YAMAHA

MUSIC SYNTHESIZER

S90

OWNER'S MANUAL
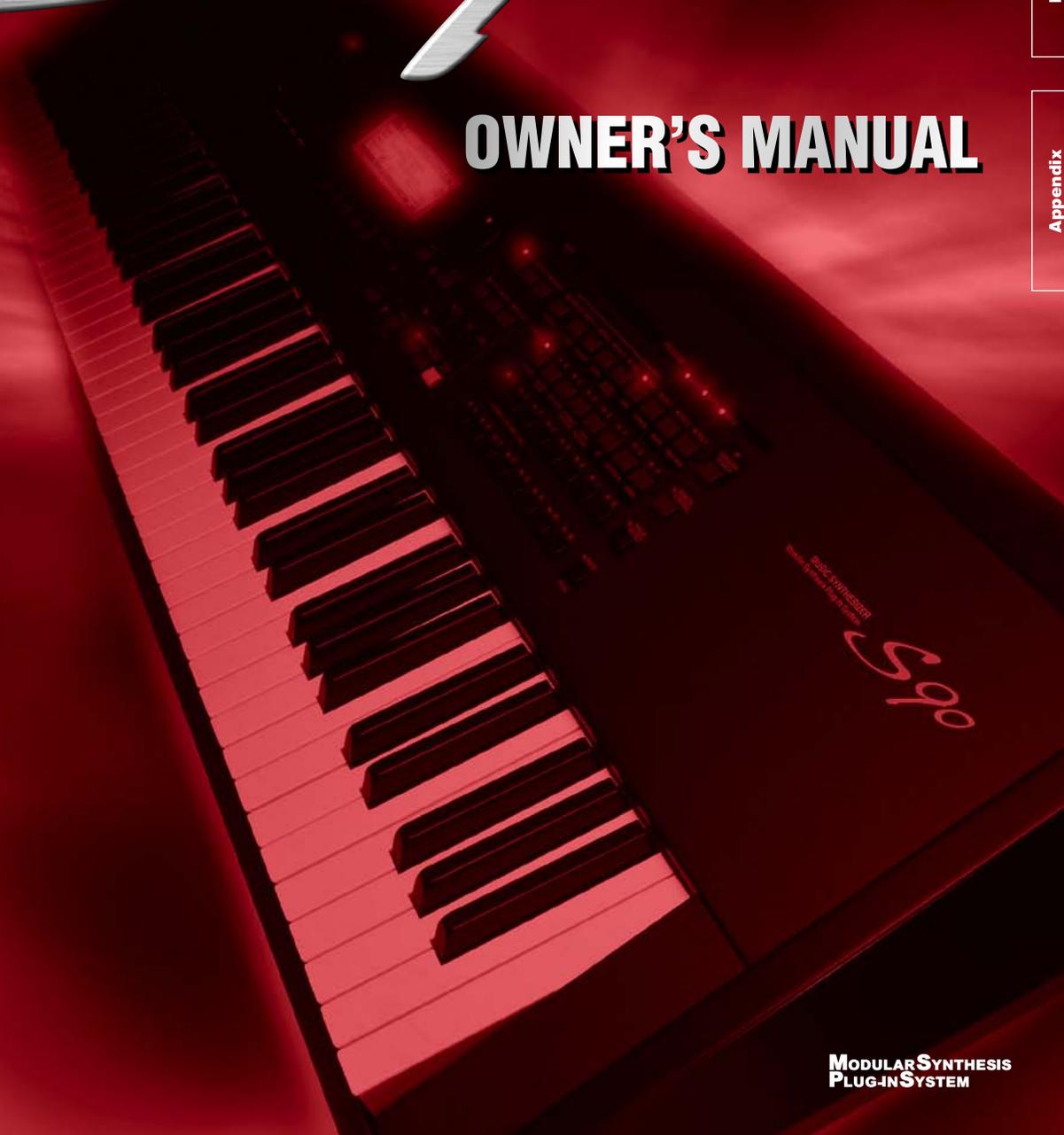
MODULAR SYNTHESIS
PLUG-IN SYSTEM

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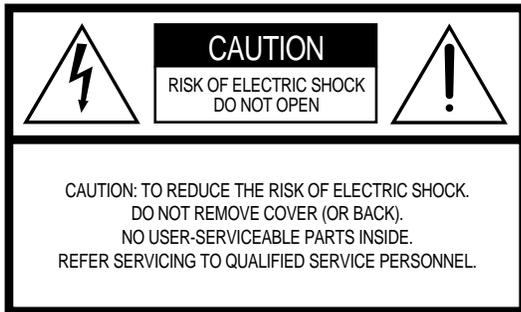
⚠ The exclamation point within the equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.
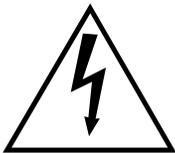
⚡ The lightning flash with arrowhead symbol, within the equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electrical shock.

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.
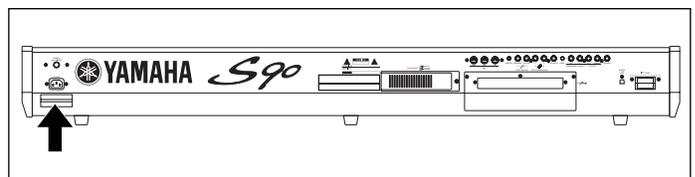
Model _____

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.

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 14.)
- 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.
- Use only the stand specified for the instrument. When attaching the stand or rack, use the provided screws only. Failure to do so could cause damage to the internal components or result in the instrument falling over.
- 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 panel or 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

- DRAM data (see page 27) is lost when you turn off the power to the instrument. Save the data to the Flash ROM (USER memory; see page 73).

  Saved data may be lost due to malfunction or incorrect operation. Save important data to a Memory Card (SmartMedia).

Never attempt to turn off the power while data is being written to Flash ROM (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 may cause the system to freeze (due to corruption of data in the Flash ROM).

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

Backing up the Memory Card (SmartMedia)/external media

- To protect against data loss through media damage, we recommend that you save your important data onto two Memory Cards (SmartMedia)/external media.

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

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

Introduction

Thank you for purchasing the Yamaha S90 Music Synthesizer. In order to get the most out of your new S90 and its sophisticated functions, we suggest you read through this manual thoroughly. Also keep it in a safe, convenient place so that you can regularly refer to it when necessary.

Package Contents

- AC Power cord
- Owner's Manual
- CD-ROM x 2
- Data List
- Installation Guide

> **About the Included CD-ROM**
>
> Application software for your S90 is included on this CD-ROM. The Voice Editor lets you edit the Voices of the S90 with a highly intuitive graphical interface, and a File Utility, which lets you easily transfer data between the memory card and a computer. With the included sequencing software (Windows only), you can easily create and edit your own original songs on your computer. For details, refer to the separate Installation Guide or the on-line manual included with the software.
>
> ⚠ Never attempt to play back the CD-ROM on an audio CD player. Doing so may result in damage to your hearing as well as to your CD player/audio speakers.

Main Features

- Wide range of dynamic and authentic voices — over 512 in total, with 49 drum kits (page 25). Use the Category Search function to quickly call up the sounds you want, based on their instrument type (page 38).

- Performance mode lets you use four different voices together — in layers or in a keyboard split (page 25).

- Extensive effect processing, with Reverb (12 types), Chorus (25 types), two separate Insertion sections (total 104 types), a Variation section (25 types), and a Master 5-band EQ (page 67).

- Comprehensive real-time control with four sliders — letting you adjust filter, levels, effects, EG, and more, while you play (page 53).

- The built-in Arpeggio feature not only puts a wealth of hip rhythmic sequences at your fingertips, it even has special "human" patterns — such as guitar strumming and woodwind trills (page 45).

- Master mode for using the S90 as a master keyboard controller (with independent Zones), and for easily reconfiguring the instrument between Voice/Performance play and Sequence Play in live applications (page 48).

- Exceptionally easy-to-understand interface with two-tiered operation buttons: [F1] - [F6] and [SF1] - [SF5] (page 32)

- Remote Control — for operating your favorite sequencing software from the panel controls of the S90. Mute tracks, control transport (Play, Stop, etc.), mix both MIDI and audio tracks (up to 16) with the S90's sliders, pan the tracks, control EQ, and tweak effect sends — all without ever touching the mouse (page 57).

- Three Modular Synthesis Plug-in System slots let you upgrade the S90 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, ready to be played as soon as you install the proper board (page 25).

- Comprehensive I/O terminals — including assignable outputs, audio inputs, MIDI, USB for multi-port connection to a computer, and SmartMedia card slot for data storage.

- Expansion bay for optional mLAN — Yamaha's new mLAN interface technology makes it possible to transfer all your digital audio and MIDI data via a single broad-band cable.

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

About This Manual

This manual consists of the following sections.

■ **Basics Section (page 12)**
This section provides an overview of the main functions and features of the S90 and introduces you to the basic operating conventions.

■ **Quick Guide (page 36)**
This section explains how to use the basic functions.

■ **Reference (page 98)**
The S90 encyclopedia. This section explains all functions and parameters.

■ **Appendix (page 114)**
This section contains detailed information on the S90 such as MIDI, instructions for installing optional equipment, Display Messages, Troubleshooting and Specifications.

■ **Installation Guide (separate booklet)**
Refer to this for instructions on installing the included software programs (on the CD-ROM) to your computer.

■ **Data List (separate booklet)**
This contains various important lists such as the Voice List, Wave List, Performance List, and MIDI Implementation Chart.

About the Reference Numbers

In addition to the regular page references, this manual also includes special Reference Numbers (e.g., Ref. #15). These let you easily and quickly cross-reference the corresponding parameters in the Parameter Table on page 93. (For more information, also see page 96.)

● Copying of commercially available music sequence data and/or digital audio files for any purpose other than your own personal use, is strictly prohibited.

● This product incorporates and bundles computer programs and contents in which Yamaha owns copyrights or with respect to which it has license to use others' copyrights. Such copyrighted materials include, without limitation, all computer software, styles files, MIDI files, WAVE data and sound recordings. Any unauthorized use of such programs and contents outside of personal use is not permitted under relevant laws. Any violation of copyright has legal consequences. DON'T MAKE, DISTRIBUTE OR USE ILLEGAL COPIES.

● The 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.

● The name "mLAN" and its logo are trademarks of Yamaha Corporation.

● The company names and product names in this Owner's Manual are the trademarks or registered trademarks of their respective companies.

Application Index

This convenient, easy-to-use index is divided to general categories to help you when you want to find information on a specific topic or function.

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Basics Section

The Controls & Connectors

Top Panel

❶ **[PITCH] Bend wheel (page 53)**

❷ **[MODULATION] wheel (page 53)**

❸ **[MASTER VOLUME] slider (page 14)**

❹ **[CONTROL FUNCTION] button (pages 53, 59)**

❺ **[CS1] - [CS4] (Control Slider) (pages 53, 56)**

❻ **LCD Contrast control (page 14)**

❼ **[F1] - [F6] (Function) buttons (page 32)**

❽ **[SF1] - [SF5] (Sub Function) buttons (page 32)**

❾ **LCD (Liquid Crystal Display) (pages 30, 114)**

❿ **[INFORMATION] button (pages 33, 34, 35)**

⓫ **Data dial (pages 33, 76)**

⓬ **[INC/YES] button (page 33)**

⓭ **[DEC/NO] button (page 33)**

⓮ **Cursor buttons (page 33)**

⓯ **[EXIT] button (page 32)**

⓰ **[ENTER] button (page 32)**

⓱ **MODE buttons (page 29)**

⓲ **[ARPEGGIO] button (page 45)**

⓳ **[EFFECT BYPASS] button (page 67)**

⓴ **[PLAY/STOP] button (page 75)**

㉑ **BANK buttons (pages 36, 38, 41)**

㉒ **GROUP [A] - [H] buttons (pages 37, 41)**

㉓ **NUMBER [1] - [16] buttons
(pages 30, 37, 42, 49, 58, 61, 76, 80)**

㉔ **[CATEGORY SEARCH] button (page 38)**

㉕ **[REMOTE CONTROL] ON/OFF button (page 57)**

㉖ **[TRACK SELECT] button (pages 30, 37, 76)**

㉗ **[MUTE] button (pages 30, 42, 61, 76)**

㉘ **SLOT 1-3 lamps (page 125)**

Rear Panel
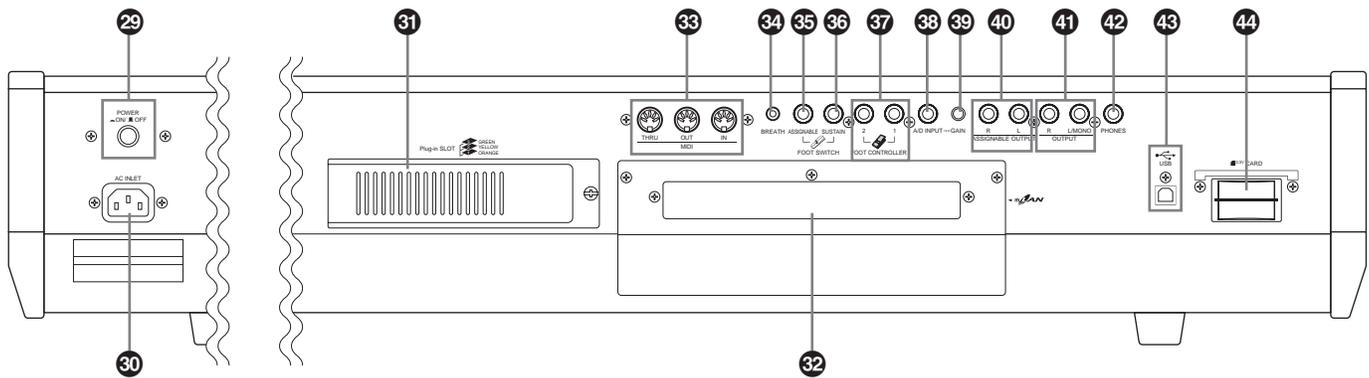
㉙ **[POWER] switch (page 14)**

㉚ **AC INLET (AC power cord socket) (page 14)**

㉛ **Plug-in Board cover (page 126)**

㉜ **mLAN Expansion Board (mLAN8E) cover (page 126)**

㉝ **MIDI IN/OUT/THRU terminals (page 16)**

㉞ **BREATH Controller jack (page 18)**

㉟ **FOOT SWITCH jack (ASSIGNABLE) (pages 18, 54)**

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㊲ **FOOT CONTROLLER 1, 2 jacks (pages 18, 54)**

㊳ **A/D INPUT jack (page 15)**

㊴ **[GAIN] knob (page 15)**

㊵ **ASSIGNABLE OUT L & R jacks (page 15)**

㊶ **OUTPUT L/MONO & R jacks (page 15)**

㊷ **PHONE jack (page 15)**

㊸ **USB terminal (page 17)**

㊹ **CARD slot (page 82)**

⚠ Never attempt to turn off the power while data is being written to Flash ROM (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 may cause the system to freeze (due to corruption of data in the Flash ROM).

USB

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

mLAN

"mLAN" is a digital network designed for musical applications. It uses and extends the industry standard IEEE 1394 high performance serial bus.
For details, refer to the Guide Book of the mLAN8E.

Setting Up

Power Supply

AC INLET terminal

Power cord
(included)
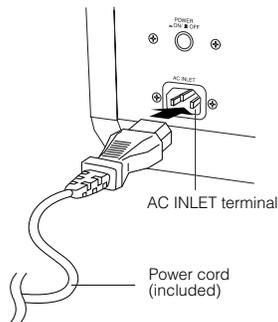
❶ Make sure the POWER switch on the S90 is set to OFF.

