status of the external controllers when switching between Voices. When this is set to "off," the controllers are kept at the current setting. When this is set to "on," the controllers are reset to the default states (below). Settings: reset, hold If you select "reset," the controllers will be reset to the following states/positions: Pitch Bend: Center Modulation Wheel: Minimum Aftertouch: Minimum Foot Controller: Maximum Breath Controller: Maximum Foot Switch: Off Expression: Maximum Foot Volume: Maximum Sustain: Off
LCD Cntrst	LCD Contrast	Sets the LCD display for optimum legibility. Settings: 1~16
PlgAutoLoad	Plug-in Auto Load	Determines whether the Board Voice data is automatically loaded (on) or not (off) when turning the power on (Plug-in Load function in the JobSel display). Settings: On, Off
BulkIntrval	Bulk Interval	Determines the transmit interval of the Bulk Dump. Settings: 1~5 The higher the value, the larger the transmit interval.
Output		
L&R Gain	L Gain and R Gain	Sets the signal gain of each output jack. Settings: 0dB, +6dB
Asn1/2Gain	Assignable 1/2 Gain	
Asn3/4Gain	Assignable 3/4 Gain	
MEQ (Master Equalizer)		These special voice-related settings are available only when entering the Utility from the Voice mode. From this display you can apply five-band equalization (LOW, LOW MID, MID, HIGH MID, HIGH) to all Voices. Parameters are the same as in the MEQ display in the Performance/Multi Common Edit mode (page 79). NOTE For details about Equalizer, see page 60.
MEF (Master Effect)		These special voice-related settings are available only when entering the Utility from the Voice mode. From this display you can set the Master Effect related parameters applied to all the Voices. Parameters are the same as in the MEF display in the Performance/Multi Common Edit mode (page 80).
Voice		
These special voice-related settings are available only when entering the Utility from the Voice mode. From this display you can make settings that apply commonly to all Voices.		
ArpOutSw	Arpeggio Output Switch	This enables or disables MIDI data output for the Arpeggio function. When this is set to "on," Arpeggio data is sent via MIDI in the Voice mode. In the Performance/Multi mode, you can set in the "OutputSw" parameter from the Arpeggio Edit. Settings: on, off
ArpTransCh	Arpeggio Transmit Channel	Determines the MIDI channel through which Arpeggio playback data will be sent (when Output Switch above is on). In the Performance/Multi mode, you can set this in the "TransmitCh" parameter in the Arpeggio Edit mode (page 89). Settings: 1~16
AS1/2 Assign	Assign 1/2	Sets the parameters related to the controllers in the Voice mode. Parameters are the same as in the CtrlAsn display in the Performance/Multi Common Edit mode (page 80).
BC Assign	Breath Controller	
RB Assign	Ribbon Controller	
FC1/2 Assign	Foot Controller	
CtrlAsn (Control Assign)		Determines the Control Numbers corresponding to the external controllers. For details, see page 46.
ArpSwitch	Arpeggio Switch	Determines the Control Number that controls on/off for Arpeggio playback. Settings: off, 1~95
ArpHold	Arpeggio Hold	Determines the Control Number that controls on/off for the "Hold" parameter (page 88).
ASA/B Asgn	Assign A/B	Determines the Control Numbers corresponding to Assign A and Assign B, and sets the Destinations (functions) assigned to the Control Numbers. Settings: Refer to the separate Data List booklet.
ASA/B Dest	Assign A/B Destination	
FS Asgn	Foot Switch Assign	Determines the Control Number corresponding to the Footswitch. Settings: Refer to the separate Data List booklet.
ArpAsgn	Arpeggio Assign	Determines the Control Number for switching among Arpeggios 1-5, stored to each Voice/Performance/Multi. For details, see page 44.
ArpAsgnMode	Arpeggio Assign Mode	Determines the mode for switching among Arpeggios 1-5, stored to each Voice/Performance/Multi. Settings: inc, direct inc..... Each time the MOTIF-RACK ES receives a message via the selected Control Change number, Arpeggios 1-5 can be switched. The actual Control Change data value does not matter. direct..... You can select the Arpeggio corresponding to the value of the selected Control Change number: 0~25 (Arpeggio 1), 26~50 (Arpeggio 2), 51~76 (Arpeggio 3), 77~101 (Arpeggio 4), 102~127 (Arpeggio 5)

MIDI		
BasicRcvCh	Basic Receive Channel	Determines the MIDI receive channel for the Voice/Performance mode. Settings: 1~16, omni (all channels), off NOTE In the Multi mode, each Part receives MIDI data according to its assigned MIDI receive channel (Multi Part Edit → Voice display → "ReceiveCh").
TransmitCh	Transmit Channel	Determines the MIDI transmit channel for the Voice/Performance mode. Settings: 1~16, off NOTE The Arpeggio output channel is determined by the Arpeggio Transmit Channel settings in each mode.
DeviceNo.	Device Number	Determines the MIDI Device Number. This number must match the Device Number of the external MIDI device when transmitting/receiving bulk data, parameter changes or other system exclusive messages. Settings: 1~16, all, off
BankSelSw	Bank Select Switch	This switch enables or disables Bank Select messages, both in transmission and reception. When this is set to "on," this synthesizer responds to incoming Bank Select messages, and it also transmits appropriate Bank Select messages (when using the panel). Settings: off, on
PgmChangeSw	Program Change Switch	This switch enables or disables Program Change messages, both in transmission and reception. When this is set to "on," this synthesizer responds to incoming Program Change messages, and it also transmits appropriate Program Change messages (when using the panel). Settings: off, on
CC Mode	Control Change Mode	Determines how this synthesizer receives and recognizes the AEG Sustain MIDI message. When set to mode1, it is received as a Parameter Change. When set to mode2, it is received as a Control Change message. Settings: mode1, mode2
RcvBulkSw	Receive Bulk Switch	Determines whether or not Bulk Dump data can be received. Settings: protect (not received), on (received)
MIDI Sync	MIDI Sync	Determines whether Arpeggio playback will be synchronized to the instrument's internal clock or an external MIDI clock. Settings: internal, MIDI internal..... Synchronization to internal clock. Use this setting when the MOTIF-RACK ES is to be used alone. MIDI..... Synchronization to a MIDI clock received from an external MIDI instrument via MIDI. Use this setting when the external MIDI device is to be used as master.
MIDI IN/OUT	MIDI In/Out	Determines which physical output terminal(s) will be used for transmitting/receiving MIDI data: Settings: MIDI, USB NOTE The two types of terminals above cannot be used at the same time. Only one of them can be used to transmit/receive MIDI data.
ThruPort	Through Port	When using the USB terminal for MIDI transmission/reception, you can have this synthesizer respond to MIDI data over one port, while relaying the data for another port number (you can set here) to a separate tone generator (connected to the MIDI OUT terminal). Settings: 1 ~ 8
PLG1Sys, PLG2Sys (Plug-in Board System)		
These settings are available only when the Plug-in Board is installed to the MOTIF-RACK ES. *The available Native System Parameters depends on each Plug-in Board.		
PolyExpand	Poly Expand	This parameter is accessible only when you have two identical Plug-in Boards (except for the PLG150-DR/PC) installed on the instrument. The "off" setting enables two or three boards to work separately (you can select them in two or three different Parts). When this is set to "on," the two boards effectively function together as one board (used in a single Part) — giving you double the amount of polyphonic notes you can play at one time. Settings: off, on
DeviceNo.	Device Number	Determines the MIDI Device Number of the Plug-in Board. This number must match the Device Number of the external MIDI device when transmitting/receiving bulk data, parameter changes or other system exclusive messages. Settings: 1~16, all, off
PortNo.	Port Number	Determines the MIDI Port number over which the Plug-in Board receives MIDI data. One port can be set for the Multi-part Plug-in Board and two ports can be set for the Single-part Plug-in Board. Settings: off, 1~3 NOTE For information on the Plug-in Board and the internal tone generator block, see page 52.
RcvGM/XG	Receive GM/XG	Determines whether "GM on" and "XG on" messages are recognized (on) or not (off). This parameter is available only when a Multi-part Plug-in Board has been installed to slot 2.
Native System Parameter	Native System Parameter	Sets various Native System parameters for the Plug-in Board. For details on the parameters, refer to the owner's manual of your particular Plug-in Board.
JobSel (Job Selection)		
Voice/Performance/Multi mode → [UTILITY] → JobSel display → select Job with [MUTE/SEL/ENTER] The available functions are: Initialize, Copy, Bulk Dump, Plug-in Save, Plug-in Load, and Factory Set. For details, see the section "Using the Jobs" on page 47.		

