YAMAHA

MUSIC SYNTHESIZER

S90 ES

OWNER'S MANUAL

MODULAR SYNTHESIS
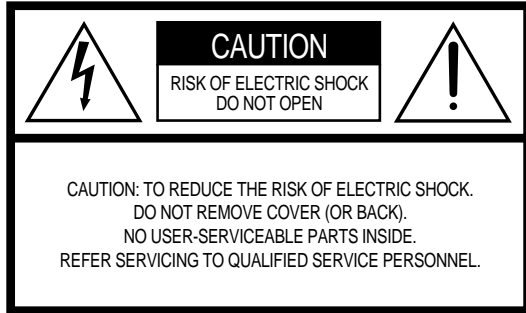PLUG-IN SYSTEM

EN

SPECIAL MESSAGE SECTION

PRODUCT SAFETY MARKINGS: Yamaha electronic products may have either labels similar to the graphics shown below or molded/stamped facsimiles of these graphics on the enclosure. The explanation of these graphics appears on this page. Please observe all cautions indicated on this page and those indicated in the safety instruction section.

```
   /!\        CAUTION          /!\
            RISK OF ELECTRIC SHOCK
               DO NOT OPEN

   CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK.
           DO NOT REMOVE COVER (OR BACK).
           NO USER-SERVICEABLE PARTS INSIDE.
     REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.
```

The exclamation point within the equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.
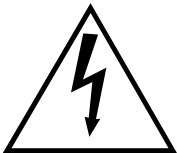
The lightning flash with arrowhead symbol, within the equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electrical shock.

IMPORTANT NOTICE: All Yamaha electronic products are tested and approved by an independent safety testing laboratory in order that you may be sure that when it is properly installed and used in its normal and customary manner, all foreseeable risks have been eliminated. DO NOT modify this unit or commission others to do so unless specifically authorized by Yamaha. Product performance and/or safety standards may be diminished. Claims filed under the expressed warranty may be denied if the unit is/has been modified. Implied warranties may also be affected.

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.

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-rechargable 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.

Warning: Do not attempt to recharge, disassemble, or incinerate this type of battery. Keep all batteries away from children. Dispose of used batteries promptly and as regulated by applicable laws. Note: In some areas, the servicer is required by law to return the defective parts. However, you do have the option of having the servicer dispose of these parts for you.

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.

NOTICE: Service charges incurred due to 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.

NAME PLATE LOCATION: The graphic below indicates the location of the name plate. 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 _____

IMPORTANT SAFETY INSTRUCTIONS

INFORMATION RELATING TO PERSONAL INJURY, ELECTRICAL SHOCK, AND FIRE HAZARD POSSIBILITIES HAS BEEN INCLUDED IN THIS LIST.

WARNING- When using any electrical or electronic product, basic precautions should always be followed. These precautions include, but are not limited to, the following:

1. Read all Safety Instructions, Installation Instructions, Special Message Section items, and any Assembly Instructions found in this manual BEFORE making any connections, including connection to the main supply.

2. Do not attempt to service this product beyond that described in the user-maintenance instructions. All other servicing should be referred to qualified service personnel.

3. Main Power Supply Verification: Yamaha products are manufactured specifically for the supply voltage in the area where they are to be sold. If you should move, or if any doubt exists about the supply voltage in your area, please contact your dealer for supply voltage verification and (if applicable) instructions. The required supply voltage is printed on the name plate. For name plate location, please refer to the graphic found in the Special Message Section of this manual.

4. **DANGER**-Grounding Instructions: This product must be grounded and therefore has been equipped with a three pin attachment plug. If this product should malfunction, the ground pin provides a path of low resistance for electrical current, reducing the risk of electrical shock. If your wall socket will not accommodate this type plug, contact an electrician to have the outlet replaced in accordance with local electrical codes. Do NOT modify the plug or change the plug to a different type!

5. **WARNING:** Do not place this product or any other objects on the power cord or place it 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.

6. Ventilation: Electronic products, unless specifically designed for enclosed installations, should be placed in locations that do not interfere with proper ventilation. If instructions for enclosed installations are not provided, it must be assumed that unobstructed ventilation is required.

7. Temperature considerations: Electronic products should be installed in locations that do not seriously contribute to their operating temperature. Placement of this product close to heat sources such as; radiators, heat registers etc., should be avoided.

8. This product was NOT designed for use in wet/damp locations and should not be used near water or exposed to rain. Examples of wet /damp locations are; near a swimming pool, spa, tub, sink, or wet basement.

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

10. The power supply cord (plug) should be disconnected from the outlet when electronic products are to be left unused for extended periods of time. Cords should also be disconnected when there is a high probability of lightning and/or electrical storm activity.

11. Care should be taken that objects do not fall and liquids are not spilled into the enclosure through any openings that may exist.

12. Electrical/electronic products should be serviced by a qualified service person when:
   a. The power supply cord has been damaged; or
   b. Objects have fallen, been inserted, or liquids have been spilled into the enclosure through openings; or
   c. The product has been exposed to rain; or
   d. The product does not operate, exhibits a marked change in performance; or
   e. The product has been dropped, or the enclosure of the product has been damaged.

13. 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 a long period of time at a high volume level or at a level that is uncomfortable. If you experience any hearing loss or ringing in the ears, you should consult an audiologist.
IMPORTANT: The louder the sound, the shorter the time period before damage occurs.

14. Some Yamaha products may have benches and/or accessory mounting fixtures that are either supplied as a part of 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.

PLEASE KEEP THIS MANUAL

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/Power cord

- Only use the voltage specified as correct for the instrument. The required voltage is printed on the name plate of the instrument.
- Check the electric plug periodically and remove any dirt or dust which may have accumulated on it.
- Use only the supplied power cord/plug.
- Do not place the power 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.
- Be sure to connect to an appropriate outlet with a protective grounding connection. Improper grounding can result in electrical shock.

Do not open

- This instrument contains no user-serviceable parts. Do not attempt to disassemble or modify the internal components in any way.

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 power 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 electric 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/Power cord

- Always connect the three-pin attachment plug to a properly grounded power source. (For more information about the main power supply, see page 8.)
- When removing the electric plug from the instrument or an outlet, always hold the plug itself and not the cord. Pulling by the cord can damage it.
- Remove the electric plug from the outlet when the instrument is not to be used for extended periods of time, 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 cables.
- When setting up the instrument, make sure that the AC outlet you are using is easily accessible. If some trouble or malfunction occurs, immediately turn off the power switch and disconnect the plug from the outlet.
- Do not place objects in front of the instrument's air vent, since this may prevent adequate ventilation of the internal components, and possibly result in the instrument overheating.

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 keyboard. 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 or keyboard.

- 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

- The edited 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 126).

- Saved data may be lost due to malfunction or incorrect operation. Save important data to a USB storage device.

- 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 and and may cause the system to freeze.
This means that this synthesizer may not be able to start up properly, even when turning the power on next time.

Backing up the USB storage device

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

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

Introduction

Congratulations and thank you for your purchase of the Yamaha S90 ES Music Production Synthesizer! You now own one of the best-sounding, most versatile, and most powerful music production instruments on the planet.

We strove to put virtually all our synthesizer technology and music making know-how into one instrument—and we succeeded. The new S90 ES not only gives you the latest and greatest sounds and rhythms (as well as the ability to create your own), it gives you powerful, easy-to-use tools for playing, combining and controlling these dynamic sounds/rhythms—in real time, as you perform!

Take time to look through this manual carefully. It's packed with important information on how to get the most from this amazing instrument.

Dive in now and enjoy!

Accessories

The following items have been included with your S90ES. Check to see that you have everything listed here.

❏ Power cord
❏ Owner's Manual (this document)
❏ Data List
❏ Sticker label for optional mLAN16E expansion board

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.

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, style files, MIDI files, WAVE data, musical scores 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.

This device is capable of using various types/formats of music data, and it optimizes the data in advance to the proper format for use with the device. As a result, the data may not be played back precisely as the creators or composers originally intended.

Copying of the commercially available musical data including but not limited to MIDI data and/or audio data is strictly prohibited except for your personal use.

- Windows is the registered trademarks of Microsoft® Corporation.
- Apple and Macintosh are trademarks of Apple Computer, Inc., registered in the U.S. and other countries.
- The company names and product names in this Owner's Manual are the trademarks or registered trademarks of their respective companies.
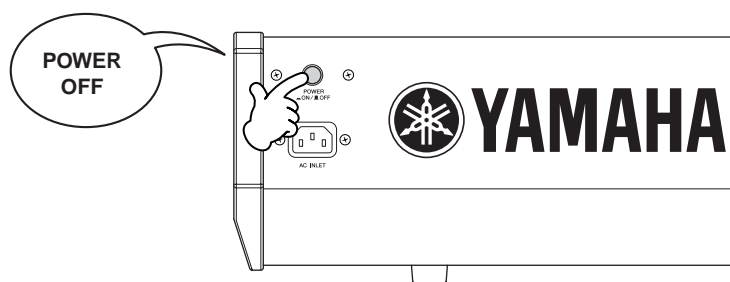
Table of Contents

Setting up and Playing

Power supply connections

Power supply connections

1. Make sure that the instrument's POWER switch on the rear panel is at the OFF position.

2. Connect the supplied power cord to the AC INLET on the instrument's rear panel.

3. Connect the other end of the power cord to an AC outlet. Make sure your S90 ES meets the voltage requirement for the country or region in which it is being used.

Power Switch

AC INLET

Power cord (included)
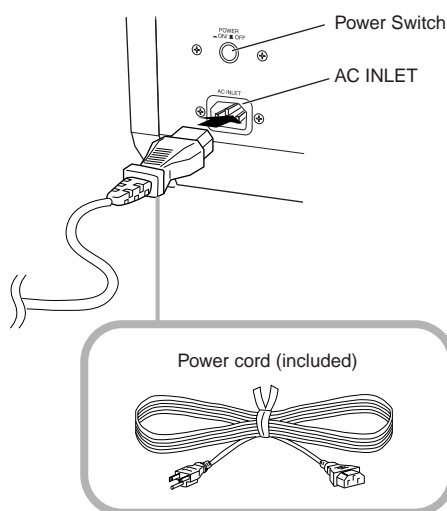
⚠ *WARNING*

Make sure your S90 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!

⚠ *WARNING*

Use only the AC power cord supplied with the S90 ES. If the supplied cord is lost or damaged and needs to be replaced, contact your Yamaha dealer. The use of an inappropriate replacement can pose a fire and shock hazard!

⚠ *WARNING*

The type of AC power cord provided with the S90 ES may be different depending on the country in which it is purchased (a third prong may be provided for grounding purposes). Improper connection of the grounding conductor can create the risk of electrical shock. Do NOT modify the plug provided with the S90 ES. If the plug will not fit the outlet, have a proper outlet installed by a qualified electrician. Do not use a plug adapter which defeats the grounding conductor.

Connecting the speakers or pair of headphones

Since the S90 ES has no built-in speakers, you will need to monitor the sound of the instrument by using external equipment. Connect a set of headphones, powered speakers, or other playback equipment as required.

Powered speaker (Left)   Powered speaker (Right)

Headphones

OUTPUT L/MONO   OUTPUT R

PHONES
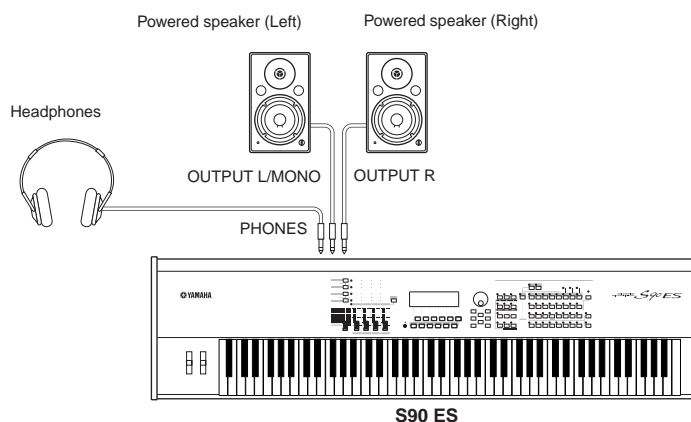
S90 ES

Turning the power on

Make sure the volume settings of the S90 ES and external devices are turned down to the minimum.

MASTER VOLUME
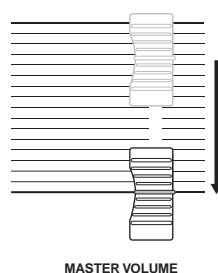
Turn the power on by pressing the [POWER] switch on the S90 ES rear panel, then turn the power on the amplifiers.

Connecting MIDI devices or a Mixer

Make sure that all volume settings are turned down all the way to the minimum. Then turn on the every device in your setup in the order of MIDI masters (controllers), MIDI slaves (receivers), then audio equipment (mixers, amplifiers, speakers, etc.).
When powering down the setup, first turn down the volume of each audio device, then switch off each device in the reverse order (first audio devices, then MIDI).

① ② ③

POWER
ON!!

MIDI master   S90 ES   Audio equipment (first mixer, then amplifier)
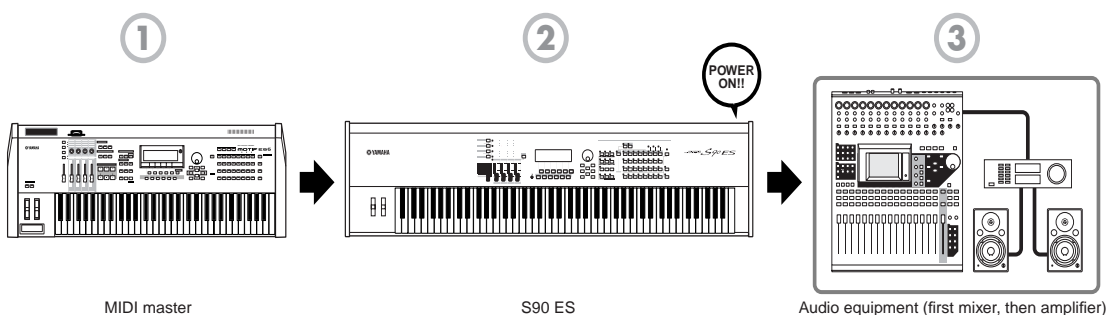
Adjusting the sound and the display contrast

Adjust the volume levels of the S90 ES and the connected amplifier/speaker system. If the display is not easily visible, use the Contrast control to adjust for optimum visibility.

Adjust the volume with the MASTER VOLUME slider.

Adjust the display contrast with the Contrast control.

SF1

F1

MASTER VOLUME

Contrast control
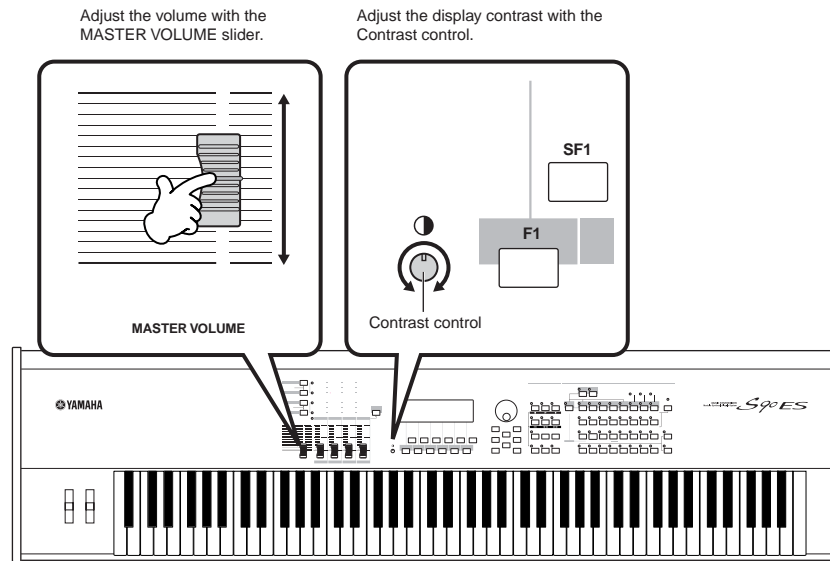
Now that you've set up the S90 ES properly, you're ready to begin playing it.

NOTE When you are ready to turn off the S90 ES, make sure to switch off the power of the external device (or lower its volume) before switching off the S90 ES.

Playing the keyboard

Playing the sounds

Try playing some of the realistic and dynamic S90 ES sounds from the keyboard now.
When you turn the power on following the directions in "Power supply connections" (page 8), the display below appears.

NOTE In the default settings, the Master mode is selected. For details about the modes, refer to the section "Modes" on page 12.

Indicates that the Master mode is selected.
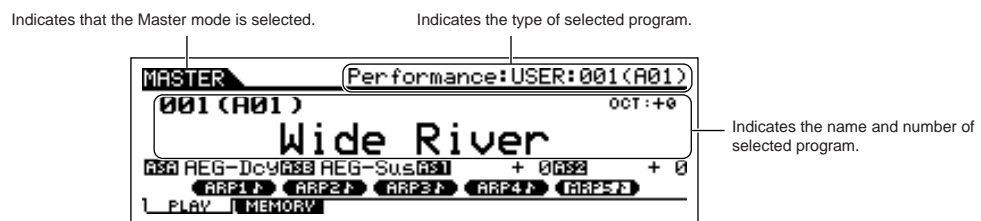
Indicates the type of selected program.

```
MASTER        Performance:USER:001(A01)
001(A01)                         OCT:+0
          Wide River
ASA AEG-DcYASB AEG-SusAS1    + 0AS2    + 0
    (ARP1♪) (ARP2♪) (ARP3♪) (ARP4♪) (ARP5♪)
 1 PLAY  MEMORY
```

Indicates the name and number of selected program.

In this condition you can play the keyboard and hear the sounds of the selected program. When the instrument is turned on, the "Wide River" program—featuring a natural, mellow piano sound with a rhythmic arpeggio and ambient synth—is automatically called up.

Notice the indication "Performance:USER1:001(A01)" at the top right of the display. This indicates that Performance 001 in User bank 1 is currently selected. A "Performance" is one of the types of programs of the S90 ES. As described below, the instrument also features other types: Voices and Multis.

NOTE For details about Banks, see page 30. Please note that Performances and Multis have only User Banks (no other banks are available).

Selecting and playing the sounds

The S90 ES provides three different types of programs for playing the sounds: Voices, Performances, and Multis. The basic difference among these programs is in their use—for playing the keyboard, or for creating music with multiple parts.

For playing the keyboard

Voice:
This program contains a basic instrument sound, such as a piano, guitar, bass guitar, drum kit, etc.

Performance:
This program allows you to combine several Voices together—either in a richly textured layer, or separately (as in different sections of the keyboard) for playing several different parts simultaneously.


For creating music of multiple parts

Multi:
This program allows you to play multiple tracks from an external sequencer, using many different Voices simultaneously.

You can choose from 128 different Voices, Performances, and Multis in the Master mode. To change the desired Master number, use the [INC/ YES] button, [DEC/NO] button, or the Data dial.

Decreases number   Increases number

DEC/NO   INC/YES

Decreases number   Increases number
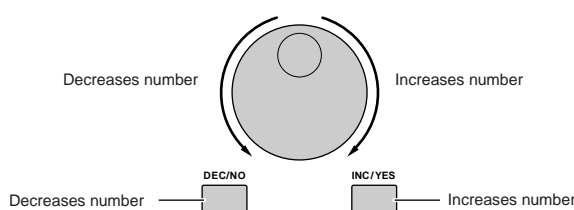
Change the Master number, and then try playing the various Voices or Performance types. When a Voice is assigned to the selected Master number, "Voice" will appear at the top of the display. When a Performance is assigned, "Performance" will appear in the display.

```
MASTER                Voice:PRE1:001(A01)
002(A02)                            OCT:+0
            Natural S
ASA AEG-DcYASB AEG-SusAS1 EfE9H-GAS2 RevSend
  (ARP1♪) (ARP2♪) (ARP3♪) (ARP4♪) (ARP5♪)
1_PLAY  MEMORY
```

```
MASTER             Performance:USER:001(A01)
001(A01)                            OCT:+0
            Wide River
ASA AEG-DcYASB AEG-SusAS1    + 0AS2    + 0
  (ARP1♪) (ARP2♪) (ARP3♪) (ARP4♪) (ARP5♪)
1_PLAY  MEMORY
```

🎵NOTE   Although a Multi can be used for playing the keyboard, it is primarily intended for creating, recording and playback of multi-part music. For details about using this function, see page 70.

As you play the various Voices and Performances, notice the differences between them—especially how some Performances sound exceptionally rich and more complex than Voices.

Here, we've introduced the operations in the Master mode that is called up first when turning the power on. The S90 ES has other modes of operation as well. In the next section, we'll explain about the modes of the S90 ES and how they are used.

Modes

There are several operation modes in the S90 ES, and they can be selected by using the six mode buttons. The use of the individual modes depends on your particular musical application. For playing the keyboard conventionally, the Voice or Performance mode should be used. If you're creating music, particularly multi-part arrangements, use the Multi mode and Sequence Play mode. To make global settings for the instrument and back up your important data, use the Utility and File modes. A special Master mode is also included for instantly calling up desired modes and related settings together in one button press, without having to first select a mode.
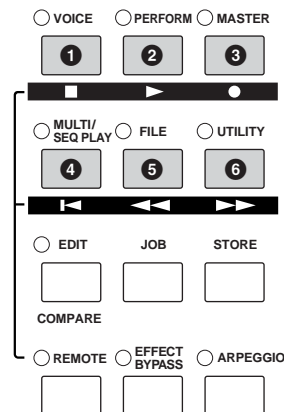
❶ Playing the keyboard using a Voice

Voice mode [VOICE] button

The S90 ES has a wealth of high-quality, dynamic sounds—also referred to as "Voices." You can play these Voices—one Voice at a time—from the keyboard in the Voice mode. The S90 ES also lets you create your own original Voices.

❷ Playing the keyboard using multiple Voices

Performance mode [PERFORM] button

In the Performance mode, you can play several Voices together in a layer, or play different Voices from separate ranges of the keyboard. Each of these combinations of Voices is called a "Performance." This mode lets you create richly textured, layered sounds or play two different parts simultaneously—for example, piano and bass guitar—and is particularly useful when performing solo.

❸ Creating original program sets

Master mode [MASTER] button

The Master mode can be used in two ways:

• Storing your favorite programs
This lets you register settings that you often use in the Voice, Performance, or Multi mode, and instantly recall the mode and custom settings together in a single button press, without having to first select a mode.

• Playing as a master keyboard
This lets you divide the keyboard into four separate sections—just as if you were playing four different MIDI keyboards.

❹ Recording via an external sequencer

Multi mode [MULTI/SEQ PLAY] button

The Multi mode lets you use the S90 ES as a multi-timbral tone generator for sequencer song playback. By assigning a different Voice to each track in a song file on your external sequencer, you can play back complex multi-part ensemble recordings.

❹ Playing back MIDI files
SMF (Standard MIDI File) format only

Sequence Play mode [MULTI/SEQ PLAY] button

In the Sequence Play mode, you can play back song data created on an external sequencer, using the S90 ES as a multi-part tone generator. Multiple SMF files can be played in order, and files saved to a USB storage device can be played back directly without having to load the data to the S90 ES.

❺ Backing up data

File mode [FILE] button

The File mode lets you save your S90 ES data to the USB storage device, and allows you to load the USB device data to the S90 ES.
You can store your data to the S90 ES; however, for best safe-keeping, Yamaha recommends that you back up your important data to a USB storage devise.

❻ Setting the system parameters

Utility mode [UTILITY] button

The Utility mode lets you set parameters that apply to the entire system of the S90 ES. These parameter settings are applied to all Voices, Performances, and Multis.

* The settings for each Voice, Performance, or Multi can be determined in the respective Voice mode, Performance mode, or Multi mode.

DI NOTE Pressing the [MULTI/SEQ PLAY] button toggles between the Multi mode and Sequence Play mode.

Basic instructions

Voices—the basic building blocks of the S90 ES

Voices—created in the Voice mode—are the basic sonic building blocks for the other modes of the S90 ES. The Performance and Multi programs are made up of different Voices, used together for specific performance or song recording applications. The S90 ES features an exceptionally wide variety of preset Voices for playing in virtually any musical style. Try searching through the Voices to find your favorites. Once you've explored them and feel comfortable with them, try branching out creatively and use the editing features to make your own original Voices.

| Selecting a preset Voice | ➡ | Page 30 |
| Creating a new Voice | ➡ | Page 44 |

Combine several Voices to create a Performance or Multi

To play several different Voices together simultaneously, select a Performance. To use the S90 ES as a multi-timbral tone generator with your sequencer, select a Multi. The S90 ES contains a full set of specially programmed 128 Performances and 64 Multis. With the help of the Multis, the S90 ES can be used to play back MIDI song files from a connected USB device.

Selecting a preset Performance	➡	Page 34
Creating a new Performance	➡	Page 36, 53
Creating music using a Multi and your computer	➡	Page 70
Playing back a MIDI file	➡	Page 96

Master mode—Create a master keyboard setup or instantly call up your desired programs

The Master mode lets you register your favorite Voices, Performances, and Multis together into easy-to-select Master programs. No matter what mode is used—Voice, Performance or Multi—you can have it instantly and automatically selected when you call up the appropriate Master.
The Master mode can also be used to divide the keyboard into four sections—each with its own Voice—just as if you were playing four different MIDI keyboards.

| Making Master mode settings | ➡ | Page 90 |

Convenient remote control of your computer software

The panel of the S90 ES also serves as a convenient control surface for your computer music system. Use the buttons and sliders to control the audio mixer and sequencer transport functions in your MIDI/audio software. This highly intuitive approach gives you hands-on control over your virtual studio—a level of control that a keyboard and mouse can't match. These features are available for any computer sequence software and Multi Part Editor software (Page 77) compatible with the Remote Control function.

| Remote-controlling the software | ➡ | Page 77 |

Global settings and data backup

While the Voice, Performance, and Multi modes provide controls for using and editing the programs of the S90 ES, the Utility mode is the place where you make overall settings for the instrument—for example, adjusting the transpose and fine tuning controls, or switching between MIDI and USB operation. You can also archive your important S90 ES data to a USB storage device for safe-keeping.

| Making global system settings | ➡ | Page 163 |
| Backing up important data | ➡ | Page 126 |

> **This concludes our short guide to the basic operations and functions of the S90 ES. Enjoy the dynamic, authentic sounds of the instrument as you continue to play it and create music on it. Make sure to follow the references above and go on to explore some of the other exciting and powerful features of the S90 ES.**

Main Features

● Naturally responsive 88-Key Balanced Hammer Effect keyboard (with aftertouch), drawing on our extensive experience and expertise in piano-making.

● Wide range of dynamic and authentic voices. Use the Category Search function to quickly call up the sounds you want, based on their instrument type.

● Half Damper function that lets you finely control the decay of the sound—and expressively recreate the complex charactistics of acoustic instruments, especially piano and stringed instruments.

● Includes the newly developed Damper Resonance—an Insertion effect that reproduces the rich harmonics and unique sound characteristics of an actual grand piano when using the damper pedal.

● Stretch tuning used on many Voices—the same kind of tuning as used on an actual acoustic piano.

● Arpeggio feature, which automatically plays a variety of sequenced phrases in response to the keys you play. This function lets you easily call up various melody and rhythm patterns—over 1,700 types—providing instant inspiration for song creation and performance.

● Versatile Multi mode lets you set up the S90 ES for playing multiple instrument parts from your sequencer software, giving you all the sounds you need to realize complete, professional-sounding songs. Moreover, the corresponding Multi Library lets you have the proper instruments for the selected type of music called up instantly and automatically.

● Extensive effect processing, with Reverb (20 types), Chorus (49 types), eight separate Insertion blocks (each having two blocks and a total 117 types), Master Effect (8 types), and a digital equalizer (3-band Part EQ and 5-band Master EQ).

● Comprehensive real-time control with four Control Sliders—letting you adjust filter, levels, effects, EG, and more, while you play.

● Master mode—for using the S90 ES as a master keyboard controller (with independent Zones), and for easily reconfiguring the instrument between Voice/Performance play and Multi play in live applications.

● Remote Control—for operating your favorite sequencer software from the S90 ES.

● Three Modular Synthesis Plug-in System slots, which let you upgrade the S90 ES with a completely new synthesizer or sound-processing engine. These Plug-in boards give you more voices, more effects, more polyphony and more instrument parts. Plus, special Plug-in voices have already been programmed and stored to the S90 ES, ready to be played as soon as you install the proper board.

● A full rear panel of input/output connections provides maximum interfacing flexibility. These include Assignable Outputs, A/D Inputs, MIDI, and two USB. Moreover, an optional mLAN16E board can be installed.

● Two USB connectors—USB TO HOST for connecting to computer, and USB TO DEVICE for connecting to storage devices, such as a hard disk drive or flash disk.

● Compatibility with Yamaha's powerful Voice Editor and Multi Part Editor software—featuring comprehensive, intuitive editing of all parameters from your computer.

Using the Owner's Manual

Data List (separate booklet)

This contains various important lists such as the Voice List, Effect List, and MIDI Implementation Chart.

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) select an Element, 5) press the [F1] OSC button, and 6) press the [SF2] OUTPUT button.

[VOICE] → Normal Voice selection → [EDIT] → Element selection → [F1] OSC → [SF2] OUTPUT

NOTE When a confirmation message (page 26) or Control Function window (page 42) is shown in the display, press the [EXIT] button to exit from that condition, then execute the instructions as in the above example. Likewise, press the [REMOTE] button to exit from the Remote Control mode, then execute the instructions as in the above example when the S90 ES is in the Remote Control mode.

The Controls & Connectors

Front Panel
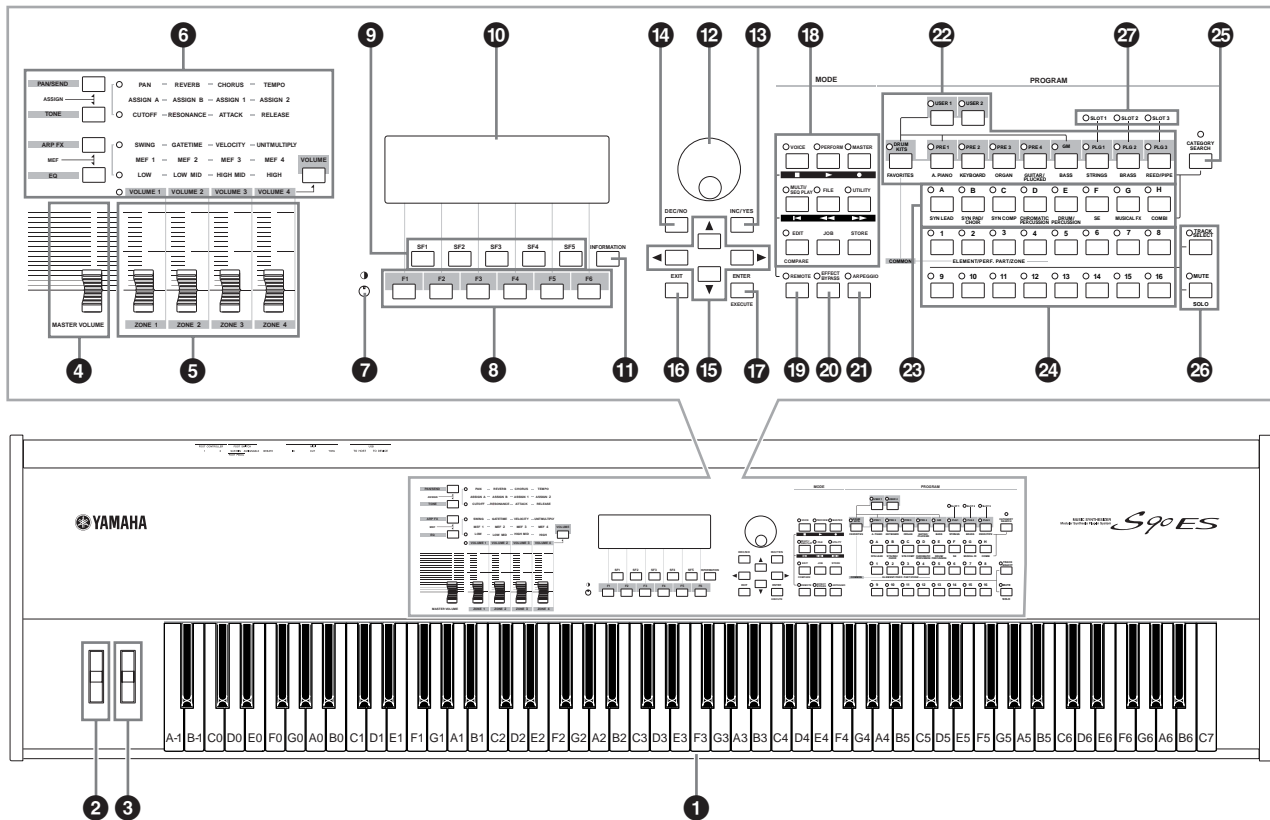
[NOTE] When setting the following parameter to "0," each key corresponds to the note name shown in the illustrations. [UTILITY] → [F1] GENERAL → [SF2] KBD → Octave. Refer to this illustration when setting parameters having note name values, such as Note Limit.

❶ Keyboard
The keyboard is equipped with a touch response feature (both initial touch and aftertouch). With initial touch, the instrument senses how strongly or softly you play the keys, and uses that playing strength to affect the sound in various ways, depending on the selected voice. With aftertouch, the instrument senses how much pressure you apply to the keys while playing, and uses that pressure to affect the sound in various ways, depending on the selected voice.
Moreover, any of a variety of functions can be assigned to aftertouch for each voice (page 62).

❷ Pitch bend wheel   Page 41
Controls the pitch bend effect. You can also assign other functions to this controller.

❸ Modulation wheel   Page 41
Controls the modulation effect. You can also assign other functions to this controller.

❹ [MASTER VOLUME] slider
Adjusts the master volume. Move the slider upwards to raise the output level from the OUTPUT L/R jacks and the PHONES jack.

❺ Control sliders 1 - 4   Page 42
These four highly versatile sliders let you adjust various aspects or parameters of the current Voice. Use the Control function buttons above to change the parameter set for the Control sliders.

[NOTE] If all of the Control sliders are set to the minimum, you may not hear any sound from the instrument, even when playing the keyboard. If this is the case, raise all the sliders to a suitable level.

[NOTE] The [MASTER VOLUME] slider adjusts the output level from this instrument. On the other hand, the volume adjustment by Control slider adjusts the MIDI volume value for the corresponding Element or Part.

❻ Control function buttons   Page 43
Use the Control function buttons to change the parameter set for the Control sliders.

❼ LCD Contrast control   Page 10
Use this control to set the LCD display for optimum legibility.

❽ [F1] - [F6] (Function) buttons   Page 23
These buttons located directly below the LCD display call up the corresponding functions indicated in the display. In the display hierarchy, these functions [F] rank just below the modes.

❾ [SF1] - [SF6] (Sub Function) buttons   Page 23

These buttons located directly below the LCD display call up the corresponding sub functions indicated in the display. In the display hierarchy, these sub functions [SF] rank just below the functions [F].

These buttons can be also used to store/recall the Arpeggio type in each Play mode. (page 39)

❿ LCD Display

The large backlit LCD displays the parameters and values related to the currently selected operation or mode.

⓫ [INFORMATION] button   Page 27

For calling up a special "help" feature that shows information about the currently selected mode. You can go back to the previous display by pressing this button again or pressing any other button.

Depending on the selected display, this button may be used to call up a window for inputting characters (page 27), or for selecting keys (page 53).

⓬ Data dial   Page 25

For editing 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.

⓭ [INC/YES] button   Page 25

For increasing the value of the currently selected parameter. Also use it to actually execute a Job or a Store operation.

⓮ [DEC/NO] button   Page 25

For decreasing the value of the currently selected parameter. Also use it to cancel a Job or a Store operation.

NOTE You can also use the [INC/YES] and [DEC/NO] buttons to quickly move through parameter values in 10-unit jumps, especially those with large ranges. Simply hold down one of the buttons (of the direction you want to jump), and simultaneously press the other. For example, to jump in the positive direction, hold down the [INC/YES] button and press [DEC/NO].

⓯ Cursor buttons   Page 25

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

⓰ [EXIT] button   Page 22

The menus and displays of this synthesizer 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.

⓱ [ENTER] button

Use this button to execute a Job or a Store operation. Also use this button to actually enter a number when selecting a Memory or Bank for Voice or Performance. In the File mode, use this button to go to the next lowest level in the selected directory.

NOTE In the File mode, the [EXIT] and [ENTER] buttons may be used to move folders in the USB storage device.

⓲ MODE buttons   Page 22

These buttons select the operating modes (e.g., Voice mode).

⓳ [REMOTE] button   Page 78

The Remote mode lets you control sequencer software on your computer from the panel controls of the instrument. Turn the [REMOTE] button on to enter the Remote mode.

NOTE When setting the MIDI IN/OUT parameter to "MIDI" ([UTILITY] → [F5] MIDI → [SF4] OTHER) or setting both of Mode A and Mode B to "off" ([UTILITY] → [F4] CTL ASN → [SF4] REMOTE), you cannot enter the Remote mode even by pressing the [REMOTE] button. Set these parameters to appropriate values (page 78) then enter the Remote mode.

⓴ [EFFECT BYPASS] button   Page 119

The extensive effect section of the instrument provides Insertion effects (eight sets, with two effect units per set), System effects (Reverb and Chorus), and Master effects.

The [EFFECT BYPASS] button enables you to turn the corresponding effect blocks on or off with a single touch. From the following display, you can select the specific effect(s) to be bypassed when the [EFFECT BYPASS] button. [UTILITY] → [F1] GENERAL → [SF3] EF BYPS display

NOTE If you install an optional Effect Plug-in Board (PLG100-VH), Plug-in Insertion effects can also be used (page 103).

㉑ [ARPEGGIO] button   Page 39

Press this button to enable or disable playback of the Arpeggio for each Voice, Performance, Multi. If the Arpeggio Switch of the selected part is set to off in the Performance/Multi mode, however, pressing this button has no effect.

㉒ Bank buttons   Pages 30, 32

Each button selects a Voice Bank. When the [CATEGORY SEARCH] button is turned on, these buttons can be used to select the desired category (printed below each button).

㉓ Group [A] - [H] buttons   Pages 31, 32

Each button selects a Voice or Performance Group. When the [CATEGORY SEARCH] button is turned on, these buttons can be used to select the desired category (printed below each button).

㉔ Number [1] - [16] buttons

Use of these buttons differs depending on the on/off status of the [TRACK SELECT] and [MUTE] buttons.

㉕ [CATEGORY SEARCH] button   **Page 32**

When this button is turned on, the lower row of Bank buttons (labeled A.PIANO—REED/PIPE below the buttons) and the Group buttons can be used to select the Voice/Performance category.

㉖ [TRACK SELECT] button   **Page 104**
[MUTE] button   **Page 105**

The buttons enable you to switch the function of Number [1] - [16] buttons. For details, see the "㉔ Number [1] - [16] buttons."

㉗ SLOT 1 - 3 lamps   **Page 99**

These three lamps show the installation status of the Plug-in Boards. If the Plug-in Board has been correctly installed, the corresponding SLOT lamp will light.

▶ NOTE The Vocal Harmony Plug-in Board (PLG100-VH) can be installed only to slot 1.

▶ NOTE The Multi part Plug-in Board (PLG100-XG) can be installed only to slot 3.

■ Functions of the Number [1] - [16] buttons

	When [TRACK SELECT] button is on	When [MUTE] button is on	When both [TRACK SELECT] and [MUTE] buttons are off
Voice Play mode	Keyboard transmit channel setting	—	Voice selection, according to Groups A - H
Voice Edit mode	Element selection (1 - 4) and Element Mute setting (9 - 12)		—
Performance Play mode	Keyboard transmit channel setting	Performance Part Mute setting (1 - 4)	Performance or Voice selection (if cursor is located at Voice name), according to Groups A - H
Performance Edit mode	Performance part selection (1 - 4)		
Master Play mode	Keyboard transmit channel setting (when memorizing the Voice mode or Performance mode to the current Master) or Multi Part selection (when memorizing the Multi mode to the current Master)	Part Mute setting (when registering a Performance or a Multi)	Master selection, according to Groups A - H
Master Edit mode	Zone selection (1 - 4)	—	—
Multi Play mode	Part selection	Part Mute setting	Multi or Voice selection (if cursor is located at Voice name), according to Groups A - D
Multi Edit mode			
Sequence Play mode	Keyboard transmit channel setting	Part Mute setting	—
Multi Voice Edit mode	Element selection (1 - 4) and Element Mute setting (9 - 12)		—

Rear Panel
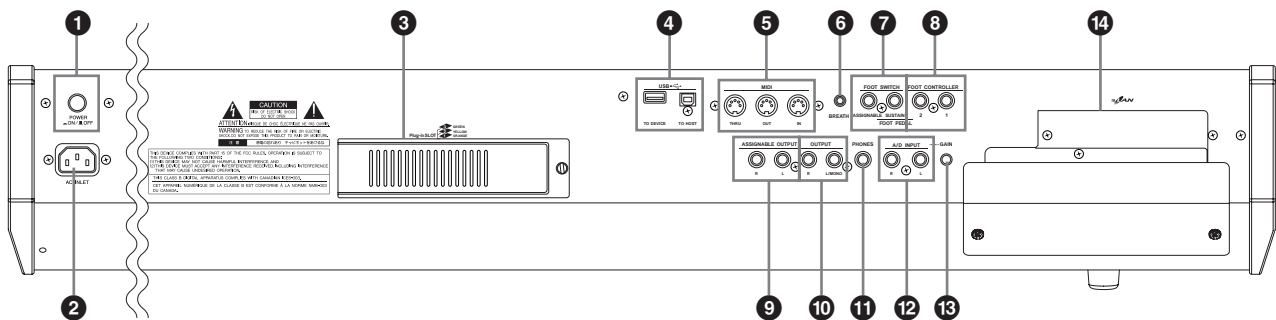
❶ POWER Switch

Use this to switch the synthesizer on or off.

❷ AC INLET (AC Power Cord Socket)   **Page 8**

Be sure the plug the AC power cord into this socket before plugging the power cord into an AC outlet. Use only the AC power cord supplied with the S90 ES.

❸ Plug-in Board Slots 1 - 3 (Plug-in Boards cover)

     Page 184

Installing an optional Plug-in Board to the S90 ES lets you greatly expand the sonic palette of the instrument. Up to three boards can be installed to the S90 ES's rear panel.

❹ USB connectors   **Page 67**

This instrument is equipped with two types of USB connectors on the rear panel—USB TO HOST and USB TO DEVICE. The USB TO HOST connector is used to connect this instrument to the computer via the USB cable. The USB connection between the instrument and the computer can only be used for transfer of MIDI data. Unlike MIDI, USB can handle multiple ports via a single cable. The USB connection can only be used for transfer of MIDI data. No audio data can be transferred via USB.

The USB TO DEVICE connector is used to connect this instrument to a USB storage device (hard disk drive, CD-ROM drive, MO drive, flash disk, etc.) via the USB cable. This lets you save the data created on this

instrument to the external USB storage device and load the data from the external USB storage device to the instrument. Save and Load operations are executed in the File mode. (Pages 50, 56, 76)

NOTE For details about USB, see page 20 .

> **USB**
>
> USB is an abbreviation for Universal Serial Bus. It is a serial interface for connecting a computer with peripheral devices, and enables much faster data transfer compared to conventional serial port connections.

❺ MIDI IN/OUT/THRU connectors   Page 65

MIDI IN receives MIDI messages from an external MIDI device. Use this connector to control the synthesizer from an external MIDI device. MIDI OUT is for transmitting all control, performance and playback data from the S90 ES to another MIDI device, such as an external sequencer.
You can also play the external tone generator by using the S90 ES and control the external MIDI device.

MIDI THRU is simply for redirecting any received MIDI data (via MIDI IN) to connected devices, allowing convenient chaining of additional MIDI instruments.

❻ BREATH Controller jack   Page 59

Connect an optional breath controller BC3 here. You can use the Breath Controller to change the output level or tone of the sounds according to the strength of your breath.

❼ FOOT SWITCH jacks   Page 59

For connection of optional FC3, FC4 or FC5 Footswitches.
When connected to the SUSTAIN jack, the Footswitch controls sustain.
When connected to ASSIGNABLE, it can control one of various different assignable functions.

NOTE The SUSTAIN jack can be used with the FC3, FC4, or FC5. The ASSIGNABLE jack can be used with the FC4 or FC5.

❽ FOOT CONTROLLER 1 and 2 jacks   Page 59

An optional foot controller (FC7, etc.) can be connected here. Each jack lets you continuously control one of various different assignable functions — such as volume, tone, pitch, or other aspects of the sound.

❾ ASSIGNABLE OUT L and R jacks   Page 63

Line level audio signals are output from this instrument via these phone jacks (1/4" mono phone plug).
These outputs are independent of the main output (at the L/MONO and R jacks below), and can be freely assigned to any of the Drum Voice keys or the Parts. This lets you route specific Voices or sounds for processing with a favorite outboard effect unit.
The parts which can be assigned to these jacks are as follows:

• Drum Voice key to which the drum/percussion instrument is assigned
• Any Part of a Performance*
• Any Part of a Multi*

* Including the Audio Input Part

❿ OUTPUT L/MONO & R jacks   Pages 9, 63

Line level audio signals are output via these phone jacks. For monophonic output, use just the L/MONO jack.

⓫ PHONES jack   Page 9

For connection to a pair of stereo headphones.

⓬ A/D INPUT jacks   Page 38

External audio signals can be input via these phone jacks (1/4" mono phone plug). Various devices such as microphone, guitar, bass, CD player, synthesizer can be connected to these jacks and their audio input signal can be sounded as the AUDIO IN part of the Performance or Multi.
For stereo signals (such as from audio equipment), use both jacks. For mono signals (such as from a microphone or guitar), use only the L jack.

⓭ GAIN knob   Page 38

For adjusting the input gain of the audio at the A/D INPUT jacks (above). Depending on the connected device (microphone, CD player, etc.), you may need to adjust this for optimum level.

⓮ mLAN expansion board (mLAN16E) cover   Pages 88, 184

The mLAN expansion board (mLAN16E) sold separately can be installed to this instrument.
With the mLAN16E board, you can conveniently and easily hook up your S90 ES to other mLAN compatible instruments or devices.

■ **When the optional mLAN16E has been installed:**
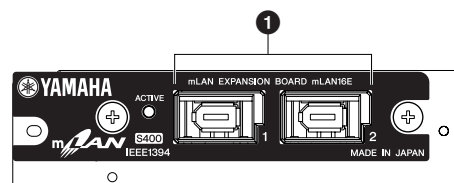
NOTE The illustration above shows the panel of the mLAN16E expansion board with the included sticker label affixed. Make sure to attach this label to the mLAN16E (page 187).

❶ mLAN (IEEE1394) connectors 1, 2

For connecting mLAN devices or IEEE1394-compatible devices via IEEE1394 standard (6-pin) cables.

> **mLAN**
>
> "mLAN" is a digital network designed for musical applications. It uses and extends the industry standard IEEE 1394 high performance serial bus.

* The name "mLAN" and its logo (above) are trademarks.

Using USB storage devices

When using USB storage devices, make sure to connect them to the USB TO DEVICE connector, and follow the important precautions below.

■ Compatible USB devices

Connect only a USB storage device (such as hard disk, CD-ROM, flash disk and other drives) to the USB TO DEVICE connector. Other devices such as a computer keyboard or mouse cannot be used.

Both bus-powered (powered by the host device) or self powered (battery or external power supply) types can be used.

The S90 ES does not necessarily support all commercially available USB storage devices. Yamaha cannot guarantee operation of USB storage devices that you purchase. Before purchasing USB storage devices, please consult your Yamaha dealer, or an authorized Yamaha distributor (see list at end of the Owner's Manual) for advice, or see the following website:

http://www.yamahasynth.com/

n **NOTE** Although CD-R/W drives can be used to load data to the instrument, they cannot be used for saving data. However, you can transfer data to a computer and save data to a CD using the CD-R/W drive on the computer.

■ Formatting USB storage media

When a USB storage device is connected or media is inserted, a "USB device unformatted." message may appear in the LCD display, indicating that the device or media must be formatted for use. Execute the Format operation in the File mode (Page 168).

Precautions when using the USB TO DEVICE connector

Never turn the USB device's power on/off and never plug/unplug the USB cable when the connected USB storage device is the self powered type. Doing so may result in the operation of the synthesizer "freezing" or hanging up.

While the instrument is accessing data (such as in the Save, Load and Delete operations in the File mode), do NOT unplug the USB cable, do NOT remove the media from the device, and do NOT turn the power off to either device. Doing so may corrupt the data on either or both devices.

■ To protect your data (Write-protect):

To prevent important data from being inadvertently erased, apply the write-protect provided with each storage device or media.

If you are saving data to the USB storage device, make sure to remove the write-protect.

USB connector types

There are two different types of USB connectors, and the rear panel of the instrument features both. Take care not to confuse the two.
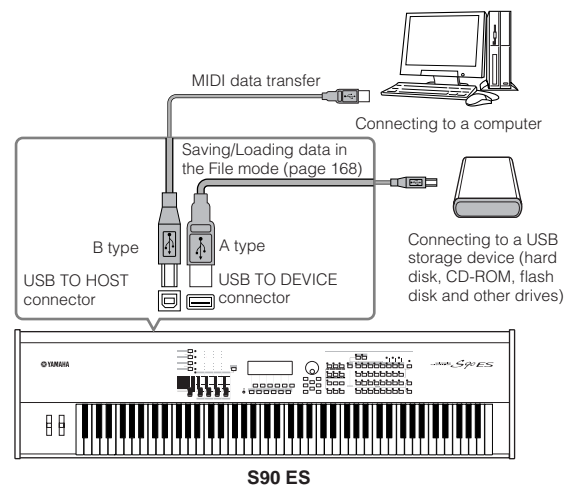
USB TO HOST connector

This type is used to connect the instrument to a computer, and allows you to transfer MIDI data between the devices. The USB connection between the instrument and the computer can only be used for transfer of MIDI data. Unlike MIDI, USB can handle multiple ports via a single cable.

USB cables have different connectors on each end: the A type and the B type. Connect the A type to your computer and the B type to the USB TO HOST connector.

USB TO DEVICE connector

This type is used to connect the instrument to a USB storage device, and allows you to save data you've created to the connected device, as well as load data from the connected device. This lets you save the data created on this instrument to the external USB storage device and load the data from the external USB storage device to the instrument. Save and Load operations are executed in the File mode (page 168). USB cables have different connectors on each end: the A type and the B type. Connect the A type to the USB TO DEVICE connector and the B type to the USB storage device.

MIDI data transfer

Connecting to a computer

Saving/Loading data in the File mode (page 168)

Connecting to a USB storage device (hard disk, CD-ROM, flash disk and other drives)

B type   A type

USB TO HOST connector   USB TO DEVICE connector

S90 ES

n **NOTE** The computer cannot access the USB storage device connected to the S90 ES's USB TO DEVICE connector, even if connecting as shown above. Only from the File mode on the instrument itself can you access the data on the USB storage device connected to the USB TO DEVICE connector.

n **NOTE** Though the S90 ES supports the USB 1.1 standard, you can connect and use a USB 2.0 storage device with the S90 ES. However, note that the transfer speed complies to USB 1.1.

Basic Operation

In this section you'll learn about the fundamental operations of the S90 ES—the use of the panel controls and how to execute basic functions such as selecting programs, naming programs/files, and using the keyboard to directly enter certain values.

This section starts off with the Factory Set operation, which allows you to restore the instrument to its original condition—in case you've inadvertently changed any important settings.

Restoring the Factory-programmed S90 ES

The S90 ES has a Factory Set function for restoring your S90 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.

⚠ **CAUTION**

Keep in mind that once you edit any settings, the corresponding factory defaults will be overwritten and lost. Make sure you are not overwriting any important data. You should back up any important data to the USB device beforehand (page 126).

1. **Press the [UTILITY] button to enter the Utility mode (the indicator lights).**

2. **Press the [JOB] button to enter the Utility Job mode.**
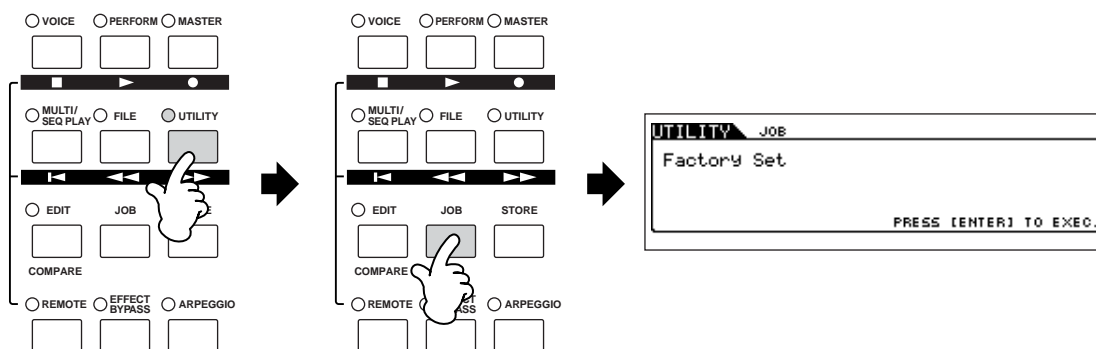
3. **Press the [ENTER] button. (The display prompts you for confirmation.)**
To return to the original display, press the [DEC/NO] button.
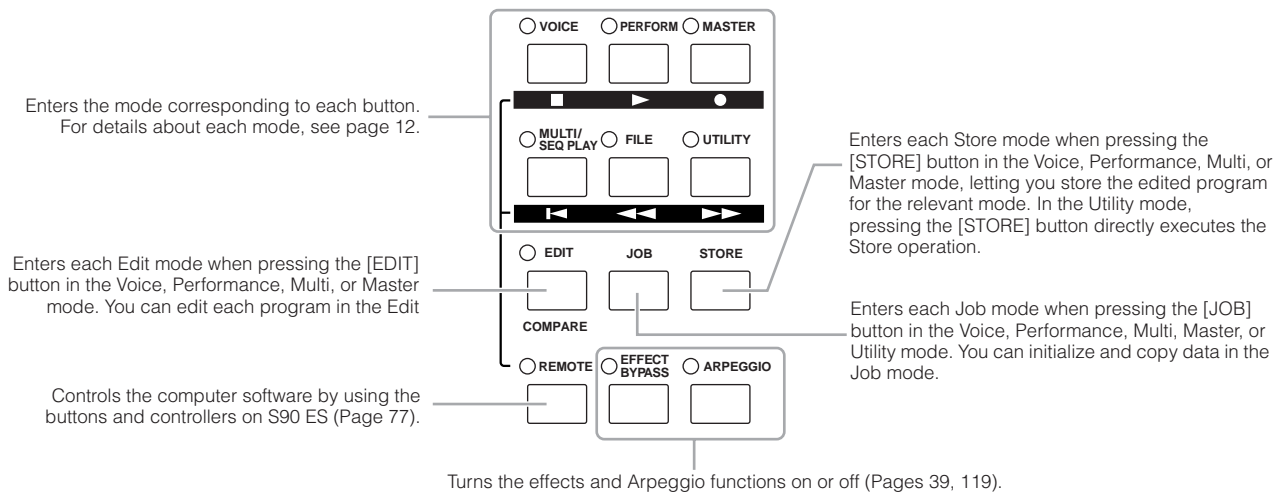To execute the Factory Set, press the [INC/YES] button.

4. **After the Factory Set has been completed, a "Completed" message appears and operation returns to the original display.**

⚠ **CAUTION**

For Factory Set operations that take longer to process, you will see the message "Executing…" or "Please Keep Power On!" during processing. Do not switch the power off while this message is on the display. Turning the power off in this state results in loss of all user data and may cause the system to freeze. This means that this synthesizer may not be able to start up properly, even when turning the power on next time.

⊅ NOTE All settings in the Utility mode that are related to the Plug-in boards are stored only to the memory on those respective boards, and not to the memory of this synthesizer. Because of this, the Factory Set operation cannot be used to restore settings for those devices.

Functions of the MODE buttons

Basic Operation

Enters the mode corresponding to each button. For details about each mode, see page 12.

Enters each Store mode when pressing the [STORE] button in the Voice, Performance, Multi, or Master mode, letting you store the edited program for the relevant mode. In the Utility mode, pressing the [STORE] button directly executes the Store operation.

Enters each Edit mode when pressing the [EDIT] button in the Voice, Performance, Multi, or Master mode. You can edit each program in the Edit

Enters each Job mode when pressing the [JOB] button in the Voice, Performance, Multi, Master, or Utility mode. You can initialize and copy data in the Job mode.

Controls the computer software by using the buttons and controllers on S90 ES (Page 77).

Turns the effects and Arpeggio functions on or off (Pages 39, 119).

Mode table

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

Mode		Function	How to enter the mode
Voice mode	Play mode	Playing a Voice	[VOICE]
	Edit mode	Editing/Creating a Voice	[VOICE] → [EDIT]
	Job mode	Initializing a Voice, etc.	[VOICE] → [JOB]
	Store mode	Storing a Voice to internal memory	[VOICE] → [STORE]
Performance mode	Play mode	Playing a Performance	[PERFORM]
	Edit mode	Editing/Creating a Performance	[PERFORM] → [EDIT]
	Job mode	Initializing a Performance, etc.	[PERFORM] → [JOB]
	Store mode	Storing a Performance to internal memory	[PERFORM] → [STORE]
Multi mode	Play mode	Playing a Multi	[MULTI/SEQ PLAY]
	Edit mode	Editing/Creating a Multi	[MULTI/SEQ PLAY] → [EDIT]
	Job mode	Initializing a Multi, etc.	[MULTI/SEQ PLAY] → [JOB]
	Store mode	Storing a Multi to internal memory	[MULTI/SEQ PLAY] → [STORE]
Master mode	Play mode	Playing a Master	[MASTER]
	Edit mode	Editing/Creating a Master	[MASTER] → [EDIT]
	Job mode	Initializing a Master, etc.	[MASTER] → [JOB]
	Store mode	Storing a Master to internal memory	[MASTER] → [STORE]
Sequence Play mode	Play mode	Playing back MIDI files	[MULTI/SEQ PLAY]
Job mode	Utility mode	Setting system related parameters	[UTILITY]
	Job mode	Restoring factory defaults	[UTILITY] → [JOB]
File mode	File mode	Managing files and folders (directories)	[FILE]

NOTE Pressing the [MULTI/SEQ PLAY] button toggles between the Multi mode and Sequence Play mode.
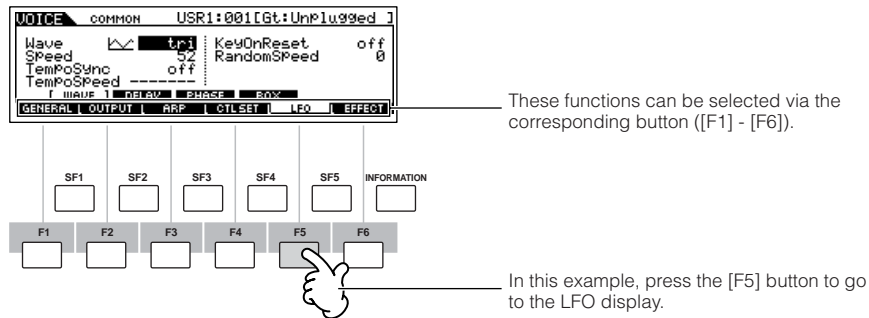
■ How to leave the current display

For most operations or displays, pressing the [EXIT] button will let you leave the current display and return you to the previous one. You can return back to each Play mode by pressing the [EXIT] button several times in the respective mode.
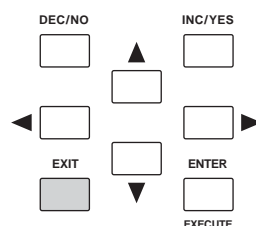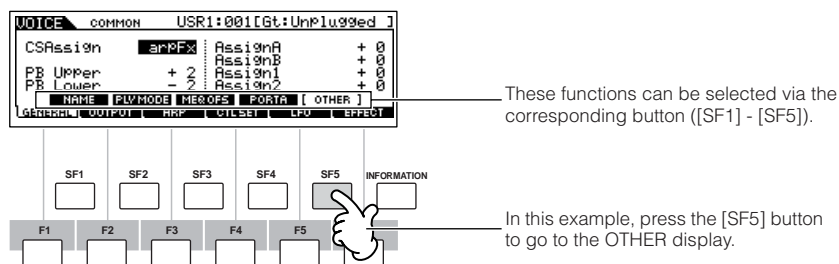
Functions and Sub-Functions

Each mode described above contains various displays, with various functions and parameters. To navigate your way through these displays and select a desired function, use the [F1] - [F6] buttons and the [SF1] - [SF5] buttons. When you select a mode, the available displays or menus appear directly above the buttons at the bottom of the display (as shown below).

Using the Function buttons [F1] - [F6]

These functions can be selected via the corresponding button ([F1] - [F6]).

In this example, press the [F5] button to go to the LFO display.

Depending on the currently selected mode, up to six functions are available and can be called up with the [F1] - [F6] buttons. Keep in mind that the available functions differ depending on the selected mode.

Using the Sub-Function buttons [SF1] - [SF5]

These functions can be selected via the corresponding button ([SF1] - [SF5]).

In this example, press the [SF5] button to go to the OTHER display.

Depending on the currently selected mode, up to five functions (sub-functions) are available and can be called up with the [SF1] - [SF5] buttons. Keep in mind that the available functions differ depending on the selected mode. (Some displays may not have any sub-functions for these buttons.)
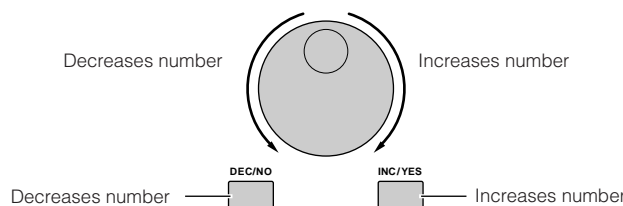
Selecting a Program

In order to play the S90 ES you'll need to call up one of its programs, i.e., a Voice, Performance, Multi, or Master. These programs can be selected in each Play mode via the same procedure.

### ■ Using the [INC/YES], [DEC/NO] buttons and the data dial

The [INC/YES] and [DEC/NO] buttons let you step up or down through the program numbers in any of the Play modes (Voice, Performance, Multi, and Master).
Rotating the data dial to the right (clockwise) increases the program number, while rotating it to the left (counter-clockwise) decreases it. This control works in the same way as the [INC/YES] and [DEC/NO] buttons, but lets you scroll through the programs more quickly.

Decreases number   Increases number
Decreases number   Increases number

■ Using the Group, Number buttons

As shown below, you can select a program number by pressing any of the Group [A] - [H] buttons and pressing any of the Number [1] - [16] buttons.
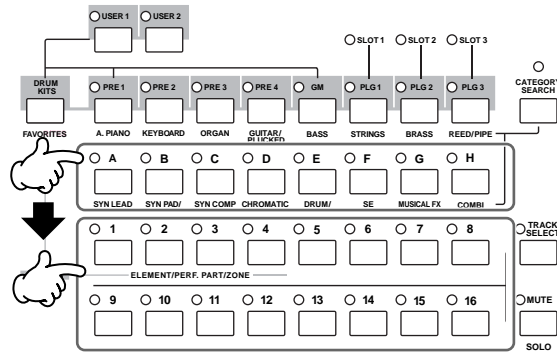
📝 **NOTE** The convenient Category Search function (page 32) lets you easily locate and select the Voices or Performance you want by type.

The Voice program numbers and the corresponding Group/Numbers are listed below.

Program Number	Group	Number	Program Number	Group	Number	Program Number	Group	Number	Program Number	Group	Number
001	A	1	033	C	1	065	E	1	097	G	1
002	A	2	034	C	2	066	E	2	098	G	2
003	A	3	035	C	3	067	E	3	099	G	3
004	A	4	036	C	4	068	E	4	100	G	4
005	A	5	037	C	5	069	E	5	101	G	5
006	A	6	038	C	6	070	E	6	102	G	6
007	A	7	039	C	7	071	E	7	103	G	7
008	A	8	040	C	8	072	E	8	104	G	8
009	A	9	041	C	9	073	E	9	105	G	9
010	A	10	042	C	10	074	E	10	106	G	10
011	A	11	043	C	11	075	E	11	107	G	11
012	A	12	044	C	12	076	E	12	108	G	12
013	A	13	045	C	13	077	E	13	109	G	13
014	A	14	046	C	14	078	E	14	110	G	14
015	A	15	047	C	15	079	E	15	111	G	15
016	A	16	048	C	16	080	E	16	112	G	16
017	B	1	049	D	1	081	F	1	113	H	1
018	B	2	050	D	2	082	F	2	114	H	2
019	B	3	051	D	3	083	F	3	115	H	3
020	B	4	052	D	4	084	F	4	116	H	4
021	B	5	053	D	5	085	F	5	117	H	5
022	B	6	054	D	6	086	F	6	118	H	6
023	B	7	055	D	7	087	F	7	119	H	7
024	B	8	056	D	8	088	F	8	120	H	8
025	B	9	057	D	9	089	F	9	121	H	9
026	B	10	058	D	10	090	F	10	122	H	10
027	B	11	059	D	11	091	F	11	123	H	11
028	B	12	060	D	12	092	F	12	124	H	12
029	B	13	061	D	13	093	F	13	125	H	13
030	B	14	062	D	14	094	F	14	126	H	14
031	B	15	063	D	15	095	F	15	127	H	15
032	B	16	064	D	16	096	F	16	128	H	16

📝 **NOTE** When selecting a Voice, it is necessary to press one of the Bank buttons before pressing the Group and Number buttons.

📝 **NOTE** The amount of numbers differ depending on the program. For example, while the selected number range of the Normal Voice, Performance, and Master is 001 - 128, the selected number range of the Multi is 001 - 064.

About the editing functions

In this section, we'll explain the basic operations for editing the Voice, Performance, Multi settings.

Moving the Cursor and Setting Parameters

Moving the cursor
Use these four buttons to navigate the display, moving the cursor around the various selectable items and parameters in the screen. When selected, the relevant item is highlighted (the cursor appears as a dark block with inverse characters). You can change the value of the item (parameter) at which the cursor is located by using the data dial, [INC/YES] and [DEC/NO] buttons.
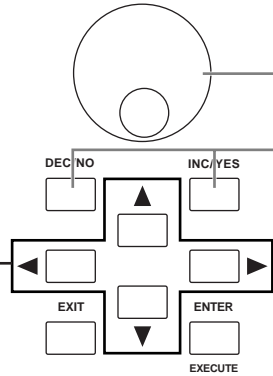
Changing (editing) parameter values
Rotating the data dial to the right (clockwise) increases the value, while rotating it to the left (counter-clockwise) decreases it.
For parameters with large value ranges, you can increase the value by 10 by simultaneously holding down the [INC/YES] button and pressing the [DEC/NO] button. To decrease by 10, do the opposite; simultaneously hold down the [DEC/NO] button and press the [INC/YES] button.

DEC/NO   INC/YES

EXIT   ENTER
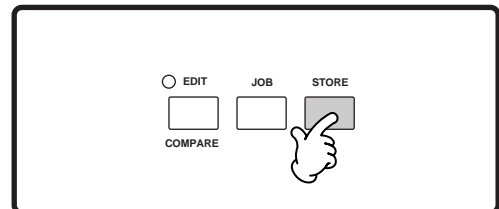
EXECUTE

Edit Indicator

You can adjust or set various parameters by using the data dial, [INC/YES] button, [DEC/NO] button, and Control sliders in each mode.
When changing the value of the parameter in the Voice, Performance, and Multi modes, the [E] (Edit Indicator) will appear on the top left corner of the LCD display. This indicates that the current program (Voice, Performance, or Multi) has been modified but not yet stored. If you wish to store your sound obtained by edit operation, be sure to store the current program to internal memory in the Store mode before selecting another program (pages 50, 56, 76).

Edit Indicator

VOICE [E]   TCH= 1
USR1:001(A01)   OCT:+0
Gt:UnPlugged
AS A AEG-DcyAS B AEG-SusAS1 EfEQL-GAS2 ChoSend
(ARP1♪) (ARP2♪) (ARP3♪) (ARP4♪) (ARP5♪)
PLAY   EFFECT PORTA   EG   ARP
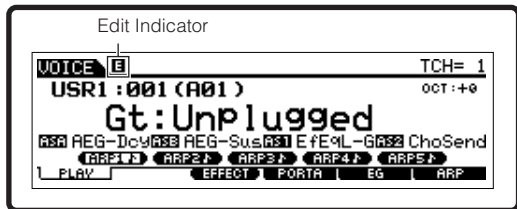
If the Edit Indicator appears...

○ EDIT   JOB   STORE

COMPARE

Compare Function

● ●

This convenient function lets you switch between the edited sound and its original, unedited condition—allowing you to listen to the difference between the two and better hear how your edits affect the sound.

For example, when editing a Voice in the Voice Edit mode, the "E" Edit indicator is shown. Pressing the [EDIT] button in this condition reverts to the original unedited sound (the button lamp flashes and the "C" Compare indicator is shown). Press the [EDIT] button again to return to the edited sound (page 104).
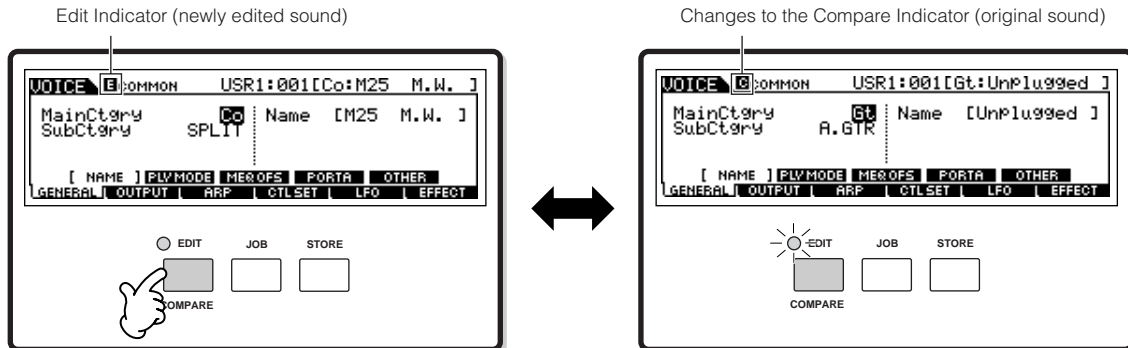
Edit Indicator (newly edited sound)

Changes to the Compare Indicator (original sound)

Edit Recall Function

● ●

If you are editing a program and select a different program without storing your edited one, all the edits you've made will be erased. However, the edited program is maintained in a backup memory location for the Edit Recall function. To restore the lost data with your latest edits intact, use the Edit Recall function in the Job mode (page 104).

| Job mode	How to call up the Edit Recall display
Voice	[VOICE] → [JOB] → [F2] RECALL
Performance	[PERFORM] → [JOB] → [F2] RECALL
Multi	[MULTI/SEQ PLAY] → [JOB] → [F2] RECALL

Confirmation Message

When you execute certain operations, such as those in the Job, Store, and File modes, a confirmation message appears.
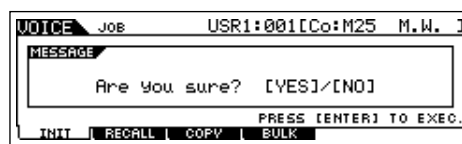
This lets you actually execute the operation or cancel it if desired. If a confirmation message (like the one illustrated above) appears, press the [INC/YES] button to execute the operation or press the [DEC/NO] button to cancel it.

Information Display

This convenient function lets you call up relevant details about the selected mode—simply by pressing the [INFORMATION] button. For example, when the Voice mode is active, you can quickly check information about which voice bank is selected, what Play mode (poly or mono) is being used, which effects are applied, and so on.
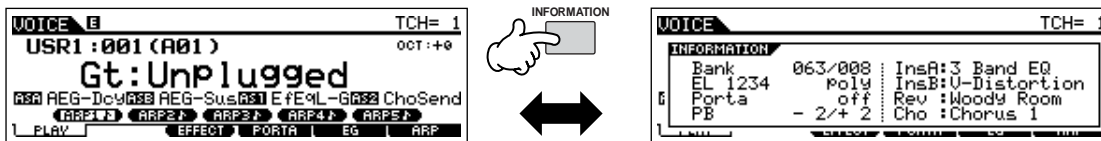
Note (Key) settings

Several parameters let you set a key range for a function—for example, in setting up a keyboard split—by specifying certain note values. You can use the [INC/YES] and [DEC/NO] buttons or data dial to set these parameters, or you can directly enter the values from the keyboard by pressing the appropriate keys (as shown below).
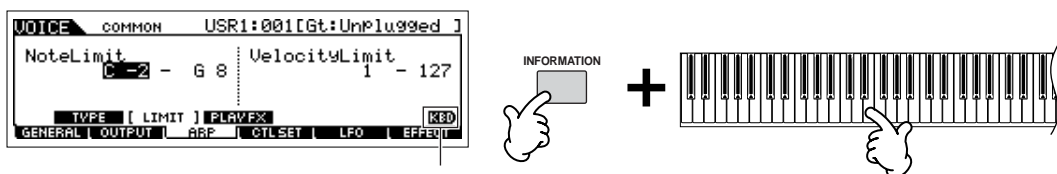
When Note Limit is selected, the [KBD] mark appears, indicating that you can use the keyboard to set the value. Simultaneously hold down the [INFORMATION] button and press the appropriate key.

NOTE About the note name assigned to each key, see page 16.

Naming

You can freely name data you've created, such as voices and files saved to the USB storage device. The chart below lists the types of data that can be named along with the operations for calling up the respective naming displays.

| Data types that can be named	How to call up the naming display	Page
Voice	[VOICE] → [EDIT] → [F1] GENERAL → [SF1] NAME	128
	[MULTI/SEQ PLAY] → [F3] VOICE → Normal Voice Selection → [F5] VCE ED	161
Performance	[PERFORM] → [EDIT] → [F1] GENERAL → [SF1] NAME	150
Multi	[MULTI/SEQ PLAY] → [EDIT] → [F1] GENERAL → [SF1] NAME	158
Master	[MASTER] → [EDIT] → [F1] NAME	173
Volume Label of the USB storage device	[FILE] → [F1] CONFIG → [SF3] FORMAT	168
File/Folder saved to the USB storage device	[FILE] → [F2] SAVE or [F4] RENAME	168

First, call up the name input display according to the above table, then, move the cursor by using the Cursor button to the desired location and input a character. See below for details.

NOTE Since the name of the program is part of the data, make sure that you properly save the program after naming it.
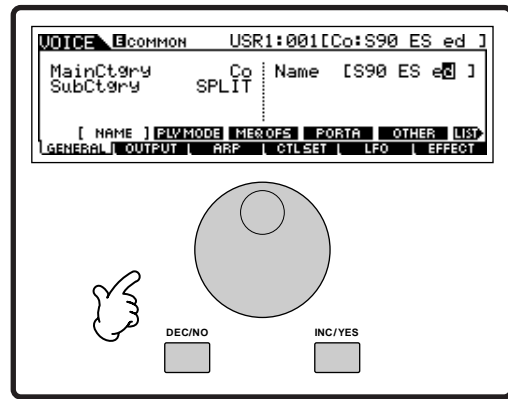
■ Basic naming operation

As shown below, you can set the name by repeating the two operations—moving the cursor to the desired location by using the Cursor button and selecting a character by using the data dial, [INC/YES] button, and [DEC/NO] button.

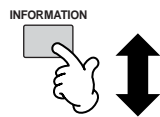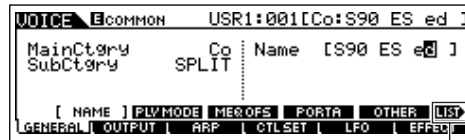Moving the cursor to the desired location on the name
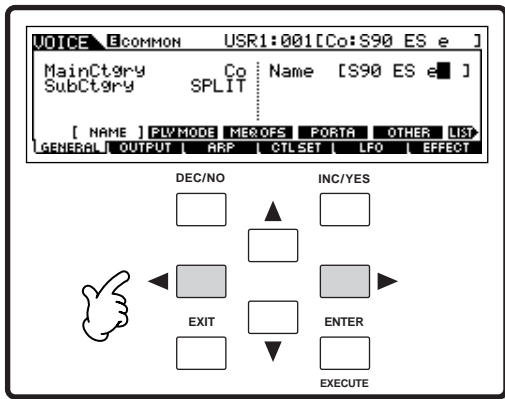
Selecting a character at the cursor location

■ Using the character list

If you find it difficult to select the desired characters with the above method, you may want to use the following method — selecting the characters from a list.

When the cursor is located at the Name, this [LIST] icon appears and you can call up the Character List display by holding the [INFORMATION] button. Release the [INFORMATION] button to return back to the original display.

Perform the operations below while holding the [INFORMATION] button.

Move the cursor to the desired location.

Select a character for the cursor location on the name.