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

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

⚠ Make sure your S90 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!

⚠ Use only the AC power cord supplied with the S90. 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!

⚠ The type of AC power cord provided with the S90 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. 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.

Power-on Procedure

Once you've made all the necessary connections (page 15) between your S90 and any other devices, make sure that all volume settings are turned down all the way to zero. Then, turn on the every device in your setup in the order of MIDI masters (senders), MIDI slaves (receivers), then audio equipment (mixers, amplifiers, speakers, etc.). This ensures smooth signal flow from the first device to the last (first MIDI, then audio). When powering down the setup, first turn down the volume for each audio devices, then switch off each device in the reverse order (first audio devices, then MIDI).

When using the S90 as MIDI receiver:

MIDI master (transmitting device)

POWER ON!

S90 as MIDI slave (MIDI receiving device)

Audio equipment (first mixer, then amplifier)
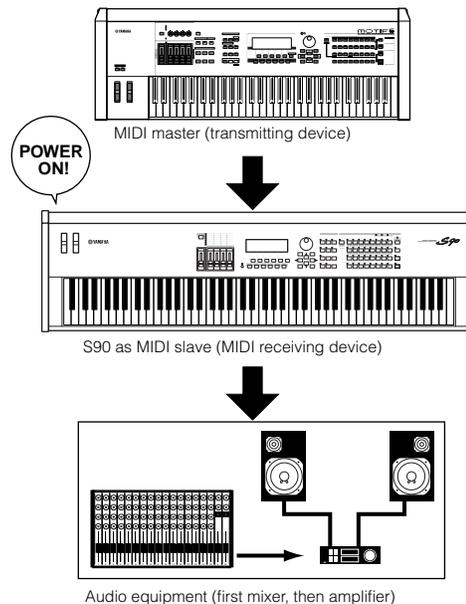
Turning on the S90

⚠ Before you switch your S90 on or off, first turn down the volume of any connected audio equipment.

❶ Press the POWER switch.
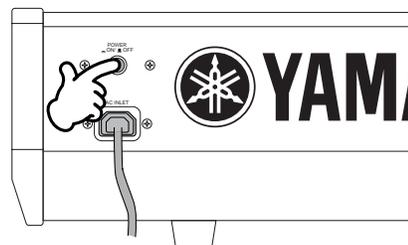
After a while, the default display appears (as set in the Utility parameter, Power On Mode Display).

♪ NOTE Adjusting the display contrast if the LCD is difficult to read, adjust the contrast with the LCD contrast control knob (page 12).

❷ Raise the sound system volume to a reasonable level.

❸ Gradually raise the MASTER VOLUME control while playing the keyboard to set the desired listening level.

Connections

⚠ Before connecting the S90 to other electronic components, turn off the power to all the components. Before turning the power on or off to all components, set all volume levels to minimum (0). Otherwise, electrical shock or damage to the components may occur.

Connecting to External Audio Equipment
· ·

Since the S90 has no built-in speakers, you'll need an external audio system or a set of stereo headphones to properly monitor it. The following illustrations show various connection examples; use the one most similar to your intended setup.

Connecting stereo powered speakers

A pair of powered speakers can accurately produce the instrument's rich sounds with their own pan and effect settings. Connect your powered speakers to the OUTPUT L/MONO and R jacks on the rear panel.
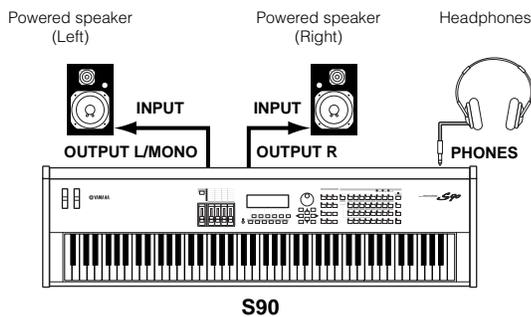
♪ NOTE When using just one powered speaker, connect it to the OUTPUT L/MONO jack on the rear panel.

Connecting to a mixer

There are extra audio outputs in addition to the OUTPUT (L/MONO and R) jacks. Connect these outputs to a mixer for separately controlling the outputs of up to four Parts in Performance mode (pages 29, 41).
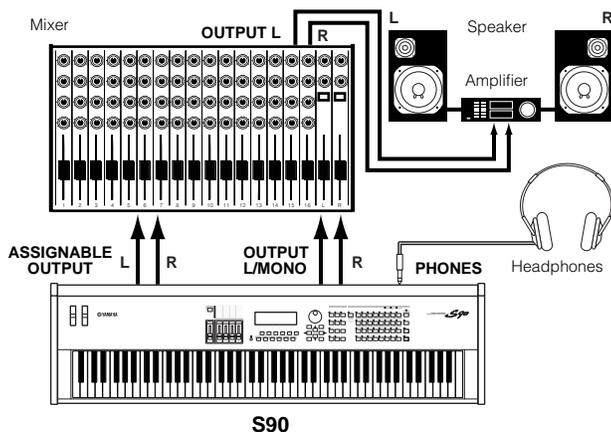
A/D input

■ Connecting a microphone or other audio equipment (analog input)

You can import external sounds (page 44). When importing from an external audio source, connect a microphone or the audio source to the A/D INPUT jack.
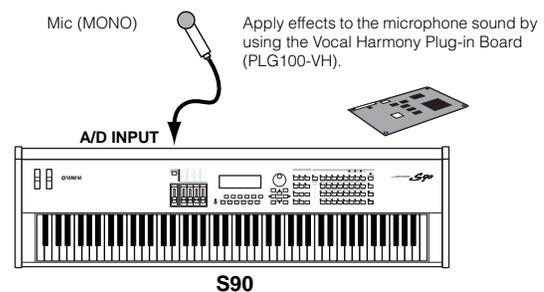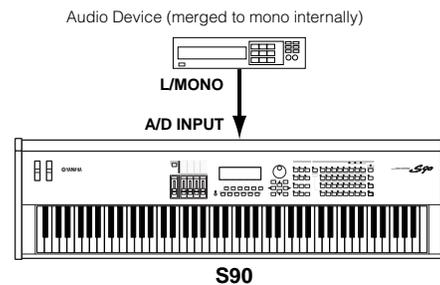
♪ NOTE After the above connections are complete, you are ready to set up for importing. When starting an importing, you may need to adjust the input gain of the audio source by using the GAIN knob.

■ Connecting to mLAN-compatible audio equipment (When an optional mLAN8E has been installed)
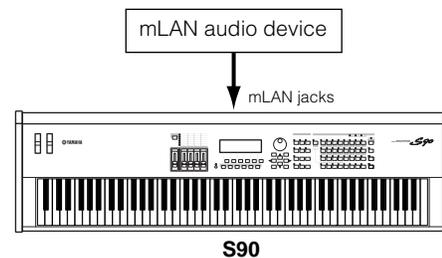
♪ NOTE Sound can be input via either the mLAN jacks or the A/D INPUT jacks. Which jacks are used is determined in the Utility mode ([F2]→[SF1] A/DSource Ref. #53).

Connecting External MIDI Equipment

Using a standard MIDI cable (available separately), you can connect an external MIDI device, and control it from the S90. Likewise, you can use an external MIDI device (such as a keyboard or sequencer) to control the sounds on the S90. Below are several different MIDI connection examples; use the one most similar to your intended setup.

■ Controlling from an external MIDI keyboard

UTILITY [F5]→[SF4] MIDI IN/OUT=MIDI

MIDI IN

S90

MIDI OUT

External MIDI keyboard or synthesizer

■ Controlling an external MIDI keyboard

UTILITY [F5]→[SF4] MIDI IN/OUT=MIDI

MIDI OUT

S90
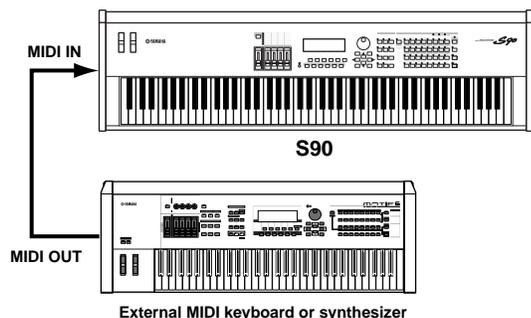
MIDI IN

External MIDI keyboard or synthesizer
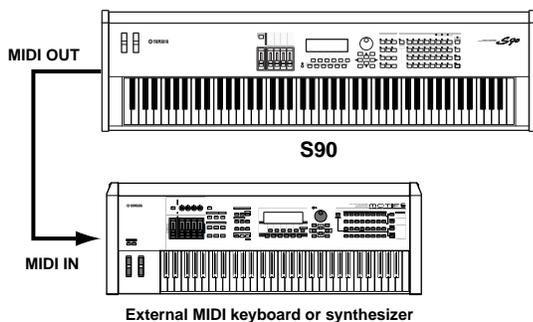
■ Recording and playback using an external MIDI sequencer

UTILITY [F5]→[SF4] MIDI IN/OUT=MIDI

External MIDI sequencer

MIDI OUT   MIDI IN

MIDI IN   MIDI OUT

S90
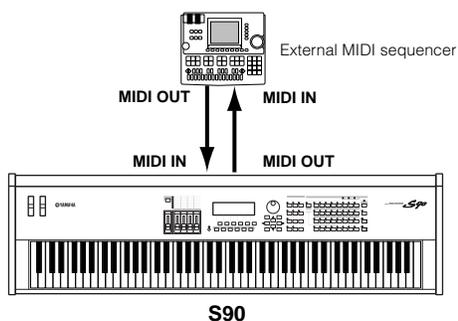
■ Controlling another MIDI device via MIDI THRU

UTILITY [F5]→[SF4] MIDI IN/OUT=MIDI

External MIDI sequencer   External MIDI synthesizer 1

MIDI OUT   MIDI IN

MIDI IN   MIDI THRU

MIDI OUT   **S90**

MIDI IN

External MIDI synthesizer 2
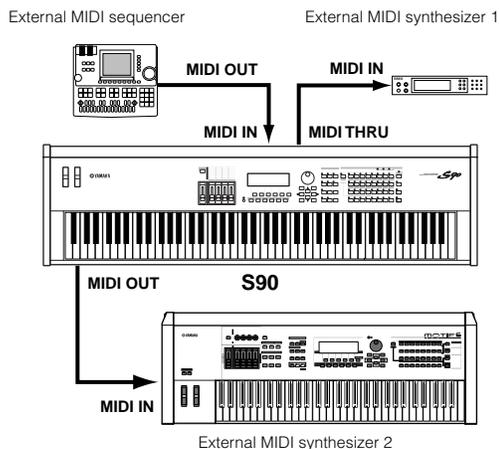
In the above setup, Synthesizer 2 can be played from the S90 (via MIDI OUT), while the external sequencer plays Synthesizer 1 (via MIDI THRU).

NOTE The MIDI cable should be no greater than 15 meters in length, and there should be no more than three devices in a MIDI chain (chained in series via each unit's MIDI THRU). To connect more units, use a MIDI Thru Box for parallel connections. You may encounter errors if the MIDI cables are too long or if too many devices are chained together via their MIDI THRU connectors.

■ Using an mLAN interface (when an optional mLAN8E has been installed)

UTILITY [F5]→[SF4] MIDI IN/OUT=mLAN

S90

IEEE1394 (mLAN) cable

Transmit & Receive

mLAN keyboard
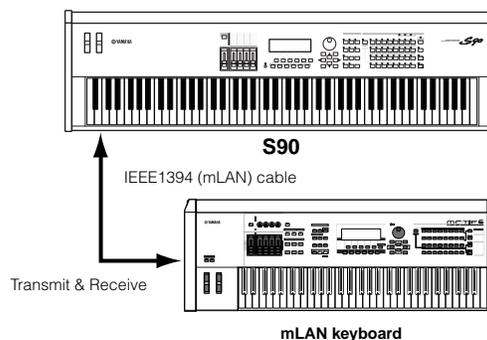
NOTE Any one of the following interfaces can be used for MIDI data transmission/reception: the MIDI connectors, the mLAN terminal connector, or the USB connector. However, they cannot be used at the same time. Select which connector is used for MIDI data transfer in the Utility mode ([F2]→[SF1] AD/Source Ref. #53).

Connecting to a Personal Computer

By connecting a computer, you can transfer data between the S90 and the computer via MIDI, and use the computer to control, edit and organize data on the S90. For example, you can use the included Voice Editor program to edit the S90's voices. There's also a special File Utility program that lets you use your computer to manage files in the Memory Card inserted in the S90's CARD slot.

■ Using an USB interface

UTILITY [F5]→[SF4] MIDI IN/OUT=USB

USB cable
USB terminal
Computer with a USB Interface
S90
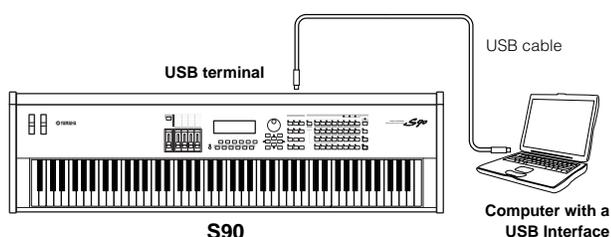
NOTE If you are using the Remote Control function to control operations on a computer sequencer, we recommend making connections with a USB cable.

NOTE The USB connection can only be used for transfer of MIDI data. No audio data can be transferred via USB.

Data send/receive
S90   USB terminal
USB cable
Computer with a USB Interface
MIDI IN   MIDI OUT
MIDI cable
MIDI OUT   MIDI IN
External MIDI synthesizer
External MIDI sequencer
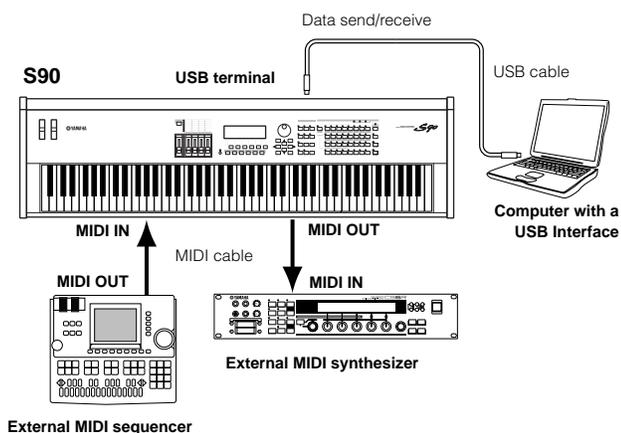
NOTE For details about the signal flow of this setting, see page 113 (*67).

About the USB connector

USB cables have different connectors on each end: an A type and a B type. When using the USB connection, connect the A type to your computer and the B type to the S90.

⚠

Disconnecting/connecting the USB cable or turning the power off/on may cause the computer operation to hang-up, or may stop the S90 from functioning properly. Be careful NOT to disrupt the USB connection or turn the power on/off in the following operating conditions.

- While the S90 is recognizing the device or while loading the driver.
- While starting or shutting down the operating system.
- While computer operation is suspended (with power management controls such as sleep or hibernation).
- While a MIDI application is starting.

The computer may also hang up and/or the S90's functions may stop if you do the following:

- Turn the power on/off, or connect/disconnect the cable too often.
- Enter the sleep mode while transmitting the MIDI data, and resume operation.
- Disconnect/connect the cable while the S90 is on.
- Turn the S90 on/off, start the computer, or install driver software while a huge amount of data is being transferred.