Appendix

Display Messages

Messages	Information
Are you sure?	Confirms whether you want to execute a specified operation or not.
Bulk protected.	Bulk data was received when RcvBulkSw was set to "protect."
Completed.	The specified save, format, or other job has been completed.
Device number is off.	Bulk data cannot be transmitted/received since the device number is off.
Device number mismatch.	Bulk data cannot be transmitted/received since the device numbers don't match.
Effect plug-in is not supported.	The Effect Plug-in Board cannot be used with the MOTIF-RACK ES.
Executing...	Never attempt to turn off the power while data is being written to internal memory. Turning the power off in this state results in loss of all user data and may cause the system to freeze.
MIDI buffer full.	Failed to process the MIDI data because too much data was received at one time.
MIDI checksum error.	An error occurred when receiving bulk data.
MIDI data error.	An error occurred when receiving MIDI data.
Multi plug-in is not in PLG2.	The Multi-part Plug-in Board does not work because it has not been installed to PLG2. The Multi-part Plug-in Board should be installed to PLG2.
Now checking plug-in board.	The MOTIF-RACK ES is checking the Plug-in Board installation status when powering the MOTIF-RACK ES on.
Please keep power on.	Never attempt to turn off the power while data is being written to internal memory. Turning the power off in this state results in loss of all user data.
Plug-in 1 communication error.	The Plug-in Board that has been installed to PLG1 does not work.
Plug-in 2 communication error.	The Plug-in Board that has been installed to PLG2 does not work.
Receiving MIDI bulk...	The MOTIF-RACK ES is receiving MIDI bulk data.
System memory crashed.	Writing data to internal memory has failed because the power was turned off during the operation. User data has been initialized automatically. Turn the power off, then turn the power on again.
Too many favorites.	You've attempted to assign more than 256 Voices or 128 Performances to the Favorite category.
Transmitting MIDI bulk...	The MOTIF-RACK ES is transmitting MIDI bulk data.

About MIDI

MIDI is an acronym that stands for Musical Instrument Digital Interface, which allows electronic musical instruments to communicate with each other, by sending and receiving compatible Note, Control Change, Program Change and various other types of MIDI data, or messages.

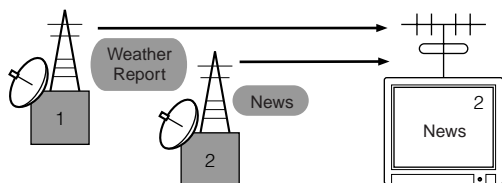
The MOTIF-RACK ES can control a MIDI device by transmitting note related data and various types of controller data. The MOTIF-RACK ES can be controlled by the incoming MIDI messages which automatically determine tone generator mode, select MIDI channels, Voices and effects, change parameter values, and of course play the Voices specified for the various Parts.

Many MIDI messages are expressed in hexadecimal or binary numbers. Hexadecimal numbers may include the letter "H" as a suffix. The letter "n" indicates a certain whole number.

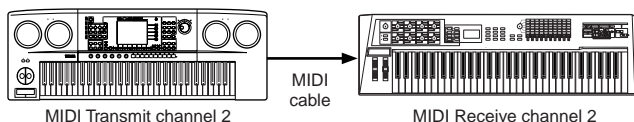
MIDI channels

MIDI performance data is assigned to one of sixteen MIDI channels. Using these channels, 1 - 16, the performance data for sixteen different instrument parts can be simultaneously sent over one MIDI cable.

Think of the MIDI channels as TV channels. Each TV station transmits its broadcasts over a specific channel. Your home TV set receives many different programs simultaneously from several TV stations and you select the appropriate channel to watch the desired program.



MIDI operates on the same basic principle. The transmitting instrument sends MIDI data on a specific MIDI channel (MIDI Transmit Channel) via a single MIDI cable to the receiving instrument. If the receiving instrument's MIDI channel (MIDI Receive Channel) matches the Transmit Channel, the receiving instrument will sound according to the data sent by the transmitting instrument. For information on how to set the MIDI transmit channel and the MIDI receive channel, see page 16.



MIDI channels and MIDI ports

MIDI data is assigned to one of sixteen channels. However, we can overcome the sixteen-channel limit by using separate MIDI "ports," each supporting sixteen channels. For details, see page 18.

MIDI Messages Transmitted/Recognized

MIDI messages can be divided into two groups: Channel messages and System messages. Below is an explanation of the various types of MIDI messages which this synthesizer can recognize/transmit. The messages transmitted/recognized by this synthesizer are shown in the MIDI Data Format and MIDI Implementation Chart of the separate Data List.

CHANNEL MESSAGES

Channel messages contain data related to the performance on the keyboard for the specific channel.

Note On/Note Off (Key On/Key Off)

Messages which are generated when the keyboard is played.
 Reception note range = C-2 (0) - G8 (127), C3 = 60
 Velocity range = 1 - 127 (Only the Note On velocity is received)
 Note On: Generated when a key is pressed.
 Note Off: Generated when a key is released.
 Each message includes a specific note number which corresponds to the key which is pressed, plus a velocity value based on how hard the key is struck.

Control Change

Control Change messages let you select a Voice bank, control volume, panning, modulation, portamento time, brightness and various other controller parameters, through specific Control Change numbers which correspond to each of the various parameters.

Bank Select MSB (Control #000) Bank Select LSB (Control #032)

Messages which select variation Voice bank numbers by combining and sending the MSB and LSB from an external device. The functions of MSB and LSB messages differ depending on the tone generator mode. MSB numbers select Voice type (Normal Voice or Drum Voice), and LSB numbers select Voice banks.
 (For more information about Banks and Programs, see Voice List in the separate Data List.)
 A new bank selection will not become effective until the next Program Change message is received.

Modulation (Control #001)

Messages which control vibrato depth using the Modulation Wheel. Setting the value to 127 produces maximum vibrato and 0 results in vibrato off.

Portamento Time (Control #005)

Messages which control the duration of portamento, or a continuous pitch glide between successively played notes. When the parameter Portamento Switch (Control #065) is set to on, the value set here can adjust the speed of pitch change. Setting the value to 127 produces maximum portamento time and 0 results in minimum portamento time.

Data Entry MSB (Control #006) Data Entry LSB (Control #038)

Messages which set the value for the parameter specified by RPN MSB/LSB (page 94) and NRPN MSB/LSB (page 94). Parameter value is determined by combining the MSB and LSB.

Main Volume (Control #007)

Messages which control the volume of each Part.
Setting the value to 127 produces maximum volume and 0 results in volume off.

Pan (Control #010)

Messages which control the stereo panning position of each Part (for stereo output).
Setting the value to 127 positions the sound to the far right and 0 positions the sound to the far left.

Expression (Control #011)

Messages which control intonation expression of each Part during performance.
Setting the value to 127 produces maximum volume and 0 results in volume off.

Hold1 (Control #064)

Messages which control sustain on/off.
Setting the value between 64 - 127 turns the sustain on, between 0 - 63 turns the sustain off.

Portamento Switch (Control #065)

Messages which control portamento on/off.
Setting the value between 64 - 127 turns the portamento on, between 0 - 63 turns the portamento off.

Sostenuto (Control #066)

Messages which control sostenuto on/off.
Holding specific notes and then pressing and holding the sostenuto pedal will sustain those notes as you play subsequent notes, until the pedal is released.
Setting the value between 64 - 127 turns the sostenuto on, between 0 - 63 turns the sostenuto off.

Harmonic Content (Control #071)

Messages which adjust the filter resonance set for each Part.
The value set here is an offset value which will be added to or subtracted from the Voice data. Higher values will result in a more characteristic, resonant sound. Depending on the Voice, the effective range may be narrower than the range available for adjustment.

Release Time (Control #072)

Messages which adjust the AEG release time set for each Part.
The value set here is an offset value which will be added to or subtracted from the Voice data.

Attack Time (Control #073)

Messages which adjust the AEG attack time set for each Part.
The value set here is an offset value which will be added to or subtracted from the Voice data.