Basic Operation
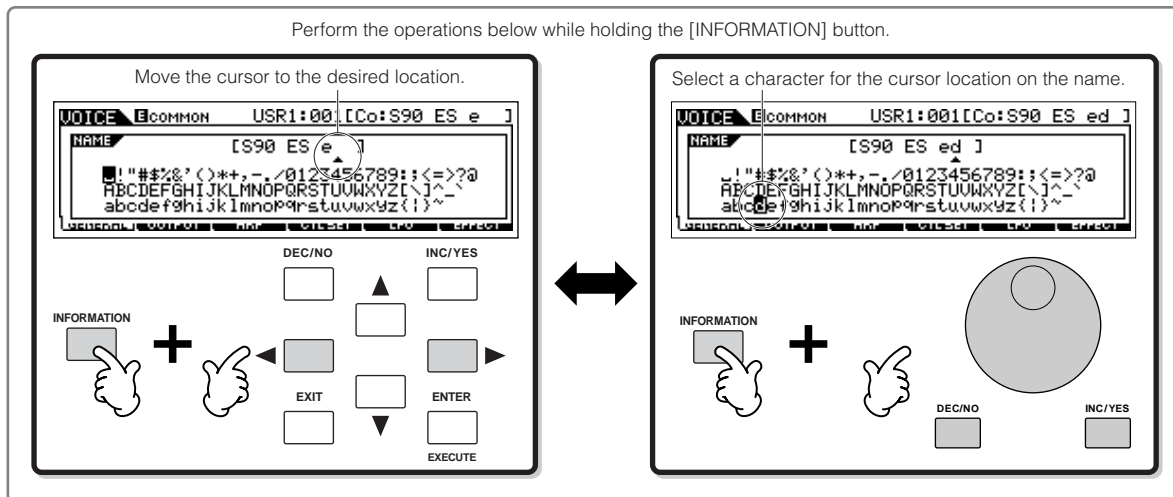
Quick Guide

Playing the Demo Songs

Several demo songs are included with this synthesizer. In this section, you'll learn how to play them back.

♪ NOTE Make sure the synthesizer is ready for playback. Details are given in the section "Setting up and Playing" on page 8.

---
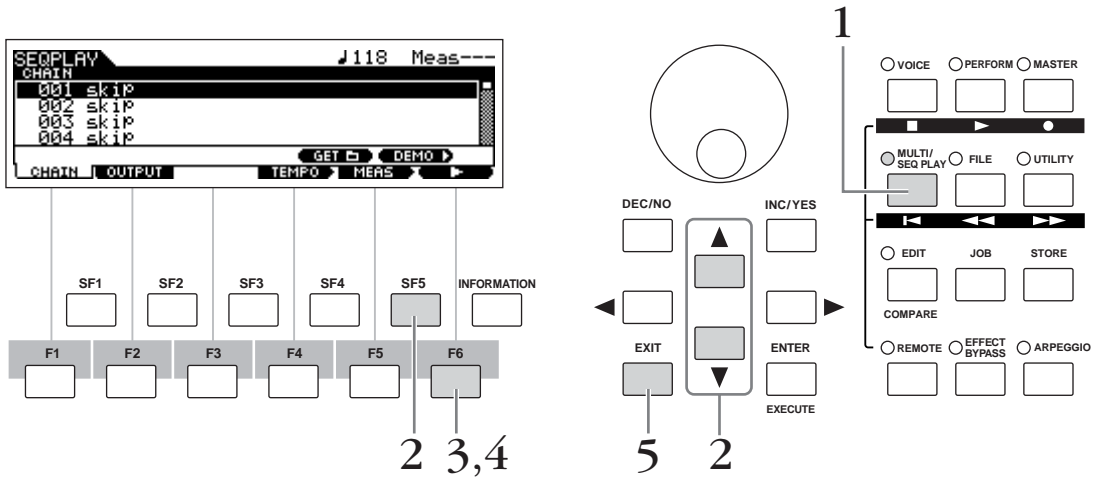
1 **Press the [MULTI/SEQ PLAY] button to enter the Sequence Play mode.**

If the following display does not appear, press the [MULTI/SEQ PLAY] button again.
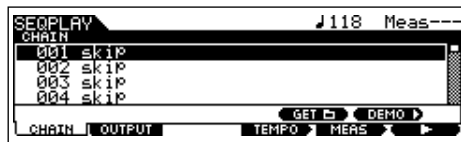
2 **Press the [SF5] DEMO button to call up the Demo songs.**

♪ NOTE You can select the first song for playback by using the [▲][▼] buttons.

3 **Press the [F6] ► button to start playback of the Demo song.**

♪ NOTE You can also specify the song tempo or the song position. The operation is the same as in the Sequence Play mode (page 96).

4 **The [SF6] ■ button lets you pause playback and then start again from the same point in the song.**

5 **To exit from the Demo display, stop playback, then press the [EXIT] button.**

Demo song playback continues indefinitely until stopped.
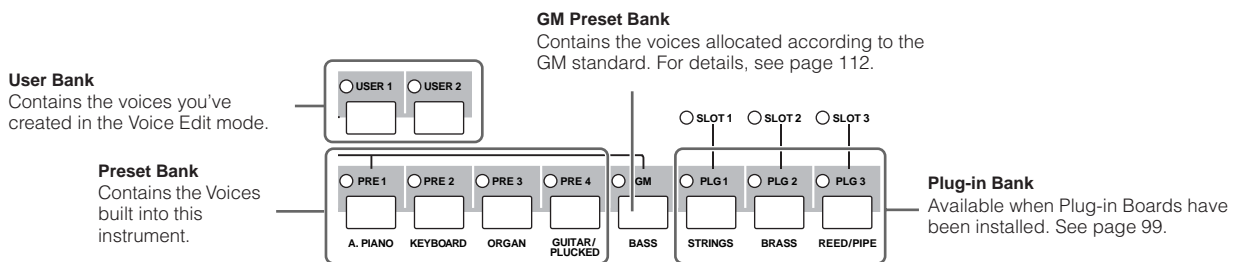
Playing the S90 ES

Voice Play mode

The Voice Play mode is where you select and play the instrument sounds (voices) of this synthesizer.

Selecting a Normal Voice

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. In this section, we'll show you how to select a Normal Voice.
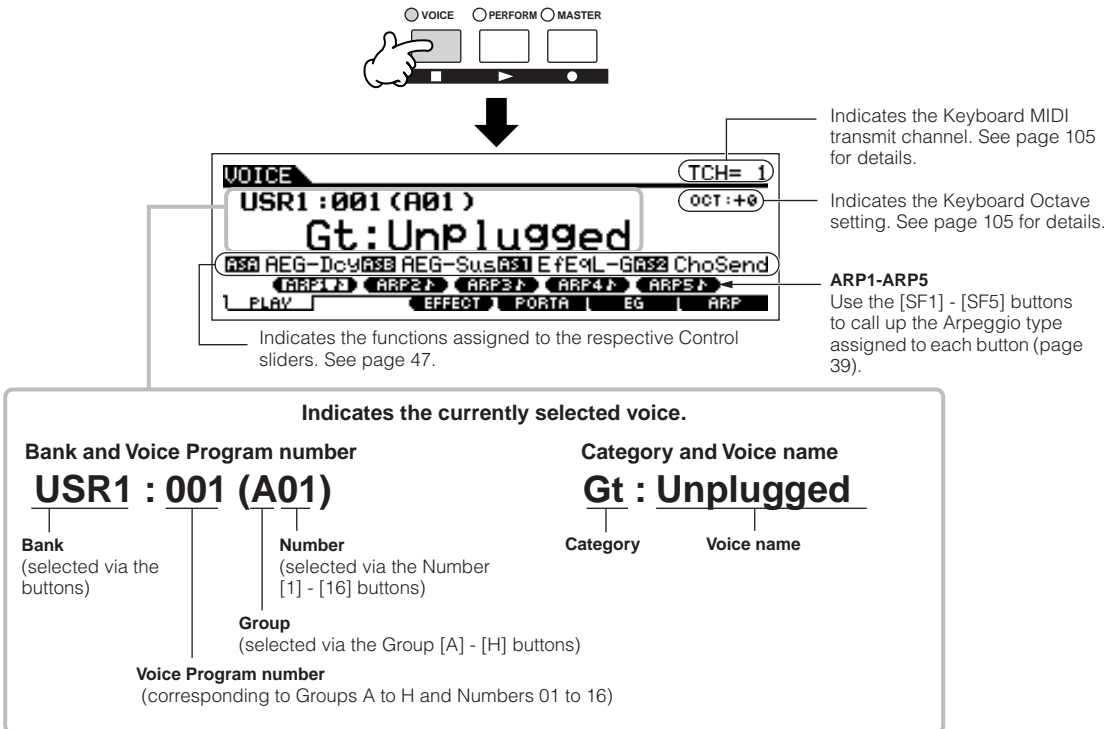You can select the desired Voice from various Voice Banks (Preset 1 - 4, User 1 - 2, GM preset, Plug-in 1 - 3) as shown below.

Voice Bank

GM Preset Bank
Contains the voices allocated according to the GM standard. For details, see page 112.

User Bank
Contains the voices you've created in the Voice Edit mode.

Preset Bank
Contains the Voices built into this instrument.

Plug-in Bank
Available when Plug-in Boards have been installed. See page 99.

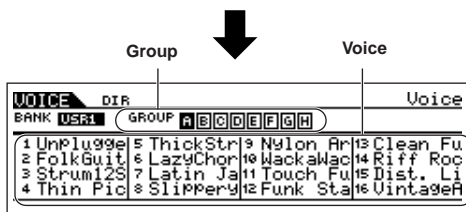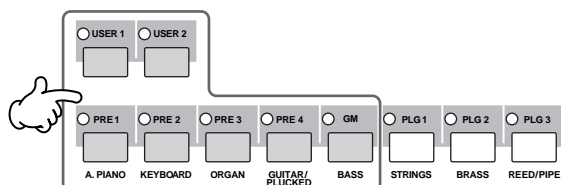| 1 | **Press the [VOICE] button to enter the Voice Play mode.** |

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

Indicates the Keyboard MIDI transmit channel. See page 105 for details.

Indicates the Keyboard Octave setting. See page 105 for details.

ARP1-ARP5
Use the [SF1] - [SF5] buttons to call up the Arpeggio type assigned to each button (page 39).

Indicates the functions assigned to the respective Control sliders. See page 47.

Indicates the currently selected voice.

Bank and Voice Program number   **Category and Voice name**

USR1 : 001 (A01)   **Gt : Unplugged**

Bank
(selected via the buttons)

Number
(selected via the Number [1] - [16] buttons)

Category   **Voice name**

Group
(selected via the Group [A] - [H] buttons)

Voice Program number
(corresponding to Groups A to H and Numbers 01 to 16)

NOTE Keep in mind that the example displays shown in this manual are for instruction purposes only, and the contents (for example, the Voice name here) may differ slightly from those on your instrument.

2 Select a Normal Voice Bank.

Select one of the Banks from Preset 1 - 4, User 1 - 2, and GM.

Group   Voice

```
VOICE  DIR                          Voice
BANK USR1  (GROUP A B C D E F G H)
 1 UnPlu99e 5 ThickStr  9 Nylon Ar 13 Clean Fu
 2 FolkGuit 6 LazYChor 10 WackaWac 14 Riff Roc
 3 Strum12S 7 Latin Ja 11 Touch Fu 15 Dist. Li
 4 Thin Pic 8 SliPPerY 12 Funk Sta 16 Vinta9eA
```

About the User Banks

The User Banks contain various factory default Voices.

User Bank 1 (USR1): This Bank contain original Voices for the User Bank. The same Voices are not included in the Preset Banks.

User Bank 2 (USR2): This Bank contains recommended 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.
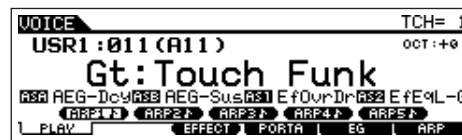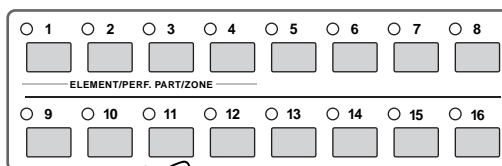
3 Select a Normal Voice Group.

Voices in each Bank are divided into Groups [A] - [H]. Select a Group to display the Voices that belong to the selected Group.
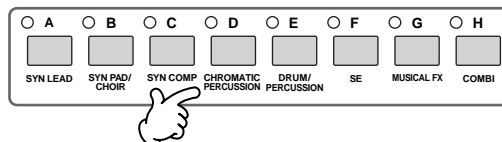
4 Select a Normal Voice Number.

Press one of the Number [1] - [16] buttons.

```
VOICE                           TCH= 1
USR1:011(A11)                   OCT:+0
       Gt:Touch Funk
AS A AEG-DcY AS B AEG-Sus AS1 EfOvrDr AS2 EfEqL-G
  (ARP1♪) (ARP2♪) (ARP3♪) (ARP4♪) (ARP5♪)
 PLAY          EFFECT   PORTA   EG    ARP
```

5 Play the keyboard.
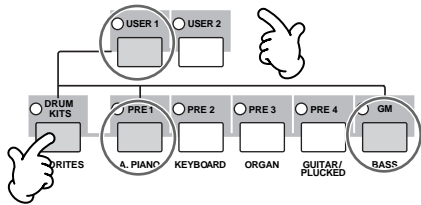
Quick Guide

Playing the S90 ES

Selecting a Drum Voice

1 Press the [VOICE] button to enter the Voice Play mode.

2 Select a Drum Voice Bank.

While holding the [DRUM KITS] button, press one of the following buttons: [PRE 1] (Preset Drum), [USER 1] (User Drum), or [GM] (GM Drum).

3 Select a Drum Voice Group.

This operation is basically the same as in selecting a Normal Voice. The numbers of Groups that you can select depends on the Bank you've selected in step 2.

4 Select a Drum Voice Number.

This is the same as in selecting a Normal Voice.

5 Play the keyboard and check which instrument is assigned to each key.

NOTE For details about the instrument assignments for each key, refer to the separate Data List.

Using the [INC/YES], [DEC/NO] buttons and data dial

In steps 3 and 4 above, you can select a Voice Number by using the [INC/YES], [DEC/NO] buttons and data dial.

Decreases number   Increases number

Decreases number — DEC/NO   INC/YES — Increases number
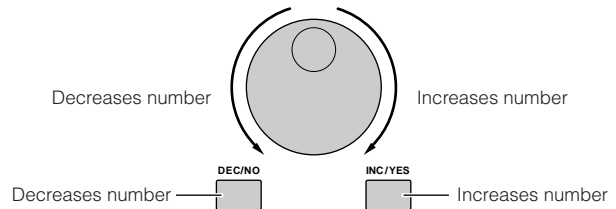
Using the Category Search function

You'll probably have a lot of fun and inspiration going through the Voices one-by-one, listening to each in order—but it will take you a long time to get through all of them, since the S90 ES has so many. This is where the Category Search function comes in handy. It's a powerful and easy-to-use way to quickly find the Voices you want. Let's try out the feature below, searching for a Voice in the Pipe Organ category.
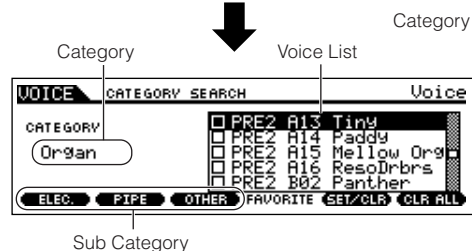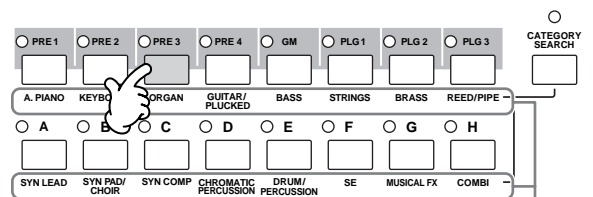
1 Turn the Category Search function on by pressing the [CATEGORY SEARCH] button.

**NOTE** Press the [CATEGORY SEARCH] button again to turn this function off.
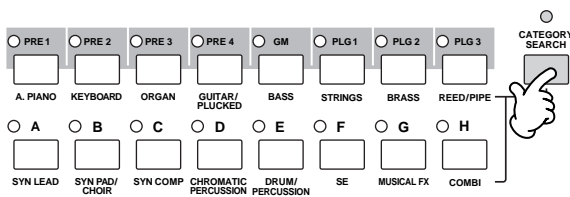
2 Select the Organ Category.

Press the [PRE 3] ORGAN button of the Bank buttons and Group buttons. The Voices in the Organ Category are displayed in a list.

Category names

Category   Voice List

Sub Category

3 Select the Sub Category of pipe organ.

The Sub Category names are shown at the bottom of the Category Search display. All Categories are divided into two or three Sub Categories for further ease in selection. Here, press the [F2] PIPE button.
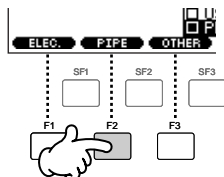
NOTE An alternate way of selecting categories is to use the Cursor buttons to select and highlight the Category name in the display, then use the [INC/YES] and [DEC/NO] buttons or the data dial to select the Category.

NOTE Some Voices such as User Voices may not be registered to any Category. You can search for these Voices by setting the Category to "--------."

4 Select the desired Voice from the Voice list of pipe organ.

Step through the available Voices by using the data dial. You can also use the [INC/YES] and [DEC/NO] buttons, or use the Cursor [▲][▼] buttons.
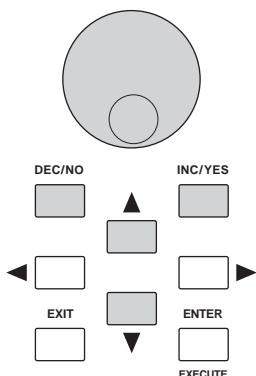
5 Press the [ENTER] button to actually select the Voice.

NOTE You can also use the [CATEGORY SEARCH] button and [EXIT] button to select the Voice.
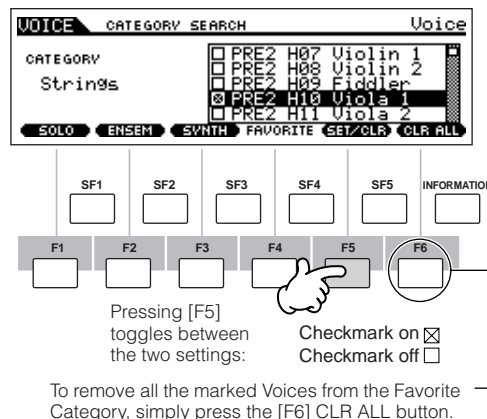
Favorite Category

The S90 ES also lets you collect and store your favorite Voices to create your personal "Favorite" Category. By putting your most often-used Voices in the Favorite Category, you can select your favorite Voices quickly and easily.

1 Select the Voice using the Category Search function.

2 Register the Voice selected in step 1 to the Favorite Category by pressing the [F5] SET/CLR button, checkmarking the box next to the Voice name.

You can un-checkmark the selection by pressing the [F5] button again.

Pressing [F5] toggles between the two settings: Checkmark on ☒ Checkmark off ☐

To remove all the marked Voices from the Favorite Category, simply press the [F6] CLR ALL button.

3 Press the [FAVORITES] button to see the Voices you've set to the Favorite Category in step 2.

You also can use the [F5] SET/CLR and [F6] CLR ALL buttons in this display to register/remove the voices to/from the Favorite Category.
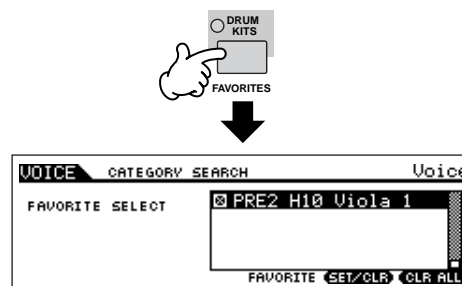
4 Press the [FAVORITES] button again to return to the Category Search display.

5 Pressing the [CATEGORY SEARCH] button to exit from the Category Search display will store the Favorite Category settings to internal memory automatically.

⚠ CAUTION
The settings made in steps 2 - 3 will be lost if you turn the power off without executing step 5.

⚠ CAUTION
Never attempt to turn off the power while an "Executing..." or "Please keep power on" message is shown. Turning the power off in this state may cause the system to freeze and prevent normal startup the next time the power is turned on, as well as resulting in the loss of all user data.

Quick Guide

Playing the S90 ES

Performance Play mode

Each Performance can contain up to four different Parts. This lets you play, for example, Flute, Violin, and Timpani Voices in a layer across the keyboard, or split the keyboard according to the bass and melody parts, then play the two different instruments and sound like a duo—even though you're playing by yourself.
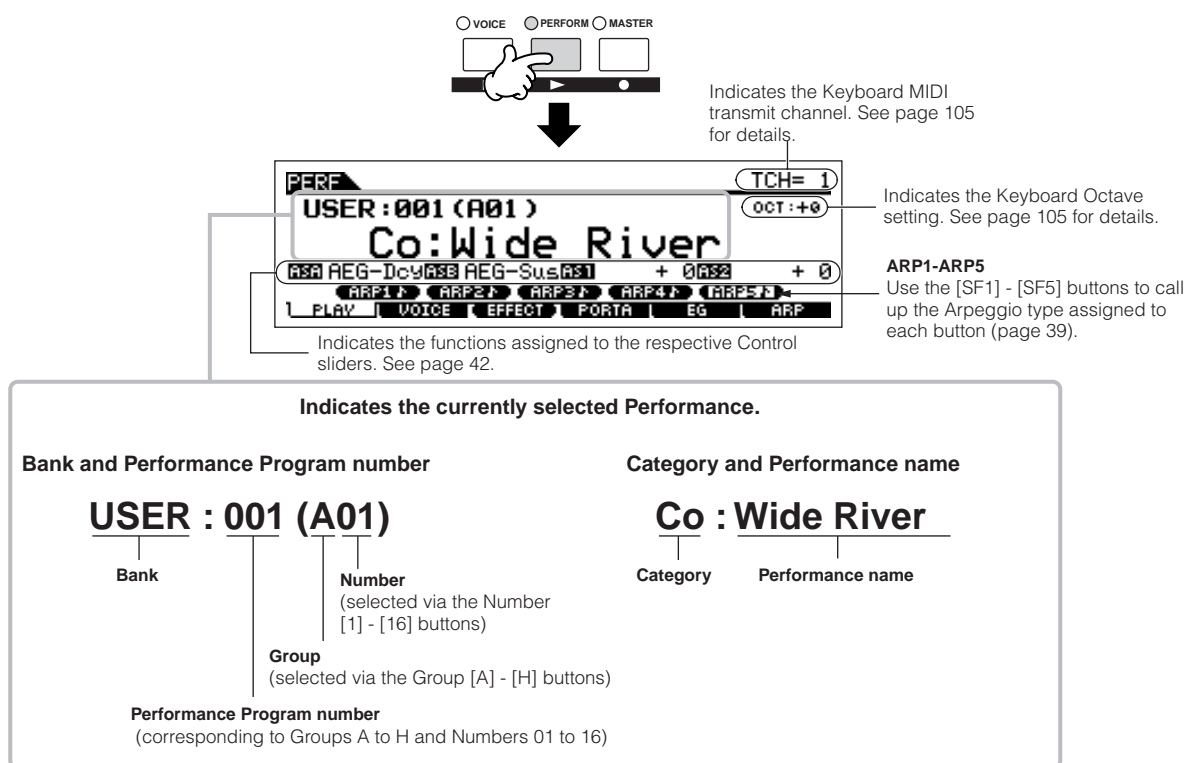
Selecting a Performance

128 Performances (1 bank) are provided in internal User memory. 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.

1 **Press the [PERFORM] button to enter the Performance Play mode.**

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

Indicates the Keyboard MIDI transmit channel. See page 105 for details.

Indicates the Keyboard Octave setting. See page 105 for details.

ARP1-ARP5
Use the [SF1] - [SF5] buttons to call up the Arpeggio type assigned to each button (page 39).

Indicates the functions assigned to the respective Control sliders. See page 42.

Indicates the currently selected Performance.

Bank and Performance Program number

Category and Performance name

USER : 001 (A01)

Bank

Number
(selected via the Number [1] - [16] buttons)

Group
(selected via the Group [A] - [H] buttons)

Performance Program number
(corresponding to Groups A to H and Numbers 01 to 16)

Co : Wide River

Category   **Performance name**

NOTE Keep in mind that the example displays shown in this manual are for instruction purposes only, and the contents (for example, the Performance name here) may differ slightly from those on your instrument.
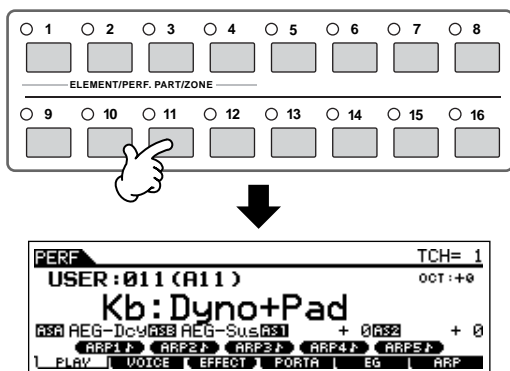
2 | **Select a Performance Group.**

Performances are divided into Groups [A] - [H]. Select a Group to display a list of the Performances.
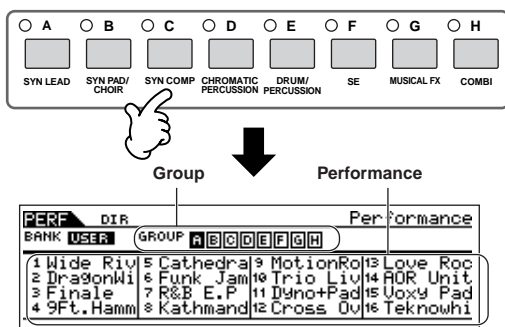
Group   **Performance**

3 | **Select a Performance Group.**

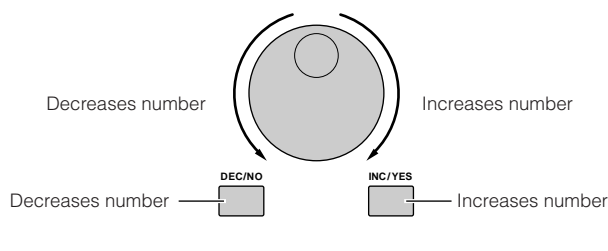Press one of the Number [1] - [16] buttons.

4 | **Play the keyboard.**

Using the [INC/YES], [DEC/NO] buttons and data dial

Rather than using the Bank/Number buttons described in steps 2 and 3 above, you can select a Performance by using the [INC/YES], [DEC/NO] buttons and data dial.

Decreases number   Increases number

DEC/NO   INC/YES

Decreases number ———   ——— Increases number

Quick Guide

Playing the S90 ES

Creating a Performance by combining the Voices

Performances can be made up of a maximum of four Parts, each of which can be assigned a different Voice. In this section, we'll create a Performance by combining two Voices.

Preparing to create the Performance (Initializing the Performance)

| 1 | Select the desired Performance in the Performance Play mode. |

| 2 | Press the [JOB] button, and then the [F1] button. |

The Initialize display is shown. Check the "ALL" check box to initialize all data of the Performance. For details about the Initialize function, refer to page 156.
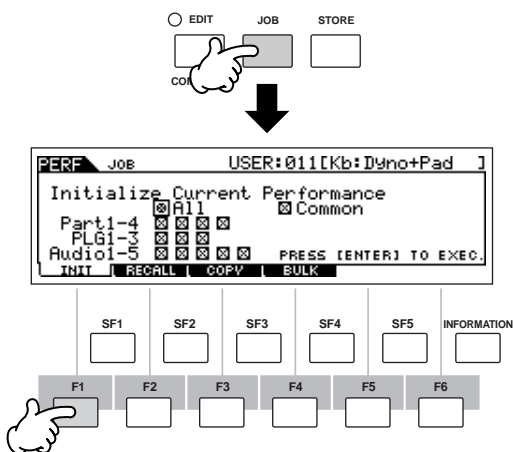
| 3 | Press the [ENTER] button. (The display prompts you for confirmation.) |

Press the [INC/YES] button to initialize the Performance.

⚠️ NOTE Please note that when you execute the Store operation by pressing the [STORE] button here, the Performance at the destination will be replaced with the Initialized Performance created in step 3 above.

⚠️ NOTE For details about the Store operation, refer to page 56.

| 4 | Press the [PERFORM] button. |

The current Performance name will change to "Init Perf" in the display.

⚠️ NOTE When you initialize a Performance, the Voice at Preset Bank 1, Voice number 1 is assigned to Part 1 as the default.

Playing the several Voices together (Layer)
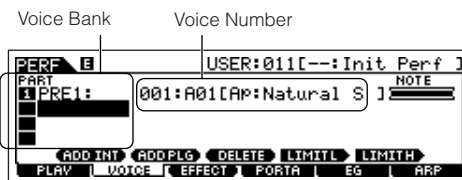
| 5 | Press the [F2] VOICE button. |

This calls up a list indicating which Voice is assigned to each Part of the current Performance.
Since the current Performance has been initialized, the only Voice in the Performance is "PRE1: Natural S," set to Part 1.
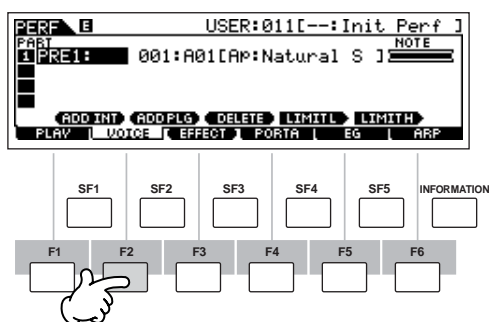
| 6 | Assign the desired Voice to Part 2. |

6-1 Move the cursor to the Voice Bank or Voice Number of the Part 2.

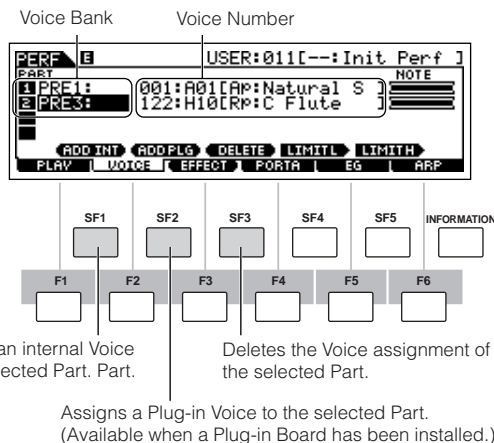Voice Bank   Voice Number

6-2 Press the [SF1] ADD INT button. This enables assignment of the selected internal Voice to Part 2.

⚠️ NOTE When assigning a Voice from Single-part Plug-in Board (page 99) to a Part, press the [SF2] ADD PLG button.

6-3 **Select the Voice you've assigned to Part 2 as you did in steps 2 - 4 in the section "Selecting a Normal Voice" or "Selecting a Drum Voice" (page 30).**

You can select the desired Bank and Number directly by using the [DEC/NO], [INC/YES] buttons and data dial. You can also use the Category Search function (page 32). Here, we'll assign a flute Voice (PRE3: C Flute) to Part 2.

Voice Bank   Voice Number

Assigns an internal Voice to the selected Part. Part.   Deletes the Voice assignment of the selected Part.

Assigns a Plug-in Voice to the selected Part. (Available when a Plug-in Board has been installed.)

▷NOTE Voices of the Multi part Plug-in Board PLG100-XG cannot be assigned to Performance Parts; they are specifically meant to be used in the Multi mode for playback of XG song data.

7 **Play the keyboard.**

The Part 1 (piano Voice) and Part 2 (flute Voice) can be played in unison.

Part 1: Piano

Part 2: Flute
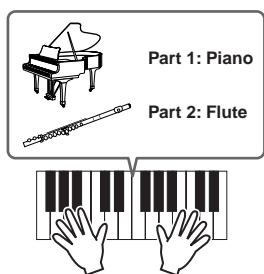
Next, we'll divide the keyboard into two sections for each Voice.

Dividing the keyboard into separate sections— Split

8 **Assign the Voice of Part 1 to the lower key range.**

8-1 **Move the cursor to Part 1.**

8-2 **Press a note on the keyboard while holding down the [SF5] LIMIT H button to set the highest note for Part 1.**

▷NOTE Note that the dark bar (at "NOTE") for Part 1 changes as the note range is changed.

9 **Assign the Voice of Part 2 to the higher key range.**

9-1 **Move the cursor to Part 2.**

9-2 **Press a note on the keyboard while holding the [SF4] LIMIT L button down to set the lowest note of Part 2.**

▷NOTE Note that the dark bar (at "NOTE") for Part 2 changes as the note range is changed.

SF 4   SF 5

Note Limit Low   **Note Limit High**
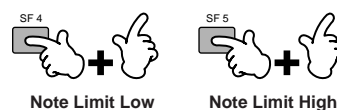
10 **Play the keyboard.**

Use your left hand to play piano sounds and your right hand to play flute sounds.

Part 1: Piano   **Part 2: Flute**
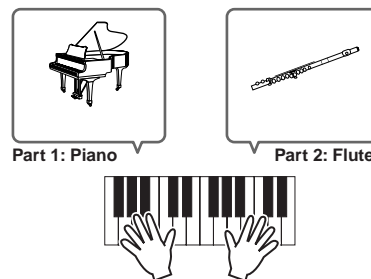
Adjusting the Part levels and storing the Performance

11 **Adjust the Volume settings of Parts 1 and 2 by using the Control sliders.**

For details, see page 42.

12 **Store the settings as a User Performance in the Performance Store mode.**

For details about the Store operation, see page 56.

▷NOTE If you are editing a program and you select a different program without storing your edited one, all the edits you've made will be erased.

In the section above, you learned how to assign two Voices to two different Parts. Use same procedure to assign Voices to Parts 3 and 4, and create a full orchestral sound or the sound of a 3- or 4-piece band—just by using a single S90 ES. You can also use the preset Performances as starting points in building your own custom Voice combinations.

Using a microphone and other audio device sounds

One of the enormous benefits of the Performance mode is that you can have the A/D input sound—such as your voice through a microphone, a guitar, bass, or CD player—assigned as one of the four Parts of a Performance. Various parameters such as volume, pan, and effect can be set to this Part and the sound is output together with other Parts. These parameters are set and stored in the Performance Store mode for each Performance.

DNOTE The Audio Input part is available also in the Multi mode, but is not available in the Voice mode. The procedure and explanations here apply to the Multi mode as well.

1 Make sure to turn the power of the S90 ES off and set the GAIN knob on the rear panel to the minimum.

2 Plug the external device to the A/D INPUT jack(s) on the rear panel.
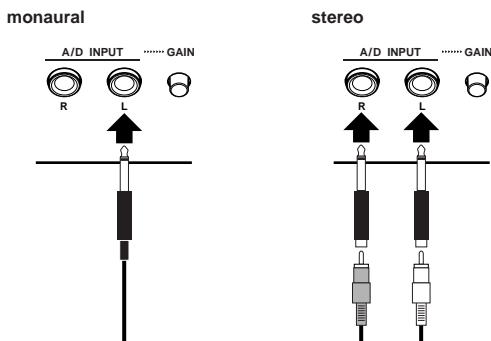
**monaural**   **stereo**

DNOTE A standard dynamic microphone is recommended. (The S90 ES does not support phantom-powered condenser microphones.)

3 Turn on the power of the external device, and then turn on the power of the S90 ES.

4 Press the [PERFORM] button to enter the Performance Play mode and select the desired Performance.

5 Press the [UTILITY] button to enter the Utility mode, press the [F2] I/O button, then press the [SF1] INPUT button.
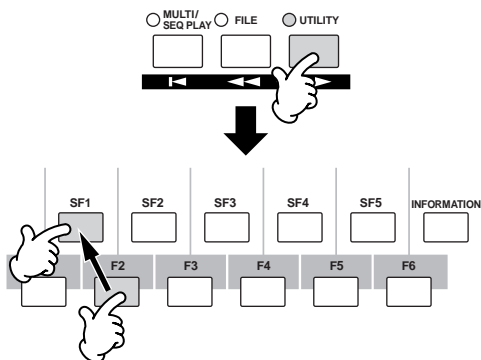
6 Set the Mic/Line parameter.

When the output level of the connected equipment (such as a microphone, guitar, bass) is low, set this parameter to "mic." When the output level of the connected equipment (such as a synthesizer keyboard, CD player) is high, set this parameter to "line."
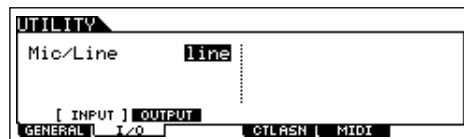
DNOTE This setting is available for all modes. If you wish to store this setting, press the [STORE] button.

7 Adjust the external device input level by using the GAIN knob on the rear panel while listening to the sound of the external device.

DNOTE If you are using the mLAN input Part, the GAIN knob has no effect on the input level.
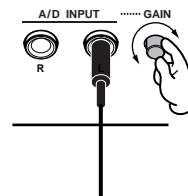
8 Set the audio input related parameters as necessary from the AUDIO IN display ([PERFORM] → [EDIT] → [COMMON] → [F5] AUDIO IN).

For details about each parameter, see page 151 in the Reference section.
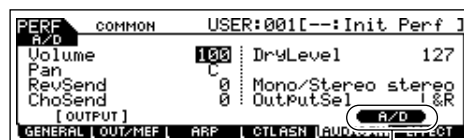
When the optional mLAN16E has been installed, call up the A/D display by pressing the [SF5] button.

9 Store the settings as a User Performance in the Performance Store mode (page 56).

Using the Arpeggio feature

The versatile Arpeggio feature allows you to automatically play various rhythms and phrases by simply pressing a key or playing a chord. The S90 ES contains a remarkably wide variety of Arpeggios—a total of 1,787—from conventional, popular phrases to the latest cutting-edge rhythm patterns. In addition, you can assign your favorite Arpeggios to the [SF1] - [SF5] buttons and switch between Arpeggio phrases instantly. This powerful function is an unending source of inspiration and will help you create various riffs, phrases and songs quickly and easily.
Since the preset Voices and Performances already have their own Arpeggio types pre-assigned, all you need to do is select the desired Voice and turn on the Arpeggio function.

> **NOTE** For details about Arpeggio, see page 124.

> **NOTE** Different Arpeggio types cannot be played back for each Part in the Performance or Multi mode.

1 **Press the [ARPEGGIO] button to turn Arpeggio on.**

Selecting some programs (Voices, Performances, Multis) automatically turns this lamp on.
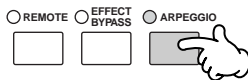
2 **Play a note or notes on the keyboard to trigger the Arpeggio playback.**

The particular rhythm pattern or phrase that plays depends on the actual notes or chords you play, as well as on the selected Arpeggio type. For details, see page 124 in the Basic Structure section.

■ Changing the Arpeggio type during your keyboard performance

A different Arpeggio type is assigned to each of the [SF1] ARP1 - [SF5] ARP5 buttons for each preset Voice. When a musical note icon appears to the right of each Arpeggio number in the display (see below), the corresponding button is assigned an Arpeggio type. The selected Arpeggio type is highlighted. Try out various Arpeggio types by pressing the [SF1] - [SF5] buttons.
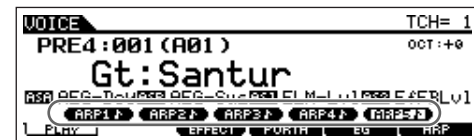
You can confirm the currently selected Arpeggio type in the [F6] ARP display.

Arpeggio type currently selected.
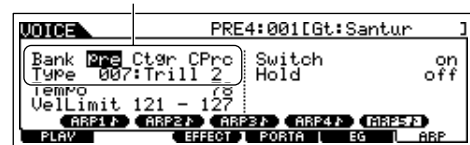
Bank	Selects "pre" (Preset) or "usr" (User). To play Arpeggios of the "usr" bank, User Arpeggio data of the MOTIF ES must be loaded to the S90 ES.
Ctgr	For details, refer to page 124.
Type	Refer to the separate Data List booklet for details.

> **NOTE** You can load User Arpeggio data from the MOTIF ES to the S90 ES, but you cannot create User Arpeggio data on the S90 ES itself.

Register your favorite Arpeggio types to the [SF1] - [SF5] buttons

You can change the default settings and assign any Arpeggio types you like to the [SF1] - [SF5] buttons.

1 Select the desired Voice, Performance, or Multi, and then press the [ARPEGGIO] button to turn Arpeggio on.

2 Select the desired Arpeggio type in the [VOICE] → [F6] (or [F5]) ARP display.

3 While holding the [STORE] button, press one of the [SF1] - [SF5] buttons.

The currently selected Arpeggio type is assigned to the pressed button. If you execute this operation with the [ARPEGGIO] lamp off, no Arpeggio type will be assigned to the pressed button.

4 Repeat steps 2 - 3 as necessary.

5 Store the changes as a User Voice, User Performance or User Multi (pages 50, 56, 76).

TIP **Transmitting Arpeggio playback as MIDI data**

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. This is done by setting the following switch parameters to "on":

• **Voice Arpeggio:**

Voice mode → [UTILITY] → [F3] VOICE → [SF3] ARP CH → OutputSwitch

• **Performance/Multi Arpeggio**

Performance mode/Multi mode → Performance/Multi selection → [EDIT] → [COMMON] → [F3] ARP → [SF4]OUT CH → OutputSwitch

---

■ **Controlling Arpeggio playback by using the Control sliders.**

These four Control sliders let you adjust the tempo and volume of Arpeggio playback. If you like the results and want to save them, you can store the changes as a User Voice, User Performance or User Multi.

1 Press the [ARP FX] button to turn the lamp on.

Selecting some voices automatically turns this lamp on.

PAN/SEND		○	PAN	–	REVERB	–	CHORUS	–	TEMPO
ASSIGN			ASSIGN A	–	ASSIGN B	–	ASSIGN 1	–	ASSIGN 2
TONE		○	CUTOFF	–	RESONANCE	–	ATTACK	–	RELEASE
ARP FX		○	SWING	–	GATETIME	–	VELOCITY	–	UNITMULTIPLY
MEF			MEF 1	–	MEF 2	–	MEF 3	–	MEF 4
EQ		○	LOW	–	LOW MID	–	HIGH MID	–	HIGH
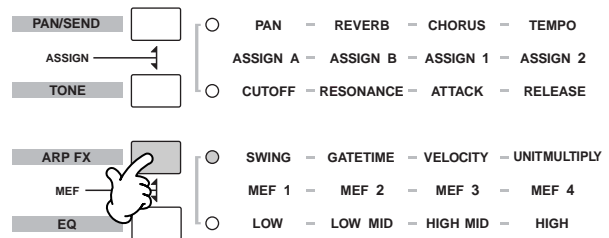
2 Move the sliders while the Arpeggio is playing.

For details on the functions controlled by the sliders, see page 42.

3 If you're satisfied with the results, you can store the changes as a User Voice, User Performance or User Multi (pages 50, 56, 76).

Using the Controllers on the S90 ES

This section shows you how to change the sounds by using the controllers on the S90 ES. When using the external controllers, see page 59.

Pitch Bend Wheel

Use the Pitch Bend wheel to bend notes up (roll the wheel away from you) or down (roll the wheel toward you) while playing the keyboard. The Pitch Bend wheel is self-centering and will automatically return to normal pitch when released. Try out the Pitch Bend wheel while pressing a note on the keyboard.

Pitch Up

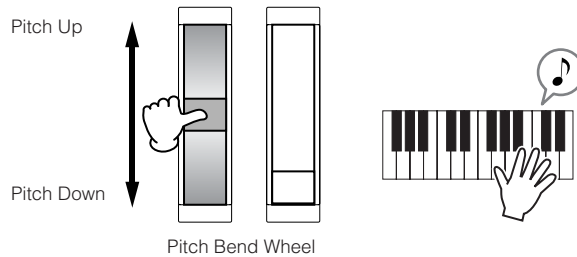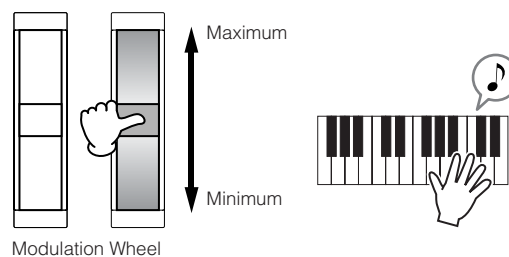Pitch Down

Pitch Bend Wheel

When playing a Performance, the Pitch Bend Range depends on the setting of the Voice assigned to each Part (made in the Voice mode).

DNOTE • The Pitch Bend Range setting for each Voice can be changed in the "OTHER" display ([VOICE] → [EDIT] → [COMMON] → [F1] GENERAL → [SF5] OTHER) and stored as a User Voice in the Voice Store mode.
  • The Pitch Bend Range setting also allows you to set the wheel to bend notes up or down in the opposite direction (i.e., the pitch goes down when you move the wheel up).

DNOTE Functions other than Pitch Bend can be assigned to the Pitch Bend Wheel in the "CTL SET" display ([VOICE] → [EDIT] → [COMMON] → [F4] CTL SET). These assignment settings can be stored as a User Voice in the Voice Store mode. Even if a different function is assigned to this wheel, the Pitch Bend function is available and Pitch Bend messages are still generated when the wheel is used.

Modulation Wheel

Even though the Modulation wheel is conventionally used to apply vibrato to the sound, many of the preset Voices have other functions and effects assigned to the wheel. The more you move this wheel up, the greater the effect that is applied to the sound. Try out the Modulation wheel with various preset voices while playing the keyboard.

Maximum

Minimum

Modulation Wheel

When playing a Performance, the effect of the Modulation Wheel depends on the setting of the Voice assigned to each Part (made in the Voice mode).

DNOTE To avoid accidentally applying effects to the current Voice, make sure the Modulation Wheel is set to minimum before you start playing.

DNOTE Various functions can be assigned to the Modulation Wheel in the "CTL SET" display ([VOICE] → [EDIT] → [COMMON] → [F4] CTL SET). These assignment settings can be stored as a User Voice in the Voice Store mode.

Quick Guide

Playing the S90 ES

Control sliders

Changing the sounds

The Control sliders are a powerful live performance feature, in that they let you change the brightness and tonal characteristics of the current Voice, Performance, or Multi in real time as you play. Moving a slider forward increases the effect while pulling the slider back decreases it. The sliders can be used for different function "sets." You can select the particular function set assigned to the sliders by pressing the appropriate Control function button (as shown below).
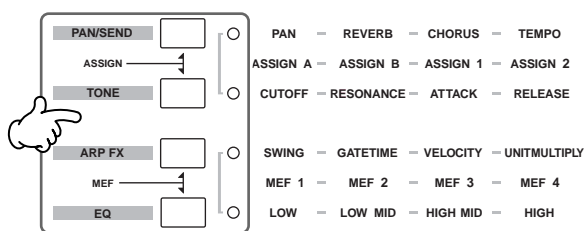
Function sets assigned to the Control slider

Operation	Lamp-on indication	Functions controlled by each Control slider			
		Control slider 1	Control slider 2	Control slider 3	Control slider 4
When pressing the [PAN/SEND] button	[PAN/SEND] button	Pan (stereo position)	Reverb Send Level	Chorus Send Level	Tempo of the Seqence Play mode/Arpeggio playback
When pressing the [TONE] button	[TONE] button	Filter Cutoff Frequency (degree of brightness)	Resonance (the level of the signal in the area of the cutoff frequency)	Attack Time of the sound	Release Time of the sound (decay time after the key is released)*
When pressing the [ARP FX] button	[ARP FX] button	Amount of swing in the Arpeggio playback	Gate time (length) of the Arpeggio playback	Velocity of the Arpeggio playback	Arpeggio playback time
When pressing the [EQ] button	[EQ] button	Low band of the Master EQ in the Voice/ Performance mode, part EQ in the Multi/ Sequence Play mode	Low-mid band of the Master EQ in the Voice/ Performance mode, part EQ in the Multi/ Sequence Play mode	Hi-mid band of the Master EQ in the Voice/ Performance mode. (Not available in the Multi/Sequence Play mode.)	High band of the Master EQ in the Voice/ Performance mode, part EQ in the Multi/ Sequence Play mode
When pressing the [PAN/SEND] button and the [TONE] button simultaneously	[PAN/SEND] button [TONE] button	Function assigned from the [UTILITY] → [F4] CTLASN → [SF2] ASSIGN display (page 165) in the Utility mode		Function assigned for each Voice from the [VOICE] → [EDIT] → [COMMON] → [F4] CTLSET display (page 131)	
When pressing the [TONE] button and the [ARP FX] button simultaneously**	All the buttons are off	Function assigned for each Master from the [MASTER] → [EDIT] → Zone selection → [F5] CS display (page 174)			
When pressing the [ARP FX] button and the [EQ] button simultaneously	[ARP FX] button [EQ] button	Function assigned to the Master Effect parameters from the [UTILITY] → [F4] CTL ASN → [SF5] MEF display.			

* For Drum Voices, this affects the decay time for all played notes, whether held or released.
** Available only when setting the Zone Switch to "on" in the Master mode (page 92)

When pressing any of the Control function buttons, the lamp(s) of the buttons will light according to the above table and the status of the Control sliders (currently assigned functions and set values) is shown on the LCD display. The appearance of the slider in the display indicates the actual control status of the slider. When a slider graphic in the display is shown with a shadow, the corresponding control slider on the panel affects the sound as indicated. A slider graphic without a shadow indicates that the current Control slider position differs from the actual parameter value. In this case, moving the slider does not affect the sound until the slider position reaches the parameter's current value (after which the slider graphic has a shadow).

Adjusting these sliders affects the sound immediately.
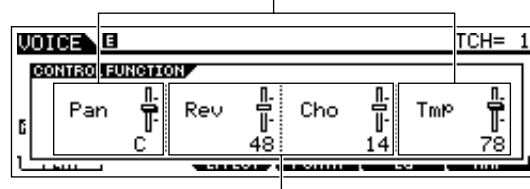
Adjusting these sliders will not affect the sound until the current value is reached.

Changing the Volume

You can use the Control sliders to adjust relative volume settings in real time, by pressing the [VOLUME] button. This lets you adjust independent volume settings of the Voice or Performance you play on the keyboard, or those of a Multi (page 70).

Function sets assigned to the Control sliders

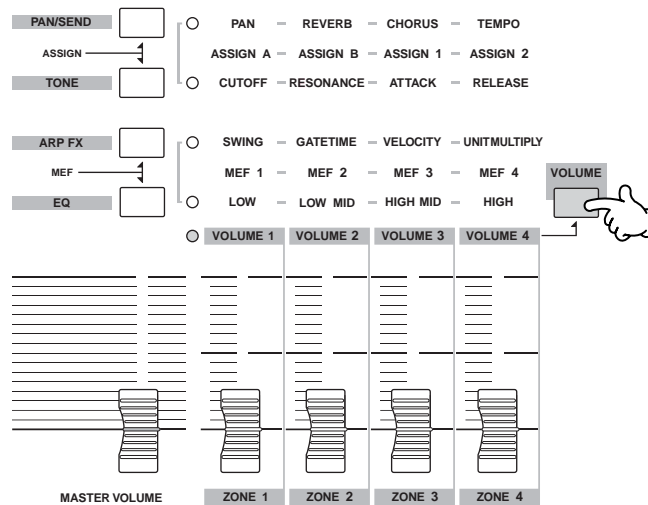| Mode		Functions controlled by each Control Slider			
		Control slider 1	Control slider 2	Control slider 3	Control slider 4
Voice mode	When a Normal Voice is selected (page 30)	Element 1 Volume*	Element 2 Volume*	Element 3 Volume*	Element 4 Volume*
	When a Drum Voice is selected (page 32)	Volume of the entire Voice sound (moving any slider produces same volume)			
Performance mode		Controls Volume of the assigned Parts (see "Precautions" note below).			
Multi/Sequence Play mode	When tracks (Parts) 1 - 4 are selected	Track 1 (Part 1) Volume	Track 2 (Part 2) Volume	Track 3 (Part 3) Volume	Track 4 (Part 4) Volume
	When tracks (Parts) 5 - 8 are selected	Track 5 (Part 5) Volume	Track 6 (Part 6) Volume	Track 7 (Part 7) Volume	Track 8 (Part 8) Volume
	When tracks (Parts) 9 - 12 are selected	Track 9 (Part 9) Volume	Track 10 (Part 10) Volume	Track 11 (Part 11) Volume	Track 12 (Part 12) Volume
	When tracks (Parts) 13 - 16 are selected	Track 13 (Part 13) Volume	Track 14 (Part 14) Volume	Track 15 (Part 15) Volume	Track 16 (Part 16) Volume

* An Element is the fundamental tone generating unit of a Voice. For details, see page 44.

NOTE **Precautions — Using Sliders in the Performance mode**

In the Performance mode, the Control sliders are assigned according to the specific Parts that are assigned in each Performance. Keep in mind that the Slider number may not correspond to the same numbered Part.
For example, when using a Performance (as shown at right) in which two Parts (Part 1 and Part 4) are combined, the sliders are assigned as follows:

- Slider 1 controls the volume of Part 1.
- Slider 2 controls the volume of Part 4.
- Sliders 3 and 4 are not used.

NOTE The [MASTER VOLUME] slider adjusts the overall output level of the instrument. The Control sliders, on the other hand, adjust the MIDI volume value for the corresponding element or part.

Edit Indicator

Moving the sliders directly changes the parameters of the Voice, Performance or Multi. When any of the parameters are changed, the [E] (Edit) Indicator appears in the top left of the display. This indicates that the current Voice, Performance, or Multi has been modified but not yet stored.
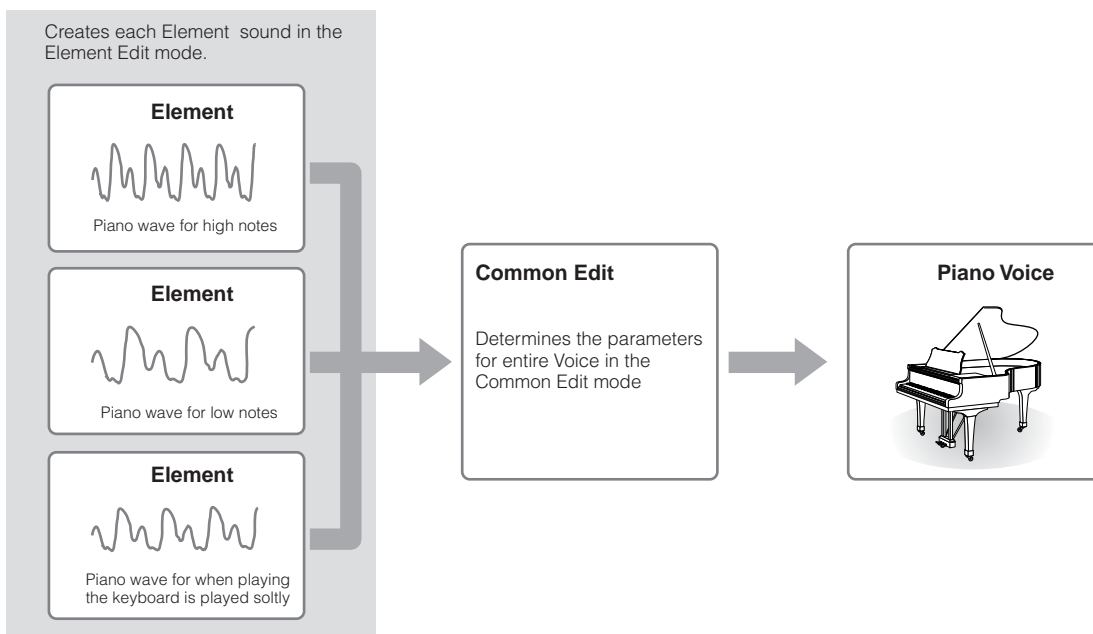For details about the Edit indicator, see page 25.

Editing a Program

Editing a Voice

Each Voice can consist of up to four Elements. An Element is made up of a basic waveform—the basic sound of a musical instrument—plus the various synthesizer processing parameters used to enhance, alter or define the sound, such as pitch, filter, and amplitude controls.

For example, a piano Voice can be actually made up of several different piano waveforms: one for high notes, one for low notes, and waveforms for when the keyboard is played softly. Combining different elements in a set for playing at same time, or programming them to switch depending on how strongly the keyboard is played helps to create a much more powerful and realistic piano sound.

Creates each Element sound in the Element Edit mode.

Element — Piano wave for high notes

Element — Piano wave for low notes

Element — Piano wave for when playing the keyboard is played soltly

Common Edit — Determines the parameters for entire Voice in the Common Edit mode

Piano Voice

> **NOTE** A Drum Voice is made up of different "Keys"—or separate percussion/drum sounds that are assigned to individual notes on the keyboard.

Normal Voice Edit
· ·

1. **Press the [VOICE] button to enter the Voice mode, then select a Normal Voice to be edited (page 30).**

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

○ EDIT   JOB   STORE

COMPARE
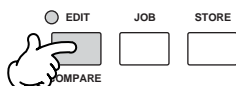
3 | **Call up the Common Edit display or Element Edit display.**

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

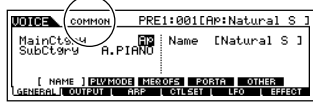While in the Voice Edit mode, you can switch between the Common Edit display and the Element Edit display as shown below.

Calling up the Common Edit display
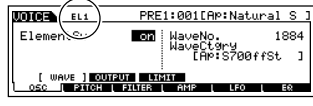Press the [COMMON] button to call up the Common Edit display.

In the Edit mode, the [DRUM KITS] button functions as the [COMMON] button.

Indicates a Common Edit display.

```
VOICE  COMMON    PRE1:001[AP:Natural S ]
MainCtgry        AP  Name [Natural S ]
SubCtgry  A.PIANO
     [ NAME ] PLY MODE MEG:OFS  PORTA   OTHER
GENERAL  OUTPUT     ARP    CTL SET   LFO   EFFECT
```

Calling up the Element Edit display
Press the desired element number from the ELEMENT [1] - [4] buttons to call up the Element Edit display.

Indicates the display for editing Element 1.

```
VOICE  EL1      PRE1:001[AP:Natural S ]
Element          on  WaveNo.     1884
                     WaveCtgry
                     [AP:S700ffSt ]
    [ WAVE ] OUTPUT  LIMIT
OSC  PITCH  FILTER   AMP    LFO    EG
```

To turn each Element on or off (to hear how each affects the overall sound), use buttons [9] - [12]. You can also isolate or solo an Element by holding down the [MUTE] button and pressing the desired number button ([9] - [12]). To cancel the solo, press the [MUTE] button again.

4 | **Select the menu you wish to edit by pressing the [F1] - [F5] buttons and [SF1] - [SF5] buttons, then edit the parameters in each display.**

The following briefly describes the main Voice parameters.

● **Basic parameters for creating a sound**
Pages 112, 133

Element selection → [F1] - [F6]

If you wish to edit the basic sound-generating and sound-shaping parameters for the Voice—such as Oscillator, Pitch, Filter, Amplitude, and EG (Envelope Generator)—use the Common Edit display.

● **Effect related parameters**　　**Pages 118, 133**

[COMMON] → [F6] EFFECT

The Effects use DSP (Digital Signal Processing) to alter and enhance the sound of a Voice. Effects are applied in the final stages of editing, letting you change the sound of the created Voice as desired. The Common Edit display lets you edit the Effect related parameters.

● **Controller related parameters**　**Pages 41, 59, 131**

[COMMON] → [F4] CTL SET (Controller Set)

For each Voice, you can assign various functions to built-in controllers such as Pitch Bend Wheel, Modulation Wheel, Control sliders (ASSIGN1 and 2), Keyboard Aftertouch and optionally connected controllers such as Footswitch, Foot Controller, Breath Controller. These settings can be edited in the Common Edit display.

● **Arpeggio related parameters**　　**Pages 124, 129**

[COMMON] → [F3] ARP (Arpeggio)
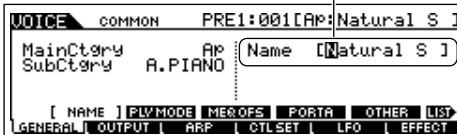
For each Voice, you can set the Arpeggio related parameters such as Arpeggio type and playback tempo. These settings can be edited in the Common Edit display.

5 | **Repeat steps 3 - 4 as desired.**

6 | **Name the edited Normal Voice.**

Enter a name for the Voice from the NAME display ([COMMON] → [F1] GENERAL → [SF1] NAME).
For detailed instructions on naming a voice, refer to Page 27.

Enter the desired Voice name

```
VOICE  COMMON    PRE1:001[AP:Natural S ]
MainCtgry        AP  Name [Natural S ]
SubCtgry  A.PIANO
     [ NAME ] PLY MODE MEG:OFS  PORTA   OTHER  LIST
GENERAL  OUTPUT    ARP    CTL SET   LFO   EFFECT
```

7 | **Store the settings as a User Voice.**

The edited Voice can be stored in the Voice Store mode. For details, see page 50.

TIP **Editing a Voice by using the Control sliders**

The four sliders at the top left of the instrument are not only for tweaking the sound while you perform—you can also use them to edit a Voice, either in the Voice Play mode or the Voice Edit mode.

● **When the [PAN/SEND] indicator is turned on:**

PAN	Determines the stereo pan position of the Voice.	[VOICE] → Voice selection → [EDIT] → [COMMON] → [F2] OUTPUT → Pan	page 129
REVERB	Determines the amount of Reverb effect that is applied to the Voice.	[VOICE] → Voice selection → [EDIT] → [COMMON] → [F2] OUTPUT → RevSend	page 129
CHORUS	Determines the amount of Chorus effect that is applied to the Voice.	[VOICE] → Voice selection → [EDIT] → [COMMON] → [F2] OUTPUT → ChoSend	page 129
TEMPO	Determines the tempo of the Arpeggio assigned to the currently selected Voice.	[VOICE] → Voice selection → [F6] ARP → Tempo	page 128

● **When the [TONE] indicator is turned on:**

CUTOFF	Raises or lowers the Filter cutoff frequency to adjust the tone brilliance.	[VOICE] → Voice selection → [F5] EG → CUTOF	page 128
RESONANCE	Boosts or attenuates the level at the area around the Filter cutoff frequency.	[VOICE] → Voice selection → [F5] EG → RESO	page 128
ATTACK	Determines the attack time of the sound. For example, you can adjust a strings Voice so that the sound gradually swells in volume by setting a slow attack time—simply move the slider upwards.	[VOICE] → Voice selection → [F5] EG → ATK (AEG)	page 128
RELEASE	Determines the release time of the sound. Moving the slider upwards sets a long release time and (depending on the selected Voice) lets the sound sustain after the key is released. To produce a sharp release, in which the sound abruptly cuts off, set a short release time.	[VOICE] → Voice selection → [F5] EG → REL (AEG)	page 128

NOTE The settings above are applied as offsets to the AEG and FEG settings in the Voice Edit mode.

● **When the [ARP FX] indicator is turned on:**

SWING	Adjusts the swing feel of the Arpeggio playback.	[VOICE] → Voice selection → [EDIT] → [COMMON] → [F3] ARP → [SF3] PLAY FX → Swing	page 130
GATE TIME	Adjusts the Gate Time (length) of the Arpeggio notes.	[VOICE] → Voice selection → [EDIT] → [COMMON] → [F3] ARP → [SF3] PLAY FX → GateTimeRate	page 131
VELOCITY	Adjusts the velocity of the Arpeggio notes.	[VOICE] → Voice selection → [EDIT] → [COMMON] → [F3] ARP → [SF3] PLAY FX → VelocityRate	page 130
UNIT MULTIPLY	Adjusts the Arpeggio playback time based on tempo.	[VOICE] → Voice selection → [EDIT] → [COMMON] → [F3] ARP → [SF3] PLAY FX → UnitMultiply	page 130

● **When the [EQ] indicator is turned on:**

LO	Determines the amount of boost or attenuation applied to the low frequency band of the Master EQ.	[VOICE] → Voice selection → [EDIT] → [COMMON] → [F1] GENERAL → [SF3] MEQ OFS → LOW	page 129
LO MID	Determines the amount of boost or attenuation applied to the low-midrange frequency band of the Master EQ.	[VOICE] → Voice selection → [EDIT] → [COMMON] → [F1] GENERAL → [SF3] MEQ OFS → LOW MID	page 129
HI MID	Determines the amount of boost or attenuation applied to the high-midrange frequency band of the Master EQ.	[VOICE] → Voice selection → [EDIT] → [COMMON] → [F1] GENERAL → [SF3] MEQ OFS → HIGH MID	page 129
HI	Determines the amount of boost or attenuation applied to the high frequency band of the Master EQ.	[VOICE] → Voice selection → [EDIT] → [COMMON] → [F1] GENERAL → [SF3] MEQ OFS → HIGH	page 129

NOTE The settings above are applied as offsets to the EQ settings in the [VOICE] → [UTILITY] → [F3] VOICE → [SF1] MEQ display.

● **When both the [PAN/SEND] and [TONE] indicators are turned on (by pressing them simultaneously):**

ASSIGN A	Adjusts parameters assigned to these sliders in the [UTILITY] → [F4] CTL ASN → [SF2] ASSIGN display.	page 165
ASSIGN B		
ASSIGN 1	Adjusts parameters assigned to these sliders in the [VOICE] → Voice selection → [EDIT] → [COMMON] → [F4] CTL SET display.	page 131
ASSIGN 2		

NOTE In addition to above functions, Master Effect related parameters (set in the [UTILITY] → [F3] VOICE → [SF2] MEF display) can be assigned to these four sliders by pressing the [ARP FX] and [EQ] buttons simultaneously. The particular parameters assigned to the four sliders can be set in the [UTILITY] → [F4] CTL ASN → [SF5] MEF display.

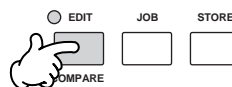● **When the [VOLUME] indicator is turned on:**

EL 1 - 4 (Element 1 - 4)	Adjusts the level balance among the Elements.	[VOICE] → Voice selection → [EDIT] → Element selection → [F4] AMP → [SF1] LVL/PAN → Level	page 137

NOTE When selection a Drum Voice, adjusts the entire level of Voice.

Drum Voice Edit

| 1 | Press the [VOICE] button to enter the Voice mode, then select a Drum Voice to be edited (page 32). |

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

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

If you want to edit the sounds that make up a Drum Voice and the basic parameters that determine the sound—such as Oscillator, Pitch, Filter, Amplitude, and EG (Envelope Generator)—call up the Key Edit display. Next, press the desired note on the keyboard. To edit more global parameters related to the overall Drum Voice and how it's processed—such as Arpeggio, Controller, and Effects—call up the Common Edit display.

While in the Voice Edit mode, you can switch between the Common Edit display and the Key Edit display as shown below.

Calling up the Common Edit display
Press the [COMMON] button to call up the Common Edit display.
In the Edit mode, the [DRUM KITS] button functions as the [COMMON] button.

Indicates a Common Edit display.

Calling up the Key Edit display
Press the Number [1] button to call up the Key Edit display, then select the key to which the desired instrument is assigned.

Indicates the display for editing the key C0.

Key Edit (1 - 73)

| 4 | Select the menu you wish to edit by pressing the [F1] - [F5] buttons and [SF1] - [SF5] buttons, then edit the parameters in each display. |

The main parameters available are basically the same as in the Normal Voice Edit (page 44). What is called "Key Edit" in the Drum Voice corresponds to "Element Edit" in the Normal Voice. Please keep in mind that the LFO parameters are not available in the Drum Voice.

| 5 | Repeat steps 3 - 4 as desired. |

| 6 | Name the edited Drum Voice. |

Enter a name for the Voice from the NAME display ([COMMON] → [F1] GENERAL → [SF1] NAME). For detailed instructions on naming a voice, refer to page 27.

Enter the desired Voice name.

| 7 | Store the settings as a User Drum Voice. |

The edited Voice can be stored in the Voice Store mode. For details, see page 50.

**TIP** **Assigning drum/percussion instruments to individual keys**

[VOICE] → Drum Voice selection → [EDIT] → Key selection → [F1] OSC → [SF1] WAVE

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 47.

2 Call up the [F1] OSC → [SF1] WAVE display.
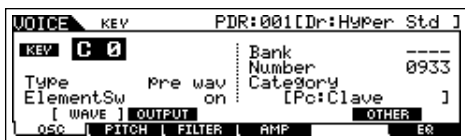
3 Press the key to which you want to assign a sound.

The drum instrument currently assigned to the pressed key will sound.
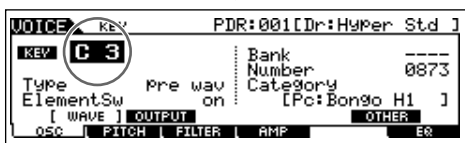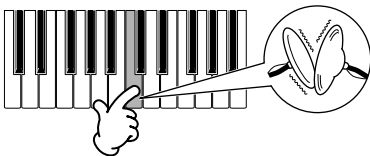
4 Select the desired Waveform to be assigned.

Move the cursor to "Number" and change the value by using the data dial, [INC/YES] button, and [DEC/NO] button. Then, press the same key set in step 3 again to confirm the selected instrument sound.
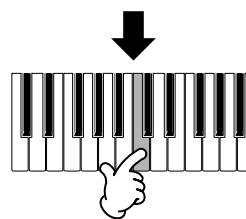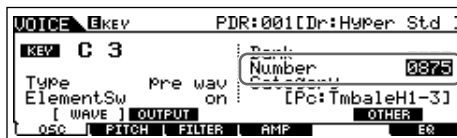
5 Create your original drum kit by repeating steps 3 - 4.

6 Store the created drum kit as a Drum Voice User memory.

The edited Voice can be stored in the Voice Store mode. See page 50 for details.

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

[VOICE] → Drum Voice selection → [EDIT] → Key selection → [F1] OSC → [SF5] OTHER → AltnateGroup

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 47.
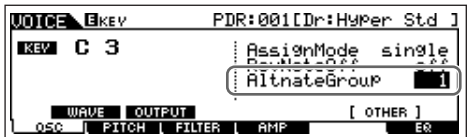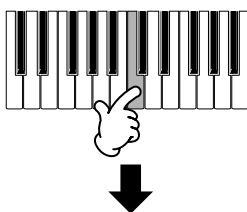
2 Call up the [F1] OSC → [SF5] OTHER display.

3 Press the key which corresponds to "Hi-Hat Open" and set the Alternate Group to "1."

4 Press the key which corresponds to "Hi-Hat Close" and set it to the same Alternate Group (1) as in step 3.
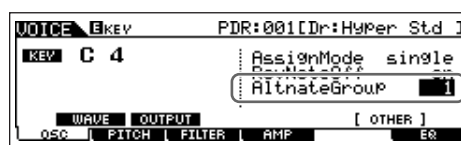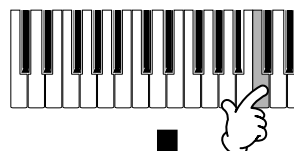
5 Confirm whether the Alternate Group has been set properly.

Immediately after pressing the "Hi-Hat Open" key, press the "Hi-Hat Close" key. Pressing 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**

[VOICE] → Drum Voice selection → [EDIT] → Key selection → [F1] OSC → [SF5] OTHER → RcvNoteOff

You can determine whether or not the selected Drum key responds to MIDI Note Off messages. Setting the Receive Note Off 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 the note is released or a Note Off message is received.
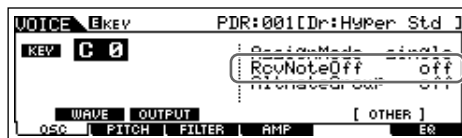
TIP **Setting the Output jack for each key (drum/percussion instrument)**

[VOICE] → Drum Voice selection → [EDIT] → Key selection → [F1] OSC → [SF2] OUTPUT → OutputSel

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 63.

Storing/Saving the created Voice

Two steps are necessary in order to store (save) your voice—storing the edited voice to internal memory and saving the stored voices to a USB storage device.
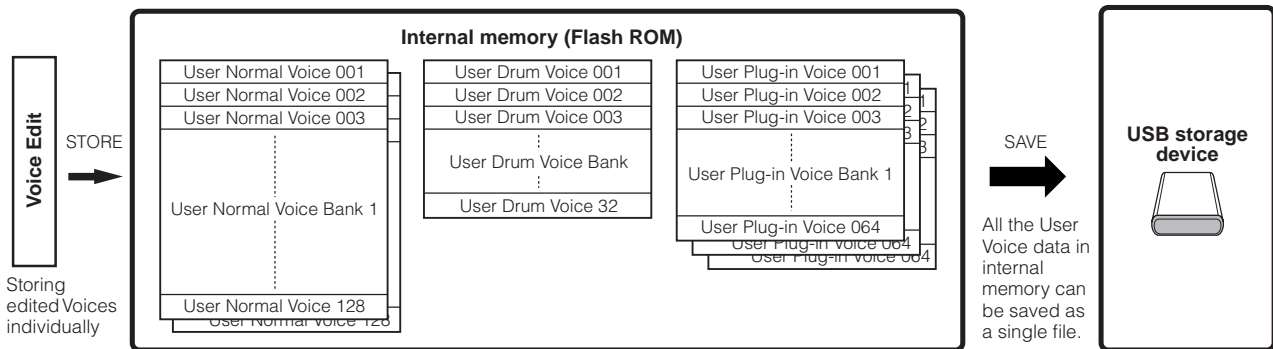
When you turn off the power to the instrument, User Voices saved in the Voice Store mode are not erased. As such it is not necessary to save the data to USB storage device; however, you may want to save it for backup or organizational purposes, using the Save operation.

Storing the edited Voice as a User Voice to internal memory

[VOICE] → [STORE]

1 **After editing the Voice, press the [STORE] button to enter the Voice Store mode.**

Make sure to execute the Store operation before selecting another Voice.

2 **Select the destination Voice memory.**

Select a User Bank ("USR1" or "USR2" when storing a Normal Voice, "UDR" when storing a Drum Voice, "P1-U"—"P3-U" when storing a Plug-in Voice) and the desired Voice number by using the data dial, [INC/YES] and [DEC/NO] button.
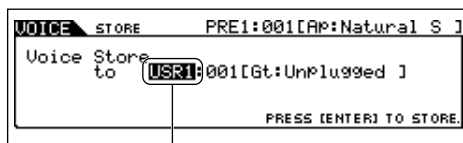
Select a User Bank.
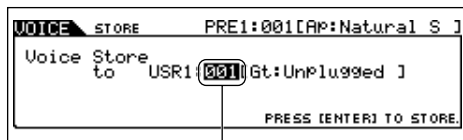
Select a Voice number.

NOTE When you execute the Store operation, the settings for the destination memory will be overwritten. Important data should always be backed up to a separate USB storage device.

3 **Press the [ENTER] button.**

The display prompts you for confirmation.
Press the [DEC/NO] button to cancel the Store operation.
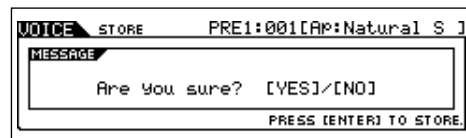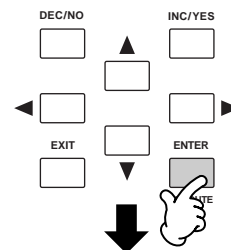
4 To execute the Store operation, press the [INC/YES] button.

After the Voice has been stored, a "Completed" message appears and operation returns to the Voice Play display.
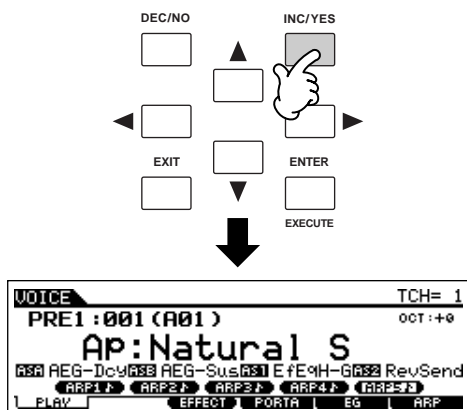
⚠ CAUTION

Never attempt to turn off the power while an "Executing..." or "Please keep power on" message is shown. Turning the power off in this state may cause the system to freeze and prevent normal startup the next time the power is turned on, as well as resulting in the loss of all user data.

⚠ CAUTION

If you select another Voice without storing, the currently edited Voice will be lost. Make sure to store the edited Voice before selecting another Voice.

Saving the edited Voices to a USB storage device

[FILE] → [F2] SAVE

Connect the USB device and follow the instructions below.

📝 NOTE   When a USB storage device is connected or media is inserted, an error message "USB device unformatted." may appear in the LCD display, indicating that the device must be formatted for use in the File mode (page 168).

1 Press the [FILE] button to enter the File mode. Then press the [F1] CONFIG button and [SF2] CURRENT button.

If the device is divided into several partitions, select the specific partition for use. If the device has several media (e.g., discs) inserted, select a specific Slot number.

2 Press the [F2] SAVE button to call up the Save display.

3 Set the Type parameter to "All Voice."
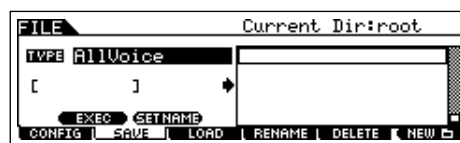
The following three file types are available for saving Voice data. Here, select "All Voice."

| All	When this is selected, execute the Save operation to save all the created data including the User Voices as a single file (extension: S7A).
AllVoice	When this is selected, execute the Save operation to save all User Voices as a single file (extension: S7V).
Voice Editor	When this is selected, execute the Save operation to save all User Voices as a single file (extension: S7E) which can be exported to the Voice Editor software (page 77).

4 Input a file name.

Move the cursor to the file name field, then input the desired file name. For detailed instructions on naming a voice, refer to page 27.
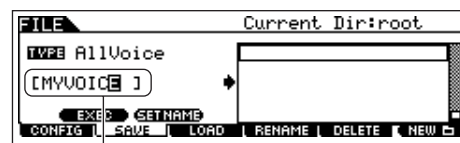
File name

5 If you have created a destination folder, select the folder.

For information on how to select a folder, see the section "Supplementary information" on page 170. For information on how to create/delete a folder and change the folder name, see the section "File mode" on page 168.

6 Press the [SF1] EXEC button to actually save the file.

If you are about to overwrite an existing file, the display prompts you for confirmation. Press the [INC/YES] button to execute the Save operation to overwrite the existing file, or press the [DEC/NO] button to cancel it.

⚠ CAUTION

While the data is being saved/loaded, make sure to follow these precautions:
• Do not remove or eject the media from the USB storage device.
• Do not unplug or disconnect the USB storage device.
• Do not turn off the power of the instrument or the relevant devices.