■ Using an IEEE1394 interface (when an optional mLAN8E has been installed)

UTILITY [F5]→[SF4] MIDI IN/OUT=mLAN

IEEE1394 cable
Computer with an IEEE1394 interface
S90

Connections **17**
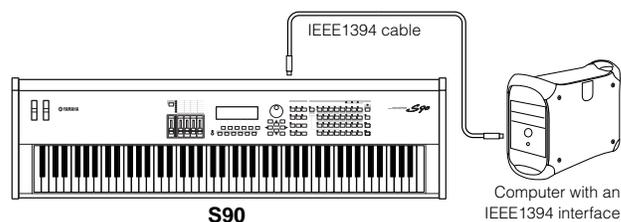
■ Using a MIDI interface

Using the computer's MIDI interface

UTILITY [F5]→[SF4] MIDI IN/OUT=MIDI

MIDI cable

MIDI IN   MIDI OUT

MIDI OUT

MIDI IN

Computer with
MIDI Interface

S90
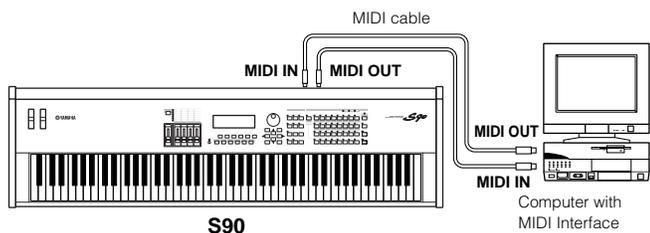
Using an external MIDI interface

UTILITY [F5]→[SF4] MIDI IN/OUT=MIDI

MIDI Interface

MIDI OUT

MIDI IN

MIDI IN   MIDI OUT

Computer

S90

Serial port
(modem or printer port)
or USB port
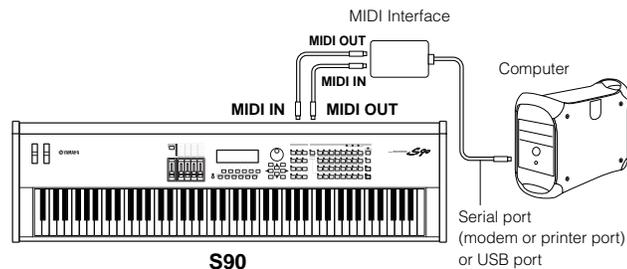
NOTE Make sure to use the appropriate MIDI interface for your
computer.

NOTE If you are using a computer that has a USB interface,
make sure to connect the computer and the S90 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 (Utility [F5] → [SF2])

When connecting the S90 to a computer, the
keyboard performance data is generally sent to the
computer, and then returned from the computer to
play the tone generator or sound source. If the Local
Control 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" is enabled on the software/
computer, set the S90 Local Control to "off."**

USB

IN   OUT

Tone
Generator

Keyboard

Local Off

OUT

IN

Computer with
Application Software

Echo Back On

S90 Local Control=off
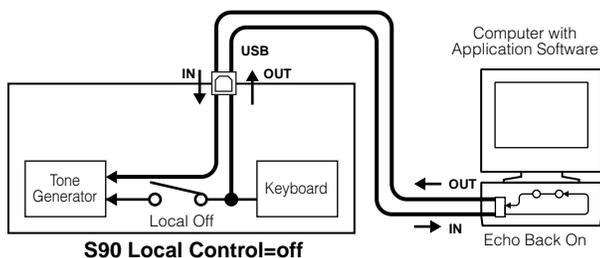
NOTE When transmitting or receiving System Exclusive
data (such as with the Bulk Dump function), use
the setting example below, making sure that MIDI
"Echo" on the computer software is set to "off."

**When MIDI "Echo" is disabled on the software/
computer, set the S90 Local Control to "on."**

USB   OUT

Computer with
Application Software

Tone
Generator

Keyboard

Local On

IN

Echo Back On

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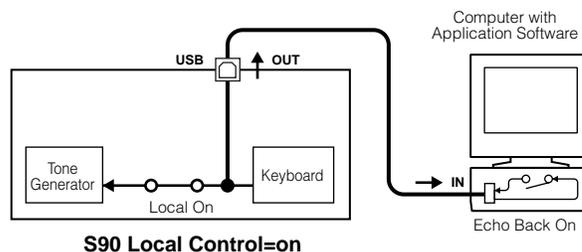
NOTE Although not indicated in the illustration above,
the S90 actually receives and responds to MIDI
data from the computer application (sequencer),
regardless of the Local Sw setting on the S90.

* 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 Refer to the owner's manual of your particular
software for specific instructions.

Connecting Various Controllers

The S90 features several controller jacks on the rear
panel — letting you independently control various
aspects of the sound and a variety of functions with
optional controllers (page 53).

BC3   FC4 or FC5   FC7

BREATH   ASSIGNABLE SUSTAIN   2   1

FOOT SWITCH   FOOT CONTROLLER
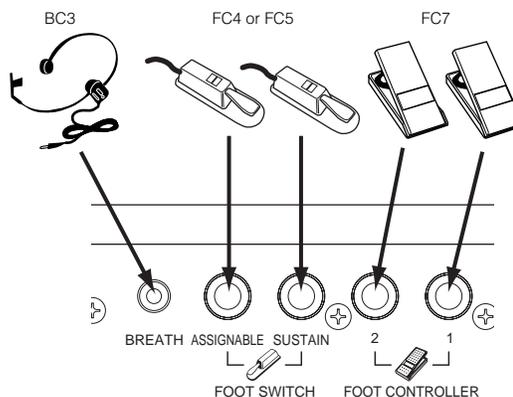
Demo Playback

The S90 features a variety of demo songs, showcasing its dynamic sound and sophisticated functions.

♪ NOTE Make sure the synthesizer is ready for playback. Details are given in the section "Setting Up" on page 14.
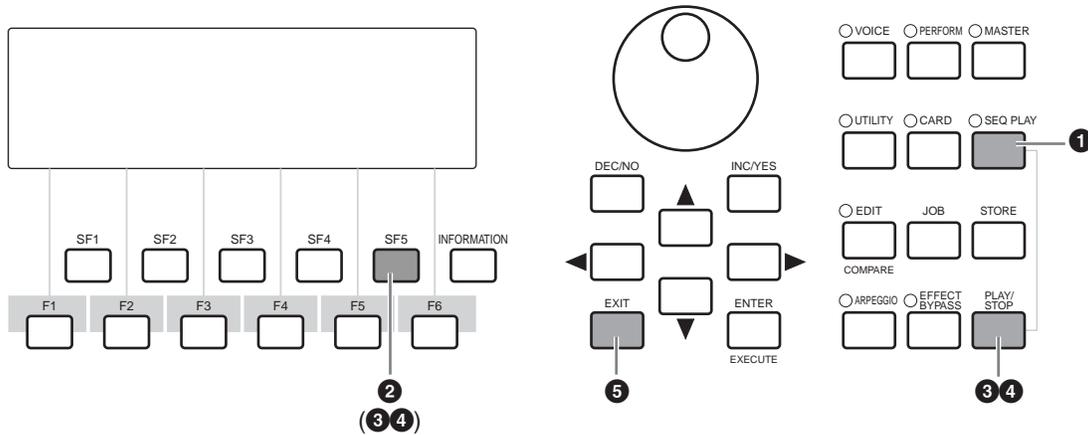
❶ Press the [SEQ PLAY] button to call up the CHAIN screen.

❷ Press the [SF5] (DEMO) button to call up the Demo data.
♪ NOTE You can select the first song for playback by using the [▲ ▼] buttons.

❸ Press the [PLAY/STOP] (or [SF5]) button to start playback of the Demo song.
♪ NOTE You can set the song tempo or the song position. The operations are the same as the ones in SEQ PLAY mode (page 76).

❹ The [PLAY/STOP] (or [SF5]) button lets you pause playback and then start again from the same point in the song.

❺ To exit from the Demo mode, stop playback, then press one of the [MODE] buttons or [EXIT] button.
♪ NOTE Demo song playback continues indefinitely until stopped.

Overview of the S90

The S90 has a wide variety of advanced and convenient features. This section gives you an overview of these features. The following diagram shows the various component sections or "blocks" of the S90.

Controller

Keyboard   Controllers

Memory Card

Song (SMF) File   S90 Data

Load

Save

MIDI OUT

Sequencer

(Playback)

Tone Generator

AWM2
Plug-in Board
Arpeggiator

Effect

Reverb   Insertion 1

Chorus   Insertion 2

Variation   Master Equalizer

Output
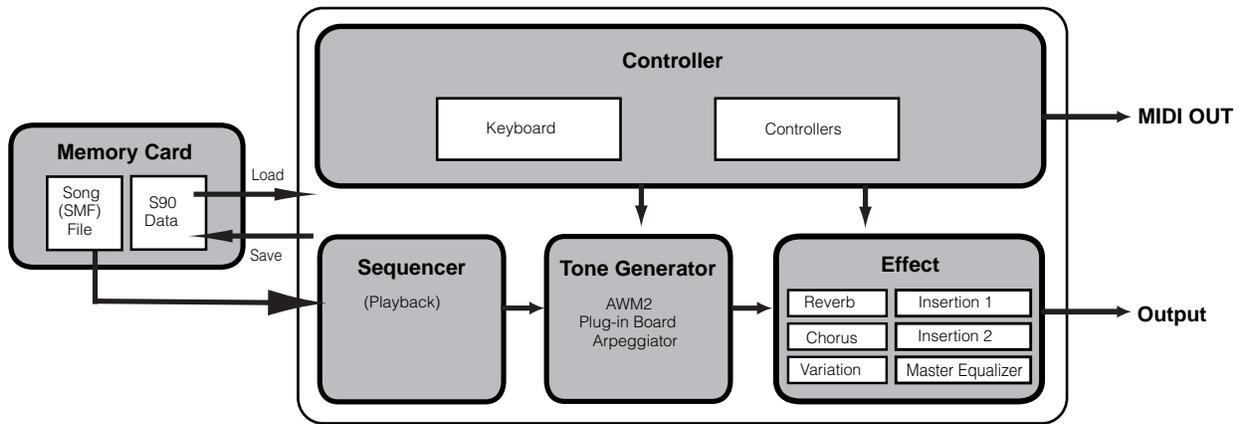
Controller

This block consists of the keyboard, Pitch Bend and Modulation wheels, Control Sliders, and so on (page 53).
The keyboard itself doesn't generate sounds, but instead sends note, velocity and other information to the S90's tone generator section for the notes you play. The controllers also send non-note performance data. Information from the keyboard and controllers can be transmitted to other external MIDI devices through the MIDI OUT connector.

Tone Generator

This block plays back sounds according to information received from the keyboard and controllers. The following example illustrates the path taken by the signal from an Element in the Voice Mode (page 26).

Controls the output level (amplitude) of each Element output from the FILTER section. The signals are then sent at this level to the Effects Unit.

Controls the pitch of each Element output from the OSC section.

Tone Generator

OSC (Oscillator) → PITCH → FILTER → AMP (Amplitude) → To Effects units

Outputs the waveform of each Element. Each Voice consists of up to four Elements.

Changes the tonal quality of each Element output from the PITCH section.

Internal AWM2 Tone Generator and Optional Plug-in Boards

The tone generator block in the S90 consists of the built-in AWM2 and optional Plug-in Boards.

| Internal AWM2 Tone Generator | Plug-in Boards (optional) |
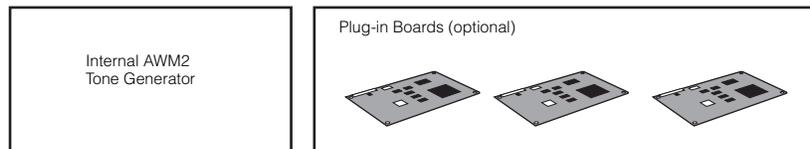
● **AWM2 (Advanced Wave Memory2) & Waveform**

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.

> **NOTE** AWM2 is not just limited to general musical instruments (Normal Voices). It can also be used for setting up percussive instruments (Drum Voices). For details on Normal and Drum Voices, see page 27.

● **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 the S90 — meaning that you can use their sounds and functions just as if they were built right into the S90 at the factory.

Up to three Plug-in Boards can be installed to the S90 (see box below for available boards). These boards are not simply a source of more Voices; they are also 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 (page 25).

The S90 is compatible with the Modular Synthesis Plug-in System. There are three types of Modular Synthesis Plug-in System-compatible Plug-in Boards: Single Part, Multi-Part and Effect. Using these, you can build your own system based on the sounds you require.

Plug-in board line-up

● **Single Part Plug-in Boards**

Single Part Plug-in Boards let you add a completely different synthesizer or tone generator and play its voices by using a single part of the S90.

• **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)**
A massive waveform memory is dedicated to the reproduction of piano sounds. This board offers 136 stereo sounds, including a number of acoustic and electric pianos, and up to 64-note polyphony. You can even install three of these boards to triple the polyphony to 192 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.

• **Drums Plug-in Board/Percussion Plug-in Board (PLG150-DR/PLG150-PC)**
Incorporates the highly-acclaimed AWM2 engine dedicated to the reproduction of drum/percussion sounds. This board also has its own dedicated effects processing. This means that you can apply Reverb and Insertion effect to the voice, letting you use all of the effects on the "mother" device for the other Parts.

● **Effect Plug-in Board**

 • **Vocal Harmony Plug-in Board (PLG100-VH)**
  With this board installed, you can add harmonies to selected parts using four types of effects.
  Backing chorus parts for your vocals can be created automatically from chords that have been prepared and stored as MIDI data. You can also use the S90 like a vocoder by connecting and using a microphone while playing the keyboard.

● **Multi-Part Plug-in Board**
  Multi-Part Plug-in Boards let you expand the voice polyphony of the S90 by giving you a full 16 independent instrumental parts. By using this type of board to play back sequencer tracks, you can reserve the maximum polyphony of the S90 for your keyboard performance.

 • **XG Plug-in Board (PLG100-XG)**
  This Plug-in Board is a 16-part XG sound generator. You can play back XG/GM song files using the rich variety of sounds and effects on this board.

MODULAR SYNTHESIS PLUG-IN SYSTEM

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 the latest and most sophisticated synthesizer and effects technology, allowing you to keep pace with the rapid and multi-faceted advances in modern music production.

Maximum Polyphony

The maximum sonic polyphony is 64 for AWM2, plus the polyphony of the Plug-in Board(s) (if installed). The actual note polyphony will vary depending on the type of tone generator unit used, the number of Elements in the Voice, and the note polyphony of the Plug-in Boards.
In the case of AWM2 Voices, the polyphony figure of 62 is divided by the number of Elements in the Voice.

Part Structure of the Tone Generator Block

The S90 plays its sounds (with the Tone Generator block) in response to MIDI data, received from the Controller block or Sequencer block. MIDI data is assigned to one of sixteen channels, and the S90 is capable of simultaneously playing sixteen separate parts, via the sixteen MIDI channels. However, we can overcome the sixteen-channel limit by using separate MIDI "ports," each supporting sixteen channels. The multiple sound sources of the S90 (internal tone generator and Plug-in Boards) take advantage of the three MIDI ports included on the instrument.