Brightness (Control #074)

Messages which adjust the filter cutoff frequency set for each Part.
The value set here is an offset value which will be added to or subtracted from the Voice data. Lower values result in a softer sound. Depending on the Voice, the effective range may be narrower than the range available for adjustment.

Decay Time (Control #075)

Messages which adjust the AEG decay time set for each Part. The value set here is an offset value which will be added to or subtracted from the Voice data.

Effect1 Depth (Reverb Send Level) (Control #091)

Messages which adjust the send level for the Reverb effect.

Effect3 Depth (Chorus Send Level) (Control #093)

Messages which adjust the send level for the Chorus effect.

**Data Increment (Control #096)
Decrement (Control #097) for RPN**

Messages which increase or decrease the MSB value of pitch bend sensitivity, fine tune, or coarse tune in steps of 1. You will need to assign one of those parameters using the RPN in the external device in advance. The data byte is ignored. When the maximum value or minimum value is reached, the value will not be incremented or decremented further. (Incrementing the fine tune will not cause the coarse tune to be incremented.)

**NRPN (Non-Registered Parameter Number)
LSB (Control #098) (Plug-in Board only)
NRPN (Non-Registered Parameter Number)
MSB (Control #099) (Plug-in Board only)**

Messages which adjust a Voice's vibrato, filter, EG, drum setup or other parameter settings.
First send the NRPN MSB and NRPN LSB to specify the parameter which is to be controlled. Then use Data Entry (page 93) to set the value of the specified parameter.
Note that once the NRPN has been set for a channel, subsequent data entry will be recognized as the same NRPN's value change. Therefore, after you use the NRPN, you should set a Null (7FH, 7FH) value to avoid unexpected results.
For details, refer to the owner's manual of the relevant Plug-in Board.

**RPN (Registered Parameter Number) LSB (Control #100)
RPN (Registered Parameter Number) MSB (Control #101)**

Messages which offset, or add or subtract values from a Part's pitch bend sensitivity, tuning, or other parameter settings. First send the RPN MSB and RPN LSB to specify the parameter which is to be controlled. Then use Data Increment/Decrement (page 94) to set the value of the specified parameter. Note that once the RPN has been set for a channel, subsequent data entry will be recognized as the same RPN's value change. Therefore after you use the RPN, you should set a Null (7FH, 7FH) value to avoid unexpected results.
The following RPN numbers can be received.

RPN MSB	RPN LSB	PARAMETER
00	00	Pitch Bend Sensitivity
00	01	Fine Tune
00	02	Coarse Tune
7F	7F	Null

■ Channel Mode Messages

The following Channel Mode Messages can be received.

2nd BYTE	3rd BYTE	MESSAGE
120	0	All Sounds Off
121	0	Reset All Controllers
123	0	All Notes Off
126	0 - 16	Mono
127	0	Poly

All Sounds Off (Control #120)

Clears all sounds currently sounding on the specified channel. However, the status of channel messages such as Note On and Hold On is maintained.

Reset All Controllers (Control #121)

The values of the following controllers will be reset to the defaults.

CONTROLLER	VALUE
Pitch Bend Change	0 (center)
Aftertouch	0 (off)
Polyphonic Aftertouch	0 (off)
Modulation	0 (off)
Expression	127 (max)
Hold1	0 (off)
Portamento	0 (off)
Sostenuto	0 (off)
Soft Pedal	0 (off)
Portamento Control	Cancels the Portamento source key number
RPN	Number not specified; internal data will not change
NRPN	Number not specified; internal data will not change

All Notes Off (Control #123)

Clears all notes currently on for the specified channel.

However, if Hold1 or Sostenuto is on, notes will continue sounding until these are turned off.

Mono (Control #126)

Performs the same function as when an All Sounds Off message is received, and if the 3rd byte (mono number) is in the range of 0 - 16, it sets the corresponding channel to Mono Mode (Mode 4: m = 1).

Poly (Control #127)

Performs the same function as when an All Sounds Off message is received, and sets the corresponding channel to Poly Mode.

Program Change

Messages that determine which Voice to select for each Part. With a combination of Bank Select, you can select not only basic Voice numbers, but also variation Voice bank numbers. For a list of the Voices, see the separate Data List.

Pitch Bend

Pitch Bend messages are continuous controller messages that allow the pitch of designated notes to be raised or lowered by a specified amount over a specified duration.

Channel Aftertouch

Messages which let you control the sounds by the pressure you apply to the keys after the initial striking of the keys, over the entire channel.

SYSTEM MESSAGES

System messages are the data related to the overall system of the device.

System Exclusive Messages

System Exclusive messages control various functions of this synthesizer, including master volume and master tuning, tone generator mode, effect type and various other parameters.

General MIDI (GM) System On

When a "General MIDI system on" message is received, the instrument will receive MIDI messages which are compatible with GM System Level 1, and consequently will not receive NRPN and Bank Select messages.

When the instrument receives the GM System On, each receive channel of Parts 1-16 (in a Multi) will be assigned to "1- 16" and the receive channels of the Plug-in Parts will be assigned to "off."

F0 7E 7F 09 01 F7 (Hexadecimal)

NOTE Make sure that the interval between this message and the first note data of the song is at least a quarter note or greater in length.

Master Volume

When received, the Volume MSB will be effective for the System Parameter.

* mm (MSB) = appropriate volume value, ll (LSB) = ignored

F0 7F 7F 04 01 ll mm F7 (Hexadecimal)

Mode Change

When received, the mode of the MOTIF-RACK ES will be switched.

* n = Device Number (page 91)

* m = 0, 1, or 3 (0: Voice mode, 1: Performance mode, 2: not available, 3: Multi mode)

F0 43 1n 7F 00 0A 00 01 0m F7 (Hexadecimal)

System Realtime Messages

These messages control the sequencer, that is to say Song and Pattern.

Active Sensing (FEH)

Once FEH (Active Sensing) has been received, if no MIDI data is subsequently received for longer than an interval of approximately 300 msec, the MOTIF-RACK ES will perform the same function as when All Sounds Off, All Notes Off, and Reset All Controllers messages are received, and will then return to a status in which FEH is not monitored

Timing Clock (F8H)

This message is transmitted with a fixed interval (24 times per quarter note) to synchronize connected MIDI instruments. You can select whether the MOTIF-RACK ES uses the internal Timing Clock, or external Timing Clock messages received via MIDI IN by setting the MIDI Sync parameter: [UTILITY] → MIDI display → "MIDI Sync."


```

+--[SW5]-----SYSTEM EXCLUSIVE MESSAGE
|               MIDI MASTER VOLUME   FOH 7FH 7FH 04H 01H 11H mmH F7H
|
|   +--[SW9]---<BULK DUMP>
|   |         FOH 43H 0nH 7FH 00H bhH bhH ahH amH alH ddH...ddH ccH F7H *3
|   |
|   +--[SW6]---<PARAMETER CHANGE>
|   |         FOH 43H 1nH 7FH 00H ahH amH alH ddH...ddH F7H *3
|   |
|   +--[SW6]---<BULK DUMP REQUEST>
|   |         FOH 43H 2nH 7FH 00H ahH amH alH ddH...ddH F7H
|   |
|   +--[SW6]---<PARAMETER REQUEST>
|   |         FOH 43H 3nH 7FH 00H ahH amH alH F7H
|   |
|   +--[SW11]---XG SYSTEM ON
|   |         FOH 43H 1nH 4CH 00H 00H 7EH 00H F7H
|   |
|   +--[SW11]---GM MODE ON
|   |         FOH 7EH 7FH 09H 01H F7H
|
+-----SYSTEM EXCLUSIVE MESSAGE
|               IDENTITY REQUEST     FOH 7EH 0nH 06H 01H F7H

```

[SW2] MIDI Control Mode

[SW3] MIDI Sync (can be set to "internal," "MIDI," or "MTC")

[SW5] MIDI Device Number

When this is not set to off, the MIDI Master Volume can be recognized in any mode.

[SW6] The System data can be transmitted/recognized in any mode.

Regarding other types of data, it depends on the current mode whether they can be transmitted/recognized or not. In an exception to this, Normal Voice Parameter Changes can be also recognized in the Multi mode when the Normal Voice is assigned to the current Part in the Multi Voice Edit mode (except for the parameters that duplicate the Multi data).

[SW7] SYSTEM Bank Select Switch

[SW8] SYSTEM Program Change Switch (Among the Play modes, this message can be recognized only in the Voice Mode.)