Quick Guide

Editing a Program

■ Loading Voice data from a USB storage device

[FILE] → [F3] LOAD

In the previous section, we saved Voice data as an "All Voice" file to a USB storage device. Here, we'll recall that Voice data and load it to the instrument with the Load operation.

1 **Press the [FILE] button to enter the File mode. Then press the [F1] CONFIG button and [SF2] CURRENT button.**

If the device is divided into several partitions, select the specific partition for use. If the device has several media (e.g., discs) inserted, select a specific Slot number.

2 **Press the [F3] LOAD button to call up the Load display.**

3 **Select the file type to be loaded.**

The file saved in operation explained on the previous page has all the User Voices.
If you wish to load all the User Voices, set Type to "All Voice."
If you wish to load only a specific voice, set Type to "Voice."
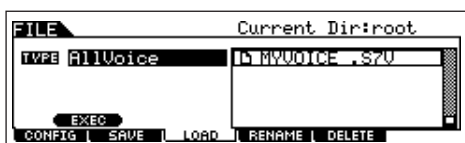
4 **Select the file (" ") to be loaded.**

Move the cursor to the file (extension: S7V) saved in the operation explained on the previous page. If you set the Type parameter to "AllVoice" in step 3, go to step 5. If the desired file was saved in specific folder, enter the folder and select the file. For information on how to select a folder, see the section "Supplementary information" on page 170. If you set the Type parameter to "Voice" in step 3, execute the operations in the following box, then go to step 5.

When Type is set to "Voice":
When Type is set to "Voice," you can specify and load a specific Voice from a file (with the extension S7V or S7A).
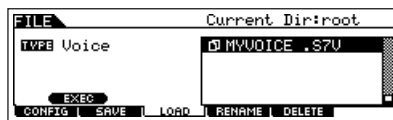
Move the cursor to the file (extension: S7A) saved in the operation explained on the previous page.

ENTER
EXECUTE
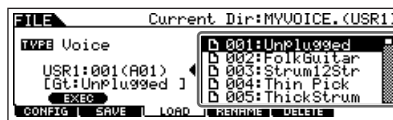
Select a source Voice Bank from the selected file with the following operation.
To select a User Normal Voice Bank, press one of the [USER1] and [USER2] buttons. To select a User Drum Voice Bank, simultaneously hold the [DRUM KITS] button and press the [USER1] button. To select a User Plug-in Voice Bank, press one of the [PLG1], [PLG2] and [PLG3] buttons.
After selecting a source Voice Bank, all the Voices contained in the selected Bank are listed in the display. Move the cursor to the desired Voice to be loaded.
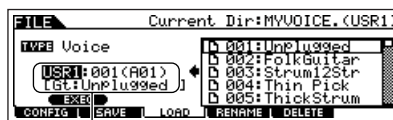
Select a destination Voice Number.
Select a Voice or a Plug-in Voice by moving the cursor to the location of "USR1" in the above display and using the data dial. When loading Plug-in Voice data, note that the Plug-in Board for the source Voice Bank should match the one for the destination Voice Bank.
When a source Voice Bank is created for the PLG150-AN, for example, you should select the Voice Bank for the PLG150- AN as the destination.

⚠ *CAUTION*

Loading data to this instrument automatically erases and replaces any existing data in the User memory.

5 **Press the [SF1] EXEC button to actually load the file.**

After the data has been loaded, a "Completed" message appears and operation returns to the original display.

⚠ *CAUTION*

While the data is being saved/loaded, make sure to follow these precautions:
• Do not remove or eject the media from the USB storage device.
• Do not unplug or disconnect the USB storage device.
• Do not turn off the power of the instrument or the relevant devices.

Editing a Performance

The Performance Edit mode ([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.

1 **Press the [PERFORM] button to enter the Performance mode, then select a Performance to be edited (page 34).**

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

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

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

While in the Voice Edit mode, you can switch between the Common Edit display amd the Part Edit display as shown below.

Calling up the Common Edit display
Press the [COMMON] button to call up the Common Edit display.

In the Edit mode, the [DRUM KITS] button functions as the [COMMON] button.

Indicates a Common Edit display.

Calling up the Part Edit display
Press the desired Part number from the PERF. PART [1] - [4] buttons to call up the Part Edit display.

Indicates the display for editing Part 1.

To switch between the Part 1 - 4 display and the Plug-in Part 1 - 3 display, press the [F6] button.

You can select the four Performance Parts from this group of seven.

Part1 Edit	Parts to which Internal voices are assigned
Part2 Edit	
Part3 Edit	
Part4 Edit	
Plug-in part 1 (PLG1) Edit	Parts to which Plug-in Board voices are assigned
Plug-in part 2 (PLG2) Edit	
Plug-in part 3 (PLG3) Edit	

Common Edit

4 Select the menu you wish to edit by pressing the [F1] - [F6] buttons and [SF1] - [SF5] buttons, then edit the parameters in each display.

The following briefly describes the main Performance parameters.

● **Parameters for the Voice assigned to each Part**

Page 152

Part selection → [F1] VOICE

The Voice assigned to each part and its note range can be set also in the Performance Play mode (page 152). In addition to the parameters available in the Performance Play mode, the Performance Edit mode also lets you set Portamento (pitch glide) and Arpeggio Switch (which determines whether the Arpeggio plays a specific Part or not).

● **Basic parameters for creating the sound**

Page 154

Part selection → [F4] TONE

Edit the parameters for each Part's Voice such as Pitch, Filter, and Amplitude. The parameters offset the same parameters in the Voice Element Edit mode.

● **Parameters related to the Audio Input Part**

Page 151

[COMMON] → [F5] AUDIO IN

The audio signal input from the A/D INPUT jack (or the optional audio inputs) can be handled as an Audio Input part. Various parameters such as volume, pan, and effect can be set to this Part and the sound is output together with other Parts. The parameters related to the Audio Input Part can be edited in Common Edit for each Performance.

● **Parameters related to the OUTPUT jacks for each Part**

Page 154

Part selection → [F2] OUTPUT → [SF3] SELECT → OutputSel

You can assign each individual Part's Voice to be output from a specific hardware output jack on the rear panel. This function is useful when you want to output a specific Part to a separate speaker or process it with a favorite external effect.

● **Effect related parameters**

Pages 118, 150, 152

[COMMON] → [F6] EFFECT

[COMMON] → [F2] OUT/MEF → [SF3] MEF (Master Effect)

The Effects use DSP (Digital Signal Processing) to alter and enhance the sound of a Performance. The Common Edit display lets you edit the Effect-related parameters.

● **Master EQ related parameters**

Pages 120, 150

[COMMON] → [F2] OUT/MEF → [SF3] MEQ (Master Equalizer)

These parameters let you use the five-band Master EQ to process the overall sound of the 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.

● **Controller related parameters**

Pages 41, 59, 151

[COMMON] → [F4] CTL ASN (Controller Assign)

For each Performance, you can assign the Control Change Number to built-in controllers such as Control sliders (ASSIGN1 and 2) and optionally connected controllers, such as Foot Controller and Breath Controller.

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

● **Arpeggio related parameters**

Pages 124, 151

[COMMON] → [F3] ARP (Arpeggio)

For each Performance, you can set the Arpeggio related parameters, such as Arpeggio type and playback tempo. These settings can be edited in the Common Edit display.

5 Repeat steps 3 - 4 as desired.

6 Name the edited Performance.

Enter a name for the Voice from the NAME display ([COMMON] → [F1] GENERAL → [SF1] NAME).
For detailed instructions on naming a voice, refer to page 27.

Enter the desired Performance name.
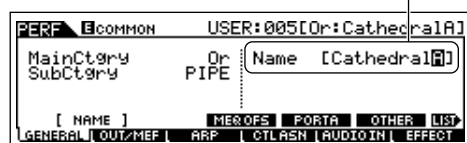
7 Store the settings as a User Performance.

The edited Performance can be stored in the Performance Store mode. For details, see page 56.

TIP **Editing a Performance by using the Control sliders**

The four sliders at the top left of the instrument are not only for tweaking the sound while you perform—you can also use them to edit a Performance, either in the Performance Play mode or the Performance Edit mode.

● **When the [PAN/SEND] indicator is turned on:**

PAN	Determines the stereo pan position of the Performance.	[PERFORM] → Performance selection → [EDIT] → [COMMON] → [F2] OUT/MEF → [SF1] OUT → Pan	Page 150
REVERB	Determines the amount of Reverb effect that is applied to the Performance.	[PERFORM] → Performance selection → [EDIT] → [COMMON] → [F2] OUT/MEF → [SF1] OUT → RevSend	Page 150
CHORUS	Determines the amount of Chorus effect that is applied to the Performance.	[PERFORM] → Performance selection → [EDIT] → [COMMON] → [F2] OUT/MEF → [SF1] OUT → ChoSend	Page 150
TEMPO	Determines the tempo of the Arpeggio assigned to the currently selected Performance.	[PERFORM] → Performance selection → [F6] ARP → Tempo	Page 149

● **When the [TONE] indicator is turned on:**

CUTOFF	Raises or lowers the Filter cutoff frequency to adjust the tone brilliance.	[PERFORM] → Performance selection → [F5] EG → CUTOF	Page 149
RESONANCE	Boosts or attenuates the level at the area around the Filter cutoff frequency.	[PERFORM] → Performance selection → [F5] EG → RESO	Page 149
ATTACK	Determines the attack time of the sound. For example, you can adjust a strings Voice so that the sound gradually swells in volume by setting a slow attack time—simply move the slider upwards.	[PERFORM] → Performance selection → [F5] EG → ATK (AEG)	Page 149
RELEASE	Determines the release time of the sound. Moving the slider upwards sets a long release time and (depending on the Voice assigned to the selected Performance) lets the sound sustain after the key is released. To produce a sharp release, in which the sound abruptly cuts off, set a short release time.	[PERFORM] → Performance selection → [F5] EG → REL (AEG)	Page 149

🔲NOTE   The settings above are applied as offsets to the AEG and FEG settings in the Performance Edit mode.

● **When the [ARP FX] indicator is turned on:**

SWING	Adjusts the swing feel of the Arpeggio playback.	[PERFORM] → Performance selection → [EDIT] → [COMMON] → [F3] ARP → [SF3] PLAY FX → Swing	Page 151
GATE TIME	Adjusts the Gate Time (length) of the Arpeggio notes.	[PERFORM] → Performance selection → [EDIT] → [COMMON] → [F3] ARP → [SF3] PLAY FX → GateTimeRate	Page 151
VELOCITY	Adjusts the velocity of the Arpeggio notes.	[PERFORM] → Performance selection → [EDIT] → [COMMON] → [F3] ARP → [SF3] PLAY FX → VelocityRate	Page 151
UNITMULTIPLY	Adjusts the Arpeggio playback time based on tempo.	[PERFORM] → Performance selection → [EDIT] → [COMMON] → [F3] ARP → [SF3] PLAY FX → UnitMultiply	Page 151

● **When the [EQ] indicator is turned on:**

LO	Determines the amount of boost or attenuation applied to the low frequency band of the Master EQ.	[PERFORM] → Performance selection → [EDIT] → [COMMON] → [F1] GENERAL → [SF3] MEQ OFS → LOW	Page 150
LO MID	Determines the amount of boost or attenuation applied to the low-midrange frequency band of the Master EQ.	[PERFORM] → Performance selection → [EDIT] → [COMMON] → [F1] GENERAL → [SF3] MEQ OFS → LOW MID	Page 150
HI MID	Determines the amount of boost or attenuation applied to the high-midrange frequency band of the Master EQ.	[PERFORM] → Performance selection → [EDIT] → [COMMON] → [F1] GENERAL → [SF3] MEQ OFS → HIGH MID	Page 150
HI	Determines the amount of boost or attenuation applied to the high frequency band of the Master EQ.	[PERFORM] → Performance selection → [EDIT] → [COMMON] → [F1] GENERAL → [SF3] MEQ OFS → HIGH	Page 150

🔲NOTE   The settings above are applied as offsets to the EQ settings in the [PERFORM] → Performance selection → [EDIT] → [COMMON] → [F2] OUT/MEF → [SF2] MEQ (Master EQ) display.

● **When both the [PAN/SEND] and [TONE] indicators are turned on (by pressing them simultaneously):**

ASSIGN A	Adjusts parameters assigned to these sliders in the [UTILITY] → [F4] CTL ASN → [SF2] ASSIGN display.	Page 165
ASSIGN B		
ASSIGN 1	Depends on the settings of the Voice assigned to the selected Performance.	Page 151
ASSIGN 2		

🔲NOTE   In addition to above functions, Master Effect related parameters (set in the [PERFORM] → Performance selection → [COMMON] → [F2] OUT/ MEF → [SF3] MEF display) can be assigned to these four sliders by pressing the [ARP FX] and [EQ] buttons simultaneously. The particular parameters are assigned to the four sliders can be set in the [UTILITY] → [F4] CTL ASN → [SF5] MEF display.

● **When the [VOLUME] indicator is turned on:**

PART1 - 4	Adjusts the level balance among the Parts.	[PERFORM] → Performance selection → [EDIT] → Part selection → [F2] OUTPUT → [SF1] VOL/PAN → Volume	Page 153

Storing/Saving the created Performance

Two steps are necessary in order to store (save) your Performance—storing the edited Performance to internal memory and saving the stored Performances to a USB storage device.
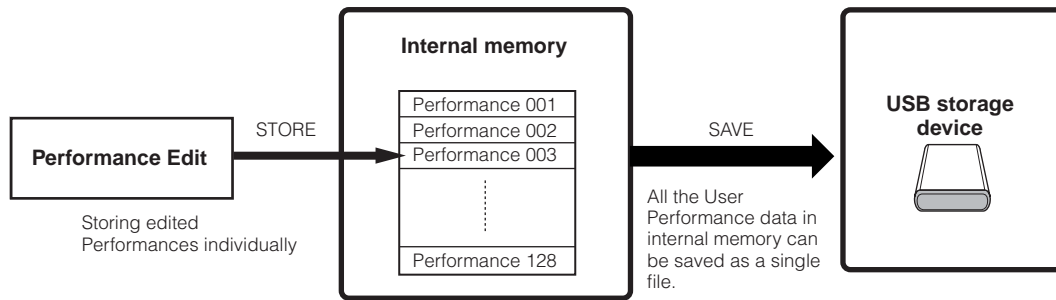
When you turn off the power to the instrument, User Performance saved in the Performance Store mode is not erased. As such it is not necessary to save the data to USB storage device; however, you may want to save it for backup or organizational purposes, using the Save operation.

Storing the edited Performance as a User Performance to internal memory

[PERFORM] → [STORE]

1 After editing the Performance, press the [STORE] button to enter the Performance Store mode.

2 Select the destination Performance memory.

Select a Performance number by using the data dial, [INC/YES] and [DEC/NO] button.

⚠ CAUTION

When you execute the Store operation, the settings for the destination memory will be overwritten. Important data should always be backed up to a separate USB storage device.

3 Press the [ENTER] button.

The display prompts you for confirmation. Press the [DEC/NO] button to cancel the Store operation.
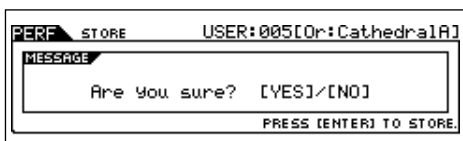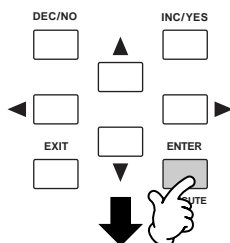
4 To execute the Store operation, press the [INC/YES] button.

After the Performance has been stored, a "Completed" message appears and operation returns to the Performance Play display.
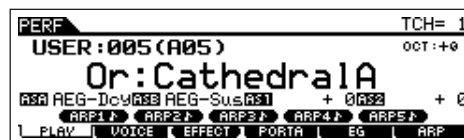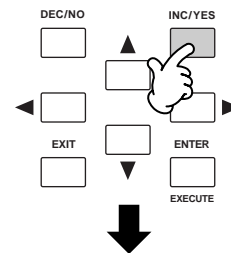
⚠ CAUTION

Never attempt to turn off the power while an "Executing..." or "Please keep power on" message is shown. Turning the power off in this state may cause the system to freeze and prevent normal startup the next time the power is turned on, as well as resulting in the loss of all user data.

⚠ CAUTION

If you select another Performance without storing, the currently edited Performance will be lost. Make sure to store the edited Performance before selecting another Performance.

Saving the edited Performances to a USB storage device

[FILE] → [F2] SAVE

The basic operations are the same as in the Voice mode (page 51).
However, keep in mind that you must set the Type parameter to "All." When Type is set to "All," executing the Save operation saves all the created data, including the Performances as well as the Voices assigned to them, as a single file (extension: S7A).
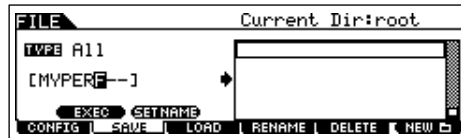
Loading Performance data from the USB storage device

[FILE] → [F3] LOAD

These instructions describe how to recall the data saved as an "All" file type (extension: S7A) from the USB storage device, by using the Load operation.

1 **Press the [FILE] button to enter the File mode. Then press the [F1] CONFIG button and [SF2] CURRENT button.**

If the device is divided into several partitions, select the specific partition for use. If the device has several media (e.g., discs) inserted, select a specific Slot number.

2 **Press the [F3] LOAD button to call up the Load display.**

3 **Select the file type to be loaded.**

The "All" file contains all the Performances.
If you wish to load all the Performances, set Type to "All." In this case, all data that can be created on this instrument will be loaded in step 5 below. If you wish to load only a specific Performance, set Type to "Performance."
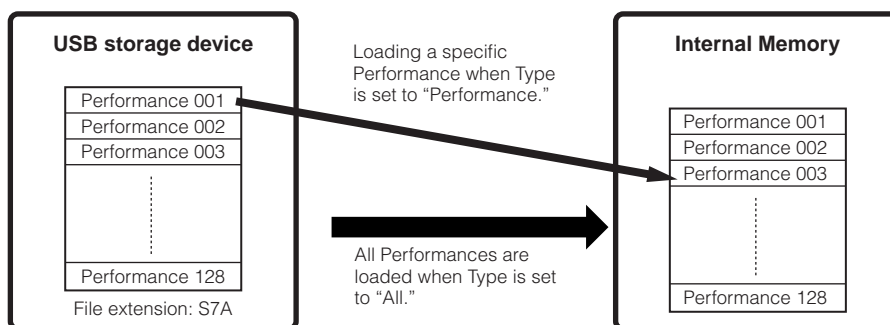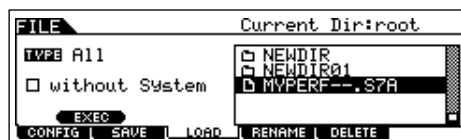
⚠ CAUTION

When Type (file type) is set to "All" and the Load operation is executed, all data that can be created on the instrument will be loaded. This means that any existing data in User memory will automatically be overwritten and lost. Make sure to save any important data to a USB storage device before performing the Load operations, especially when Type is set to "All."

🔲 NOTE   When Type (file type) is set to "Performance" and the Load operation is executed, the sound of the Performances may not be reproduced properly if the User Voices assigned to the Performances saved in the file have been changed by editing.

4 | Select the file (" 🗋 ") to be loaded.

Move the cursor to the file (extension: S7A) saved in the operation explained in the previous instructions. If the desired file was saved in specific folder, enter the folder and select the file. For information on how to select a folder, see the section "Supplementary information" on page 170. If you have set the Type parameter to "All" in step 3, go on to step 5.
If you have set the Type parameter to "Performance" in step 3, execute the operations in the following box, then go on to step 5.

When Type is set to "Performance":
When Type is set to "Performance," you can specify and load a specific Performance from a file (with the extension S7A).
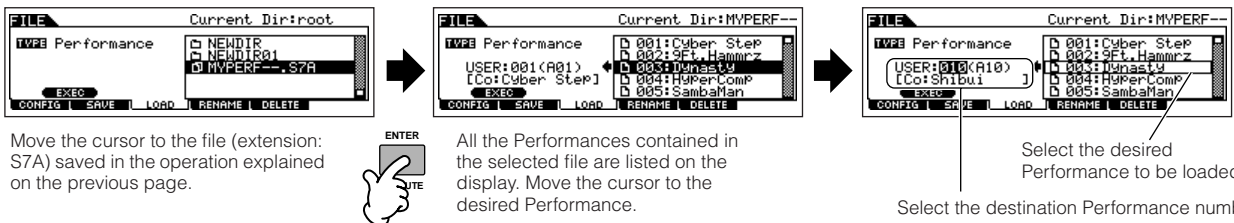
Move the cursor to the file (extension: S7A) saved in the operation explained on the previous page.

ENTER

All the Performances contained in the selected file are listed on the display. Move the cursor to the desired Performance.

Select the desired Performance to be loaded.

Select the destination Performance number.

⚠️ **CAUTION**

Loading data to this instrument automatically erases and replaces any existing data in the User memory.

---

5 | Press the [SF1] EXEC button to actually load the file.

After the data has been loaded, a "Completed" message appears and operation returns to the original display.

⚠️ **CAUTION**

While the data is being saved/loaded, make sure to follow these precautions:
• Do not remove or eject the media from the USB storage device.
• Do not unplug or disconnect the USB storage device.
• Do not turn off the power of the instrument or the relevant devices.

Using the Controllers—Advanced Course

Controllers supported by the S90 ES

You can control tone, volume, pitch and other parameters by using the controllers on the front panel, as well as by using external controllers connected to several controller jacks on the rear panel.

Controllers on the front panel

S90 ES rear panel

Optional Controllers

BC3   FC4/FC5   FC3/FC4/FC5   FC7   FC7
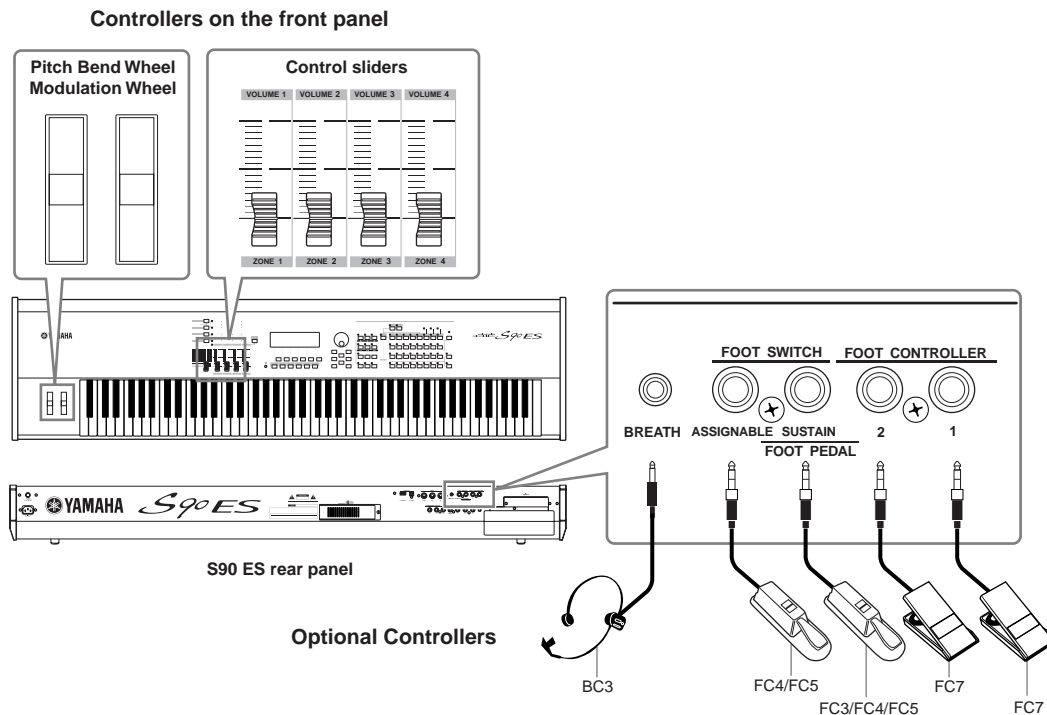
Controllers on the S90 ES

■ **Pitch Bend wheel/Modulation wheel**

Controls pitch or vibrato. For details, see page 41.

■ **Control sliders**

Controls various parameters. For details, see page 42.

Controllers (optional) that can be connected to the rear panel of the S90 ES

■ **Breath Controller**

You can connect an optional Breath Controller (BC3) to the BREATH jack on the rear panel, and use it to control various parameters on this instrument—particularly those controlled by a wind player's breath, including dynamics, timbre, pitch and so on. The Breath Controller is ideally suited for realistic expression with wind instrument Voices.

■ **Footswitch (assignable)**

An optional Yamaha FC4 or FC5 Foot Switch connected to the rear panel FOOT SWITCH ASSIGNABLE jack can be assigned to a range of parameters. It is suited for switch-type (on/off) controls, such as Portamento Switch, increment/decrement of a Voice or Performance Number, start/stop of the Sequencer, and holding the Arpeggio on or off.

■ **Footswitch (sustain)**

An optional FC3, FC4 or FC5 Footswitch connected to the SUSTAIN jack on the rear panel lets you control sustain. When you press the damper pedal, the notes you play have a longer sustain. The S90 ES also provides a special Half Damper function for finer control over sustain.

When the Half Damper function is set to on (only FC3)

By connecting an optional FC3 foot controller, you can use the Half Damper feature. The Half Damper feature reproduces the fine control of an acoustic piano's damper pedal to control the sustain over time: pressing the pedal fully down makes the sound last longer, while letting up on the pedal part of the way slightly mutes the sustained sound. Effective use of the Half Damper feature lets you play piano sounds more expressively and realistically.

When the Half Damper function is set to off

By pressing the footswitch (sustain) on/off, you can control whether the sound is cut off or continues playing, even when the keys are released.

Keep in mind that some sounds may not be suitable for use in all situations with the Sustain footswitch. For example, for organ sounds that have no natural decay, the sound continues at the same level when holding down the Sustain footswitch. On the other hand, many sounds benefit from the use of Sustain, such as piano, which has a natural decay when a note is held.

You can switch the Half Damper function on or off in the following parameters:

[UTILITY] → [F4] CTL ASN → [SF3] FT SW → SusPedal (page 165)

[VOICE] → Voice selection → [EDIT] → Element selection → [SF3] AEG → Half Damper switch parameter (page 138)

NOTE Keep in mind that two separate parameters must be set to on in order to use the Half Damper function.

NOTE The on/off setting of the half-damper feature automatically affects the AEG (Amplitude Envelope Generator) settings. For details, refer to page 114.

NOTE The default setting for the SusPedal parameter is "FC (Half On)." When using the FC4 or FC5, make sure to change this setting, depending on the particular footswitch you are using.

■ Foot Controller

An optional Foot Controller (such as the FC7), connected to the FOOT CONTROLLER jack on the rear panel, can be assigned to control a variety of parameters on the instrument. By using a foot controller for parameter control in this way, both your hands are left free to play the keyboard (or to operate other controllers)—an exceptional convenience when playing live.

Controlling a Voice with Controller Set

[VOICE] → Voice selection → [EDIT] → [COMMON] → [F4] CTL SET (page 131)

Each of the Preset Voices of S90 ES is programmed with appropriate Modulation Wheel and Control slider assignments, for adjusting the sound and effects in ways that best match the selected Voice.

For example, you can apply the chorus effect by using the Modulation Wheel in a piano Voice and control the decay time parameter using the Control slider in a bass guitar Voice. The settings for all the controllers are referred to as a "Controller Set." These Controller Set settings can be stored with the User Voice.

Switch the display for each Controller Set by using the [SF1] - [SF3] buttons

❶ Element Switch

Select whether the controller will affect each individual Element.

Keep in mind that some destinations affect only the entire Voice (all Elements). In this case, the Element Switch parameter will be indicated by "----" and cannot be changed. This applies only to Normal Voices.

❷ Source (controller)

Determines the desired controller. For details about the abbreviations for each controller, see page 131.

The number in brackets indicates the Control Change number generated when moving the controller.

❸ Destination (function)

Determines the function assigned to the Source (controller). For the details about the abbreviations and the parameter types, refer to the Control List in the separate Data List booklet.

❹ Depth

Determines the amount by which the parameter selected in Destination can be controlled. For negative values, the controller operation is reversed.

TIP **Assigning multiple functions to a controller**

You can have a single controller affect different aspects of the sound at the same time. 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 simultaneously panned from left to right.

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

NOTE The functions assigned to the Controller by the Controller Set function are applied only to the internal tone generator block. For connected external MIDI instruments, use of the controllers generates separate MIDI Control Change numbers, as shown in the Source parameter.

NOTE Even if a different function is assigned to this wheel, the Pitch Bend function is available and Pitch Bend messages are still generated when the wheel is used.

Controlling the overall system with ASSIGN A and B

The ASSIGN A and B (Control slider 1 and 2) settings let you control the functions that affect all Voices, Performances, and Multis.
You can store the ASSIGN A and B settings as the system settings by pressing the [STORE] button.

NOTE ASSIGN A and B are common to all Voices/Performances/Multis. Changing the setting of ASSIGN A and B may result in changes to the data of stored User Voices/Performances/Multis.
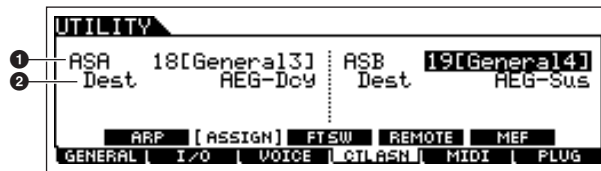
❶ ASSIGN A, ASSIGN B

Determines the Control Change numbers generated when controlling the ASSIGN A and B (Control sliders 1 and 2). Normally, there is no need to change these parameters. The general features used for the control numbers are indicated in the parentheses.

❷ Destination (function)

Determines the functions assigned to ASSIGN A and B. For the details about the abbreviations and the parameter types, refer to the Control List in the separate Data List booklet.

Changing Control Change numbers

The functions assigned to the controllers by the Controller Set and ASSIGN A/B functions are applied only to the internal tone generator block.

For connected external MIDI instruments, use of the controllers generates MIDI Control Change messages, as assigned in the chart below.
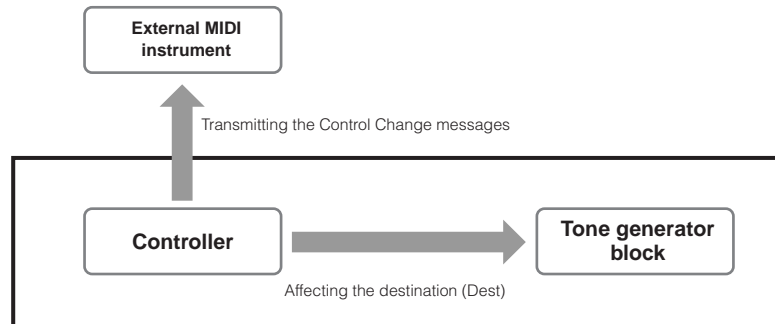
Controller	Generated MIDI message	Display to set the Control Change number
Aftertouch	Channel Aftertouch (DnH)	-
Pitch Bend wheel	Pitch Bend (EnH)	-
Modulation wheel	Control Change (BnH, 01H)	-
Footswitch (connected to the SUSTAIN connector)	Control Change (BnH, 40H)	-
ASSIGN A, B	Control Change (BnH)	[UTILITY] → [F4] CTL ASN → [SF2] ASSIGN
Footswitch (connected to the ASSIGNABLE jack)*	Control Change (BnH)	[UTILITY] → [F4] CTL ASN → [SF3] FT SW
Ribbon Controller*	Control Change (BnH)	[VOICE] → [UTILITY] → [F3] VOICE → [SF4] CTL ASN
ASSIGN 1, 2		[PERFORM] → Performance selection → [EDIT] → [COMMON] → [F4] CTL ASN
Foot Controller 1, 2		[MULTI/SEQ PLAY] (selecting Multi mode) → Multi selection → [EDIT] → [COMMON] → [F4] CTL
Breath Controller		ASN

* The S90 ES does not have a Ribbon Controller. However, keep in mind that if the same MIDI Control Change messages as set here are received from an external device, the internal tone generator also responds to those messages as if the Ribbon Controller of the instrument was used.

Conventional controllers, such as Modulation wheel, will affect connected MIDI instruments in their conventional way. For example, when the pan function is assigned to the Modulation wheel under Controller Set, using the Modulation wheel will apply the pan function to the internal tone generator, but will transmit the Modulation messages to the external MIDI instrument.

Keep in mind also that if the same MIDI Control Change messages as set here are received from an external device, the internal tone generator also responds to those messages as if the controller on the S90 ES itself was used.

> **TIP** **Using the Controllers effectively**
>
> You can also set up a controller such that it sends one kind of Control message to the internal tone generator of the S90 ES, yet another kind of message to the MIDI Out. For example, in a Controller Set you could assign Resonance to ASSIGN 1 (Control slider 3). Then, in the Utility mode, you could assign Control Change number 1 (modulation) to the same slider. Now, when you move Control slider 3, resonance will be applied to the sound of the internal tone generator block, while modulation messages will be transmitted to the external MIDI instrument.

Connecting the Computer and MIDI devices

Connections

Connecting to External Audio Equipment

Since the S90 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.

Audio Output

■ Connecting stereo powered speakers

Hooking up a pair of powered speakers lets you hear accurate reproduction of the instrument's rich sounds with their own pan and effect settings. Connect the powered speakers to the OUTPUT L/MONO and R jacks on the rear panel.
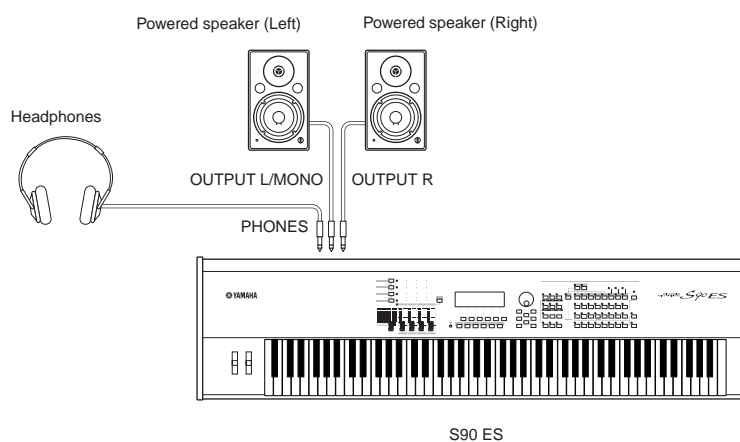
NOTE When using just one powered speaker, connect it to the OUTPUT L/MONO jack on the rear panel.

■ Connecting to a Mixer

There are extra audio outputs in addition to the main OUTPUT (L/MONO and R) jacks. Connect these outputs to a mixer for separately controlling and processing individual Drum Key sounds or Parts. Installing the mLAN16E expands the output capabilities with sixteen addition digital outputs, over a single FireWire (IEEE 1394) connector/cable. For details on how to set the Part/output jack assignments, refer to the chart below.

Outputting separate notes (keys) of a Drum Voice
This is done from the OutputSel parameter (as selected below) as Drum Voice data.

[VOICE] → Drum Voice selection → [EDIT] → Drum Key selection → [F1] OSC → [SF2] OUTPUT → OutputSel (page 141)

This setting is available for Parts for which the OutputSel parameter is set to "drum" in another mode (e.g., Performance or Multi).

Outputting separate Parts of a Performance
This is done from the OutputSel parameter (as selected below).

[PERFORM] → Performance selection → [EDIT] → Part selection → [F2] OUTPUT → [SF3] SELECT → OutputSel (page 154)

Assigning an audio input Part of a Performance to an output is done from the OutputSel parameter (as selected below).

[PERFORM] → Performance selection → [EDIT] → [COMMON] → [F5] AUDIO IN → [SF1] OUTPUT → OutputSel (page 151)

Outputting separate Parts of a Multi
This is done from the OutputSel parameter (as selected below).

[MULTI/SEQ PLAY] (selecting Multi mode) → Multi selection → [EDIT] → Part selection → [F2] OUTPUT → [SF3] SELECT → OutputSel (page 159)

Assigning an audio input Part of a Multi to an output is done from the OutputSel parameter (as selected below).

[MULTI/SEQ PLAY] (selecting Multi mode) → Multi selection → [EDIT] → [COMMON] →[F5] AUDIO IN → [SF1] OUTPUT → Outputsel (page 158)

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	
asL&R	ASSIGNABLE OUTPUT L and R	Stereo	
as1&2	mLAN16E Audio Output 1 and 2	Stereo (1:L, 2:R)	*
as3&4	mLAN16E Audio Output 3 and 4	Stereo (3:L, 4:R)	*
as5&6	mLAN16E Audio Output 5 and 6	Stereo (5:L, 6:R)	*
as7&8	mLAN16E Audio Output 7 and 8	Stereo (7:L, 8:R)	*
as9&10	mLAN16E Audio Output 9 and 10	Stereo (9:L, 10:R)	*
as11&12	mLAN16E Audio Output 11 and 12	Stereo (11:L, 12:R)	*
as13&14	mLAN16E Audio Output 13 and 14	Stereo (13:L, 14:R)	*

Display indication	Output jacks	Stereo/Mono	
asL	ASSIGNABLE OUTPUT L	Mono	
asR	ASSIGNABLE OUTPUT R	Mono	
as1	mLAN16E Audio Output 1	Mono	*
as2	mLAN16E Audio Output 2	Mono	*
⋮	⋮	⋮	⋮
as7	mLAN16E Audio Output 7	Mono	*
⋮	⋮	⋮	⋮
as13	mLAN16E Audio Output 13	Mono	*
as14	mLAN16E Audio Output 14	Mono	*

* Available only when the optional mLAN16E board has been installed.

● **Connection example when the optional mLAN16E board has been installed (analog and digital outputs)**
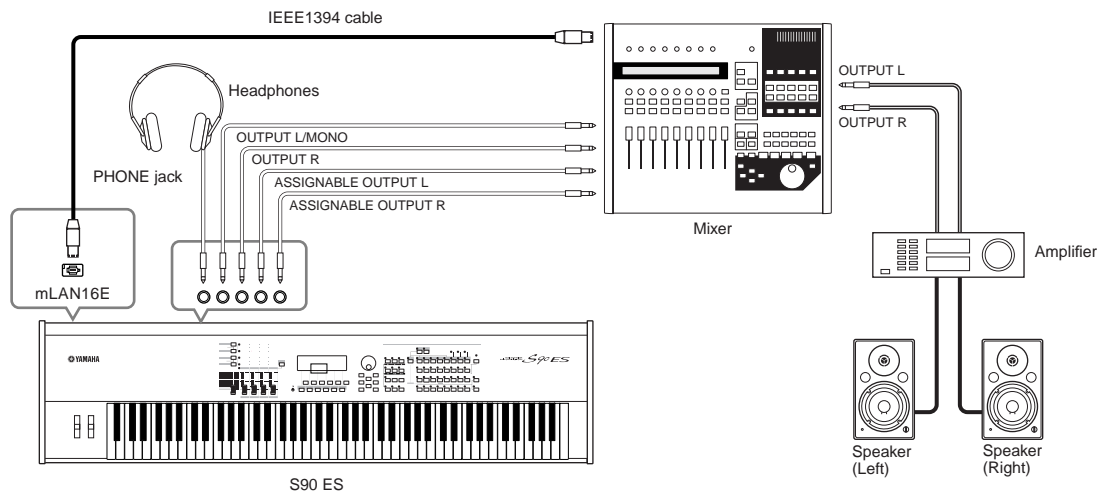
> **NOTE**
> • Connecting a pair of headphones does not affect audio output from the OUTPUT (L/MONO and R) jacks.
> • The sound monitored through the headphones is identical to the sound of the OUTPUT L/MONO and R jacks.
> • Any Parts/Drum keys assigned to the ASSIGNABLE OUTPUT jacks or mLAN connectors on mLAN16E will not be output through the OUTPUT L/MONO and R jacks.
> • The System Effects (Reverb, Chorus), the Master EQ, and the Master Effect are not applied to the sound output through the ASSIGNABLE OUTPUT jacks or mLAN connectors on mLAN16E. (Only the Part EQ and the Insertion Effect are applied.)
> • The output from the ASSIGNABLE OUTPUT jacks or mLAN connectors on mLAN16E is not affected by the [MASTER VOLUME] slider.
> • In the Voice mode, Normal Voices cannot be output via the ASSIGNABLE OUTPUT jacks or mLAN connectors on the mLAN16E.

Audio Input

■ Connecting a microphone or other audio equipment to the A/D INPUT jacks (analog input)

Virtually any audio device—such as a microphone, guitar, bass, CD player, synthesizer, etc.—can be connected to these jacks and its audio input signal can be mixed with and sounded as the AUDIO IN part of the Performance or Multi. For details, see the "Using the microphone and audio device sounds" section on page 38.

■ Digital Input using the optional mLAN16E

The optional mLAN16E allows you to connect this instrument to an mLAN device or computer, giving you high-speed audio and MIDI data transfer between devices with just one IEEE 1394 cable connection.
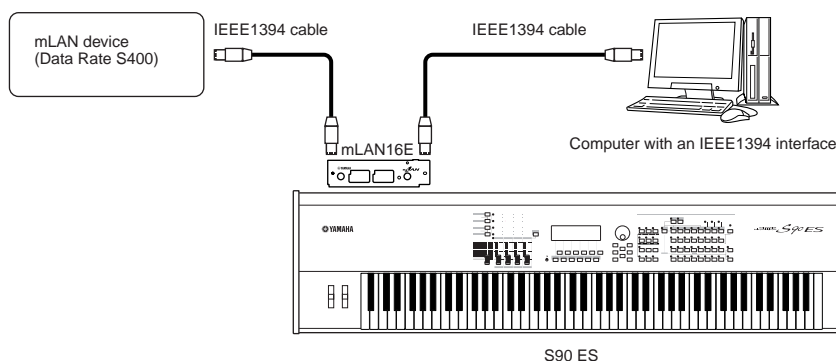
Connecting External MIDI Equipment

Using a standard MIDI cable (optional), you can connect an external MIDI device, and control it from the S90 ES. Likewise, you can use an external MIDI device (such as a keyboard or sequencer) to control the sounds on the S90 ES. This section introduces several different applications of MIDI.

NOTE When using the MIDI cable, make sure to set the following parameter to "MIDI." [UTILITY] → [F5] MIDI → [SF4] OTHER → MIDI IN/OUT parameter

■ Controlling from an external MIDI keyboard

Use an external keyboard to remotely select and play Voices of the S90 ES.

MIDI IN

MIDI OUT

S90 ES

External MIDI keyboard or synthesizer, such as the MOTIF ES series
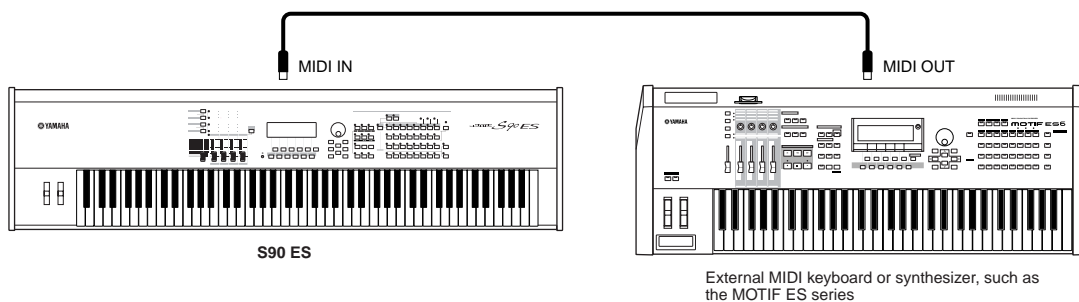
MIDI Transmit Channel and Receive Channel

Make sure to match the MIDI Transmit Channel of the external MIDI instrument with the MIDI Receive Channel of the S90 ES. For details on setting the MIDI Transmit Channel of the external MIDI instrument, refer to the owner's manual of the instrument. For details on setting the MIDI Receive Channel of the S90 ES, follow the instructions below.

In the Voice mode/Performance mode (using the S90 ES as a single timbre tone generator)
Confirm the MIDI Basic Receive Channel with the operation below. If necessary, change this parameter to the same number as the MIDI Transmit Channel of the external MIDI instrument.

> **[UTILITY] → [F5] MIDI → [SF1] CH → BasicRcvCh**

In the Multi mode/Sequence Play mode (using the S90 ES as a multi-timbral tone generator)
Change the settings of the desired parts to match the MIDI Transmit Channel settings on the external MIDI instrument. Confirm and change the MIDI Receive Channel for each Part of the Multi with the operation below.

> **[MULTI/SEQ PLAY] (selecting Multi mode) → Multi selection → [EDIT] → Part selection → [F1] VOICE → [SF2] MODE → ReceiveChITY] → [F5] MIDI → [SF1] CH → BasicRcvCh**

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

NOTE For details about the tone generator block of S90 ES, see page 115.

■ Controlling an external MIDI keyboard

This connection lets you sound an external MIDI tone generator (synthesizer, tone generator module, etc.) by playing the S90 ES or playing back the MIDI song file. Use this connection when you wish to sound the another instrument along with the S90 ES.

MIDI OUT

MIDI IN

S90 ES

External MIDI keyboard or synthesizer, such as the S/SY/EX series
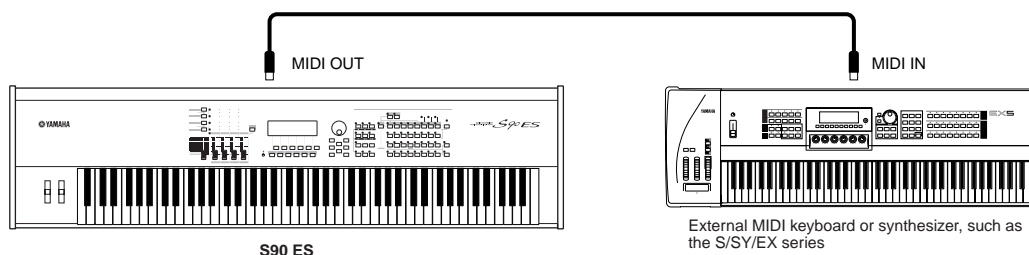
TIP **Splitting the sound between the S90 ES and an external tone generator by MIDI channel**

Using the connection example shown above, you can play both instruments and have them separately sound different parts. To use this feature, you must set the S90 ES's output channel and the external tone generator's receive channel to the same channel number. Follow the instructions below.

■ **In the Voice mode/Performance mode**

You can check the MIDI Transmit Channel at the right corner of the [F1] PLAY display in the Voice Play mode/Performance Play mode. If necessary, change the MIDI Transmit Channel by turning the [TRACK SELECT] button on and entering the desired value with the Number buttons. When you wish to mute the sound of the S90 ES and sound only the external tone generator, set Master Volume to "0," or set Local Control to "off" with the following operation.

[UTILITY] → [F5] MIDI → [SF2] SWITCH → LocalCtrl

For details on how to set the MIDI Receive Channel of the external MIDI instrument, refer to the owner's manual of the instrument.

■ **In the Multi mode/Sequence Play mode**

In the Multi mode and Sequence Play mode, the MIDI messages generated by playing the keyboard are transmitted on the same MIDI channel number as that of the currently selected Part.
Alternately, you can set the output destination (Internal or external MIDI tone generator) for each Part from the following display in the Sequence Play mode (page 99).

[MULTI/SEQ PLAY] (select Sequence Play mode) → [F2] OUTPUT → INT SW (Internal Switch), EXT SW (External Switch)

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

NOTE You can also split the sound between the S90 ES and external tone generators by using the Zone settings.

NOTE For details about the tone generator block of S90 ES, see page 115.

■ **Controlling another MIDI device via MIDI THRU**

MIDI THRU simply re-transmits the MIDI messages received via MIDI IN. In the example below, the MIDI messages generated by playing an external keyboard are transmitted to an external tone generator via the MIDI THRU connector on the S90 ES. The MIDI data of your performance on the S90 ES are transmitted to an external device via the MIDI OUT connector on the S90 ES.

MIDI OUT

MIDI OUT   MIDI IN   MIDI THRU   MIDI IN   MIDI IN

MIDI Keyboard   S90 ES   MIDI tone generator   MIDI Synthesizer
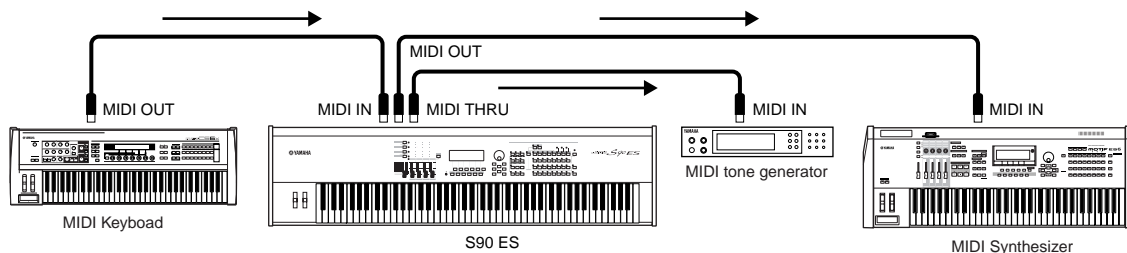
■ **Using an IEEE1394 interface (when an optional mLAN16E has been installed)**

The mLAN connection to computer (page 64) allows you to transfer both audio and MIDI data between your S90 ES and a computer.

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 S90 ES sounds or using the Voice Editor/Multi Part Editor software to create and edit your own custom Voices/Multis.

In order to use the instrument with a computer via a USB connection, you will need to install an appropriate USB-MIDI driver. You can download the proper driver from our website:

http://www.global.yamaha.com/download/usb_midi/

OS: Windows XP Professional/Home Edition, Mac OS X 10.2-10.4.0
*This information is current as of May 2005. For the latest information check the web site above.

Using a USB cable

MIDI messages can be transferred between the sequencer software and S90 ES using the USB cable. However, audio data cannot be transmitted or received via USB on the S90 ES.
When using a USB connection, make sure to set the following parameter to "USB."

[UTILITY] → [F5] MIDI → [SF4] OTHER → MIDI IN/OUT = USB

USB cable

USB TO HOST

S90 ES   Computer with a USB interface
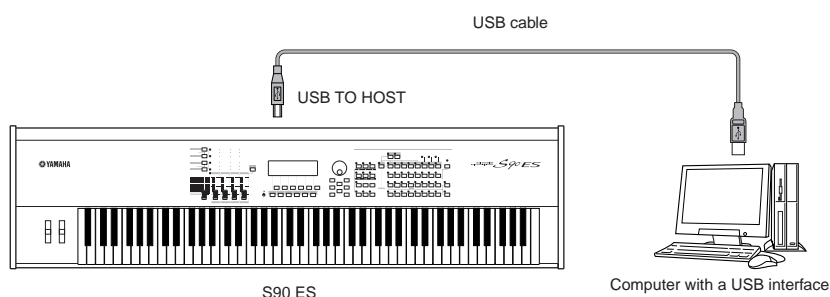
📝 **NOTE** USB cables have different connectors on each end: the A type and the B type. When connecting this synthesizer to the computer, connect the A type to your computer and the B type to the USB TO HOST connector. When connecting this synthesizer to the computer, connect the A type to your computer and the B type to the USB TO HOST connector.

📝 **NOTE** If you are using the Remote Control function of the S90 ES to control operations on a computer sequencer, use the USB connection.

MIDI channel and MIDI port

MIDI data is assigned to one of sixteen channels, and this instrument is capable of simultaneously playing sixteen separate parts via these channels. While a single MIDI cable is equipped to handle data over up to sixteen channels simultaneously, a USB connection is capable of handling far more—thanks to the use of MIDI ports. Each MIDI port can handle sixteen channels, and the USB connection allows up to eight ports, letting you use up to 128 channels (8 ports x 16 channels) on your computer.

📝 **NOTE** This instrument can recognize and use up to three ports at the same time.

📝 **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.

Synchronizing with an external sequencer (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 sequencer to trigger the Arpeggio function on the S90 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 S90 ES receives clock signals from the master instrument.

> **TIP** **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 S90 ES is played by MIDI data via port 5, as set in the ThruPort parameter with the following operation.
>
> **[UTILITY] → [F5] MIDI → [SF4] OTHER → ThruPort = 5**
>
>
>
> MIDI IN   MIDI cable   USB cable
>
> Only MIDI data over port 5 will be transmitted through the S90 ES to this tone generator.
>
> MIDI OUT   USB TO HOST
>
> Outputting the MIDI data via multiple ports
>
> S90 ES
>
> 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 115.
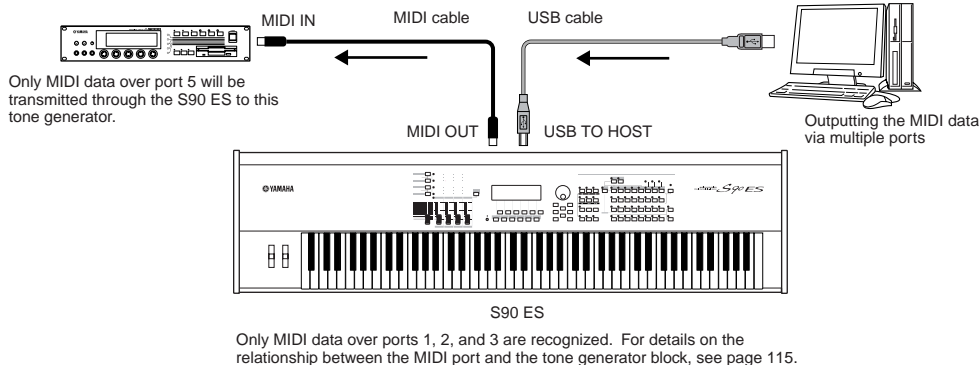
Precautions when using the USB TO HOST connector

When connecting the computer to the USB TO HOST connector, make sure to observe the following points.
Failing to do so risks freezing the computer and corrupting or even losing the data. If the computer or the instrument freezes, turn the power to the instrument off or restart the computer.

⚠ **CAUTION**

- **Before connecting the computer to the USB TO HOST 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 TO HOST connector.**
- **Execute the following before turning the power to the instrument on/off or plugging/unplugging the USB cable to/from the USB TO HOST connector.**
  - **Quit any open applications (such as Voice Editor, Multi Part Editor, and sequencer software).**
  - **Make sure that data is not being transmitted from the instrument. (Data is transmitted only by playing notes on the keyboard or playing back a song.)**
- **While a USB device is connected to the instrument, you should wait for six seconds or more between these operations: (1) when turning the power of the instrument off then on again, or (2) when alternately connecting/disconnecting the USB cable.**

Using an IEEE1394 (mLAN) cable (when an optional mLAN16E has been installed)

By installing an optional mLAN16E interface, you can connect a computer (with an IEEE 1394 interface) to this instrument and have both MIDI and audio data transfer via a single cable.

[UTILITY] → [F5] MIDI → [SF4] OTHER → MIDI IN/OUT = mLAN

IEEE1394 cable

mLAN16E   mLAN connector

S90 ES   Computer with an IEEE1394 interface
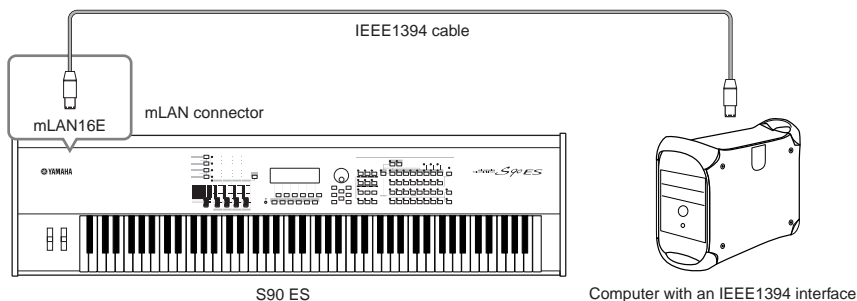
The mLAN connection using an IEEE1394 cable lets you transfer both MIDI data and audio data. For example, you can record your keyboard performance to hard disk of the computer as audio data (page 88).

Using a MIDI cable

MIDI cable

MIDI interface

Serial port (modem or printer port)
or USB port

MIDI IN   MIDI OUT
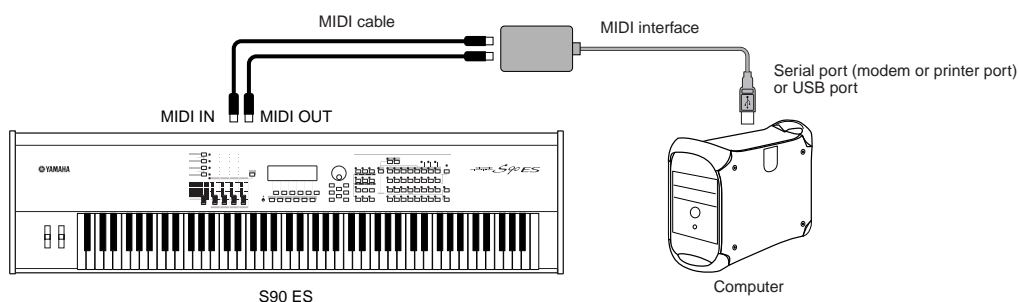
S90 ES

Computer

> **NOTE** Use an appropriate MIDI interface for your computer. If you are using a computer that has a USB port, make sure to connect the computer and the S90 ES by USB. (The data transfer rate is faster than MIDI and you'll have access to multiple MIDI ports.)

Local On/Off—when Connected to a Computer

When connecting this synthesizer to a computer, the keyboard performance data is generally sent to the computer, and then returned from the computer to play the tone generator block. If the Local Control in the Utility mode is set to "on," a "double" sound may result, since the tone generator is receiving performance data from both the keyboard directly and the computer. Use the setting suggestions below as a guideline; specific instructions may differ depending on your computer and the software used.

• When MIDI "Echo" (MIDI Thru) is set to "on" the software/computer:

Computer (SQ01, etc.)

USB TO HOST

S90 ES   IN   OUT

Tone generator
block

Keyboard

OUT

IN

[UTILITY] → [F5] MIDI → [SF2] SWITCH → LocalCtrl = off

MIDI Echo (MIDI thru) = on
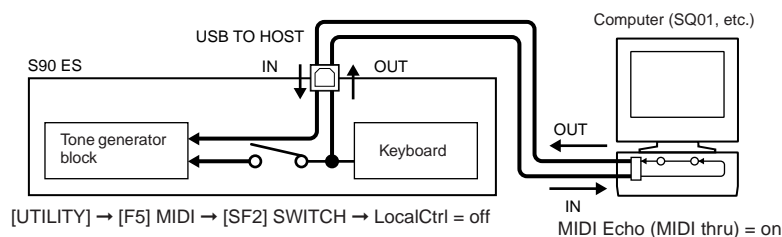
> **NOTE** When transmitting or receiving System Exclusive data (such as with the Bulk Dump function), use the setting example below, making sure that MIDI "Echo" (MIDI through) on the computer software is set to "off."

• When MIDI "Echo" (MIDI Thru) is set to "off" the software/computer:

Computer (SQ01, etc.)

USB TO HOST

S90 ES   OUT

Tone generator
block

Keyboard

IN

[UTILITY] → [F5] MIDI → [SF2] SWITCH → LocalCtrl = on

MIDI Echo (MIDI thru) = off
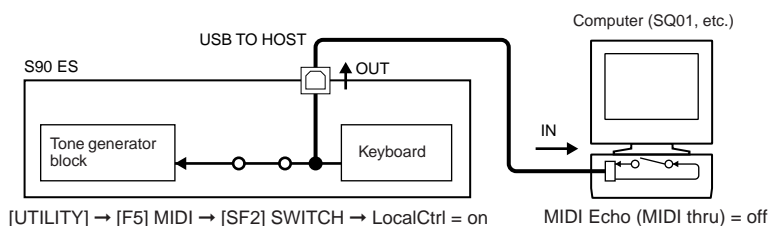
> **NOTE** Although not indicated in the illustration above, the S90 ES actually receives and responds to MIDI data from the computer application (sequencer), regardless of the Local Control setting on the S90 ES.

* MIDI "Echo" is a function on sequencers that takes any data received via the MIDI IN and "echoes" it (or sends it as is) through the MIDI OUT. In some software, this function is also called "MIDI Thru."

> **NOTE** For details about the MIDI Echo, refer to the owner's manual of your particular software.

Creating a Song with the Multi mode

The Multi Mode lets you set up the S90 ES as a multi-timbral tone generator for use with computer-based music software or external sequencers. If each track in a MIDI 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. Installing Plug-in Boards allows you to create a Multi containing up to 34 Parts (page 117).

Since there is only one bank of Multi presets, you can select a Multi directly without specifying a bank.

DNOTE **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 64 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 109. Here, you'll learn how to play back song files of your computer sequencer software with the S90 ES.

Setting up for using a computer

DNOTE In the example explanations below, the S90 ES is connected to a computer via USB. You can also use MIDI cables or an mLAN (IEEE1394) cable to connect the instrument to a computer.

1 **Download the latest USB-MIDI driver from the website at the following URL:**

http://www.global.yamaha.com/download/usb_midi/
OS: Windows XP Professional/Home Edition, Mac OS X 10.2-10.4.0
*This information is current as of May 2005. For the latest information check the web site above.

2 **Install the USB-MIDI driver to the computer.**

For information about how to install, refer to the installation guide included in the downloaded file.

3 **Connect the S90 ES to the computer by the USB cable.**

For details, see page 67.

4 **Set the following parameter to "USB."**

[UTILITY] → [F5] MIDI → [SF4] OTHER → MIDI IN/OUT

5 **Press the [STORE] button to store the settings as the system setting of Utility mode.**

⚠️ **CAUTION**

Never attempt to turn off the power while an "Executing..." or "Please keep power on" message is shown. Turning the power off in this state may cause the system to freeze and prevent normal startup the next time the power is turned on, as well as resulting in the loss of all user data.

Using the sounds of the S90 ES for song playback from a sequencer

1 **Follow the instructions described in "Setting up for using a computer" (at left).**

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

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

MIDI Port settings
If you are using the internal tone generator of the S90 ES, set the MIDI port of each track of the sequencer to "1." If you are using Plug-in Board Voices, set the MIDI port of the track(s) to the same number as in the "PORT NO." parameter.

[UTILITY] → [F6] PLUG → [SF2] MIDI → PORT NO.

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 [F1] VOICE display in the Multi Part Edit mode (page 159).

DNOTE MIDI ports 1 - 8 of USB are shown as "YAMAHA USB IN/OUT 0 - 1" - "YAMAHA USB IN/OUT 0 - 8" in Windows, and as "YAMAHA S90 ES Port 1" - "YAMAHA S90 ES Port 8" on the Macintosh.

Quick Guide

Connecting the Computer and Midi devices

3 Press the [MULTI/SEQ PLAY] button once or twice to enter the Multi mode.
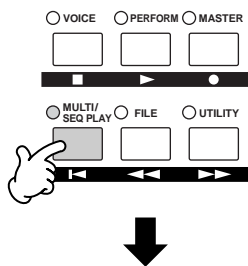
4 Select a Multi.

This operation is the same as in the "Selecting a Performance" section on page 34. However, keep in mind that the following points differ from the Performance.

• Only Group buttons [A] - [D] can be used. (A maximum of 64 channels can be used with a Multi.)

• You cannot use the Category Search function.

Set the Voices to be assigned to each Multi Part, as well as the Receive Channels and Effects for the desired song. For more information, refer to "Simple Mixing functions (Multi Play mode)" on page 72 and "Detailed Mixing functions (Multi Edit mode)" on page 74.

> **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 107). The Bank Select MSB/LSB values for changing the Multi are as follows:

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

This Bank Select/Program Change data must be sent over the same MIDI channel as that of the BasicRcvCh (Basic Receive Channel) setting.

> **NOTE** When switching the mode (e.g., changing the Voice mode to the Multi mode), transmit the proper Mode Change message (System Exclusive) before sending the Bank Select MSB to the S90 ES (page 183).

> **NOTE** After sending 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 S90 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.

Multi Play Mode

Playing a Multi

Quick Guide

Connecting the Computer and Midi devices
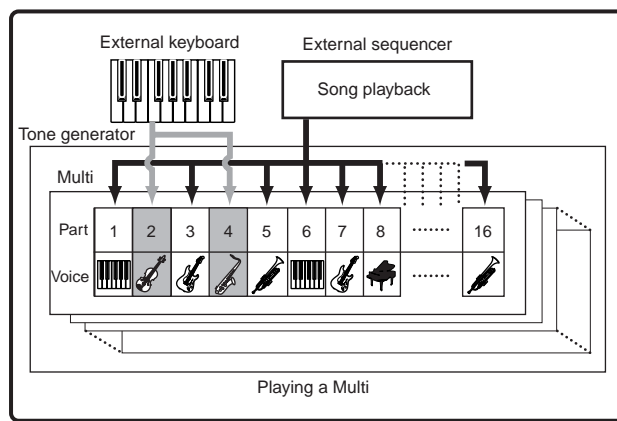
TIP **Multi Part mute/solo**

■ To mute a Part

1. Press the [MUTE] button so that its lamp lights.

To turn Mute off, press the [MUTE] button again (the lamp goes off).

2. Press any of the Number [1] - [16] buttons to select the Part number to be muted.

The corresponding Part is set to mute (its lamp goes off) and produces no sound. When pressing the same number button again, the Part mute is canceled (its lamp lights).
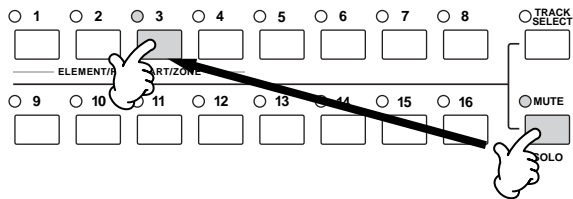
■ To solo a Part

Simultaneously hold down the [MUTE] button and press one of the Number buttons [1] to [16] to solo the corresponding Part. Once you've selected a Part for soloing, the [MUTE] button's lamp flashes, indicating the Solo function is active. While Solo is active, you can change the soloed track simply by pressing the corresponding Number button [1] to [16].

Press the buttons simultaneously

NOTE When selecting a Multi in the Master mode, the mute/solo settings apply not to each Part but to each MIDI transmit channel. Details are the same as for the mute/solo settings in the Sequence Play mode.
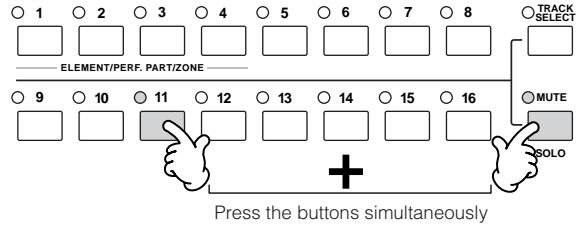
Simple mixing functions (Multi Play mode)

The Multi Play 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, use the Multi Edit mode (page 74).

1 **Select the Multi you wish to edit according to the instructions in "Using the sounds of the S90 ES for song playback from a sequencer" on page 70.**

When creating a new Multi from scratch, you can conveniently clear the settings for the current Multi beforehand by using the Initialize function in the Multi Job mode (page 160).

2 **Turn the [TRACK SELECT] button on and select a Part by using the Number [1] - [16] buttons.**

When you play the keyboard, the Voice assigned to the current selected Part will be played.
Pressing the [F6] button switches among the following displays: the display for Parts 1 - 16, to which the internal Voices are assigned, the display for Multi Plug-in Parts (17 - 32), to which the PLG100-XG voices are assigned, and the display for Plug-in Parts (PLG1 - 3), to which the Plug-in Voices of the single part Plug-in board are assigned.

Notes on playing the selected Part using the keyboard

The process of step 2 above not only selects the Part in the display, but the MIDI transmit channel that is assigned to the same number as the Part number as well (just as in the Voice or Performance mode). Therefore, when the MIDI receiving channel (ReceiveCh) is changed, the Voice assigned to an unselected Part may sound.
For example, when you set the [TRACK SELECT] button to on and press the number [2] button, Part 2 is selected, and the MIDI transmit channel of the keyboard is set to channel 2 at the same time.
However, if you've set the MIDI receive channel (ReceiveCh) of Part 2 to channel 3, and the MIDI receive channel of Part 3 to channel 2, the MIDI data of your keyboard performance is output to channel 2, and Part 3's voice will be output—instead of the selected Part 2 voice. (See illustration below.)
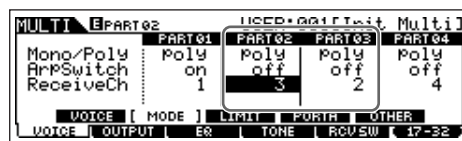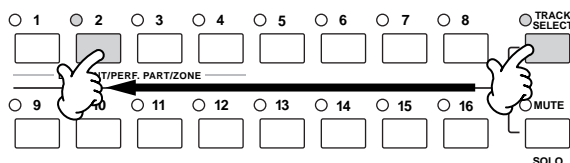
NOTE The Receive Channel can be set in the Multi Edit mode (page 159).

3 Select the desired display, then edit the desired parameters by using the [F1] - [F6] and [SF1] - [SF5] buttons.

[F2] VOL/PAN

Set the pan and output level (volume) of each Part.
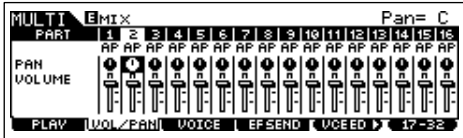
[F3] VOICE

Turn the [TRACK SELECT] button and [MUTE] button to off, and then select the Voice Bank or Number, in the same way as in the Voice mode (page 30).

⏵NOTE Bank
By selecting the "BankMSB/BankLSB" parameter and using the data dial, you can call up the Voice Banks listed below.

Normal Voice	Drum Voice	Plug-in Voice
Pr 1 - 4: Preset	PD: Preset Drum	Pp: Plug-in Preset
GM	GD: GM Drum	Pu1: Plug-in User
Us 1 - 2: User	UD: User Drum	PB: Plug-in Board *

* For details about Plug-in Board Voices, see page 100.

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 32).

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 S90 ES, the Part Voice corresponding to the MIDI channel of these messages can be changed (page 107).

⏵NOTE Make sure that the MIDI Channel of the MIDI message is set to the same value as the Receive Channel (ReceiveCh) of the desired Part.

[F4] EF SEND (Effect Send)

Adjust the Reverb/Chorus Effect for each Part.
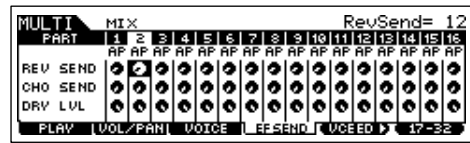
For details about the effect settings, see page 123.

[F5] VCE ED (Multi Voice Edit)

Edit the Normal Voice assigned to each Part. This is the same function as in both Common Edit and Voice Element Edit in the Voice mode (page 45).
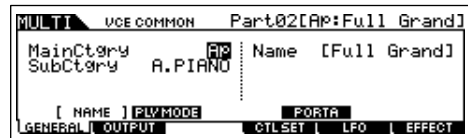
⏵NOTE Certain parameters cannot be edited in Multi Voice Edit.

⏵NOTE Only Normal Voices can be edited.

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

⏵NOTE Please note that the functions of the [F5] and [F6] buttons depend on whether the [F1] PLAY display is selected or not. For details, see page 157.

4 Store the edited Multi.

You can store up to 64 Multis to internal memory. For details about storing Multis, see page 76.

Playing Single-part Plug-in Board Voices

In the default settings, the Receive Channels are set to 1 for the PLG1 Part, 2 for PLG2, and 3 for PLG3. If the MIDI Port for a PLG Part is set to 1, the internal Parts which are set to the same receive channel as that of the Plug-in Part are also played when a Note On message is received.

To prevent this from happening, set the receive channels of the Parts that you want to keep from playing to "off," or set the MIDI port of the Plug-in Part(s) to "2" or "3" (page 100).

Quick Guide

Connecting the Computer and Midi devices

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. When creating a new Multi from scratch, you can conveniently clear the settings for the current Multi beforehand by using the Initialize function in the Multi Job mode (page 160).

1 **Press the [MULTI/SEQ PLAY] button to enter the Multi mode, then select a Multi to be edited (page 70).**

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

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

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

While in the Multi Edit mode, you can switch between the Common Edit display and the Part Edit display as shown below.

Calling up the Common Edit display
Press the [COMMON] button to call up the Common Edit display.
In the Edit mode, the [DRUM KITS] button functions as the [COMMON] button.

Indicates a Common Edit display.

Calling up the Part Edit display
Press the desired Part number from the PART [1] - [16] buttons to call up the Part Edit display.

Indicates the display for editing part 1.

To switch between the Part 1 - 16 display, Part 17 - 32, and Part PLG1 - 3 display, press the [F6] button.

DRUM KITS
PRE 1 PRE 2 PRE 3 PRE 4
FAVORITES
A. PIANO KEYBOARD ORGAN GUITAR/PLUCKED
A B C D
SYN LEAD SYN PAD/CHOIR SYN COMP CHROMATIC PERCUSSION
COMMON
1 2 3 8
ELEMENT/PERF. PART/ZONE
9 10 11 16

F6

NOTE You can mute or solo a Part just as is done with Parts in the Multi Play mode.

Part1 Edit
Part2 Edit
Part3 Edit
Part4 Edit
⋮
Part 16 Edit
Part 17 Edit
⋮
Part 32 Edit
Plug-in part 1 (PLG1) Edit
Plug-in part 2 (PLG2) Edit
Plug-in part 3 (PLG3) Edit

Internal Tone Generator

Multi-Part Plug-in Board PLG100-XG

Single Part Plug-in Board
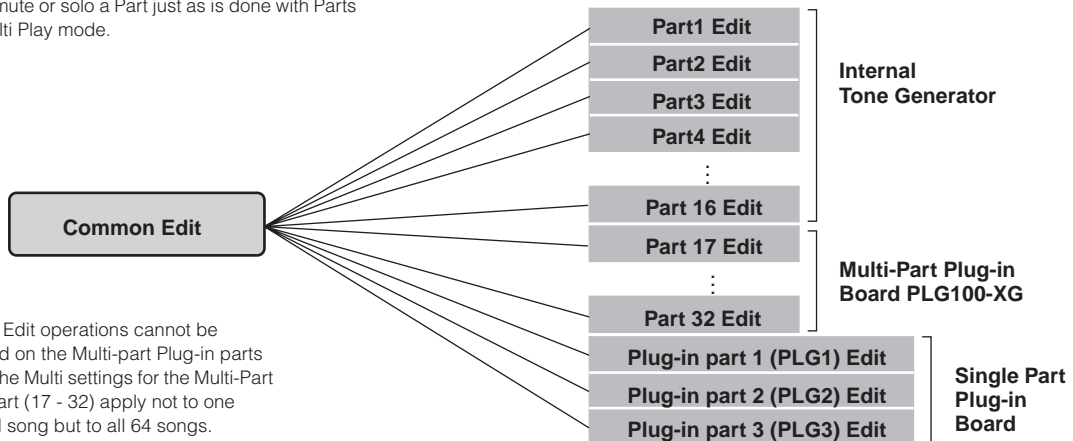
Common Edit

NOTE Common Edit operations cannot be performed on the Multi-part Plug-in parts 17 - 32. The Multi settings for the Multi-Part Plug-in Part (17 - 32) apply not to one individual song but to all 64 songs.

4 **Select the menu you wish to edit by pressing the [F1] - [F5] buttons and [SF1] - [SF5] buttons, then edit the parameters in each display.**

For details on the available parameters, see page 157.

5 **Repeat steps 3 - 4 as desired.**

6 **Name the edited Multi.**

For detailed instructions on naming a Multi, refer to Page 27.

7 **Store the settings as a User Multi.**

The edited Multi can be stored in the Multi Store mode. For details, refer to page 76.

TIP **Editing a Multi by using the Control sliders**

The four sliders at the top left of the instrument are not only for tweaking the sound while you perform — you can also use them to edit a Multi, either in the Multi Play mode or the Multi Edit mode.
For details on the parameters edited by the sliders, refer to the descriptions in the Performance mode (page 55).

● **When the [PAN/SEND] indicator is turned on:**

PAN	[MULTI/SEQ PLAY] (Selecting Multi mode) → Multi Selection → [EDIT] → Part Selection → [F2] OUTPUT → [SF1] VOL/PAN → Pan	Page 159
REVERB	[MULTI/SEQ PLAY] (Selecting Multi mode) → Multi Selection → [EDIT] → Part Selection → [F2] OUTPUT → [SF2] EF SEND → RevSend	Page 159
CHORUS	[MULTI/SEQ PLAY] (Selecting Multi mode) → Multi Selection → [EDIT] → Part Selection → [F2] OUTPUT → [SF2] EF SEND → ChoSend	Page 159
TEMPO	[MULTI/SEQ PLAY] (Selecting Multi mode) → Multi Selection → [EDIT] → [COMMOM] → [F3] APP → [SF1] TYPE → Tempo	Page 158

● **When the [TONE] indicator is turned on:**

CUTOFF	[MULTI/SEQ PLAY] (Selecting Multi mode) → Multi Selection → [EDIT] → Part Selection → [F4] TONE → [SF2] FILTER → Cutoff	Page 159
RESONANCE	[MULTI/SEQ PLAY] (Selecting Multi mode) → Multi Selection → [EDIT] → Part Selection → [F4] TONE → [SF2] FILTER → Resonance	Page 159
ATTACK	[MULTI/SEQ PLAY] (Selecting Multi mode) → Multi Selection → [EDIT] → Part Selection → [F4] TONE → [SF4] AEG → Attack	Page 159
RELEASE	[MULTI/SEQ PLAY] (Selecting Multi mode) → Multi Selection → [EDIT] → Part Selection → [F4] TONE → [SF4] AEG → Release	Page 159

NOTE The settings above are applied as offsets to the AEG and FEG settings in the Performance Edit mode.