Tone Generator block

Part for Voice mode

Port 1	Port 2	Port 3
part 1	part 17	part 33
part 2	part 18	part 34
⋮	⋮	⋮
part 14	part 30	part 46
part 15	part 31	part 47
part 16	part 32	part 48

These parts are used in modes other than the Voice mode.
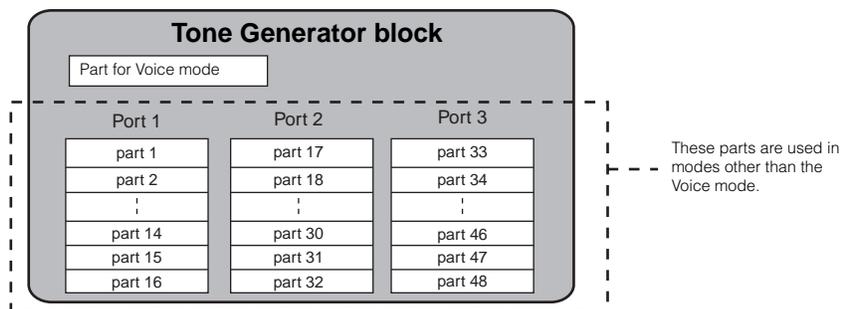
As shown in the above illustration, up to 48 parts can be used in the modes (excepting the Voice mode).
However, the number of parts that are actually used is a maximum of 34 in the Sequence Play mode, as we'll see later in some examples.

🎵NOTE See page 29 for details about the modes.

🎵NOTE The USB cable supports up to eight separate MIDI ports. The S90's Tone Generator block supports three separate ports as illustrated above, and the S90's MIDI Thru function supports eight separate MIDI ports.

🎵NOTE The MIDI cable and IEEE cable (when the mLAN8E has been installed) cannot handle independent MIDI port data.

Part Structure – Voice/Performance/Sequence Play Modes

● **Voice mode**

Controller block

Keyboard

Controllers

The sequencer block is not available in the Voice mode.

Tone Generator block (Internal / Plug-in)

Part for Voice mode

Parts 1-48 are not used.

Port 1	Port 2	Port 3
part 1	part 17	part 33
part 2	part 18	part 34
part 3		
part 4		
part 5	part 30	part 46
⋮	part 31	part 47
part 16	part 32	part 48

Output
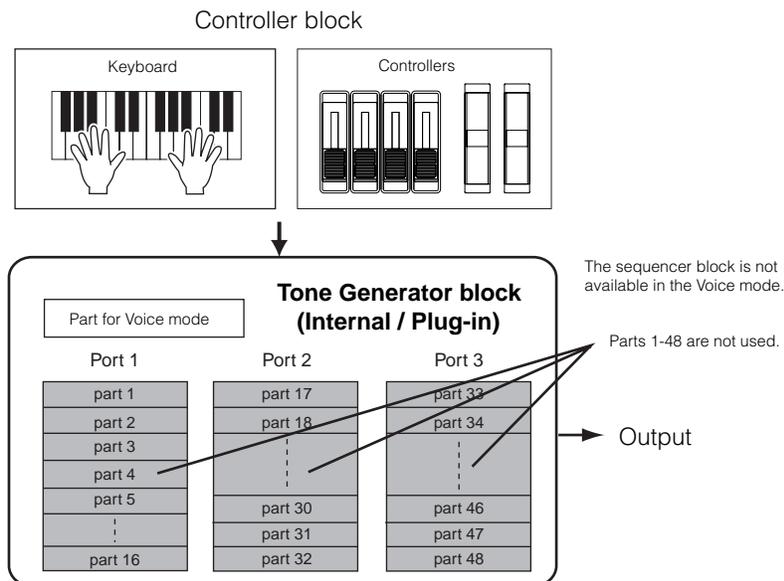
NOTE In the Voice mode, the MIDI port number is 1.

NOTE The Multi-Part Plug-in Board cannot be used in the Voice mode. However, other Plug-in Boards can be used.

● **Performance mode**

Controller block

Keyboard

Controllers

A maximum of four parts can be used among parts 1-4 and 14-16.
Parts that are set to on in the Performance Play mode are used.

Tone Generator block (Internal / Plug-in)

The sequencer block is not available in the Performance mode.

PLG3 part

PLG2 part

PLG1 part

Port 1	Port 2	Port 3
Part 1	Part 17	Part 33
Part 2	Part 18	Part 34
Part 3		
Part 4		
Part 5		
⋮		
Part 14	Part 30	Part 46
Part 15	Part 31	Part 47
Part 16	Part 32	Part 48

Parts 5-13 and 17-48 are not used.

Output

NOTE In the Performance mode, the MIDI port number is 1.

NOTE The Multi-Part Plug-in Board cannot be used in the Performance mode. However, other Plug-in Boards can be used.

● **Sequence Play mode**

External sequencer

MIDI cables by themselves cannot handle data from multiple ports. If a MIDI cable is used to transmit data from an external sequencer, only the Port 1 parts are used. To take advantage of the multiple ports of the S90, use a USB cable.

Controller block

Keyboard

Controllers

In the Sequence Play Mixing mode, the only parts that sound are the currently selected (edited) part, and parts having the same receive channel as the selected one.

Sequencer block
MIDI sequence data

Track 1
Track 2
Track 3
Track 4

Track 15
Track 16

Each track of music (MIDI) data sounds a corresponding part on the S90, according to the MIDI channel/Port settings.
(The receive channel/Port for each part must match the transmit channel/Port of each track.)

Tone Generator block (example)

When the Multi-Part Plug-in board and two Single Part Plug-in boards have been installed:

Port 1	Port 2 (Multi-Part Plug-in Board)	Port 3 (Single Part Plug-in Board)
Part 1	Part 17	Part 33
Part 2	Part 18	Part 34
Part 3		
Part 4		
	Part 30	Part 46
Part 15	Part 31	Part 47
Part 16	Part 32	Part 48

Parts 33-46 are not used.

PLG1 part   PLG2 part

These Port settings are available in Utility mode (PORT NO. [F6] → {SF2} Ref. #207).

Effects

Utilizing sophisticated DSP (digital signal processing) technology, the effects of the S90 can be used to change or enhance the sound.

◘ NOTE For more details about the effects, see page 67.

Card Drive/Sequencer

The Card Drive block lets you transfer or load data to and from the Memory Card (page 82).
The sequencer block can be used to play back Standard MIDI Files contained on Memory Card (page 75).

Voices & Performance

Bank (Memory) Structure

A Voice is a single instrument sound, created by using the Elements and setting various parameters. In the Voice Play mode (page 36), you can select and play any of these Voices. Performances, on the other hand, combine Voices in various ways. In the Performance Play mode (page 41), you can select and play any of these Performances.

Voices

Preset Voice
(384 Normal Voices + 48 Drum Voices)

Preset 1 (128 Normal Voices)	Preset 2 (128 Normal Voices)	Preset 3 (128 Normal Voices)	Preset 1 (48 Drum Voices)
Group A~H	Group A~H	Group A~H	Group A~C
Number 1~16	Number 1~16	Number 1~16	Number 1~16
Voice	Voice	Voice	Voice

GM Preset Voice
(128 Normal Voices+1Drum Voice)

GM Preset (128 Normal Voices)	GM Preset (1 Drum Voice)
Group A~H	
Number 1~16	
Voice	Voice

User Voice
(128 Normal Voices+16 Drum Voices)

User (128 Normal Voices)	User (16 Drum Voices)
Group A~H	Group A
Number 1~16	Number 1~16
Voice	Voice

Plug-in Voice
(The maximum amount of Preset and Users Banks is three, depending on the number of Plug-in Board that are installed.)

PLG1	PLG2	PLG3
Preset	Preset	Preset
(AN/PF/DX/DR/PC board: 64 voices VL board: 192 voices)	(AN/PF/DX/DR/PC board: 64 voices VL board: 192 voices)	(AN/PF/DX/DR/PC board: 64 voices VL board: 192 voices)
Number 1~16	Number 1~16	Number 1~16
Voice	Voice	Voice
User (64 Voices)	User (64 Voices)	User (64 Voices)
Group A~D	Group A~D	Group A~D
Number 1~16	Number 1~16	Number 1~16
Voice	Voice	Voice

Performance

User
(128)

Group A~H
Number 1~16
Performance

Indicates the separate "Banks" of Voices/Performances.

Voices & Performance **25**

Overview of Voice/Element/Performance

Each Voice can consist of up to four Elements. Each Element itself is a high-quality waveform or instrument sound.

Voice & Element

• •

Each Voice can consist of up to four Elements. Elements are made from waveforms, and the quality of the Elements is high enough that each can be used on its own as a voice. Since you can combine up to four Elements together in a voice, highly expressive and richly textured sounds are possible. You can also split different instrument sounds across the keyboard to be playable separately with your left and right hands — without having to specially set up a Performance program (Voice Element Edit [F1]→[SF3] NoteLimit Ref. #32).

Performance

• •

A Performance consists of up to four Parts, each of which can play a Normal Voice or Drum Voice Part. By assigning different Voices to each part, you can play these four Parts simultaneously from the keyboard — either in layers of different Voices, or special key splits in which your right and left hands can play separate Voices (page 42).

🎵 NOTE Song playback settings are available in Mixing setup of Sequence Play mode.
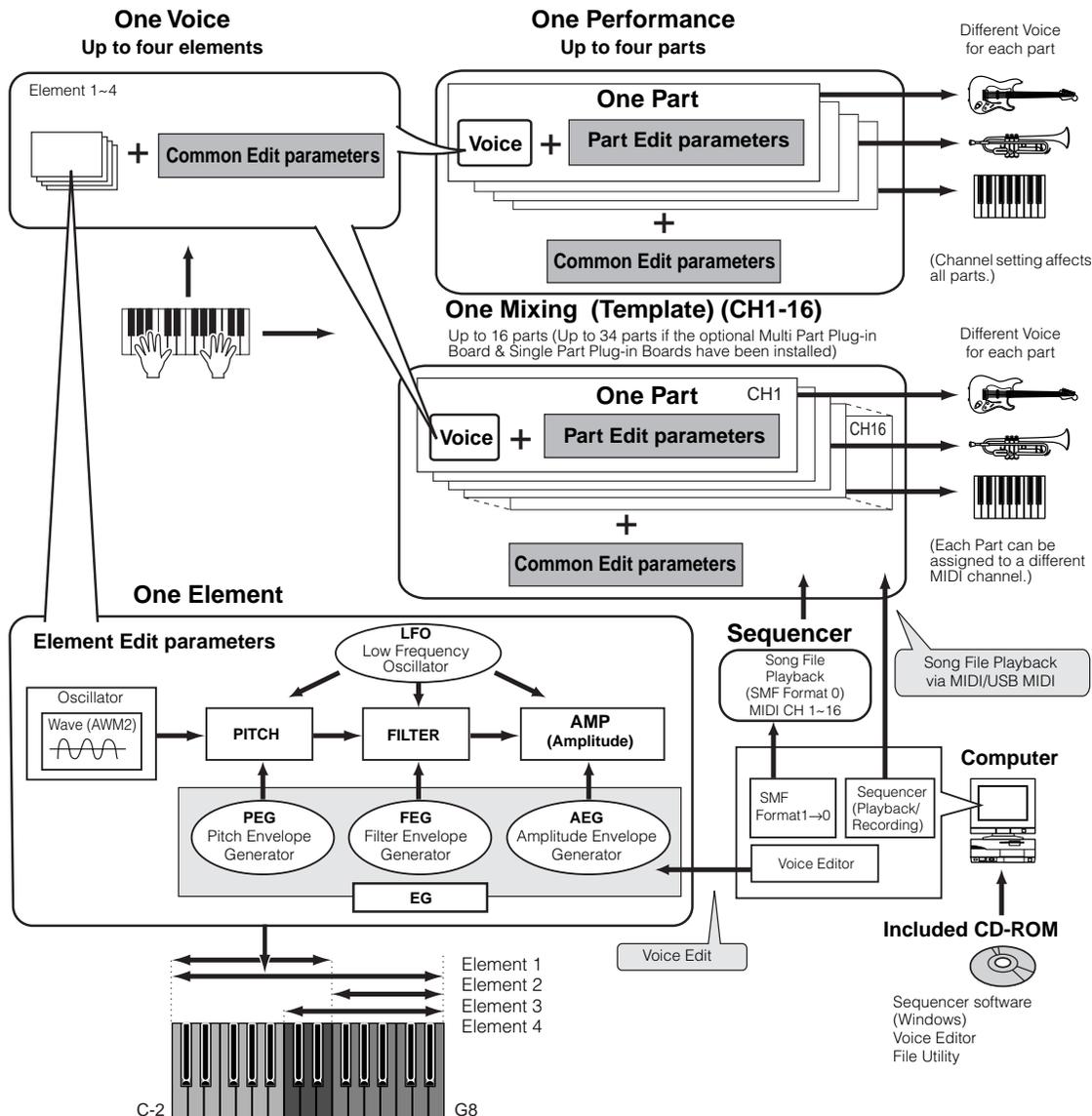
Normal Voices & Drum Voices

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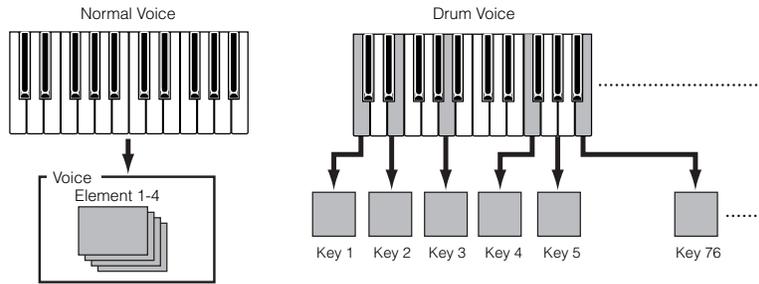
GM Voices

GM 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 the S90 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.

Internal Memory and File Management

In this section, how to store the various types of data and use the memory media for storing them.
This diagram details the relationship among the S90's functions and the internal memory and memory card.
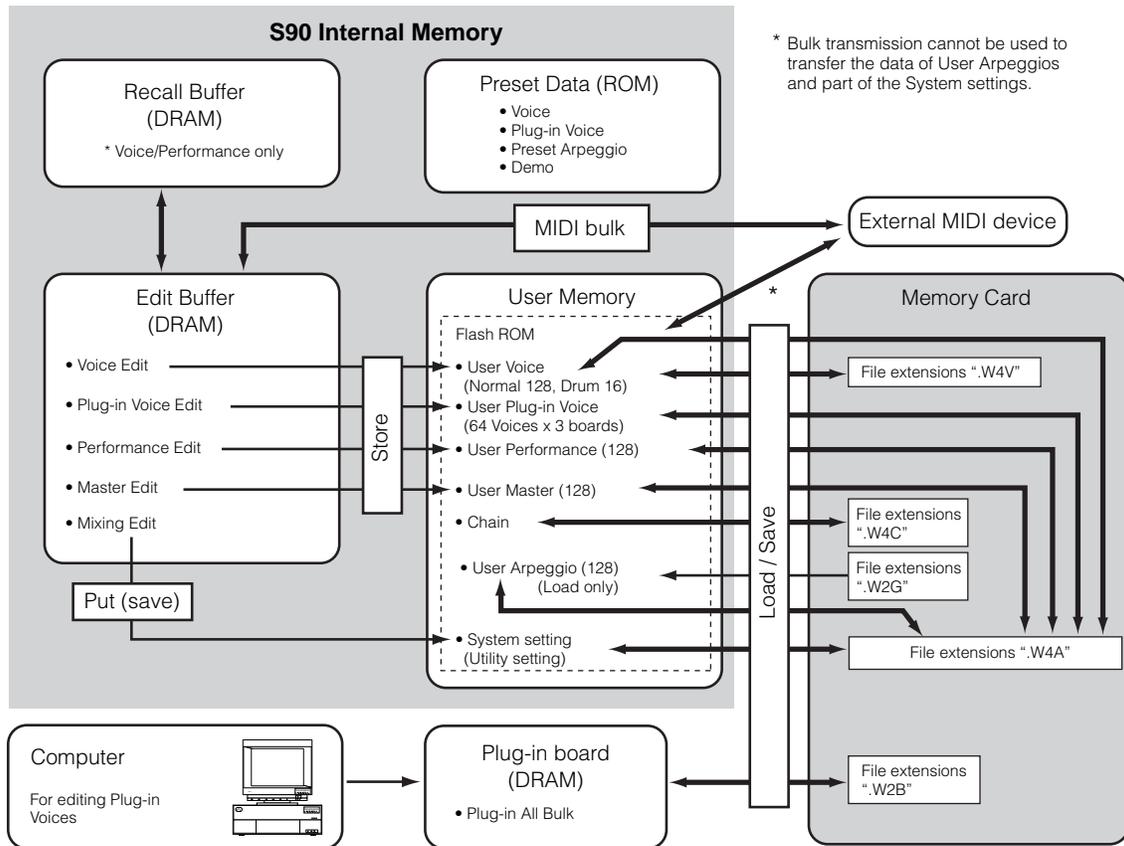
Internal Memory

● ROM and RAM

ROM (Read Only Memory) is memory designed specifically for reading out of data, and as such data cannot be written to it. This is the location where preset data for the instrument is permanently stored.