[SW9] SYSTEM Bulk Protect and same as SW6.

The User Voice, User Performance, and User Multi data can be transmitted/recognized in any mode.

In an exception to this, the bulk data of the Normal Voice can be also recognized in the Multi mode when the Normal Voice is assigned to the current Part in the Multi Voice Edit mode.

[SW10] MIDI Receive Channel and Receive Filter

In the Performance/Multi mode: complies with Part Receive Channel and Part Receive Switch. In the other mode: complies with Basic Receive Channel.

[SW11] SYSTEM Receive GM/XG On

*1: Performance Mode and Multi Mode

*2: Available only for the Plug-in Voices

*3: Recognized/transmitted only when the Plug-in Voice (MODEL ID = 0x64) is selected.

However, specific parameter blocks (Common, Plug-in XG Part, and Native) cannot recognize Parameter Change messages.

*3 Relation between BANK CHANGE and PROGRAM is as follows:

CATEGORY	MSB	LSB	PROGRAM No.
GM Voice	0	0	0..127(1..128)
GM Drum Voice	127	0	0 (1)
Normal Voice Preset 1	63	0	0..127(1..128)
Preset 2	63	1	0..127(1..128)
Preset 3	63	2	0..127(1..128)
Preset 4	63	3	0..127(1..128)
Preset 5	63	4	0..127(1..128)
Preset 6	63	5	0..127(1..128)
User 1	63	8	0..127(1..128)
User 2	63	9	0..127(1..128)
User 3	63	10	0..127(1..128)
Drum Voice Preset	63	32	0..63 (1..64)
User	63	40	0..31 (1..32)
Plug-in Voice User 1	63	24	0..63 (1..64)
User 2	63	25	0..63 (1..64)
Plug-in Voice Preset 1 (Slot 1)	63	70	0..63 (1..64) *4
Preset 2 (Slot 1)	63	71	0..63 (1..64) *4
Preset 3 (Slot 1)	63	72	0..63 (1..64) *4
Preset 1 (Slot 2)	63	73	0..63 (1..64) *4
Preset 2 (Slot 2)	63	74	0..63 (1..64) *4
Preset 3 (Slot 2)	63	75	0..127(1..128) *4
Performance User	63	64	0..127(1..128)
Multi User	63	65	0..127(1..128)

When switching the modes, MODE CHANGE must be transmitted to the instrument (3-6-3-2).

*4 Can be selected only when the corresponding Plug-in Board has been installed.

*5 Transmitted/received only when MODE 2 is selected in CONTROL CHANGE MODE.

*6 The default CONTROL NUMBERS of ASSIGNABLE CONTROLLER are as follows:

BREATH CONTROLLER	2
FOOT CONTROLLER	4
Assign 1	16
Assign 2	17
Assign A	18
Assign B	19
FOOT SWITCH	88
ARPEGGIO HOLD	89
ARPEGGIO SWITCH	90

PORTAMENTO TIME sets the time it takes for the pitch to reach the next note played when PORTAMENTO SWITCH is set to on.

PAN position relatively changes according to the preset value for each Voice.

EFFECT1 DEPTH controls reverb send level.

EFFECT3 DEPTH controls chorus send level.

HARMONIC CONTENT adjusts the resonance preset for each Voice. Setting a value adds to or subtracts from the center value, 64, since it is an offset parameter. The larger the value more resonant sound will be produced. The effective range may be narrower than the range you can designate depending on the selected Voice.

The parameters, EG ATTACK TIME, EG DECAY TIME, EG SUSTAIN LEVEL, EG RELEASE TIME adjust the envelopes preset for each Voice. Setting these values add to or subtract from the center value, 64, since these are offset parameters.

BRIGHTNESS adjusts the cutoff frequency preset for each Voice. Setting a value adds to or subtracts from the center value, 64, since it is an offset parameter. The smaller the value the cutoff frequency will be lowered. The effective range may be narrower than the range you can designate depending on the selected Voice.

Bank Select will be actually executed when the Program Change message is received. Bank Select and Program Change numbers that are not supported by Yamaha will be ignored, but transmitted to the Plug-in Board.

(3) TRANSMIT/RECEIVE DATA

(3-1) CHANNEL VOICE MESSAGES

(3-1-1) NOTE OFF

```

STATUS          1000nnnn(8nH)      n = 0 - 15 CHANNEL NUMBER
NOTE No.        0kkkkkkk          k = 0 (C-2) - 127 (G8)
VELOCITY        0vvvvvvv          v: ignored
Receive only

```

(3-1-2) NOTE ON/OFF

```

STATUS          1001nnnn(9nH)      n = 0 - 15 CHANNEL NUMBER
NOTE NUMBER     0kkkkkkk          k = 0 (C-2) - 127 (G8)
VELOCITY        0vvvvvvv          v = 0 - 127 AFTER TOUCH VALUE
NOTE ON         0vvvvvvv(v≠0)
NOTE OFF        0vvvvvvv(v=0)

```

(3-1-3) CONTROL CHANGE

```

STATUS          1011nnnn(BnH)      n = 0 - 15 CHANNEL NUMBER
CONTROL NUMBER  0ccccccc
CONTROL VALUE   0vvvvvvv

```

*TRANSMITTED CONTROL NUMBER

```

c = 0          BANK SEL MSB          ; v = 0 - 127          *3
c = 32         BANK SEL LSB          ; v = 0 - 127          *3

```

*RECEIVED CONTROL NUMBER

```

c = 0          BANK SEL MSB          ; v = 0 - 127          *3
c = 32         BANK SEL LSB          ; v = 0 - 127          *3
c = 1          MODULATION            ; v = 0 - 127
c = 5          PORTAMENTO TIME        ; v = 0 - 127          *2
c = 6          DATA ENTRY MSB       ; v = 0 - 127          *1
c = 38         DATA ENTRY LSB       ; v = 0 - 127          *1
c = 7          MAIN VOLUME           ; v = 0 - 127
c = 10         PAN                   ; v = 0 - 127
c = 11         EXPRESSION             ; v = 0 - 127
c = 31         EG SUSTAIN LEVEL        ; v = 0:-64 - 64:0 - 127:+63 *2,*5
c = 64         SUSTAIN SWITCH         ; v = 0 - 63:OFF, 64 - 127:ON *2
c = 65         PORTAMENTO SWITCH       ; v = 0 - 63:OFF, 64 - 127:ON *2
c = 66         SOSTENUTO              ; v = 0 - 63:OFF, 64 - 127:ON *2
c = 71         HARMONIC CONTENT        ; v = 0:-64 - 64:0 - 127:+63
c = 72         EG RELEASE TIME        ; v = 0:-64 - 64:0 - 127:+63 *2
c = 73         EG ATTACK TIME         ; v = 0:-64 - 64:0 - 127:+63
c = 74         BRIGHTNESS             ; v = 0:-64 - 64:0 - 127:+63
c = 75         EG DECAY TIME          ; v = 0:-64 - 64:0 - 127:+63
c = 91         EFFECT1 DEPTH          ; v = 0 - 127
c = 93         EFFECT3 DEPTH          ; v = 0 - 127
c = 96         DATA ENTRY INC        ; v = 127          *1
c = 97         DATA ENTRY DEC        ; v = 127          *1
c = 0..95     ASSIGNABLE CONTROLLER  ; v = 0 - 127          *6
c = 0..95     ARPEGGIO SW            ; v = 0 - 63:OFF, 64 - 127:ON *6
c = 0..95     ARPEGGIO HOLD          ; v = 0 - 63:OFF, 64 - 127:ON *6

```

*1 Used only when a value is set using RPN.

*2 Invalid with Drum Voices.

(3-1-4) PROGRAM CHANGE

```

STATUS          1100nnnn(CnH)      n = 0 - 15 CHANNEL NUMBER
PROGRAM NUMBER  0ppppppp          p = 0 - 127

```

(3-1-5) CHANNEL AFTER TOUCH

```

STATUS          1101nnnn(DnH)      n = 0 - 15 CHANNEL NUMBER
VALUE           0vvvvvvv          v = 0 - 127 AFTER TOUCH VALUE

```

(3-1-6) PITCH BEND CHANGE

```

STATUS          1110nnnn(EnH)      n = 0 - 15 CHANNEL NUMBER
LSB             0vvvvvvv          PITCH BEND CHANGE LSB
MSB             0vvvvvvv          PITCH BEND CHANGE MSB
Transmitted with a resolution of 7 bits.