● **When the [ARP FX] indicator is turned on:**

SWING	[MULTI/SEQ PLAY] (Selecting Multi mode) → Multi Selection → [EDIT] → [COMMON] → [F3] APP → [SF3] PLAY FX → Swing	Page 158
GATE TIME	[MULTI/SEQ PLAY] (Selecting Multi mode) → Multi Selection → [EDIT] → [COMMON] → [F3] APP → [SF3] PLAY FX → Gate Time Rate	Page 158
VELOCITY	[MULTI/SEQ PLAY] (Selecting Multi mode) → Multi Selection → [EDIT] → [COMMON] → [F3] APP → [SF3] PLAY FX → Velocity Rate	Page 158
UNIT MULTIPLY	[MULTI/SEQ PLAY] (Selecting Multi mode) → Multi Selection → [EDIT] → [COMMON] → [F3] APP → [SF3] PLAY FX → UnitMultiply	Page 158

● **When the [EQ] indicator is turned on:**

LO	[MULTI/SEQ PLAY] (Selecting Multi mode) → Multi Selection → Part Selection → [F3] EQ → Low Gain	Page 159
LO MID	[MULTI/SEQ PLAY] (Selecting Multi mode) → Multi Selection → Part Selection → [F3] EQ → Mid Gain	Page 159
HI MID	–	Page 159
HI	[MULTI/SEQ PLAY] (Selecting Multi mode) → Multi Selection → Part Selection → [F3] EQ → High Gain	Page 159

● **When both the [PAN/SEND] and [TONE] indicators are turned on (by pressing them simultaneously):**

ASSIGN A	Adjusts parameters assigned to these sliders in the [UTILITY] → [F4] CTL ASN → [SF2] ASSIGN display.	Page 165
ASSIGN B		
ASSIGN 1	Depends on the settings of the Voice assigned to the selected Multi.	Page 131
ASSIGN 2		

NOTE In addition to above functions, Master Effect related parameters (set in the [MULTI/SEQ PLAY] (selecting Multi mode) → Multi selection → [EDIT] → [COMMON] → [F2] MEQ/MEF → [SF2] MEFF display) can be assigned to these four sliders by pressing the [ARP FX] and [EQ] buttons simultaneously. The particular parameters are assigned to the four sliders can be set in the [UTILITY] → [F4] CTL ASN → [SF5] MEF display.

● **When the [VOLUME] indicator is turned on:**

PART	Adjusts the level balance among the Parts. [MULTI/SEQ PLAY] (Selecting Multi mode) → Multi selection → [EDIT] → Part selection → [F2] OUTPUT → [SF1] VOL/PAN → Volume	Page 159

Compare function and Edit Recall (Multi mode)

These are the same as in the Voice mode and Performance mode. For details, refer to page 105.

Storing/saving the created Multi

Two steps are necessary in order to store (save) your Multi—storing the edited Multi to internal memory and saving the stored Multis to a USB storage device.
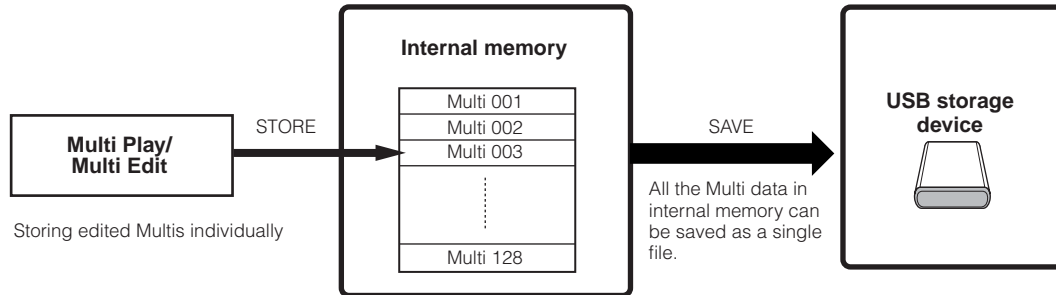
When you turn off the power to the instrument, User Multis saved in the Multi Store mode are not erased. As such it is not necessary to save the data to USB storage device; however, you may want to save it for backup or organizational purposes, using the Save operation.

Storing the edited Multi as a User Multi to internal memory

[MULTI/SEQ PLAY] (select Multi mode) → [STORE]

The operation is the same as in the Performance mode (page 56).

Saving the edited Multis to a USB storage device

[FILE] → [F2] SAVE

The basic operation is the same as in the Voice mode (page 51). However, you must select the file type "All" as in the Performance mode. When Type is set to "All," execute the Save operation to save all the created data, including the Multis as well as the Voices assigned to them, as a single file (extension: S7A).

Loading Multi data from the USB storage device

[FILE] → [F3] LOAD

These instructions describe how to recall the "All" file data saved to the USB storage device, using the Load operation to transfer the data to the instrument. An "All" file (extension: S7A) contains all Multis.

1 | **Press the [FILE] button to enter the File mode. Then press the [F1] CONFIG button and [SF2] CURRENT button.**

If the device is divided into several partitions, select the specific partition for use. If the device has several media (e.g., discs) inserted, select a specific Slot number.

2 | **Press the [F3] LOAD button to call up the Load display.**

3 | **Select the file type "All."**

If the desired file was saved to a specific folder, enter the folder and select the file. For information on how to select a folder, see the "Supplementary information" on page 170.
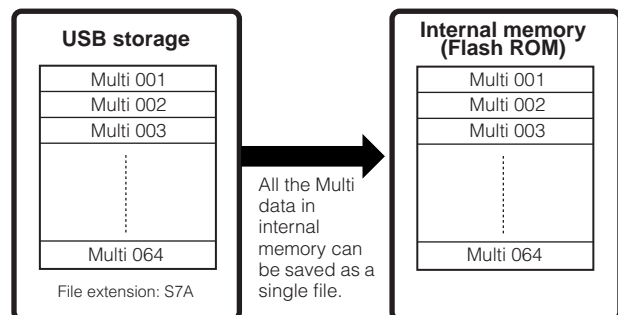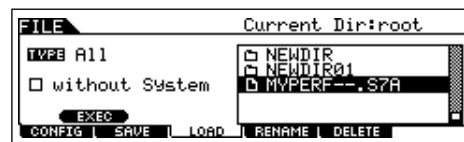
NOTE Multis cannot be loaded separately from the other data in an "All" file.

⚠ **CAUTION**
When Type (file type) is set to "All" and the Load operation is executed, all data that can be created on the instrument will be loaded. This means that any existing data in User memory will automatically be overwritten and lost. Make sure to save any important data to a USB storage device before performing the Load operations, especially when Type is set to "All."

4 | **Press the [SF1] EXEC button to actually load the file.**

After the data has been loaded, a "Completed" message appears and operation returns to the original display.

⚠ **CAUTION**
While the data is being saved/loaded, make sure to follow these precautions:
* Do not remove or eject the media from the USB storage device.
* Do not unplug or disconnect the USB storage device.
* Do not turn off the power of the instrument or the relevant devices.

Using the S90 ES with computer software

Editing the S90 ES as a software synthesizer

Voice Editor and Multi Part Editor

The Voice Editor and Multi Part Editor for S90 ES provide a highly intuitive way to create and edit the Voice and Multi settings completely from your computer display. These programs not only allow you to see virtually all parameters at once, they also give you direct graphic control—for example, letting you adjust the settings by clicking and dragging on a graph—enabling you to edit Voices and Multis with remarkable efficiency, speed and convenience.
The latest versions of Voice Editor and Multi Part Editor for S90 ES can be downloaded at our website:

http://www.yamahasynth.com/download/
For details on how to operate the Editor, refer to the PDF manual included with the Editor.
OS: Windows XP Professional/Home Edition, Mac OS X 10.3 or later
*This information is current as of May 2005. For the latest information check the web site above.

> **NOTE** You will need the Studio Manager software (Version 2) to start each Editor. Make sure to download Studio Manager together with the appropriate Editors from the website above.

Editing the S90 ES from a computer

Multi Part Editor

Voice Editor
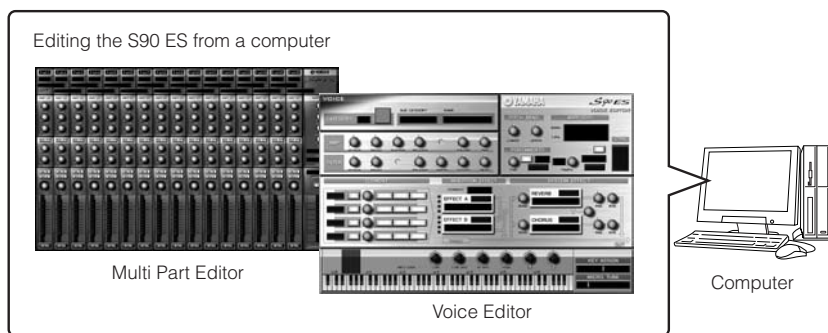
Computer

Studio Connections

STUDIO CONNECTIONS

RECALL

Studio Connections is a sophisticated software/hardware solution that lets you seamlessly integrate the S90 ES into your computer music system. If you are using sequencer software that is compatible with Studio Connections, such as Cubase SX 3, you can start the Voice Editor and Multi Part Editor from your sequencer and make all edits within the program and save all Editor settings along with the project (song) file. Then, when you open the project again, all your Voice/Multi settings for the song are instantly recalled and automatically loaded to the S90 ES. Using Studio Connections effectively lets you control your hardware synthesizer as easily and conveniently as if it were a software synthesizer within your sequencer—all with no decrease in the processing power of your system.

For details about Studio Connections, visit our website at:
http://www.studioconnections.org/

Managing software and hardware with Studio Connections

Computer

S90 ES

Sequencer software compatible with Studio Connections (such as Cubase SX 3)

Editor for each hardware device

Tone generator compatible with Studio Connections

Mixer compatible with Studio Connections

Quick Guide

Connecting the Computer and Midi devices
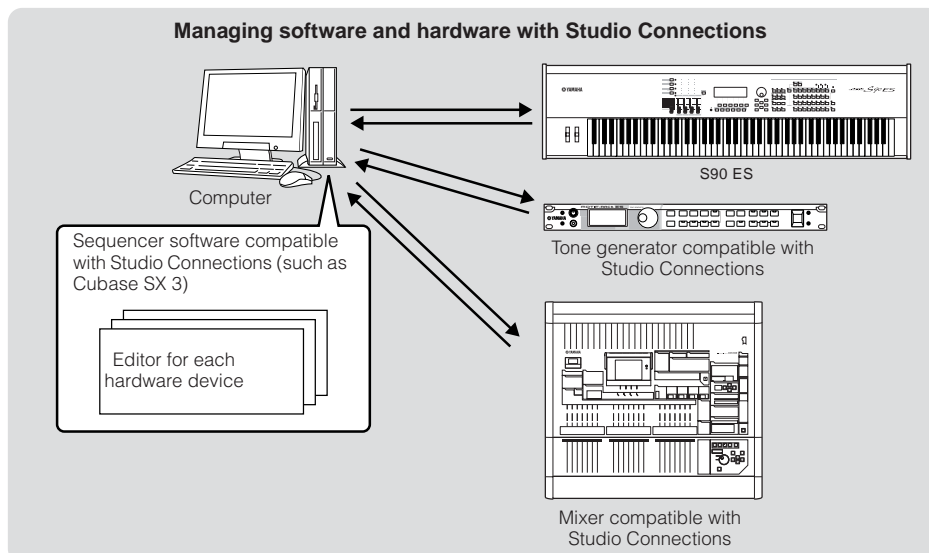
Remote-controlling the software

• •

This powerful feature lets you control your music/audio software programs by using sliders and buttons on the panel of the S90 ES, rather than your computer's mouse and keyboard. The S90 ES can be used to control sequencer software and DAW (digital audio workstation) software, such as Cubase SX, Logic, and SONAR.

These sequencers or DAWs are already set to respond to specific hardware controllers. The Remote Control function on the S90 ES emulates popular hardware controllers such as the Yamaha 01X, letting you use the panel buttons/controllers on the S90 ES for controlling your music/audio software.

Computer Software that can be controlled from the instrument

Windows	Macintosh
Cubase SX 3 SQ01 SONAR 4 S90 ES Multi Part Editor MOTIF ES Multi Part Editor MOTIF-RACK Multi Part Editor MOTIF-RACK ES Multi Part Editor	Cubase SX 3 Logic Pro 7 Digital Performer 4.52 S90 ES Multi Part Editor MOTIF ES Multi Part Editor MOTIF-RACK Multi Part Editor MOTIF-RACK ES Multi Part Editor

Setting up for Remote Control

1 **Connect the S90 ES to the computer via USB (page 67).**

The mLAN connection can also be used for remote control (page 68).

2 **Set the following parameter to "USB."**

[UTILITY] → [F5] MIDI → [SF4] OTHER → MIDI IN/OUT

If connecting via mLAN, set the MIDI IN/OUT parameter to "mLAN."

D NOTE If the S90 ES is connected to the computer by MIDI cable, the Remote Control function cannot be used.

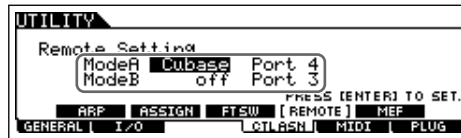**D NOTE** If you are using the Remote Control function, we recommend making connections with a USB cable.

3 **Call up the Remote Control Setup display by pressing the [F4] CTL ASN button, followed by the [SF4] REMOTE button.**

4 **Select the software to be controlled and the Port number.**

From the S90 ES, you can remote-control the sequencer and Multi Part Editor simultaneously using Mode A and Mode B.

● **When controlling Cubase SX via MIDI port 4**

```
UTILITY
Remote Setting
  ModeA  Cubase  Port 4
  ModeB    off   Port 3
              PRESS [ENTER] TO SET.
   ARP  ASSIGN  FT SW [ REMOTE ]  MEF
GENERAL |  I/O |       | CTL ASN | MIDI | PLUG
```

Mode A
Set the Port for remote control of the sequencer or DAW. Select your sequencer and the desired Port number. When controlling Yamaha software, select "general."

Mode B
Set the Port for remote control of the Multi Part Editor. When controlling the Multi Part Editor, select "general." In this case, the parameter is set to "off" because the Multi Part Editor is not used.

D NOTE The "general" setting is for remote control of the Yamaha software. This lets you control the Multi Part Editor in Mode A, and control Yamaha sequencer software in Mode B.

D NOTE For details on how to operate the Editor, refer to the PDF manual included with the software.
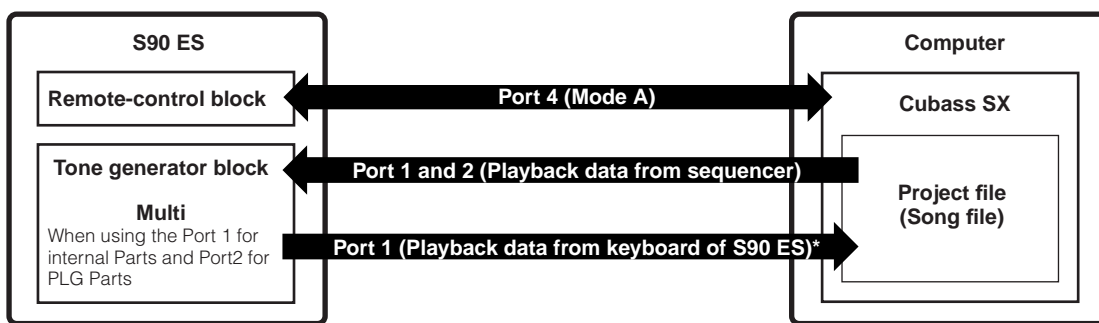
* In the Multi mode or Sequence Play mode, the transmit Port may be set to 2 or 3 (page 100). In this case, if you try to use Port number 2 or 3 for the remote control function, the function may not work properly because of Port conflicts.

5 **Press the [ENTER] button to execute the settings.**

6 **Press the [STORE] button to store the settings as the system setting of Utility mode.**

⚠ *CAUTION*
If you turn the power off without storing, the currently edited settings will be lost.

⚠ *CAUTION*
Never attempt to turn off the power while an "Executing..." or "Please keep power on" message is shown. Turning the power off in this state may cause the system to freeze and prevent normal startup the next time the power is turned on, as well as resulting in the loss of all user data.

7 **Start the software to be remote-controlled, and make the MIDI settings and remote control settings.**

Set the Port setting for remote-control on the software, referring to the illustration in step 4.

Specific instructions for setting up your particular software follow. For instructions on how to start the software, refer to the documentation included with the software.

■ **Cubase SX 3**

1 Pull down the [Devices] menu and select [Device Setup] to call up the "Device Setup" window.

2 Click the [+] button and add "Mackie Control."

3 Select "Mackie Control" from the popup list.

4 When setting the Port to "4," for example, in step 4 of "Setting up for Remote Control," set the MIDI Input to "YAMAHA USB IN 0 - 4" and the MIDI Output to "YAMAHA USB OUT 0 - 4."

> **NOTE** The functions of buttons on the Mackie Control are assigned to the buttons of the S90 ES, with the exception of UserA and UserB (FootSw) which are not supported by the S90 ES.

■ **SONAR 4**

1 Pull down the [Options] menu and select [MIDI Devices] to call up the "MIDI Devices" window.

2 When setting the Port to "4" for example in step 4 of "Setting up for Remote Control" add "YAMAHA USB IN 0-4" to the "Inputs" and add "YAMAHA USB OUT 0 - 4" to the "Outputs."

3 Pull down the [Options] menu and select [Control Surfaces] to call up the Control Surface window.

4 Click the "[+] button, select "Mackie Control," then set the Input Port to "YAMAHA USB IN 0 - 4" and the Output Port to "YAMAHA USB OUT 0 - 4" (for example, when setting the Port to "4" in step 4 of "Setting up for Remote Control").

■ **Digital Performer 4.52**

1 Pull down the [Setup] menu and select [Control Surface Setup] to call up the "Control Surface" window.

2 Click the [+] button.

3 Select "Mackie Control" in the Driver section.

4 In the box for setting "Unit" and "MIDI," select "Mackie Control" in the "Unit" section and select the MIDI port in the "MIDI" section.

■ **Logic Pro 7**
When turning on the power of the S90 ES before starting Logic:

1 Start Logic on the computer, then turn on the power of the S90 ES.

2 Start Logic on the computer.
Logic automatically recognizes the S90 ES as Logic Control and performs the required settings.

When starting Logic before turning on the power of the S90 ES:

1 Start Logic on the computer, then turn the power to the S90 ES on.
If you have already set the software to be controlled to "Logic" in the Utility mode, you need not perform step 2 because Logic automatically recognizes the S90 ES when this step is performed.

2 Set the software to be controlled to "Logic" in the Utility mode, then enter the Remote Control mode.
Logic automatically recognizes the S90 ES and performs the required settings.

Using the Remote Control functions

1 **To enter the Remote Control mode, press the [REMOTE] button (the lamp flashes).**

The REMOTE display appears, and the panel controls are enabled for Remote operation of the computer software (their normal functions are disabled).
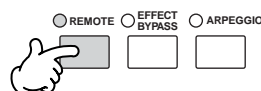
> **NOTE** Press this button again to exit from the Remote Control mode.

2   Select the software to be remote-controlled (Mode A or Mode B).

Change the Mode by simultaneously holding down the [F6] SHIFT button and pressing the [REMOTE] button.

Mode A

REMOTE   ModeA=General Port=2

PAN
CENTER CENTER CENTER CENTER

CENTER CENTER CENTER CENTER

SEND   GROUP   NAME   (DIAL) (KN5=8)
PAN   DVN   EFFECT   «BANK   BANK»   SHIFT

Mode B

REMOTE   ModeB=General Port=3

PAN
CENTER CENTER CENTER CENTER

CENTER CENTER CENTER CENTER

SEND   GROUP   NAME   (DIAL) (KN5=8)
PAN   DVN   EFFECT   «BANK   BANK»   SHIFT

3   Use the Control sliders and buttons on the S90 ES to remotely control the software.

The following explains which sequencer functions are assigned to which panel controls in the remote control.

> **NOTE**   For details about how to operate the Editor, refer to the PDF manual included the Editor.

Press the Control function button to change the functions assigned to the [F1] - [F6] and [SF1] - [SF5] buttons (shown at the bottom of the display). Refer to the separate Data List.
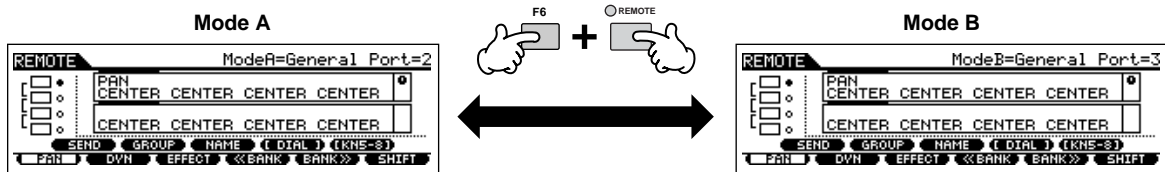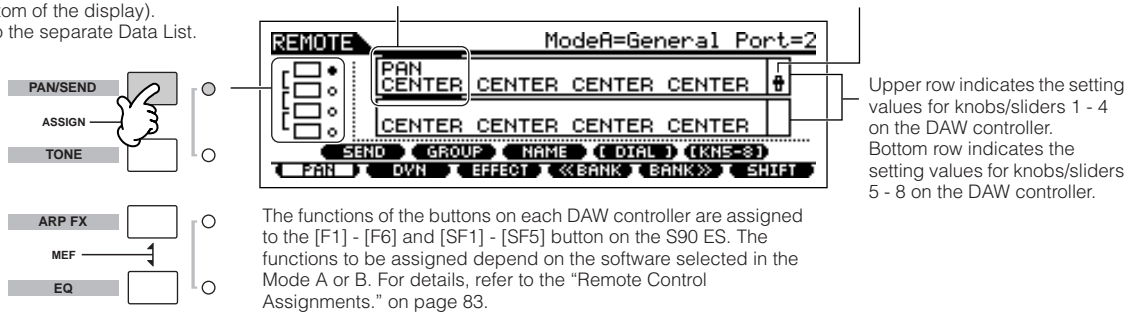
These dark bars serve as the cursor, indicating the track/part currently being edited by the slider. Moving the slider automatically moves the cursor to the corresponding track/part.

Indicates which DAW controller is assigned to the Control sliders: knobs or faders. Use the [VOLUME] button to change the assignment.

PAN/SEND

ASSIGN

TONE

REMOTE   ModeA=General Port=2

PAN
CENTER CENTER CENTER CENTER

CENTER CENTER CENTER CENTER

SEND   GROUP   NAME   (DIAL) (KN5=8)
PAN   DVN   EFFECT   «BANK   BANK»   SHIFT

Upper row indicates the setting values for knobs/sliders 1 - 4 on the DAW controller. Bottom row indicates the setting values for knobs/sliders 5 - 8 on the DAW controller.

ARP FX

MEF

EQ

The functions of the buttons on each DAW controller are assigned to the [F1] - [F6] and [SF1] - [SF5] button on the S90 ES. The functions to be assigned depend on the software selected in the Mode A or B. For details, refer to the "Remote Control Assignments." on page 83.

■ [■], [▶], [●], [◄◄], [◄◄], [▶▶] buttons

The six MODE buttons are used as transport controls, letting you start/stop playback of the DAW software on the computer.

■ [EDIT], [JOB], and [STORE] buttons

When the Mode is set to "General" or "Cubase"	Not used.
When the Mode is set to "Logic"	These buttons perform the same functions as those of the [OPTION], [CONTROL] and [ALT] buttons on the Logic Control.
When the Mode is set to "SONAR"	These buttons perform the same functions as those of the [M2], [M3] and [M4] buttons on the Mackie Control.
When the Mode is set to "D.Perf"	These buttons perform the same functions as those of the [OPTION], [CONTROL] and [COMMAND] buttons on the Mackie Control.

■ [DRUM KIT] button

When the Mode is set to "General" or "Cubase"	Not used.
When the Mode is set to "Logic"	The button can be used to switch the whether the track/slot number of DAW is displayed on the LCD or not.
When the Mode is set to "SONAR"	The button can be used to switch the whether the track/slot number of DAW is displayed on the LCD or not.
When the Mode is set to "D.Perf"	The button can be used to switch the whether the send/effect number of DAW is displayed on the LCD or not.

■ Data dial, [INC/YES] and [DEC/NO] buttons

When the [DIAL] menu appears at the [SF4] button	These controls can be used to set the value for the knob of the DAW controller, for the track/part selected by the cursor. The Control sliders can also be used, but these help you make fine adjustments to the value that are difficult to make with the Control sliders.
When the menu does not appear at the [SF4] button	The buttons can be used to move the song position in the DAW.

> **NOTE**   You can also move the song position by using the cursor [◄] [▶] buttons.

Quick Guide

Connecting the Computer and Midi devices

■ Control sliders

Assigns the functions of eight sliders and eight knobs on the DAW controller (01X, Mackie Control, and Logic Control) to the four Control sliders on the S90 ES. You can switch between fader and knob control by pressing the [VOLUME] button.

When assigning the functions of faders to the Control sliders (The [VOLUME] button lights.)	Controls the volume of each track (part). Pressing the [SF5] button changes which group of faders (faders 1 - 4 or faders 5 - 8 on the DAW controller) is assigned to the Control sliders on the S90 ES.
When assigning the functions of knobs to the Control sliders (The [VOLUME] button turns off.)	Controls various parameters of each track (part). As with the fader assignment above, pressing the [SF5] button changes which group of knobs is assigned (knobs 1 - 4 or knobs 5 - 8). The eight knobs on the DAW controller can also be used as switches. The switch function corresponding to the knob track (part) at the cursor position is also assigned automatically to the [ENTER] button, since the Control sliders on the S90 ES do not have a switch function.

■ Control function buttons, [F1] - [F6] buttons, [SF1] - [SF5] buttons

When the Mode is set to "General"	These buttons are assigned to perform the same functions as the panel buttons on the 01X. The corresponding names of the 01X panel buttons are also indicated at the bottom of the display of the S90 ES.
When the Mode is set to "Logic"	These buttons are assigned to perform the same functions as the panel buttons on the Logic Control. The corresponding names of the Logic Control panel buttons are also indicated at the bottom of the display of the S90 ES.
When the Mode is set to "Cubase," "SONAR," or "D.Perf"	These buttons are assigned to perform the same functions as the panel buttons on the Mackie Control. The corresponding names of the Mackie Control panel buttons are also indicated at the bottom of the display of the S90 ES.

⚑ NOTE Among the functions assigned to the [F1] - [F6] buttons and [SF1] - [SF5] buttons, the functions indicated with brackets (such as [DIAL]) are not related to the Mackie Control, Logic Control and 01X but are unique to the S90 ES.

■ Cursor [◄][►] buttons

By moving the cursor left/right, you can change the track or part to controlled by the data dial and [INC/YES]/[DEC/NO] buttons. Pressing the Cursor [►] button moves through the columns in succession (1, 2, 3, 4...). After 4, the cursor is hidden and wraps around to 1.
Press the [SF5] KN 5 - 8 (KN 1 - 4) button to move the cursor up/down.

■ Cursor [▲][▼] buttons

When the Mode is set to "General"	These buttons are assigned to the functions of the DISPLAY [▲][▼] buttons on the 01X.
When the Mode is not set to "General"	These buttons are assigned to the functions of the cursor [▲][▼] buttons on the Mackie Control and Logic Control.

■ [EXIT] button

When the Mode is set to "General"	The button is assigned to the function of the [PAGE SHIFT] button on the 01X.
When the Mode is not set to "General"	Not used.

■ Bank, Group [A] - [H], Number [1] - [16] buttons
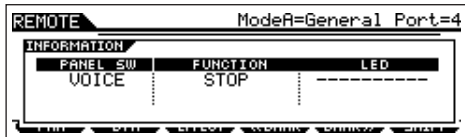
These buttons are assigned to perform the same functions as the buttons directly over the faders on the 01X, Mackie Control and Logic Control.

When the Mode is set to "General"	**Numbers [1] - [8] and [TRACK SELECT] buttons** These buttons are assigned to the functions of the nine [SEL] buttons on the 01X.
	Numbers [9] - [16] and [MUTE] buttons These buttons are assigned to the functions of the nine [ON] buttons on the 01X.
When the Mode is not set to "General"	**[PRE1] - [PLG3] buttons** These buttons are assigned to the functions of the eight [REC/RDY] buttons on the Mackie Control and Logic Control.
	Group [A] - [H] buttons These buttons are assigned to the functions of the eight [SOLO] buttons on the Mackie Control and Logic Control.
	Numbers [1] - [8] buttons These buttons are assigned to the functions of the eight [MUTE] buttons on the Mackie Control and Logic Control.
	Numbers [9] - [16] buttons These buttons are assigned to the functions of the eight [SELECT] buttons on the Mackie Control and Logic Control.

Checking the Remote Control assignments

If you're unsure as to which software function has been assigned to a particular panel control on the S90 ES, this convenient feature lets you quickly check it from the display.

1 In the Remote Control mode, press the [INFORMATION] button to call up the information display, indicating the function of the last pressed button.

2 Press the button for which you want to check the assignment.

```
REMOTE            ModeA=General Port=4
INFORMATION
 PANEL SW     FUNCTION      LED
  VOICE        STOP       ----------
```
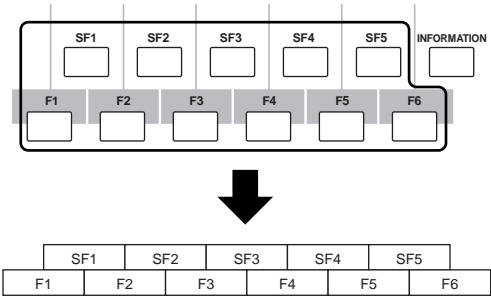
This display shown above appears when you press the [▶] ([PERFORM]) button. In this way, you can check each button's control assignment simply by pressing it.

3 Press the [INFORMATION] button again to return to the Remote Control mode.

NOTE While the Information display is shown, the panel buttons cannot be used to control the computer software.

Remote Con trol Assignments

When controlling Multi Part Editor/SQ01 V2

Functions of 01X assigned to [F1] - [F6] and [SF1] - [SF5] buttons

Button/Controller names on 01X	Functions
In all modes:	
[DISPLAY UP] [DISPLAY DOWN]	Changes the parameter to be edited.
[NAME/VALUE]	Changes the indication of the parameter name and its value.
[SHIFT]+[NAME/VALUE]	Changes the meter display mode.
[ON] (in the normal status)	Turns each channel off or on (mutes/unmutes the signal).
[SHIFT] + [ON] of the Master Channel (in the normal status)	Turns all the channels including the Master Channel off or on (mutes/unmutes the signal).
[SHIFT] + [ON] of each channel (in the normal status)	Turns all the channels with the exception of the Master Channel off or on (mutes/unmutes the signal).
[ON] (with the [SOLO] lamp turned on)	Turns the Solo function of each channel on or off (applies to the Channel Module/Software Synthesizer Module)
[SHIFT] + [ON] (with the [SOLO] lamp turned on)	Turns the Solo function of each channel on or off (applies to the Channel Module/Software Synthesizer Module)
[SOLO]	Changes the function of the [ON] button to the Solo function.
[SHIFT]+[SOLO]	Determines the Solo/Mute settings of the selected tracks in the Track View window.
[SHIFT]+[REC RDY]	Turns track recording on or off.
[AUDIO]	Starts the Audio Mixer or moves the Audio Mixer Window to the front of the computer screen. This button operation applies to the Channel Module software.
[INST]	Starts the Audio Mixer or moves the Audio Mixer Window to the front of the computer screen. This button operation applies to the Software Synthesizer Module.
[MIDI]	Starts the MIDI Editor (such as the Multi Part Editor) or moves it to the front of the computer screen.

Button/Controller names on 01X	Functions
[AUX/BUS]	Opens the AUX/BUS window or brings it to the front of the computer screen (when the Audio Mixer is active).
[OTHER]	Starts the Audio Mixer or brings it to the front of the computer screen. This operation applies to the Effect Module software. (Only PAN is available in the R settings.)
[BANK </>]	Scrolls through the track indication every eight channels.
[SHIFT]+[F1]	Brings the Track View window to the front of the computer screen. (This operation applies to the current song.)
[SHIFT]+[F2]	Starts the Mixer window (Audio Mixer/Multi Part Editor) or brings it to the front of the computer screen.
[SHIFT]+[F3]	Opens the List window or brings it to the front of the computer screen.
[SHIFT]+[F4]	Closes the current window.
[SHIFT]+[F5]	Opens the Piano Roll window or brings it to the front of the computer screen.
[SHIFT]+[F6]	—
[SHIFT]+[F7]	Starts the TWE (Wave Editor).
[SHIFT]+[F8]	Alternately hides/shows the Transport window (Transport Bar/Location Bar/Record).
[RWD]	Press briefly to move back one measure at a time, or hold to continuously rewind.
[FF]	Press briefly to move forward one measure at a time, or hold to continuously fast-forward.
[STOP]	Press to stop recording or playback. Pressing this when playback is stopped goes to the top of the song.
[PLAY]	Press to start playback from the current point.
[REC]	Press this to enter/exit from the Recording Standby. The [▶] (Play) and [●] (Rec) lamp are turned on during recording.
[SCRUB]	Determines how the Scrub function is applied when using the dial. When this is set to on, Scrub moves according to the Grid position in the Track View window. When set to off, it moves in measures.
[UP] (with the [ZOOM] lamp turned off)	Moves the cursor (indicating the current track) up.
[DOWN] (with the [ZOOM] lamp turned off)	Moves the cursor (indicating the current track) down.
[LEFT] (with the [ZOOM] lamp turned off)	Selects the next block.
[RIGHT] (with the [ZOOM] lamp turned off)	Selects the previous block.
[ZOOM]	Turns Zoom on and off.
[UP]/[DOWN]/[LEFT]/[RIGHT] (with the [ZOOM] lamp turned on)	Zooms in/out in the active Track View and Piano Roll Window.
PAN mode [PAN]	
Knobs 1 - 8 (tweaking)	Edits the Pan (on page 1).
Knobs 1 - 8 (tweaking)	Edits the Input level (on page 2).
[SHIFT] + Knobs 1 - 8 (pressing)	Resets the edited parameter to the default value (CENTER/0.00).
AUX SEND mode [SEND] (Not available when the AUX/BUS window is active.)	
Knobs 1 - 8 (tweaking)	Edits the AUX Send Level.
[SHIFT] + Knobs 1 - 8 (pressing)	Resets the edited parameter to the default value (-∞).
EFF SEND mode [EFFECT] (Not available when the AUX/BUS window is active.)	
Knobs 1 - 8 (tweaking)	Edits the Effect Send Level.
[SHIFT] + Knobs 1 - 8 (pressing)	Resets the edited parameter to the default value (-∞).

When turning the [VOLUME] button off, the Control sliders on the S90 ES are assigned to perform the same functions as the Knobs on the DAW controller.

When controlling Logic Pro 7:

Functions of Logic Control assigned to [F1] - [F6] and [SF1] - [SF5] buttons

Button/Controller names on Logic Control	Functions
In all modes:	
[NAME/VALUE]	Changes the indication of the parameter name and its value.
[SHIFT]+[NAME/VALUE]	Changes the meter display mode.
[SEL]	Selects a channel.
[MUTE]	Mutes or unmutes each channel.
[OPTION]+[MUTE]	Sets all channels to on.
[SOLO]	Sets the Solo of each channel to on or off.
[OPTION]+[SOLO]	Sets the Solo of all the channels to off.
[REC RDY]	Sets the REC RDY of each channel to on or off.
[OPTION]+[REC RDY]	Sets the REC RDY of all the channels to off.
[MIDI TR]	Makes the Global View mode active and displays the MIDI track with the Multi Channel view.
[INPUT]	Makes the Global View mode active and displays the AUDIO INPUT object with the Multi Channel view.
[AUDIO TR]	Makes the Global View mode active and displays the Audio track with the Multi Channel view.
[AUDIO INST]	Makes the Global View mode active and displays the Audio Instrument track with the Multi Channel view.
[AUX]	Makes the Global View mode active and displays the AUX object with the Multi Channel view.
[BUSSES]	Makes the Global View mode active and displays the BUS object with the Multi Channel view.
[OUTPUT]	Makes the Global View mode active and displays the AUDIO OUTPUT object with the Multi Channel view.
[GLOBAL VIEW]	Switches between the Global View mode and Track View mode.
[BANK </>]	Scrolls through the track indication every eight channels.
[CHANNEL </>]	Scrolls through the track indication channel-by-channel.
[SHIFT]+[FLIP]	Exchanges the functions between the Channel Knobs and the Faders.
[FLIP]	Assigns the function of the Channel Knob to the Fader.
[NUDGE]	Turns Nudge on or off.
[SHIFT]+[NUDGE]	Enters the Nudge Option mode.
[CYCLE]	Turns Loop on or off.
[SHIFT]+[CYCLE]	Enters the Cycle Option mode.
[F1] - [F7]	Calls up Screen Sets 1 - 7.
[F8]	Closes the window located at the front of the computer or floating window.
[UNDO]	Executes the Undo operation.

Button/Controller names on Logic Control	Functions
In all modes:	
[SHIFT]+[UNDO]	Executes the Redo operation.
[SAVE]	Executes the Save operation.
[MARKER]	Turns the Marker on or off.
[SHIFT]+[MARKER]	Enters the Marker Option mode.
[RWD]	Press to continuously rewind. Press repeatedly to rewind more quickly. When the Marker is turned on, this operation moves the song position to the previous Marker. When Nudge is turned on, this operation moves the current object.
[FF]	Press to continuously fast-forward. Press repeatedly to fast-forward more quickly. When the Marker is turned on, this operation moves the song position to the next Marker. When Nudge is turned on, this operation moves the current object.
[STOP]	Press to stop recording or playback. Pressing this when playback is stopped goes to the top of the song.
[PLAY]	Press to start playback from the current point.
[REC]	Press this to start song recording. The [▶] (Play) and [●] (Rec) lamp are turned on during recording.
[ZOOM]	Turns Zoom on and off.
[SCRUB]	Turns Scrub on and off. When Scrub is on, the dial can be used for Scrub playback. When Scrub is off, the dial is used to move the song position.
PAN mode [PAN] (Multi Channel View) [PAN] → [PAN] (Track Parameter View of PAN/SURROUND)	
Knobs 1 - 8 (turning)	Edits the parameter.
Knobs 1 - 8 (pressing) (Parameters other than Mode selection)	Resets the edited parameter to the default value.
SEND mode [SEND] (Multi Channel View) [SEND] → [SEND] (Track Parameter View)	
Cursor [UP]/[DOWN] (Multi Channel View)	Changes the Slot number.
Cursor [LEFT] Cursor [RIGHT] (Multi Channel View)	Changes the parameter to be edited.
Cursor [LEFT] Cursor [RIGHT] (Track Parameter View)	Switches between SEND 1/2 and SEND 3/4...
Knobs 1 - 8 (turning/turning → pressing)	For editing parameters. When setting the Send destination, turn the knob to select it (indication flashes), then press the knob to actually enter the selected setting.
Knobs 1 - 8 (pressing) (when the edited parameter is Send Level)	Reset the parameter value to the default.
Knobs 1 - 8 (pressing) (when the edited parameter is PRE/POST or Mute)	Changes the setup.
PLUG-IN mode [PLUG-IN] (Multi Channel View) [PLUG-IN] → [PLUG-IN] (Track Parameter View)	
Cursor [UP]/[DOWN] (Multi Channel View)	Changes the Slot number.
Knobs 1 - 8 (tweaking → pressing)	Turn the knob to select the desired Plug-in for insertion (indication flashes), then press the knob to actually enter the selected setting.
Knobs 1 - 8 (pressing) (Knob to which the Plug-in is assigned)	Calls up the parameter page and opens the Editor window on Logic.
Knobs 1 - 8 (tweaking) (Parameter page)	For editing parameters.
Knobs 1 - 8 (pressing) (Parameter page)	Reset the parameter value to the default. (Some parameters cannot be reset.)
Cursor [LEFT] Cursor [RIGHT] (Parameter page)	Changes the page.
[PLUG-IN]	Return to the PLUG-IN mode.
INSTRUMENT mode [INSTRUMENT] (Multi Channel View) [INSTRUMENT] → [INSTRUMENT] (Track Parameter View)	
Knobs 1 - 8 (tweaking → pressing)	Turn the knob to select the desired instrument for insertion (indication flashes), then press the knob to actually enter the selected setting.
Knobs 1 - 8 (pressing) (a Knob to which the Instrument is assigned)	Calls up the parameter page and opens the Editor window on Logic.
Knobs 1 - 8 (tweaking) (Parameter page)	Edits the parameter.
Knobs 1 - 8 (pressing) (Parameter page)	Resets the edited parameter value to the default. (Please note that some parameters cannot be reset.)
Cursor [LEFT] Cursor [RIGHT] (Parameter page)	Changes the page.
[INSTRUMENT]	Return to the INSTRUMENT mode.

When turning the [VOLUME] button off, the Control sliders on the S90 ES are assigned to perform the same functions as the Knobs on the DAW controller.

Press the [DRUM KIT] button to indicate the Track/Slot number in the brackets [ ] at the top of the LCD.
The [OPTION], [CONTROL], and [ALT] buttons on the Logic Control corresponds to the [EDIT], [JOB], and [STORE] buttons at left below the LCD respectively.

Additional operations other than those listed above are available. For details, refer to the relevant documentation of Logic Control.

When controlling Cubase SX 3:

Functions of Mackie Control assigned to [F1] - [F6] and [SF1] - [SF5] buttons

ASSIGNMENT

PAGE UP	PLUG-INS	DYN	DIAL RESET	KN1-4/5-8
PAGE DWN	PAN	EQ	BANK-L	BANK-R	SHIFT

FADER BANKS

FLIP	EDIT	NAME/VALUE	DIAL RESET	KN1-4/5-8
CHANNEL-L	CHANNEL-R		BANK-L	BANK-R	SHIFT

MASTER	SAVE	REVERT	DIAL RESET	KN1-4/5-8
SENDS	INSTRUMENTS	UNDO	REDO		SHIFT

FaderGroup

5	6	7	8	KN1-4/5-8
1	2	3	4		SHIFT

F5	F6	F7	F8	KN1-4/5-8
F1	F2	F3	F4		SHIFT

PROJECT	MIXER	SOLO DEFAT	DIAL RESET	KN1-4/5-8
LEFT	RIGHT	CYCLE	PUNCH		SHIFT

CURSOR-L	CURSOR-R	ADD	DIAL RESET	KN1-4/5-8
CURSOR-DWN	CURSOR-UP	PREV	NEXT	EDIT	SHIFT

Button/Controller names on Mackie Control	Functions
In all modes:	
[PAGE UP] [PAGE DOWN]	Calls up the next/previous page.
[SHIFT]+[PAGE UP]	Calls up the first page.
[SHIFT]+[PAGE DOWN]	Calls up the last page.
[NAME/VALUE]	Changes the indication of the parameter name and its value.
[SEL]	Selects a channel.
[MUTE]	Mutes or unmutes each channel.
[SHIFT]+[SOLO DEFEAT]	Unmutes all channels.
[SOLO]	Sets Solo for each channel to on or off.
[SOLO DEFEAT]	Sets Solo for all channels to off.
[REC RDY]	Sets the REC RDY of each channel to on or off.
[BANK </>]	Scrolls through the track indication every eight channels.
[CHANNEL </>]	Scrolls through the track indication channel-by-channel.
[FLIP]	Switches the functions of the Channel Knobs and Faders.
[CYCLE]	Turns Loop on or off.
[F1] - [F8]	[F1] - [F8] as defined in Cubase SX.
[PROJECT]	Brings the Track View window to the front of the computer screen.
[MIXER]	Opens the Mixer window.
[SHIFT]+[EDIT]	Closes the current window.
[1] - [8]	Corresponds to 1 - 8 of the Channel View on the Mixer Window.
[UNDO]	Executes the Undo operation.
[REDO]	Executes the Redo operation.
[SAVE]	Executes the Save operation.
[ADD]	Enters a Marker at the current song position.
[RWD]	Hold to continuously rewind.
[SHIFT]+[RWD]	Moves the song position to the top of the song.
[PREV]	Moves the song position to the previous Marker.
[FF]	Hold to continuously fast-forward.
[SHIFT]+[FF]	Moves the song position to the end of the song.
[NEXT]	Moves the song position to the next Marker. (This may not work in certain conditions.)
[STOP]	Press to stop recording or playback. Pressing this when playback is stopped goes to the song location at which the song playback started at last time.
[PLAY]	Press to start playback from the current point.
[REC]	Press this to start song recording. The [▶] (Play) and [●] (Rec) lamp are turned on during recording.
PAN mode [PAN] (MULTI CHANNEL only)	
Knobs 1 - 8	For editing parameters.
EQ mode [EQ] (SELECTED CHANNEL only)	
Knobs 1 - 8	For editing parameters.
SEND mode [DYN] (SELECTED CHANNEL only)	
Knobs 1 - 8	For editing parameters.

Quick Guide

Connecting the Computer and Midi devices

Button/Controller names on Mackie Control	Functions
PLUG-IN mode [PLUG-IN] (SELECTED CHANNEL only)	
Knob 1	Changes the Slot Number (on page 1 only).
Knob 2	Turns the Effects on or off (on page 1 only).
Knob 3	Selects an Effect Type (on page 1 only).
Knobs 1 - 8 (turning)	Edits each of the parameters (on page 2 and later).
SEND EFFECT mode [SENDS]/MASTER EFFECT mode [MASTER] (Global mode only)	
Knob 1	Changes the Slot Number (on page 1 only).
Knob 2	Turns the Effects on or off (on page 1 only).
Knobs 1 - 8	Edits each of the parameters (on page 2 and later).
INSTRUMENT mode [INSTRUMENTS] (Global mode only)	
Knob 1	Changes the Slot Number (on page 1 only).
Knob 2	Turns the software tone generator on or off (on page 1 only).
Knobs 1 - 8	Edits each of the parameters (on page 2 and later).

Parameters to be edited differ depending on the assigned Effect and Software Tone Generator.

Additional operations other than those listed above are available. For details, refer to the relevant documentation of Mackie Control.

When turning the [VOLUME] button off, the Control sliders on the S90 ES are assigned to perform the same functions as the Knobs on the DAW controller.

When controlling SONAR 4:

Functions of Mackie Control assigned to [F1] - [F6] and [SF1] - [SF5] buttons

ASSIGNMENT

PAN/SEND

	SENDS	PLUG-INS	DYN	DIAL RESET	KN1-4/5-8
TRACKS	PAN	EQ	BANK-L	BANK-R	M1

FADER BANKS

TONE

	FLIP	EDIT	NAME/VALUE	DIAL RESET	KN1-4/5-8
CHANNEL-L	CHANNEL-R		BANK-L	BANK-R	M1

TRACKS/DIALOG/WINDOW

ARP FX

	OK/ENTER	CANCEL	NEXT WINDOW	CLOSE WINDOW	KN1-4/5-8
NEW AUDIO	NEW MIDI	FIT TRACK	FIT PROJECT		M1

EQ

	TRACK	AUX	MAIN	DIAL RESET	KN1-4/5-8
SAVE	UNDO	REDO	BANK-L	BANK-R	M1

PAN/SEND
TONE

	F5	F6	F7	F8	KN1-4/5-8
F1	F2	F3	F4		M1

TONE
ARP FX

	JOG PRM	LOOP ON/OFF	HOME	DIAL RESET	KN1-4/5-8
MAKER	LOOP	SELECT	PUNCH		M1

ARP FX
EQ

	CURSOR-L	CURSOR-R	SCRUB	DIAL RESET	KN1-4/5-8
CURSOR-DWN	CURSOR-UP	ZOOM	BANK-L	BANK-R	M1

Button/Controller names on Mackie Control	Functions
In all modes:	
[EDIT]	Assigns a parameter to a Knob by using the [CHANNEL] and [BANK] buttons.
[CHANNEL </>] (Multi channel)	Changes a parameter to be edited via a Knob in order one by one when [EDIT] is turned on.
[BANK </>] (Multi channel)	Changes the parameters to be edited via a Knob in groups of eight when [EDIT] is turned on.
[CHANNEL </>] (Selected channel)	Changes an indicated parameter in order one by one when [EDIT] is turned on.
[BANK </>] (Selected channel)	Changes the indicated parameters in groups of eight when [EDIT] is turned on.
[NAME/VALUE]	Changes the indication of the parameter name and its value.
[SEL]	Selects a channel.
[MUTE]	Mutes or unmutes each channel.
[M4]+[MUTE]	Unmutes all channels.
[SOLO]	Sets Solo for each channel to on or off.
[M4]+[SOLO]	Sets Solo for all channels to off.
[REC RDY]	Sets the REC RDY of each channel to on or off.
[M4]+[REC RDY]	Sets the REC RDY of all channels to off.
[TRACK]	Assigns a Track to a Fader.
[AUX]	Assigns an AUX BUS to a Fader.

Button/Controller names on Mackie Control	Functions
[MAIN]	Assigns output level adjustment of the Virtual Main Bus to the Faders.
[BANK </>]	Scrolls through the track indication every eight channels.
[CHANNEL </>]	Scrolls through the track indication channel-by-channel.
[FLIP]	Assigns the functions of the Channel Knobs to the Faders.
[FLIP] → [FLIP]	Switches the functions of the Channel Knobs and the Faders.
[NEXT WINDOW]	Moves the next window to the front of the screen.
[LOOP SW]	Sets Loop to on or off.
[F1] - [F8]	[F1] - [F8] as defined in SONAR.
[CLOSE WINDOW]	Closes the current window.
[UNDO]	Executes the Undo operation.
[REDO]	Executes the Redo operation.
[SAVE]	Executes the Save operation.
[M1]+[MARKER]	Opens the window for entering the Marker to the current song position.
[MARKER]	Turns the Marker on or off.
[RWD]	Press briefly to move back one measure at a time, or hold to continuously rewind. When the Marker is turned on, this operation moves the song position to the previous Marker.
[M1]+[RWD]	Moves the song position to the top of the song. When the Marker is turned on, this operation opens the window for entering the Marker.
[FF]	Press briefly to move forward one measure at a time, or hold to continuously fast-forward. When the Marker is turned on, this operation moves the song position to the next Marker.
[M1]+[FF]	Moves the song position to the end of the song. When the Marker is turned on, this operation opens the window for entering the Marker.
[STOP]	Stops recording or playback.
[PLAY]	Press to start playback from the current point.
[REC]	Press this to start song recording. The [▶] (Play) and [●] (Rec) lamp are turned on during recording.
[ZOOM]	Turns Zoom on and off.
[SCRUB]	Turns Scrub on and off. When Scrub is on, the dial can be used for Scrub playback. When Scrub is off, the dial is used to move the song position.
[JOG PRM]	Turns Data Entry on and off. When turned on (the lamp lights), rotating the dial has the Data Entry function.
TRACK mode [TRACKS] (Track Parameter mode) [TRACKS] → [TRACKS] (Selected Channel mode)	
Knobs 1 - 8 (turning)	For editing parameters. (The LCD indication may not be updated.)
Knobs 1 - 8 (pressing)	Resets the parameter value to its default.
PAN mode [PAN] [PAN] → [PAN] (Selected Channel mode of PAN/SURROUND)	
Knobs 1 - 8 (turning)	For editing parameters.
Knobs 1 - 8 (pressing)	Resets the parameter value to its default.
SEND mode [SENDS] [SENDS] → [SENDS] (Selected Channel mode)	
Knobs 1 - 8 (turning)	For editing parameters.
Knobs 1 - 8 (pressing)	Resets the parameter value to its default.
PLUG-IN mode [PLUG-IN] [PLUG-IN] → [PLUG-IN] (Selected Channel mode)	
[M1]+[CHANNEL </>]	Changes the Plug-in number when the [EDIT] is turned on.
Knobs 1 - 8 (turning)	For editing parameters.
Knobs 1 - 8 (pressing)	Resets the parameter value to its default.
EQ Edit [EQ] [EQ] → [EQ] (Selected Channel mode) (in the Selected Channel mode) [EQ] (Band mode)	
[M1]+[CHANNEL </>]	Changes the EQ number when the [EDIT] is turned on.
Knobs 1 - 8 (Band mode)	For editing each frequency band.
Faders (Band mode)	For editing the gain of each Band.

When turning the [VOLUME] button off, the Control sliders on the S90 ES are assigned to perform the same functions as the Knobs on the DAW controller.

The Song Position Bar may not synchronize with the actual playback position during Scrub playback.

Parameters to be edited may differ depending on the assigned Effect and Software Tone Generator.

Some parameters may not be available depending on the selected Effect Type.

Press the [DRUM KIT] button to indicate the Track/Slot/EQ/DYN number in the brackets [ ] at the top of the LCD.

The [M2] - [M4] buttons on the Mackie Control correspond respectively to the [EDIT], [JOB], and [STORE] buttons at left below the LCD.

Additional operations other than those listed above are available. For details, refer to the relevant documentation of Mackie Control.

You can find the Help window by selecting "Mackie Control" from the Tool Menu on SONAR and pressing the [F1] button.

Please keep in mind that some functions may not be available.

When controlling Digital Performer 4.52:

Functions of Mackie Control assigned to [F1] - [F6] and [SF1] - [SF5] buttons

ASSIGNMENT

PAN/SEND

	SENDS	PLUG-INS	DYN	DIAL RESET	KN1-4/5-8
I/O	PAN	EQ	BANK-L	BANK-R	SHIFT

FADER BANKS

TONE

	FLIP	EDIT	LEVEL METERS	DIAL RESET	KN1-4/5-8
CHANNEL-L	CHANNEL-R		BANK-L	BANK-R	SHIFT

Track Groups/Windows

ARP FX

	SEQ EDITOR	TR OVERVIEW	MIXING BOARD	DIAL RESET	KN1-4/5-8
GROUOP	UNGROUP	SUSPEND	BANK-L	BANK-R	SHIFT

Dialog/Record

EQ

	OVERDUB	PATCH THRU	CLEAR CLIP	DIAL RESET	KN1-4/5-8
ENTER	ESCAPE	CLICK	COUNTOFF		SHIFT

Transport/Project

PAN/SEND
TONE

	UNDO	REDO	SAVE	AUDIBLE MODE	KN1-4/5-8
SLAVE EXT SYNC	MEMORY LINK	PRE/POST ROLL	BANK-L	BANK-R	SHIFT

TONE
ARP FX

	PUNCH	SELECT	SOLO	DIAL RESET	KN1-4/5-8
MARKER	EDIT GRID	CYCLE	BANK-L	BANK-R	SHIFT

ARP FX
EQ

	CURSOR-L	CURSOR-R	SCRUB	DIAL RESET	KN1-4/5-8
CURSOR-DWN	CURSOR-UP	ZOOM	BANK-L	BANK-R	SHIFT

Button/Controller names on Mackie Control	Functions
In all modes:	
[I/O]	Calls up the Mode list display.
[LEVEL METERS]	Turns the Meter indication on or off.
[SEL]	Selects a channel.
[SHIFT] + [SEL]	Selects multiple channels.
[MUTE]	Mutes or unmutes each channel.
[SOLO]	Sets Solo for each channel to on or off.
[REC RDY]	Sets the REC RDY of each channel to on or off.
[BANK </>]	Scrolls through the track indication every eight channels.
[CHANNEL </>]	Scrolls through the track indication channel-by-channel.
[CONTROL]+[CYCLE]	Turns Loop on or off.
[TR OVERVIEW]	Moves the Track Overview to front.
[MIXING BOARD]	Opens the Mixer window.
[SEQ EDITOR]	Starts the Sequencer Editor window.
[SHIFT]+[SEQ EDITOR]	Starts the Soundbites window.
[UNDO]	Executes the Undo operation.
[REDO]	Executes the Redo operation.
[SAVE]	When the lamp lights, press this so that the lamp flashes. Press this again to execute the Save operation (lamp turns off).
[MARKER]	Turns the Marker on or off.
[SHIFT]+[MARKER]	Opens the Marker Option window.
[RWD]	Press to continuously rewind. Press again to rewind more quickly. When the Marker is turned on, this operation moves the song position to the previous Marker.
[FF]	Press to continuously fast-forward. Press again to fast-forward more quickly. When the Marker is turned on, this operation moves the song position to the next Marker.
[STOP]	Stops recording or playback.
[PLAY]	Press to start playback from the current point.
[REC]	Press this to start song recording. The [▶] (Play) and [●] (Rec) lamp are turned on during recording.
[ZOOM]	Switches between Scroll (lamp lights), Zoom (lamp is off), and Nudge (lamp flashes).
[SCRUB]	Turns Scrub on and off. When turned on, you can use the dial to move the song position. (A malfunction may occur.)
PAN mode [PAN] (or [I/O] → knob)	
Knobs 1 - 8 (turning)	For editing parameters.
[DYN] + Knobs 1 - 8 (pressing)	Resets the edited parameter to the default value (center).
[FLIP]	Switches the functions of the Channel Knobs and the Faders.
[PAN] in the PAN mode	Turns the Meter on or off.

Button/Controller names on Mackie Control	Functions
SndVal mode [SEND] (or [I/O] → knob)	
Knobs 1 - 8 (turning)	For editing parameters.
Cursor [UP] [DOWN]	Changes the Send number.
Knobs 1 - 8 (pressing)	Sets Mute to on or off.
[DYN] + Knobs 1 - 8 (pressing)	Resets the parameter value to the default (0 dB).
[FLIP]	Switches the functions of the Channel Knob and the Faders.
[SEND] in the SndVal mode	Turns the Meter on or off.
SndOut mode [I/O] → Knob	
Cursor [UP] [DOWN]	Changes the Send number.
Knobs 1 - 8 (turning)	Selects the bus for each Send of the track.
Knobs 1 - 8 (turning) (except when selecting a bus)	Switches between Send PRE and POST.
Input mode [I/O] → Knob	
Knobs 1 - 8 (turning)	Selects an input bus for a track.
Output mode [I/O] → Knob	
Knobs 1 - 8 (turning)	Selects an output bus for a track.
Effect mode [PLUG-IN] (or [I/O] → Knob)	
Knobs 1 - 8 (turning)	Selects a Plug-in Effect for each track.
Cursor [UP] [DOWN]	Changes the Effect Number.
Knobs 1 - 8 (pressing)	Turns the Effect Bypass on or off. When the bus is turned on, X is indicated above the Effect name.
[EQ] + Knobs 1 - 8 (pressing)	Assigns the Parametric EQ to the corresponding track.
[EDIT] + Knobs 1 - 8 (pressing) (when any track is selected)	Enters the Plug-in Effect Edit mode. (Available only when the Plug-in Effect is selected.) Please keep in mind that some parameters may not be available depending on the selected Effect Type. Press the [EDIT] button again to exit from the Edit mode.
Edit mode	
Knobs 1 - 8 (turning)	For editing parameters.
Cursor [UP] [DOWN]	Changes an Effect Number.
[LEFT]/[RIGHT]	Calls up the Effect of a different track.
[CHANNEL </>]	Changes the parameters to be edited with the Knobs in order one by one.
[BANK </>]	Changes the parameters to be edited with the Knobs in groups of eight.
[FLIP]	Switches the functions of the Channel Knobs and the Faders.

When turning the [VOLUME] button off, the Control sliders on the S90 ES are assigned to perform the same functions as the Knobs on the DAW controller.

Some edited values are not shown on the S90 ES display.

Press the [DRUM KIT] button to indicate the Send/Effect number in the brackets [ ] at the top of the LCD.

Some parameters may not be available depending on the Effect Type.

The [OPTION], [CONTROL], and [COMMAND] buttons on the Mackie Control correspond respectively to the [EDIT], [JOB], and [STORE] buttons at left below the LCD.
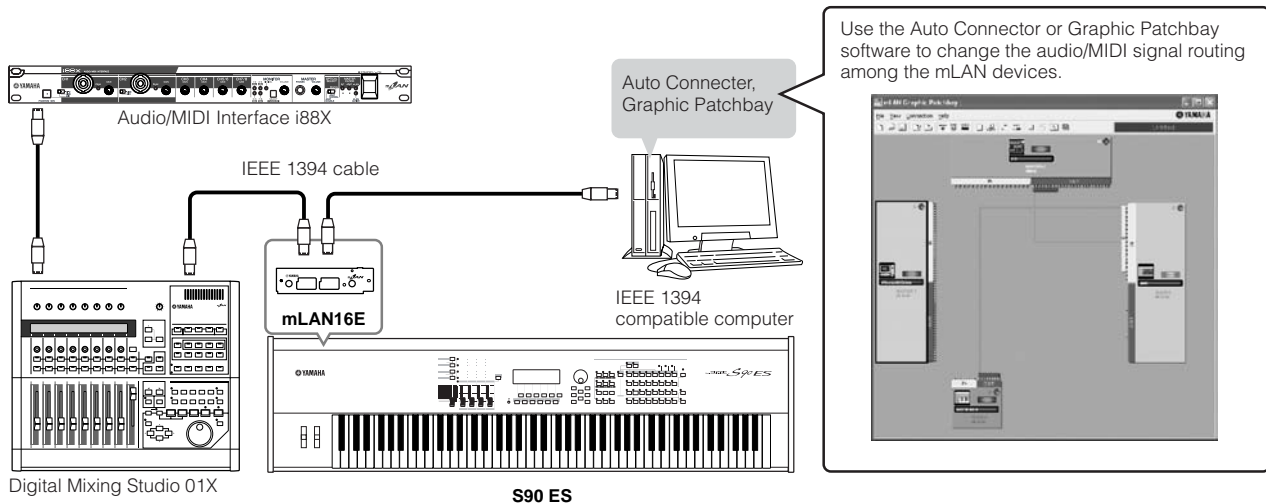
Additional operations other than those listed above are available. For details, refer to the relevant documentation of Mackie Control.

Please keep in mind that some functions may not be available.

Quick Guide

Connecting the Computer and Midi devices

Using mLAN

The mLAN interface is a powerful and flexible system that allows you to set up complex audio/MIDI routings through the use of a standard IEEE 1394 connection—eliminating the need for dozens of audio and MIDI cables, as was necessary on earlier conventional systems.

By installing the optional mLAN16E, you can directly connect the S90 ES to a computer or another mLAN device, and take advantage of high-speed audio and MIDI data transfer between the devices with just a single IEEE 1394 cable. Special software is also available, letting you easily change the audio and MIDI signal routing among several mLAN devices from your computer.

Audio/MIDI Interface i88X

IEEE 1394 cable

mLAN16E

Digital Mixing Studio 01X

S90 ES

Use the Auto Connector or Graphic Patchbay software to change the audio/MIDI signal routing among the mLAN devices.

Auto Connecter, Graphic Patchbay

IEEE 1394 compatible computer

Recording to computer using mLAN

In these example instructions, we'll record the audio output of the S90 ES (from playing the keyboard in the Voice mode) to your audio sequencer on the computer.

Setting up the S90 ES

1 **Install the optional mLAN16E to the S90 ES**

2 **After turning the power on, set the MIDI IN/ OUT parameter to "mLAN" ([UTILITY] → [F5] MIDI → [SF4] OTHER).**

Press the [STORE] button to store the Utility mode settings.

3 **Enter the Voice mode by pressing the [VOICE] button and select the desired Voice.**

Setting up the computer

1 **Install the necessary software such as the mLAN driver.**

Refer to the relevant documentation for the mLAN16E.

2 **Connect the computer to the S90 ES using an IEEE1394 cable (page 64).**

3 **From the mLAN Auto Connector or Graphic Patchbay software, connect the audio outputs of the S90 ES to the audio inputs of the computer.**

From the software patch bay, connect output channels 15 and 16 of the mLAN16E to any two channels of the computer. For details, refer to the mLAN16E installation guide and Graphic Patchbay PDF manual.

NOTE The audio signals from playing keyboard in the Voice mode are sent from output channels 15 and 16 of the mLAN 16E. Refer to the next section "mLAN Audio/MIDI" signal routing.

4 **Enable the mLAN input channels in the audio device settings in the sequencer.**

Refer to the owner's manual of your sequencer for details.

Recording the audio

After completing the setup described above, try recording your keyboard performance to the computer by using the sequencer software. For specific information, refer to the owner's manual of your particular sequencer.

You can also follow this procedure to record the MIDI data. However, you must set the MIDI connections on the mLAN Auto Conenctor or Graphic Patchbay, and make the appropriate MIDI device settings on your sequenecer.

mLAN Audio/MIDI signal routing

Connecting mLAN16E-equipped mLAN devices allows for data transmission of up to eight audio input channels (four stereo channels) and sixteen output channels, as well as four MIDI in/out ports. Try setting up your own mLAN system, referring to the illustration below.
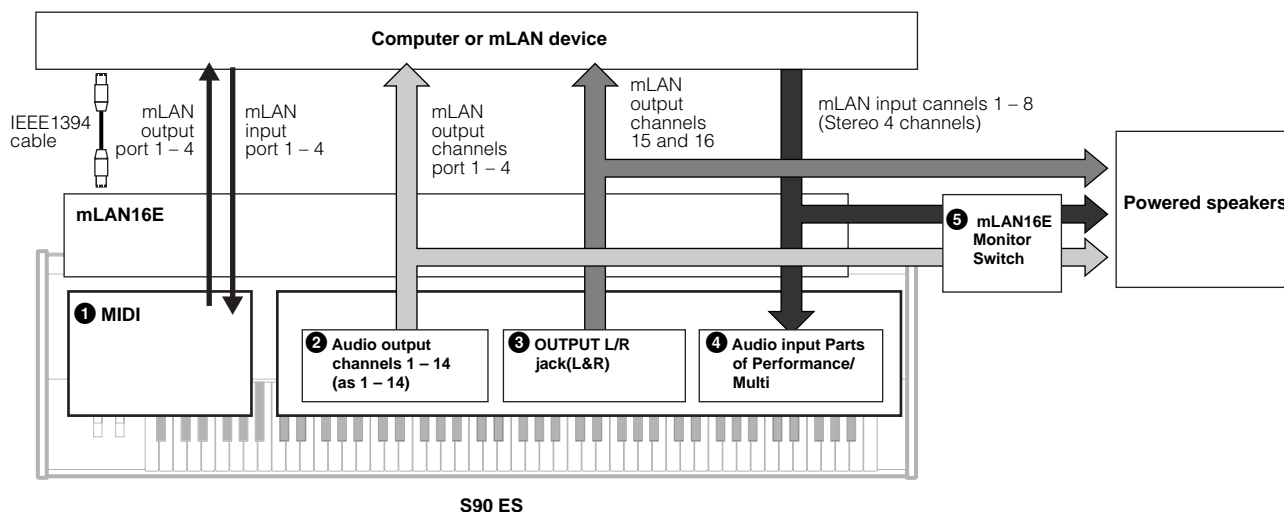
❶ MIDI

The MIDI settings are the same as those for connecting the USB cable.

❷ Audio output channels 1 - 14 (as1 - 14)

When selecting a Drum Voice, Performance or Multi, each Drum key or Part can be output from a specific mLAN audio output (channels 1 - 14). For details about the output settings, refer to "Connecting to a Mixer" on page 63.

❸ OUTPUT L and R jacks (L&R)

The signals from the OUTPUT L and R jacks (when playing the keyboard using a Normal Voice) are sent from mLAN output channels 15 and 16.

❹ Audio input Parts of the Performance and Multi

You can also use the audio from mLAN input channels 1 - 8 as the Audio Input Part(s). Refer to the "Using the microphone and audio device sounds" on page 38 and the "Audio Input Part (AUDIO IN)" on page 118.

❺ mLAN Monitor Switch

To monitor the sounds from mLAN output channels 1 - 14 and mLAN input channels 1 - 8 (through the OUTPUT L and R jacks on the rear panel), set the following parameter set to "on."

[UTILITY] → [F2] I/O → [SF2] OUTPUT → mLANMonitorSw (mLAN Monitor Switch) = on

Creating Your Original Program Set (Master mode)

The Master mode is the highest mode in the S90 ES hierarchy, letting you instantly switch between programs you've created in the Voice, Performance and Multi modes. Use the Master mode in one of the following ways

■ Storing your favorite programs

This lets you register settings that you often use in the Voice, Performance, or Multi mode, and instantly recall the mode and custom settings together in a single button press, without having to first select a mode. It also lets you set up a sequence of custom programs—for example, when playing different songs live—and smoothly switch from setting to setting as needed.

■ Playing as a master keyboard

This lets you divide the keyboard into four separate sections—just as if you were playing four different MIDI keyboards. You can also separately play the sounds of the S90 ES and the sounds of connected MIDI devices—all from the S90 ES keyboard—by assigning each zone to a different MIDI channel. Moreover, you can use the Control sliders to tweak the sound of each as desired.

Selecting a Master

The S90 ES features 128 specially programmed Masters. Try some of these out now.

1 Press the [MASTER] button to enter the Master Play mode.

Mode memorized to the current Master.

Program number (Voice number in this example) memorized to the current Master.

Indicates the Keyboard Octave setting. Same as in the Voice mode/Performance mode (page 105).

Indicates the currently selected Master.

Use the [SF1] - [SF5] buttons to call up the Arpeggio type assigned to each button (page 39). Assigned types depend on the program number memorized to the current Master.

Indicates information related to the Control sliders. The settings depend on the program number memorized to the current Master.

2 Select a Master.

Selecting a Master is done in basically the same way as selecting a Voice. Since there is only one bank for Masters, you need not select a Master bank.

3 Play the selected Master program.

When the Mode is set to Voice or Performance, play the keyboard.
When the Mode is set to Multi, play the MIDI song file on the external sequencer.

Storing your favorite programs

1 Select a Master to be created.

2 Press the [F2] MEMORY button to call up the Mode setting display.

3 Select the desired mode and program number to register the Mater. If you want to divide the keyboard into multiple Zones in the Master, set the Zone Switch to "on."
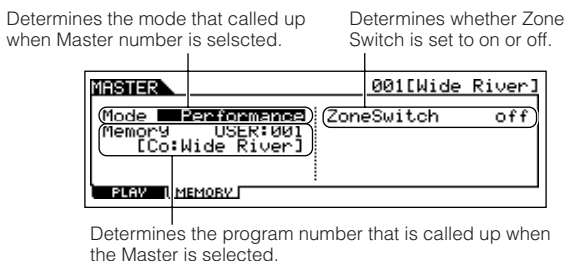
Determines the mode that called up when Master number is selscted.

Determines whether Zone Switch is set to on or off.

```
MASTER              001[Wide River]
Mode  Performance  ZoneSwitch    off
Memory    USER:001
     [Co:Wide River]

  PLAY  MEMORY
```

Determines the program number that is called up when the Master is selected.

4 Name the edited Master.

Input a name in the [EDIT] → [COMMON] → [F1] NAME display.
For detailed instructions on naming a voice, refer to page 27.

```
MASTER   COMMON      001[Wide River]
Name  [Wide River]

                              LIST
  NAME  OTHER
```

Input a Master name.
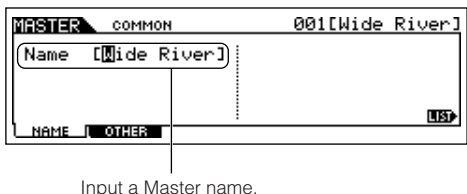
5 Store the edited Master to internal User memory.

5-1 Press the [STORE] button to enter the Master Store mode.

5-2 Select the destination Master by using the data dial or the [INC/YES] and [DEC/NO] buttons.

⚠ *CAUTION*

When you execute the Store operation, the settings for the destination memory will be overwritten. Important data should always be backed up to a separate USB storage device (page 127).

5-3 Press the [ENTER] button. (The display prompts you for confirmation.)

To cancel the Store operation, press the [DEC/NO] button.

5-4 Press the [INC/YES] button to execute the Store operation.

⚠ *CAUTION*

Never attempt to turn off the power while an "Executing..." or "Please keep power on" message is shown. Turning the power off in this state may cause the system to freeze and prevent normal startup the next time the power is turned on, as well as resulting in the loss of all user data.

⚠ *CAUTION*

If you select another Master without storing, the currently edited Master will be lost. Make sure to store the edited Master before selecting another Master.

Playing as a master keyboard

In the Master mode, you can divide the keyboard into (up to) four independent areas (called "Zones"). Each Zone can have different MIDI channel assignments as well as different functions for the Control sliders. This makes it possible to control several parts of the multi-timbral tone generator simultaneously by a single keyboard or to control voices of an external MIDI instrument over several different channels in addition to the internal voices of this synthesizer itself—letting you use the S90 ES to effectively do the work of several keyboards.

You can set the parameters related to the four Zones in the Master Edit mode and store the settings as a User Master.

1 Select a Master to be created.

2 Press the [F2] MEMORY button to call up the Mode setting display.

Quick Guide

Creating Your Original Program Set (Master mode)

3 After setting the Mode and Program number which you wish to memorize to the Master, set the Zone Switch to "on."

Determines the mode that is called up when the Master number is selected.

Set the Zone Switch to "on."

```
MASTER            001[Wide River]
Mode   Performance  ZoneSwitch    on
Memory   USER:001
       [Co:Wide River]

  PLAY  MEMORY
```
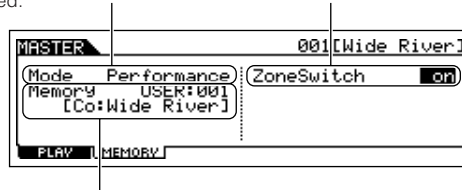
Determines the program number that is called up when the Master is selected.

4 Press the [EDIT] button to enter the Master Edit mode.

EDIT   JOB   STORE

COMPARE
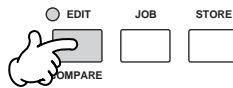
5 Call up the Common Edit display or Zone Edit display.

Use Zone Edit to edit the parameters for each Zone. Use Common Edit to edit the parameters for all of the Zones.

While in the Master Edit mode, you can switch between the Common Edit display and the Zone Edit display as shown below.

Calling up the Common Edit display
Press the [COMMON] button to call up the Common Edit display.
In the Edit mode, the [DRUM KITS] button functions as the [COMMON] button.

Indicates a Common Edit display.

```
MASTER  COMMON      001[InitMaster]
Name  [InitMaster]

                          LIST
  NAME  OTHER
```

DRUM KITS

PRE 5   PRE 6   USER 1   USER 2

FAVORITES   A. PIANO   KEYBOARD   GUITAR/PLUCKED   GUITAR

A   B   C   D

SYN LEAD   SYN PAD/CHOIR   SYN COMP   CHROMATIC PERCUSSION

1   2   3   4

COMMON   ELEMENT/PERF. PART/ZONE

9   10   11   12

Calling up the Zone Edit display
Press the desired Zone number from the ZONE [1] - [4] buttons to call up the Zone Edit display.

Indicates the display for editing Zone 1.

```
MASTER  ZONE1        001[InitMaster]
       ZONE1  ZONE2  ZONE3  ZONE4
TransCh    1      1      1      1
TGSwitch   on    off    off    off
MIDISwitch on    off    off    off

 TRANS   NOTE   TX SW   PRESET   CS
```

Common Edit

Zone 1 Edit
Zone 2 Edit
Zone 3 Edit
Zone 4 Edit

6 Select the menu you wish to edit by pressing the [F1] - [F5] buttons and [SF1] - [SF5] buttons, then edit the parameters in each display.

See the next page for details and some setting examples.

7 Name the edited Master.

Input a name in the [EDIT] → [COMMON] → [F1] NAME display.
For detailed instructions on naming a voice, refer to page 27.

8 Store the edited Master to internal User memory.

Refer to step 5 on page 91.

Using Zones effectively with external

The two examples below show how to use the Zones with both the internal tone generator and a connected external tone generator. These instructions correspond to step 6 on the previous page.

▸**NOTE** Though all four Zones are used in the example below, you can use any number of Zones (two, three, or four). The settings are made with the MIDISwitch parameter ([MASTER] → [EDIT] → Zone selection → [F1] TRANS → MIDISwitch) and the TGSwitch parameter ([MASTER] → [EDIT] → Zone selection → [F1] TRANS → TGSwitch).

▸**NOTE** In these examples, the Zones are assigned to different areas of the keyboard. However, two or more Zones can also be assigned to the same area in a layer, from the NOTE display ([MASTER] → [EDIT] → Zone selection → [F2] NOTE).

■ Master settings with the Voice mode/Performance mode (Single-timbre tone generator mode)

External tone generator (Multi-timbral)
Set the MIDI receive channel for each part.

For each Zone, set whether or not MIDI data is transmitted to the external instrument.
[MASTER] → [EDIT] → Zone selection → [F1] TRANS → MIDISwitch

MIDI Transmit Channel 1

MIDI Transmit Channel 2

MIDI Transmit Channel 3

MIDI Transmit Channel 4

Determine the MIDI Transmit Channel for each zone.
[MASTER] → [EDIT] → Zone selection → [F1] TRANS → TransCh

Determine the note range of each zone.
[MASTER] → [EDIT] → Zone selection → [F2] NOTE → NoteLimitH
[MASTER] → [EDIT] → Zone selection → [F2] NOTE → NoteLimitL

For each Zone, set whether or not MIDI data is transmitted to each Part of the internal tone generator.
[MASTER] → [EDIT] → Zone selection → [F1] TRANS → TGSwitch

Internal tone generator (Single Timbre)
[UTILITY] → [F5] MIDI → [SF1] CH → BasicRcvCh = 01

■ Master settings with the Multi mode (Multi-timbral tone generator mode)

External tone generator (Multi-timbral)
Set the MIDI receive channel for each part.