On the other hand, RAM (Random Access Memory) allows both reading and writing of data. This is the location for the edit buffer data.

● Flash ROM and DRAM

The data contained in Flash ROM can be read and written and maintained indefinitely, even if the power is off. This is the location where the data created by editing is stored. On the other hand, data contained in DRAM is lost when the power is turned off. Because of this, you should always store any data residing in DRAM to Flash ROM or a memory card before turning off the power.

⚠ Never attempt to turn off the power while data is being written to Flash ROM (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 may cause the system to freeze (due to corruption of data in the Flash ROM).

Edit Buffer (DRAM) and Recall Buffer (DRAM)

● Edit Buffer and User Memory

The edit buffer is the memory location for edited data of these types: Voice, Performance and Master. Data edited in this location will be stored to the User Memory.

If you select another Voice, Performance, Master, or Mixing setup, the entire contents of the edit buffer will be rewritten with the newly selected Voice/Performance/Master/Mixing setup. Make sure to store any important data before selecting another Voice, etc.

● Edit Buffer and Recall Buffer

If you've selected another Voice or Performance without storing the one you were editing, you can recall your original edits, since the edit buffer's contents are stored in backup memory. Keep in mind that the recall buffer is available only in the Voice or Performance mode.

Memory Card

To properly protect and store your valuable User data, you should save it to Memory Card for indefinite safekeeping (page 82).

There are two different ways to save data created on the S90 to memory card:

- By saving all data in the User memory as a single file (with the extension ".W4A").
- By saving the files separately according to their specific functions (with the extensions corresponding to each type).

Basic Operations

In this section, you'll learn about the structure of the modes of the S90, its panel display indications and its fundamental operations.

Modes

The S90 is organized into various modes, each covering a different set of operations and functions.
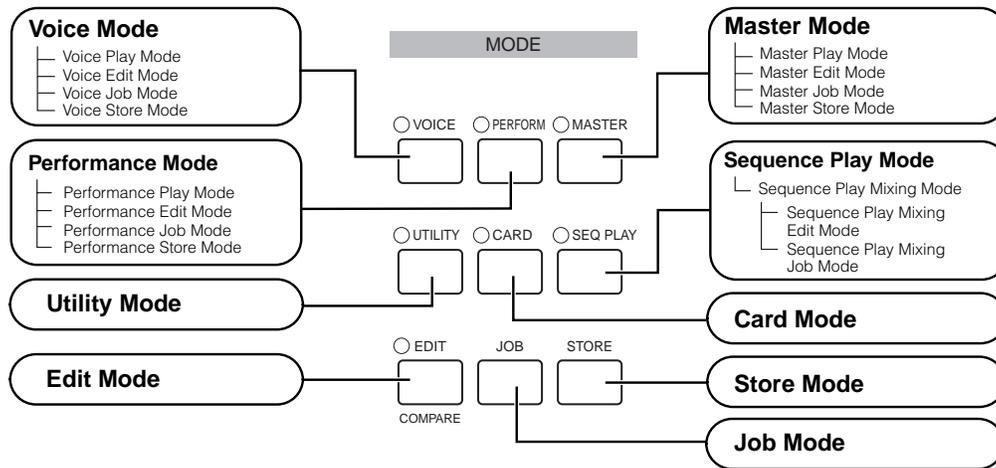
Mode Table

Mode (Status)	Play	EDIT (LED lights. When comparing, it flashes.)	JOB (Displayed)	STORE (Displayed)	Relevant function
VOICE (LED lights)	page 36	page 60	page 70	page 73	Play/Edit/Save the Voice
PERFORMANCE (LED lights)	page 41	page 98	page 70	page 73	Play/Edit/Save the Performance
MASTER (LED lights)	page 48	page 51	page 70	page 73	Register/Recall the settings that are often used in the Voice, Performance and Sequence Play mode to User Master. Make/Register Master Keyboard function settings.
SEQ PLAY (LED lights)	page 75				Song playback (from memory card)
SEQ PLAY MIXING (Displayed)		page 79	page 70		Set the tone generation parameters of each part in Sequence Play mode (page 77).
UTILITY (LED lights)			page 72		Global settings for the entire system (page 98)
CARD (LED lights)					Save/Load the S90 data (page 82)

NOTE You need to select the Voice/Performance/Master before entering Edit mode. All parameters can be set and stored per Voice/Performance/Master.

NOTE Utility mode is a sub-mode of the Voice/Performance/Sequence Play mode. For example, if you press the [UTILITY] button while in the Performance mode, you enter the Utility mode as a sub-mode of the Performance mode — allowing you to select and play performances while in the Utility mode.

Parameters are divided into two basic groups: 1) functions that are related to each Voice, Performance etc., and 2) functions that affect all Voices, Performances etc. The former are set in the Edit mode and latter in the Utility mode. Utility mode settings can be saved to memory card along with the Voices and Performances.

Selecting a Mode

There are separate Play modes for Performances/Voices and Sequence Play mode. To enter each of these modes, use the appropriate MODE button.

In the Sequence Play mode, there is a Mixing mode. To enter the Mixing mode, press the [F6] button while selecting the Sequence play mode.

To enter the Master mode, press the [MASTER] button. Depending on the Master program, the indicator of the VOICE/PERFORMANCE/SEQ PLAY lights.

There are also separate Edit and Job modes for Performances, Voices, Masters and Mixing setups. To enter the Edit or Job mode, simply press the [EDIT] or [JOB] button while in each respective mode.

Similarly, pressing the [STORE] button in the Voice, Performance, Master mode takes you into the Store mode where you can store Performances, Voices and Masters.

In addition, the modes mentioned above, there is also a Utility mode, which is for making global settings to the instrument and the Card mode, which contains Card related settings.

NOTE Keep in mind that the particular displays and parameters in the Utility mode differ depending on which main mode was active before calling up the sub-mode.

NOTE Note that the Mixing settings are memorized with the "Put" function (not "Store") (page 79).

To exit to another mode, press the respective button for that mode or the [EXIT] button.

Functions of the NUMBER [1] - [16] buttons

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

	When [TRACK SELECT] is on	When [MUTE] is on	When both [TRACK SELECT] [MUTE] 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	Zone selection (1 - 4)	—	Master selection, according to Groups A - H
Master Edit mode	Zone selection (1 - 4)	Zone Mute setting (1 - 4)	—
Sequence Play mode Mixing mode	Mixing part selection	Mixing part Mute setting	—

Display Indications

Here we explain how to read the display indications.

Voice Play Mode
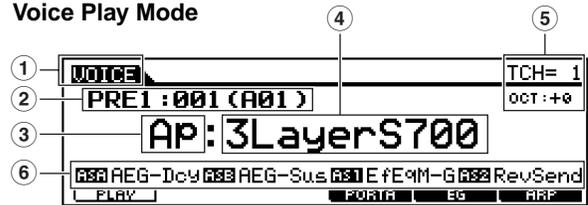
Voice Play Mode (Quick Edit)
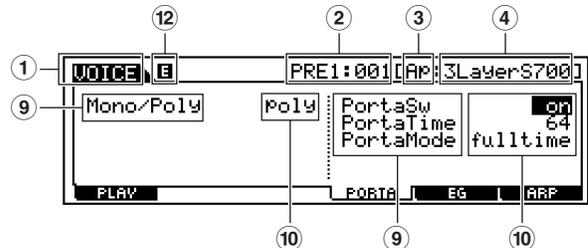
Voice Edit Mode
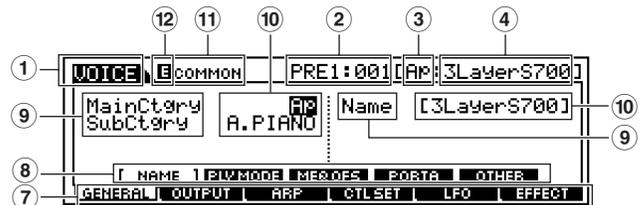
Performance Play Mode
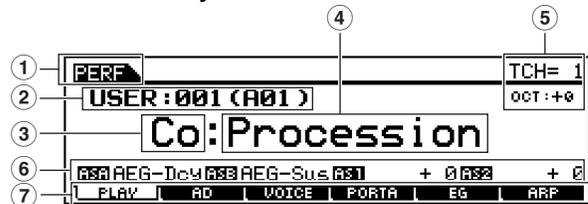
Performance Play Mode (Quick Edit)
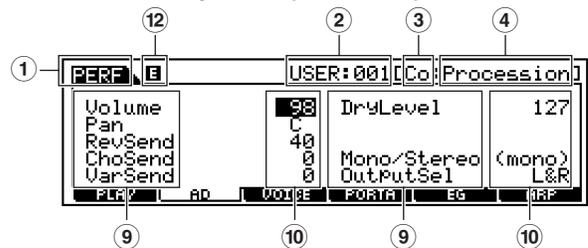
Performance Edit Mode
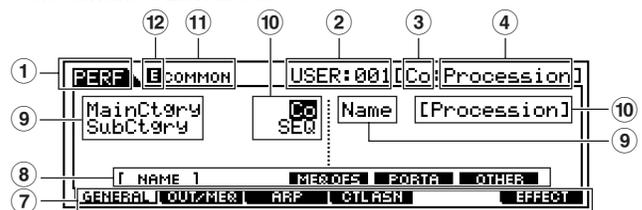
Master Play Mode

Indicates the mode assigned to the Master

Indicates the bank number assigned to the Master

Master Quick Edit Mode
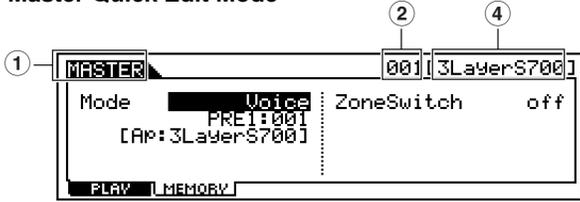
Master Edit Mode
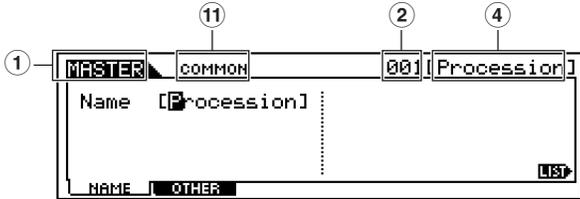
Sequence Play Mode
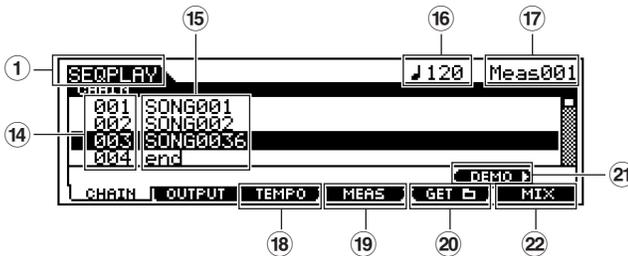
Sequence Play Mixing Mode

Sequence Play Mixing Edit Mode

Job Mode (Ex. Voice Copy)

Source Voice   Destination Data Type   Source Data Type
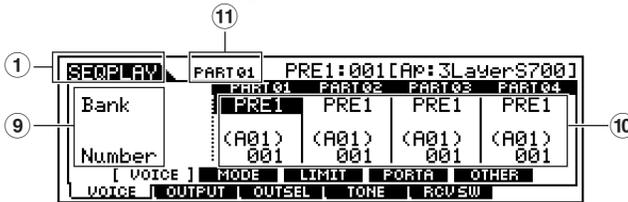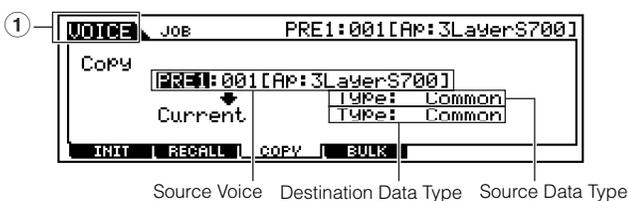
Store Mode (Ex. Voice Store)

Naming List
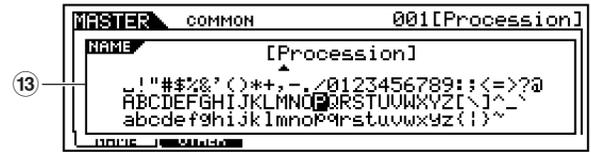
① Mode (PERF = PERFORMANCE)

② Bank/Number
   P1-P3 = PLG1-PLG3

③ Category (page 35)

④ Name (refer to the separate Data List)

⑤ Keyboard MIDI transmit channel (page 37)
   Keyboard Octave setting set via the Octave parameter
   (UTILITY [F1]→[SF1] Octave Ref. #17)

⑥ Functions assigned to the respective Control sliders
   (3rd row). AS = ASSIGN (page 53)

⑦ Function (selected via [F1]-[F6]buttons)

⑧ Sub-Function (selected via [SF1]-[SF5]buttons)

⑨ Parameter/function name (page 98)

⑩ Settings

⑪ Edit type
   COMMON = Common Edit status
   EL1-EL4 = Element Edit status
   KEY = Key Edit Status
   PART01-PART16 = Part Edit status

⑫ Edit indicator (Indicates the current Voice/
   Performance has been modified but not yet stored; page
   39. In the Compare condition, the ▣ indicator is
   shown; page 61.)