```

(3-2) CHANNEL MODE MESSAGES

```

STATUS          1011nnnn(BnH)      n = 0 - 15 CHANNEL NUMBER
CONTROL NUMBER  0ccccccc          c = CONTROL NUMBER
CONTROL VALUE   0vvvvvvv          v = DATA VALUE

```

(3-2-1) ALL SOUND OFF (CONTROL NUMBER = 78H, DATA VALUE = 0)

All the sounds currently played including the channel messages such as note-on and hold-on in a certain channel are muted when receiving this message.

(3-2-2) RESET ALL CONTROLLERS (CONTROL NUMBER = 79H, DATA VALUE = 0)

Resets the values set for the following controllers.

PITCH BEND CHANGE	0 (center)
CHANNEL AFTER TOUCH	0 (minimum)
MODULATION	0 (minimum)
EXPRESSION	127 (maximum)
BREATH CONTROLLER	127 (maximum)
FOOT CONTROLLER	127 (maximum)
Assign A	0 (center)
Assign B	0 (center)
Assign 1	0 (center)
Assign 2	0 (center)
SUSTAIN SWITCH	0 (off)
SOSTENUTO SWITCH	0 (off)
RPN	Not assigned; No change

Doesn't reset the following data:

PROGRAM CHANGE, BANK SELECT MSB/LSB, VOLUME, PAN, HARMONIC CONTENT, SUSTAIN LEVEL, RELEASE TIME, ATTACK TIME, DECAY TIME, BRIGHTNESS, EFFECT SEND LEVEL 1, EFFECT SEND LEVEL 3, PORTAMENTO SWITCH, PITCH BEND SENSITIVITY, FINE TUNING, COARSE TUNING

(3-2-3) ALL NOTE OFF (CONTROL NUMBER = 7BH, DATA VALUE = 0)

All the notes currently set to on in certain channel(s) are muted when receiving this message. However, if Sustain or Sostenuto is on, notes will continue sounding until these are turned off.

(3-2-4) OMNI MODE OFF (CONTROL NUMBER = 7CH, DATA VALUE = 0)

Performs the same function as when receiving ALL SOUNDS OFF.
Sets VOICE RECEIVE CHANNEL to "OMNI OFF," channel 1.

(3-2-5) OMNI MODE ON (CONTROL NUMBER = 7DH, DATA VALUE = 0)

Performs the same function as when receiving ALL SOUNDS OFF.
Sets VOICE RECEIVE CHANNEL to "OMNI ON."

(3-2-6) MONO (CONTROL NUMBER = 7EH, DATA VALUE = 0..16)

Performs the same function as when receiving ALL SOUNDS OFF. If the 3rd byte (mono) is within 0 through 16, the channel will be Mode 4 (m = 1).
In the Voice mode, the mode can be Mode 2 (m = 1) according to VOICE RECEIVE CHANNEL.

(3-2-7) POLY (CONTROL NUMBER = 7FH, DATA VALUE = 0)

Performs the same function as when receiving ALL SOUNDS OFF. The channel will be Mode3.
In the Voice mode, the mode can be Mode 1 according to VOICE RECEIVE CHANNEL.

(3-3) REGISTERED PARAMETER NUMBER

STATUS	1011nnnn (BnH)	n = 0 - 15 CHANNEL NUMBER
LSB	01100100 (64H)	
RPN LSB	0pppppppp	p = RPN LSB (Refer to the table as shown below.)
MSB	01100101 (65H)	
RPN MSB	0qqqqqqqq	q = RPN MSB (Refer to the table as shown below.)
DATA ENTRY MSB	00000110 (06H)	
DATA VALUE	0mmmmmmm	m = Data Value
DATA ENTRY LSB	00100110 (26H)	
DATA VALUE	01111111	l = Data Value

First, designate the parameter using RPN MSB/LSB numbers. Then, set its value with data entry MSB/LSB.

RPN	D. ENTRY		
LSB MSB	MSB LSB	PARAMETER NAME	
00H 00H	mmH ---	PITCH BEND SENSITIVITY	
01H 00H	mmH 11H	MASTER FINE TUNE	{mmH, 11H} = {00H, 00H} - {40H, 00H} - {7FH, 7FH}
			(-8192*100/8192) - 0 - (+8192*100/8192)
02H 00H	mmH ---	MASTER COARSE TUNE	28H - 40H - 58H (-24 - 0 - +24 semitones)
7FH 7FH	--- ---	RPN RESET	
		RPN numbers will be left not designated.	
		The internal values are not affected.	

(3-4) NON-REGISTERED PARAMETER NUMBER

There are no applicable parameters.
These are transmitted to the Plug-in Board.

(3-5) SYSTEM REAL TIME MESSAGES

(3-5-1) ACTIVE SENSING

STATUS 11111110 (FEH)
Once this code is received, the instrument starts sensing. When neither status nor data is received for over approximately 350 ms, MIDI receiving buffer will be cleared, and the sounds currently played and the sustain switch are forcibly turned off. In this case, each control data will be reset to a certain value.

(3-6) SYSTEM EXCLUSIVE MESSAGE

(3-6-1) UNIVERSAL NON REALTIME MESSAGE

(3-6-1-1) GENERAL MIDI MODE ON
FOH 7EH 7FH 09H 01H F7H
The PLG100-XG Plug-in Board installed to the instrument will receive this message when the instrument is in the Multi mode and SYSTEM Receive GM/XG is set to on.
The internal Part values will be reset according to the SYSTEM when the Port is set to 1.

(3-6-1-2) IDENTITY REQUEST (Receive only)
FOH 7EH 0nH 06H 01H F7H
("n" = Device No. However, this instrument receives under "omni.")

(3-6-1-3) IDENTITY REPLY (Transmit only)
FOH 7EH 7FH 06H 02H 43H 00H 41H ddH ddH 00H 00H 00H 7FH F7H
dd; Device Number Code
MOTIF-RACK ES: 19 06

(3-6-2) UNIVERSAL REALTIME MESSAGE

(3-6-2-1) MIDI MASTER VOLUME
FOH 7FH 7FH 04H 01H 11H mmH F7H

Sets the MASTER VOLUME value.
The value "mm" is used to set the master volume (the value "11" should be ignored).

(3-6-3) PARAMETER CHANGE

(3-6-3-1) XG SYSTEM ON

11110000	F0	Exclusive Status
01000011	43	YAMAHA ID
0001nnnn	1n	Device Number
01001100	4C	Model ID
0aaaaaaaa	0	Address High
0aaaaaaaa	0	Address Mid
0aaaaaaaa	7E	Address Low
0	0	Data
11110111	F7	End of Exclusive

In MULTI MODE, received only when the PLG100-XG is installed and SYSTEM Receive GM/XG on is set to on.
Be aware that executing this message takes about 170 ms and that, therefore, a certain interval before executing the following message is needed.

(3-6-3-2) NATIVE PARAMETER CHANGE, MODE CHANGE

11110000	F0	Exclusive Status
01000011	43	YAMAHA ID
0001nnnn	1n	Device Number
01111111	7F	Model ID
00000000	00	Model ID
0aaaaaaaa	aaaaaaa	Address High
0aaaaaaaa	aaaaaaa	Address Mid
0aaaaaaaa	aaaaaaa	Address Low
0ddddddd	ddddddd	Data
11110111	F7	End of Exclusive

For parameters with data size of 2 or more, the appropriate number of data bytes will be transmitted.
For Address, see the MIDI Data Table in the separate Data List.

(3-6-4) BULK DUMP

11110000	F0	Exclusive Status
01000011	43	YAMAHA ID
0000nnnn	0n	Device Number
01111111	7F	Model ID
00000000	00	Model ID
0bbbbbbb	bbbbbbb	Byte Count
0bbbbbbb	bbbbbbb	Byte Count
0aaaaaaaa	aaaaaaa	Address High
0aaaaaaaa	aaaaaaa	Address Mid
0aaaaaaaa	aaaaaaa	Address Low
0	0	Data
0ccccccc	ccccccc	Check-sum
11110111	F7	End of Exclusive

For Address and Byte Count, see the MIDI Data Table in the separate Data List.
The Check sum is the value that results in a value of 0 for the lower 7 bits when the Byte Count, Start Address, Data and Check sum itself are added.