For each Zone, set whether or not MIDI data is transmitted to the external instrument.
[MASTER] → [EDIT] → Zone selection → [F1] TRANS → MIDISwitch

MIDI Transmit Channel 1

MIDI Transmit Channel 2

MIDI Transmit Channel 3

MIDI Transmit Channel 4

Determine the MIDI Transmit Channel for each zone.
[MASTER] → [EDIT] → Zone selection → [F1] TRANS → TransCh

Determine the note range of each zone.
[MASTER] → [EDIT] → Zone selection → [F2] NOTE → NoteLimitH
[MASTER] → [EDIT] → Zone selection → [F2] NOTE → NoteLimitL

For each Zone, set whether or not MIDI data is transmitted to each Part of the internal tone generator.
[MASTER] → [EDIT] → Zone selection → [F1] TRANS → TGSwitch

Part 05 Receive Channel 1

Part 13 Receive Channel 2

Internal tone generator (Multi-timbral)
[MULTI/SEQ PLAY] (selecting Multi mode) → [EDIT] → Part selection → [F1] VOICE → [SF2] MODE → ReceiveCh

Assigning Control Change numbers to the Conrol sliders for each Zone

Here in the CS display of the Master Edit mode, you can set how the Control sliders will affect each Zone. This lets you specify a separate MIDI Control Change number for each slider.
Set the parameters as shown below, corresponding to step 6 on page 92.

All indicators are turned off by setting the [MASTER] → [EDIT] → [COMMON] → [F2] OTHER → Slider parameter to "zone."

You can determine which Control Change numbers are used for the Control sliders for each zone in the [MASTER] → [EDIT] → Zone selection → [F5] CS display.

In the example above, the Control sliders 1 - 2 have been set to 11 (Expression), and sliders 3 - 4 for all Zones have been set to 10 (Pan). In this way, you can use the Control sliders 1 - 2 to adjust the relative volume balance among the Zones, and control the stereo position of each Zone with the slider 3 - 4.

TIP **Setting up the Master Zones to Split or Layer**

This operation lets you easily determine whether the Zones of the selected Master are to be used in a Split or a Layer. The note range settings for each Zone can be determined by setting the NoteLimitH and NoteLimitL parameters from the NOTE display ([MASTER] → [EDIT] → Zone selection → [F2] NOTE).

NOTE Zones 1 and 2 are used in the explanations here.

1 In the Master Play mode, press the [JOB] button to enter the Master Job mode.

2 Press the [F1] INIT button to call up the Initialize display.

3 Uncheckmark the box of "All" by using the [DEC/NO] button and checkmark the box of "Zone."

4 Set the Type to "Split" or "Layer."


```
MASTER   JOB          001[InitMaster]
Initialize Current Master
        □All      □Common
        ⊠Zone    ¦UpperCh        1
      Type  Split ¦LowerCh        1
                  ¦SplitPoint    C 3
  INIT               BULK
```

When Type is set to "Split"
Set the UpperCh (MIDI transmit channel of the upper range), LowerCh (MIDI transmit channel of the lower range), and Split Point (which separates the keyboard into the upper range and lower range).
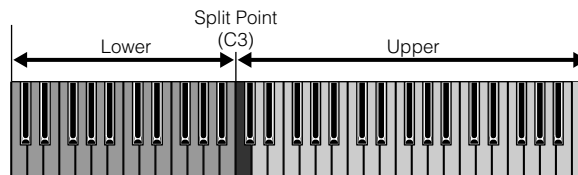
When Type is set to "Layer"
Set the UpperCh (MIDI transmit channel of Zone 1) and LowerCh (MIDI transmit channel of Zone 2).
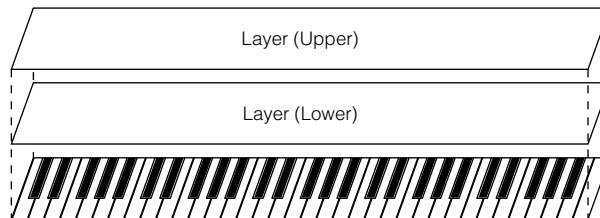
5 Press the [ENTER] button. (The display prompts you for confirmation.)
To cancel the Job, press the [DEC/NO] button.

6 Press the [INC/YES] button to execute the Job.
After the Job has been completed, a "Completed" message appears and operation returns to the original display.

Quick Guide

Creating Your Original Program Set (Master mode)

Playing back MIDI files (Sequence Play mode)

In the Sequence Play mode you can directly play back SMF (Standard MIDI File) song data, without the need of a computer or external sequencer. Simply load your MIDI song data (Format 0) to a USB storage device, such as a USB memory stick or flash drive, and connect it to the S90 ES. This is a huge convenience in live performance situations, since you could record the basic rhythm parts of a song beforehand, then play the melody and solo parts over top of them as they play back during your performance. You can also set the order of playback, having the S90 ES automatically call up the songs in the proper order for you.

D NOTE The settings in the Sequence Play mode cannot be stored to the S90 ES. If you need to save these settings, save them to a USB storage device in the File mode.

D NOTE Make sure to connect a USB storage device Card containing appropriate Song data.

D NOTE The S90 ES is compatible with and can play back Standard MIDI Files of Format 0.

⚠ **CAUTION**

Never attempt to remove/insert the USB storage device while in the Sequence Play mode.

Setting the playback order of MIDI files (Chain)

From the Chain display ([F1] CHAIN), you can specify the order of the MIDI files to be played, set the particular Multi to be used for each song, and stop MIDI file playback as desired. These settings are executed in order according to the specified Chain Step numbers. A maximum number of 100 Chain Steps can be programmed; after reaching 100, playback returns to 001.
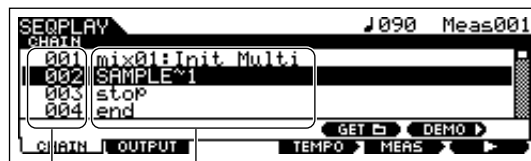
Chain Step Number   Setting to execute

1 Press the [MULTI/SEQ PLAY] button once or twice to enter the Sequence Play mode.

2 Connect the USB storage device, then press the [F1] CHAIN button to enter the CHAIN display.

3 Press the [SF4] GET button and select the folder which contains the desired MIDI files, then press the [ENTER] button.

If the device has several media (e.g., discs, cards) inserted at the same time, select the Slot number. If the device is divided into multiple partitions, select the Partition number.
For information on how to select a folder, see the section "Supplementary information" on page 170.
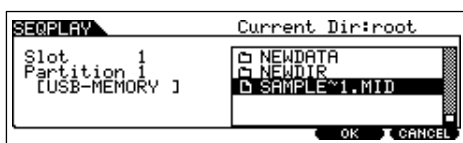
D NOTE A Chain can only play back song files contained in the same directory.

4 Press the [F5] OK button.

In step 6 below, you can select the specific MIDI song file from the folder you've specified here.

5 Use the [▲] and [▼] buttons to select the Chain Step number.

6 Use the [DEC/NO], [INC/YES] buttons, and data dial to assign the following parameter to each Chain Step.

Parameters

MIDI	Selects desired MIDI file from the folder selected in step 4
Multi name	Specifies the Multi to be used for playback of the MIDI file, allowing you to set the desired Voices to be used for playback or the next song.
skip	Skips this Chain Step and playback will jump to the next Chain Step.
end	Returns to Chain Step number 001.
stop	Stops MIDI file playback.

7 Repeat steps 5 and 6 above to set up the Chain.

8 Press the cursor [▲][▼] buttons to move the cursor to the desired Chain Step.

9 Press the [F6] ▶ button to start playback of the song.

You can also play back the song by simultaneously holding down the [MULTI/SEQ PLAY] button and pressing the [PERFORM] button.
When the Chain Step playback has finished, the song at the next Chain Step number will automatically be started.

10 Press the [F6] ■ button to stop playback of the song.

You can also stop playback by simultaneously holding down the [MULTI/SEQ PLAY] button and pressing the [VOICE] button.
Also, if an "end" or "stop" Chain Step is reached, playback will stop.

Moving the song position/changing the tempo

You can move the Song position or change the playback tempo for the Song at the currently selected Chain Step. When the Song is played back, the tempo setting made here automatically takes precedence over the original tempo setting of the Song.

Change the tempo   Move through the measures

F4   F5
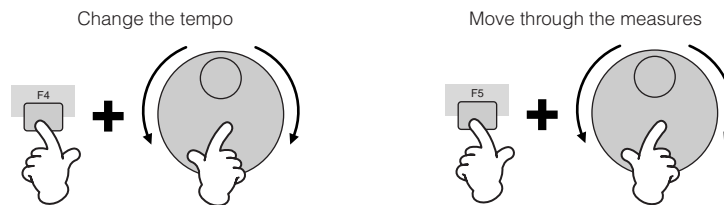
The measure be specified when releasing the [F5] button.

Selecting the MIDI transmit channel for playing back the keyboard

Press the [TRACK SELECT] button so that its indicator lights and press one of the Number [1] - [16] buttons to select the desired track for playing the keyboard.
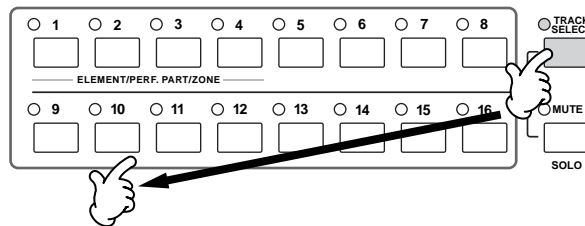
The internal Voices of Multi Parts 1-16 are set by default to the respective MIDI receive channels 1-16. As a result, selecting a Part number will normally select the same numbered MIDI channel for use as the MIDI transmit channel for your keyboard performance. Keep in mind however, if any of the settings have been changed for the Multi, you will need to check the channel assignments and select the appropriate channel for the Part you wish to play.

Changing the transmit settings for each MIDI channel

When using a Multi with the Plug-in Boards or an external tone generator, you must set the appropriate transmit ports and determine whether the playback data is transmitted to internal/external tone generator or not in the [F2] OUTPUT display. You can set the OUTPUT settings for each Chain Step Number.

```
SEQPLAY    002[SAMPLE~1]      ♩090   Meas001
CHAIN
         1  2  3  S  M  M  M  8  9 10 11 12 13 14 15 16
OUT CH
PORT    off off off off off off off off off off off off off off off off
INT SW  On On On On    On On On On On On On On On On On
EXT SW  On On On On On On On On On On On On On On On On
        ── ALL ──▶  1-8 ──▶  9-16
        CHAIN  OUTPUT              TEMPO ⟩  MEAS ⟩  ▶
```
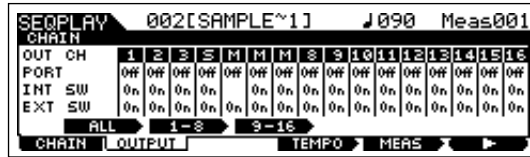
OUT CH (MIDI transmit channel)

Displays the MIDI transmit channel. The "M" mark indicates muted channels, while "S" indicates channels set to solo.

PORT (transmit Port)

Determines the transmit Port for each MIDI channel. When this is set to "off," MIDI data is output without any Port data. Keep in mind that this parameter can only be set for channels having assignments to Plug-in parts 1 - 3 (for installed single-part boards) or Plug-in parts 17 -32 (for installed multi-part boards).

> ♪ NOTE   The internal tone generator parts of the S90 ES are automatically set to Port 1.

INT SW (Internal Switch)

Determines whether or not MIDI data is transmitted to the internal tone generator. When using the internal tone generator of S90 ES or Plug-in Boards, set this parameter to "on." When this is set to "off," the tone generator or Plug-in Boards cannot be played using the corresponding MIDI channels.

EXT SW (External Switch)

Determines whether or not MIDI data is transmitted to the external tone generator. When using an external tone generator, set this parameter to "on." When this is set to "off," the external tone generator cannot be played using the corresponding MIDI channels.

> **TIP** **Changing all channel settings simultaneously**
>
> You can change the settings for all MIDI channels simultaneously by holding down the [SF1] ALL button while making the change. In the same way, if you change the setting while holding down the [SF2] 1-8 or [SF3] 9-16 button, you can change the respective group of MIDI channels (1-8 or 9-16) at once.

> **IMPORTANT** **When changing settings in the OUTPUT display**
>
> Keep in mind that the OUTPUT settings of the Chain Step last selected in the Sequence Play mode will be maintained, even when selecting the Multi mode. In other words, depending on the OUTPUT settings called up by the last Chain Step, the sound may be unexpected or incorrect the next time you play the keyboard in the Multi mode. Always check the OUTPUT settings and rest them accordingly when returning to the Multi mode from the Sequence Play mode.

> **TIP** **MIDI transmit channel mute/solo**
>
> ♪ NOTE   In the Sequence Play mode, you can mute or solo the playback sound of MIDI song data. Playback of the keyboard cannot be mute or soloed.
>
> ■ **To mute a MIDI transmit channel**
>
> **1.** **Press the [MUTE] button so that its lamp lights.**
> To turn Mute off, press the [MUTE] button again (the lamp goes off).
>
> **2.** **Press any of the Number [1] - [16] buttons to select the transmit channel to be muted.**
> The corresponding transmit channel is set to mute (its lamp goes off) and produces no sound. When pressing the same number button again, the channel mute is canceled (its lamp lights).
>
>
>
> ■ **To mute a MIDI transmit channel**
>
> Simultaneously hold down the [MUTE] button and press one of the Number buttons [1] to [16] to solo the corresponding channel. Once you've selected a channel for soloing, the [MUTE] button's lamp flashes, indicating the Solo function is active. While Solo is active, you can change the soloed channel simply by pressing the corresponding Number button [1] to [16].
>
>
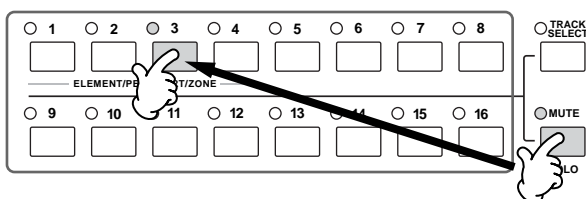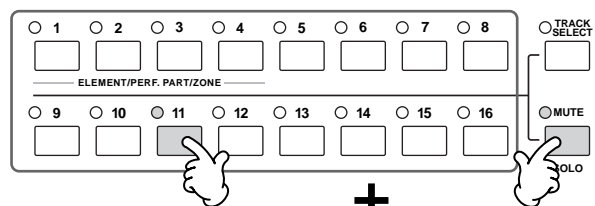
Using the Plug-in Boards

Plug-in Boards give you an enormous amount of additional sonic flexibility and power. When installed, they work seamlessly and transparently within the system of this synthesizer—meaning that you can use their sounds and functions just as if they were built right into this synthesizer at the factory.
The boards that are available for and can be installed to this synthesizer are described below.
Up to three Plug-in boards can be installed to the S90 ES. 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.
In addition, they allow you to use synthesis systems besides AWM2. You can play Plug-in Voices just like ordinary internal Voices and use them as Parts in a Performance/Multi.
This synthesizer is compatible with the Modular Synthesis Plug-in System (see below).

MODULAR SYNTHESIS PLUG-IN SYSTEM

About MODULAR SYNTHESIS PLUG-IN SYSTEM

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

Available Plug-in Boards

There are three types of Modular Synthesis Plug-in System-compatible Plug-in Boards: Single Part, Multi-Part and Effect Plug-in Board. Using these, you can build your own system based on the sounds you require.

Single Part Plug-in Boards

Single Part Plug-in Boards let you add a completely different synthesizer or single timbre tone generator (page 115) and play its voices by using a single part of this synthesizer. Some boards allow you to use synthesis systems besides AWM2.

● **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 add a completely independent multi-timbral tone generator to the S90 ES (page 115)—expanding the Voice capacity and polyphony of the instrument with a full sixteen additional instrument 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.

Effect Plug-in Board

Effect Plug-in Boards let you add a completely different effect block to the host synthesizer.

● **Vocal Harmony Plug-in Board (PLG100-VH)**

With this board installed, you can add harmonies to selected parts using four types of effects. Chorus parts for vocals can be created automatically from chords that have been prepared and stored as MIDI data. You can also use this synthesizer like a vocoder by connecting and using a microphone while playing the keyboard.

Using a Single Part Plug-in Board

Install any of the Single Part Plug-in Boards such as the PLG150-AN, PLG150-AP, PLG150-PF, PLG150-DX, PLG150-VL, PLG150-DR, and PLG150-PC to the S90 ES and play the Plug-in Voice in the Voice Play mode.

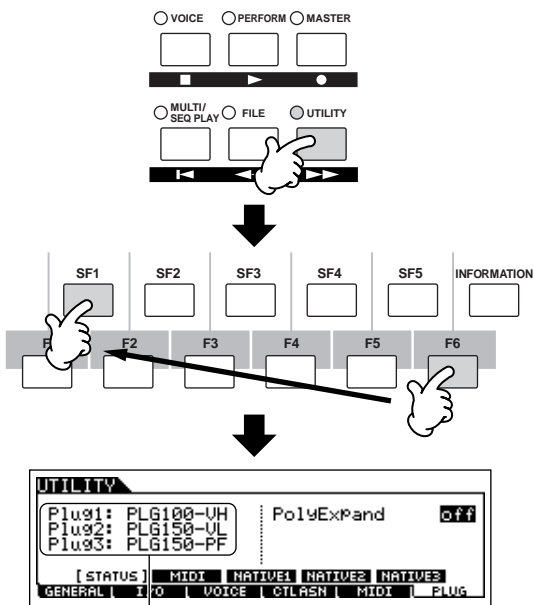**1** **After turning the power off, install a Single Part Plug-in Board to the instrument.**

See page 184.

2 **Switch the S90 ES on.**

The corresponding slot indicator at the right top of the front panel lights. This indicates that the board has been successfully installed.
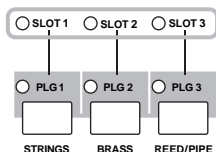
3 **Check the status of the installed Plug-in Boards in the [UTILITY] → [F6] PLUG → [SF1] STATUS display.**

The name of the installed Plug-in Board is displayed.

4 **Set the MIDI port of the installed Plug-in Board to "2" or "3" in the [UTILITY] → [F6] PLUG → [SF2] MIDI display.**
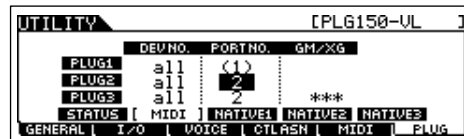
NOTE If the MIDI Port number here is set to "1" or "off," the Plug-in Voice may sound simultaneously with the internal Voice, when playing back a Multi in the Multi/Sequence Play mode. To keep this from happening, make sure the MIDI Port number of the Plug-in Board is set to "2" or "3"—especially when using the Multi/Sequencer Play mode.
To prevent a similar problem when using both a Single Part Plug-in Board and a Multi Part Plug-in Board together, set each board to a different MIDI Port number.

5 **Press the [VOICE] button to enter the Voice Play mode and select a Plug-in Voice.**

Selecting a Plug-in Voice is done in the same way as selecting a Normal Voice (page 30) with the exception that you select one of the PLG (Plug-in) Banks. Press the PLG button which corresponds to the slot to which the Plug-in Board has been installed.
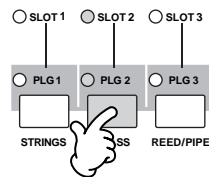
You'll also need to select a Bank within the Plug-in Board. Press the [F2] BANK button to call up the Plug-in Board Bank selection display, then select the desired Bank.
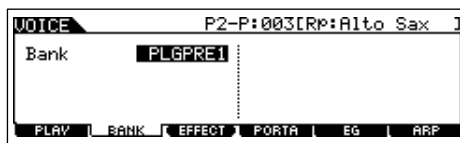
NOTE For details about the Bank structure of each Plug-in Board, refer to the Owner's Manual of each Plug-in Board. Regarding the PLGPRE (Plug-in Preset) bank, refer to the Plug-in Voice List. Regarding the Board Voice bank displayed as "035/000," refer to the Voice Map/List. The PLGUSR (Plug-in User) banks contain the Voices you edited and stored as User Voices.

6 **Play the keyboard.**

NOTE Playing Voices of the Plug-in User banks (PLG1USR, PLG2USR, PLG3USR) will result in no sound, if the Plug-in Board has just been installed. These banks become available only after you edit a Plug-in Voice and store it as a User Plug-in Voice.

Editing with a Single Part Plug-in Board

● **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 Plugin 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 S90 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.

● **Editing the Plug-in Voice**

This is basically the same as Normal Voice Edit. Unlike with Normal Voices, the Plug-in Voices only have one Element for editing. In addition, some of the other parameters may not be available. For details, refer to reference section on page 143.

● **Editing the Board Voice**

Board Voices can be edited using the computer software for each Plug-in Board. You cannot edit the Board Voice on the S90 ES.

TIP **Playing the PLG150-VL sound with the Breath Controller**

With Virtual Acoustic (VA) synthesis, the PLG150-VL has the sounds of real instruments 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 Breath Controller, you can even capture some of the physical feel of woodwind instruments.

1 **Install the PLG150-VL to the S90 ES.**

2 **Connect the Breath Controller BC3 to the BREATH connector on the rear panel (page 59).**
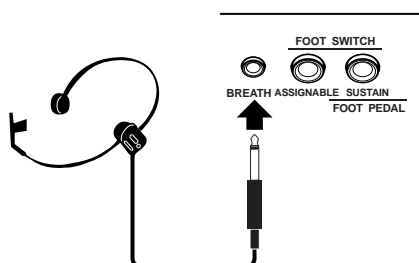
3 **Switch the S90 ES power on.**

4 **Set the Plug-in Board related parameters in the Utility mode, corresponding to steps 3 and 4 in the instructions on the previous page.**

5 **Set the Breath Controller Curve via the [UTILITY] → [F1] GENERAL → [SF1] TG → BCCurve parameter (page 163).**
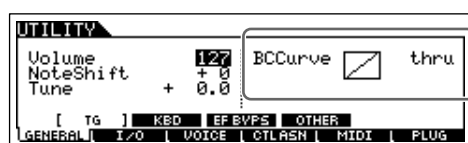
6 **Press the [VOICE] button to enter the Voice Play mode, then select a Plug-in Voice of the PLG150-VL.**

7 **Play the Voice and blow into the Breath Controller to expressively change the sound.**

You can also use the MIDI Wind Controller WX5 to play the Plug-in Voice of the PLG150-VL. Connect the WX5 to the S90 ES with a MIDI cable.

S90 ES
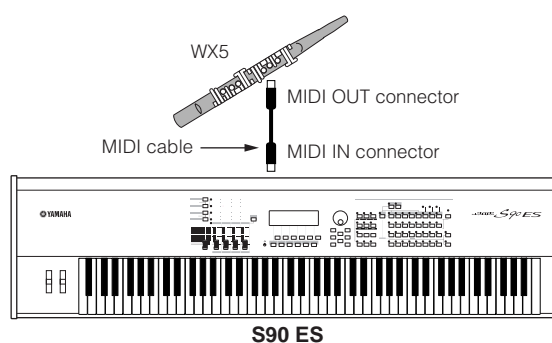
NOTE If you are using a Breath Controller and there is no sound, make sure that the BrthMode parameter is set to "BC/WC" in the [F4] NATIVE display of the Element Edit mode.

Using a Multi Part Plug-in Board

In this section, we'll explain how to play back an XG for mat song in the Multi mode, using the PLG100-XG Plug-in Boar d. Naturally, to get the most out of these instructions, you should prepare to play back XG song data (Standard MIDI File) by connecting the S90 ES to the computer.

Playback with a Multi Part Plug-in Board

1 After turning the power off, install the Multi Part Plug-in Board PLG100-XG to slot 3 of this synthesizer.

See page 184 for details.

2 Switch the S90 ES power on.

3 Check the status of the installed Plug-in Boards in the [UTILITY] → [F6] PLUG → [SF1] STATUS display.

The name of the installed Plug-in Board is displayed.
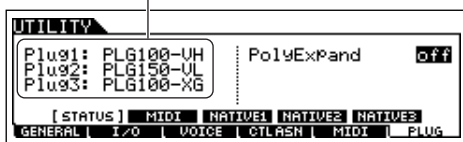
4 Set the MIDI port of the PLG100-XG to "2" or "3" in the [UTILITY] → [F6] PLUG → [SF2] MIDI display.
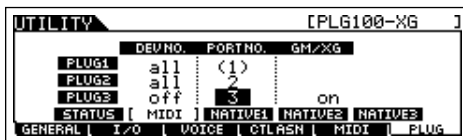
⚠ NOTE If the MIDI Port number here is set to "1" or "off," the Plug-in Voice may sound simultaneously with the internal Voice, when playing back a Multi in the Multi/Sequence Play mode. To keep this from happening, make sure the MIDI Port number of the Plug-in Board is set to "2" or "3"—especially when using the Multi/Sequencer Play mode.
To prevent a similar problem when using both a Single Part Plug-in Board and a Multi Part Plug-in Board together, set each board to a different MIDI Port number.

5 Press the [MULTI/SEQ PLAY] button to enter the Multi mode.

6 Play back XG song from the sequencer software on the computer.

You must set the transmit port of each track on the XG song to the same number as the port number selected in the step 4.
For details how to connect the S90 ES to computer, see page 67.

Editing a Part on a Multi Part Plug-in Board

How to edit the Multi Part Plug-in Parts 17 - 32 is basically the same as editing the internal Parts 1 - 16. See page 44. However, please note that the Multi Part Plug-in Part (17 - 32) settings apply not to one individual Multi but to all Multis, and the Insertion Effects and System Effects are not applied to Multi Part Plug-in Parts.

Using an Effect Plug-in Board

In the example explanation below, the PLG100-VH Vocal Harmony Plug-in Board is used to apply harmony effects to the microphone sound in the Performance mode.

NOTE For Multi, the Effect Plug-in Board related parameters can be edited in the Multi Play mode or Multi Edit mode.

NOTE Please note that the Effect Plug-in Board cannot be used in the Voice mode.

1 After turning the power off, install the Effect Plug-in Board PLG100-VH to slot 1.

See page 184 for details.

2 Plug the microphone to the A/D INPUT jack on the rear panel.
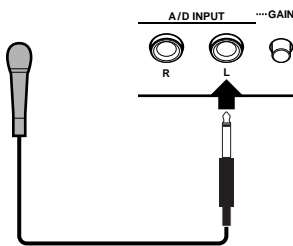
NOTE A standard dynamic microphone is recommended. (The S90 ES does not support phantom-powered condenser microphones.)

3 Turn the S90 ES power on.

4 Press the [PERFORM] button to enter the Performance Play mode, select the desired Performance, then set the microphone related parameters.

For details, refer to steps 4 - 9 on page 38.

5 Check the status of the installed Plug-in Boards in the [UTILITY] → [F6] PLUG → [SF1] STATUS display.

6 Select "PartAD" as the Part to which the Plug-in Insertion Effect is applied in the CONNECT display ([PERFORM] → [F3] EFFECT → [SF1] CONNECT).
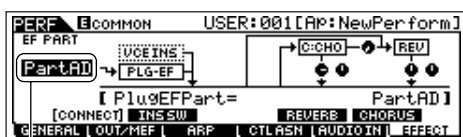
Move the cursor here, then select the Part.

7 Select the Plug-in Insertion Effect Type.
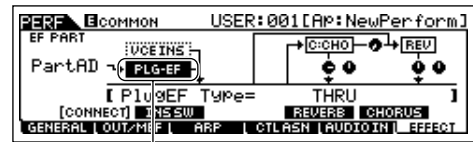
Move the cursor here, then select the Part.

8 Set related parameters from the Plug-in Effect display ([PERFORM] → [EDIT] → [COMMON] → [F6] EFFECT → [SF3] PLG-EF).

For details, refer to the Owner's Manual of the PLG100-VH.

9 Sing or talk into the microphone to check the effect sound, and adjust the settings as necessary.
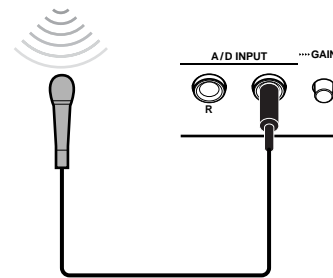
10 If desired, store the settings for the microphone sound and PLG100-VH as a Performance in the Performance Store mode (page 56).

Quick Guide

Using the Plug-in Board

Tips

This section explains the useful features included on your S90 ES.

TIP **Comparing the sound before editing with the just-edited one (Compare function)**

This convenient function lets you switch between the edited Voice and its original, unedited condition—allowing you to listen to the difference between the two and better hear how your edits affect the sound. You can use the function in each Edit mode (Voice/Performance/Multi).

1 **In the Edit mode (the [EDIT] indicator lighting), press the [EDIT] button so that its indicator flashes.**

The [C] indicator is shown at the top of the display (in place of the [E] indicator), and the original, unedited Performance is restored for monitoring.
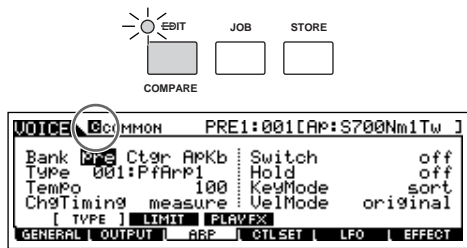
2 **Press the [EDIT] button again to disable the "Compare" function and restore the settings for your edited program.**

Compare the edited sound with the unedited sound by repeating steps 1 and 2.

NOTE While Compare is active, you cannot edit.

TIP **Edit Recall Function**

If you are editing a program and select a different program without storing your edited one, all the edits you've made will be erased.
If this happens, you can use Edit Recall to restore the program with your latest edits intact.

1 **Press the [JOB] button in each mode to enter the Job mode.**

2 **Press the [F2] RECALL button to call up the Recall display.**

3 **Press the [ENTER] button. (The display prompts you for confirmation.)**

If you wish to cancel the operation, press the [DEC/NO] button.

4 **Press the [INC/YES] button to execute the Edit Recall to restore the program.**

TIP **Voice Element mute/solo (in the Normal Voice Edit mode only)**

■ **Muting an Element**

1 **Make sure that the [MUTE] button's lamp is turned on in the Normal Voice Edit mode.**

If the indicator is flashing, press the [MUTE] button.

2 **Press one of the [9] - [12] buttons that you want to mute and turned the indicator off.**

Pressing the button alternates on and off.

The example below shows that the Element 3 is muted.
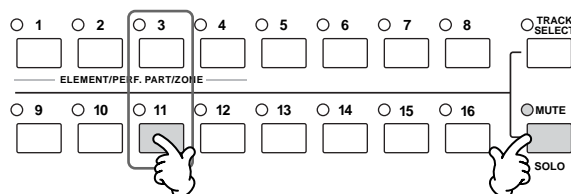
■ **Soloing an Element**

1 **In the Normal Voice Edit mode, simultaneously hold down the [SOLO] button and press one of the Number buttons [9] to [12] to solo the corresponding Element.**

Once you've selected an Element for soloing, the [SOLO] button's lamp flashes, indicating the Solo function is active and only the selected Element can be played.

2 **To exit from the Solo function, press the [SOLO] button again.**

The example below shows that the Element 3 is muted.
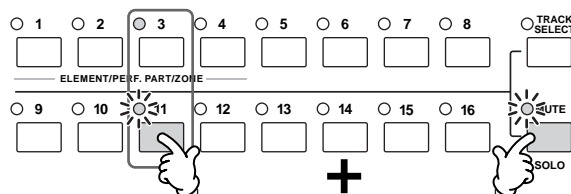
Press the buttons simultaneously
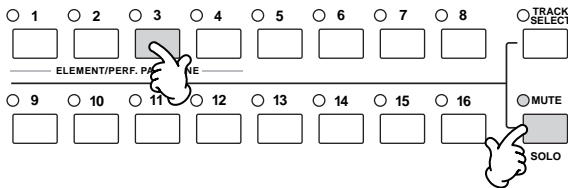
TIP Multi/Performance Part mute/solo

■ Muting a Part

1 Make sure that the [MUTE] button's lamp is turned on.

If the indicator is flashing, press the [MUTE] button.

2 press one of the [1] - [4] buttons in the Performance mode or press one of the [1] - [16] buttons in the Multi mode that you want to mute and turned the indicator off.

The example below shows that the Part 3 is muted.

■ Soloing a Part

1 Press one of the [1] - [4] buttons in the Performance mode or press one of the [1] - [16] buttons in the Multi mode that you want to solo, whiile holding the [SOLO] button.

Once you've selected an Part for soloing, the [SOLO] button's lamp flashes, indicating the Solo function is active and only the selected Part can be played.

2 To exit from the Solo function, press the [SOLO] button again.

The example below shows that the Part 3 is muted.

Press the buttons simultaneously
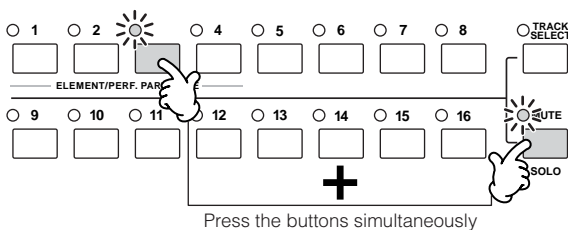
NOTE When selecting a Multi in the Master mode, the mute/solo settings apply not to each Part but to each MIDI transmit channel. Details are the same as for the mute/solo settings in the Sequence Play mode.

TIP Keyboard MIDI transmit channel setting

Press the [TRACK SELECT] button so that its indicator lights, and press any of the Number [1] - [16] buttons to change the Keyboard MIDI transmit channel in any mode.
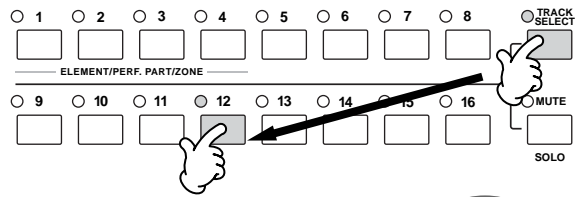
NOTE You can also set the MIDI keyboard transmit channel of the Voice mode and Performance mode from the Utility mode ([UTILITY] → [F5] MIDI → [SF1] CH → KBDTransCh).

TIP Transpose setting of the keyboard

You can transpose the pitch up or down of the keyboard in semitone steps or octave steps.

1 Press the [UTILITY] button to enter the Utility mode.

2 Press the [F1] GENERAL button, then the [SF2] KBD button.
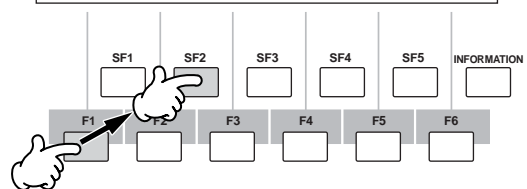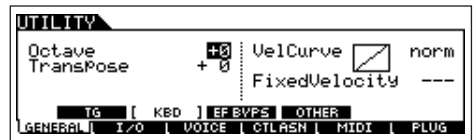
3 Move the cursor the "Octave" when you want to shift the key by one octave. Move the cursor "Transpose" when you want to shift the key by one semitone.

4 Change the parameter value by using the [INC/YES], [DEC/NO] buttons and data dial.

5 Press the [STORE] button to store the settings as the system setting of Utility mode.

⚠ CAUTION

If you turn the power off without storing, the currently edited settings will be lost.

TIP **Setting a specific file to load automatically when the power is turned on**

The S90 ES is very easy to use and you can create Voices, Performances, and Multis very quickly on it. However, there may be times that creating and editing of data may be spread out over several sessions. In such a case, you may find it convenient to have the instrument automatically load the appropriate files for you when you turn it on, so you can easily resume your editing session.

Save the data after editing. ➡ Turn the power off ➡ The saved files are loaded automatically when you turn the power on next time.

USB storage device

Save

USB storage device
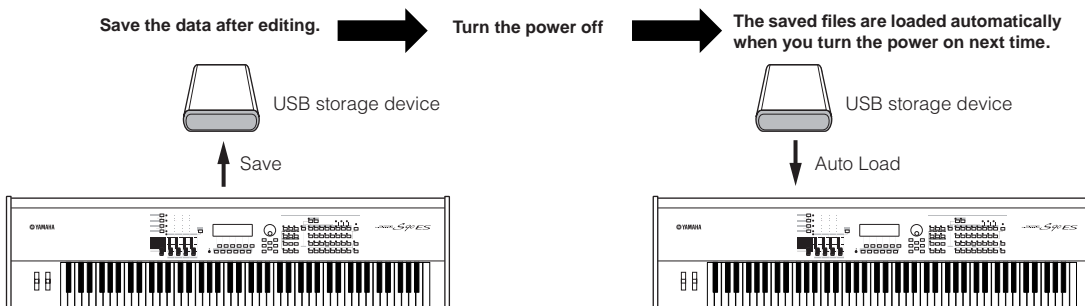
Auto Load

NOTE The Auto Load parameter is set to on when this synthesizer is shipped from the factory.

NOTE The file types which can be loaded automatically are "All," "Plugin All Bulk 1," "Plugin All Bulk 2," and "Plugin All Bulk 3."

1 Change the names of the files you wish to have load automatically when the power is turned on as described below, and save them together in a single folder or in the root directory.

File type	File name
All	AUTOLOAD.S7A
Plugin All Bulk 1 (for slot 1)	AUTOLD1.W2B
Plugin All Bulk 2 (for slot 2)	AUTOLD1.W2B
Plugin All Bulk 3 (for slot 3)	AUTOLD1.W2B

2 Enter the Utility mode and call up the Auto Load display ([UTILITY] → [F1] GENERAL → [SF4] OTHER).

3 Set "Auto Load" to on, and press the [SF5] GET button.
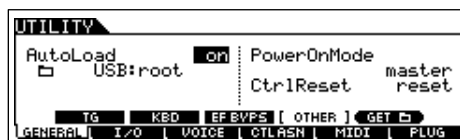
4 Select the folder saved in step 1.

If the device is inserted the multiple medias, select the Slot number. If the device is divided the multiple partitions, select the Partition number.
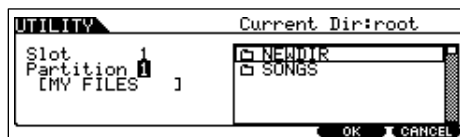
5 Press the [STORE] button to store the settings as the system setting of Utility mode.

TIP **Selecting programs from a computer**

You can select Voices/Performances/Multis on this instrument from your computer software by specifying the following MIDI messages. When changing the program in each mode, the following three MIDI messages must be transmitted to the S90 ES.

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

For example, transmit the following MIDI messages to select the Voice of number 12 in the PRE2 in the Voice mode.

1 **Transmit a Bank Select MSB (Control change #000) value of 63.**

2 **Transmit a Bank Select LSB (Controll change #032) value of 1.**

3 **Transmit a Program Change value of 12.**

For details on what values are assigned to the Bank Select MSB/LSB and Program Change number of this synthesizer, refer to the separate Data List.

NOTE When switching Voices in the same Bank or Performances, you can change a Voice or Performances by a Program Change message. When switching Multis, you must transmit Bank Select MSB/LSB messages before a Program Change.

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 S90 ES (page 183).

Basic Structure

This section gives you an easy-to-understand overview of the S90 ES — its wide range of sophisticated features, its MIDI control and performance functions, and its convenient file management system for original data you've created with the instrument.

Internal Structure (System Overview)

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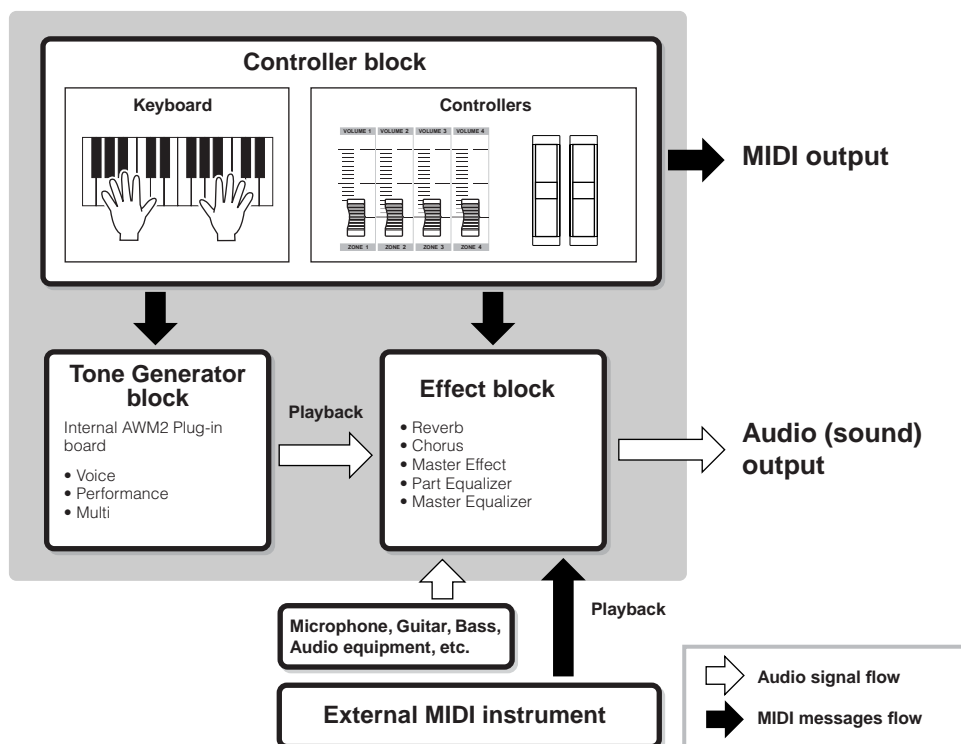
Controller block

This block consists of the keyboard, Pitch Bend and Modulation Wheels, Control sliders, and so on.
The keyboard itself doesn't generate sounds, but instead generates/transmits note on/off, velocity and other information (MIDI messages) to the synthesizer's tone generator block when you play notes. The controllers also generates/transmits MIDI messages. The synthesizer's tone generator block produces the sound according to the MIDI messages transmitted from the keyboard and controllers.

Controller supported by the S90 ES

The controllers you can use on this synthesizer and the reference pages are as follows:

● **Controllers with which the S90 ES is equipped**

● **Controllers (sold separately) that can be connected to the rear panel of the S90 ES**

Tone Generator block

The tone generator block is what actually produces sound in response to the MIDI messages received from the controller block, and from an external sequencer.

Internal AWM2 Tone Generator and optional Plug-in board

The tone generator block in the S90 ES consists of the built-in AWM2 and optional Plug-in boards.

Internal AWM2 Tone Generator

Plug-in boards (optional)

Up to three boards can be installed.
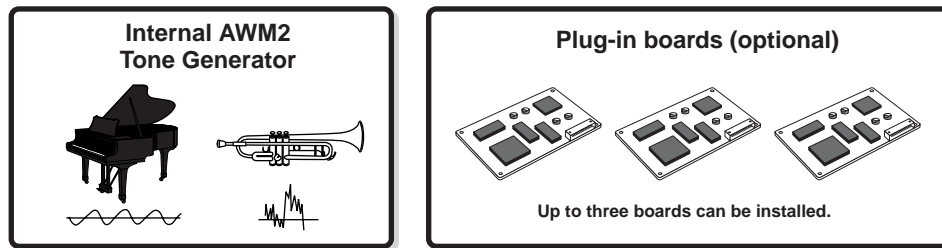
● **AWM2 (Advanced Wave Memory 2)**

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 envelope generator, filter, modulation, and other parameters can be applied to the basic waveform.

● **Plug-in board**

For details, see page 99.

Voice, Performance, and Multi

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

● **Voice**

A Voice is a program that contains the sonic Elements for generating a specific musical instrument sound. 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 44) or in the Multi Voice Edit mode (page 73).

● **Performance**

A Performance is a program in which multiple Voices (Parts) are combined in a layer, or in other configurations. 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 53).
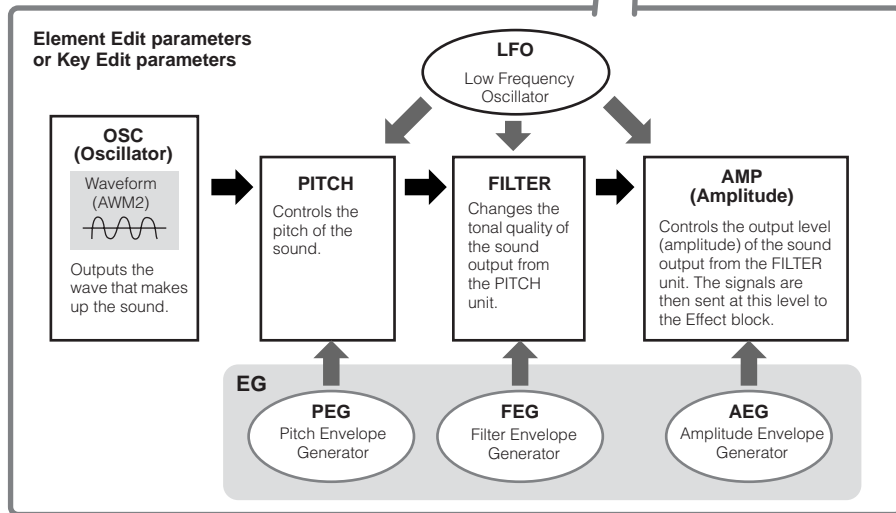
● **Multi**

A Multi is a program in which multiple Voices are assigned to Parts for multi-timbral play in the Multi mode. Each Multi can contain up to 34 Parts. Each Multi can be created by editing parameters unique to each Part and parameters common to all the Parts in the Multi mode (page 72).

Basic Structure

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

One Voice
◯ VOICE
Up to four elements (Normal Voice)
Up to 73 keys (Drum Voice)

Element 1 - 4
or Key C0-C6

+

Common Edit parameters
Arpeggio, Effects, Controller Set, etc.

One Performance
◯ VOICE
Up to four parts

One Part
Voice + **Part Edit parameters**

+

Common Edit parameters

Different Voice for each part

One Multi
◯ MULTI/ SEQ PLAY
• Parts 1 - 16 (of the internal tone generator)
• Parts 17 - 32 (of the optionally installed PLG100-XG)
• Parts PLG 1 - 3 (of the optionally installed single part Plug-in boards)

One Part CH1 CH16
Voice + **Part Edit parameters**

+

Common Edit parameters

Different Voice for each part

Set in the Voice Edit mode (page 44)

Element Edit parameters or Key Edit parameters

LFO
Low Frequency Oscillator

OSC (Oscillator)
Waveform (AWM2)
Outputs the wave that makes up the sound.

→ **PITCH**
Controls the pitch of the sound.

→ **FILTER**
Changes the tonal quality of the sound output from the PITCH unit.

→ **AMP (Amplitude)**
Controls the output level (amplitude) of the sound output from the FILTER unit. The signals are then sent at this level to the Effect block.

EG

PEG
Pitch Envelope Generator

FEG
Filter Envelope Generator

AEG
Amplitude Envelope Generator

NOTE The Drum Voice Key Edit parameters do not contain LFO settings.

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.
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.
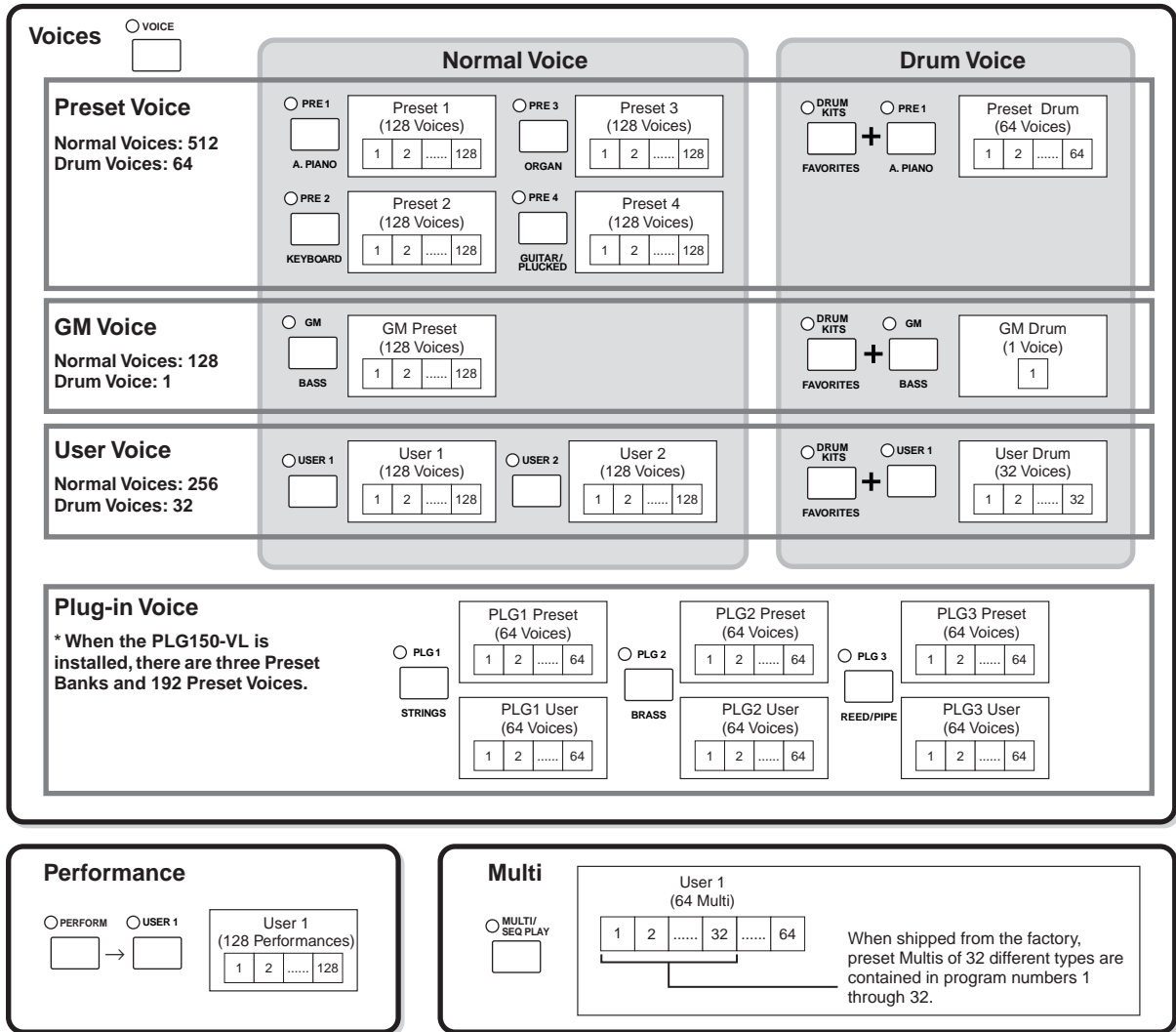
■ Normal Voice and Drum Voice

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

Drum Voice

Individual drum sounds (different for each key)
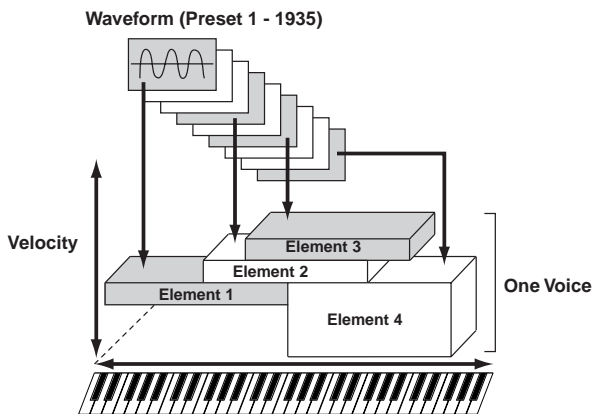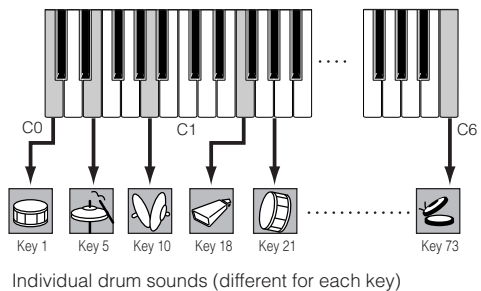
■ **GM Voices**

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 various parameters that makes up one Voice, Oscillator, Pitch, Filter, Amplitude, LFO and three Envelope Generators (PEG, FEG, AEG) shown in the illustration on pages 112 - 114 are the basic parameters for creating the Voice sound. Parameters about Oscillator, Pitch, Filter and Amplitude 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] → Voice selection → [EDIT] → Element selection/Drum Key selection → [F1] OSC

This unit outputs the 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 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.

NOTE You can assign the wave with the following operation.
[VOICE] → Voice selection → [EDIT] → Element selection/Drum Key selection → [F1] OSC → [SF1] WAVE
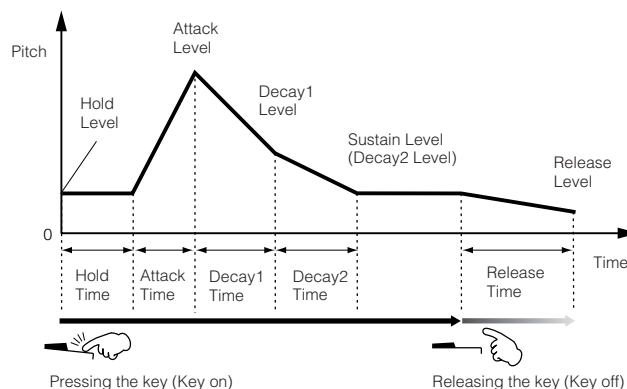
● **Pitch**

[VOICE] → Voice selection → [EDIT] → Element selection/Drum Key selection → [F2] PITCH

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 the moment the sound stops. You can create the PEG by setting parameters as illustrated below. When you press a note on the keyboard, the pitch of the Voice will change according to these envelope settings. This is useful for creating automatic changes in pitch, which is effective for example in synth brass sounds. Furthermore, different PEG parameters can be set for each Element or each Key.
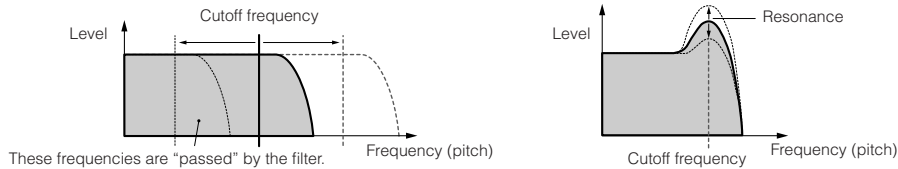
● Filter

[VOICE] → Voice selection → [EDIT] → Element selection/Drum Key selection → [F3] FILTER

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

Cutoff Frequency and Resonance

Here's how filters work. 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. 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 four other Filter types 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.
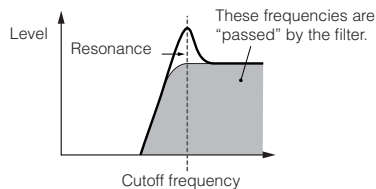
- **Band Pass Filter**
 This passes only those a band of signals around the Cutoff frequency. The width of this band can be varied.
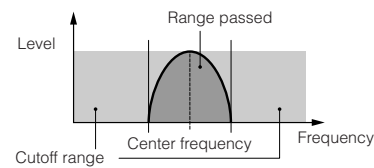
- **Band Elimination Filter**
  This attenuates a band of signals around the Cutoff frequency, but passes everything else.
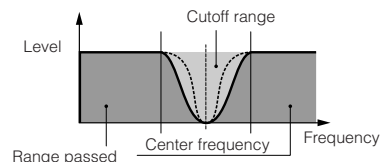
FEG (Filter Envelope Generator)

Using the FEG, you can control the transition in tone from the moment the sound starts to the moment the sound stops. You can create the FEG by setting parameters as illustrated below. When you press a note on the keyboard, the cutoff frequency 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 each Key.
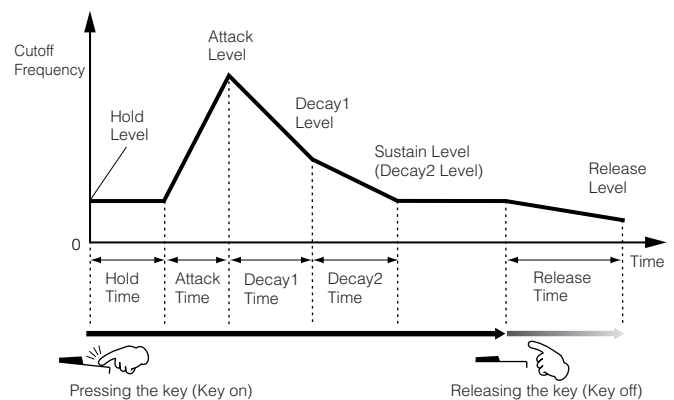
● **Amplitude**

[VOICE] → Voice selection → [EDIT] → Element selection/Drum Key selection → [F4] AMP

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 is to the moment the sound stops. You can create the AEG by setting parameters as illustrated below. When you press a note on the keyboard, the volume will change according to these envelope settings. Furthermore, different AEG parameters can be set for each Element or each Key.
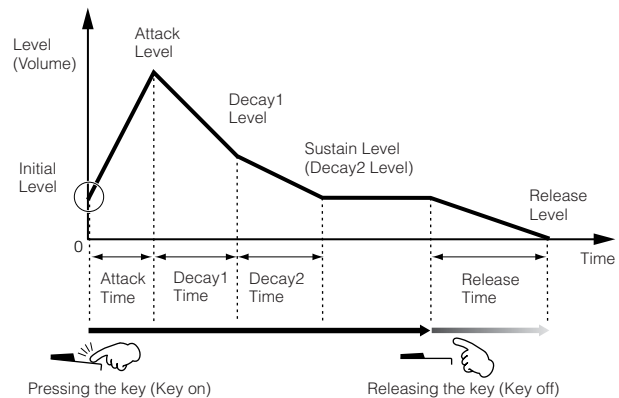
When using a Footswitch connected to the FOOT SWITCH (SUSTAIN) jack
When the Half Damper function is set to off
When you release the key while holding the Footswitch, the sound will stay at the Sustain Level (Decay 2 Level) shown. (For Voices having a Sustain Level of 0, the sound decays naturally to silence.)
When releasing the Footswitch, the operation is same as key off; the sound will start to decay, and finally decay to silence according to the Release Time.

When the Half Damper function is set to on (FC3 only)
When you release the key while pressing the Footswitch fully down, the sound will decay to the Sustain Level (Decay 2 Level), according to the Sustain Time value.
In this case, you can control the decay time between the Sustain Time and Release Time by how far down you press the pedal. However, when you release the pedal after releasing the keys (key off event), the sound will decay according to the Release Time, as if the Half Damper function was set to off.
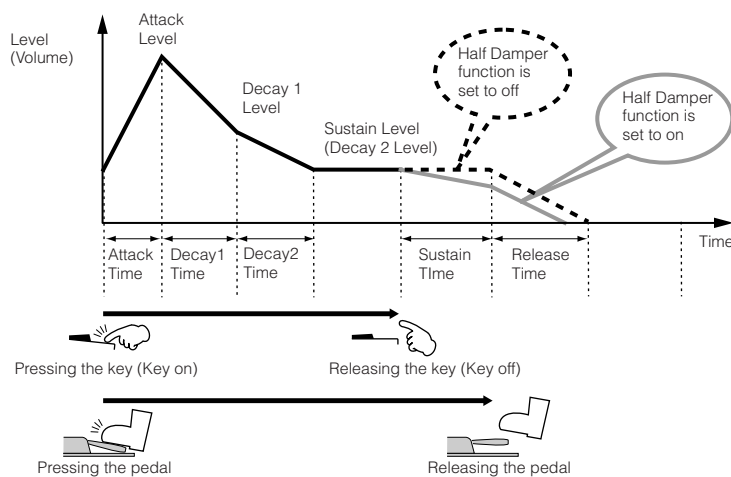
D NOTE For details about the Footswitch and how to turn the Half Damper function on or off, see page 60.

D NOTE **When releasing the key before the sound reaches the Sustain Level**
When pressing the Footswitch fully down, the sound will decay after reaching the Sustain Level (after the Decay 2 Time). When the Footswitch is not pressed fully down, the sound will decay immediately.

● **LFO (Low Frequency Oscillator)**

[VOICE] → Voice selection → [EDIT] → Element selection/Drum Key selection → [F5] LFO

[VOICE] → Voice selection → [EDIT] → [COMMON] → [F5] LFO

As its name suggests, the LFO produces a wave of a low frequency.
These waves can be used to vary the pitch, filter or amplitude of each Element to create effects such as vibrato, wah and tremolo. LFO can be set independently for each Element; it can also be set globally for all Elements.

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 "single timbre" tone generator receives data over a single MIDI channel and plays a single instrument Part.
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] → [F5] MIDI → [SF1] CH → BasicRcvCh

● **Multi-timbral Tone Generator (Multi mode)**

A "multi-timbral" tone generator simultaneously receives data over multiple MIDI channels and plays multiple instrument Parts. This allows playback of multichannel 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/SEQ PLAY] (select Multi mode) → [EDIT] → Part selection → [F1] VOICE → [SF2] MODE → ReceiveCh

---

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 S90 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 S90 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.
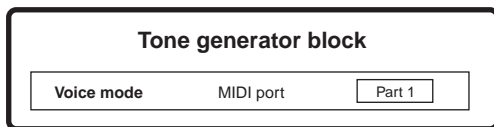
The multiple sound sources of this synthesizer (internal tone generator and Plug-in Boards) take advantage of the three MIDI ports included on the instrument.

DNOTE The USB cable supports up to eight separate MIDI ports. However, the S90 ES supports up to three MIDI ports.

DNOTE 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.
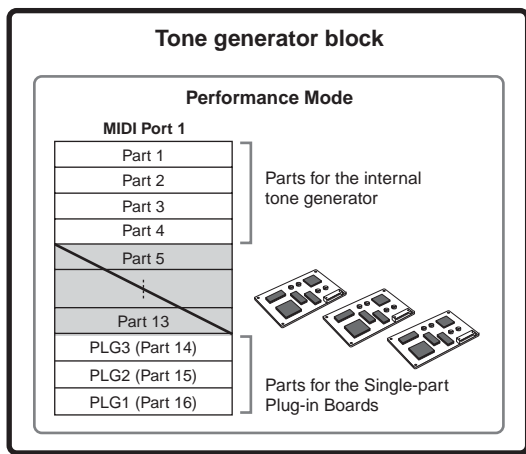
```
┌────────────────────────────────────────────────┐
│              Tone generator block               │
│  ┌────────────────────────────────────────────┐ │
│  │  Voice mode      MIDI port      │ Part 1 │  │ │
│  └────────────────────────────────────────────┘ │
└────────────────────────────────────────────────┘
```

DNOTE • 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.

DNOTE 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 seven 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.

```
┌──────────────────────────────────────────┐
│            Tone generator block           │
│  ┌────────────────────────────────────┐   │
│  │          Performance Mode          │   │
│  │  MIDI Port 1                       │   │
│  │  ┌──────────┐                      │   │
│  │  │  Part 1  │                      │   │
│  │  │  Part 2  │  Parts for the       │   │
│  │  │  Part 3  │  internal            │   │
│  │  │  Part 4  │  tone generator      │   │
│  │  │  Part 5  │                      │   │
│  │  │    :     │                      │   │
│  │  │  Part 13 │                      │   │
│  │  │ PLG3 (Part 14) │                │   │
│  │  │ PLG2 (Part 15) │ Parts for the  │   │
│  │  │ PLG1 (Part 16) │ Single-part    │   │
│  │  └──────────┘      Plug-in Boards  │   │
│  └────────────────────────────────────┘   │
└──────────────────────────────────────────┘
```

▨ Parts 5-13 are not used.

▢ These seven Parts (1, 2, 3, 4, PLG1, PLG2, PLG3) 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 [PERFORM] → Performance selection → [EDIT] → Part selection → [F1] VOICE → [SF1] VOICE display) are played.

DNOTE • To set the MIDI receive channel for single timbre operation (Voice and Performance modes), use the following operation in the Utility mode.
[UTILITY] → [F5] MIDI → [SF1] CH → BasicRcvCh
• In the Performance mode, the instrument recognizes only data over MIDI Port 1.

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

Basic Structure

■ Part structure of the tone generator block in the Multi mode/Sequence Play 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 34, as we will see later in the example.
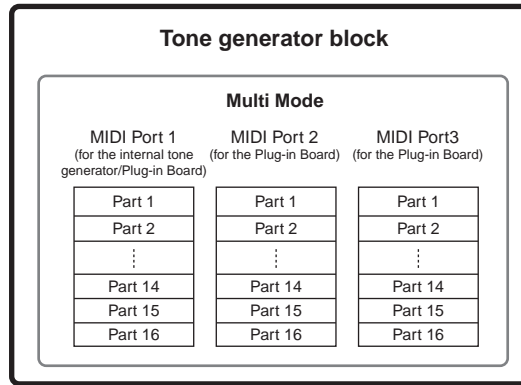
This example applies when installing one Multi part Plug-in Board and two Single-part Plug-in Boards, and assigning the Multi-part Plug-in Board to "Port 3" and the Single-part Plug-in Boards to "Port 2."
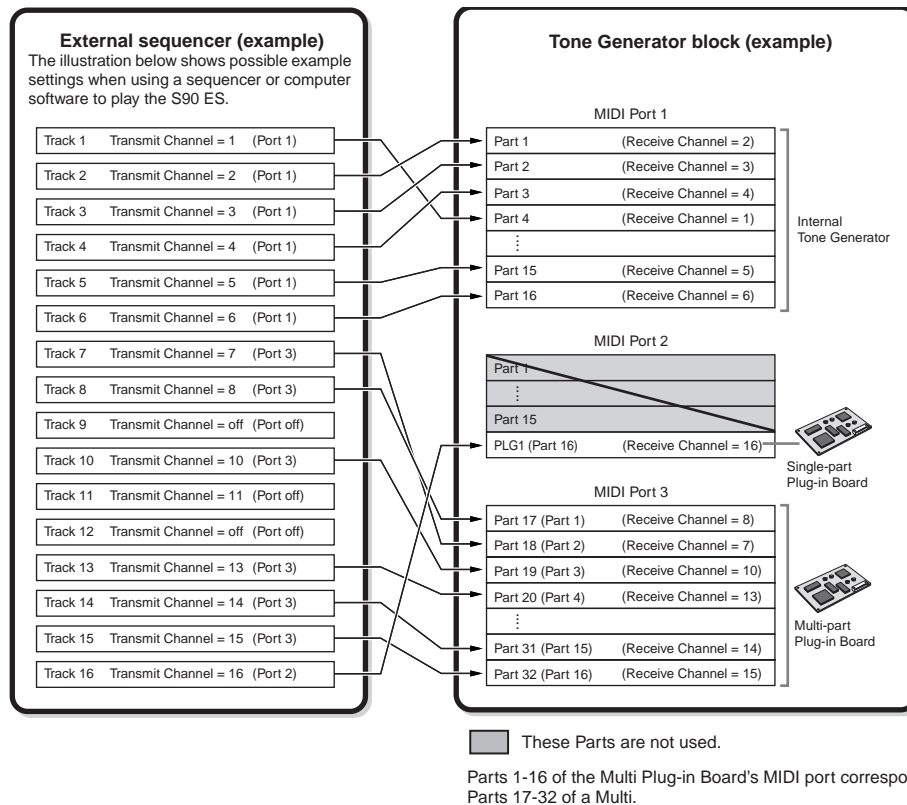
When using the internal tone generator of the S90 ES, set the MIDI port of each track on the sequencer to "1." Keep in mind that data received over Ports 2 or 3 cannot sound the internal tone generator block. The tone generator of the installed Plug-in Board can be sounded via any of the MIDI ports 1 - 3.

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

[MULTI/SEQ PLAY] (select Multi mode) → Multi selection → [EDIT] → Part selection → [F1] VOICE → [SF2] MODE → ReceiveCh

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

[UTILITY] → [F6] PLUG → [SF2] MIDI

DNOTE 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.

DNOTE The Multi-part Plug-in Board can only be installed to slot 3 (PLG3).

DNOTE 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.

Basic Structure

Audio Input Part (AUDIO IN)

The Performance mode and Multi mode are capable of handling the audio input signal (such as a microphone or guitar) as a Part. Various parameters such as volume, pan, and effect can be set to this Part and the sound is output together with other Parts. Other available settings include how stereo input signals are handled, as well the output assignment of the audio Part. These parameters are set and stored for each Performance and Multi. Please note that the Audio Input Part is not available in the Voice mode.

A/D input Part	This part (one stereo part) is input from the external audio equipment connected to the A/D INPUT jack.
mLAN Input Parts (when the optional mLAN16E has been installed)	These four stereo parts are input from external mLAN-compatible audio equipment connected to the mLAN jack via a single IEEE1394 cable.

Parameters for the above Parts can be set with the following operations.

In the Performance mode	[PERFORM] → Performance selection → [EDIT] → [COMMON] → [F5] AUDIO IN
In the Multi mode	[MULTI/SEQ PLAY] (select Multi mod) → Multi selection → [EDIT] → [COMMON] → [F5] AUDIO IN

NOTE Although the Insertion Effects of this synthesizer can be applied to the A/D Input Part, they cannot be applied to the mLAN Input Part.

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.

Effect structure

The effect processing of this synthesizer features the System Effects, Insertion Effects, Master Effect, Part EQ (Equalizer), and Master EQ (Equalizer).

■ System Effects (Reverb, Chorus)

System Effects are applied to the overall sound, whether it be a Voice, an entire Performance, and 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 A, B

Insertion effects can be applied individually to each part. Insertion effects are mainly used to directly process a single part. The depth of the effect is adjusted by setting the dry/wet balance. 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. You can also set the balance so that only the effect sound is heard, by setting Wet to 100%.
This synthesizer features eight sets of Insertion effects (one set has A and B units). They can be applied to all parts of the Performance, and applied to eight parts (maximum) of the Multi.
A total of 117 different Chorus types are available.

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

NOTE Among the AUDIO IN Parts, Insertion effects cannot be applied to the mLAN Parts.

■ **Plug-in Insertion Effects**

This is a special effect system, only available when an effect-type Plug-in Board is installed (page 101). Plug-in Board effects are not available in the Voice mode.

■ **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)

When only turning the [EFFECT BYPASS] button to on, you can bypass the specific effect(s).
From the following display, you can select the effect(s) to be bypassed using the [EFFECT BYPASS] button.
[UTILITY] → [F1] GENERAL → {SF3} EF BYPS

Controlling the Master effect by using the Control sliders

When pressing the [ARP FX] button and the [EQ] button simultaneously (both lamps light), you can control the Control sliders to adjust the Master effect related parameters specified in the [UTILITY] → [F4] CTL ASN → [SF5] MEF display of the Utility mode.

■ **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] → Voice selection → [EDIT] → Element selection/Key selection → [F6] EQ

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 among 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.
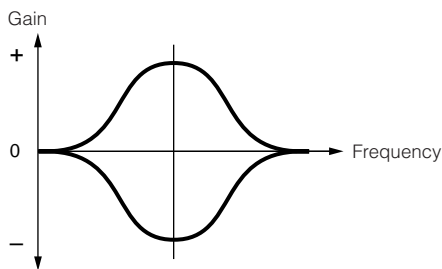
Shelving type
This type of EQ shape lets you attenuate/boost the signal at frequencies above or below the specified Frequency setting.
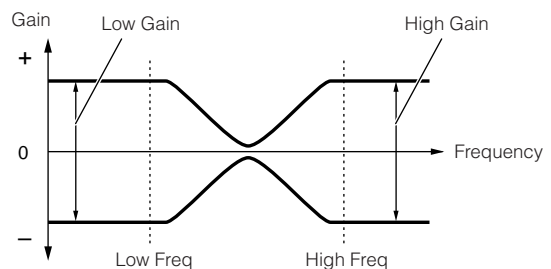
D NOTE In addition to the individual gain controls, there is also an overall level parameter that attenuates/boosts the entire frequency range.

● **Part EQ**

[PERFORM] → Performance selection → [EDIT] → Part selection → [F3] EQ

[MULTI/SEQ PLAY] (select Multi mode) → Multi selection → [EDIT] → Part selection → [F3] EQ

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.
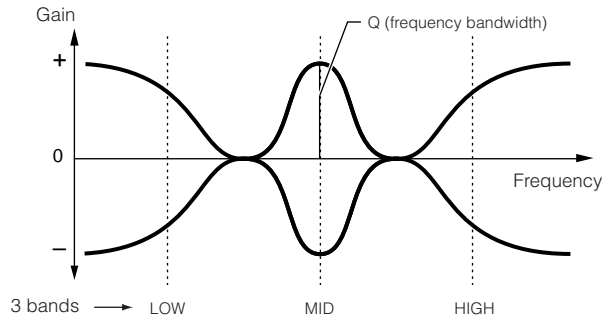
**NOTE** The part EQ is not available in the Voice mode.

● **Master EQ**

[VOICE] → Voice selection → [UTILITY] → [F3] VOICE → [SF1] MEQ

[PERFORM] → Performance selection → [EDIT] → [COMMON] → [F2] OUT/MEF → [SF2] MEQ

[MULTI/SEQ PLAY] (select Multi mode) → Multi selection → [EDIT] → [COMMON] → [F2] MEQ/MEF → [SF1] MEQ

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).

EQ for which all bands are set to peaking type
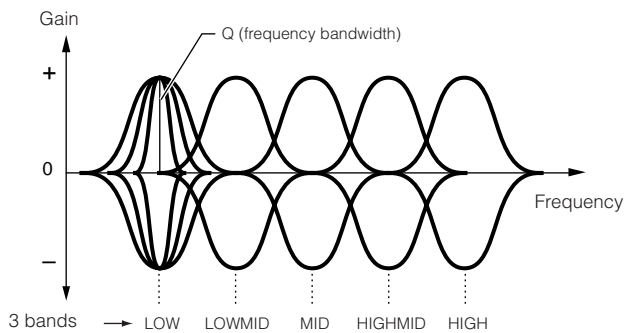
EQ for which LOW and HIGH are set to shelving type
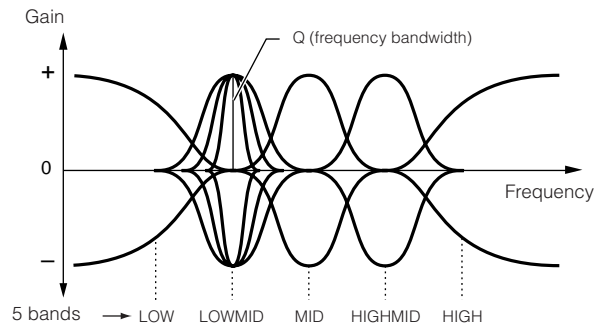
Effect connection in each mode

● In the 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 [STORE] button.

[VOICE] → Voice selection → [EDIT] → [COMMON] → [F6] EFFECT → [SF1] CONNECT

System effects (Reverb effect and Chorus effect)

Chorus Ctg, Chorus Typ (Chorus Effect Category, Chorus Effect Type)
Reverb Typ (Reverv Effect Type)
Determines the effect type for Chorus.

Chorus Send, Reverb Send
Determines the level of the sound (from Insertion A or B, or the bypassed signal) that is sent to Chorus/Reverb effect.
 Settings: 0 - 127

Chorus Return, Reverb Return
Chorus Pan, Reverb Pan
Determines the Return level and pan position setting for the Chorus/Reverb effect.
 Settings: 0 - 127, L63 (far left) - C (center) - R63 (far right)

Chorus to Reverb
Determines the Send level of the signal sent from the Chorus Effect to the Reverb Effect.

Tone Generator block

Element 1-4 Effect Output
EL: OUT 1-4

Element or Key
Element EQ

Determines which Insertion effect (A or B) is used to process each individual Element (Key). The "thru" setting lets you bypass the Insertion effects for the specific Element.

Settings: insA, insB, thru

Insertion effects

Ins A Ctgry, Ins B Ctgry (Insertion effect Category), Ins A Type, Ins B Type (Insertion effect Type)

Determines the effect type for Insertion A or B.

Ins EF Connect (Insertion Effect Connect)

Determines the effect routing for Insertion effects A and B. The setting changes are shown on the diagram in the display, giving you a clear picture of how the signal is routed.

Reverb Send
Chorus Send

Reverb Return
Chorus Return

Master effect

[VOICE] → [UTILITY] → [F3] VOICE → [SF2] MEF (for all Voices)

Master EQ

[VOICE] → [UTILITY] → [F3] VOICE → [SF1] MEQ (for all Voices)

[VOICE] → Voice selection → [EDIT] → [COMMON] → [F1] GENERAL → [SF3] MEQ OFS

Output

Settings

Ins A to B **Ins B to A** **Para**

🎵 **NOTE**   The parallel connection is not available for Plug-in voices.

🎵 **NOTE**   The Plug-in Insertion effect (when the Effect Plug-in board has been installed) is not available in the Voice mode.

● **In the Performance mode**

The Effect parameters in the Performance mode are set for each Performance.

Basic Structure

[PERFORM] → Performance selection → [EDIT] →
[COMMON] → [F6] EFFECT → [SF1] CONNECT

The Insertion connection type depends on the setting of the Voice assigned to the selected Part.

System effects (Reverb effect and Chorus effect)

Chorus Ctg, Chorus Typ (Chorus Effect Category, Chorus Effect Type)
Reverb Typ (Reverv Effect Type)
Determines the effect type for Chorus.

Chorus Send, Reverb Send
Determines the level of the sound (from Insertion A or B, or the bypassed signal) that is sent to Chorus/Reverb effect.
Settings: 0 - 127

Chorus Return, Reverb Return
Chorus Pan, Reverb Pan
Determines the Return level and pan position setting for the Chorus/Reverb effect.
Settings: 0 - 127, L63 (far left) - C (center) - R63 (far right)

Chorus to Reverb
Determines the Send level of the signal sent from the Chorus Effect to the Reverb Effect.

Part 1 Insertion Effect (VCE INS)

A

B

*1

Tone Generator block

Part 1
Part EQ *3

*1

*2

Plug-in Insertion Effect (PLG-EF)

When the PLG100-VH has been installed

Audio Input part

*2

*4
Reverb Send
Chorus Send

Reverb Return
Chorus Return

Master effect → **Master EQ** *5 → **Output**

[PERFORM] → Performance selection → [EDIT] →
[COMMON] → [F2] OUT/MEF → [SF3] MEF

*1 Select the part to which the Insertion effect is applied. The Insertion effect depends on the setting of the Voice assigned to the selected part.
[PERFORM] → Performance selection → [EDIT] → [COMMON] → [F6] EFFECT → [SF2] INS SW

NOTE Among all of the audio input Parts, the Insertion effect can be applied only to the A/D Input Part.