⑬ Pop-up character list (page 35)

⑭ Chain Step number (page 75)

⑮ Settings (Song file/Mix template)

⑯ Tempo

⑰ Song position

⑱ Tempo button (page 76)

⑲ Measure button (page 76)

⑳ Folder setting button (page 75)

㉑ Press the button to enter the Demo mode (page 19)

㉒ Press the button to enter the Mixing mode (page 77)

㉓ Destination for Store operation

Selecting Functions and Parameters

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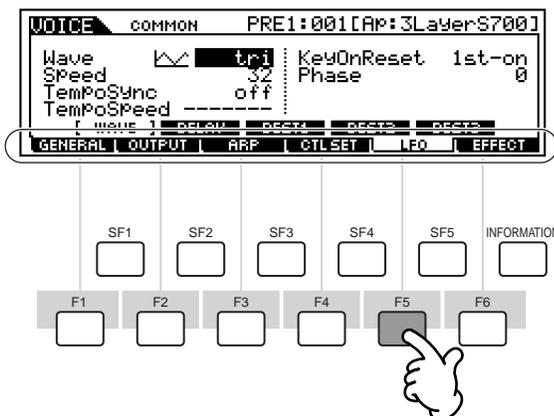
In this example, press the [F5] button to go to the LFO display.

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.

NOTE In some cases, the function buttons are used for special operations, such as the ones in the Sequence Play (CHAIN) display (page 76).

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

These functions can be selected via the corresponding button ([SF1]-[SF5]).
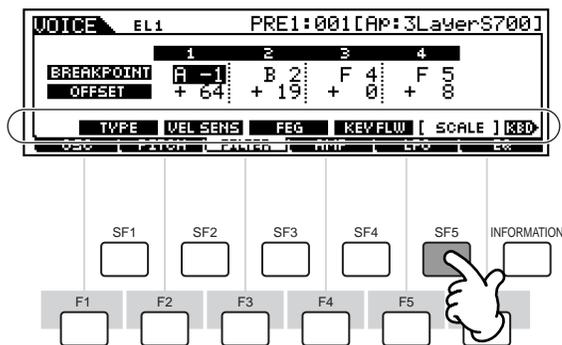
In this example, press the [SF5] button to go to the SCALE display.

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.)

How to leave the current display

For most operations (especially editing and Job- or Store-related), pressing the [EXIT] button will let you leave the current display and return you to the next highest level or to the normal play mode display.
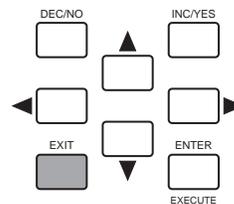
[ENTER] button

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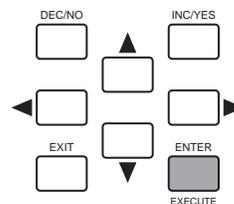
Display-based Controls

Data Entry

Changing (editing) values
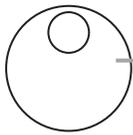
Rotating the data dial to the right (clockwise) increases the value, while rotating it to the left (counter-clockwise) decreases it.
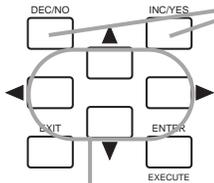
For parameters with large value ranges, you can increase the value by 10 by simultaneously holding down the [INC/YES] button and pressing the [DEC/NO] button. To decrease by 10, do the opposite; simultaneously hold down the [DEC/NO] button and press the [INC/YES] button.

Moving the cursor

Use these four cursor 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).

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

Never attempt to turn off the power while data is being written to Flash ROM (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 may cause the system to freeze (due to corruption of data in the Flash ROM).

Confirmation Message

When you execute certain operations, such as those in the Job, Store, and File modes, the S90 shows a confirmation message. This lets you actually execute the operation or cancel it if desired.
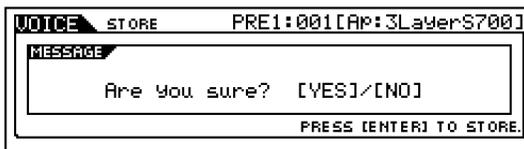
If a confirmation message (like the one illustrated above) appears, press the [INC/YES] button to execute the operation or press the [DEC/NO] button to cancel it.

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.
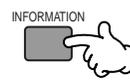
In the Sequence Play mode, you can confirm the selected (current) folder (directory).
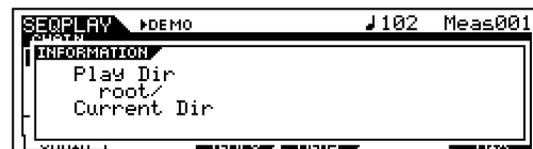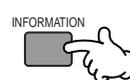
For details about Information Display, see page 114.

Basic Operations **33**

Note (Key) settings

Several S90 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). In the example display here, Element 1 of a voice is being edited.
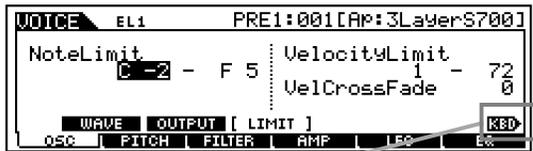
When Note Limit is selected, the [KBD] mark appears, indicating that you can use the keyboard to set the value. Simultaneously hold down the [INFORMATION] button and press the appropriate key.
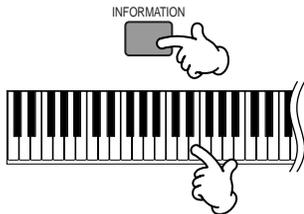
Naming (Entering Characters)

The S90 allows you to create your own original data such as voices, performances, masters. You can also freely name the data as desired.
The following data types can be named.

- User voices   page 66
- User performances   page 43
- User masters   pages 50, 52
- Mix templates   page 79
- Files saved to memory card   page 85

The example below applies when naming a User voice.

❶ Move the cursor to the first position of the name by using the cursor buttons.
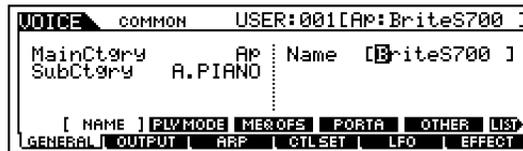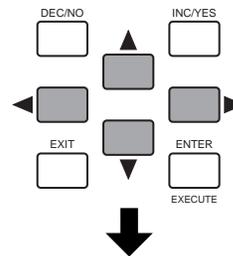
❷ Select a character by using the [INC/YES] button, [DEC/NO] button or the data dial.
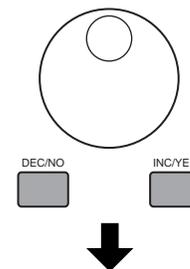
❸ Move the cursor to the next position of the name by using the cursor buttons.
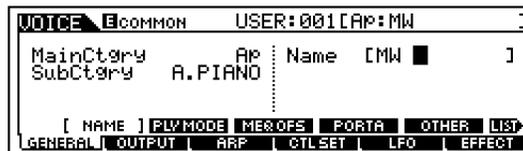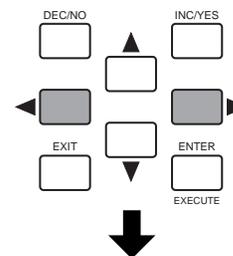
❹ Enter the other characters as desired by repeating steps ❶ - ❸ above.

Using the Character List

In steps ❷ and ❸ above, you can use the special pop-up Character List, which shows you all the available characters, making it exceptionally easy to enter names and text. To call up the list, press and hold down the [INFORMATION] button. To select a character, keep holding down the [INFORMATION] button and use the [INC/YES] and [DEC/NO] buttons or data dial.

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.

INFORMATION

```
VOICE Ecommon    USER:001[AP:MW    ]
MainCtgry        AP │Name [MW       ]
SubCtgry  A.PIANO  │
           [ NAME ] PLYMODE ME&OFS PORTA OTHER LIST
GENERAL │ OUTPUT │ ARP │ CTLSET │ LFO │ EFFECT
```

INFORMATION

```
VOICE Ecommon    USER:001[AP:MW    ]
NAME        [MW       ]
 .!"#$%&'()*+,-./0123456789:;<=>?@
ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`
abcdefghijklmnopqrstuvwxyz{|}~
GENERAL │ OUTPUT │ ARP │ CTLSET │ LFO │ EFFECT
```

While holding the [INFORMATION] button....

Select a character by using the [INC/YES] button, [DEC/NO] button or the data dial.

DEC/NO   INC/YES

Move the cursor to the desired position.

Use these two 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).

EXIT   ENTER

EXECUTE

LCD	Category	LCD	Category
--	Unassigned	Ld	Synth Lead
Ap	Acoustic Piano	Pd	Synth Pad
Kb	Keyboard	Sc	Synth Comping
Or	Organ	Cp	Chromatic Percussion
Gt	Guitar	Dr	Drums
Ba	Bass	Se	Sound Effects
St	Strings/Orchestral	Me	Musical Effects
Br	Brass	Co	Combination
Rp	Reed/Pipe		

Types of Parameters (Absolute and Relative)

There are many ways to set parameters. Some parameters require you to directly enter numerical settings or alphabetic characters. With others, you can choose from a number of available settings. Furthermore, some types of parameters are "absolute" whereas others are "relative."
For example, the absolute parameter in the following illustration can be set to either "mono" or "poly." For other absolute parameters such as Volume, the setting can be any value between zero and 127. The Volume setting has a linear, one-to-one relationship with the actual volume, as shown in the graph on the left. However, relative parameters do not follow the same relationship. The graph on the bottom shows the role of the Velocity Offset parameter. The value you have set here, known as an "offset," is added to, or subtracted from, the actual value. With Velocity Offset, the specified offset value is added to, or subtracted from, the actual velocity of the notes you play on the keyboard. Sometimes, these types of relative parameters are set as a percentage.

```
VOICE   COMMON    PRE1:001[AP:3LayerS700]
Volume        127 │RevSend          13
Pan             C │ChoSend           0
GENERAL │ OUTPUT │ ARP │ CTLSET │ LFO │ EFFECT
```

```
VOICE             PRE1:001[AP:3LayerS700]
Mono/Poly    Poly │PortaSw        off
                  │PortaTime       64
                  │PortaMode  fulltime
PLAY              │ PORTA │ EG │ ARP
```

```
PERF   PART01    USER:001[Co:Procession]
              PART01  PART02  PART03  PART04
PB Upper       + 2     + 2     + 2     ---
PB Lower       - 2     - 2     - 2     ---
VelSensDpt      64      64      64     ---
VelSensOfs      64      64      64     ---
        VOICE │ MODE │ LIMIT │ PORTA │[ OTHER ]
VOICE │ OUTPUT │ OUTSEL │ TONE │ RCVSW │ PLG1-3
```

1. Volume (absolute)

2. Velocity Sensitivity offset (relative)

Quick Guide
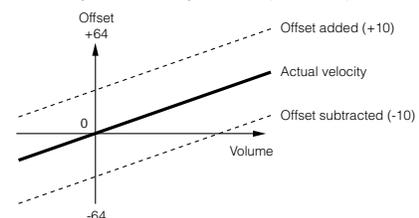
Playing Voices

Here, you'll learn how to select and play Voices (instrument sounds) from the PRESET1-3, GM, USER and PLG 1-3 memory groups (Banks).

NOTE For details about voices, see pages 25, 26. For information on the Voice List, see the separate Data List.

NOTE Up to 128 Normal Voices and 16 Drum Voices can be stored to User memory (pages 25, 27, 73). The Voice settings can be changed in the Voice Edit mode (page 60).

Selecting a voice
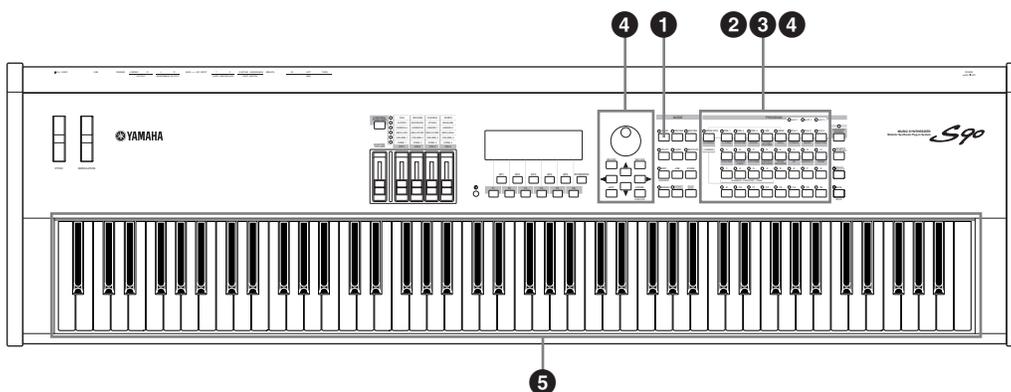
❶ Enter the Voice Play mode.
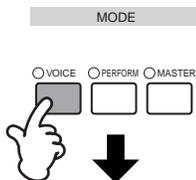
When the Voice Play mode is active, the currently selected voice is shown in huge letters — so you can easily check which voice you're about to play.

❷ Select a Voice Bank.

● **Normal Voice**

Select a Normal Voice Bank.   Select a Plug-in Voice Bank.
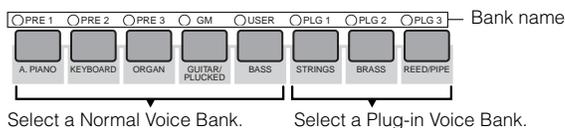
● **Drum Voice**
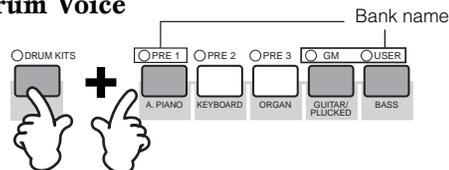
NOTE When shipped from the factory, the S90 contains a full set of specially programmed User voices in the User bank. Naturally, you can edit these and overwrite them if you want. You can also restore them to the original factory set from the Utility Job (page 72). For details about Voice Banks and Groups, see page 25.

❸ Select a Voice Group.

Voices in each Bank are divided into Groups [A] - [H]. Select the desired Group, and all the Voices of that Group are shown in the display.

Group

❹ Select a Voice number.

Decreases number / Increases number

DEC/NO / INC/YES

Decreases number / Increases number

ELEMENT / PERF.PART / ZONE
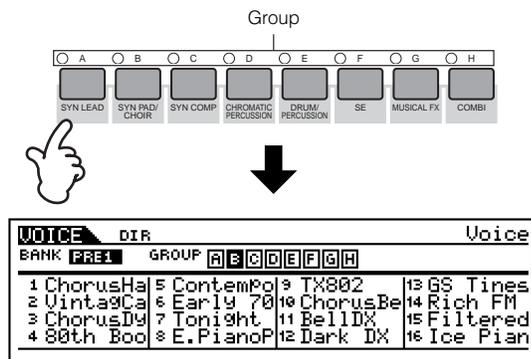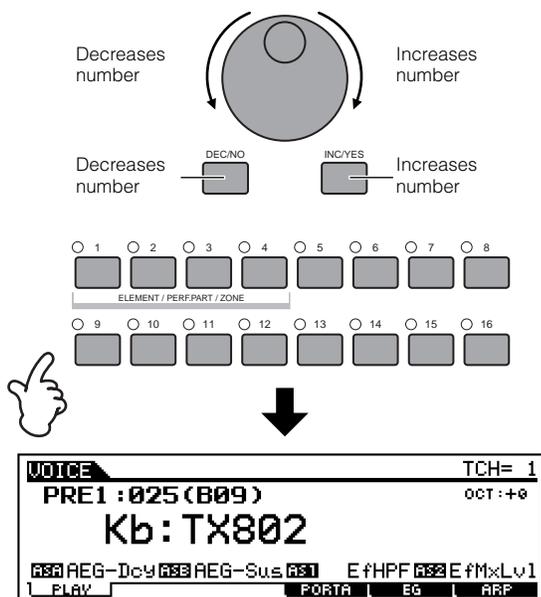
❺ Play the keyboard.