(3-6-5) DUMP REQUEST

11110000	F0	Exclusive Status
01000011	43	YAMAHA ID
0010nnnn	2n	Device Number
01111111	7F	Model ID
00000000	00	Model ID
0aaaaaaaa	aaaaaaa	Address High
0aaaaaaaa	aaaaaaa	Address Mid
0aaaaaaaa	aaaaaaa	Address Low
11110111	F7	End of Exclusive

For Address and Byte Count, see the MIDI Data Table in the separate Data List.

(3-6-6) PARAMETER REQUEST

11110000	F0	Exclusive Status
01000011	43	YAMAHA ID
0011nnnn	3n	Device Number
01111111	7F	Model ID
00000000	00	Model ID
0aaaaaaaa	aaaaaaa	Address High
0aaaaaaaa	aaaaaaa	Address Mid
0aaaaaaaa	aaaaaaa	Address Low
11110111	F7	End of Exclusive

For Address, see the MIDI Data Table in the separate Data List.

Optional Plug-in Board installation

A variety of optional Plug-in Boards (page 52) sold separately let you expand the Voice library of your instrument. The following types of Plug-in Boards can be used with your instrument.

- PLG150-AN
- PLG150-DX
- PLG150-PF
- PLG150-DR
- PLG150-AP
- PLG150-PC
- PLG150-VL
- PLG100-XG

Installation precautions

Before installing the optional hardware, make sure you have a Phillips screwdriver.

! WARNING

- Before beginning installation, switch off the power to the MOTIF-RACK ES and connected peripherals, and unplug them from the power outlet. Then remove all cables connecting the MOTIF-RACK ES to other devices. (Leaving the power cord connected while working can result in electric shock. Leaving other cables connected can interfere with work.)
- Be careful not to drop any screws inside the instrument during installation (this can be prevented by keeping the optional units and cover away from the instrument while attaching). If this does happen, be sure to remove the screw(s) from inside the unit before turning the power on. Loose screws inside the instrument can cause improper operation or serious damage. If you are unable to retrieve a dropped screw, consult your Yamaha dealer for advice.
- Install the optional units carefully as described in the procedure below. Improper installation can cause shorts which may result in irreparable damage and pose a fire hazard.
- Do not disassemble, modify, or apply excessive force to board areas and connectors on optional units. Bending or tampering with boards and connectors may lead to electric shock, fire, or equipment failures.

! CAUTION

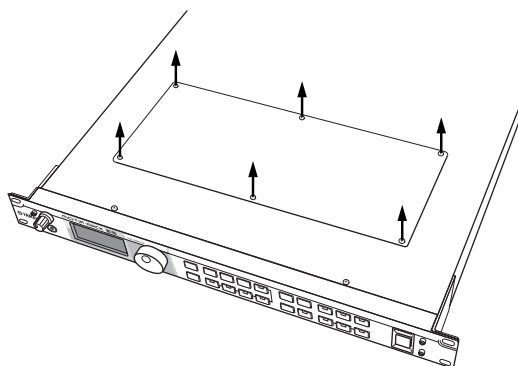
- It is recommended that you wear gloves to protect your hands from metallic projections on optional units and other components. Touching leads or connectors with bare hands may cause finger cuts, and may also result in poor electrical contact or electrostatic damage.
- Handle the optional units with care. Dropping or subjecting them to any kind of shock may cause damage or result in a malfunction.
- Be careful of static electricity. Static electricity discharge can damage the IC chips on the Plug-in Board. Before you handle the optional Plug-in Board, to reduce the possibility of static electricity, touch the metal parts other than the painted area or a ground wire on the devices that are grounded.
- Do not touch the exposed metal parts in the circuit board. Touching these parts may result in a faulty contact.
- When moving a cable, be careful not to let it catch on the circuit Plug-in Board. Forcing the cable in anyway may cut the cable, cause damage, or result in a malfunction.
- Be careful not to misplace any of the screws since all of them are used.
- Do not use any screws other than what are installed on the instrument.

Installing the Plug-in Board

1. Turn the MOTIF-RACK ES power off, and disconnect the power cord.

Also, if the MOTIF-RACK ES is connected with other external device(s), disconnect the device(s).

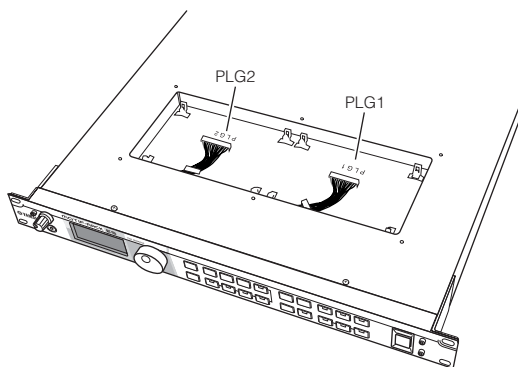
2. Move to a position facing the front panel of the device, and remove the screws (six flat-head screws) from the Plug-in Board cover at the top panel with a Phillips screwdriver.



NOTE Keep the removed (6) screws in a safe place. They will be used when attaching the Plug-in Board cover to the device again.

3. Remove the Plug-in Board cover.

Plug-in Board plate appears. Two Plug-in Boards can be accommodated: PLG1 at the right and PLG2 at the left.



NOTE The Multi-part Plug-in Board (PLG100-XG) can be installed only to PLG2.

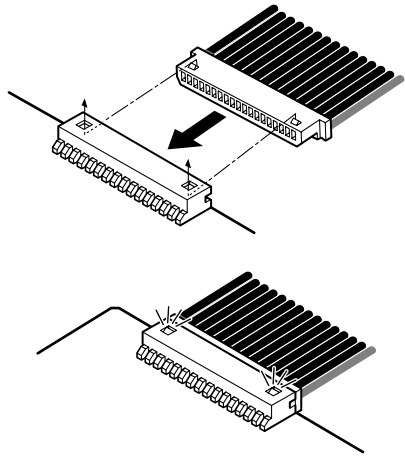
! CAUTION

When installing the optional Plug-in Board (from when you remove the cover to when the cover is replaced securely) all operations must be done with the AC power cord disconnected.

4. Take out the Plug-in Board from the anti-static bag.

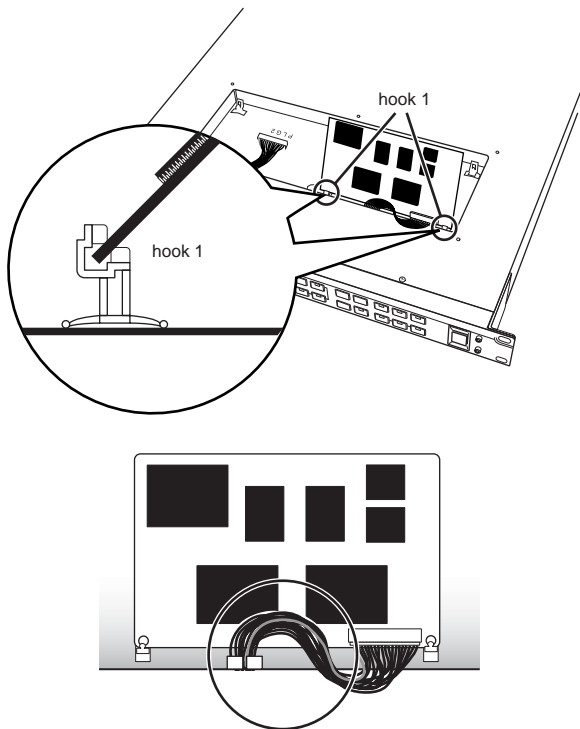
When installing the board, the side with a connector and ICs must be on top.

5. Carefully plug the cable connector into the Plug-in Board connector until the two notches on the cable connector lock into the sockets on the board as shown in the illustration.