*2 Select the part to which the Plug-in Insertion effect is applied from Parts 1-4, Plug-in Parts 1-3, and the audio input Part (Plug EF Part parameter).

Settings: Part 01 - Part 04, Part AD, Part P2 - Part P3, off"

*3 **[PERFORM] → Performance selection → [EDIT] →**
Part selection → [F3] EQ

*4 **[PERFORM] → Performance selection → [EDIT] → [COMMON]**
→ [F2] OUT/MEF → [SF1] OUT

*5 **[PERFORM] → Performance selection → [EDIT] → [COMMON]**
→ [F2] OUT/MEF → [SF2] MEQ

[PERFORM] → Performance selection → [EDIT] → [COMMON]
→ [F1] GENERAL → [SF3] MEQ OFS

● In the Multi mode

The Effect parameters in the Multi mode are set for each Multi.

System effects (Reverb effect and Chorus effect)

Chorus Ctg, Chorus Typ (Chorus Effect Category, Chorus Effect Type)
Reverb Typ (Reverv Effect Type)
Determines the effect type for Chorus.

Chorus Send, Reverb Send
Determines the level of the sound (from Insertion A or B, or the bypassed signal) that is sent to Chorus/Reverb effect. These Parameters can be set in the Multi Play mode (*4)

Settings: Settings: 0 - 127

Chorus Return, Reverb Return
Chorus Pan, Reverb Pan
Determines the Return level and pan position setting for the Chorus/Reverb effect.
Settings: 0 - 127, L63 (far left) - C(center) - R63 (far right)

Chorus to Reverb
Determines the Send level of the signal sent from the Chorus Effect to the Reverb Effect.

[MULTI/SEQ PLAY] (select Multi mode) → Multi selection → [EDIT] → [COMMON] → [F6] EFFECT → [SF1] CONNECT

Basic Structure

Tone Generator block

Part 1-16

Part 1
Part EQ *3

Plug-in Part 1-3
(When the Single part Plug-in board has been installed)

*2

Audio Input part

*1

Part 1 Insertion Effect (VCE INS)

A

B

*2

Plug-in Insertion Effect (PLG-EF)

When the PLG100-VH has been installed

*4
Reverb Send
Chorus Send

Reverb Return
Chorus Return

Master effect

Master EQ 5*

Output

[MULTI/SEQ PLAY] (select Multi mode) → Multi selection → [EDIT] → [COMMON] → [F2] MEQ/MEF → [SF2] MEF

Tone Generator block

Part 17-32
(When the Multi-part Plug-in Board PLG100-XG has been installed)

*1 Select the part to which the Insertion effect is applied from Parts 1-16, Plug-in Parts 1-3, and the audio input Part. The Insertion effect depends on the setting of the Voice assigned to the selected part.

[MULTI/SEQ PLAY] (select Multi mode) → Multi selection → [EDIT] → [COMMON] → [F6] EFFECT → [SF2] INS SW

▶ NOTE Among all of the audio input Parts, the Insertion effect can be applied only to the A/D Input Part.

*2 Select the part to which the Plug-in Insertion effect is applied from Parts 1-16, Plug-in Parts 1-3, and the audio input Part (Plug EF Part parameter).
Settings: Part 01 - Part 16, Part AD, Part P2 - Part P3, off

*3 [MULTI/SEQ PLAY] (select Multi mode) → Multi selection → [EDIT] → Part selection → [F3] EQ

*4 [MULTI/SEQ PLAY] (select Multi mode) → Multi selection → [F4] EF SEND

*5 [MULTI/SEQ PLAY] (select Multi mode) → Multi selection → [EDIT] → [COMMON] → [F2] MEQ/MEF → [SF2] MEQ

[MULTI/SEQ PLAY] (select Multi mode) → Multi selection → [EDIT] → [COMMON] → [F1] GENERAL → [SF3] MEQ OFS

▶ NOTE The Insertion effect, Plug-in Insertion effect, and the System effect cannot be applied to Parts 17-32 (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 or the mLAN connector of the mLAN16E board. (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 A single Arpeggio type can be played back at the same time even in the Performance, Multi mode, enabling you to play multiple tone generator's parts simultaneously.

Arpeggio type categories

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 below).
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 below).
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	Various arpeggio types suited for Performances. These are combination arpeggios, with separate phrases suitable for drum voices, bass voices, and chord/melody instruments.
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 S90 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.

● 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] → Voice selection → [EDIT] → [COMMON] → [F3] ARP → [SF1] TYPE → KeyMode
Performance mode	[PERFORM] → Performance selection → [EDIT] → [COMMON] → [F3] ARP → [SF1] TYPE → KeyMode
Multi mode	[MULTI/SEQ PLAY] (select Multi mode) → Multi selection → [EDIT] → [COMMON] → [F3] ARP → [SF1] TYPE → 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] → Voice selection → [F6] ARP	Page 128
	[VOICE] → Voice selection → [EDIT] → [COMMON] → [F3] ARP	Page 129
Assigning Arpeggio types to the [SF1] - [SF5] buttons for each Voice	[VOICE] → Voice selection → [F1] PLAY	Page 127
MIDI output parameters for Arpeggio playback for all the Voices	[VOICE] → [UTILITY] → [F3] VOICE → [SF3] ARP CH	Page 165

NOTE MIDI output parameters for Arpeggio playback are set for each Voice 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)	[PERFORM] → Performance selection → [F6] ARP	Page 149
	[PERFORM] → Performance selection → [EDIT] → [COMMON] → [F3] ARP	Page 151
Assigning Arpeggio types to the [SF1] - [SF5] buttons for each Performance	[PERFORM] → Performance selection → [F6] ARP	Page 149

● **Multi mode**

Arpeggio type parameters called up when selecting a Multi (including MIDI output parameters for Arpeggio playback)	[MULTI/SEQ PLAY] (select Multi mode) → Multi selection → [EDIT] → [COMMON] → [F3] ARP	Page 158
Assigning Arpeggio types to the [SF1] - [SF5] buttons for each Multi	[MULTI/SEQ PLAY] (select Multi mode) → Multi selection → [F1] PLAY → [F5] ARP	Page 157
Arpeggio playback on or off for each Part (Only one Part can be turned on)	[MULTI/SEQ PLAY] (select Multi mode) → Multi selection → [EDIT] → Part selection → [F1] VOICE → [SF2]MODE	Page 159

NOTE You can turn Arpeggio playback on for several Parts simultaneously, if the Parts have the same receive channel.

Basic Structure

Maintaining data

As you use the S90 ES, you'll create many different kinds of data, including Voices, Performances, and Multis. This section describes how to maintain the various data.

■ Store

This is a process of transferring or saving the created data of this synthesizer to a dedicated location (User Memory) in the internal memory. Each type of data can be stored with the following operations.

Voice	[VOICE] → Voice selection → [STORE]	Page 50
Performance	[PERFORM] → Performance selection → [STORE]	Page 56
Multi	[MULTI/SEQ PLAY] (select Multi mode) → Multi selection → [STORE]	Page 76
Master	[Master] → Master selection → [STORE]	Page 91
System settings	[UTILITY] → [STORE]*	Page 163

* Please note that pressing the [STORE] button in the Utility mode immediately starts the Store operation for the System settings.

⚠ CAUTION

Never attempt to turn off the power while an "Executing..." or "Please keep power on" message is shown. Turning the power off in this state may cause the system to freeze and prevent normal startup the next time the power is turned on, as well as resulting in the loss of all user data.

■ Save

[FILE] → [F2] SAVE

This is a process of transferring or saving the created data of this synthesizer to a USB storage device. This process can be done in the File mode. The Save operation can be done via various methods, such as saving all data as a single file or saving a specified type of data (e.g., only Voices) as a single file. For details, refer to page 168.
The saved data as files can be recalled by loading them in the File mode.

■ Bulk Dump

This function lets you save the data in the S90 ES by transmitting it as Bulk data (system exclusive message) to an external MIDI instrument or sequence software on a computer.

● Sending the editing current program as Bulk Dump data

From each display, you can send the data of the program currently being edited on the S90 ES panel as Bulk Dump data.

Voice	[VOICE] → Voice selection → [JOB] → [F4] BULK
Performance	[PERFORM] → Performance selection → [JOB] → [F4] BULK
Multi	[MULTI/SEQ PLAY] (select Multi mode) → Multi selection → [JOB] → [F4] BULK
Master	[MASTER] → Master selection → [JOB] → [F4] BULK

● Sending other data as Bulk Dump data

The data of Voice, Performance, Multi, Master, and System settings can be transmitted to an external MIDI instrument or computer upon reception of a bulk request message. For details about the bulk request message and bulk dump format, see the separate Data List.

📝 **NOTE** User Arpeggio data and some of the System settings are not handled as Bulk data.

● Using the Voice Editor and Multi Part Editor

Voice and Plug-in Voice data can be transmitted to a computer for editing with the Voice Editor software (page 79). The edited Voice on the instrument itself data can then be transmitted back to the instrument in banks as bulk data. Similarly, Voice data created in the Voice Edit mode can be sent to the computer in banks as bulk data.
Multi data can also be transmitted to a computer for editing, using the Multi Part Editor software (page 79). The edited Multi data can then be transmitted back to the instrument as bulk data. Multi data created in the Multi Edit mode on the instrument itself can also be sent to the computer in banks as bulk data.

Reference

Voice mode

Voice Play mode	[VOICE] → Voice selection

The Voice Play mode lets you perform a variety of general editing operations on the selected voice. For more detailed and comprehensive editing operations, use the Voice Edit mode. With few exceptions, you can store all parameter settings to internal memory as User Voices.

[NOTE] In the Voice Play mode and Voice Edit mode, you can set the parameters for each Voice. The parameters for all the Voices such as Master EQ and Master Effect can be set from the [UTILITY] → [F3] VOICE display in the Utility mode.

[NOTE] The parameters that have the same name in the Voice Play mode and in the Voice Edit mode have the same functions and settings.

[NOTE] When a Plug-in voice is selected, certain parameters are not available for editing, even if they're described here.

[F1] PLAY	
TCH (Transmit Channel)	Indicates the Keyboard MIDI transmit channel. You can change the Keyboard MIDI transmit channel by pressing the [TRACK SELECT] button so that its indicator lights and pressing any of the NUMBER [1] - [16] buttons. The Keyboard MIDI transmit channel can be changed also with the following operation: [UTILITY] → [F5] MIDI → [SF1] CH → KBDTransCh.
OCT (Octave)	Indicates the Keyboard Octave setting. This can be changed also with the following operation: [UTILITY] → [F1] GENERAL → [SF2] KBD → Octave.
ASA (ASSIGN A), **ASB (ASSIGN B)**	Indicates the functions assigned to the respective Control sliders (printed "ASSIGN A" and "ASSIGN B") when the lamps of both the [PAN/SEND] and [TONE] buttons are turned on. The functions are assigned with the following operation: [UTILITY] → [F4] CTL ASN → [SF2] ASSIGN.
[NOTE] TCH (Transmit Channel), OCT (Octave), ASA (ASSIGN A), and ASB (ASSIGN B) settings do not belong to each Voice. Because of this, these are not stored as an individual Voice in the Voice Store mode (page 46).	
AS1 (ASSIGN 1), **AS2 (ASSIGN 2)**	Indicates the functions assigned to the respective Control sliders (printed "ASSIGN 1" and "ASSIGN 2") when the lamps of both the [PAN/SEND] and [TONE] buttons are turned on. The functions are assigned by setting the Voice Edit common parameters with the following operation: [VOICE] → [EDIT] → [COMMON] → [F4] CTL SET.
[SF1] ARP1 (Arpeggio 1) - **[SF5] ARP5 (Arpeggio 5)**	You can register the desired Arpeggio types to these buttons and call them up any time during your keyboard performance. Refer to page 39 in the Quick Guide section.

[F2] BANK

This display is available only when a Plug-in Board has been installed and a Voice of the Plug-in Board is selected.
From this display you can select the particular bank on the Plug-in board, and determine whether you will be using a Plug-in Voice or a "Board" Voice. Board Voices are unprocessed, unaltered Voices of the Plug-in board—the "raw material" for Plug-in Voices. Plug-in Voices are edited Board Voices—Voices that have been specially programmed and processed for optimum use with this synthesizer. For more details, see page 101.

Settings: The following selections are available, for example, when a Plug-in Voice using the Plug-in board installed to slot 1 is selected: PLG1USR (User Plug-in Voice), PLGPRE1 (Preset Plug-in Voice), 032/000 ... (Indicates the Bank Select MSB/LSB of the Board Voice. These values differ depending on the installed Plug-in board.)

[F3] EFFECT

Pressing the [F3] EFFECT button in the Voice Play mode calls up the same EFFECT display in the Voice Edit mode ([VOICE] → [EDIT] → [COMMON] → [F6] EFFECT). From this display, you can set the effect related parameters for the current Voice. See page 133.

[F4] PORTA (Portamento)

From this display you can select monophonic or polyphonic playback and set the Portamento parameters.
Portamento is used to create a smooth transition in pitch from the first note played on the keyboard to the next.

Mono/Poly	Determines whether the Voice is played back monophonically (single notes only) or polyphonically (multiple simultaneous notes). **Settings:** mono, poly **[NOTE]** When pressing the second note while holding the first note with the PortaSw set to on and the Mono/Poly set to on, the second note sound starts succeeding the transition of the first note, or the second note starts not from the EG (AEG/PEG/FEG) start point but from the EG (AEG/PEG/FEG) point the first note reaches. This realizes the legato performance. This legato degree can be set with the following operation: [VOICE] → [EDIT] → [COMMON] → [F1] GENERAL → [SF4] PORTA → LegatoSlope (page 129).
PortaSw (Portamento Switch)	Determines whether Portamento is applied to the current Voice or not. **Settings:** off, on
PortaTime (Portamento Time)	Determines the pitch transition time. Higher values result in longer transition times. **Settings:** 0 ~ 127
PortaMode (Portamento Mode)	Determines the Portamento mode. The behavior of the Portamento varies depending on whether Mono/Poly is set to "mono" or "poly." **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.

[F5] EG (Envelope Generator)

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 Voice Edit mode.
The full names of the available parameters are shown in the chart below, as they appear in the display.

	ATK	DCY	SUS	REL	DEPTH	CUTOFF	RESO
AEG	Attack time	Decay time	Sustain level	Release time	---	---	---
FEG	Attack time	Decay time	---	Release time	Depth	Cutoff frequency	Resonance

Settings: -64 ~ 0 ~ +63 (except --- above)

[F6] ARP (Arpeggio)

This display contains the basic settings for Arpeggio playback, including Type and Tempo. About the [SF1] - [SF5] buttons, see the explanation of the [F1] PLAY display.

Bank, Ctgr (Category), Type	These three parameters determine the Arpeggio Type. The three-letter prefix number before the Type name indicates the number within the selected Category. **Settings:** Refer to the separate Data List.
Tempo	Determines the Arpeggio Tempo. When MIDI Sync ([UTILITY] → [F5] MIDI → [SF3] SYNC → MIDI Sync) is set to "MIDI," "MIDI" is displayed here and cannot be set. **Settings:** 1 ~ 300
VelLimit (Velocity Limit)	Determines the lowest and highest velocity which can trigger the Arpeggio playback. The Arpeggio plays when you play notes at velocities within in this range. **Settings:** 1 ~ 127 **NOTE** Keys played outside the set limit sound normally without any Arpeggio.
Switch	Determines whether Arpeggio is on or off. You can also turn Arpeggio on/off from the front panel with the [ARPEGGIO] button. **Settings:** off, on
Hold	Determines whether the Arpeggio playback is "held" or not. 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. **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. 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.

Voice Edit mode   [VOICE] → Voice selection → [EDIT]

There are three kinds of Voices: Normal Voices, Drum Voices and Plug-in Voices (if a Plug-in board has been installed). The following section shows how to edit the different types of voices and explains the parameters available. Note that available parameters to be edited differ depending on the Voice types (Normal Voice, Drum Voice, Plug-in Voice).

Normal Voice Edit

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] → Normal Voice selection → [EDIT] → [COMMON]

These parameters are for making global (or common) edits to all four Elements of the selected Normal Voice.

[F1] GENERAL

[SF1] NAME	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 a voice, see "Basic Operation" on page 27.
[SF2] PLY MODE (Play mode)	From this display you can make various settings for the tone generator of this synthesizer, and assign different Micro Tuning settings.
Mono/Poly	Determines whether the Voice is played back monophonically (single notes only) or polyphonically multiple simultaneous notes). **Settings:** mono, poly
KeyAsgnMode (Key Assign Mode)	When this is set to "single," double playback of the same note is prevented. This is useful when two or more instances of the same note are received nearly simultaneously, or without a corresponding note off message. 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. Normally, this should be set to 00 (Equal temperament); however additional tuning systems are available for a variety of tuning applications and effects. **Settings:** See the Micro Tuning List on page 147.
M.TuningRoot (Micro Tuning Root)	Determines the root note of the Micro Tuning set above. **Settings:** C ~ B

Voice mode

Performance mode

Multi mode

Multi Voice mode

Sequence Play mode

Utility mode

File mode

Master mode

Reference

[SF3] MEQ OFS (Master EQ Offset)		From this display you can adjust 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] → [F3] VOICE → [SF1] MEQ. You can use the Control sliders to edit these parameters when the [EQ] button is turned on. **Settings:** -64 ~ 0 ~ +63
[SF4] PORTA (Portamento)		This display allows you to set the Portamento related parameters. Portamento is used to create a smooth transition in pitch from the first note played on the keyboard to the next.
	Switch	Determines whether Portamento is applied to your keyboard performance using the current Voice or not. **Settings:** off, on
	Time	Determines the pitch transition time. Higher values result in a longer pitch change time, when Time Mode below is set to "Time." **Settings:** 0 ~ 127
	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.
	TimeMode	This determines how the pitch changes in time. **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 a octave. time2................ Pitch changes in the specified time within a octave.
	LegatoSlope	Determines the speed of the attack of legato notes, when 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
[SF5] OTHER		From this display you can set the control functions for the Control sliders, and determine the up/down range for the Pitch Bend wheel.
	CSAssign (Control slider Assign)	Determines the function for the assignable Control sliders (1-4). Pressing the Control function button on the panel sets the desired function row, which is automatically stored to memory with the currently selected voice. **Settings:** pan, tone, assign, MEQofs, MEF, arpFx, vol
	PB Upper (Pitch Bend range Upper), PB Lower (Pitch Bend range Lower)	Sets the amount (in semitones) by which the pitch of the note is varied when you move the Pitch bend wheel up/down. 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 ~ 24
	AssignA, AssignB, Assign1, Assign2	This parameter offsets the value of each Dest (Destination) parameter. Please note that certain Destinations of Assign A/B change the absolute value.
[F2] OUTPUT		
	Volume	Determines the output level of the Voice. **Settings:** 0 ~ 127
	Pan	Determines the stereo pan position of the Voice. You can also adjust this parameter using the Control slider when the [PAN/SEND] button is turned on. **Settings:** L63 (Left) ~ C (Center) ~ R63 (Right) ■NOTE When a stereo Voice is selected, this parameter setting may not be effective. Voices with Elements set to opposite Pan settings (set in [F4] AMP → [SF1] LVL/PAN → Pan) — i.e., one at L63 and another at R63 — are considered stereo Voices.
	RevSend	Determines the Send level of the signal sent from Insertion Effect A/B (or the bypassed signal) to the Reverb/Chorus effect. You can also adjust these parameters using the Control sliders when the [PAN/SEND] button is turned on.
	ChoSend	**Settings:** 0 ~ 127
	■NOTE See page 121 for the Effect connection in the Voice mode.	
[F3] ARP (Arpeggio)		
[SF1] TYPE		The basic Arpeggio parameters (e.g., type, tempo) are provided in this display.
	Bank, Ctgr (Category), Type	These three parameters determine the Arpeggio Type. The three-letter prefix number before the Type name indicates the number within the selected Category. **Settings:** Refer to the separate Data List.
	Tempo	Determines the Arpeggio Tempo. When MIDI Sync ([UTILITY] → [F5] MIDI → [SF3] SYNC → MIDI Sync) is set to "MIDI," "MIDI" is displayed here and Tempo cannot be set. **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.

Voice mode

Performance mode

Multi mode

Multi Voice mode

Sequence Play mode

Utility mode

File mode

Master mode

Reference

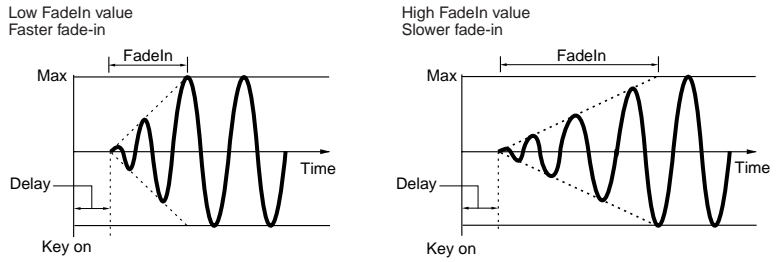|	
Switch	Determines whether Arpeggio is on or off. You can also turn Arpeggio on/off from the front panel with the [ARPEGGIO] button. **Settings:** off, on
Hold	Determines whether the Arpeggio playback is "held" or not. When this is set to "on," the Arpeggio cycles automatically, even if you release your fingers from the keys, and it continues to cycle until the next key is pressed. **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. 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	Determines how the Arpeggio plays back when playing the keyboard. **Settings:** sort, thru, direct, sortdirect, thrudirect 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 "Ctrl" is selected. sortdirect ....The Arpeggio is played back according to the "sort" setting here, and the note pressed is also sounded. thrudirect ....The Arpeggio is played back according to the "thru" setting here, and the note pressed is also sounded. ▶**NOTE** Some Arpeggio types belonging to the "Cntr" Category may not have note events (page 170). When such an Arpeggio type is selected and the KeyMode is set to "sort" or "thru," no sound is produced even if you press the note on the keyboard. ▶**NOTE** 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 included in the Arpeggio sequence data. 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.
[SF2] LIMIT	
NoteLimit	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** You can also create a lower and an upper trigger range for the Arpeggio, with a note range "hole" in the middle, by specifying the highest note first. 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. ▶**NOTE** You can also set the range directly from the keyboard, by holding down the [INFORMATION] button and pressing the desired low and high keys. ▶**NOTE** Please keep in mind that no sound is produced when the KeyMode is set to "sort" or "thru" and notes are played outside the Note Limit setting here.
VelocityLimit	Determines the lowest and highest velocity in the Arpeggio's velocity range. This lets you control when the Arpeggio sounds by your playing strength. **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.
[SF3] PLAY FX	These Play Effect parameters let you control the playback of the Arpeggio in useful and interesting ways. By changing the timing and velocity of the notes, you can change the rhythmic "feel" of the Arpeggio.
UnitMultiply (Unit Multiply)	Adjust the Arpeggio playback time. For example, if you set a value of 200%, the playback time will be doubled (tempo is halved). On the other hand, if you set a value of 50%, the playback time will be halved (tempo is doubled). Normal playback time is 100%. **Settings:** 50%, 66%, 75%, 100%, 133%, 150%, 200%
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:** 32nd note ♪ 8th note triplet ♪♫ 1/4 note ♩ 16th note triplet ♪♫ 8th note ♪ 16th note ♪ 1/4 note triplet ♩♫
QuntStrength (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%
VelocityRate	Determines how much the Velocity of the Arpeggio playback is offset from the original value. For example, 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.

GateTimeRate	Determines how much the Gate Time (length) of the Arpeggio notes is offset from the original value. 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.

[F4] CTL SET (Controller Set)

[SF1] SET1/2 - [SF3] SET5/6	Since up to six Controller Sets can be assigned to each Voice, three pages (Sets 1/2, Sets 3/4 and Sets 5/6) are provided. For more information on Controller Sets, see page 60.
ElementSw	Determines whether or not the selected controller affects each individual Element.
	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.
Source	Determines which panel 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 (After Touch), FC1 (Foot Controller 1), FS (Footswitch), RB (Ribbon Controller), BC (Breath Controller), AS1 (Control slider ASSIGN 1), AS2 (Control slider ASSIGN 2), FC2 (Foot Controller2)
	NOTE Keep in mind that unlike the other controllers, the ASSIGN A and B Control slider 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 refer to the Utility mode (page 165).
Dest (Destination)	Determines the parameter that is controlled by the Source controller (above).
	Settings: For a complete list of the available parameters/controls, refer to the separate Data List booklet.
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

[F5] LFO (Low Frequency Oscillator)

From these displays, you can make a variety of LFO related settings. As its name suggests, the LFO creates waveforms of a low frequency. These waveforms can be used to vary the pitch, filter or amplitude to create effects such as vibrato, wah and tremolo.

[SF1] WAVE	
Wave	Determines the LFO Wave.
	Settings: tri, tri+, sawup, sawdwn, squ1/4, squ1/3, squ, squ2/3, squ3/4, trpzp, S/H 1, S/H 2, user
Speed	Determines the speed of the LFO Wave modulation. Higher values result in faster modulation speeds.
	Settings: 0 ~ 63
TempoSync	Determines whether or not the LFO is synchronized to the tempo of the Arpeggio or Sequence Play mode.
	Settings: off (not synchronized), on (synchronized)
TempoSpeed	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 or sequencer.
	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.
KeyOnReset	Determines whether or not the LFO is reset each time a note is pressed. The following three settings are available.
	Settings: off, each-on, 1st-on
	off.....................The LFO cycles freely with no key synchronization. Pressing a key starts the LFO wave at whatever phase the LFO happens to be at that point.
	each-on ....The LFO resets with each note you play 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.
RandomSpeed	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

Voice mode
Performance mode
Multi mode
Multi Voice mode
Sequence Play mode
Utility mode
File mode
Master mode

Reference

[SF2] DELAY		
	Delay (Delay Time)	Determines the delay time before the LFO comes into effect. A higher value results in a longer delay time. **Settings:** 0 ~ 127
	FadeIn (Fade In Time)	Determines the amount of time for the LFO effect to fade in (after the Delay time has elapsed). A higher value results in a slower fade-in. **Settings:** 0 ~ 127
	Hold (Hold Time)	Determines the length of time during which the LFO is held at its maximum level. A higher value results in a longer Hold time. **Settings:** 0 ~ 127
	FadeOut	Determines the amount of time for the LFO effect to fade out (after the Delay time has elapsed). A higher value results in a slower fade-out. **Settings:** 0 ~ 127
[SF3] PHASE		
	Phase	Determines the value for the particular step selected in the Step parameter below. **Settings:** 0, 90, 120, 180, 240, 270
	Offset EL1 - EL4 (Phase Offset Element1 - Element4)	Determines the offset values of the Phase parameter (above) for the respective Elements. **Settings:** +0, +90, +120, +180, +240, +270
[SF4] BOX1 - 3		From this display you can select the destination parameter for the LFO (which aspect of the sound the LFO controls), the Elements to be affected by the LFO, and the LFO Depth. Three pages (boxes) provided for setting the destination let you assign multiple destinations.
	ElemSw (Element Switch)	Determines whether or not each Element is to be affected by the LFO. The Element number (1- 4) is shown when the LFO is enabled; a dash (-) indicates the LFO is disabled for that Element.
	Dest (Destination)	Determines the parameters which are to be controlled (modulated) by the LFO Wave. **Settings:** amd, pmd, fmd, reso (Resonance), pan, ELFOSpd (Element LFO Speed)
	Depth	Determines the LFO Wave Depth. **Settings:** 0 ~ 127
	DptRatio EL1 - EL4 (Depth Offset Element1 - Element4)	Determines the offset values of the Depth parameter (above) for the respective Elements. **Settings:** 0 ~ 127
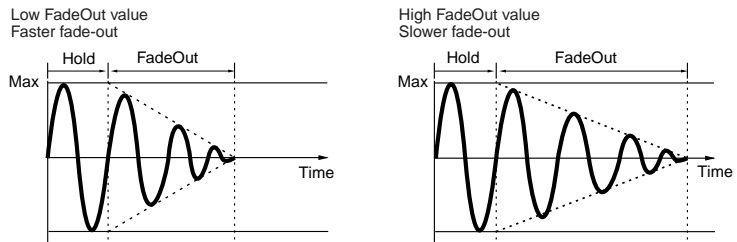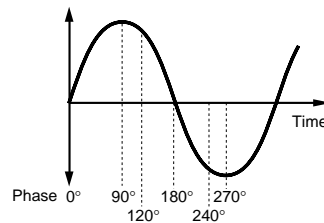
Voice mode
Performance mode
Multi mode
Multi Voice mode
Sequence Play mode
Utility mode
File mode
Master mode

Reference

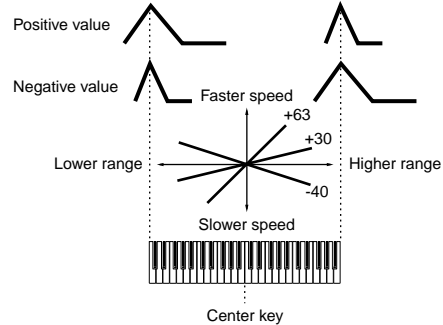| [SF5] USER	This menu is available only when the User LFO wave is selected. You can create a custom LFO wave consisting of up to sixteen steps.
Template	You can select a pre-programmed template for the LFO wave. The selected template's wave graph appears on the display and you can create the LFO wave by viewing it. Each time pressing the [SF1] random button, different LFO wave is appears on the display randomly. **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.
Slope	Determines the slope or ramp characteristics of the LFO wave. **Settings:** OFF (no slope), up, down, up&down
Value	Determines the value for the particular step selected in the Step parameter below. **Settings:** 0 ~ 127
Step	Numerator: Selects the desired step. **Settings:** 1-16 Denominator: Determines the maximum number of steps. **Settings:** 2, 3, 4, 6, 8, 12, 16

[F6] EFFECT

NOTE For details on the Effect connections in the Voice mode, see page 121. For details on the Effect Types, refer to the Effect Type list in the separate Data List booklet.

[SF1] CONNECT	This display gives you comprehensive control over the effects. For details on the parameters, see page 121.
[SF2] INS A (Insertion A)	These are for adjusting the various parameters of the Effect blocks. The number of parameters and values available differs depending on the currently selected effect type. For more information, see the Effect Type List in the separate Data List booklet. Note that the menu of the corresponding Effect block disappears when the "thru" type is selected.
[SF3] INS B (Insertion A)	
[SF4] REVERB	
[SF5] CHORUS	

Element Edit	[VOICE] → Normal Voice selection → [EDIT] → Element selection

These parameters are for editing the individual Elements that make up a Normal Voice.

[F1] OSC (Oscillator)

[SF1] WAVE	From this display you can select the desired waveform or sound used for the Element.
ElementSw (Element Switch)	Determines whether the currently selected Element is on or off. **Settings:** off (inactive), on (active)
Wave No. (Waveform Number), WaveCtgry (Waveform Category)	Determines the Waveform for the selected Element. See the Waveform list in the separate Data List.
[SF2] OUTPUT	From this display you can set certain output parameters for the selected Element.
KeyOnDelay	Determines the time (delay) between the moment you press a note on the keyboard and the point at which the sound is played. You can set different delay times for each Element. **Settings:** 0 ~ 127
DelayTempoSync	Determines whether or not the KeyOnDelay is synchronized to the tempo of the Arpeggio or Sequence Play mode. **Settings:** off (not synchronized), on (synchronized)
DelayTempo	Determines the timing of the KeyOnDelay when the DelayTempoSync 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)
InsEffectOut (Insertion 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. (This parameter is the same as "EL: OUT" on the [F6] EFFECT → [SF1] CONNECT display in Normal Common Edit. Making a setting here automatically changes the setting of that parameter as well.) **Settings:** thru, insA (Insertion Effect A), insB (Insertion Effect B)

Voice mode

Performance mode

Multi mode

Multi Voice mode

Sequence Play mode

Utility mode

File mode

Master mode

Reference

[SF3] LIMIT

NoteLimit

Determines the lowest and highest notes of the keyboard range for each Element. The selected Element will sound only when you play notes within this range.

Settings: C -2 ~ G8

> **NOTE** You can also create a lower and an upper range for the Element, with a note range "hole" in the middle, by specifying the highest note first. For example, setting a Note Limit of "C5 - C4" lets you play the Element from two separate ranges: C -2 to C4 and C5 to G8. Notes played between C4 and C5 do not play the selected Element.

> **NOTE** You can also set the range directly from the keyboard, by holding down the [INFORMATION] button and pressing the desired low and high keys.

VelocityLimit

Determines 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** You can also create separate low and high ranges for the Element, 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 Element 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 selected Element.

VelCrossFade (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 practical application of this parameter is to create natural-sounding velocity crossfades, in which different Elements change gradually depending on how strongly or softly you play. The higher the value, the more gradual the level change.

Settings: 0 ~ 127

[F2] PITCH

[SF1] TUNE

From this display you can set various pitch-related parameters for the selected Element.

Coarse

Determines the pitch of each Element in semitones.

Settings: -48 ~ 0 ~ +48

Fine

Determines the fine tuning for the pitch of each Element.

Settings: -64 ~ 0 ~ +63

FineScaling

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. Negative values will have the opposite effect.

Settings: -64 ~ 0 ~+63

Random

This lets you randomly vary the pitch of the Element for each note you play. This is effective in reproducing the natural pitch variations in acoustic instruments. It is also useful for creating unusual random pitch changes. The higher the value, the greater the pitch variation. A value of "0" results in no pitch change.

Settings: 0 ~127

[SF2] VEL SENS (Velocity Sensitivity)

From this display you can determine how the Pitch EG responds to velocity.

EGTime, Segment

Determines the velocity sensitivity of the PEG's Time parameters. Select the Segment first, then set its Time parameter. Positive Time settings will play back the specified Segment faster in proportion to the played velocity and negative values will play it back slower.

Settings: EGTime: -64 ~0 ~+63
Settings: Segment: atk, atk+dcy, dcy, atk+rls, all
atk (attack)..............................EG Time Value affects Attack time.
atk+dcy (attack + decay)......EG Time Value affects Attack/Decay1 time.
dcy (decay)............................EG Time Value affects Decay time.
atk+rls (attack + release).......EG Time Value affects Attack/Release time.
all ....EG Time Value affects all PEG Time parameters.

EGDepth, Curve

Determines the velocity sensitivity of the PEG Level. Positive settings will cause the pitch change to rise the harder you play the keyboard, and negative values will cause it to fall. The Curve parameter lets you select from five different preset velocity curves (graphically indicated in the display), that determine how velocity affects the Pitch EG Depth.

Settings: EGDepth: -64 ~ 0 ~ +63
Settings: Curve: 0 ~ 4

Pitch

Determines the velocity sensitivity of the Pitch. Extreme values produce greater variation in PEG Depth. For positive values, the harder you play the keys, the greater the change in PEG Depth. For negative values, the softer you play the keys, the greater the change in PEG Depth.

Settings: -64 ~ 0 ~ +63

[SF3] PEG (Pitch Envelope Generator)

From this display you can make all the time and level settings for the Pitch EG, which determine how the pitch of the sound changes over time. These can be used to control the change in pitch from the moment a note is pressed on the keyboard to the moment the sound stops.
The full names of the available parameters are shown in the chart below, as they appear in the display.

	HOLD	ATK	DCY1	DCY2	REL	DEPTH
TIME	Hold time	Attack time	Decay1 time	Decay2 time	Release time	
LEVEL	Hold level	Attack level	Decay1 level	Decay2 level	Release level	Depth

Settings: TIME: 0 ~ 127
LEVEL: -128 ~ 0 ~ +127
DEPTH: -64 ~ 0 ~ +63

> **NOTE** For details on the PEG, see page 112.

Voice mode
Performance mode
Multi mode
Multi Voice mode
Sequence Play mode
Utility mode
File mode
Master mode
Reference

[SF4] KEY FLW (Key Follow)	From this display you can set the Key Follow effect—in other words, how the pitch of the Element and its Pitch EG respond to the particular notes (or octave range) you play.
PitchSens (Pitch Sensitivity)	Determines the sensitivity of the Key Follow effect (the pitch interval of adjacent notes). 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.
► CenterKey	Determines the central note or pitch for the Key Follow effect on pitch. The note number set here is the same pitch as normal regardless of the Pitch Sensitivity setting. Depending on the Pitch Sensitivity parameter above, the further away from the Center Key the keys are played, the greater the degree of pitch change. **Settings:** C -2 ~ G8 **NOTE** You can also set the Center Key directly from the keyboard, by holding down the [INFORMATION] button and pressing the desired key.
EGTimeSens (EG Time Sensitivity)	Determines the degree to which the notes (specifically, their position or octave range) affect the Pitch EG times of the selected Element. The Center Key (next parameter) is used as the basic pitch for this parameter. A positive setting will cause the pitch of lower notes to change slower and that of higher notes to change faster. Negative values will have the opposite effect. **Settings:** -64 ~ 0 ~ +63
► CenterKey	Determines the central note or pitch for the Key Follow effect on Pitch EG. 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 EG Time settings. **Settings:** C -2 ~ G8 **NOTE** You can also set the Center Key directly from the keyboard, by holding down the [INFORMATION] button and pressing the desired key.

Pitch Sensitivity and Center Key

EG Time Sensitivity and Center Key

[F3] FILTER

[SF1] TYPE	From this display you can make comprehensive settings for the Filter unit. The available parameters differ depending on which Filter type is selected here.
Type	Basically, there are four different Filter types: an LPF (Low Pass Filter), an HPF (High Pass Filter), a BPF (Band Pass Filter) and a BEF (Band Elimination Filter). Each type has a different frequency response and produces a different effect on the sound. This synthesizer also features special combination Filter types, for additional sonic control. **Settings:** Refer to page 148.
Gain	Determines the Gain (the amount of boost applied to the signal sent to the Filter). **Settings:** 0 ~ 255
Cutoff	Determines the cutoff frequency for the Filter, or the central frequency around which the Filter is applied. **Settings:** 0 ~ 255
Resonance/Width	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 is used to set the Resonance. For the BPFw, it is used to adjust the Width of the band. Resonance is used to set the amount of Resonance (harmonic emphasis) applied to the signal at the cutoff frequency. This can be used in combination with the cutoff frequency parameter to add further character to the sound. The Width parameter is used to adjust the width of the band of signal frequencies passed by the filter with the BPFw. **Settings:** 0 ~ 127
Distance	Determines the distance between the Cutoff frequencies, for the Dual Filter types (which feature two identical filters combined in parallel, and the LPF12 + BPF6 type). **Settings:** 0 ~ 255
HPFCutoff	Determines the central frequency for the Key Follow parameter (below) of the HPF. When a filter type "LPF12" or "LPF6" is selected, this parameter is available. **Settings:** 0 ~ 255

Voice mode

Performance mode

Multi mode

Multi Voice mode

Sequence Play mode

Utility mode

File mode

Master mode

Reference

HPFKeyFlw (Key Follow)	Determines the Key Follow setting for the HPF Cutoff frequency. This parameter varies the center frequency according to the position of the notes played on the keyboard. 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. This parameter is available only when the filter type "LPF12" or "LPF6" is selected. **Settings:** -200 ~ 0 ~ +200
[SF2] VEL SENS (Velocity Sensitivity)	From this display you can determine how the Filter and the FEG respond to velocity.
EGTime, Segment	Determines the velocity sensitivity of the FEG's Time parameters. Select the Segment first, then set its Time parameter. Positive Time settings will play back the specified Segment faster in proportion to the played velocity and negative values will play it back slower. **Settings:** EG Time: -64 ~0 ~+63 **Settings:** Segment: atk, atk+dcy, dcy, atk+rls, all atk (attack) ....EG Time Value affects Attack time. atk+dcy (attack + decay) ......EG Time Value affects Attack/Decay1 time. dcy (decay)...........................EG Time Value affects Decay time. atk+rls (attack + release).......EG Time Value affects Attack/Release time. all ....EG Time Value affects all FEG Time parameters.
EGDepth, Curve	Determines the velocity sensitivity of the FEG Level. For positive settings, the more strongly you play the keyboard, the more Filter changes the sound. Negative settings do the opposite; the more softly you play, the more the sound changes. The Curve parameter lets you select from five different preset velocity curves (graphically indicated in the display), that determine how velocity affects the Filter EG. **Settings:** EGDepth: -64 ~ 0 ~ +63 **Settings:** Curve: 0 ~ 4
Cutoff	Determines the degree to which velocity affects the Cutoff frequency of the Filter EG. For positive values, the more strongly you play the keys, the greater the change in the Cutoff frequency. Negative values do the opposite; the more softly you play, the greater the change in frequency. **Settings:** -64 ~ 0 ~ +63
Resonance	Determines the degree to which velocity affects the Resonance of the Filter EG. For positive values, the more strongly you play the keys, the greater the Resonance change. Negative values do the opposite; the more softly you play, the greater the change in Resonance. **Settings:** -64 ~ 0 ~ +63
[SF3] FEG (Filter Envelope Generator)	From this display you can make 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 is pressed on the keyboard to the moment the sound stops. The full names of the available parameters are shown in the chart below, as they appear in the display.

	HOLD	**ATK**	**DCY1**	**DCY2**	**REL**	**DEPTH**
TIME	Hold time	Attack time	Decay1 time	Decay2 time	Release time	
LEVEL	Hold level	Attack level	Decay1 level	Decay2 level	Release level	Depth

Settings: TIME: 0 ~ 127
      LEVEL: -128 ~ 0 ~+127
      DEPTH: -64 ~ 0 ~+63
NOTE For details on the FEG, see page 113.

|	
[SF4] KEY FLW (Key Follow)	From this display you can set the Key Follow effect for the Filter—in other words, how the tonal qualities of the Element and its Filter EG respond to the particular notes (or octave range) you play.
CutoffSens (Cutoff Sensitivity)	Determines the degree to which the notes (specifically, their position or octave range) affect the Filter of the selected Element. A Center Key setting (next parameter) of C3 is used as the basic setting by the Cutoff parameter. 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
▶ **CenterKey**	This indicates that the central note for Cutoff Sensitivity above is C3. At C3, the tone remains unchanged. For other notes played, the Cutoff Frequency varies according to the particular note and the Cutoff Sensitivity setting. Keep in mind that this is for display purposes only; the value cannot be changed. **Settings:** C -2 ~ G8
EGTimeSens (EG Time 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 Center Key (next parameter). A positive setting will cause slower changes for lower notes and faster changes for higher notes. A negative setting will have the opposite effect. **Settings:** -64 ~ 0 ~ +63
▶ **CenterKey**	Determines the central note or pitch for the Key Follow effect on Filter EG. Depending on the EG Time Sensitivity parameter above, the further away from the Center Key the keys are played, the more the time of the Filter EG deviates from the normal. 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 EG Time settings. **Settings:** C -2 ~ G8 **NOTE** You can also set the Center Key directly from the keyboard, by holding down the [INFORMATION] button and pressing the desired key.

Voice mode

Performance mode

Multi mode

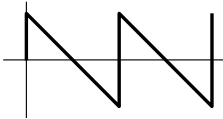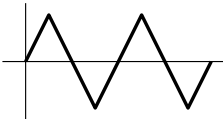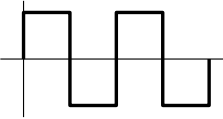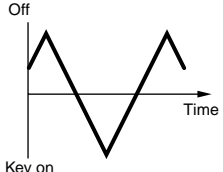Multi Voice mode

Sequence Play mode

Utility mode

File mode

Master mode

Reference

Cutoff Sensitivity and Center Key

When Cutoff Sensitivity is set to 100

Large

Amount of cutoff frequency change

Small

Lower range ← Center key → Higher range

EG Time Sensitivity and Center Key

Positive value

Negative value

Faster speed

+63
+30

Lower range

Higher range

-40

Slower speed

Center key

[SF5] SCALE (Filter Scaling)	Filter Scaling controls the filter cutoff frequency according to the positions of the notes on the keyboard. 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 page 147.
	Settings: BREAK POINT 1 ~ 4: C-2 ~ G8 OFFSET 1 ~ 4: 128 ~ 0 ~ +127
	NOTE You can also set the Break Point directly from the Keyboard, by holding down the [INFORMATION] button and pressing the desired key.

[F4] AMP (Amplitude)

[SF1] LVL/PAN (Level/Pan)	This display not only lets you make basic Level and Pan settings for each individual Element, it also gives you some detailed and unusual parameters for affecting Pan position.
Level	Determines the output level for the selected Element. **Settings:** 0 ~ 127
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 (Left) ~ C (Center) ~ R63 (Right)
AlternatePan	Determines the amount by which the sound of the selected Element is panned alternately left and right for each note you press. The Pan setting (above) is used as the basic Pan position. **Settings:** L64 ~ 0 ~ R63
RandomPan	Determines the amount by which the sound of the selected Element is panned randomly left and right for each note you press. The Pan setting is used as the Center Pan position. **Settings:** 0 ~ 127
ScalingPan	Determines the degree to which the notes (specifically, their position or octave range) affect the Pan position, left and right, of the selected Element. At note C3, the main Pan setting (above) is used for the basic Pan position. **Settings:** -64 ~ 0 ~ +63
[SF2] VEL SENS (Velocity Sensitivity)	From this display you can determine how the Amplitude (volume) EG responds to velocity.
EG Time, Segment	Determines the velocity sensitivity of the AEG's Time parameters. Select the Segment first, then set its Time parameter. Positive Time settings will play back the specified Segment faster in proportion to the played velocity and negative values will play it back slower. **Settings:** EG Time: -64 ~0 ~+63 **Settings:** Segment: atk, atk+dcy, dcy, atk+rls, all atk (attack) .... EG Time Value affects Attack time. atk+dcy (attack + decay)...... EG Time Value affects Attack/Decay1 time. dcy (decay) .... EG Time Value affects Decay time. atk+rls (attack + release) ...... EG Time Value affects Attack/Release time. all .... EG Time Value affects all AEG Time parameters.
Level, Curve	Determines the velocity sensitivity of the Amplitude EG Level. For positive settings, the more strongly you play the keyboard, the more the volume changes. Negative settings do the opposite; the more softly you play, the more the volume changes. The Curve parameter lets you select from five different preset velocity curves (graphically indicated in the display), that determine how velocity affects the Amplitude EG. **Settings:** Level: 64 ~ 0 ~ +63 Curve: 0 ~ 4

Voice mode

Performance mode

Multi mode

Multi Voice mode

Sequence Play mode

Utility mode

File mode

Master mode

Reference

[SF3] AEG (Amplitude Envelope Generator)

From this display you can make 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 pressed on the keyboard to the moment the sound stops.
The full names of the available parameters are shown in the chart below, as they appear in the display.

	INIT	ATK	DCY1	DCY2	REL	SUS
TIME	---	Attack time	Decay1 time	Decay2 time	Release time	Sustain time
LVL/SW	Initial level	Attack level	Decay1 level	Decay2 level	---	Half damper switch

When the Half Damper switch is turned on, you can use the Half Damper function with an optional Foot Controller FC3 connected to the FOOT SWITCH SUSTAIN jack.
Unlike a conventional damper pedal control which simply turns sustain on and off, the Half Damper function lets you finely control the amount of sustain and natural decay—just as with a real acoustic piano—by using a continuous pedal controller.

NOTE Please note that the SusPedal parameter (below) must be set to "FC3 (Half On)."
[UTILITY] → [F4] CTL ASN → [SF3] FT SW → SusPedal → FC3 (Half On)
However, if you are controlling the Half Damper function by Control Change messages from an external MIDI device, it is not necessary to change the SusPedal parameter.

Settings: TIME: 0 ~ 127
LVL/SW (Level/Switch): 0 ~ 127 or on/off

NOTE For details on the AEG, see page 114.

[SF4] KEY FLW (Key Follow)

From this display you can set the Key Follow effect for Amplitude—in other words, how the volume of the Element and its Amplitude EG respond to the particular notes (or octave range) you play.

LevelSens (Level Sensitivity)

Determines the degree to which the notes (specifically, their position or octave range) affect the volume of the selected Element. A Center Key setting of C3 is used as the basic setting.
A positive setting will lower the output level for lower notes and raise it for higher notes. A negative setting will have the opposite effect.

Settings: -200 ~ 0 ~+200

► CenterKey

This indicates that the central note for Level Sensitivity above is C3. At C3, the volume (level) remains unchanged. For other notes played, the volume varies according to the particular note and the Level Sensitivity setting. Keep in mind that this is for display purposes only; the value cannot be changed.

EGTimeSens (EG Time Sensitivity)

Determines the degree to which the notes (specifically, their position or octave range) affect the Amplitude EG times of the selected Element. The 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. Negative values will have the opposite effect.

Settings: -64 ~ 0 ~ +63

► CenterKey

Determines the central note or pitch for the Key Follow effect on Amplitude EG. Depending on the EG Time Sensitivity parameter above, the further away from the Center Key the keys are played, the more the time of the Amplitude EG deviates from the norm.
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 EGTime settings.

Settings: C -2 ~ G8

NOTE You can also set the Center Key directly from the keyboard, by holding down the [INFORMATION] button and pressing the desired key.

Level Sensitivity and Center Key
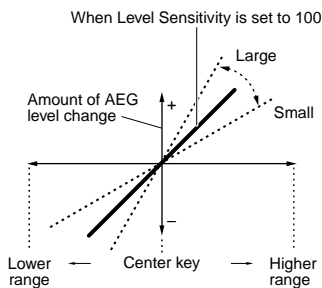
EG Time Sensitivity and Center Key
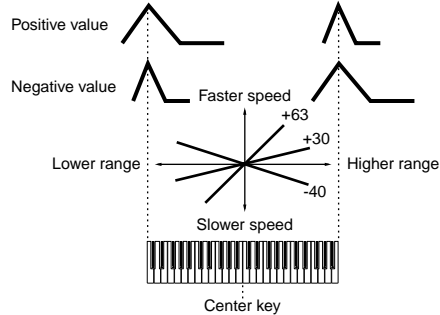
[SF5] SCALE (Amplitude Scaling)

Amplitude Scaling controls the output level (set in the [F4] AMP → [SF1] LVL /PAN display) according to the positions of the notes on the keyboard. You can divide the entire keyboard by four break points, and assign different offset values of amplitude to them respectively. Refer to the setting example on page 147.

Settings: BREAK POINT 1 ~ 4: C-2 ~ G8
Settings: OFFSET 1 ~ 4: -128 ~ 0 ~ +127

NOTE You can also set the Break Point directly from the Keyboard, by holding down the [INFORMATION] button and pressing the desired key.
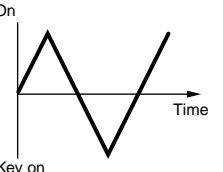
[F5] LFO (Low Frequency Oscillator)

This display gives you a comprehensive set of controls over the LFO for each individual Element. The LFO can be used to create vibrato, wah, tremolo and other special effects, by applying it to the pitch, filter and amplitude parameters.

Wave	Determines the LFO waveform used to vary the sound. Settings: saw, tri, squ saw (sawtooth wave) tri (triangle wave) squ (square wave)
Speed	Determines the speed of the LFO waveform. The higher the value, the faster the speed. Settings: 0 ~ 63
KeyOnReset	Determines whether or not the LFO is reset each time a note is played. Settings: off, on Off On Time Time Key on Key on
KeyOnDelay	Determines the delay time between the moment you play a note on the keyboard and the moment the LFO comes into effect. A higher value results in a longer delay time. Settings: 0 ~ 127
PMod (Pitch Modulation Depth)	Determines the amount (depth) by which the LFO waveform varies (modulates) the pitch of the sound. The higher the value, the greater the amount of pitch modulation. Settings: 0 ~ 127
FMod (Filter Modulation Depth)	Determines the amount (depth) by which the LFO waveform varies (modulates) the Filter Cutoff frequency. The higher the value, the greater the amount of filter modulation. Settings: 0 ~ 127
AMod (Amplitude Modulation Depth)	Determines the amount (depth) by which the LFO waveform varies (modulates) the amplitude or volume of the sound. The higher the value, the greater the amount of amplitude modulation. Settings: 0 ~ 127
FadeInTime	Determines the amount of time for the LFO effect to fade in (after the KeyOnDelay time has elapsed). A higher value results in a slower fade-in. Settings: 0 ~ 127

[F6] EQ (Equalizer)

Type	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. Settings: EQ L/H, P.EQ, boost6, boost12, boost18, thru EQ L/H (Low/High) .... This is a "shelving" equalizer, which combines separate high and low frequency bands. 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. 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. thru .... If you select this, the equalizers are bypassed and the entire signal is unaffected.

When set to EQ L/H

Gain

Low Freq
Settings: 50.1Hz – 2.00kHz

High Freq
Setttings: 503.8Hz – 10.1kHz

+

0

Frequency

–

Low Gain
Settings: -32 – 0 – +32

High Gain
Settings: -32 – 0 – +32

When set to P.EQ

+

0

–

Gain

Q (Frequency characteristic)
Settings: 0 – 31

Frequency

Gain
Settings: -32 – 0 – +32

Freq
Settings: 139.7Hz – 12.9kHz

Voice mode / Performance mode / Multi mode / Multi Voice mode / Sequence Play mode / Utility mode / File mode / Master mode / Reference

Drum Voice Edit

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	[VOICE] → Drum Voice selection → [EDIT] → [COMMON]

These parameters are for making global (or common) edits to all keys of the selected Drum Voice.

[F1] GENERAL	
[SF1] NAME	Same as in Normal Voice Common Edit. See page 128.
[SF3] MEQ OFS (Master EQ Offset)	
[SF5] OTHER	

[F2] OUTPUT	

Same as in Normal Voice Common Edit. See page 129. 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 A/B 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 A/B to the Chorus effect. **Settings:** 0 ~ 127

NOTE The parameters cannot be set indepently for each Drum key.
NOTE For Normal Voices, the values are fixed at 127 (maximum).

[F3] ARP (Arpeggio)	
[SF1] TYPE	Same as in Normal Voice Common Edit. See page 129.
[SF2] LIMIT	
[SF3] PLAY FX	

[F4] CTL SET (Controller Set)	

Same as in Normal Voice Common Edit. See page 131.
Please note that the Element Switch parameter is not available in Drum Voice Common edit.

[F6] EFFECT	

Same as in Normal Voice Common Edit. See page 133.
The only difference here is that "KEY: OUT" appears in the [SF1] CONNECT display instead of "EL: OUT" (in Normal Common Effect).

Key Edit	[VOICE] → Drum Voice selection → [EDIT] → Key selection

These parameters are for editing the individual keys that make up a Drum Voice.

[F1] OSC (Oscillator)	
[SF1] WAVE	From this display you can select the desired wave or Normal voice used for the individual Drum key.
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:** pre wav (Preset wave), voice **NOTE** When the Type is set to "voice" here, some parameters in the Drum Voice Edit mode cannot be edited.
ElementSw (Element Switch)	This parameter is available when Type (above) is set to "pre wav." 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	This parameter is available when Type (above) is set to "voice." Any of the Normal voice banks can be selected. **NOTE** Plug-in voices cannot be selected for Drum keys.
Number	Determines the Wave/Voice number. The number differs depending on the selected Type. For details about available Waves and Voices, refer to the separate Data List booklet. **Settings:** When Type is set to "pre wav": 001 ~ 1935 When Type is set to "voice": 001 ~ 128
Category	Determines the Category of the Wave/Normal Voice. If you switch to another Category, the first Wave/Normal Voice in that Category will be selected. **NOTE** For more information about the Categories, refer to the separate Data List booklet.

[SF2] OUTPUT	From this display you can set certain output parameters for the selected Drum key.
InsEFOut (Insertion Effect Output)	Determines which Insertion effect (A or B) is used to process each individual Drum key. The "thru" setting lets you bypass the Insertion effects for the specific key. **Settings:** thru, insA (Insertion Effect A), insB (Insertion Effect B)
RevSend (Reverb Send)	Determines the level of the Drum key sound (the bypassed signal) that is sent to Reverb effect. A setting of "0" results in no Reverb processing of the Drum key sound. This is available only when Insertion Effect Output (above) is set to "thru." **Settings:** 0 ~ 127
ChoSend (Chorus Send)	Determines the level of the Drum key sound (the bypassed signal) that is sent to Chorus effect. A setting of "0" results in no Chorus processing of the Drum key sound. This is available only when Insertion Effect Output (above) is set to "thru." **Settings:** 0 ~ 127
OutputSel (Output Select)	Determines the specific output(s) for the individual Drum key signal. 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 Insertion Effect Output (above) is set to "thru." **Settings:** See page 49.

[SF5] OTHER	From this display you can set various parameters related to how the individual notes of the Drum voice respond to the keyboard and MIDI data.
AssignMode	When this is set to "single," double playback of the same note is prevented. This is useful when two or more instances of the same note are received nearly simultaneously, or without a corresponding note off message. To allow playback of each instance of the same note, set this to "multi." **Settings:** single, multi
RcvNoteOff (Receive Note Off)	Determines whether or not the selected Drum key responds to MIDI Note Off messages. **Settings:** off, on **NOTE** This parameter is only available if the Type parameter ([F1] OSC → [SF1] WAVE display) is set to "pre wav."
AlternateGroup	Set the Alternate Group to which the key 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 keys 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 Type parameter ([F1] OSC → [SF1] WAVE display) is set to "pre wav."

[F2] PITCH

[SF1] TUNE	From this display you can set various pitch-related parameters for the selected key.
Coarse	Determines the pitch of each Drum Key Wave (or Normal Voice) in semitones. **Settings:** -48 ~ +48 **NOTE** If a Normal voice has been assigned to the key, this parameter adjusts the position of its note (not its pitch) relative to note C3.
Fine	Determines the fine tuning for the pitch of each Drum Key Wave (or Normal Voice). **Settings:** -64 ~ +63
[SF2] VEL SENS (Velocity Sensitivity)	This parameter is only available if the Type parameter ([F1] OSC → [SF1] WAVE display) is set to "pre wav."
Pitch	Determines how the pitch of the selected Drum key responds to velocity. For positive values, the more strongly you play the key, the higher the pitch becomes. For negative values, the more strongly you play the key, the lower the pitch. **Settings:** -64 ~ +63

[F3] FILTER

[SF1] CUTOFF	This synthesizer lets you apply a low pass filter and high pass filter to each individual Drum key — giving you exceptionally detailed and comprehensive sonic control over the Drum voice. **Settings:** This parameter is available when the Type is set to "pre wav" in the [F1] OSC → [SF1] WAVE display.
LPFCutoff	Determines the Cutoff frequency of the Low Pass Filter. **Settings:** 0 ~ 255
LPFReso	Determines the amount of Resonance (harmonic emphasis) applied to the signal at the Cutoff frequency. **Settings:** 0 ~ 127
HPFCutoff	Determines the Cutoff frequency of the High Pass Filter. **Settings:** 0 ~ 255
[SF2] VEL SENS (Velocity Sensitivity)	This parameter is only available if the Type parameter ([F1] OSC → [SF1] WAVE display) is set to "pre wav."
LPFCutoff	Determines the velocity sensitivity of the Low Pass Filter Cutoff frequency. For positive settings, the more strongly you play the keyboard, the higher the cutoff frequency becomes. For negative settings, the more strongly you play, the lower the cutoff frequency. **Settings:** -64 ~ 0 ~ +63

Voice mode

Performance mode

Multi mode

Multi Voice mode

Sequence Play mode

Utility mode

File mode

Master mode

Reference

[F4] AMP (Amplitude)	
[SF1] LVL/PAN (Level/Pan)	This display not only lets you make basic Level and Pan settings for the sound of each individual Drum key, it also gives you some detailed and unusual parameters for affecting Pan position.
Level	Determines the output for the selected Drum key (Wave). This lets you make detailed balance adjustments among the various sounds of the Drum voice. **Settings:** 0 ~ 127
Pan	Determines the stereo Pan position for the selected Drum key (Wave). This will also be used as the basic Pan position for the Alternate and Random settings. **Settings:** L63 (Left) ~ C (Center) ~ R63 (Right)
AlternatePan	Determines the amount by which the sound of the selected Drum key is panned alternately left and right for each note you press. The Pan setting (above) is used as the basic Pan position. **Settings:** L64 ~ 0 ~ R63 **NOTE** This parameter is available when the Type is set to "pre wav" in the [F1] OSC → [SF1] WAVE display.
RandomPan	Determines the amount by which the sound of the selected Drum key is panned randomly left and right for each note you press. The Pan setting (above) is used as the Center Pan position. **Settings:** 0 ~ 127 **NOTE** This parameter is available when the Type is set to "pre wav" in the [F1] OSC → [SF1] WAVE display.
[SF2] VEL SENS (Velocity Sensitivity)	
Level	Determines the velocity sensitivity of the Amplitude Envelope Generator's output level. Positive settings will cause the output level to rise the harder you play the keyboard and, conversely, negative values will cause it to fall. **Settings:** -64 ~ 0 ~ +63
[SF3] AEG (Amplitude Envelope Generator)	
AttackTime	**Settings:** 0 ~ 127
Decay1Time	**Settings:** 0 ~ 127
Decay1Lvl (Level)	**Settings:** 0 ~ 127
Decay2Time	**Settings:** 0 ~ 126, hold **Decay2Time=0 - 126**　　　　　**Decay2Time=hold**
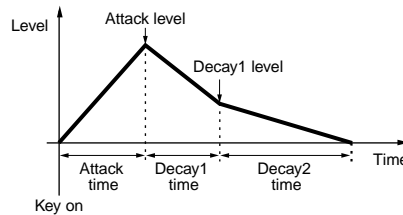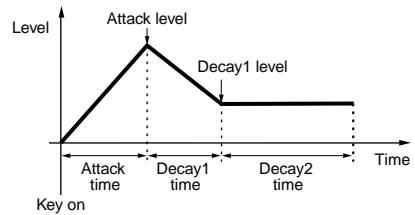
[F6] EQ (Equalizer)
Same as in Normal Voice Element Edit. See page 139. **NOTE** This parameter is available when the Type is set to "pre wav" in the [F1] OSC → [SF1] WAVE display.

Voice mode

Performance mode

Multi mode

Multi Voice mode

Sequence Play mode

Utility mode

File mode

Master mode

Reference

Plug-in Voice Edit

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. For details, refer to the relevant owner's manual of the Plug-in board.

◢NOTE For details on the current lineup of available Plug-in boards, see page page 99.

Common Edit	[VOICE] → Plug-in Voice selection → [EDIT] → [COMMON]

[F1] GENERAL	
[SF1] NAME	Same as in Normal Voice Common Edit. See page 128.
[SF2] PLY MODE (Play mode)	Same as in Normal Voice Common Edit. See page 128. Please note that Micro Tuning is not available in Plug-in Voice Common Edit.
[SF3] MEQ OFS (Master EQ Offset)	Same as in Normal Voice Common Edit. See page 129.
[SF4] PORTA (Portamento)	Same as in Normal Voice Common Edit. See page 129. Please note that Portamento Mode, Time Mode and Legato Slope are not available in Plug-in Voice Common Edit.
[SF5] OTHER	Same as in Normal Voice Common Edit. See page 129. Unlike with Normal Voice Edit, the Upper and Lower ranges cannot be independently set here.

[F2] OUTPUT
Same as in Normal Voice Common Edit. See page 129.

[F3] ARP (Arpeggio)	
[SF1] TYPE	Same as in Normal Voice Common Edit. See page 131.
[SF2] LIMIT	
[SF3] PLAY FX	

[F4] CTL SET (Controller Set)	
[SF1] SET1/2	Same as in Normal Voice Common Edit. See page 131. Please note that Element Switch is not available in Plug-in Voice Common Edit.
[SF2] MW (Modulation Wheel)	From this display you can set how the Plug-in Voice responds to the Modulation wheel, by changing the control depth for the filter, pitch and amplitude (volume).
Filter	Determines the depth of control of the Modulation Wheel over the filter cutoff frequency. Negative settings result in reversed Modulation wheel operation (i.e., moving the wheel up results in less modulation). **Settings:** -64 ~ 0 ~ +63
PMod (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
FMod (Filter Modulation Depth)	Determines the depth of control the Modulation Wheel has over filter cutoff modulation. The higher the setting, the greater the depth of control. **Settings:** 0 ~ 127
AMod (Amplitude Modulation Depth)	Determines the depth of control the Modulation Wheel has over amplitude modulation. The higher the setting, the greater the depth of control. **Settings:** 0 ~ 127
[SF3] AT (After Touch)	This synthesizer gives you a comprehensive set of after touch controls for the Plug-in voice, allowing you to change the pitch and filter settings, and produce modulation effects (pitch, filter and amplitude) — simply by pressing down hard on the keys.
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
Filter	Determines the depth of control of keyboard aftertouch over the filter cutoff frequency. **Settings:** -64 ~ 0 ~ +63
PMod (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
FMod (Filter Modulation Depth)	Determines the depth of control that keyboard aftertouch has over filter cutoff modulation. The higher the setting, the greater the depth of control. **Settings:** 0 ~ 127

Side tab labels: Voice mode · Performance mode · Multi mode · Multi Voice mode · Sequence Play mode · Utility mode · File mode · Master mode · Reference

	AMod (Amplitude Modulation Depth)	Determines the depth of control that keyboard aftertouch has over amplitude modulation. The higher the setting, the greater the depth of control. **Settings:** 0 ~ 127
[SF4] AC (Assignable Control)		From this display you can assign MIDI Control Change numbers (as Src) and determine the degree to which the assigned controllers affect the filter and the modulation effects (pitch, filter and amplitude).
	Src (Source)	Determines the MIDI Control Change number used to control the filter, PMod, FMod, and AMod. **Settings:** 0 ~ 95
	Filter	Determines the depth of control the Control Change numbers (set in the Src parameter above) have over the filter cutoff frequency. **Settings:** -64 ~ 0 ~ +63
	PMod (Pitch Modulation Depth)	Determines the depth of control the Control Change messages (set in the Src parameter above) have over pitch modulation. The larger the setting, the greater the depth of control. **Settings:** 0 ~ 127
	FMod (Filter Modulation Depth)	Determines the depth of control the Control Change messages (set in the Src parameter above) have over filter cutoff modulation. The larger the setting, the greater the depth of control. **Settings:** 0 ~ 127
	AMod (Amplitude Modulation Depth)	Determines the depth of control the Control Change messages (set in the Src parameter above) have over amplitude modulation. The larger the setting, the greater the depth of control. **Settings:** 0 ~ 127

[F6] EFFECT

Same as in Normal Voice Common Edit. See page 133.
Please note that the EL: OUT settings are not available in the [SF1] CONNECT display and the parallel setting (Insertion Connection) is not available in the [SF1] CONNECT display.

Element Edit	[VOICE] → Plug-in Voice selection → [EDIT] → Element selection

[F1] OSC (Oscillator)

[SF1] WAVE		From this display you can select the desired Board Voice used for the Element of the Plug-in voice. Keep in mind that a Plug-in voice only has one Element.
	Bank	Determines the Board Voice Bank. **Settings:** These depend on the particular Plug-in board; refer to the relevant owner's manual for details.
	Number	Determines the Board Voice Number. **Settings:** These depend on the particular Plug-in board; refer to the relevant owner's manual for details.
[SF5] OTHER		
	VelocityDepth	Determines the velocity sensitivity of the Plug-in Voice. For higher values, the harder you play the keyboard, the louder the Voice becomes. **Settings:** 0 ~ 127
	VelocityOffset	This lets you specify an offset value for Velocity Depth (above). 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	Determines the transpose setting for the Plug-in voice, or the amount (in semitones) by which the pitch is raised or lowered. The pitch range is two octaves, up or down. **Settings:** -24 ~ 0 ~ +24

[F2] PITCH

From this display you can make various time and level settings for the Pitch EG, which determine how the pitch of the Plug-in Voice changes over time. The full names of the available parameters are shown in the chart below, as they appear in the display.

	INIT	ATK	DCY1	DCY2	REL	DEPTH
TIME	---	Attack time	---	---	Release time	
LEVEL	Initial level	---	---	---	Release level	---
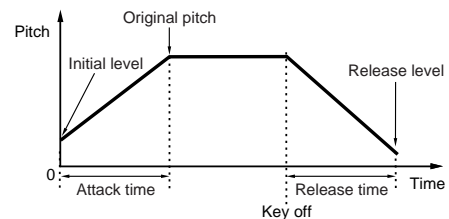
[F3] FILTER

	HPFCutoff (High Pass Filter Cutoff frequency)	Determines the Cutoff frequency for the High Pass Filter. **Settings:** -64 ~ 0 ~ +63

[F4] NATIVE

With a Plug-in board installed to this synthesizer, you can create a Plug-in Voice by editing both native parameters (those parameters exclusive to the particular board) and unique parameters (related specifically to this synthesizer).
Pressing [F4] gives you access to the native parameters of the Plug-in board. 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.

[F5] LFO (Low Frequency Oscillator)

From this display you can set the basic LFO parameters for modulating the pitch to create vibrato and other special effects.

Speed	Determines the speed of the LFO waveform. Positive settings increase the speed and negative settings decrease it. **Settings:** -64 ~ 0 ~ +63
Delay	Determines the delay time between the moment you press note on the keyboard and the moment the LFO comes into effect. Positive settings lengthen the delay and negative settings shorten it. **Settings:** -64 ~ 0 ~ +63
PMod (Pitch Modulation Depth)	Determines the amount by which the LFO waveform controls the pitch. Positive settings increase the amount and negative settings decrease it. **Settings:** -64 ~ 0 ~ +63

[F6] 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 on the EQ, see page 119.
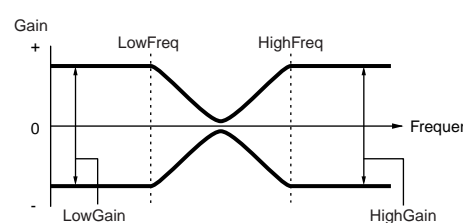
LowFreq (Low Frequency)	Determines the shelving point for the low frequencies. The levels of signals below this frequency will be boosted/attenuated by the amount set in the LowGain parameter. **Settings:** 32Hz ~ 2.0kHz
LowGain (Low Gain)	Determines the amount by which signals below the LowFreq frequency will be boosted/attenuated. **Settings:** -64 ~ 0 ~ +63
HighFreq (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 ~ 16.0kHz
HighGain (High Gain)	Determines the amount by which signals above the HighFreq frequency will be boosted/attenuated. **Settings:** -64 ~ 0 ~ +63

Voice mode

Performance mode

Multi mode

Multi Voice mode

Sequence Play mode

Utility mode

File mode

Master mode

Reference

Voice Job mode [VOICE] → Voice selection → [JOB]

The Voice Job mode features several basic operations, such as Initialize and Copy. After setting parameters as required from the selected display, press the [ENTER] button to execute the Job.

[F1] INIT (Initialize)

This function lets you reset (initialize) all Voice parameters to their default settings. It also allows you to selectively initialize certain parameters, such as Common settings, settings for each Element/Drum key, and so on—very useful when creating a completely new voice from scratch.

Type of parameter to be initialized	All: All data in the Common Edit and Element (Key) Edit modes Common: Data in the Common Edit mode EL (1-4): Data of the corresponding Element Edit parameters If "without Wave" is checked, the waves assigned to the Elements (Keys) will not be initialized. **NOTE** In order to select "Common," "EL," or "without Wave," the "ALL" box must be unchecked. **NOTE** If you turn the check mark on when a Drum Voice is selected, you can select a specific Drum Key.

[F2] RECALL (Edit Recall)

If you are editing a Voice and select a different Voice without storing your edited one, all the edits you've made will be erased. If this happens, you can use Edit Recall to restore the Voice with your latest edits intact.

[F3] COPY

Source Voice

Destination Voice (Current Voice)
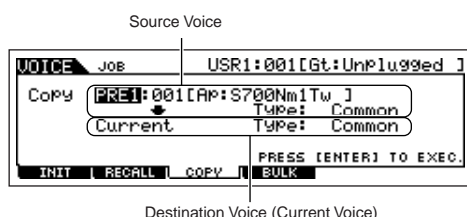
From this display you can copy Common and Element/Drum Key parameter settings from any Voice to the Voice you are editing. This is useful if you are creating a Voice and wish to use some parameter settings from another Voice.

Data type to be copied (Type)
Common: Data in the Common Edit mode
Element (1-4): Data of the corresponding Element Edit parameters
Key C0-C6: Data of the corresponding Key Edit parameters

Copy procedure
1. Select the Source Voice.
   When "Current" is selected in the Source Voice, the Source Voice will be same as the Destination Voice. If you wish to copy one Element to another Element in the same Voice, select "Current."
2. Select the Destination Voice (Current Voice).
   If the Source Voice type (Normal/Drum/Plug-in) differs from that of the Voice you are currently editing (destination), you will only be able to copy the Common parameters.
3. When "Element" or "Key" is selected in the Source Voice, select the Part/Key to be copied in the Destination Voice.
4. Press the [ENTER] button.

[F4] BULK (Bulk Dump)

This function lets you send all your edited parameter settings for the currently selected Voice to a computer or another MIDI instrument for data archiving. For details, see page 126.
NOTE In order to execute Bulk Dump, you'll need to set the correct MIDI Device Number, with the following operation: [UTILITY] → [F5] MIDI → [SF1] CH → DeviceNo.

Voice Store mode [VOICE] → Voice selection → [STORE]

This function lets you store your edited voice to User memory.
For details, refer to page 50 in the Quick Guide section.

■ Supplementary information

Micro Tuning List

[VOICE] → [EDIT] → [COMMON] → [F1] GENERAL → [SF2] PLY MODE → M.TuningNo./M.TuningRoot (page 128)

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 pitch relationships. 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 Werckmeiser, 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. (Octaves are 24 notes apart.)
08	**1/8 tone**	--	Forty-eight equally spaced notes per octave. (Octaves are 48 notes apart.)
09	**Indian**	--	Designed for use Indian music (white keys only).
10	**Arabic 1**	C ~ B	Designed for use Arabic music.
11	**Arabic 2**		
12	**Arabic 3**		

Setting example of Filter Scaling

[VOICE] → [EDIT] → Element selection → [F3] FILTER → [SF5] SCALE (page 137)

The best way to understand Filter Scaling is by example. For the settings shown in the example display below, the basic Cutoff frequency value is 64, and the various Offset values at the selected Break point settings change that basic value accordingly. The specific changes to the Cutoff frequency are shown in the diagram below. The Cutoff frequency changes in a linear fashion between successive Break Points as shown.

Setting example of Amplitude Scaling

[VOICE] → [EDIT] → Element selection → [F4] AMP → [SF5] SCALE (page 138)

The best way to understand Amplitude Scaling is by example. For the settings shown in the example display above, the basic Amplitude (volume) value for the selected Element is 80, and the various Offset values at the selected Break point settings change that basic value accordingly. The specific changes to the Amplitude are shown in the diagram below. The Amplitude changes in a linear fashion between successive Break Points as shown.

Voice mode

Performance mode

Multi mode

Multi Voice mode

Sequence Play mode

Reference

Utility mode

File mode

Master mode

Filter Type List

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.
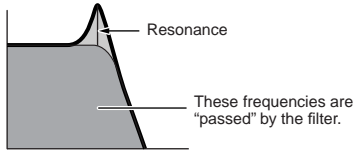
LPF24A (24dB/oct Analog Low Pass Filter)
A digital dynamic low-pass filter with characteristics similar to a 4-pole analog synth filter.
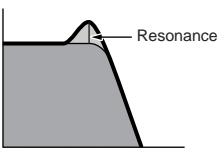
LPF18 (18dB/oct Low Pass Filter)
3-pole 18dB/oct low-pass filter.