● **Program numbers and the corresponding Group/Numbers**

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

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.

ELEMENT / PERF.PART / ZONE

TRACK SELECT

SOLO
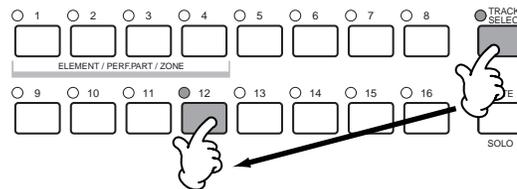
♪ NOTE You can set this parameter also in the Utility mode ([F5]→ [SF1] KBDTransCh Ref. #177). This parameter cannot be stored in the Store mode.

Using the Category Search function

The S90 features a powerful Category Search function that gives you quick access to the sounds you want, irrespective of their bank locations. Simply select a voice category, such as A. PIANO or SYN LEAD, and you can browse through all related voices one by one — and audition each of them, too. Plus, you can use the special Favorites category to store the voices you use most.
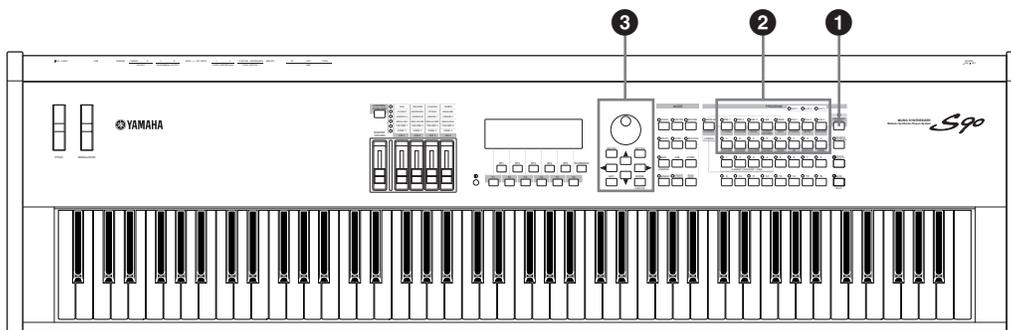
❶ Turn the Category Search function on by pressing the [CATEGORY SEARCH] button.
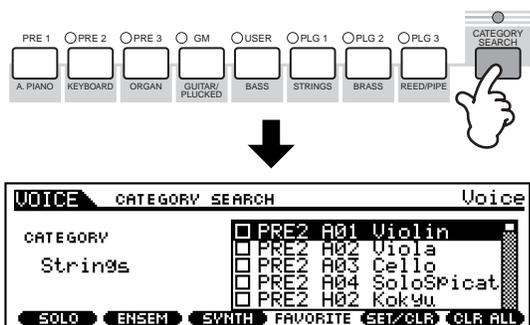
NOTE To turn the function off, press [CATEGORY SEARCH] button again.

❷ Select a Category.

■ Select a Category

Press the Category buttons to display the Category name and the voice list. The first voice in this Category is selected.

Category names

Category name   Voice list
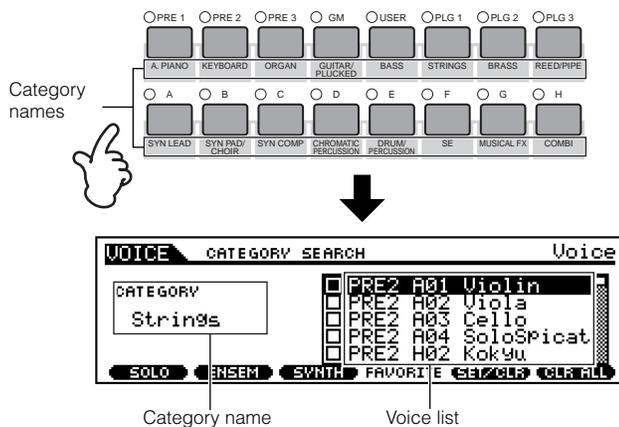
■ Select a Sub Category

All Categories are divided into two or three Sub Categories for further ease in selection. The Sub Category names are displayed at the bottom of the Category Search display. Press the [F1] - [F3] buttons to select the first voice in the corresponding Sub Category.
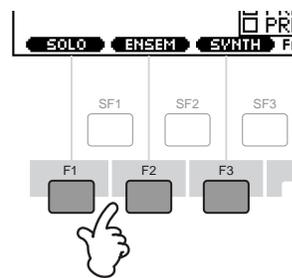
❸ Select a voice and play it.

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. Remember, you can play and audition each Voice as you select it — without having to leave the Category Search function.
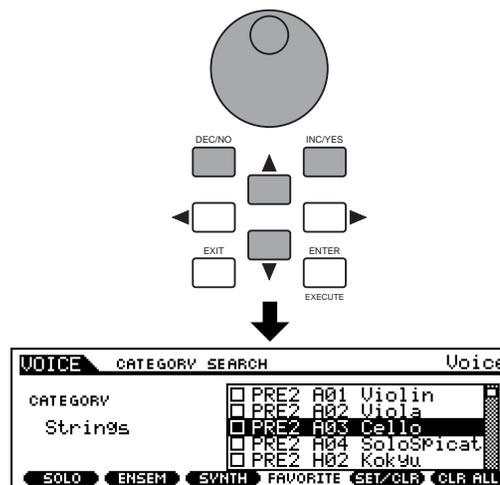
To actually call up the Voice and return to the Play mode, press the [ENTER] button.

Favorite Category

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

Select the desired Category, then move the cursor to your favorite voice in the Category list, and press the [F5] button to checkmark the box next to the voice name. (You can un-checkmark it by pressing the [F5] button again.) Go on to other Categories and continue registering your favorites. After you've checkmarked all the voices you want, press the [FAVORITES] button to store them to the Favorites Category. All the voices you've checkmarked — and only those voices — will be shown in the list. To exit from the Favorites Category, simply press the [FAVORITES] button again.

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

⚠ Never attempt to turn off the power while data is being written to Flash ROM (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 may cause the system to freeze (due to corruption of data in the Flash ROM).

Pressing this toggles between the two settings:
Checkmark on ☒
Checkmark off ☐
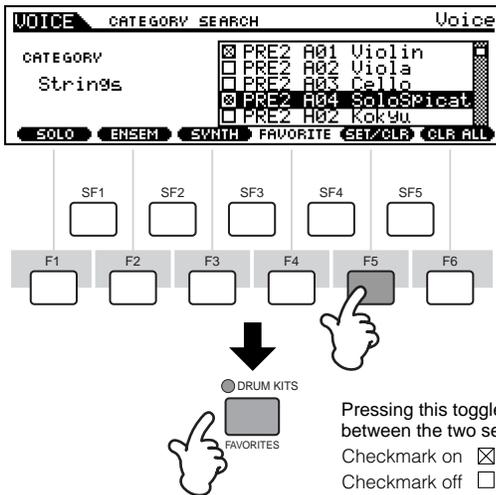
Voice editing in the Voice Play mode (Quick Edit)

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.

❶ Select the desired Voice (page 36).

❷ Select the menu you wish to edit by pressing the [F4] - [F6] buttons and edit the parameters in each display.

NOTE When the Plug-in voice is selected (when the Single part Plug-in board is installed), you can press the [F2] button to call up the BANK display.

❸ Store the settings edited in step ❷ to the User Memory as required (page 73).

❹ Press the [F1] button to return to the original display.

NOTE Depending on the particular Plug-in Voice, certain parameters may not be available for editing.

NOTE Parameters in the Voice Play mode and Voice Edit mode having the same name also have the same functions and settings.

The [E] Indicator

If you alter any parameters, the [E] indicator will appear in the top left of the display. This indicates that the current settings have been modified but not yet stored.

⚠ If you select another program or mode during editing, the [E] indicator will disappear and all your edits will be lost. It is a good idea to store the edited data from the Store mode (page 73). Even if you lose the edited data, you can restore it by using the Edit Recall function (page 71).

● **[F2] Voice Play   Plug-in Bank**

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. Simply put, the difference between the two types of voices is this:

• 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 the S90.

```
VOICE          P2-P:001[Co:Killer    ]
Bank      PLGPRE1

  PLAY   BANK           PORTA   EG   ARP
```

❏ Settings (with Plug-in Board installed to Slot 1)
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)

♪ **NOTE** This display is available only when the Plug-in board is installed to the S90 and the Plug-in voice is selected.

● **[F4] Voice Play   Portamento**

From this display you can select monophonic or polyphonic playback and set the Portamento parameters (Voice Edit Common [F1]→ [SF4] Ref. #7, 8, 10, 11).

● **[F5] Voice Play   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 Edit mode (pages 65, 66).
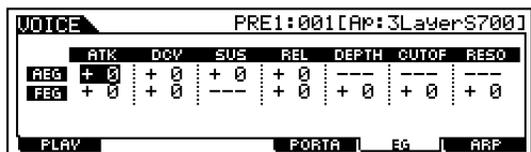
```
VOICE          PRE1:001[Ap:3LayerS700]
        ATK   DCY  SUS  REL  DEPTH CUTOF  RESO
 AEG   + 0   + 0  + 0  + 0   ---   ---   ---
 FEG   + 0   + 0  ---  + 0   + 0   + 0   + 0

  PLAY                PORTA   EG    ARP
```

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			---		Depth	Cutoff frequency	Resonance

● **[F6] Voice Play   Arpeggio**

This display contains the basic settings for Arpeggio playback, including Type and Tempo (page 45).

About Plug-in voices and Board voices

The voices of a Plug-in Board installed to the S90 can be divided into two types: Board voices and Plug-in voices. Board voices are unprocessed, unaltered voices of the Plug-in board — the "raw material" used for the Plug-in voices. Plug-in voices, on the other hand, are edited Board voices — voices that have been specially programmed and processed for optimum use with the S90.
Included among the Board voices is a special set of voices — called Board Custom voices — which can be edited by a computer connected to the S90, using special editing software included with the Plug-in board. (See page 73.)

```
 Plug-in voice                      Copy
 ┌────────────────────────┐  →  Plug-in
 │  Plug-in preset voice  │     Voice Edit
 └────────────────────────┘
 ┌────────────────────────┐
 │  Plug-in user voice    │     Store
 └────────────────────────┘

          ↑  S90 voice parameter

 Board voice
 ┌────────────────────────┐ ···· Cannot be edited
 │  Board preset voice    │
 └────────────────────────┘     Save
 ┌────────────────────────┐  →
 │  Board custom voice    │     Bulk send/
 └────────────────────────┘     edit
                                 Computer
                        (Voice Editor in CD-ROM
                         supplied with the Plug-in board)
```
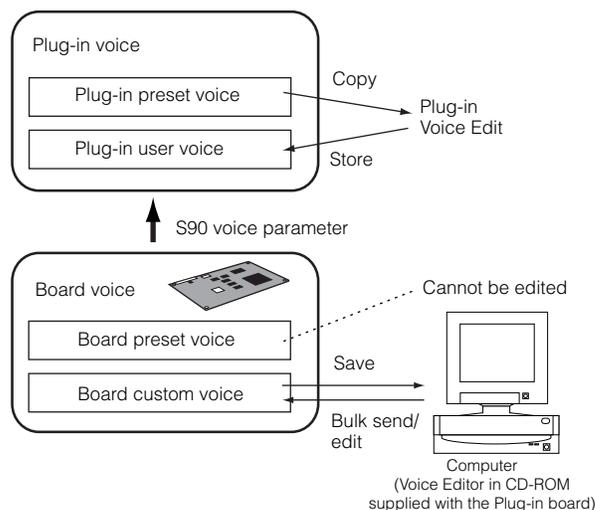
♪ **NOTE** Depending on the particular Plug-in board you are using, some of the parameters may not be available. For details, refer to the relevant owner's manual of the Plug-in board.

♪ **NOTE** For details on the current lineup of available Plug-in boards, see page 21.

Playing Performances

In the Performance mode, you can select and play individual User performances.

🎵 NOTE For details about the performances and their memory (bank) structure, see page 26.

Selecting a Performance

❶ Enter the Performance Play mode.

MODE

○ VOICE ○ PERFORM ○ MASTER

```
PERF                          TCH= 1
USER:001(A01)                 OCT:+0
     Co:Procession
AS3 AEG-Dcy AS8 AEG-Sus AS1    + 0 AS2      + 0
  PLAY  |  AD  | VOICE | PORTA |   EG   |  ARP
```
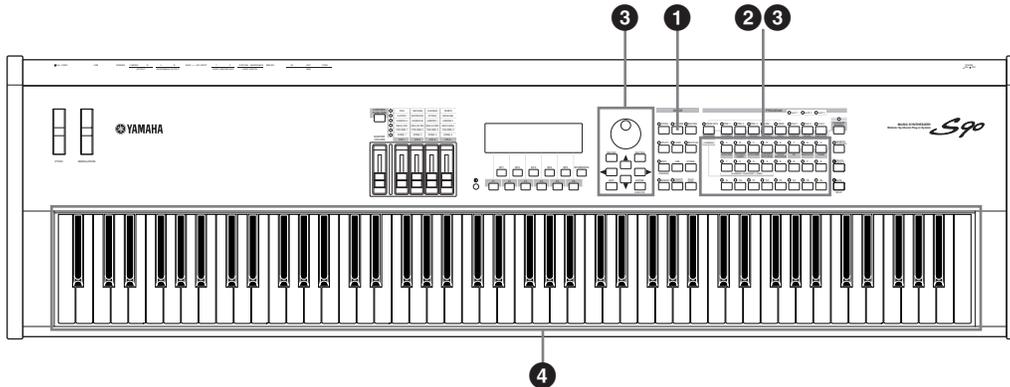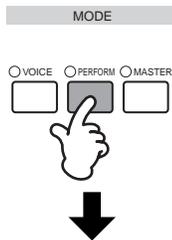
When the Performance Play mode is active, the currently selected performance is shown in huge letters — so you can easily check which performance you're about to play.

❷ Select a Performance Group.

Performances in each Bank are divided into Groups A ~ H. Select the desired Group, and all the Performances of that Group are shown in the display.

○ A   ○ B   ○ C   ○ D   ○ E   ○ F   ○ G   ○ H

SYN LEAD | SYN PAD/CHOIR | SYN COMP | CHROMATIC PERCUSSION | DRUM/PERCUSSION | SE | MUSICAL FX | COMBI

Group

```
PERF    DIR                 Performance
BANK USER   GROUP A B C D E F G H
1 Processi  5 GuitarRo  9 LittleBe 13 PoPR&B
2 2001BrsO  6 Sprinkle 10 SynHeave 14 Iron Dan
3 RStreet   7 SoulSpir 11 BluesCru 15 LittleFo
4 Nouveau   8 Film Noi 12 SmoothMo 16 Glass+sa
```
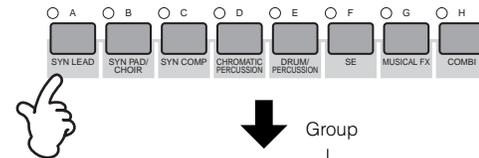
Performance

🎵 NOTE All performances are stored to a single bank, so you need not select a bank here.