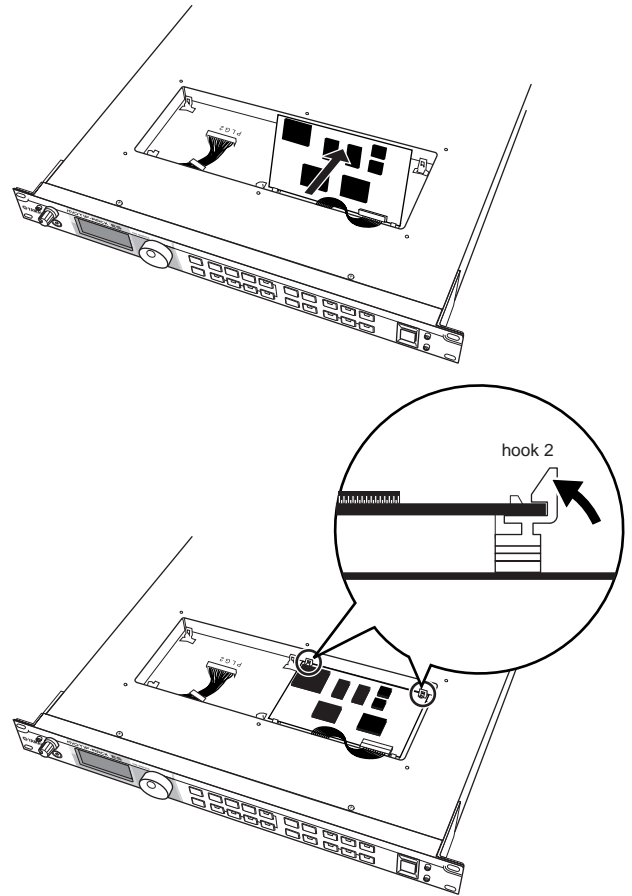


6. Mount the Plug-in Board onto the plate as detailed in the following steps.

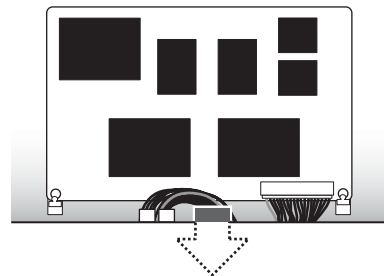
6-1 Insert one side of the Plug-in Board (the connector side) into hooks 1 as shown in the illustration, making sure that the cable is above the board.



6-2 Press down the other side until it is securely settled on hooks 2.



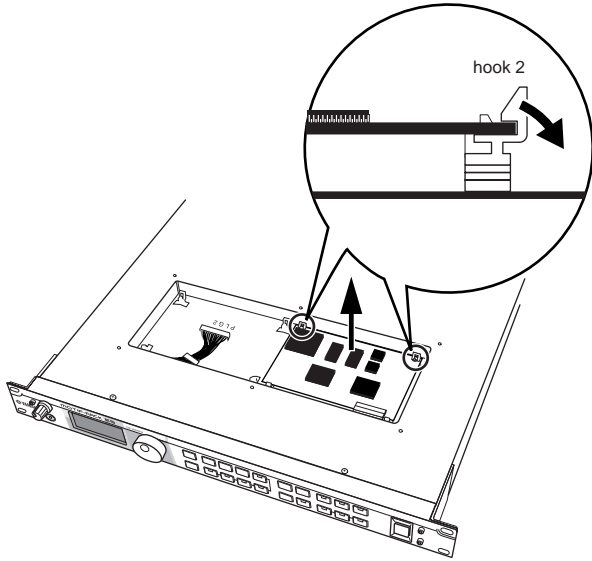
6-3 Put the cable into the MOTIF-RACK ES, making sure that no part of the cable sticks out of the instrument.



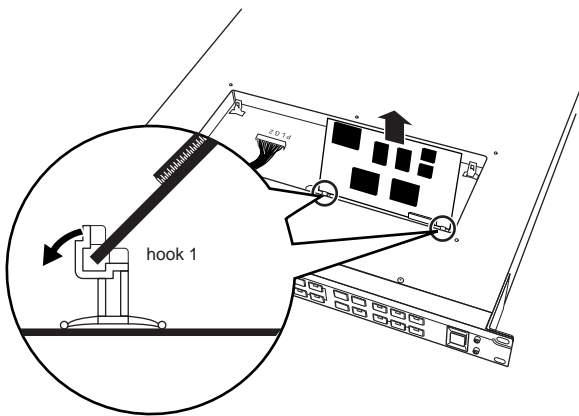
7. Replace the Plug-in Board cover by fastening the six flat-head screws you removed in step 2.

Removing the Plug-in Board from the MOTIF-RACK ES

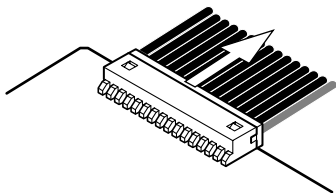
1. Press down hooks 2 in the direction as shown in the illustration and take the board out from hooks 2 by lifting up the one side.



2. Pull out the other side of the board from hooks 1 while pressing down hook 1 as shown in the illustration.



3. Pull out the cable connector from the Plug-in Board connector.



Removing rubber stoppers for rack mount installation

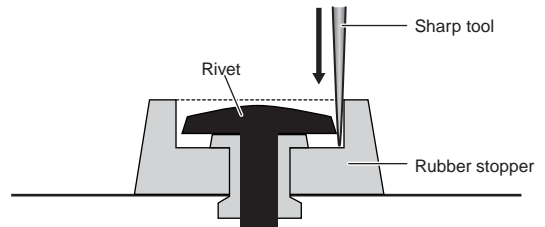
The MOTIF-RACK ES has four removable rubber stoppers. If the MOTIF-RACK ES does not fit in your rack mount cabinet because the stoppers hit against another device, remove the stoppers as described below.

Before removing the stoppers, make sure you have a sharp, thin tool — such as a safety pin or straightened paper clip.

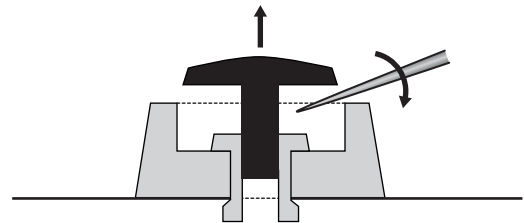
⚠ CAUTION

Do not use any tool that easily snaps or bends, such as a toothpick or thin wire.

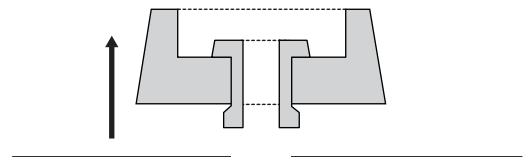
1. Turn the MOTIF-RACK ES power off, and disconnect the power cord.
Also, if the MOTIF-RACK ES is connected with other external device(s), disconnect the device(s).
2. Turn the MOTIF-RACK ES upside down.
3. Insert the tool between the rubber stopper and the plastic rivet (as shown).



4. Pull the rivet up and out of the panel.



5. Pull out the rubber stoppers.



To re-attach the removed stoppers, reverse the procedure above, inserting the rivets perpendicularly.

Troubleshooting

No sound? Wrong sound? When a problem like this occurs, please check the following points before assuming that the product is faulty. In many cases you'll find the solution to your problem here. If the problem persists, then contact your Yamaha dealer or service center (page 111).

No sounds

Volume:

- Have you made all the appropriate level settings – including the Master Volume on the MOTIF-RACK ES and the volume settings on any connected external equipment? pages 12, 14

Certain settings:

- Is the volume or level setting appropriate?
Check the following parameters:
Voice Element Edit/Key Edit → AMP display → "Level" pages 71, 74
Voice/Performance Common Edit → Output display → "Volume" pages 66, 80
Performance/Multi Part Edit or Multi Mixing Edit → Output display → "Volume" pages 81, 85, 83
- Are any of the Elements or Parts muted? pages 26, 31, 34
- Has a Voice been assigned to each Part of the Performance/Multi? pages 32, 38
- Have any of the ElementSw parameters been set to off?
Normal Voice Element Edit/Drum Voice Key Edit → OSC display pages 68, 73
- Have the Element/Drum filters been set so that they cut off almost all the sound? page 56
- Are the Effect settings appropriate? pages 29, 35, 40
- Has each Effect type been set to off? pages 29, 35, 40
- Are the velocity sensitivity settings set appropriately?
Performance/Multi Part Edit → Voice display → "VelSensDpt," "VelSensOfs" pages 81, 84
- Are the note limit and velocity limit of each Part set appropriately?
Voice Element Edit → OSC display page 68
Performance/Multi Part Edit → Voice display → NtLmt/VILmt. pages 81, 84
- Have the MIDI receive channels been set correctly?
[UTILITY] → MIDI display → "BasicRcvCh" page 91
Multi Part Edit → Voice display → "RcvCh" page 84
- Has the output select of each Part been set appropriately?
Performance/Multi Part Edit → Output display → "OutputSel" pages 81, 85
- With the Arpeggiator enabled, has the Arpeggio Category parameter been set to "Ct" and the Key Mode parameter set to something other than "direct"?
Arpeggio Edit → "KeyMode" page 88
- When the arpeggio produces no sound, are the note limit and velocity limit set appropriately?
Arpeggio Edit → "NoteLimit," "VelLimit" page 88