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.
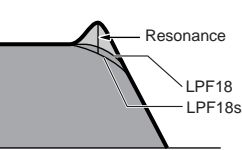
LPF12 (12dB/oct Low Pass Filter)
12dB/oct low-pass filter. This filter is designed to be used in conjunction with a high-pass filter.
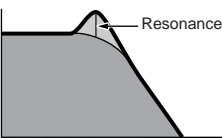
LPF6 (6dB/oct low-pass Filter)
1-pole 6dB/oct low-pass filter. No resonance. This filter is designed to be used in conjunction with a high-pass filter.
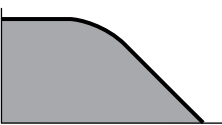
HPF24D (24dB/oct Digital High Pass Filter)
A dynamic 24dB/oct high-pass filter with a characteristic digital sound. This filter can produce a pronounced resonance effect.
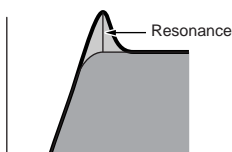
HPF12 (12dB/oct High Pass Filter)
12dB/oct dynamic high-pass filter.
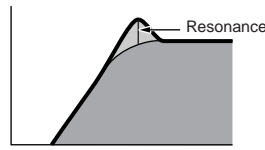
BPF12D (12dB/oct Digital Band Pass Filter)
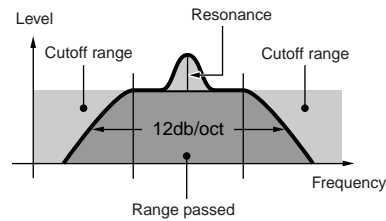
BPFw (Wide Band Pass Filter)
A 12dB/oct BPF that combines HPF and LPF filters to allow wider bandwidth settings.
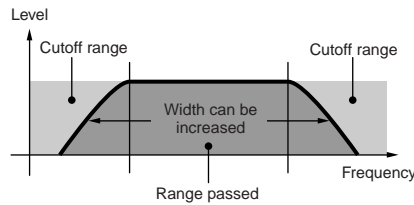
BPF6 (6dB/oct Band Pass Filter)
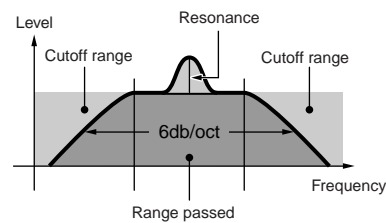
BEF12 (12dB/oct Band Elimination Filter)
BEF6 (6dB/oct Band Elimination Filter)
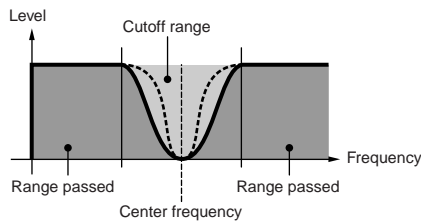
Dual LPF (Dual Low Pass Filter)
Two 12dB/oct low-pass filters connected in parallel.
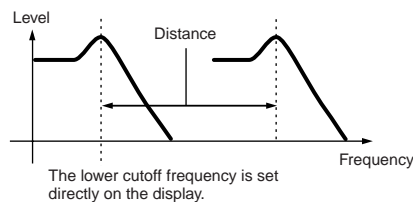
Dual HPF (Dual High Pass Filter)
Two 12dB/oct high-pass filters connected in parallel.
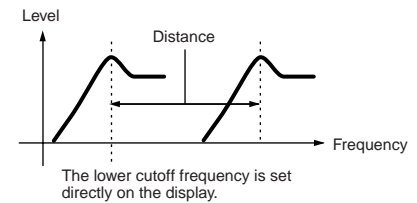
Dual BPF (Dual Band Pass Filter)
Two 6dB/oct band-pass filters connected in parallel.
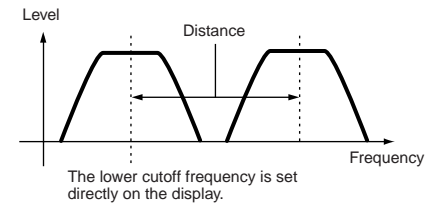
Dual BEF (Dual Band Elimination Filter)
Two 6dB/oct band-elimination filters connected in serial.
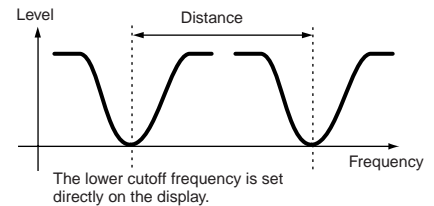
LPF12 + BPF6 (12dB/oct Low Pass Filter + 6dB/oct Band Pass Filter)
A combined low-pass and high-pass filter.
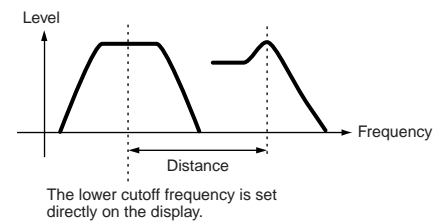
thru
The filters are bypassed and the entire signal is unaffected.

Performance mode

<table>
<tr>
<td>Performance Play mode</td>
<td>[PERFORM] → Performance selection</td>
</tr>
</table>

The Performance Play mode lets you perform a variety of general editing operations on the selected Performance. For more detailed and comprehensive editing operations, use the Performance Edit mode.

ⓝNOTE The parameters that have the same name in the Performance Play mode and in the Performance Edit mode have the same functions and settings.

[F1] PLAY

TCH (Transmit Channel)	Same as in Voice Play mode.
OCT (Octave)	These parameters are available both in the Voice mode and the Performance mode regardless of the selected Voice or Performance.
ASA (ASSIGN A), ASB (ASSIGN B)	

ⓝNOTE TCH (Transmit Channel), OCT (Octave), ASA (ASSIGN A), and ASB (ASSIGN B) settings do not belong to each Performance. Because of this, these are not stored as an individual Performance in the Performance Store mode (page 156).

AS1 (ASSIGN 1), AS2 (ASSIGN 2)	Indicates the values obtained by controlling the respective Control sliders (printed "ASSIGN 1" and "ASSIGN 2") when the lamps of both the [PAN/SEND] and [TONE] buttons are turned on. The functions assigned to these sliders depend on the setting of the Voice assigned to each Part of the Performance.
[SF1] ARP1 (Arpeggio 1) - [SF5] ARP5 (Arpeggio 5)	You can register the desired Arpeggio types to these buttons and call them up any time during your keyboard performance. Refer to page 39 in the Quick Guide section.

[F2] VOICE

From this display you can select a Voice for each Part and determine the note range it can be played from.

[SF1] ADD INT (Add Internal Voice)	Press this button to assign an internal Voice to the selected Part.
[SF2] ADD PLG (Add Plug-in Voice)	Press this button to assign a Plug-in Voice to the selected Part.
[SF3] DELETE	Pressing this button deletes the Voice assignment for the selected Part, leaving the Part blank.
[SF4] LIMIT L (Note Limit Low)	This sets the lowest note of the range over which the Voice of the selected Part sounds. Simultaneously hold down this button and press the desired key on the keyboard to set the note.
[SF5] LIMIT H (Note Limit High)	This sets the highest note of the range over which the Voice of the selected Part sounds. Simultaneously hold down this button and press the desired key on the keyboard to set the note.

[F3] EFFECT

Pressing the [F3] EFFECT button in the Performance Play mode calls up the same EFFECT display in the Performance Edit mode ([PERFORM] → [EDIT] → [COMMON] → [F6] EFFECT). From this display, you can set the effect related parameters for the current Performance. See page 122.

[F4] PORTA (Portamento)

From this display you can set the Portamento parameters. Portamento is used to create a smooth transition in pitch from the first note played on the keyboard to the next.

PortaSw (Portamento Switch)	Determines whether Portamento is on or off for all Parts. (This is a global switch and overrides the individual Part settings in Part Switch below.) **Settings:** off, on
PortaTime (Portamento Time)	Determines the pitch transition time. This parameter offsets the same parameter in Part Edit (page 152). Higher values result in longer transition times. **Settings:** -64 ~ 0 ~ +63
PartSwitch	Determines whether Portamento is on or off for each individual Part. This is available only when the PortaSw (above) is set to on.

[F5] EG (Envelope Generator)

This display contains the basic EG settings, both volume and filter, for the Performance, 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 Performance Edit mode (pages 154, 155).
The parameters are same as in Voice Play mode. See page 128.

[F6] ARP (Arpeggio)

This display contains the basic settings for Arpeggio playback, including Type and Tempo. Note that the Performance mode lets you independently enable or disable Arpeggio playback for each Part.
The parameters are same as in the Voice Play mode (page 128) except for the following one.

PartSw	Determines whether Arpeggio is on or off for the selected Part. The Parts for which boxes are checkmarked are enabled for Arpeggio play.

Voice mode

Performance mode

Multi mode

Multi Voice mode

Sequence Play mode

Utility mode

File mode

Master mode

Reference

Performance Edit mode   [PERFORM] → Performance selection → [EDIT]

Voice Edit parameters are divided into Common Edit (parameters common to all four Parts), and Part Edit (parameters of individual Parts).

Common Edit	[PERFORM] → Performance selection → [EDIT] → [COMMON]

[F1] GENERAL

[SF1] NAME	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 a Performance, see "Basic Operation" on page 128.
[SF3] MEQ OFS (Master EQ Offset)	Determines the offset values of the Master EQ in the [F2] OUT/MEF → [SF2] MEQ display. The level of each of the four bands (with the exception of "MID") can be adjusted. When the [EQ] button is turned on, you can also adjust these settings directly from the Control sliders.
[SF4] PORTA (Portamento)	This display allows you to set the Portamento related parameters. The parameters are the same as in the Performance Play mode. See page 129.
[SF5] OTHER	From this display you can set the control functions for the Control sliders and related parameters. With the exception of Pitch Bend, which cannot be set here, these parameters are the same as in the Voice Edit mode (page 129).

[F2] OUT/MEF (Output/Master Effect)

[SF1] OUT (Output)		
	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	Determines the stereo pan position of the selected Performance. This parameter offsets the same parameter in the Part Edit setting. When the [PAN/SEND] button is turned on, you can also adjust this parameter using the Control slider. **Settings:** L63 (Left) ~ C (Center) ~ R63 (Right) **DNOTE** A setting of "C" (center) maintains the individual Pan settings of each Part.
	RevSend (Reverb send)	Determines the Send level of the signal sent from Insertion Effect A/B (or the bypassed signal) to the Reverb effect. When the [PAN/SEND] button is turned on, you can also adjust this parameter using the Control slider. **Settings:** 0 ~ 127
	ChoSend (Chorus send)	Determines the Send level of the signal sent from Insertion Effect A/B (or the bypassed signal) to the Chorus effect. When the [PAN/SEND] button is turned on, you can also adjust this parameter using the Control slider. **Settings:** 0 ~127
	DNOTE For details on Effect connections in the Performance mode, see page 122.	
[SF2] MEQ (Master EQ)		From this display you can apply five-band equalization to all Parts of the selected Performance. You can raise or lower the signal level at the Frequency of each band (LOW, LOWMID, MID, HIGHMID, HIGH).
	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)
	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: 500Hz ~ 16.0kHz
	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
	Q (Frequency Characteristic)	This varies the signal level at the Frequency setting to create various frequency curve characteristics. **Settings:** 0.1 ~ 12.0
	DNOTE For details on the EQ, see page 119.	
[SF3] MEF (Master Effect)		From this display you can set the Master Effect related parameters.
	Switch	Determines whether Master Effect is applied or not to the selected Performance. **Settings:** off, on
	Type	Determines the Master effect type. **Settings:** Refer to the Effect Types list in the separate Data List booklet.
	DNOTE The available parameters except for the above two differ depending on the currently selected effect type. For more information, refer to the separate Data List booklet.	

[F3] ARP (Arpeggio)

From this display you can set the Arpeggio related parameters.

[SF1] TYPE	Same as in Normal Voice Common Edit. See page 129.
[SF2] LIMIT	
[SF3] PLAY FX (Play Effect)	
[SF4] OUT CH (Output Channel)	From this display you can set a separate MIDI output channel for the Arpeggio playback data, letting you have the Arpeggio sound from an external tone generator or synthesizer.
OutputSwitch	When this is set to on, Arpeggio playback data is output via MIDI. **Settings:** on, off
TransmitCh	Determines the MIDI transmit channel for Arpeggio playback data. When set to "KbdCh," the Arpeggio playback data is output via the MIDI Keyboard Transmit Channel ([UTILITY] → [F5] MIDI → KBDTransCh). **Settings:** 1 ~ 16, KbdCh (Keyboard Channel)

[F4] CTL ASN (Controller Assign)

You can assign Control Change numbers to the controllers listed below, letting you use the hardware controllers on the keyboard to alter the sound of external MIDI devices, via the appropriate MIDI messages. When the S90 ES receives Control Change data corresponding to the settings here, the internal tone generator responds as if the instrument's controllers were used.

BC (Breath Controller)	Determines the Control Change number generated when you apply breath pressure to the Breath Controller connected to the BREATH connector.
RB (Ribbon Controller)	The S90 ES does not have a Ribbon Controller. However, the S90 ES responds as if a Ribbon Controller was used when receiving Control Change messages over the Control Change number determined in this parameter.
AS1 (Assign 1), AS2 (Assign 2)	Determines the Control Change number generated when you control the Control slider 3 and the Control slider 4 with both the [PAN/SEND] and [TONE] lamp turned on.
FC1 (Foot Controller 1), FC2 (Foot Controller 2)	Determines the Control Change number generated when you use the Foot Controller connected to the FOOT CONTROLLER jack.

NOTE   Keep in mind that the functions of these controllers set here are not changed for the internal tone generator. The controller assignments for the S90 ES itself depend on the settings of the Voices assigned to each Part.

[F5] AUDIO IN

The audio signal input from the A/D INPUT jack, and mLAN connector (when the optional mLAN16E has been installed to this synthesizer), can be handled as Audio Input Parts. You can apply various parameters such as Effect settings to these Parts, just as with the other Parts.

NOTE   For details about the Audio Input Parts, see page 118.

[SF1] OUTPUT	
Volume	Determines the output level of the Audio Input Part. **Settings:** 0 ~ 127
Pan	Determines the stereo pan position of the Audio Input Part. **Settings:** L63 (Left) ~ C (Center) ~ R63 (Right)
RevSend	Determines the Send level of the Audio Input Part signal sent to the Reverb effect. **Settings:** 0 ~ 127
ChoSend	Determines the Send level of the Audio Input Part signal sent to the Chorus effect. **Settings:** 0 ~ 127
DryLevel	Determines the level of the Audio Input Part which has not been processed with the System Effects (Reverb, Chorus). **Settings:** 0 ~ 127

NOTE   For details about Effect connection in the Performance mode, see page 122.

Mono/Stereo	Determines the signal configuration for the Audio Input Part, or how the signal or signals are routed (stereo or mono). **Settings:** stereo, L mono, R mono, L+R mono stereo...............Both the L and R channels of the audio input are used. L (left) mono ....Only the L channel of the audio input is used. R (right) mono .Only the R channel of the audio input is used. L+R mono........The L and R channels of the audio input are mixed and processed in mono.
OutputSel (Output Select)	Determines the output jack assignment for the Audio Input Part. **Settings:** See page 63.

Voice mode

Performance mode

Multi mode

Multi Voice mode

Sequence Play mode

Utility mode

File mode

Master mode

Reference

[SF2] INS TYPE (Insertion Type)	This display is available only when the AD (A/D Part) is set to on from the [F6] EFFECT → [SF2] INS SW display. The type and connection of the Insertion Effect applied to the A/D Part can be set from this display.
InsEF Connect (Insertion Effect Connection)	Same as in the CONNECT display in the Voice Edit mode ([VOICE] → [EDIT] → [COMMON] → [F6] EFFECT → [SF1] CONNECT). Please note that the InsEF Connect cannot be set to "parallel" here.
InsA Ctgry (Insertion A Category) InsA Type (Insertion A Type)	**DNOTE** When selecting the effect types in this display, [SF3] INS A and [SF4] INS B are displayed and you can set the effect parameters.
InsB Ctgry (Insertion B Category) InsB Type (Insertion B Type)	

DNOTE Insertion effects can be applied only to the A/D Part, among the Audio Input Parts.

[F6] EFFECT

This menu gives you comprehensive control over the effects. For details about the Effect connections in the Performance mode, see page 122.

[SF1] CONNECT (Connection)	For details on the parameters, see page 122.
[SF2] INS SW (Insertion Switch)	The Insertion Effects can be applied to up to eight Parts. This display lets you set to which Parts the Insertion Effects are applied.
[SF3] PLG-EF (Plug-in Effect)	This display lets you set the Plug-in Insertion Effect related parameters when the Effect Plug-in Board PLG100-VH has been installed to this synthesizer. For details on each parameter, refer to the Owner's Manual included with the PLG100-VH.
[SF4] REVERB	The number of parameters and values available differs depending on the currently selected effect type. For more information, see the Effect Type List in the separate Data List booklet.
[SF5] CHORUS	

Part Edit | [PERFORM] → Performance selection → [EDIT] → Part selection
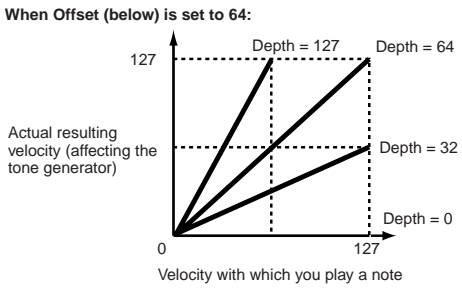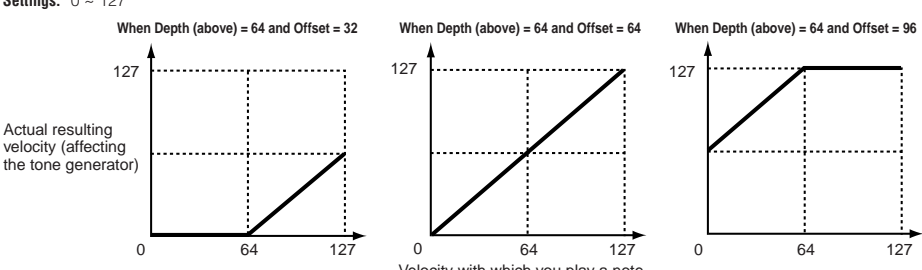
These parameters are for editing the individual Parts that make up a Performance.
To switch between the display for Parts 1 - 4 to which the internal Voices are assigned and the display for Plug-in Parts (PLG1 - 3) to which the Plug-in Voices are assigned, press the [F6] button.

DNOTE When a Plug-in Voice is assigned to a Part of the selected Performance, some parameters may not be available depending on the installed Plug-in board.

[F1] VOICE

[SF1] VOICE	
PartSw (Part Switch)	Determines whether each Part is 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 - 3. **Settings:** on, off
Bank	Determines the Voice Bank (page 30) for each Part. For details about the Plug-in Voice Bank, refer to the Owner's Manual included with your Plug-in Board.
Number	Determines the Voice Program number for each Part. For details about the Plug-in Voice Program number, refer to the Owner's Manual included with your Plug-in Board.
[SF2] MODE	
Mono/Poly	Determines the playback method of the Voice for each Part — monophonic (single notes only) or polyphonic (multiple notes). **Settings:** mono, poly **DNOTE** This parameter is not available for the Part to which a Drum Voice is assigned.
ArpSwitch (Arpeggio Switch)	Determines whether Arpeggio is on or off for the currently selected Part. **Settings:** on, off
[SF3] LIMIT	
NoteLimitH (Note Limit High) NoteLimitL (Note Limit Low)	Determines the lowest and highest notes of the keyboard range for each Part. Each Part will only sound for notes played within its specified range. **Settings:** C -2~G8 **DNOTE** 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." **DNOTE** You can set the note by pressing the keyboard while holding the [INFORMATION] button.
VelLimitH (Velocity Limit High) VelLimitL (Velocity Limit Low)	Determines the minimum and maximum values of the velocity range within which each Part will respond. Each Part will only sound for notes played within its specified velocity range. **Settings:** 1~127 **DNOTE** 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."

Reference — Voice mode | Performance mode | Multi mode | Multi Voice mode | Sequence Play mode | Utility mode | File mode | Master mode

[SF4] PORTA (Portamento)		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.
	Switch	Determines whether Portamento is on or off. **Settings:** off, on
	Time	Determines the pitch transition time. Higher values mean longer transition times. **Settings:** 0 ~ 127
	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.
[SF5] OTHER		
	PB (Pitch Bend) Upper, **PB (Pitch Bend) Lower**	Determines the amount and direction of Pitch Bend range. Details are same as that in the Common Edit parameters in Normal Voice mode (page 129). **Settings:** -48 ~ 0 ~ +24
	PB (Pitch Bend) Range	This parameter is available for Plug-in Parts 1 - 3. This determines the pitch change range (in semitones) of the Pitch Bend wheel. Unlike the Pitch Bend setting for Parts 1 - 4 to which the internal Normal Voices are assigned described above, the Upper and Lower ranges of the Drum Voice Parts and Plug-in Parts cannot be set independently. **Settings:** -24 ~ 0 ~ +24
	VelSensDpt **(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
	VelSensOfst **(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 — allowing you to automatically compensate for playing too strongly or too softly. **Settings:** 0 ~ 127

When Offset (below) is set to 64:

When Depth (above) = 64 and Offset = 32

When Depth (above) = 64 and Offset = 64

When Depth (above) = 64 and Offset = 96

[F2] OUTPUT		
[SF1] VOL/PAN (Volume/Pan)		
	Volume	Determines the volume for each Part, giving you detailed control over the level balance among the Parts. **Settings:** 0~127
	Pan	Determines the stereo pan position for each Part. **Settings:** L63 (far left) ~ C (center) ~ R63 (far right)
	VoiceELPan (Voice Element Pan)	Determines whether the individual pan settings for each Voice (made via [VOICE] → [EDIT] → Element selection → [F4] AMP → [SF1] LVL/PAN → Pan) 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** This parameter is not available for the Plug-in Parts.
[SF2] EF SEND (Effect Send)		From this display you can set the Send Level and Dry Level sent to the System Effects for each Part. For details about the Effect connection in the Performance mode, see page 122.
	RevSend (Reverb Send)	Determines the send level for the Reverb effect of the selected Part, giving you detailed control over the Reverb balance among the Parts. **Settings:** 0~127
	ChoSend (Chorus Send)	Determines the send level for the Chorus effect of the selected Part, giving you detailed control over the Chorus balance among the Parts. **Settings:** 0~127

Voice mode

Performance mode

Multi mode

Multi Voice mode

Sequence Play mode

Utility mode

File mode

Master mode

Reference

	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
[SF3] SELECT (Output Select)		From this display you can assign individual Parts to sound from independent output connectors (jacks).
	OutputSel (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 63.
	InsEF (Insertion Effect)	Determines whether the Insertion effects are applied to the output signal from the rear panel or not. **Settings:** on, off

[F3] EQ (Equalizer)

From this display you can adjust the EQ settings for each Part. Note that two different display types listed below are provided and you can switch between them by pressing the [SF5] button. Each display type features the same settings in a different format; use the type you feel most comfortable with.
• Display showing four Parts
• Display showing all parameters for one Part
Keep in mind that since all the available parameters cannot be simultaneously displayed in the four-Part display, you will need to use the cursor controls to scroll the display in order to see and set the other parameters.

For details about the Effect connection including the EQ in the Performance mode, see page 122.

NOTE This display is not available for the Plug-in Part.

	LowFreq (Low Frequency)	Determines the center frequency of the low EQ band that is attenuated/boosted. **Settings:** 50.1 ~ 2.00K
	LowGain (Low Gain)	Determines the amount of boost or attenuation applied to the low EQ band. **Settings:** -32 ~ +32
	MidFreq (Middle Frequency)	Determines the center frequency of the middle EQ band that is attenuated/boosted. **Settings:** 139.7 ~ 10.1K
	MidGain (Middle Gain)	Determines the amount of boost or attenuation applied to the middle EQ band. **Settings:** -32 ~ +32
	MidReso (Middle Resonance)	Determines the resonance applied to the center frequency of the middle EQ band. **Settings:** 0 ~ 31
	HighFreq (High Frequency)	Determines the center frequency of the high EQ band that is attenuated/boosted. **Settings:** 503.8 ~ 14.0K
	HighGain (High Gain)	Determines the amount of boost or attenuation applied to the high EQ band. **Settings:** -32 ~ +32

[F4] 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.

[SF1] TUNE		
	NoteShift	Determines the pitch (key transpose) setting for each Part in semitones. **Settings:** -24 ~ +24
	Detune	Determines the fine tuning for each Part. **Settings:** -12.8Hz ~+12.7Hz
[SF2] FILTER		Keep in mind that the settings made here are applied as offsets to the filter settings in the Element Edit parameters of each Part's Voice.
	Cutoff	Determines the cutoff frequency for each Part. This parameter is available for the LPF when the filter used by the Part is a combination type of LPF and HPF. **Settings:** -64 ~ 0 ~ +63
	Resonance	Determines the amount of filter resonance or emphasis of the Cutoff Frequency for each Part. **Settings:** -64 ~ 0 ~ +63
	FEGDepth	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 113.
[SF3] FEG **(Filter Envelope Generator)**		From this display you can set the FEG (Filter Envelope Generator) parameters for each Part. Keep in mind that the settings made here are applied as offsets to the filter settings in the Element Edit parameters of each Part's Voice.
	Attack (Attack Time)	Determines each parameter of the FEG for each Part. For details about FEG, see page 113. **Settings:** -64 ~ 0 ~ +63 **NOTE** These parameters are not available for the Drum Voice Parts and PLG Parts.
	Decay (Decay Time)	
	Sustain (Sustain Level)	
	Release (Release Level)	

[SF4] AEG (Amplitude Envelope Generator)	From this display you can set the AEG (Amplitude Envelope Generator) parameters for each Part.
Attack (Attack Time)	Determines each parameter of the AEG for each Part. For details about AEG, see page 114.
Decay (Decay Time)	**Settings:** -64 ~ 0 ~ +63
Sustain (Sustain Level)	▶ NOTE The Sustain and Release parameters are not available for the Drum Voice Parts. The Sustain parameter is not available
Release (Release Level)	for the Plug-in Parts.

[F5] RCV SW (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.
Note that two different display types listed below are provided and you can switch between them by pressing the [SF5] button. Each display type features the same settings in a different format; use the type you feel most comfortable with.
• Display showing four Parts
• Display showing all parameters for one Part
Keep in mind that since all the available parameters cannot be simultaneously displayed in the four-Part display, you will need to use the cursor controls to scroll the display in order to see and set the other parameters.

Settings: See below. Parameters marked with an asterisk (*) are not available for the Plug-in Part.

CtrlChange (Control Change)	Indicates all the Control Change messages.
PB (Pitch Bend)	MIDI messages generated by using the Pitch Bend Wheel.
MW (Modulation Wheel)	MIDI messages generated by using the Modulation Wheel.
RB (Ribbon Controller)*	MIDI messages generated by using the Ribbon Controller.
ChAT (Channel After Touch)	MIDI messages generated by pressing and holding the note on the keyboard.
FC1 (Foot Controller 1)*	MIDI messages generated by using the optional Foot Controller connected to the rear panel.
FC2 (Foot Controller 2)*	
Sus (Sustain)	MIDI messages generated by using the optional Footswitch connected to the SUSTAIN jack on the rear panel.
FS (Footswitch)*	MIDI messages generated by using the optional Footswitch connected to the ASSIGNABLE jack on the rear panel.
AS1 (Assign1)*, AS2 (Assign2)*	MIDI messages generated by using the ASSIGN1 and ASSIGN2 Control sliders with both the [PAN/SEND] and [TONE] lamps turned on.
BC (Breath Controller)*	MIDI messages generated by using the optional Breath Controller connected to the BREATH jack on the rear panel.
Exp (Expression)	MIDI messages generated by using the optional Foot Controller connected to the rear panel.

Voice mode

Performance mode

Multi mode

Multi Voice mode

Sequence Play mode

Utility mode

File mode

Master mode

Reference

Performance Job mode   [PERFORM] → Performance selection → [JOB]

The Performance Job mode features several basic operations, such as Initialize and Copy. After setting parameters as required from the selected display, press the [ENTER] button to execute the Job.

NOTE   Among the Audio Parts shown in the Job display, Audio 1 indicates the A/D Input Part. When the optional mLAN16E has been installed, Audio 2, 3, 4, and 5 indicate the mLAN Input Parts.

[F1] INIT (Initialize)

This function lets you reset (initialize) all Performance parameters to their default settings. It also allows you to selectively initialize certain parameters, such as Common settings, settings for each Part, and so on — very useful when creating a completely new Performance from scratch.

Type of parameter to be initialized	All: All data in the Performance Common: Data in the Common Edit mode Part 1-4: Data of the Part Edit parameters of the corresponding internal Part PLG 1-3: Data of the Part Edit parameters of the corresponding Plug-in Part Audio 1-5: Data of the Part Edit parameters of the corresponding Audio Part
	NOTE In order to select "Common," "Part," or "Audio," the "ALL" box must be unchecked.

[F2] RECALL (Edit Recall)

If you are editing a Performance and select a different Performance without storing your edited one, all the edits you've made will be erased. If this happens, you can use Edit Recall to restore the Performance with your latest edits intact.

[F3] COPY

Source Performance
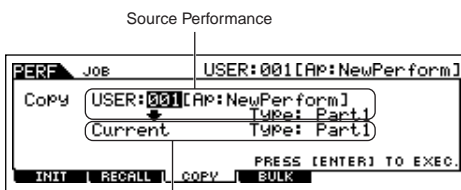
Destination Performance (currently selected Performance)

ou can copy Part parameter settings from any Performance to a particular Part of the Performance you are editing. This is useful if you are creating a Performance and wish to use some parameter settings from another Performance.

Data type to be copied (Type)
Part 1-4: Data of the Part Edit parameters of the corresponding internal Part
Part P1-P3: Data of the Part Edit parameters of the corresponding Plug-in Part
Part A1-A5: Data of the Part Edit parameters of the corresponding Audio Part

Copy procedure
1. Select the Source Performance
   When "Current" is selected in the Source Performance, the Source Performance will be same as Destination Performance. If you wish to copy one Part to another Part in same Performance, select "Current."
2. Select the type of Source Performance (data that you want to copy).
3. Select which Parts will be replaced by the copied Part in the Destination Performance parameter.
   If you choose Arp (Arpeggio) or Effect, the Arpeggio data or Effect settings for the Voice assigned to the Source Part will be copied.
4. Press the [ENTER] button.

[F4] BULK (Bulk Dump)

This function lets you send all your edited parameter settings for the currently selected Performance to a computer or another MIDI instrument for data archiving. For details, see page 126.
In order to execute Bulk Dump, you'll need to set the correct MIDI Device Number, with the following operation: [UTILITY] → [F5] MIDI → [SF1] CH → DeviceNo.

Performance Store mode   [PERFORM] → Performance selection → [STORE]

This function lets you store your edited Performance to User memory. For details, refer to page 56 in the Quick Guide section.

Multi mode

Multi Play mode	[MULTI/SEQ PLAY] (select Multi mode) → Multi selection

[F1] PLAY

Track	Indicates the selected Part number. The notes you play in Multi Mode will be transmitted on the same MIDI channel as the corresponding Track number. You can change the Track number by pressing the [TRACK SELECT] button (the indicator lights), then press any of the Number [1] - [16] buttons. **NOTE** Selecting one of the PLG Parts 1-3 displays Track 1-3. Selecting one of the Multi-part Plug-in Parts 17-32 displays Track 1-16, e.g. the PLG Part 1-3, displays Track 1-3. When selecting Multi-part Plug-in Part 17-32, displays Track 1-16.
OCT (Octave)	Same as in the Performance Play mode (page 149).
ASA (Assign A), ASB (Assign B)	
AS1 (Assign 1), AS2 (Assign 2)	
[SF1] ARP1 (Arpeggio 1) - [SF5] ARP5 (Arpeggio 5)	

[F2] VOL/PAN

PAN	Determines the stereo pan position for each part. **Settings:** Settings: L63 - L01, C, R01 - R63
VOLUME	Determines the volume for each part, giving you detailed control over the level balance among the parts. **Settings:** 0 - 127

[F3] VOICE

Determines the Voices for assigning to each Part. Select the Part then determine the Voice bank and Voice number via the same procedure as in the Voice mode (page 24).

NOTE The Category Search function cannot be used to select the Voices of the Multi Part Plug-in Parts 17-32 (when the PLG 100-XG has been installed).

NOTE You can also change the VOICE NUM (Voice Number) or BANK MSB/LSB (Bank select MSB/LSB) directly using the Data dial.

[F4] EF SEND (Effect Send)

Determines the Send Level/Dry Level to the System Effects for each Part.

REV SEND (Reverb 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.
CHO SEND (Chorus Send)	**Settings:** 0 - 127
DRY LVL (Dry Level)	Determines the Dry Level (unprocessed level) of the selected Part, giving you detailed control over the balance between the original, unprocessed sound of the Parts and the Reverb/Chorus sound. **Settings:** 0 - 127

[F5] ARP (Arpeggio)

You can select the Arpeggio display only from the [F1] Play display. The parameters are same as in the Performance Play mode.

NOTE Only Normal Voices can be edited.

[F5] VCE ED (Multi Voice Edit) (when a display other than [F1] PLAY is shown)

You can select the VCE ED display from any display other than the [F1] play display. Press the [F5] VCE ED button in the Multi mode to call up the Multi Voice Edit mode (page 161). Press the [EXIT] button to return to the original display.

NOTE Only Normal Voices can be edited.

[F6] ▶ / ■ (when the [F1] PLAY display is shown)

Pressing the [F1] button plays back the MIDI song assigned to the last selected Chain Step number in the Sequence Play mode.

[F6] 17-32/PLG1-3/1-16 (when a display other than [F1] PLAY is shown)

You can switch among the displays for three types of Parts by pressing this button. Numbers 1-16 are Parts of the internal tone generator, 17-32 are Multipart Plug-in Parts of the optionally installed PLG100-XG, and PLG 1-3 are Plug-in Parts of the optionally installed Single Part Plug-in Board.

NOTE Please note that the Multi-part Plug-in Part (17 - 32) settings apply not to one individual Multi but to all Multis.

Voice mode

Performance mode

Multi mode

Multi Voice mode

Sequence Play mode

Utility mode

File mode

Master mode

Reference

Multi Edit mode	**[MULTI/SEQ PLAY] (select Multi mode) → Multi selection → [EDIT]**

Common Edit	**[MULTI/SEQ PLAY] (select Multi mode) → Multi selection → [EDIT] → [COMMON]**

These parameters are for making global (or common) edits to all Parts of the selected Multi.

NOTE Common Edit operations cannot be performed on Multi Plug-in Parts 17 - 32.

[F1] GENERAL	
[SF1] NAME	Determines the name of the currently edited Multi. For detailed instructions on naming, see page 27.
[SF3] MEQ OFS (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 [F2] MEQ/MEF display below. **Settings:** -64 - +63
[SF5] OTHER	Determines the Control slider settings. These parameters are the same as in the Voice mode. However, you cannot set the Pitch Bend range in the Multi mode.

[F2] MEQ/MEF (Master EQ/Master effect)	
[SF1] MEQ (Master EQ)	These parameters are the same as in the Performance Edit mode (page 150).
[SF2] MEF (Master Effect)	

[F3] ARP (Arpeggio)	
[SF1] TYPE	These parameters are the same as in the Performance Edit mode (page 151).
[SF2] LIMIT	
[SF3] PLAY FX (Play Effect)	
[SF4] OUT CH (Output Channel)	

[F4] CTL ASN (Control Assign)
These parameters are the same as in the Performance Edit mode (page 151).

[F5] AUDIO IN	
[SF1] OUTPUT	These parameters are the same as in the Performance Edit mode (page 151).
[SF2] INS SW	

[F6] EFFECT	For details about the effect connections in the Multi mode, see page 123.
[SF1] CONNECT	These parameters are the same as in the Performance Edit mode (page 152).
[SF2] INS SW (Insertion Effect Switch)	
[SF3] PLG-EF (Plug-in Effect)	
[SF4] REVERB	
[SF5] CHORUS	

Voice mode

Performance mode

Multi mode

Multi Voice mode

Sequence Play mode

Utility mode

File mode

Master mode

Reference

Part Edit	[MULTI/SEQ PLAY] (select Multi mode) → Multi selection → [EDIT] → Part selection

These parameters are for editing the individual Parts that make up a Multi.
Press the [F6] button to switch among the various Part displays:
• Display for Parts 1 - 16 to which the internal Voices are assigned.
• Display for Multi-part Plug-in Parts (17 - 32) to which the PLG100-XG voices are assigned.
• Display for Plug-in Parts (PLG1 - 3) to which the Plug-in Voices of the single part Plug-in board are assigned.

ⁿNOTE   Please note that the Multi-part Plug-in Part (17 - 32) settings apply not to one individual Multi but to all Multis.
ⁿNOTE   When one of the Multi-part Plug-in Parts (17 - 32) is selected, some parameters cannot be edited.

[F1] VOICE

[SF1] VOICE	Determines the Voice to be assigned to each Part. Select the Part then determine the Voice bank and Voice number via the same procedure as in the Voice mode (page 73).
	ⁿNOTE To select the desired Part, move the cursor using the [<][>] buttons or see page 72.
	ⁿNOTE The Category Search function cannot be used to select the Voices of the Multi Part Plug-in Parts 17-32 (when the PLG 100-XG has been installed).
	ⁿNOTE You can also change the VOICE NUM (Voice Number) or BANK MSB/LSB (Bank select MSB/LSB) directly using the Data dial.

[SF1] MODE	
Mono/Poly	Determine whether the Voice is played back monophonically (single notes only) or polyphonically (multiple simultaneous notes). **Settings:** mono, poly **ⁿNOTE** This parameter is not available for the Part to which a Drum Voice is assigned.
ArpSwitch (Arpeggio Switch)	Determines whether Arpeggio is on or off for the currently selected Part. **Settings:** off, on **ⁿNOTE** Arpeggio Switch is applied to only one Part at the same time. It cannot be applied to multiple Parts simultaneously. However, only Parts having the same receive channel can be applied simultaneously. **ⁿNOTE** The "ArpeggioSW" parameter is not available for Multi-part Plug-in Parts 17 - 32.
ReceiveCh (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

[SF3] LIMIT	The parameters are the same as in the Performance Edit mode (page 152).
[SF4] PORTA (Portamento)	
[SF5] OTHER	

[F2] OUTPUT

[SF1] VOL/PAN	The parameters are the same as in the Performance Edit mode (page 153).
[SF2] EF SEND	
[SF3] SELECT	

[F3] EQ (Equalizer)

The parameters are the same as in the Performance Edit mode (page 154).

[F4] TONE

The parameters are the same as in the Performance Edit mode (page 154).

[F5] RCV SW (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.
Note that two different display types listed below are provided and you can switch between them by pressing the [SF5] button.
Each display type features the same settings in a different format; use the type you feel most comfortable with.
• **Display showing four Parts**
This display type shows the Receive Switch status for four Parts at a time. Set the desired Part on or off, for the corresponding MIDI data type. To view and edit another set of four Parts, press the appropriate Number button, [1] to [16]. Keep in mind that since all the available parameters cannot be simultaneously displayed, you will need to use the cursor controls to scroll the display in order to see and set the other parameters.
• **Display showing all parameters for one Part**
This display type shows all of the Receive Switch settings for a single selected Part. Set the desired MIDI data type on or off for the selected Part. To select other Parts, use the Number [1] - [16] buttons (making sure that the [TRACK SELECT] button is on).

Sidebar (right margin): Voice mode · Performance mode · Multi mode · Multi Voice mode · Sequence Play mode · Utility mode · File mode · Master mode · Reference

Multi Job mode

[MULTI/SEQ PLAY] (select Multi mode) → Multi selection → [JOB]

The Multi Job mode features several basic operations, such as Initialize and Copy. After setting parameters as required from the selected display, press the [ENTER] button to execute the Job.

NOTE Among the Audio Parts shown in the Multi Job display, Audio Part 1 indicates the A/D Input Part. When the optional mLAN16E has been installed, Audio Parts 2 - 5 are mLAN Input Parts.

[F1] INIT (Initialize)

This function lets you reset (initialize) all Multi parameters to their default settings. It also allows you to selectively initialize certain parameters, such as Common settings, settings for each Part, and so on — very useful when creating a completely new Multi program from scratch.

Type of parameter to be initialized	GM ....Initializes the Voice(s) of Part(s) selected below, just as if they were reset by a GM System On message.
	All ....All data in the Common Edit and Part Edit modes
	Common ....Data in the Common Edit mode
	Part 1-16 ....Data of the Part Edit parameters of the corresponding internal Part
	PLG 1-3............Data of the Part Edit parameters of the corresponding Plug-in Part
	Audio 1-5 ....Data of the Part Edit parameters of the corresponding Audio Part
	NOTE In order to select "Common," "Part," "PLG," or "Audio," the "All" box must be unchecked.

[F2] RECALL (Edit Recall)

If you are editing a Multi program and select a different program without storing your edited one, all the edits you've made will be erased. If this happens, you can use Edit Recall to restore the Multi program with your latest edits intact.

[F3] COPY

You can copy Part parameter settings from any Multi to a particular Part of the Multi you are editing. This is useful if you are creating a Multi and wish to use some parameter settings from another Multi.

Data type to be copied	Part 1-4 ....Data in each Part edit of the internal Parts
	Part P1-P3........Data in each Part edit of the Plug-in Parts
	Part A1-A5........Data in each Part edit of the Audio Parts
	The procedure is same as Performance mode. See page 156.

[F4] BULK (Bulk Dump)

This function lets you send all your edited parameter settings for the currently selected Multi program to a computer or another MIDI instrument for data archiving.

NOTE In order to execute Bulk Dump, you'll need to set the correct MIDI Device Number. For details, see page 126.

[F5] PF COPY (Performance Copy)

This convenient operation lets you copy certain settings of the four Parts in a performance to the Multi program currently being edited.
This would come in handy when a certain performance has settings that you want to use in your Multi program. Use this Job to simply copy the settings you need.
The MIDI receive channel settings are set to match the basic channel settings (page 165). When the basic channel is set to "omni," the receive channel here is set to 1. To select a group of parameters for copying, checkmark the appropriate box in the display.

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

Multi Store mode

[MULTI/SEQ PLAY] (select Multi mode) → Multi selection → [STORE]

This function lets you store your edited Multi program to User memory. For details, refer to page 76 in the Quick Guide section.

Voice mode / Performance mode / Multi mode / Multi Voice mode / Sequence Play mode / Utility mode / File mode / Master mode

Reference

160 *S90ES* Owner's Manual

Multi Voice mode

⧉ NOTE   You can selsct the Multi Voice mode from any display other than the [F1] play display.

Multi Voice Edit mode	[MULTI/SEQ PLAY] (select Multi mode) → Multi selection → [F3] VOICE → Normal Voice selection → [F5] VCE ED

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 128) and the Voice Element Edit mode (page 133).
Please note that there are certain parameters that cannot be edited in the Multi Voice Edit mode.

Common Edit	[MULTI/SEQ PLAY] (select Multi mode) → Multi selection → [F3] VOICE → Normal Voice selection → [F5] VCE ED → [COMMON]

These parameters are for making global (or common) edits to all four Elements of the selected Normal Voice.
These are the same as in the Voice Common Edit mode (page 128). Please note that there are certain parameters that cannot be edited in the Multi Voice Edit.

Element Edit	[MULTI/SEQ PLAY] (select Multi mode) → Multi selection → [F3] VOICE → Normal Voice selection → [F5] VCE ED → Element selection

These parameters are for editing the individual Elements that make up a Normal Voice.
These are the same as in the Voice Element Edit mode (page 133). Please note that there are certain parameters that cannot be edited in the Multi Voice Edit mode.

Multi Voice Job mode (Edit Recall)	[MULTI/SEQ PLAY] (select Multi mode) → Multi selection → [F3] VOICE → Normal Voice selection → [F5] VCE ED → [JOB]

If you are editing a Multi Voice and select a different Multi Voice, Multi program, Multi without storing your edited one, all the edits you've made will be erased. Edits are also erased if the current part to which the edited Multi Voice is assigned receives a program change from an external MIDI instrument.
If this happens, you can use Edit Recall to restore the Multi Voice with your latest edits intact by pressing the [ENTER] button.
Since a Recall Buffer for the Multi Voice is prepared for each Part of the current Multi, you can specify the Part to which the Multi Voice to be recalled is assigned before executing the Edit Recall.

Multi Voice Store mode	[MULTI/SEQ PLAY] (select Multi mode) → Multi selection → [F3] VOICE → Normal Voice selection → [F5] VCE ED → [STORE]

This function lets you store your edited Multi Voice to User memory. For details, refer to page 50 in the Quick Guide section.

Voice mode
Performance mode
Multi mode
Multi Voice mode
Sequence Play mode
Utility mode
File mode
Master mode

Reference

Sequence Play mode

Sequence Play mode	[MULTI/SEQ PLAY] (select Sequence Play mode)

[F1] CHAIN

Determines how the SMF files are played back. You can assign the desired SMF files and Multi settings to the desired Chain Step numbers (the playback order). For details, see page 96.

[SF4] GET	Determines the desired slot number, partition, and directory (folder).
[SF5] DEMO	Plays the demo songs for S90 ES. For details, see page 29.

[F2] OUTPUT

These settings apply to each Chain Step number and let you specify the port number and whether or not MIDI messages are output to the internal/external tone generator.

NOTE The OUTPUT settings selected at the last Chain Step are applied to the Multi mode.

NOTE You can change the settings of all channels simultaneously by changing the parameter while holding the [SF1] ALL button.
Also, you can change the settings of channels 1 - 8 or channels 9 - 16 simultaneously by changing the parameter while holding the [SF2] 1-8 button or [SF3] 9-16 button.

PORT	Determines the MIDI transmission port for the corresponding track. Playback data of tracks set to off is output without a Port designation via MIDI. When using the internal tone generator block, the Port setting here is available for the tracks assigned to the Plug-in Parts 1-3 (when a single Plug-in Board has been installed) and Multi Plug-in Parts 17-32 (when the PLG100-XG has been installed). Tracks using the internal tone generator parts of this synthesizer are automatically fixed to Port 1. **Settings:** off, 1-3 **NOTE** Port data can be output only through the USB terminal. No Port data is transmitted through the MIDI OUT terminal, even if the corresponding track is set to a specific Port number.
INT SW (Internal Switch)	Determines whether or not the MIDI messages of each channel are sent to the internal tone generator. **Settings:** on, off
EXT SW (External Switch)	Determines whether the MIDI messages of each channel are sent to the external device. **Settings:** on, off

[F4] TEMPO

Determines the SMF file playback tempo. Simultaneously hold down the [F4] TEMPO button and use the Data dial or [INC/YES]/[DEC/NO] buttons to change the value.

[F5] MEAS

Moves the current measure number. Simultaneously hold down the [F5] MEAS button and use the Data dial or [INC/YES]/[DEC/NO] buttons to change the value.

Voice mode

Performance mode

Multi mode

Multi Voice mode

Reference

Sequence Play mode

Utility mode

File mode

Master mode

162 S90 ES Owner's Manual

Utility mode

The Utility mode features a variety of important settings related to overall operation of the S90 ES. These settings can also be stored — simply press the [STORE] button from any mode (with the exception of the Utility Job mode), and store the data to internal memory as system settings.

Utility mode	[UTILITY]

In this mode, you can set parameters that apply to the entire system of the S90 ES.
This mode is actually a sub-mode of the Voice/Performance/Multi/Sequence Play 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.

[F1] GENERAL		
[SF1] TG (Tone Generator)		From this display you can make overall settings for the internal tone generator. Settings here do not affect MIDI messages transmitted to the external MIDI instrument.
	Volume	Determines the overall volume of the instrument. **Settings:** 0~127
	NoteShift	Determines the amount (in semitones) by which the pitch of all notes is shifted. **Settings:** -24~0~+24
	Tune	Determines the fine tuning (in 0.1 cent steps) of the internal tone generator's overall sound. **Settings:** -102.4~+102.3
	BCCurve (Breath Controller Curve)	These four curves determine how the sound of the internal tone generator responds to use of a Breath Controller. The setting here affects the Destination parameters when the Source is set to "BC," both of which can be set in the CTL SET displays ([VOICE] → [EDIT] → [COMMON] → [F4] CTL SET). The graph shown in the display indicates the controller response curve. (The horizontal line represents the received breath control values, while the vertical line represents the actual response of the internal tone generator.) **Settings:** thru, soft, hard, wide
[SF2] KBD (Keyboard)		From this display you can set the keyboard-related parameters. The settings here affect the MIDI messages generated by playing the keyboard.
	Octave	Determines the amount in octaves by which the range of the keyboard is shifted up or down. **Settings:** -3~0~+3
	Transpose	Determines the amount in semitones by which the range of the keyboard is shifted up or down. **Settings:** -11~ 0 ~+11 **DNOTE** If you transpose beyond the note range limits (C-2 and G8), notes in the adjacent octaves will be used. For example, a transposed note of F9 will be changed to F8.
	VelCurve (Velocity Curve)	These five curves determine how the actual velocity will be generated and transmitted according to the velocity (strength) with which you play notes on the keyboard. The graph shown in the display indicates the velocity response curve. (The horizontal line represents the received velocity values (strength of your playing), while the vertical line represents the actual velocity values transmitted to the internal/external tone generators.) **Settings:** norm, soft, hard, wide, fixed norm (normal)....... This linear "curve" produces one-to-one correspondence between the strength of your keyboard playing (velocity) and the actual sound change. soft........................ This curve provides increased response, especially for lower velocities. In other words, playing softly results in higher response than the "norm" curve. hard .... This curve provides increased response, especially for higher velocities. In other words, playing hard results in higher response than the "norm" curve. wide .... This setting provides opposite response curves for lower and higher velocities. It widens the apparent dynamic range of the controller, producing less sound change in the softer range and more change in the higher range. fixed...................... This setting produces the same amount of sound change (set in Fixed Velocity below), no matter what your playing strength.
	FixedVelocity	This parameter is only available if you select the "fixed" Velocity Curve above. The velocity of the note you play is fixed at the value set here. **Settings:** 1 ~ 127
[SF3] EF BYPS (Effect Bypass)		From this display you can select the specific effect(s) to be bypassed when the [EFFECT BYPASS] button is turned on.
	Insertion	
	▶ Internal	When this is set to on and the [EFFECT BYPASS] button is turned on, the internal Insertion Effect is bypassed.
	▶ PLG-EF (Plug-in Effect)	When this is set to on and the [EFFECT BYPASS] button is turned on, the Insertion Effect or Variation Effect of the Plug-in Boards is bypassed. **DNOTE** This parameter does not affect certain Plug-in Boards.

Voice mode

Performance mode

Multi mode

Multi Voice mode

Sequence Play mode

Utility mode

File mode

Master mode

Reference

System		
▶ Reverb	When this is set to on and the [EFFECT BYPASS] button is turned on, the Reverb effect is bypassed.	
▶ Chorus	When this is set to on and the [EFFECT BYPASS] button is turned on, the Chorus effect is bypassed.	
Master	When this is set to on and the [EFFECT BYPASS] button is turned on, the Master effect is bypassed.	

NOTE For details about the Effects, see page 118.

[SF4] OTHER	
AutoLoad	Determines whether the Auto Load function is on or off. When this is on, the instrument will automatically load the specified files (from USB storage device) to User memory — whenever the power is turned on. For details about the Auto Load function, see page 106. **Settings:** on, off
PowerOnMode	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:** performance, voice (USR1), voice (PRE1), GM, last, master performance ....Performance Play mode (User Performance 001) voice (USR1)....Voice Play mode (User Voice "USR1: 001") voice (PRE1) ....Voice Play mode (Preset Voice "PRE 1: 001") GM ....Voice Play mode (GM Voices "GM: 001") last ....The mode and program number registered the last time by the procedure on page 167. master ....Master Play mode (User Master 001) mult ....Multi Play mode (User Multi 001)
CtrlReset (Controller Reset)	Determines the status of the controllers (Modulation Wheel, Aftertouch, Foot Controller, Breath Controller, Knobs, etc.) when switching between voices. When this is set to "hold," the controllers are kept at the current setting. When this is set to "reset," 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

[F2] I/O (Input/Output)	
[SF1] INPUT	From this display you can set parameters related to audio input.
Mic/Line	When using the A/D INPUT jacks, this determines the input source, microphone (mic) or line. **Settings:** mic, line mic ....Intended for low output equipment, such as a microphone, electric guitar or bass. line ....Intended for high output equipment, such as a keyboard, synthesizer, or CD player.
[SF2] OUTPUT	From this display you can set parameters related to audio output.
L&RGain	Set the output gain of each jack.
Assign Gain L&R, 1&2, 3&4, 5&6, 7&8, 9&10, 11&12, 13&14	**Settings:** 0dB, +6dB **NOTE** The Assign Gain 1&2 - 13&14 parameters are only available when the mLAN16E is installed.
mLAN MonitorSw	When this is set to on, the audio signal of the instrument output via an IEEE1394 cable to a computer will be output also via the main OUTPUT L/MONO and R jacks. When this is set to on, the audio signal sent from a computer to the instrument will be output via the main OUTPUT L/MONO and R jacks directly, bypassing the Effect block. **Settings:** on, off

[F3] VOICE	[VOICE] → [UTILITY] → [F3]

These special voice-related settings are available only when entering the Utility mode from the Voice mode, letting you set parameters related to all the Voices.

[SF1] MEQ (Master EQ)	From this display you can apply five-band equalization to all Voices, raising or lowering the level of each frequency band (LOW, LOWMID, MID, HIGHMID, HIGH). The parameters are the same as in the Performance Common Edit. See page 150. **Settings:** For details about EQ, see page 119.
[SF2] MEF (Master Effect)	From this display you can set the Master Effect related parameters applied to all the Voices. The parameters are the same as in the Performance Common Edit. See page 150.

Voice mode

Performance mode

Multi mode

Multi Voice mode

Sequence Play mode

Utility mode

File mode

Master mode

Reference

[SF3] ARP CH (Arpeggio Channel)	From this display you can set parameters related to output of the Arpeggio MIDI data in the Voice mode.
OutputSwitch	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. **Settings:** on (enable), off (disable)
TransmitCh (Transmit channel)	Determines the MIDI channel through which Arpeggio playback data will be sent (when Output Switch above is on). **Settings:** 1 ~ 16
[SF4] CTL ASN (Controller Assign)	Sets the parameters related to the controllers in the Voice mode. Details on each parameter are the same as in Performance Common Edit. See page 150.

[F4] CTL ASN (Controller Assign)

[SF1] ARP (Arpeggio)	
Switch	Determines the Control Change Number that controls on/off status of Arpeggio playback. **Settings:** 00~95
Hold	Determines the Control Change Number that controls on/off status of Arpeggio Hold (page 128). **Settings:** 00~95
[SF2] ASSIGN	You can assign specific functions to the Control slider 1 and 2 (ASSIGN A and B) when the [PAN/SEND] and [TONE] lamps are on.
ASA (Assign A) Dest (Destination)	Two parameters are available here. The first (ASA) determines the Control Change number generated by the ASSIGN A slider. The second, Destination (Dest), determines what parameter or aspect of the sound is affected by the slider. Keep in mind that if the same MIDI Control Change messages as set here are received from an external device, the internal tone generator also responds to those messages. **Settings:** Refer to the separate Data List booklet.
ASB (Assign B) Dest (Destination)	Two parameters are available here. The first (ASB) determines the Control Change number generated by the ASSIGN B slider. The second, Destination (Dest), determines what parameter or aspect of the sound is affected by the slider. Keep in mind that if the same MIDI Control Change messages as set here are received from an external device, the internal tone generator also responds to those messages. **Settings:** Refer to the separate Data List booklet.
[SF3] FT SW (Footswitch)	
FSAssign (Footswitch Assign)	From this display you can determine the Control Change number generated by using the Footswitch connected to the ASSIGNABLE jack. Keep in mind that if the same MIDI Control Change messages set here are received from an external device, the internal tone generator also responds to those messages as if the Footswitch of the instrument was used. **Settings:** 000~100 (000, 032: off, 096: Arpeggio Switch, 097: Arpeggio Hold, 098: playback start/stop in the Sequence Play mode, 099/100: Program Change INC/DEC 101: Octave Rest)
SusPedal (Sustain Pedal Select)	Selects the Foot Controller type connected to the FOOTSWITCH SUSTAIN jack. **Using the FC 3** When using the half damper function, set this parameter to "FC3 (Half On)" and turn the half damper switch on (Voice Element Edit mode → [F4] AMP → [SF3] AEG display). If you are not using the half damper function, set this parameter to "FC3 (Half Off)." **Using the FC4 or FC5** Set this parameter to "FC4/5." You cannot use the half damper function with the FC4 or FC5. **NOTE** You can also control the half damper function by using Control Change messages from an external device. In this case, you do not need to set the Sustain Pedal Select parameter. **Settings:** FC3 (Half On), FC3 (Half Off), FC4/5
[SF4] REMOTE	Two different computer software control modes can be selected here, as well as the respective MIDI port settings for control. When you've made the desired settings, press the [ENTER] button to actually call up the preset control templates for the software. For details, refer to the Quick Guide on page 78.
[SF5] MEF (Master Effect)	From this display you can set the parameters related to the Master Effect Control slider operations. (Press both the [ARP FX] and [EQ] buttons so that their lamps light.)
Slider1 ~ Slider4	Assigns a parameter of the Master Effect to each slider. Available parameters differ depending on the selected Master Effect type.

[F5] MIDI

[SF1] CH (Channel)	From this display you can make basic MIDI settings.
BasicRcvCh (Basic Receive Channel)	Determines the MIDI receive channel when this synthesizer is set to single-timbre tone generator mode (Voice/Performance modes). **Settings:** 1~16, omni (all channels), off **NOTE** In the multi-timbral tone generator mode (Multi mode), each Part receives MIDI data according to its assigned MIDI receive channel ([MULTI/SEQ PLAY] → multi selection→ [EDIT] → Part selection → [F1] VOICE → [SF2] MODE → ReceiveCh). **NOTE** However, when changing the Multi program from the external device, make sure that the MIDI channel used for transmitting the bank select and program change settings is the same as the Basic Receive Channel.

Voice mode

Performance mode

Multi mode

Multi Voice mode

Sequence Play mode

Utility mode

File mode

Master mode

Reference

	KBDTransCh (Keyboard Transmit Channel)	Determines the MIDI channel over which the instrument sends MIDI data (to an external sequencer, tone generator, or other device). This parameter is available in the single-timbre tone generator mode (Voice/ Performance modes). **Settings:** 1~16, off **NOTE** In the multi-timbral tone generator mode (Multi/Sequence Play modes), MIDI data generated by playing the keyboard (and its controllers) is sent to the internal tone generator and external devices via the MIDI output channel, which corresponds to the selected Part number. The Port setting also depends on the setting of the last Chain Step selected in the Sequence Play mode (page 98). Also keep in mind that if one of the Multi-part Plug-in Parts 17 –32 is selected, MIDI data is sent via MIDI channels 1 - 16. Similarly, if one of the PLG Parts 1-3 is selected, MIDI data is sent via MIDI channels 1 - 3. **NOTE** When changing the Multi program using the S90 ES panel buttons, the bank select and program change messages are transmitted via the Keyboard Transmit Channel set here.
	DeviceNo. (Device Number)	Determines the device number used by this synthesizer in receiving or transmitting data. 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
[SF2] SWITCH		
	BankSel (Bank Select)	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
	PgmChange (Program Change)	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
	CtrlChange (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
	LocalCtrl (Local Control On/Off)	This determines whether or not the tone generator of the instrument responds to your keyboard playing. Normally, this should be set to "on" — since you'll want to hear the sound of the S90 ES as you play it. However, for external sequencer applications, you may need to set this to "off" to avoid getting "double" notes, in which the tone generator of the instrument is played twice — once by the keyboard and once again by the keyboard data routed through the sequencer. Even if this is set to "off," the data will be transmitted via MIDI. Also, the internal tone generator block will respond to messages received via MIDI. **Settings:** off, on
	RcvBulk (Receive Bulk)	Determines whether or not Bulk Dump data can be received. **Settings:** protect (not received), on (received)
[SF3] SYNC (Synchronization)		From this display you can set various parameters related to MIDI clock and synchronization.
	MIDI Sync	Determines whether Arpeggio playback and sequence playback in the Sequence Play mode 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 this synthesizer is to be used alone or as the master clock source for other equipment. MIDI ....Synchronization to a MIDI clock received from an external MIDI instrument via MIDI.
	ClockOut	Determines whether MIDI clock (F8) messages will be transmitted via MIDI. **Settings:** on (transmitted), off
	SeqCtrl (Sequencer Control)	Determines whether Sequencer Control signals—start, continue, stop, and song position pointer— will be received and/or transmitted via MIDI. **Settings:** off, in, out, in/out off ....Not transmitted/recognized. in ....Recognized but not transmitted. out ....Transmitted but not recognized. in/out ....Transmitted/recognized.
[SF4] OTHER		
	MIDI IN/OUT	Determines which physical output terminal(s) will be used for transmitting/receiving MIDI data: MIDI IN/OUT, USB, or mLAN (when the optional mLAN16E has been installed). **Settings:** MIDI, USB, mLAN **NOTE** Three 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)	Many computer sequencers are capable of transmitting data over several MIDI ports, effectively breaking the 16-channel barrier. When using the USB terminal or mLAN terminal (when the optional mLAN16E has been installed) 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). In this way, 16 channels of data can be played on this synthesizer and another 16 can be played on the connected MIDI device. **Settings:** 1~8 **NOTE** When the mLAN16E has been installed and the MIDI IN/OUT is set to mLAN, ports 5-8 are not available even if you set them here.

[F6] PLUG		
[SF1] STATUS		
	Plug1: - Plug3:	Indicates the name of the Plug-in Board which has been installed to this synthesizer.
	PolyExpand	This parameter is accessible only when you have two or three identical Plug-in boards installed. The "off" setting enables two or three boards to work separately (you can select them for 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:** on, off
[SF2] MIDI		From this display you can set various MIDI-related parameters for the Plug-in board.
	DEVNO. (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 in the multi-timbral tone generator mode (Multi/Sequence Play). One port can be set for a Multi-part Plug-in board and two ports can be set for a Single part Plug-in board. **Settings:** off, 1~3 **NOTE** The Port number for the Effect Plug-in board (VH) is fixed to 1. **NOTE** For information on the Plug-in board and the internal tone generator block, see page 116.
	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 3. **Settings:** on, off
[SF3] NATIVE1		From this display you can set the Native System parameters of the Plug-in board installed to slots 1 - 3. For details on the parameters, refer to the owner's manual of your particular Plug-in board.
[SF4] NATIVE2		
[SF5] NATIVE3		

Utility Job mode   [UTILITY] → [JOB]

In this Mode, you can restore this synthesizer's User memory to the factory default settings (Factory Set). For details, see page 21.

NOTE Since the settings of the Plug-in Boards in the Utility mode are stored not to internal User memory but to the memory on the respective boards themselves, the data cannot be restored with this Job.

■ Supplementary

Setting the default display when turning the power on

[UTILITY] → [F1] GENERAL → [SF4] OTHER → PowerOnMode (page 164)

1 Enter the desired mode and the program number you wish to call up first when turning the power on.

2 Press the [ENTER] button while holding the [STORE] button to register the mode and program number set in step 1.

3 Set the PowerOnMode parameter to "last" in the [UTILITY] → [F1] GENERAL → [SF4] OTHER display.

4 Press the [STORE] button to store the Utility setting made in step 3 above.

5 Turn the power off and turn the power on again to call up the mode/program number set in step 2 to the display.

Voice mode

Performance mode

Multi mode

Multi Voice mode

Sequence Play mode

Utility mode

File mode

Master mode

Reference

File mode

The File mode provides tools for transferring data between the instrument and USB storage device.

NOTE For details about USB storage devices, see page 20.

NOTE For details about the relationship between the data created on this synthesizer and the files for saving, see page 171.

File mode	[FILE]

NOTE For information on how to select a file/folder and how to create a new folder, see page 170.

[F1] CONFIG

[SF1] CURRENT		From this display you can set the parameters about the currently recognized USB storage device.
	USB Device	Select the partition in the device. You can transfer files between the partition in the slot selected below and the S90 ES.
	▶ Slot	If using a USB storage device compatible with multiple media, select the slot number. The desired partition can be selected in the right box.
	Status	Indicates the status of the storage device recognized by this synthesizer.
	▶ Free	Indicates the amount of unused (free) memory on the current device.
	▶ Total	Indicates the amount of total memory on the current device.
[SF2] FORMAT		Before you can use a new USB storage device with this synthesizer, you will need to format it. Use this operation to format the USB storage device and assign a Volume Label to it. For instructions formatting, see page 170.
	Slot	Selects a slot to be accessed when the connected USB storage device supports multiple media. **Settings:** CARD, USB.
	Type	Specifies the partition to be formatted. **Settings:** all, partition1 ~ 4
	Volume Label	Names the Volume Label. For instructions on naming, refer to page 27 in the Basic Operation section.

[F2] SAVE

File name · File/Folder selection box

```
FILE
TYPE All        Current Dir:root
[MY DATA ]      📁 NEWDATA
                📁 NEWDIR
             ▶  📁 NEWDIR01      ── File/Folder selection box
                📄 NEWPEFOM.S7A
      EXEC SETNAME
CONFIG | SAVE | LOAD | RENAME | DELETE | NEW 📁
```
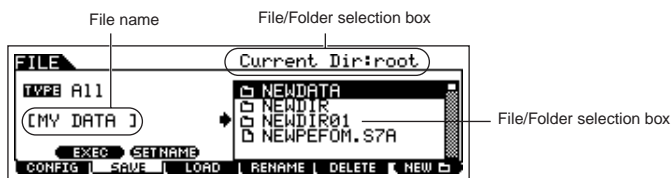
This operation lets you save files to a USB storage device.
For instructions on saving files of the various data types, refer to the following pages: page 51 (Voices), page 57 (Performances), page 76(Multis).

TYPE	Among the various types of data created on this synthesizer, you can save all of them or only a specific type of data to a single file. This parameter determines which specific type of data will be saved to a single file. **Settings:** Refer to "Supplementary information" on page 171.
[SF1] EXEC	Executes saving of the file into the selected folder. **NOTE** The [ENTER] button on the panel is used to call up the contents of the selected folder.
[SF2] SETNAME	Copies the file/folder name selected in the File/Folder selection box into the File name column.
[F6] NEW	Creates a new folder in the current folder.

[F3] LOAD

Indicates the current folder (directory).

```
FILE
TYPE AllVoice    Current Dir:root
                 📁 NEWDATA
                 📁 NEWDIR
                 📁 NEWDIR01      ── File/Folder selection box
                 📄 MYPEFORM.S7V
       EXEC      📄 MYVOICE .S7V
CONFIG | SAVE | LOAD | RENAME | DELETE
```
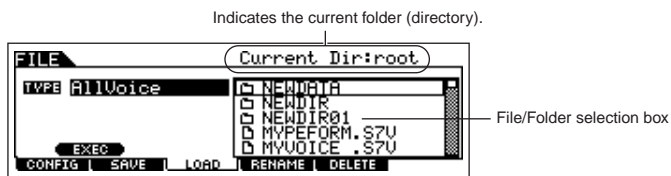
This operation lets you load files from a USB device to this synthesizer.

TYPE	Among the various types of data saved in a single file on a USB storage device, you can load all of them or only a specific type of data to this synthesizer. This parameter determines which specific type of data will be loaded from a single file. **Settings:** Refer to "Supplementary information" on page 171.
[SF1] EXEC	Executes loading of the file. **NOTE** The [ENTER] button on the panel is used to call up the contents of the selected folder.

[F4] RENAME

Select the desired file type.

FILE — Current Dir:root

TYPE AllVoice
[MY DATA0]

EXEC SETNAME
CONFIG | SAVE | LOAD | RENAME | DELETE | NEW
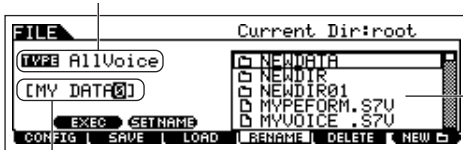
File/Folder selection box
Select the file/folder to be renamed.

File name
Rename the selected file/folder here.

From this display you can rename files or folders in the selected USB storage device, using up to eight alphabetic and numeric characters.

Files are named according to the MS-DOS naming convention. If the file name contains spaces and other characters unrecognized in MS-DOS, these characters will automatically be replaced by "_" (underscore) characters when saving.

[SF1] EXEC	Executes renaming of the file. **NOTE** The [ENTER] button on the panel is used to call up the contents of the selected folder.
[SF2] SETNAME	Copies the file/folder name selected in the File/Folder selection box into the File name column.
[F6] NEW	Creates a new folder within the current folder.

[F5] DELETE

Select the desired file type.

FILE — Current Dir:root

TYPE AllVoice

EXEC
CONFIG | SAVE | LOAD | RENAME | DELETE
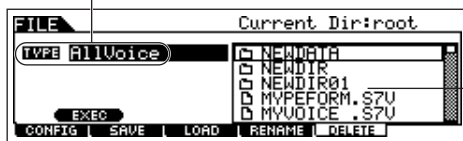
File/Folder selection box
Select the file or folder to be deleted.

From this display you can delete files/folders from the selected USB storage device. Select the desired file or folder as shown below, then press the [SF1] EXEC button.

NOTE When you wish to delete a folder, delete all the files and folders contained in the folder beforehand.
Please keep in mind that only folders that contain no files or other nested folders can be deleted.

■ Supplementary information

File (📄)/Folder (📁) selection

The instructions and illustrations below show you how to select files and folders on the USB storage devices within the File mode.

Move the cursor to the desired file or folder by using the [INC/YES] and [DEC/NO] buttons or the data dial.

```
FILE                    Current Dir:root
TYPE AllVoice        📁 NEWDATA
                     📁 NEWDIR
                     📁 NEWDIR01
            EXEC     📄 MYPEFORM.S7V
CONFIG | SAVE | LOAD | RENAME | DELETE
```
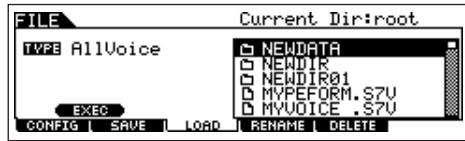
To return to the next highest level, press the [EXIT] button.

To call up the contents of a desired folder, highlight the folder and press the [ENTER] button.
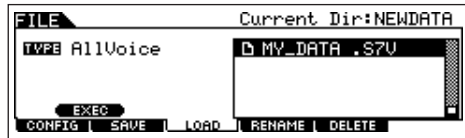
```
FILE                    Current Dir:NEWDATA
TYPE AllVoice        📄 MY_DATA .S7V

            EXEC
CONFIG | SAVE | LOAD | RENAME | DELETE
```

Move the cursor to the desired file or folder by using the [INC/YES] and [DEC/NO] buttons or the data dial.

Formatting a USB storage device

Before you can use a new USB storage device with this synthesizer, you will need to format it. Follow the instructions below.

⚠️**CAUTION**

If data is already saved to the USB storage device, be careful not to format it. If you format the USB storage device, all previously recorded data will be deleted.

1 Connect a USB storage device to the USB TO DEVICE connector.

If necessary, insert the proper media into the slot of the USB storage device.

2 Press the [FILE] mode to enter the File mode.

3 Press the [F1] CONFIG button, then the [SF2] FORMAT button to call up the Format display.

```
FILE
Format USB Device        Slot 1
       Type=all
       Volume_Label[USB-MEMORY ]
       Free  59.5MB/ 61.9MB
CURRENT [FORMAT]      PRESS [ENTER] TO EXEC.
CONFIG | SAVE | LOAD | RENAME | DELETE
```
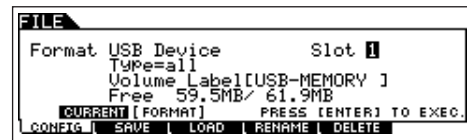
4 Select the slot and partition to be formatted.

Specify the slot number at the right top of the display as necessary and select the partition to be formatted at the Type value location in the second line of the display.

5 Set the Volume Label.

Move the cursor to the "Volume Label" and input a Volume Label.
For instructions on naming, refer to page 53 in the Basic Operation section.

6 Press the [ENTER] button. (The display prompts you for confirmation.)

Press the [DEC/NO] button to cancel the Format operation.

7 Press the [INC/YES] button to execute the Format.

After formatting has been completed, a "Completed" message appears and operation returns to the original display.

⚠️**CAUTION**

While formatting is in process, make sure to follow these precautions:
• **Never remove or eject the media from the USB storage device.**
• **Never unplug or disconnect any of the devices.**
• **Never turn off the power of the S90 ES or the relevant devices.**

📝**NOTE** By executing the Format operation in the File mode, the USB storage device will be formatted to MS-DOS or Windows format. The formatted USB storage device may not be compatible with other devices such as a Macintosh computer or a digital camera.

Voice mode
Performance mode
Multi mode
Multi Voice mode
Sequence Play mode
Utility mode
File mode
Master mode
Reference

File types that can be handled by the S90 ES

File types that can be saved from the instrument to the USB storage device [FILE] → [F2] SAVE → TYPE

TYPE	File extension	Description
All	*.S7A	All data in this synthesizer's internal User Memory is treated as a single file, and can be saved.
All Voice	*.S7V	All the User Voice data in this synthesizer's internal User Memory is treated as a single file, and can be saved.
Chain	*.S7C	The Chain data in the Sequence Play mode can be saved.
Plugin All Bulk 1-3	*.W2B	All the data of a Plug-in board (Board Voice data created by using the editor software that comes with the Plug-in Board and the Board related settings in the Utility mode) is treated as a single file, and can be saved. The numbers 1, 2, and 3 correspond to the Plug-in slots.
Voice Editor	*.S7E	All the User Voice data stored to User Banks is handled as a single file and saved. The saved file can be loaded to the Voice Editor software (page 77) on your computer.

NOTE A "All" file does not include the "Plugin All Bulk 1-3" data.

File types that can be loaded from USB storage device to the instrument [FILE] → [F3] LOAD → TYPE

TYPE	File extension	Description
All	*.S7A	Files of the "All" type can be loaded and restored to the instrument. When the box at the left of "without System" is checkmarked, only the Utility mode settings will not be loaded.
All Voice	*.S7V (*.W7V, *.W4V, *.W2V)	Files of the "All Voice" type can be loaded and restored to the instrument.
Voice	*.S7A, *.S7V (*.W7A, *.W4A, *.W2A, *.W7V, *.W4V, *.W2V)	A specified voice in a file that is saved as "All" or "All Voice" type can be individually selected and loaded to the instrument. Please note that the file icons of "All" and "All Voice" ▯ are changed to ▯ (as virtual folders) when this file type is selected (Quick Guide on page 52).
Performance	*.S7A	A specified performance in a file that is saved as an "All" type can be individually selected and loaded to the instrument. Please note that the file icon of "All" ▯ is changed to ▯ (as a virtual folder) when this file type is selected (Quick Guide on page 58).
Chain	*.S7C	Files of the "Chain" type can be loaded and restored to the instrument.
Plugin All Bulk 1-3	*.W2B	A file that is saved as "Plugin All Bulk 1, 2, 3" type can be loaded and restored to the Plug-in board installed to the instrument. Please note that the same Plug-in Boards should be installed to the same slots as when the file was saved.
Voice Editor	*.S7E	Voice data edited with the Voice Editor software (page 77) on your computer can be loaded to the instrument.
User Arp	*.W7G	Files of the "Usr ARP" type saved using the Yamaha MOTIF ES can be loaded and restored to the instrument.

NOTE The "All" and "All Voice" files using the S90, MOTIF ES, or MOTIF can be loaded to the S90 ES (*.W4A, *.W7A, *.W2A, *.W4V, *.W7V, *.W2V).
However, the Voices may not produce the exact same sound as those on the original instrument, since the contents of the preset Waveforms and the Effect structure are different between the two instrument series.

Voice mode

Performance mode

Multi mode

Multi Voice mode

Sequence Play mode

Utility mode

File mode

Master mode

Reference

Master mode

Master Play mode	[MASTER] → Master selection

The Master Play mode lets you perform a variety of general editing operations on the selected Master. For more detailed and comprehensive editing operations, use the Master Edit mode. Edited parameters with the exception of some parameters are stored to internal memory as a User Master.

[F1] PLAY

OCT (Octave)	Indicates Keyboard Octave setting. This can be changed also with the following operation: [UTILITY] → [F1] GENERAL → [SF2] KBD → Octave.
ASA (ASSIGN A), ASB (ASSIGN B)	Indicates the functions assigned to the respective Control sliders (printed "ASSIGN A" and "ASSIGN B") when the lamps of both the [PAN/SEND] and [TONE] buttons are turned on. The functions are assigned from the [UTILITY] → [F4] CTL ASN → [SF2] ASSIGN display.
NOTE	OCT (Octave), ASA (ASSIGN A), and ASB (ASSIGN B) settings are not independently assignable for each Master. Because of this, these are not stored as an individual Master in the Master Store mode (page 175).
AS1 (ASSIGN 1), AS2 (ASSIGN 2)	Indicates the values obtained by controlling the respective Control sliders (printed "ASSIGN 1" and "ASSIGN 2") when the lamps of both the [PAN/SEND] and [TONE] buttons are turned on. The functions assigned to these sliders depend on the setting of the Voice selected as a Master program.
[SF1] ARP1 (Arpeggio 1) - [SF5] ARP5 (Arpeggio 5)	You can call up the Arpeggio types by pressing these buttons to which the Arpeggio types are assigned. The Arpeggio type assigned to each button depends on the program (Voice, Performance, Multi) selected as a Master.

[F2] MEMORY

From this display you can set basic parameters for the Master, including the mode that is called up with the Master and the program number.

Mode	Determines the mode that is called up when the Master number is selected. **Settings:** Voice, Performance, Multi/SeqPlay.
Memory	Determines the Program number that is called up when the Master is selected. **Settings:** When the Mode is set to Voice: Select a Voice back and number. Refer to the instructions page 30. When the Mode is set to Performance: Select a Performance number. Refer to the instructions on page 34. When the Mode is set to Multi: Select a Multi number. Refer to the instructions on page 71.
ZoneSwitch	Determines whether the Zone function is used (on) or not (off). See page 93 for details about the Zone function. **NOTE** When the Mode is set to "Voice" or "Performance" and the Zone Switch is turned on, only Zone 1 can be used in the default setting (playing Zones 2-4 will produce no sound). You can use these Zones by setting various parameters in the Master Edit mode.

Reference

Voice mode
Performance mode
Multi mode
Multi Voice mode
Sequence Play mode
Utility mode
File mode
Master mode

172 *S90 ES* Owner's Manual

Master Edit mode	**[MASTER] → Master selection → [EDIT]**

The Master Edit is divided into Common Edit, for setting parameters common to all four Zones, and Zone Edit, for setting parameters of individual Zones.
When Zone Switch is set to on in the [F2] MEMORY display in the Master Play mode, only the Common Edit is available.

Common Edit	**[MASTER] → Master selection → [EDIT] → [COMMON]**

These parameters are for making global (or common) edits to all four Zones of the selected Master.

[F1] NAME

From this display you can create a name for the Master. For instructions on naming, refer to page 27 in the Basic Operation section.

[F2] OTHER

Slider	From this display you can set which row of slider functions will be lit and selected.
	Settings:
	pan ....Selecting the Master lights the [PAN/SEND] lamp, for control over the Pan/Send row.
	tone ....Selecting the Master lights the [TONE] lamp, for control over the Tone row.
	assign.......................Selecting the Master lights the [PAN/SEND] and [TONE] lamps, for control over the Assign row.
	MEQofs or partEQ ....Selecting the Master lights the [EQ] lamp, for control over the EQ row. When the Mode is set to Voice, MEQofs is available. When the Mode is set to Performance or Multi, partEQ is available.
	MEF ....Selecting the Master lights the [ARP FX] and [EQ] lamps, for control over the Master Effects row.
	arpFx ....Selecting the Master lights the [ARP FX] lamp, for control over the Arpeggio FX row.
	vol.............................Selecting the Master lights the [VOLUME] lamp, for control over the Volume row.
	zone...........................Selecting the Master lights no lamp and automatically calls up the slider functions specifically set for each respective Zone (page 91). This is available only when the Zone Switch is set to on in the [F2] MEMORY display in the Master Play mode.