System settings (Utility):

- Have the MIDI receive channels been set correctly?
[UTILITY] → MIDI display → "BasicRcvCh" page 91
- Is the MIDI IN/OUT setting appropriate?
[UTILITY] → MIDI display → "MIDI IN/OUT" page 91

External Device or Sequencer settings:

- When playing this MOTIF-RACK ES using an external MIDI sequencer, have the transmit channels for each sequencer track and the receive channels for each Part in the Multi been set correctly?
Multi Part Edit → Voice display → "RcvCh" page 84
- Are the MIDI "echo" settings (MIDI through) set appropriately? page 19
- When playing back a song data using the external sequencer, have the volume and expression parameters been set appropriately?

External audio devices or cables:

- Has the audio equipment been connected correctly? page 15
- Are any of the MIDI cables damaged?
- Is the volume of the external device set to an appropriate level?

Distorted sound

- Are the effect settings appropriate?
Use of an effect at certain settings may produce distortion. pages 29, 35, 40
- Are the filter settings appropriate?
Excessively high filter resonance settings can cause distortion. page 56
- Is the MASTER VOLUME set so high that clipping is occurring? pages 12, 14
- Is the volume of each Element in the Voice mode or the volume of each Part in the Performance/Multi mode set too high? pages 66, 81

Sound is very quiet.

- Has the MIDI volume or MIDI expression been set too low?
- Is the cutoff frequency of the filters set too low? page 56

Playback continues without stopping.

- When the [ARPEGGIO] button is turned on, press it again so that its lamp turns off.

The pitch is wrong.

- Is the tune setting appropriate?
[UTILITY] → General display → "Tune" page 89
- Is the note shift setting appropriate?
[UTILITY] → General display → "NoteShift" page 89
- Have the micro tuning parameters been set to an unconventional scale?
Voice Common Edit → General display → "M.TuningNo." page 65
- Have the pitch related parameters been set appropriately? page 55
- Has the Pitch Modulation Depth been set too high?
Voice Element Edit → Pitch display → "Pmod" page 72
- Have the following parameters been set to values other than "0"?
Voice Element Edit/Key Edit → Pitch display → "CoarseTune," "FineTune" pages 68, 74
Plug-in Voice Element Edit → OSC display
Performance/Multi Part Edit → Tone display → "NoteShift," "Detune" pages 82, 85
[UTILITY] → General display → "NoteShift" page 89

Sound is choppy and intermittent.

- Are you exceeding the maximum polyphony of the instrument? page 57

Only single notes are sounded (no chords).

- Has the Mono/Poly parameter been set to "mono"?
Voice Common Edit → General display → "Mono/Poly" page 65
Performance/Multi Part Edit → Voice display → "Mono/Poly" pages 80, 84

No effects are applied.

- Have the parameters in the Effect Bypass mode been set appropriately? pages 60, 87
- Have any or all of the Elements' Effect Output parameter been set to "thru"?
Have any or all of the effect types been set to "thru" or "off" (in the Effect display of the Voice Edit mode)? page 29
- Have the Insertion Effect Parts been specified? page 29

Cannot find the Drum Voice.

- Drum Voices are selected differently than Normal Voices page 23

Cannot enter the Edit mode.

- If the Category Search function is turned on, the Edit mode cannot be entered.

Plug-in Board does not work.

- Has the Multi-part Plug-in Board been installed to slot 1? (The Multi-part Plug-in Board should be installed to slot 2.) page 99
- Has a Plug-in Voice been assigned to the current Part of the Performance/Multi? page 58

Data communication between the computer and the MOTIF-RACK ES does not work properly.

- Check whether the Port setting on the computer is appropriate or not.
- Is the MIDI IN/OUT setting appropriate?
 [UTILITY] → MIDI display → "MIDI IN/OUT"
 If the instrument is connected to the MIDI IN/OUT terminals, set the switch to "MIDI."
 If the instrument is connected to the USB terminal, set the switch to "USB" page 91

Data communication between the MIDI instrument and the MOTIF-RACK ES does not work properly.

- Is the MIDI IN/OUT parameter set to "MIDI"?
 [UTILITY] → MIDI display → "MIDI IN/OUT" page 91

The MOTIF-RACK ES does not sound properly even when playing back the song data on the computer or the MIDI instrument connected to the MOTIF-RACK ES.

- Is the MOTIF-RACK ES set to the Multi mode?
 The Voice mode or Performance mode may not produce the proper sound even when playing back the Song data on the MIDI instrument or the computer connected to the MOTIF-RACK ES. page 36

Cannot receive bulk data.

- When using the Voice Editor/Multi Part Editor, have you set a sufficient Dump Interval?
 The Dump Interval in the Editor Setup dialog must be set to 20ms or greater. For details, refer to the owner's manual of the relevant Editor.
- Is the Device Number setting correct?
 If the data was saved with the Bulk Dump function of the MOTIF-RACK ES, you need to set the Device Number to the same number before Bulk Dump transmission.
 [UTILITY] → MIDI display → "DeviceNo." page 91
- Is the MIDI IN/OUT setting appropriate?
 [UTILITY] → MIDI display → "MIDI IN/OUT" page 91
- Has the Receive Bulk Switch parameter been set to "protect"?
 [UTILITY] → MIDI display → "RcvBulkSw" page 91
- Are any of the MIDI cables damaged?

Specifications

Tone Generator Section	Tone Generator	AWM2 (complying with the Modular Synthesis Plug-in System)
	Maximum polyphony	128 notes + the polyphony of the Plug-in Board (if installed)
	Wave Memory	175MB (when converted to 16-bit linear format), 1,859 waveforms
Voices	Voice Selection	Preset: 768 Normal Voices + 64 drum Kits GM: 128 Normal Voices + 1 drum kit User: 384 Normal Voices + 32 drum kits
	Plug-in Voice	Preset for the PLG150-AN/DX/PF/AP/DR/PC: 64 Voices Preset for the PLG-150VL: 192 Voices User: 64 Voices for each Plug-in connector
Performance	Performance	User: 128 Performances
Multi	Multi	User: 128 Multis
Effects	Reverb	20 types
	Chorus	49 types
	Insertion 1	116 types (up to 8 blocks available in the Multi mode)
	Insertion 2	116 types (up to 8 blocks available in the Multi mode)
	Master Effect	8 types
	Master Equalizer	5 bands (High, High Mid, Mid, Low Mid, Low)
	Part Equalizer	3 bands (High, Mid, Low)
Arpeggio		1,787 types * MIDI Sync, MIDI transmit/receive channel, Velocity Limit, and Note Limit can be set.
Controls		STANDBY/ON switch, VOLUME knob, data dial, cursor buttons, EXIT button, PAGE buttons, MULE/SEL/ENTER button, Part/Element buttons, BANK buttons, SHIFT button, CATEGORY button, Mode buttons
Jacks and Terminals	Front Panel	PHONES
	Rear Panel Controls	DC IN, USB, MIDI IN/OUT/THRU/ DIGITAL OUTPUT, OPTICAL OUTPUT, ASSIGNABLE OUTPUT 1-4, OUTPUT L/MONO, R
	Top panel	PGL1, PLG2
Other	Display	160- x 64-dot graphic backlit LCD
	Supplied Accessories	Power adaptor, Owner's Manual set, CD-ROM
	Power Consumption	17W (maximum; 22W when two Plug-in Boards are installed)
	Optical/Digital Output	44.1kHz, 24bit
	Dimensions	480 (w) x 372.4 (D) x 44 (H) mm
	Weight	4.1kg

* Specifications and descriptions in this owner's manual are for information purposes only. Yamaha Corp. reserves the right to change or modify products or specifications at any time without prior notice. Since specifications, equipment or options may not be the same in every locale, please check with your Yamaha dealer.

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