Zone Edit	**[MASTER] → Master selection → [EDIT] → Zone selection**

These parameters are for editing the individual Zones that make up a Master. Zone Edit is available only when the Zone Switch is turned on in the [F2] MEMORY display in the Master Play mode.

[F1] TRANS (Transmit)

From this display you can set how each Zone transmits MIDI messages when you play the keyboard.

TransCh (Transmit Channel)	Determines the MIDI Transmit Channel for each Zone.
	Settings: 1 ~ 16
TGSwitch **(Tone Generator Switch)**	Determines whether or not MIDI data for each Zone is transmitted to the internal tone generator.
	Settings: on, off
MIDISwitch	Determines whether or not MIDI data for each Zone is transmitted to an external MIDI device.
	Settings: on, off

[F2] NOTE

From this display you can set the pitch- and keyboard-related parameters for each Zone — allowing you to set up Zone splits and determine the pitch range for each Zone.

Octave	Determines the amount in octaves by which the range of the Zone is shifted up or down.
	Settings: -3 ~ 0 (Default) ~ +3
Transpose	Determines the amount in semitones by which the range of the Zone is shifted up or down.
	Settings: -11 ~ 0 (Default) ~ +11
NoteLimitH, L (High, Low)	Determines the lowest and highest notes of the range for each Zone. The selected Zone will sound only when you play notes within this range.
	Settings: C -2 ~ G8
	NOTE You can also set the range directly from the keyboard, by holding down the [INFORMATION] button and pressing the desired low and high keys.

Voice mode
Performance mode
Multi mode
Multi Voice mode
Sequence Play mode
Utility mode
File mode
Master mode
Reference

Voice mode

Performance mode

Multi mode

Multi Voice mode

Sequence Play mode

Utility mode

File mode

Master mode

Reference

[F3] TX SW (Transmit Switch)

From this display you can set how the playing of each individual Zone affects transmission of various MIDI messages, such as Control Change and Program Change messages. When the relevant parameter is set to "on," playing the selected Zone will transmit the corresponding MIDI messages.
Note that two different display types are provided (see below). Each display type features the same settings in a different format; use the type you feel most comfortable with.
• Display showing four Zones
• Display showing all parameters for one Zone
Keep in mind that since all the available parameters cannot be simultaneously displayed in the four-Zone display, you will need to use the cursor controls to scroll the display in order to see and set the other parameters.

Settings:

Bank (TG)	Determines whether or not to transmit Bank Select MSB/LSB messages to the internal tone generator.
PC (TG)	Determines whether or not to transmit Program Change messages to the internal tone generator.
Bank (MIDI)	Determines whether or not to transmit Bank Select MSB/LSB messages to the external tone generator via MIDI.
PC (MIDI)	Determines whether or not to transmit Program Change messages to the external tone generator via MIDI.
PB (Pitch Bend)	Determines whether or not to transmit Pitch Bend messages to the internal and external tone generator.
MW (Modulation Wheel)	Determines whether or not to transmit MIDI messages generated by using the Modulation Wheel to the internal and external tone generator.
ChAT (Channel Aftertouch)	Determines whether or not to transmit Channel Aftertouch messages generated by pressing the keys to the internal and external tone generator.
BC (Breath Controller)	Determines whether or not to transmit MIDI messages generated by using the Breath controller connected to the BREATH connector to the internal and external tone generator.
Slider	Determines whether or not to transmit MIDI messages generated by using the sliders to the internal and external tone generator.
FC1 (Foot Controller1) FC2 (Foot Controller2)	Determines whether or not to transmit MIDI messages generated by pressing the optional Foot Controller to the internal and external tone generator.
Vol (Volume)	Determines whether or not to transmit Volume messages to the internal and external tone generator.
Pan	Determines whether or not to transmit Pan messages to the internal and external tone generator.
Sus (Sustain)	Determines whether or not to transmit Sustain messages generated by pressing the Footswitch connected to the SUSTAIN jack to the internal and external tone generator.
FS (Footswitch)	Determines whether or not to transmit MIDI messages generated by pressing the Footswitch connected to the ASSIGNABLE jack to the internal and external tone generator.

[F4] PRESET
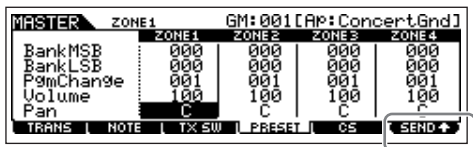
From this display you can make the Voice-related settings for each Zone, in the selected Master program number. In this way, selecting a different Master automatically calls up a completely different set of Voices and Voice-related settings for the four Zones.

> **NOTE** Using the [F6] SEND button, you can select whether the settings in PRESET display are immediately applied or not.
> If the [F6] SEND button is turned on (**SEND**), each MIDI messages will be output from the S90 ES as soon as you changed each parameter in this display.
> If the [F6] SEND button is turned off (**SEND**), each MIDI messages will be output from the S90 ES after you store the edited Master and then select the Master again.
> However, the parameters set to off in the [F1] TRANS or [F3]TX SW display cannot be output.

BankMSB, BankLSB, PgmChange (Program Change)	Determines the Voice assignment for each Zone in the selected Master. **Settings:** Refer to the Voice List in the separate Data List booklet.
Volume	Determines the output level of the Voice in each Zone. **Settings:** 0 ~ 127
Pan	Determines the stereo pan position of the Voice in each Zone. **Settings:** L64 (Left) ~ C (Center) ~ R63 (Right)

[F5] CS (Control slider)

From this display you can determine which Control Change numbers are used for the sliders for each Zone. These settings are available only when the slider parameter (in the [F2] OTHER display in Common Edit) is set to "zone."

Settings: off, 1~95

Master Job mode   [MASTER] → [JOB]

The Master Job mode contains two convenient operations (called "Jobs") — one letting you initialize (reset) the Master data, and the other letting you transmit your edited Master data to an external MIDI device or computer.
After setting parameters as required from the selected display, press the [ENTER] button to execute the Job.

[F1] INIT (Initialize)

This function lets you reset (initialize) all Master parameters to their default settings. It also allows you to selectively initialize certain parameters, such as Common settings, settings for each Zone, and so on — very useful when creating a completely new Master from scratch.
Parameter Types (for Initializing): All, Common, Zone

ALL		All settings for the selected Master are initialized.
Common		Common parameter settings for the selected Master are initialized.
Zone		You can initialize the Zone setting to one of the following three types.
	Split	Splits the keyboard range using Zone 1 and Zone 2. "UpperCh" determines the MIDI transmit channel of the upper range of the keyboard, "LowerCh" determines the MIDI transmit channel of the lower range of the keyboard, and "SplitPoint" determines the note (C2 ~ G8) number which separates the upper range and lower range of the keyboard.
	4Zone	Initializes all four Zones.
	Layer	Lets you layer two parts using Zone 1 and Zone 2. "UpperCh" and "LowerCh" determine the MIDI transmit channels of the two Zones respectively.

[F4] BULK (Bulk Dump)

This function lets you send all your edited parameter settings for the currently selected Master to a computer or another MIDI device for data archiving. For details, see page 126.

NOTE   In order to execute Bulk Dump, you'll need to set the correct MIDI Device Number, with the following operation: [UTILITY] → [F5] MIDI → [SF1] CH → DeviceNo.

Master Store mode   [MASTER] → Master selection → [STORE]

This function lets you store your edited Master to User memory. For details, refer to page 126 in the Quick Guide section.

Voice mode

Performance mode

Multi mode

Multi Voice mode

Sequence Play mode

Reference

Utility mode

File mode

Master mode

Appendix

Information Displays

The convenient Information displays let you see at-a-glance some of the more important settings relevant to each mode.
Select the desired mode, then press the [INFORMATION] button to call up the Information display for that mode.

Voice mode

```
VOICE                       TCH= 1
 INFORMATION
  Bank      000/000 │ InsA:3 Band EQ
  EL 1234     Poly  │ InsB:Thru
  Porta        off  │ Rev :Large Hall
  PB         - 2/+ 2│ Cho :Chorus 1
```
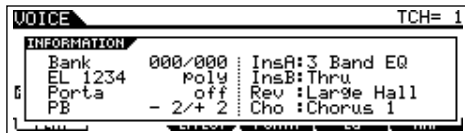
Bank
Indicates the MSB/LSB (page 180) of currently selected
Voice bank.

EL 1234
Indicates the currently selected Voice, on/off status of four
Elements and mono/poly (page 128) status.

Porta (Portamento)
Indicates the Portamento switch on/off status of the
currently selected Voice.

PB (Pitch Bend)
Indicates the Upper/Lower setting of the Pitch Bend range.

InsA (Insertion A), InsB (Insertion B)
Rev (Reverb), Cho (Chorus)
Indicates the currently selected effect type for each effect
block (page 121).

Performance mode

```
PERF                        TCH= 1
 INFORMATION
  Bank      063/064 │ Ins:1234
  1:PLG100-VH        │ InsPLG:□
  2:PLG150-VL        │ Rev:R3 Hall
  3:PLG100-XG        │ Cho:Chorus 1
```

Bank
Indicates the MSB/LSB (page 180) of currently selected
Performance bank.

1 (Plug-in board 1), 2 (Plug-in board 2),
3 (Plug-in board 3)
Indicates the installation status of the respective Plug-in
board. The Plug-in board name is displayed at the right of
the corresponding slot number. When PolyExpand (page
167) is set to on in the Utility mode, "P" is indicated at the
left of the slot number.

Ins (Insertion), InsPLG (Plug-in Insertion)
Indicates the part number to which the Insertion effect is
applied and the part number to which the Plug-in Insertion
effect is applied (when the PLG100-VH is installed).

Rev (Reverb), Cho (Chorus)
Indicates the currently selected effect type for each effect
block (page 122).

Multi mode
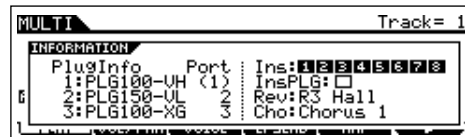
```
MULTI                      Track= 1
 INFORMATION
  PlugInfo  Port │ Ins:12345678
  1:PLG100-VH (1)│ InsPLG:□
  2:PLG150-VL  2 │ Rev:R3 Hall
  3:PLG100-XG  3 │ Cho:Chorus 1
```

PlugInfo/Port (Plug-in board installation status)
Indicates the Plug-in board name and its MIDI port number
(page 167) at the right of the slot number. When
PolyExpand (page 167) is set to on in the Utility mode,
"P" is indicated at the left of the slot number.

Ins (Insertion), InsPLG (Plug-in Insertion)
Indicates the part number to which the Insertion effect is
applied and the part number to which the Plug-in Insertion
effect is applied (when the PLG100-VH is installed).

Sequence Play mode

```
SEQPLAY              ♩090  Meas---
CHAIN
 INFORMATION
  Play Dir       Slot1 [USB-MEMORY ]
   root/
  Current Dir    Slot1 [USB-MEMORY ]
   root/
```
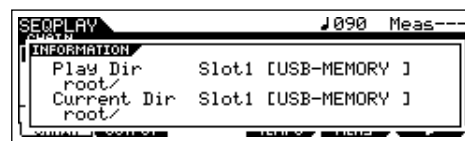
Play Dir (Play Directory)
Indicates the slot number and volume label of USB storage
device's directory used in the Sequence Play mode, and
indicates the path to the directory.

Current Dir (Current Directory)
Indicates the currently selected directory.

Utility mode
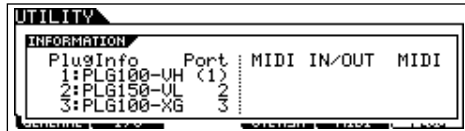
```
UTILITY
INFORMATION
PlugInfo    Port : MIDI IN/OUT  MIDI
  1:PLG100-VH (1):
  2:PLG150-VL    2 :
  3:PLG100-XG    3 :
```

PlugInfo/Port (Plug-in board installation status)

Indicates the Plug-in board name and its MIDI port number (page 167) at the right of the slot number. When PolyExpand (page 167) is set to on in the Utility mode, "P" is indicated at the left of the slot number.

MIDI IN/OUT

Indicates which physical output terminal(s) will be used for transmitting/receiving MIDI data.
However, the following display will be shown in the [F1] GENERAL → [SF4] OTHER display.

```
UTILITY
INFORMATION
AutoLoad Dir
  Slot1  Volume Label=
    root/
```
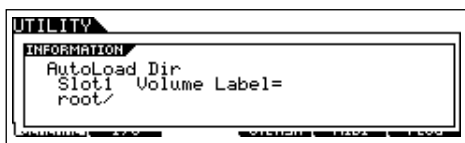
AutoLoad Dir (Auto Load Directory)

Indicates the slot number and volume label of USB storage device's directory used in the Auto Load function, and indicates the path to the directory.

File mode

```
FILE              Current Dir:root
INFORMATION
USB Free  59.5MB/ 61.9MB    Slot1
     Volume Label=USB-MEMORY
Current Dir
   root/
```
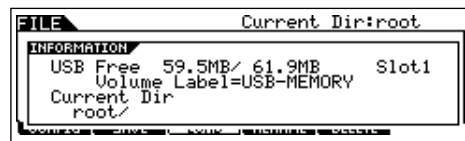
USB Free

Indicates the amount of currently available (unused) memory of the connected USB storage device.

Slot, Volume Label

Indicates the slot number and volume label of USB storage device's directory used in the File mode.

Current Dir (Current Directory)

Indicates the currently selected directory.

Master mode

```
MASTER            Voice:  GM:001(A01)
INFORMATION
Mode       Voice
    GM:001[AP:ConcertGnd]
ZoneSwitch    off
ZoneTCH  1:1   2:1   3:1   4:1
```
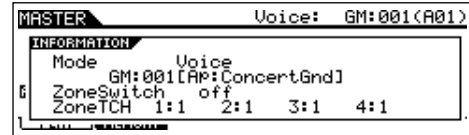
Mode

Indicates the mode and program number memorized to the currently selected Master.

ZoneSwitch

Indicates the on/off status of the Zone switch.

ZoneTCH (Zone Transmit Channel)

Indicates the MIDI transmit channel of each zone (when the Zone Switch is set to on).

Remote Control mode

```
REMOTE            ModeA=General Port=4
INFORMATION
PANEL SW    FUNCTION       LED
  VOICE       STOP      ----------
```
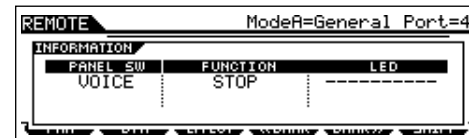
See page 83 for details.

Appendix

Display Messages

LCD Indication	Description
Are you sure? [YES]/[NO]	Confirms whether you want to execute a specified operation or not.
Arpeggio type stored.	The current Arpeggio type has been stored to one of the [SF1] - [SF5] buttons.
Bad USB device.	The USB storage device is unusable. Format the device and try again.
Bulk protected.	Bulk data was received when RcvBulk was set to "protect." (See page 166.)
Can't make folder.	No more directories can be created below the current level.
Completed.	The specified load, save, format, or other job has been completed.
Device number is off.	Bulk data cannot be transmitted/received because the device number is set to "off."
Device number mismatch.	Bulk data cannot be transmitted/received because the device numbers don't match
Effect plug-in is not in slot 1.	The Effect Plug-in board does not work because it has not been installed to slot 1.
Executing...	A format operation or job is being executed. Please wait.
File already exists.	A file having the same name as the one you are about to save already exists.
File not found.	Can't find the specified type of file.
Folder is too deep.	Directories below this level cannot be accessed.
Folder not empty.	You have attempted to delete a folder that contains data.
Illegal USB device.	USB storage device has been incorrectly formatted.
Illegal file.	The file specified for loading is unusable by the S90 ES or cannot be loaded in the current mode.
Illegal file name.	The specified file name is unacceptable.
Incompatible USB device	A USB device which cannot be used with the S90 ES has been connected to the USB TO DEVICE connector.
MIDI buffer full.	Failed to process the MIDI data because too much data was received at once.
MIDI checksum error.	Error occurred when receiving bulk data.
MIDI data error.	Error occurred when receiving MIDI data.
Multi plug-in is not in slot 3.	The Multi-Part Plug-in board does not work because it has not been installed to slot 3.
No response from USB device.	There is no response from the USB device connected to the USB TO DEVICE terminal.
Not empty folder.	You have attempted to delete a folder that contains data.
Now checking plug-in board.	The S90 ES is checking the Plug-in board installation status during power-on.
Now loading... (xxxx)	Indicates that a file is being loaded.
Now saving... (xxxx)	Indicates that a file is being saved.
Now scanning autoloaded files.	Scanning for the files specified for Auto Load.
Now working...	Executing the memory arrangement after canceling the Load/Save operation by pressing the [EXIT] button.
Overwrite? [YES]/[NO]	A save operation will overwrite data on the USB storage device, and this message confirms whether it is OK to continue or not. Press [INC/YES] or [DEC/NO] as required.
Please keep power on.	The data is being written to internal memory. Never attempt to turn off the power while data is being written to internal memory. Turning the power off while this message is shown results in loss of all user data and may cause the system to freeze. This may also result in the S90 ES being unable to properly start up the next time the power is turned on.
Please stop sequencer.	The operation you've attempted to execute cannot be done during sequencer playback.
PLG100 not supported.	The Plug-in All Bulk Save function does not apply to the PLG100 series boards.
Plug-in1 communication error.	The Plug-in board that has been installed to slot 1 does not work.
Plug-in1 type mismatch.	The User Voice created by using the Plug-in board previously installed to slot 1 (but now removed from slot 1) has been selected.
Plug-in2 communication error.	The Plug-in board that has been installed to slot 2 does not work.
Plug-in2 type mismatch.	The User Voice created by using the Plug-in board previously installed to slot 2 (but now removed from slot 2) has been selected.
Plug-in3 communication error.	The Plug-in board that has been installed to slot 3 does not work.
Plug-in3 type mismatch.	The User Voice created by using the Plug-in board previously installed to slot 3 (but now removed from slot 3) has been selected.
Power on mode stored.	The setting of the program number automatically selected when turning the power on has been stored.
Read only file.	You have attempted to delete, rename, or overwrite a read-only file.
Receiving MIDI bulk.	The S90 ES is receiving MIDI bulk data.
System memory crashed.	Writing data to internal Memory has failed
This performance uses user voices.	The performance you have loaded includes User voice data. Check whether the voice you saved exists at the appropriate User voice bank.
Too many favorites.	You've attempted to assign more than 257 voices to the Favorite category.
Transmitting MIDI bulk.	The S90 ES is transmitting MIDI bulk data.
Unknown file format.	File format is not recognized.

LCD Indication	Description
USB connection terminated. Press [ENTER].	A break in the connection with the USB storage device has occurred because of an abnormal electric current. Disconnect the USB storage device from the USB TO DEVICE connector, then press the [ENTER] button.
USB device connecting.	Currently recognizing the USB storage device connected to the USB TO DEVICE terminal.
USB device full.	The USB storage device is full and no more data can be saved. Use a new USB storage device, or make space by erasing unwanted data from the USB storage device.
USB device not ready.	A USB storage device is not properly inserted in or connected to the S90 ES.
USB device read/write error.	An error occurred while reading or writing to/from a USB storage device.
USB device unformatted.	The disk is not formatted, or the format is unusable by the S90 ES.
USB device write protected.	The USB storage device is write protected, or you have attempted to write to a read-only medium such as CD-ROM.
USB power consumption exceeded.	The power consumption of the USB storage device connected to the USB TO DEVICE connector exceeds the regulated value.
USB transmission error.	An error has occured when communicating with the USB storage device.
Utility stored.	The settings in the Utility mode have been stored.

About MIDI

"MIDI" is an acronym for "Musical Instrument Digital Interface," and is a worldwide standard designed to allow performance, voice, and other data to be transferred between musical instruments. Data communication is assured even between musical instruments and equipment from different manufacturers.
This synthesizer can control other MIDI devices by transmitting note related data and various types of controller data. It can also be controlled by incoming MIDI messages which automatically determine the 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 listed in the About MIDI section and the MIDI Data Format (in the separate Data List) lists are expressed in decimal numbers, binary numbers and hexadecimal numbers.
Hexadecimal values have "H (hexadecimal)" at the beginning of the data line or at the end of the values. Also, "n" indicates any integer number.

MIDI Channels

MIDI data is transferred over 16 channels numbered from 1 through 16. Using these channels, 1 - 16, the performance data for sixteen different instrument parts can be simultaneously sent over one MIDI cable.

MIDI channels can be thought of as being like television channels. Each TV station broadcasts on a separate 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.
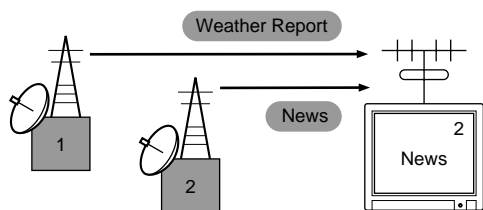
MIDI operates on the same basic principle. The transmitting instrument sends MIDI data on a specific MIDI channel (MIDI Transmit Channel) via a single MIDI cable to the receiving instrument.
If the receiving instrument's MIDI channel (MIDI Receive Channel) matches the Transmit Channel, the receiving 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 65.

MIDI Transmit channel 2   MIDI Receive channel 2
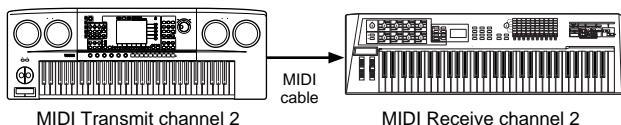
MIDI channel and MIDI port

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 67.

MIDI Messages Transmitted/ Recognized by this synthesizer

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.

> **NOTE** Some of the following explanations are described in a general sense, and not necessarily as how they relate to the S90 ES. For details about the behavior of S90 ES when receiving each MIDI message, refer to the "MIDI Data Format" and the "MIDI Implementation Chart" in the separate Data List.

Channel Messages

Channel messages contain data related to the performance on the keyboard for the specific channel.

■ Note On/Off

Messages which are generated when the keyboard is played.
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.
Reception note range = C-2 (0) - G8 (127), C3 = 60
Velocity range = 1 - 127 (Only the Note On velocity is received)

■ 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 Change #000)
Bank Select LSB (Control Change #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. A new bank selection will not become effective until the next Program Change message is received.
For more information about Banks and Programs, see "Voice List" in the separate Data List.

Modulation Wheel (Control Change #001)

The MIDI data produced when a modulation wheel is operated. Setting the value to 127 produces maximum vibrato and 0 results in vibrato off.

Portamento Time (Control Change #005)

Messages which control the duration of portamento, or a continuous pitch glide between successively played notes. Setting the value to 127 produces maximum portamento time and 0 results in minimum portamento time. When the parameter Portamento Switch (Control Change #065) is set to on, the value set here can adjust the speed of pitch change.

Data Entry MSB (Control Change #006)
Data Entry LSB (Control Change #038)

Messages which set the value for the parameter specified by RPN MSB/LSB (page 182) and NRPN MSB/LSB (page 182). The value is represented by two control change data numbers — the MSB and the LSB.

Main Volume (Control Change #007)

Sets the volume for each individual part. Setting the value to 127 produces maximum volume and 0 results in volume off.

Pan (Control Change #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 Change #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 Change #064)

Messages which control sustain on/off. Notes playing when the pedal is pressed will be sustained. Setting the value between 64 - 127 turns the sustain on, between 0 - 63 turns the sustain off. While sustain is on, notes currently playing will be sustained, even if Note Off messages are received.

> **NOTE** The Half Damper function lets you finely control the length of sustain over a range of 1 - 127, according to the depth at which you press a continuous foot pedal.

Portamento (Control Change #065)

Messages which control portamento on/off. Setting the value between 64 –127 turns the portamento on, and between 0 - 63 turns the portamento off.
If portamento is turned on and the Mono/Poly parameter is set to "mono," expressive legato play is possible. In other words, when you play one note before releasing the next, the pitch will glide smoothly from note to note, and the envelopes (PEG, FEG and AEG) will stay in effect from note to note — mimicking the natural behavior of acoustic instruments. The speed of the pitch glide is determined by the portamento time (Control Change #005).

Sostenuto Pedal (Control Change #066)

Messages which control sostenuto on/off. Setting the value between 64 –127 turns the sostenuto on, between 0 - 63 turns the sostenuto 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.

Harmonic Content (Control Change #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.

Release Time (Control Change #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 Change #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 Change #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.

Decay Time (Control Change #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.

Effect Send Level 1 (Reverb Depth) (Control Change #091)

Specifies the reverb effect send level.

Effect3 Send Level 3 (Chorus Depth) (Control Change #093)

Messages which adjust the send level for the Chorus effect.

Data Increment (Control Change #096)
Data Decrement (Control Change #097)

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.

NRPN (Non Registered Parameter Number) LSB (Control Change #098) (only for Plug-in Board)
NRPN (Non Registered Parameter Number) MSB (Control Change #099) (only for Plug-in Board)

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 181) 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 RPN, 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 Change #100)
RPN (Registered Parameter Number) MSB (Control Change #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 above 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 Name
00H	00H	Pitch Bend Sensitivity
00H	01H	Fine Tune
00H	02H	Coarse Tune
7FH	7FH	Null

■ **Channel Mode Messages**

2nd BYTE	3rd BYTE	MESSAGE
120	0	All Sound Off
121	0	Reset All Controller
123	0	All Notes Off
126	0 –16	Mono
127	0	Poly

All Sound Off (Control Change #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 Change #121)

Resets all controllers to their initial values.

Controller	Initial Value
Pitch Bend	0 (center)
Aftertouch	0 (min)
Modulation	0 (min)
Expression	127 (max)
Breath Controller	127 (max)
Foot Controller	127 (max)
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	Number not specified; internal data will not change

All Notes Off (Control Change #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 Change #126)

Performs the same operation as when an All Sound Off message is received. If the 3rdbyte parameter (the parameter that determines the mono number) is 0 - 16 the parts corresponding to those channels are set to mono.

Poly (Control Change #127)

Performs the same operation as when an All Sound Off message is received, and sets the parts corresponding to those channels are set to poly.

■ 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.

> **NOTE** Keep in mind that the programs of the S90 ES are numbered starting with 1. This means that when you use MIDI program change numbers 0 - 127, you will have to subtract 1 from the S90 ES program to determine the correct MIDI program change number. (For example, to call up program number 128 on the S90 ES you will have to specify MIDI program change number 127.)

■ 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.

■ Polyphonic Aftertouch

Messages which let you control the sounds by the pressure you apply to the keys after the initial striking of the keys, for each individual key. This synthesizer does not transmit this data from the keyboard.

System Messages

System messages are the data related to the overall system of the device.

■ System Exclusive Message

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. When the instrument receives the GM System On, each receive channel of Parts 1-16 (in a Multi) will be assigned to "1- 16."

```
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.

MIDI 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 S90 ES will be switched.

* n = Device Number (page 166)
* m = 0, 1, or 3 (0: Voice mode, 1: Performance mode, 2: not available, 3: Multi mode, 4: Master)

```
F0 43 1n 7F 01 0A 00 01 0m F7 (Hexadecimal)
```

■ System Realtime Messages

These messages control the sequencer.

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 S90 ES will perform the same function as when 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 to synchronize connected MIDI instruments. You can select whether the S90 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."

Start (FAH)

This message lets the MIDI sequence data start playing back from the beginning. This message will be transmitted when pressing the [F6] ▶ (Play) button at the top of the MIDI song file.

Continue (FBH)

This message lets the MIDI sequence data start playing back from the current song position. This message will be transmitted when pressing the [F6] ▶ (Play) button at the middle of the MIDI song file.

Stop (FCH)

This message causes MIDI sequence data (song) to stop playing back. This message will be transmitted when pressing the [F6] ■ (Stop) button while playing back the MIDI song file.

> **NOTE** You can select whether this synthesizer will transmit Timing Clock, Start, Continue, and Stop messages by setting the SeqCtrl parameter: [UTILITY] → [F5] MIDI → [SF3] SYNC → SeqCtrl.

Installing Optional Hardware

Available devices

Plug-in Boards
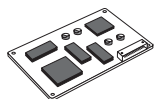
Up to three boards can be installed.

mLAN16E
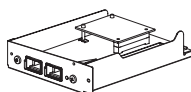
Locations to which the optional units are installed

Plug-in Board cover

mLAN16E cover
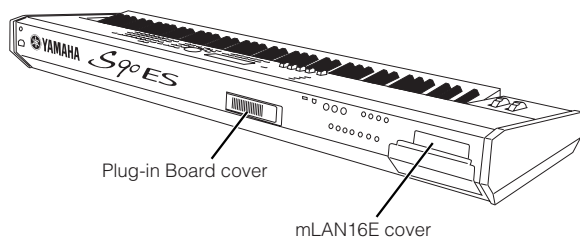
Installation Precautions

Before installing the optional hardware, make sure you have a Phillips screwdriver and ample space to work. Protective cushions or supports for the instrument may also be needed.

⚠ WARNING

- **Before beginning installation, switch off the power to the instrument and connected peripherals, and unplug them from the power outlet. Then remove all cables connecting the instrument to other devices. (Leaving the power cord connected while working can result in electric shock. Leaving other cables connected can interfere with work.) Installation or removal of any devices should be started ONLY after the instrument (and the optional hardware) returns to normal room temperature.**

- **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.**

- **Before handling the optional units, you should briefly touch the metal surface to which the optional unit cover is attached (or other such metallic area/be careful of any sharp edges) with your bare hand so as to drain off any static charge from your body. Note that even a slight amount of electrostatic discharge may cause damage to these components.**

⚠ 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.**

How to Install the Optional Plug-in Board

A variety of optional Plug-in boards sold separately let you expand the voice library of your instrument. The S90 ES provides three slots behind the rear panel for the Plug-in Boards, allowing you to install up to three board to the instrument. For details about the Plug-in Boards which can be used with the S90 ES, see page 99.

NOTE The Vocal Harmony Plug-in board (PLG100-VH) can be installed only to slot 1.

NOTE The Multi part Plug-in Board (PLG100-XG) can be installed only to slot 3.

NOTE The Single Part Plug-in boards can be installed to any of the three slots.

1 **Turn the S90 ES's power off, and disconnect the AC power cord. Also, make sure to disconnect the S90 ES from any other external devices.**

2 **Remove the large screw from the expansion bay cover on the rear panel using a Phillips screwdriver.**

IMPORTANT Keep the removed screw in a safe place. Be careful not to misplace any of the screws since all of them are used.
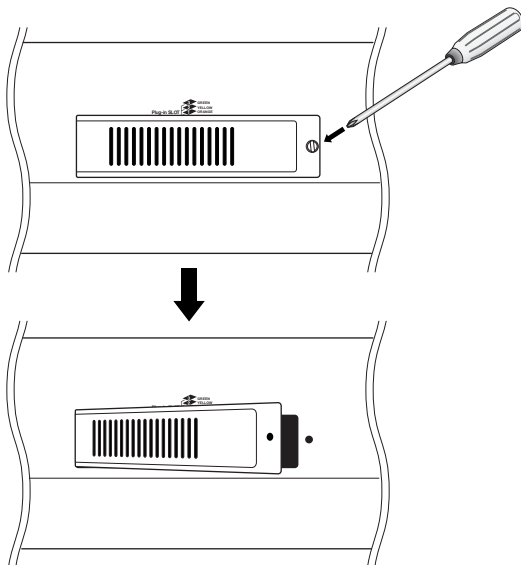
3 **Remove the ribbon cables that are to be connected to the Plug-in board from the inside of the S90 ES.**

The slots are assigned to the color-coded cables as follows: Slot 1 — orange, Slot 2 — yellow, Slot 3 — green.

Plug-in SLOT GREEN YELLOW ORANGE

Slot 3
Slot 2
Slot 1

Cable for Slot 3 (Green)
Cable for Slot 2 (Yellow)
Cable for Slot 1 (Orange)

Green
Yellow
Orange
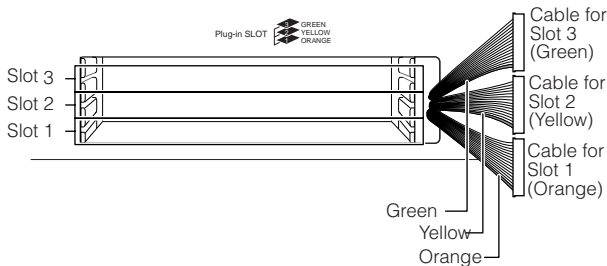
4 **Insert the board along the guide rails about two-thirds of the way inside the S90 ES, with the connector side face up and toward you.**

Plug-in SLOT GREEN YELLOW ORANGE

Slot 3

Slot 2

Slot 1

Securely insert the board into the appropriate slot, taking care that the board isn't jammed between slots.
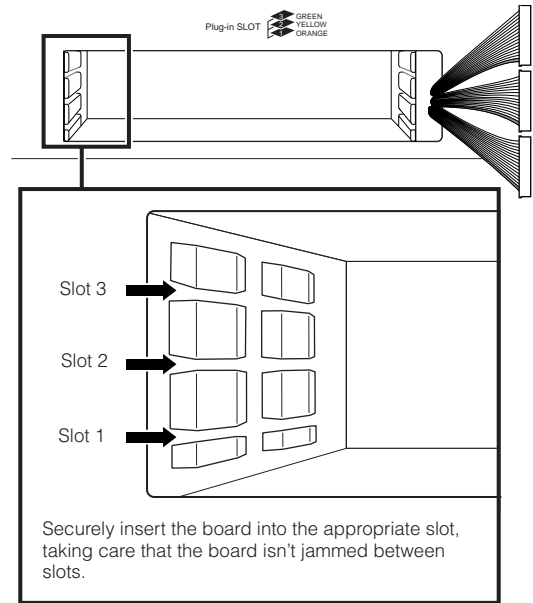
5 **Insert the Plug-in board the rest of the way into the expansion bay.**

Plug-in SLOT GREEN YELLOW ORANGE
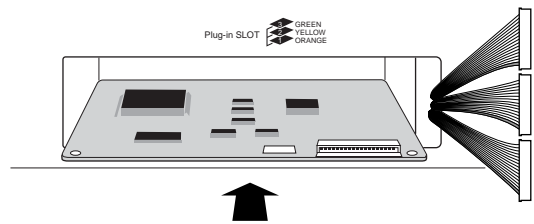
NOTE The Vocal Harmony Plug-in Board (PLG100-VH) can be installed only to slot 1. It cannot be installed to slot 2 or 3.

NOTE The Multi part Plug-in Board (PLG100-VH) can be installed only to slot 3. It cannot be installed to slot 1 or 2.

Appendix

6 Connect the cable to the Plug-in Board.

Make sure to connect the proper cable, matching the color of the cable to the slot used.

Plug-in connector

Notch

Press the connectors together until the two notches lock into the sockets.

Connector from S90 ES   Plug-in board

Plug-in SLOT   GREEN YELLOW ORANGE
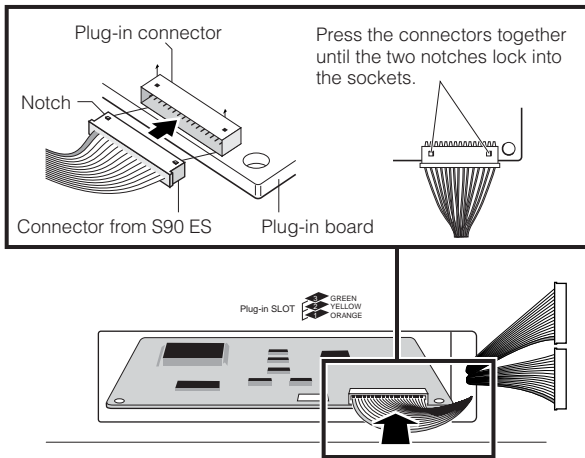
7 Carefully put the cable back into the S90 ES, making sure that no part of the cable sticks out of the instrument.

Plug-in SLOT   GREEN YELLOW ORANGE
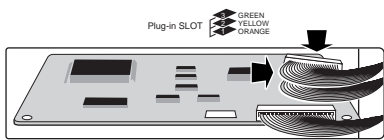
8 Replace the cover with the screw you removed in step 2 above.

9 Check that the installed Plug-in board is functioning properly.

After connecting the AC power cord to the S90 ES, turn on the power. The main display then appears and the corresponding slot indicator at the right top of the front panel lights. This indicates that the board has been successfully installed. If the cable is not connected properly or firmly, the indicator will not light.

Slot indicator

SLOT 1   SLOT 2   SLOT 3

PRE 4   GM   PLG 1   PLG 2   PLG 3   CATEGORY SEARCH

GUITAR/ PLUCKED   BASS   STRINGS   BRASS   REED/PIPE
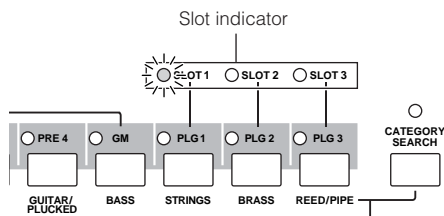
In this example, a Plug-in board has been installed to slot 1.

Installing the mLAN16E

The mLAN expansion board (mLAN16E) sold separately can be installed to this instrument.

1 Turn the S90 ES's power off, and disconnect the AC power cord. Also, make sure to disconnect the S90 ES from any other external devices.

2 Turn over the S90 ES so you can have direct access to the underside.

To protect the wheels and sliders, place the keyboard so the four corners are supported by something that provides sufficiently high and firm support, such as magazines or cushions.
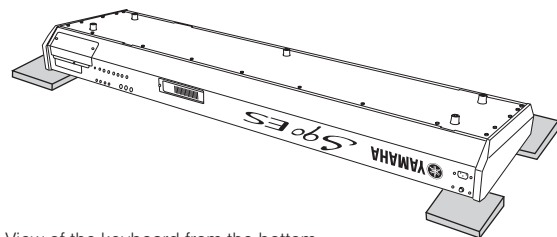
View of the keyboard from the bottom

Place supports at all four corners, taking care not to touch the wheels and sliders.
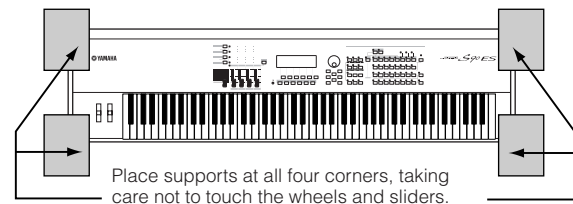
⚠ *CAUTION*

Since this instrument is very heavy, this procedure should not be done alone, but by two or three people.

3 Remove the top cover on the rear of the instrument (as shown below).

With the rear panel facing you, remove the screws of the top cover, then remove the cover from the instrument.
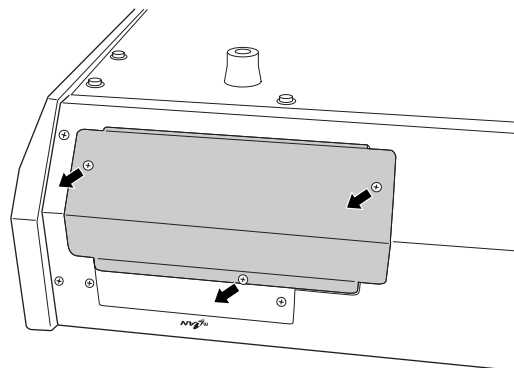
IMPORTANT Keep the removed screws in a safe place. They will be used when attaching the cover to the S90 ES again after installing the mLAN16E. Also make sure to keep the cover in a safe place. Do not leave the cover inside the instrument.

4 Remove the second cover (shown below).

Hold the cover with your hand and remove the two screws.
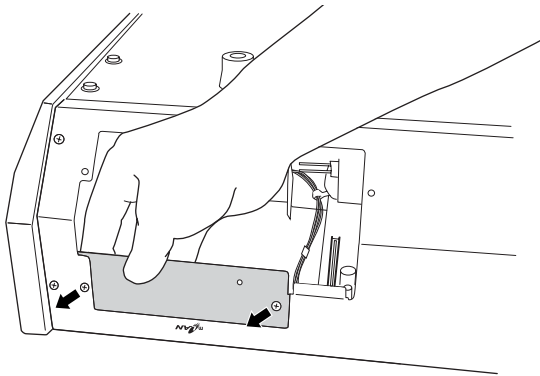
IMPORTANT Keep the removed screws in a safe place. They will be used when installing the mLAN16E to the S90 ES. Also make sure to keep the cover in a safe place. Do not leave the cover inside the instrument.

5 Remove the mLAN16E from its package.

6 Attach the sticker label to the front of the mLAN16E.

Remove the protective transparent film from the label, then apply it to the panel of the mLAN16E.
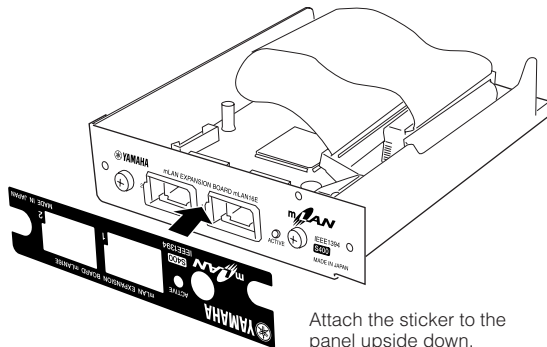
Attach the sticker to the panel upside down.

7 Fasten the mLAN16E to the S90 ES.
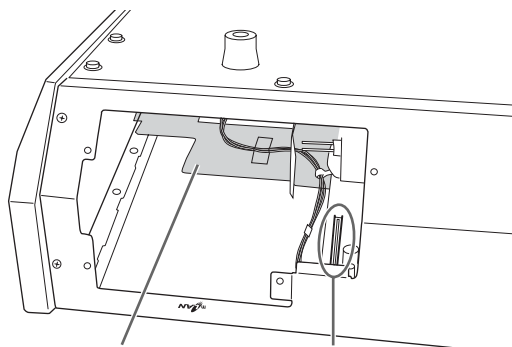
Place the mLAN16E here.   Cable connector

Insert the mLAN16E into the opening of the instrument with the panel facing out. While holding the panel with your hand, fasten the panel to the instrument with the screws you removed in step #4 above.
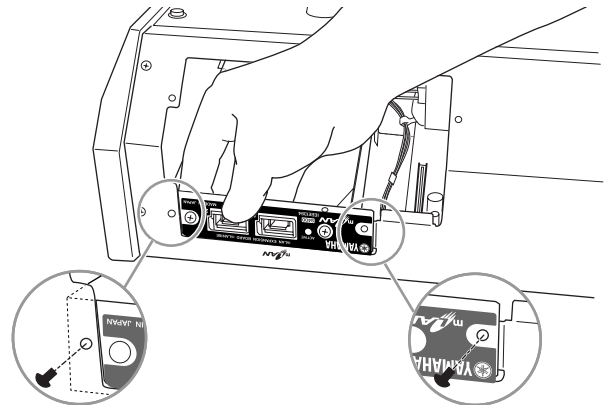
Fasten the screw with the front panel of the mLAN16E inside the instrument.

Fasten the screw with the front panel of the mLAN16E outside the instrument.

8 Insert the connector on the other end of the flat ribbon cable to the circuit board of the S90 ES.
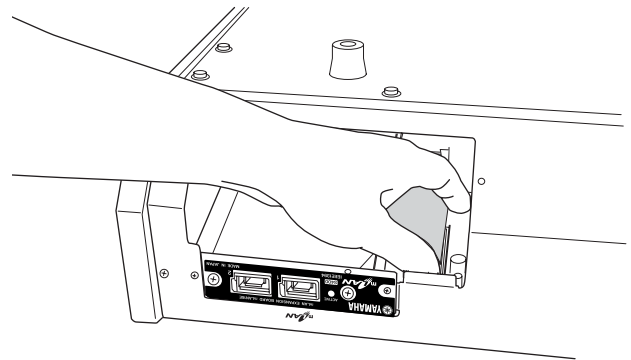
9 Re-install the cover you removed in step #3, in reverse order.
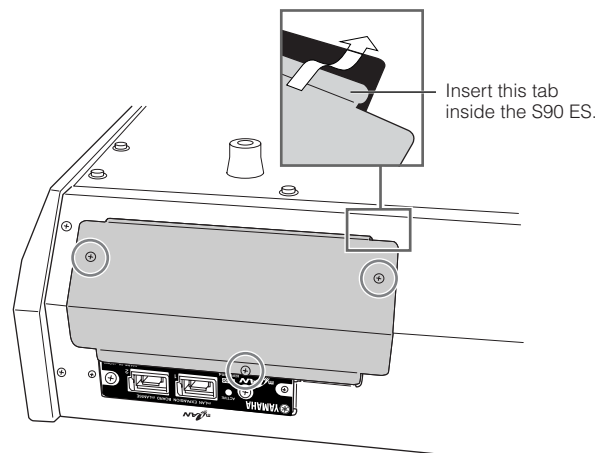
Insert this tab inside the S90 ES.

Specifications

Keyboard		88 keys, Balanced Hammer Effect Keyboard (Initial Touch/Aftertouch)
Tone Generator block	Tone Generator	AWM2 (complying with the Modular Synthesis Plug-in System)
	Maximum polyphony	128 notes + the polyphony of the Plug-in Board (if installed)
	Multi Timbral Capacity	16 Internal Parts + 3 Plug-in Boards + Audio Input Part(s) (A/D, mLAN*) * 4 stereo parts
	Wave	228MB (when converted to 16-bit linear format), 1,935 waveforms
	Voice	Preset: 512 normal voices + 64 drum kits GM: 128 normal voices + 1 drum kits User: 128 x 2 (Bank 1: Original, Bank 2: copied from Preset bank) 　　　　Normal Voice + 32 drum kits
	Plug-in Voice	Preset for the PLG150-AN/DX/PF/DR/PC: 64 Preset for the PLG-150VL: 192 User: 64 for each Plug-in slot
	Performance	User: 128 (up to 4 Parts)
	Multi	User: 64
	Filter	18 types
	Effects	Reverb x 20 types, Chorus x 49 types, Insertion (A, B) x 117 types x 8 blocks, Master Effect x 8 types, Master Equalizer (5 bands), Part EQ (3 bands, stereo), Plug-in Insertion (available when the PLG100-VH has been installed to slot 1)
	Expendability	3 Slots for Modular Synthesis Plug-in Boards
Sequencer Section	Sequence Play	SMF Format 0 (playback only)
	BPM (Tempo)	1 - 300
	Number of Chain Steps	100
	Arpeggio	Preset x 1,787 types User x 256 types (when loading the User Arpeggio data of MOTIF ES). * MIDI Sync, MIDI transmit/receive channel, Velocity Limit, and Note Limit can be set.
Other	Master	User: 128 * 4 Zones (Master keyboard settings), Assignable Slider settings, Program Change Table
	Sequence Software compatible with the Remote Control function	For Windows®: Cubase SX 3, SQ01 V2, SONAR 4, S90 ES/MOTIF ES/MOTIF-RACK ES/MOTIF-RACK Multi Part Editors. For Macintosh®: Cubase SX 3, Logic Pro 7, Digital Performer 4.52, S90 ES/MOTIF ES/MOTIF-RACK ES/MOTIF-RACK Multi Part Editors * Functions to be controlled by the S90 ES differ depending on the software you use.
	Controllers	Pitch Bend wheel, Modulation wheel, Assignable Control sliders (4), Data dial
	Display	240 x 64 dot graphic backlit LCD
	Jack and Terminals	OUTPUT L/MONO, R (standard phone jack), ASSIGNABLE OUTPUT L, R (standard phone jack), A/D INPUT L, R (standard phone jack), PHONES (standard stereo phone jack), FOOT CONTROLLER 1, 2, FOOT SWITCH x 2 (SUSTAIN, ASSIGNABLE), BREATH, MIDI IN/OUT/THRU, USB (TO HOST, TO DEVICE), AC INLET
	Power Consumption	33W
	Dimensions, Weight	1,472 (W) x 385 (D) x 163 (H) mm, 22.5 kg
	Accessories	AC Power cord, Owner's Manual (this book), Data List, sticker label for optional mLAN16E.

* 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.

Troubleshooting

If you hear no sound or a strange sound, first check the items described below and take appropriate action. You may be able to solve the problem by resetting the instrument to the factory settings (page 21). (Make sure to back up any important data to an external device first.)
If the problem persists, consult your Yamaha dealer.

■ No sound comes from the speakers.

- Are all four Control sliders set to appropriate levels (other than zero or minimum)? (page 16)

- Has the Local Control switch been set to off?
  If this is set to off, the internal tone generator will not sound.

  [UTILITY] → [F5] MIDI → [SF2] SWITCH → Local Ctrl (page 69)

- Have you turned on the power of the S90 ES and all connected external equipment?

- Have you made all the appropriate level settings—including the Master Volume on the S90 ES and the volume settings on any connected external equipment?

- Is the Foot Controller pressed down (when it is connected to the FOOT CONTROLLER jack)?

- Are you using an external MIDI controller and are the MIDI volume and/or MIDI expression settings too low?

- Is the S90 ES properly connected to related external equipment (e.g., amplifier or speaker) via audio cables?

- Are the effect and filter settings appropriate?
  If you are using the filter, try changing the cutoff setting. Some cutoff settings may mute the sound entirely.

  [VOICE] → [EDIT] → [COMMON] → [F6] EFFECT (page 133)

  [PERFORM] → [EDIT] → [COMMON] → [F6] EFFECT (page 152)

  [MULTI/SEQ PLAY] (selecting Multi mode) → [EDIT] → [COMMON] → [F6] EFFECT (page 158)

  [VOICE] → [EDIT] → Element/Key selection → [F3] FILTER (page 135)

  [PERFORM] → [EDIT] → Part selection → [F4] TONE → [SF2] FILTER (page 154)

  [MUTLI/SEQ PLAY] (selecting Multi mode) → [EDIT] → Part selection → [F4] TONE → [SF2] FILTER (page 159)

- Are the volume or level settings too low?

  [UTILITY] → [F1] GENERAL → [SF1] TG → Volume (page 163)

  [VOICE] → [EDIT] → [COMMON] → [F2] OUTPUT → Volume (page 129)

  [VOICE] → [EDIT] → Element/Key selection → [F4] AMP → [SF1] LVL/PAN → Level (page 137)

  [PERFORM] → [EDIT] → [COMMON] → [F2] OUT/MEF → Volume (page 150)

  [PERFORM] → [EDIT] → Part selection → [F2] OUTPUT → [SF1] VOL/PAN → Volume (page 153)

  [MULTI/SEQ PLAY] (selecting Multi mode) → [F2] VOL/PAN → Volume (page 157)

  [MUTLI/SEQ PLAY] (selecting Multi mode) → [EDIT] → Part selection → [F2] OUTPUT → [SF1] VOL/PAN → Volume (page 159)

- Are the element switch, note limit, velocity limit parameters set appropriately?

  [VOICE] → [EDIT] → Element/Key selection → [F1] OSC → [SF1] WAVE → Element Sw (page 133)

  [VOICE] → [EDIT] → Element/Key selection → [F1] OSC → [SF3] LIMIT (page 134)

  [PERFORM] → [F2] VOICE (page 149)

  [PERFORM] → [EDIT] → Part selection → [F1] VOICE → [SF1] VOICE → Part Sw (page 152)

  [PERFORM] → [EDIT] → Part selection → [F1] VOICE → [SF3] LIMIT (page 152)

- When the Performance/Multi produces no sound, has a Voice been assigned to each Part?

  [PERFORM] → [F2] VOICE (page 149)

  [MULTI] (selecting Multi mode) → [F3] VOICE (page 157)

- When the Performance/Multi produces no sound, is the output setting of each Part set appropriately?

  [PERFORM] → [EDIT] → Part selection → [F2] OUTPUT → [SF3] SELECT → OutputSel (page 154)

  [MUTLI/SEQ PLAY] (selecting Multi mode) → [EDIT] → Part selection → [F2] OUTPUT → [SF3] SELECT → OutputSel (page 159)

• When the Multi produces no sound, are the output port/channel of each track in the external sequencer and the receive port/channel of each Part in the Multi set appropriately?

[MUTLI/SEQ PLAY] (selecting Multi mode) → [EDIT] → Part selection → [F1] VOICE → [SF2] MODE → Receive Ch (page 159)

[MUTLI/SEQ PLAY] (selecting Sequence Play mode) → Chain Step selection → [F2] OUTPUT → PORT (page 162)

NOTE Keep in mind that the Output ([F2] OUTPUT) setting of the Chain Step last selected in the Sequence play mode is effective.

• When the Multi produces no sound, are the Chain Step settings in the Sequencer Play mode set appropriately?

[MUTLI/SEQ PLAY] (selecting Sequence Play mode) → Chain Step selection → [F2] OUTPUT (page 162)

NOTE Keep in mind that the Output ([F2] OUTPUT) setting of the Chain Step last selected in the Sequence play mode is effective.

■ Playback continues without stopping.
• When the [ARPEGGIO] button is turned on, press it so that its lamp is turned off. (page 17)

■ Distorted sound.
• Are the effect settings appropriate? (Some effect types or settings can cause distortion.)

[VOICE] → [EDIT] → [COMMON] → [F6] EFFECT (page 133)

[PERFORM] → [EDIT] → [COMMON] → [F6] EFFECT (page 152)

[MULTI/SEQ PLAY] (selecting Multi mode) → [EDIT] → [COMMON] → [F6] EFFECT (page 158)

• Are the filter settings appropriate? (Excessively high filter resonance settings can cause distortion.)

[VOICE] → [EDIT] → Element/Key selection → [F3] FILTER (page 135)

[PERFORM] → [EDIT] → Part selection → [F4] TONE → [SF2] FILTER (page 154)

[MUTLI/SEQ PLAY] (selecting Multi mode) → [EDIT] → Part selection → [F4] TONE → [SF2] FILTER (page 159)

• Is the volume set so high that clipping is occurring?

[UTILITY] → [F1] GENERAL → [SF1] TG → Volume (page 163)

[VOICE] → [EDIT] → [COMMON] → [F2] OUTPUT → Volume (page 129)

[PERFORM] → [EDIT] → [COMMON] → [F2] OUT/MEF → [SF1] OUT → Volume (page 150)

[MUTLI/SEQ PLAY] (selecting Multi mode) → [F2] VOL/PAN → Volume (page 157)

■ Sound is choppy and intermittent.
• Are you exceeding the maximum polyphony of the S90 ES ? (page 188)

■ Only one note sounds at a time.
• Is the Mono/Poly parameter set to "mono"?
  If you wish to play chords, set this parameter to "poly."

[VOICE] → [F4] PORTA → Mono/Poly(page 127)

[PERFORM] → [EDIT] → Part selection → [F1] VOICE → [SF2] MODE → Mono/Poly (page 152)

[MUTLI/SEQ PLAY] (selecting Multi mode) → [EDIT] → Part selection → [F1] VOICE → [SF2] MODE → Mono/Poly (page 159)

■ Pitch or intervals are wrong.
• Is the Master Tune parameter set at a value other than "0"?

[UTILITY] → [F1] GENERAL → [SF1] TG → Tune (page 163)

• Is the Note Shift parameter set at a value other than "0"?

[UTILITY] → [F1] GENERAL → [SF1] TG → NoteShift (page 163)

• When the voice produces a wrong pitch, is the appropriate tuning system selected from Micro Tuning parameter?

[VOICE] → [EDIT] → [COMMON] → [F1] GENERAL → [SF2] PLY MODE → M.Tuning No (page 128)

- When the voice produces a wrong pitch, is the LFO Pitch Modulation Depth set too high?

  [VOICE] → [EDIT] → Element/Key selection → [F5] LFO → P Mod (page 139)

- When the Performance/Multi produces a wrong pitch, is the Note Shift or Detune parameter of each Part set to a value other than "0"?

  [PERFORM] → [EDIT] → Part selection → [F4] TONE → [SF1] TUNE (page 154)

  [MUTLI/SEQ PLAY] (selecting Multi mode) → [EDIT] → Part selection → [F4] TONE → [SF1] TUNE (page 159)

■ No effects are applied.

- Is the [EFFECT BYPASS] button turned off? (page 17)

- Are the Control sliders (for REVERB and CHORUS) set to appropriate levels (other than zero or minimum)? (page 42)

- Have any or all of the Elements' Effect Output parameters been set to "thru" in the effect setting display?

  [VOICE] → [EDIT] → [COMMON] → [F6] EFFECT → [SF1] CONNECT → EL: OUT 1-4 (page 133)

- Have any or all of the effect types been set to "thru" or "off"? (pages 121, 122, 123)
  When this occurs in the Performance mode/Multi mode, check whether the Insertion Switch (INS SW) parameters are set properly or not.

  [PERFORM] → [EDIT] → [COMMON] → [F6] EFFECT → [SF2] INS SW (page 152)

  [MULTI/SEQ PLAY] (selecting Multi mode) → [EDIT] → [COMMON] → [F6] EFFECT → [SF2] INS SW (page 158)

■ The Edit Indicator appears, even when parameters are not being edited.

- Keep in mind that simply moving a Slider changes the parameter, automatically displaying the Edit indicator. (page 25)

■ Cannot start the Arpeggio.

- Check whether the [ARPEGGIO] button is turned on or off. (page 17)

- Have you selected a User Arpeggio type (with no User data)?
  To use the User Arpeggios, the User Arpeggio data created in the MOTIF ES must be loaded to the S90 ES. .. (page 39)

- Are the Arpeggio related parameters such as Note Limit and Velocity Limit set appropriately?

  [VOICE] → [EDIT] → [COMMON] → [F3] ARP → [SF2] LIMIT (page 130)

  [PERFORM] → [EDIT] → [COMMON] → [F3] ARP → [SF2] LIMIT (page 151)

  [MULTI/SEQ PLAY] (selecting Multi mode)→ [EDIT] → [COMMON] → [F3] ARP → [SF2] LIMIT (page 158)

  When this occurs in the Performance mode/Multi mode, check whether the Arpeggio Switch parameter for each Part is set properly or not.

  [PERFORM] → [EDIT]] → Part selection → [F1] VOICE → [SF2] MODE → ArpSwitch (page 152)

  [MULTI/SEQ PLAY] (selecting Multi mode) → [EDIT] → Part selection → [F1] VOICE → [SF2] MODE → ArpSwitch (page 159)

■ Cannot stop the Arpeggio.

- When Arpeggio playback does not stop even if you release the key, set the Arpeggio Hold parameter to "off."

  [VOICE] → [EDIT] → [COMMON] → [F3] ARP → [SF1] TYPE → Hold (page 130)

  [PERFORM] → [EDIT] → [COMMON] → [F3] ARP → [SF1] TYPE → Hold (page 151)

  [MULTI/SEQ PLAY] (selecting Multi mode) → [EDIT] → [COMMON] → [F3] ARP → [SF1] TYPE → Hold (page 158)

■ Microphone does not work properly.

- Check whether the S90 ES is in the Voice mode or not.
  In the Voice mode, the A/D part which handles the microphone sound cannot be recognized.

  [UTILITY] → [F2] I/O → [SF1] INPUT → Mic/Line (page 164)

- Check whether the Gain Knob on the rear panel is set to minimum position or not. (page 19)

■ A Plug-in Voice cannot be selected even when a Plug-in Board has been installed.

- Check whether the SLOT lamp (from SLOT1 - 3) corresponding to the selected PLG button ([PLG1] - [PLG3]) is turned on or off.

- When selecting a User bank, are any Voices stored into the User bank?
  In the default settings, User banks for Plug-in Voice contain no Voices. You must the select the Preset bank or create a User Voice.

  [VOICE] → [F2] BANK (page 127)

- Check whether the PLG which corresponds to the PLG100-XG slot is selected or not.
  The Voice on the PLG100-XG cannot be selected in the Voice mode or Performance mode.

- Check whether the PLG which corresponds to the PLG100-VH slot is selected or not.
  The PLG100-VH contains no Voices for selection, since it is an Effect Plug-in Board.

■ The Plug-in Board does not work.

Is the lamp of the corresponding slot number to which the Plug-in board has been installed lit? (page 18)

- Has the PLG100-VH been installed to slot 2 or 3?
  The PLG100-VH can be installed only to slot 1.

- Has the PLG100-XG been installed to slot 1 or 2?
  The PLG100-XG can be installed only to slot 3.

■ Data communication between the computer and the S90 ES does not work properly.

- Check whether the Port setting on the computer is appropriate or not.

- Is the cable setting (MIDI, USB, mLAN) in the Utility mode appropriate?

  [UTILITY] → [F5] MIDI → [SF4] OTHER → MIDI IN/OUT(page 166)

■ The S90 ES does not sound properly even when playing back the song data on the computer or the MIDI instrument connected to the S90 ES.

- Make sure to set the S90 ES to the Multi mode. To play back the multiple channels simultaneously, select multi mode. (page 70)

■ MIDI bulk data transmission/reception does not work properly.

- Is Bulk data receive protection enabled?
  Turn the Receive Bulk parameter to "on."

  [UTILITY] → [F5] MIDI → [SF2] SWITCH → RcvBulk (page 166)

- When receiving recorded data with the internal Bulk Dump function, the device number must be set to the same value as that used when transmitting/recording.

  [UTILITY] → [F5] MIDI → [SF1] CH → DeviceNo (page 166)

- When transmission does not work properly, is the device number of the MIDI instrument connected to the S90 ES set to match the DeviceNo. parameter?

  [UTILITY] → [F5] MIDI → [SF1] CH → DeviceNo (page 166)

- 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 PDF manual included with the Editor.

■ Data cannot be saved in the USB storage device

- Is the connected USB storage device write protected? (Write-protect should be set to off for saving data.)

- Is the connected USB storage device properly formatted?

  [FILE] → [F1] CONFIG → [SF2] FORMAT (page 168)

■ Cannot enter the Edit mode

- Is the Category Search function turned on?
  After exiting from the Category Search function, press the [EDIT] button.

- Is the S90 ES in the File mode?
  After exiting from the File mode, press the [EDIT] button.

Application Index

Appendix

■ Sounding only the specified Part or Voice

■ Adjusting the volume or output level

■ Inputting audio from a microphone, instrument or other audio device

■ Using Plug-in Boards

■ **Creating data**

■ **Storing/saving the created data**

■ **Recovering lost data**

■ **Maintaining data**

■ **Pitch related settings (Tune, Note Shift, etc.)**

Entire

Voice mode

Performance mode

Appendix

Multi/Sequence Play mode

- Shifting the note up or down for each Part
  [MULTI/SEQ PLAY] (selecting Multi mode) → [EDIT] → Part selection → [F4] TONE → [SF1] TUNE → NoteShift .... page 154

- Determining the fine tuning for the pitch of each Part.
  [MULTI/SEQ PLAY] (selecting Multi mode) → [EDIT] → Part selection → [F4] TONE → [SF1] TUNE → Detune .... page 154

Master mode

- Shifting the keyboard octave up or down for each zone of the edited Master.
  [MASTER] → Master selection → [F2] MEMORY → ZoneSwitch = on → [EDIT] → Zone selection → [F2] NOTE → Octave .... page 173

- Adjusting the keyboard pitch for each zone of the edited Master.
  [MASTER] → Master selection → [F2] MEMORY → ZoneSwitch = on → [EDIT] → Zone selection → [F2] NOTE → Transpose .... page 173

■ Connecting to a computer/external MIDI instrument

- Determining which connector (among the MIDI, USB TO HOST, mLAN) is used as a MIDI input/output connector.
  [UTILITY] → [F5] MIDI → [SF4] OTHER → MIDI IN/OUT .... page 166
- Using the sounds of the S90 ES for song playback from a MIDI sequencer .... page 70
- Setting whether or not Bulk Dump data can be received
  [UTILITY] → [F5] MIDI → [SF2] SWITCH → RevBulk = on/protect .... page 166

- Sounding only the external MIDI tone generator and turning the internal tone generator off when playing the keyboard
  (turning the Local Control setting off).
  [UTILITY] → [F5] MIDI → [SF2] SWITCH → LocalCtrl = off .... page 166

- Synchronizing with an external MIDI instrument/computer
  Using the S90 ES as a MIDI master
  [UTILITY] → [F5] MIDI → [SF3] SYNC → MIDI Sync = internal, ClockOut = on, SeqCtrl = out .... page 166

  Using the S90 ES as a MIDI slave
  [UTILITY] → [F5] MIDI → [SF3] SYNC → MIDI Sync = MIDI, ClockOut = off, SeqCtrl = in .... page 166

- Synchronizing the LFO wave speed of the Voice with an external MIDI instrument/computer.
  [UTILITY] → [F5] MIDI → [SF3] SYNC → MIDI Sync = MIDI .... page 166
  [VOICE] → Normal Voice selection → [EDIT] → [COMMON] → [F5] LFO → [SF1] WAVE → TempoSync = on .... page 131

- Specifying the MIDI transmit port/channel.
  Determining the MIDI transmit channel from the keyboard (by using [TRACK SELECT] button and Number [1] - [16]
  buttons). .... page 105
- Selecting the transmit port from the keyboard in the Voice mode or Performance mode.
  In the Voice mode and Performance mode, the transmit port is fixed to 1.
- Selecting the transmit ports from the keyboard in the Multi mode.
  In the Multi mode, the transmit port depends on the last Chain Step settings selected in the Sequence Play mode
  .... page 98
- Determining the MIDI channel for Arpeggio playback data.
  [UTILITY] → [F3] VOICE → [SF3] ARP CH → TransmitCh .... page 165

- Specifying the MIDI receive port/channel.
  Setting the MIDI receive channel in the Voice mode/Performance mode.
  [UTILITY] → [F5] MIDI → [SF1] CH → BasicRcvCh .... page 165

  Setting the MIDI Receive Channel for each Part.
  [MULTI/SEQ PLAY] (selecting Multi mode) → [EDIT] → Part selection → [F1] VOICE → [SF2] MODE → ReceiveCh .... page 152

- Checking the receive Ports.
  When selecting a Voice or Part of internal tone generator, the transmit port is fixed to 1.
  When selecting a Plug-in Voice or Plug-in Part, the transmit port depends on the settings in the following display.
  [UTILITY] → [F6] PLUG → [SF2] MIDI .... page 167

■ **Setting parameters for Program Change transmission/recognition**

• Enabling or disabling the sending of Bank Select and Program Change messages, when selecting a Voice or Performance.

[UTILITY] → [F5] MIDI → [SF2] SWITCH → BankSel, PgmChange .... page 166

• Enabling or disabling selection of S90 ES Voices/Performances/Multis from an external MIDI device.

[UTILITY] → [F5] MIDI → [SF2] SWITCH → BankSel, PgmChange .... page 166

[MULTI/SEQ PLAY] (selecting Multi mode) → [EDIT] → Part selection → [F5] RCV SW → PgmChange .... page 159

• Setting whether each Part playback sounds the internal tone generator or an external tone generator in the Sequence Play mode.

[MULTI/SEQ PLAY] (selecting Sequence Play mode) → Chain Step selection → [F2] OUTPUT → INT SW (Internal Switch), EXT SW (External Switch)

.... page 162

• Setting whether each Multi's Part playback sounds the internal tone generator or an external tone generator.
 In the Multi mode, the transmit port depends on the last Chain Step settings selected in the Sequence Play mode.

■ **Other Tips**

• Loading the specified file on the USB storage device automatically when the power is turned on. .... page 106
• Setting the default display when turning the power on.

[UTILITY] → [F1] GENERAL → [SF4] OTHER → PowerOnMode .... page 164

• Selecting the output jack for each Drum key or Part. .... page 63

Index

Appendix

Appendix

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.

IMPORTANT NOTICE FOR THE UNITED KINGDOM
Connecting the Plug and Cord

WARNING: THIS APPARATUS MUST BE EARTHED
IMPORTANT. The wires in this mains lead are coloured in accordance with the following code:

GREEN-AND-YELLOW	:	EARTH
BLUE	:	NEUTRAL
BROWN	:	LIVE

As the colours of the wires in the mains lead of this apparatus may not correspond with the coloured markings identifying the terminals in your plug proceed as follows:

The wire which is coloured GREEN-and-YELLOW must be connected to the terminal in the plug which is marked by the letter E or by the safety earth symbol or colored GREEN or GREEN-and-YELLOW.

The wire which is coloured BLUE must be connected to the terminal which is marked with the letter N or coloured BLACK.

The wire which is coloured BROWN must be connected to the terminal which is marked with the letter L or coloured RED.

COMPLIANCE INFORMATION STATEMENT
(DECLARATION OF CONFORMITY PROCEDURE)

Responsible Party	:	Yamaha Corporation of America
Address	:	6600 Orangethorpe Ave., Buena Park, Calif. 90620
Telephone	:	714-522-9011
Type of Equipment	:	Music Synthesizer
Model Name	:	S90 ES

This device complies with Part 15 of the FCC Rules.
Operation is subject to the following conditions:
1) this device may not cause harmful interference, and
2) this device must accept any interference received including interference that may cause undesired operation.

See user manual instructions if interference to radio reception is suspected.

For details of products, please contact your nearest Yamaha representative or the authorized distributor listed below.

Pour plus de détails sur les produits, veuillez-vous adresser à Yamaha ou au distributeur le plus proche de vous figurant dans la liste suivante.

Die Einzelheiten zu Produkten sind bei Ihrer unten aufgeführten Niederlassung und bei Yamaha Vertragshändlern in den jeweiligen Bestimmungsländern erhältlich.

Para detalles sobre productos, contacte su tienda Yamaha más cercana o el distribuidor autorizado que se lista debajo.

NORTH AMERICA

CANADA
Yamaha Canada Music Ltd.
135 Milner Avenue, Scarborough, Ontario,
M1S 3R1, Canada
Tel: 416-298-1311

U.S.A.
Yamaha Corporation of America
6600 Orangethorpe Ave., Buena Park, Calif. 90620,
U.S.A.
Tel: 714-522-9011

CENTRAL & SOUTH AMERICA

MEXICO
Yamaha de México S.A. de C.V.
Calz. Javier Rojo Gómez #1149,
Col. Guadalupe del Moral
C.P. 09300, México, D.F., México
Tel: 55-5804-0600

BRAZIL
Yamaha Musical do Brasil Ltda.
Av. Reboucas 2636-Pinheiros CEP: 05402-400
Sao Paulo-SP. Brasil
Tel: 011-3085-1377

ARGENTINA
Yamaha Music Latin America, S.A.
Sucursal de Argentina
Viamonte 1145 Piso2-B 1053,
Buenos Aires, Argentina
Tel: 1-4371-7021

PANAMA AND OTHER LATIN AMERICAN COUNTRIES/ CARIBBEAN COUNTRIES
Yamaha Music Latin America, S.A.
Torre Banco General, Piso 7, Urbanización Marbella,
Calle 47 y Aquilino de la Guardia,
Ciudad de Panamá, Panamá
Tel: +507-269-5311

EUROPE

THE UNITED KINGDOM
Yamaha-Kemble Music (U.K.) Ltd.
Sherbourne Drive, Tilbrook, Milton Keynes,
MK7 8BL, England
Tel: 01908-366700

IRELAND
Danfay Ltd.
61D, Sallynoggin Road, Dun Laoghaire, Co. Dublin
Tel: 01-2859177

GERMANY
Yamaha Music Central Europe GmbH
Siemensstraße 22-34, 25462 Rellingen, Germany
Tel: 04101-3030

SWITZERLAND/LIECHTENSTEIN
Yamaha Music Central Europe GmbH,
Branch Switzerland
Seefeldstrasse 94, 8008 Zürich, Switzerland
Tel: 01-383 3990

AUSTRIA
Yamaha Music Central Europe GmbH,
Branch Austria
Schleiergasse 20, A-1100 Wien, Austria
Tel: 01-60203900

CZECH REPUBLIC/SLOVAKIA/ HUNGARY/SLOVENIA
Yamaha Music Central Europe GmbH,
Branch Austria, CEE Department
Schleiergasse 20, A-1100 Wien, Austria
Tel: 01-602039025

POLAND
Yamaha Music Central Europe GmbH
Sp.z. o.o. Oddzial w Polsce
ul. 17 Stycznia 56, PL-02-146 Warszawa, Poland
Tel: 022-868-07-57

THE NETHERLANDS/ BELGIUM/LUXEMBOURG
Yamaha Music Central Europe GmbH,
Branch Benelux
Clarissenhof 5-b, 4133 AB Vianen, The Netherlands
Tel: 0347-358 040

FRANCE
Yamaha Musique France
BP 70-77312 Marne-la-Vallée Cedex 2, France
Tel: 01-64-61-4000

ITALY
Yamaha Musica Italia S.P.A.
Combo Division
Viale Italia 88, 20020 Lainate (Milano), Italy
Tel: 02-935-771

SPAIN/PORTUGAL
Yamaha-Hazen Música, S.A.
Ctra. de la Coruna km. 17, 200, 28230
Las Rozas (Madrid), Spain
Tel: 91-639-8888

GREECE
Philippos Nakas S.A. The Music House
147 Skiathou Street, 112-55 Athens, Greece
Tel: 01-228 2160

SWEDEN
Yamaha Scandinavia AB
J. A. Wettergrens Gata 1
Box 30053
S-400 43 Göteborg, Sweden
Tel: 031 89 34 00

DENMARK
YS Copenhagen Liaison Office
Generatorvej 6A
DK-2730 Herlev, Denmark
Tel: 44 92 49 00

FINLAND
F-Musiikki Oy
Kluuvikatu 6, P.O. Box 260,
SF-00101 Helsinki, Finland
Tel: 09 618511

NORWAY
Norsk filial av Yamaha Scandinavia AB
Grini Næringspark 1
N-1345 Østerås, Norway
Tel: 67 16 77 70

ICELAND
Skifan HF
Skeifan 17 P.O. Box 8120
IS-128 Reykjavik, Iceland
Tel: 525 5000

OTHER EUROPEAN COUNTRIES
Yamaha Music Central Europe GmbH
Siemensstraße 22-34, 25462 Rellingen, Germany
Tel: +49-4101-3030

AFRICA

Yamaha Corporation,
Asia-Pacific Music Marketing Group
Nakazawa-cho 10-1, Hamamatsu, Japan 430-8650
Tel: +81-53-460-2312

MIDDLE EAST

TURKEY/CYPRUS
Yamaha Music Central Europe GmbH
Siemensstraße 22-34, 25462 Rellingen, Germany
Tel: 04101-3030

OTHER COUNTRIES
Yamaha Music Gulf FZE
LB21-128 Jebel Ali Freezone
P.O.Box 17328, Dubai, U.A.E.
Tel: +971-4-881-5868

ASIA

THE PEOPLE'S REPUBLIC OF CHINA
Yamaha Music & Electronics (China) Co.,Ltd.
25/F., United Plaza, 1468 Nanjing Road (West),
Jingan, Shanghai, China
Tel: 021-6247-2211

HONG KONG
Tom Lee Music Co., Ltd.
11/F., Silvercord Tower 1, 30 Canton Road,
Tsimshatsui, Kowloon, Hong Kong
Tel: 2737-7688

INDONESIA
PT. Yamaha Music Indonesia (Distributor)
PT. Nusantik
Gedung Yamaha Music Center, Jalan Jend. Gatot
Subroto Kav. 4, Jakarta 12930, Indonesia
Tel: 21-520-2577

KOREA
Yamaha Music Korea Ltd.
Tong-Yang Securities Bldg. 16F 23-8 Yoido-dong,
Youngdungpo-ku, Seoul, Korea
Tel: 02-3770-0660

MALAYSIA
Yamaha Music Malaysia, Sdn., Bhd.
Lot 8, Jalan Perbandaran, 47301 Kelana Jaya,
Petaling Jaya, Selangor, Malaysia
Tel: 3-78030900

PHILIPPINES
Yupangco Music Corporation
339 Gil J. Puyat Avenue, P.O. Box 885 MCPO,
Makati, Metro Manila, Philippines
Tel: 819-7551

SINGAPORE
Yamaha Music Asia Pte., Ltd.
#03-11 A-Z Building
140 Paya Lebor Road, Singapore 409015
Tel: 747-4374

TAIWAN
Yamaha KHS Music Co., Ltd.
3F, #6, Sec.2, Nan Jing E. Rd. Taipei.
Taiwan 104, R.O.C.
Tel: 02-2511-8688

THAILAND
Siam Music Yamaha Co., Ltd.
891/1 Siam Motors Building, 15-16 floor
Rama 1 road, Wangmai, Pathumwan
Bangkok 10330, Thailand
Tel: 02-215-2626

OTHER ASIAN COUNTRIES
Yamaha Corporation,
Asia-Pacific Music Marketing Group
Nakazawa-cho 10-1, Hamamatsu, Japan 430-8650
Tel: +81-53-460-2317

OCEANIA

AUSTRALIA
Yamaha Music Australia Pty. Ltd.
Level 1, 99 Queensbridge Street, Southbank,
Victoria 3006, Australia
Tel: 3-9693-5111

NEW ZEALAND
Music Houses of N.Z. Ltd.
146/148 Captain Springs Road, Te Papapa,
Auckland, New Zealand
Tel: 9-634-0099

COUNTRIES AND TRUST TERRITORIES IN PACIFIC OCEAN
Yamaha Corporation,
Asia-Pacific Music Marketing Group
Nakazawa-cho 10-1, Hamamatsu, Japan 430-8650
Tel: +81-53-460-2312

HEAD OFFICE **Yamaha Corporation, Pro Audio & Digital Musical Instrument Division**
Nakazawa-cho 10-1, Hamamatsu, Japan 430-8650
Tel: +81-53-460-2445

SY37

This document is printed on chlorine free (ECF) paper with soy ink.