❸ Select a Performance number.

```
PERF▶                           TCH= 1
 USER:002(A02)                  OCT:+0
      Br:2001BrsOrc
ASAAEG-DcyASBAEG-SusAS1  + 0AS2     + 0
  PLAY │ AD │ VOICE │ PORTA │ EG │ ARP
```

Decreases number   Increases number

Decreases number DEC/NO   INC/YES Increases number
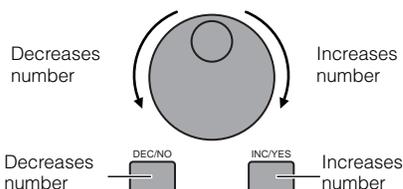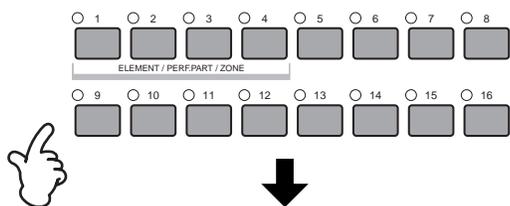
❹ Play the keyboard.

♪NOTE The Category Search function (page 38) can be used also in the Performance Play mode in the same way as in the Voice Play mode.

♪NOTE The MIDI transmit channel can be set in the same way as in the Voice mode.

Performance Part on/off

Each performance can contain a maximum of four parts, selected from a total of seven — internal Parts 1 - 4 and Plug-in Parts 1 - 3.

♪NOTE This operation is available also in the Edit mode.

❶ Press the [MUTE] button so that its indicator lights.
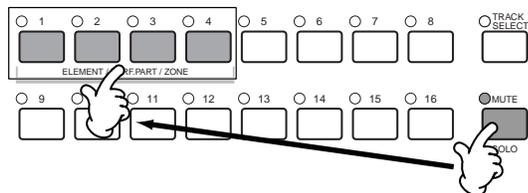
❷ Press any of the [1] - [4] buttons you wish to mute. The part corresponding to the unlit indicator is muted.

❸ Press the [MUTE] button again so that its indicator goes out.

To solo part
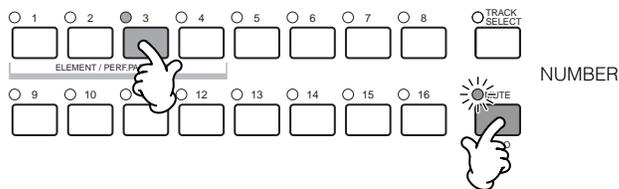
NUMBER

Simultaneously hold down the [MUTE] button and press one of the NUMBER buttons [1] to [4] 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 [4].
To exit from the Solo function, press the [MUTE] button again.

Layering Voices (Parts) Together (Layer) Splitting the Keyboard (Split)

Performances can be made up of a maximum of four parts (voices), selected from the internal tone generator Parts 1 - 4 and Plug-in board Parts 1 - 3. You can create a performance by layering several voices together, and/or by assigning different voices to separate ranges of the keyboard. You can then store up to 128 of your original, edited performances (page 73) to internal User memory (page 28).

Layer

Built-in tone generator parts   Plug-in parts

PRE1 PRE2 PRE3 USER   PL1 PL2 PL3

Split

Built-in tone generator parts   Plug-in parts

PRE1 PRE2 PRE3 USER   PL1 PL2 PL3
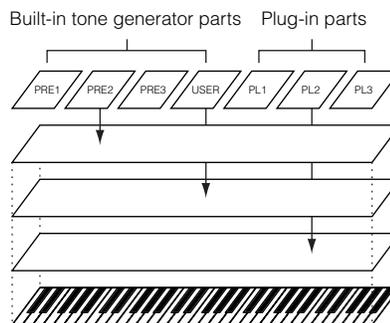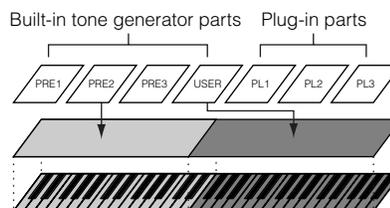
❶ Call up the VOICE display by pressing the [F3] button in the Performance Play mode.

```
PERF          USER:002[Br:2001BrsOrc]
PART                            NOTE
1 PRE2:  039:C07[Br:SlowAttack]▖▖▖▖▖
2 PRE2:  015:A15[St:BigSymphny]▖▖▖▖▖
3 PRE2:  041:C09[Br:Movie Ens ]▖▖▖▖▖
4   GM:  048:C16[Cp:Timpni+Cym]▖▖▖▖▖
  ADD INT  ADD PLG  DELETE  LIMITL  LIMITH
  PLAY  |  AD  |  VOICE  |  PORTA  |  EG  |  ARP
```

SF1 SF2 SF3 SF4 SF5 INFORMATION

F1 F2 F3 F4 F5 F6
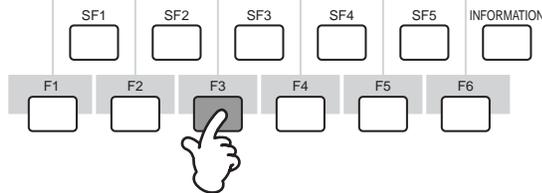
❷ Assign the desired voice to each part.

Move the cursor to the desired part and select a voice by pressing the [F1] or [F2] button.

DEC/NO INC/YES

Edit indicator (page 39)

```
PERF E         USER:002[Br:2001BrsOrc]
PART                            NOTE
1 PRE1:  001:A01[Ap:3LayerS700]▖▖▖▖▖
2 PRE2:  015:A15[St:BigSymphny]▖▖▖▖▖
3 PRE2:  041:C09[Br:Movie Ens ]▖▖▖▖▖
4   GM:  048:C16[Cp:Timpni+Cym]▖▖▖▖▖
  ADD INT  ADD PLG  DELETE  LIMITL  LIMITH
  PLAY  |  AD  |  VOICE  |  PORTA  |  EG  |  ARP
```

Assign the built-in voice to the selected part.

SF1 SF2 SF3 SF4 SF5 INFORMATION

F1 F2 F3 F4 F5 F6

Delete the voice assignment of the selected part.

Assign the Plug-in voice to the selected part.

❸ Specify the note range of each part, as required.

You can set the lowest note of the range over which the voice of the selected part sounds by pressing the desired key while holding the [SF4] button. To set the highest note of the range, press the desired key while holding the [SF5] button.
This lets you create a split keyboard, with up to four different parts (voices) sounding in four different ranges. You can also overlap parts to create layers.

```
PERF E         USER:002[Br:2001BrsOrc]
PART                            NOTE
1 PRE1:  001:A01[Ap:3LayerS700]▖▖▖▖▖
2 PRE2:  015:A15[St:BigSymphny]▖▖▖▖▖
3 PRE2:  041:C09[Br:Movie Ens ]▖▖▖▖▖
4   GM:  048:C16[Cp:Timpni+Cym]▖▖▖▖▖
  ADD INT  ADD PLG  DELETE  LIMITL  LIMITH
  PLAY  |  AD  |  VOICE  |  PORTA  |  EG  |  ARP
```

Note Limit Low   Note Limit High
SF4   SF5
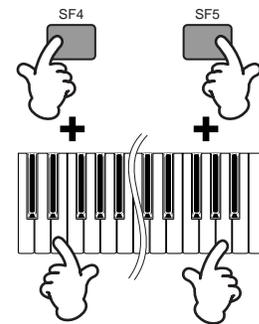
❹ Change the volume of each part and adjust the relative balance among the four parts

When the CONTROL FUNCTION is set to VOLUME, you can adjust the volume of each part by using the Control sliders.

NOTE The Portamento, EG (Envelope Generator), and Arpeggio parameters can be edited by calling up the corresponding display via the [F4] - [F6] buttons in the same way as in the Voice mode.
A wider variety of detailed editing controls is also available in the Performance Edit mode. See page 98.

❺ Store the settings.

Before exiting from the Performance Edit mode, make sure to store the settings you made to the Performance (page 73).

Editing Performances in the Performance Play mode (Quick Edit)

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 Parameters in the Performance Play mode and Performance Edit mode having the same name also have the same functions and settings.

● **[F2] Performance Play A/D**

From this display you can make settings for the A/D input parts. The A/D input feature lets you input external audio (such as from a microphone or guitar), then process and mix it with the other sounds of the S90. The audio signal can be input via the A/D INPUT jack or the mLAN terminal (if an optional mLAN8E has been installed).

NOTE For details about effect connection, see page 67.

NOTE In the Utility mode, you can set whether you use the A/D INPUT jack or the mLAN8E terminal as an input jack for the A/D part ([F2] → [SF1] A/DSource Ref. #53).

• **Volume**
Determines the output level of the A/D part.

• **Pan**
Determines the stereo pan position of the A/D part.

• **RevSend**
Determines the Send level of the A/D part signal sent to the Reverb effect.

• **ChoSend**
Determines the Send level of the A/D part signal sent to the Chorus effect.

• **VarSend(Variation Send)**
Determines the Send level of the A/D part signal sent to the Variation effect.

• **DryLevel**
Determines the level of the unprocessed A/D part — in other words, the signal not affected by the System Effects (Reverb, Chorus, Variation; Utility [F1]→[SF3] Ref. #21).

• **Mono/Stereo (mLAN Input)**
Determines the signal configuration for the mLAN audio (input), or how the signal or signals are routed (stereo or mono). This parameter can be set only when the mLAN terminal (with the optional mLAN8E installed) is set as the input source for the A/D part.

❏Settings

stereo
Audio received via mLAN terminal is processed in stereo.

L (left) mono
Audio received the L (left) channel via mLAN terminal is processed in mono.

R (left) mono
Audio received the R (right) channel via mLAN terminal is processed in mono.

L + R mono
Audio received via mLAN terminal is mixed and processed in mono.

• **OutputSel (Output Select)**
Determines the output jack assignment for the A/D part.

❏ Settings (below)

LCD	Output Jack	Stereo/Mono	
L&R	OUTPUT L&R	Stereo	
as L&R	ASSIGNABLE OUTPUT L&R	Stereo	
as1&2	mLAN8E ASSIGNABLE OUTPUT 3&4	Stereo 1 : L 2 : R	*
as3&4	mLAN8E ASSIGNABLE OUTPUT 3&4	Stereo 3 : L 4 : R	*
asL	ASSIGNABLE OUTPUT L	Mono	
asR	ASSIGNABLE OUTPUT R	Mono	
as1	mLAN8E ASSIGNABLE OUTPUT1	Mono	*
as2	mLAN8E ASSIGNABLE OUTPUT2	Mono	*
as3	mLAN8E ASSIGNABLE OUTPUT3	Mono	*
as4	mLAN8E ASSIGNABLE OUTPUT4	Mono	*

* Available only when the optional mLAN8E board has been installed.

● **[F3] Performance Play Voices**

From this display you can select a voice for each part and determine the note range it can be played from (page 43).

● **[F4] Performance Play Portamento**

From this display you can set the Portamento parameters for each part (Performance Edit [F1]→[SF4] Ref. #7-10).

● **[F5] Performance Play EG (Envelope Generator)**

Same as in Voice Play mode. See page 40.

● **[F6] Performance Play Arpeggio**

This display contains the basic settings for Arpeggio playback, including Type and Tempo (page 45).

Using the Arpeggio function

What is the Arpeggio function?

This function automatically triggers preset arpeggio phrases, according to the keys you play.
It is particularly suited to dance/techno music genres. You can assign the desired Arpeggio Types to each Voice/Performance, and adjust the tempo. You can also set the Arpeggio playback method, Velocity range and Play Effects to create your own original grooves. What's more, Arpeggio playback can be transmitted through the MIDI Out (Ref. #86), letting you record the Arpeggio data to a sequencer or play it back from another tone generator.

Arpeggio structure

The following illustration shows the Arpeggio structure.
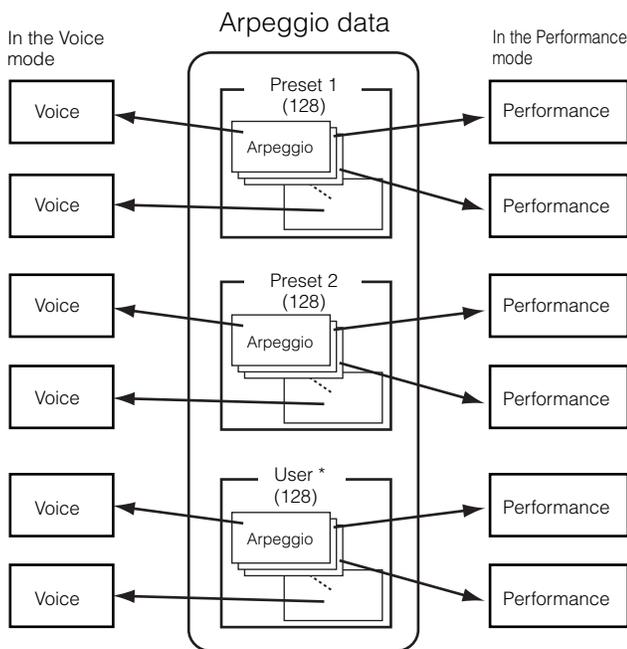
Different Arpeggio types can assigned
to each Voice/Performance.

* User Arpeggio data of the MOTIF can be loaded.

Arpeggio on/off during Song playback

Arpeggio On/Off can be set individually for each part of a Song (Mixing mode). Just like playing Arpeggios manually from the keyboard, this inserts Arpeggios in the playback of Song sequence data (page 79).

Four playback categories of Arpeggio

Arpeggio types are divided into the four following categories.

Sq: Sequence

Creates a general arpeggio phrase. Mainly octave up/down phrases.

Ph: Phrase

Creates phrases that are more musical and rhythmically varied than Sequence. Starting with "Techno," there are phrases for a wide variety of musical genres, and for creating backing tracks for guitar, piano and other instruments.

Dr: Drum Pattern

Creates drum pattern-type phrases. Any note produces the same drum pattern.
This type is ideal for use with drum and percussion sounds.

Ct: Control

Creates dynamic tonal and volume changes by using control change data. No note data is created — the tonal variations affect the played notes.

Arpeggio playback

❶ Select a Voice/ Performance (pages 36, 41).

❷ Turn the Arpeggio on by pressing the [ARPEGGIO] button.

○ ARPEGGIO ○ EFFECT BYPASS PLAY/ STOP
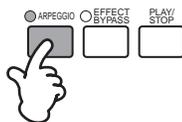
📝 **NOTE** When you select a voice or performance for which the Arpeggio Switch is set to on, the [ARPEGGIO] button is automatically turned on.

📝 **NOTE** The on/off status of the [ARPEGGIO] button can be stored to each voice or performance setup (page 73).

❸ Play the keyboard.

While holding the key(s), the Arpeggio is played back according to the played note, Arpeggio type, tempo, note limit settings, and so on.

📝 **NOTE** In the Voice Play mode, the Arpeggio is played back via the selected voice.

📝 **NOTE** In the Performance/Mixing mode, the Arpeggio is played back via the voice assigned to the selected part when the Arpeggio Switch (Part Edit [F1]→[SF2] Ref. #77) of the selected part is set to on (page 47).

Arpeggio Type, Tempo, and Limit

A variety of Arpeggio types are provided with the S90. You can change the tempo of Arpeggio as desired. The Arpeggio function is available in all modes. The explanation below applies to the Performance Play mode.

❶ Call up the ARP (Arpeggio) display by pressing the [F6] button in the Performance Play mode.

```
PERF               USER:006[Pd:Sprinkler ]
Bank        Pre1   Switch            on
Type  Sq:U/DAOct4  Hold             off
Tempo         75   PartSwitch
VelocityLimit              ⊠□□□□□□□
         1 - 127         1 2 3 4 P1P2P3
PLAY   | AD  | VOICE | PORTA |  EG   | ARP
```

SF1 SF2 SF3 SF4 SF5 INFORMATION

F1 F2 F3 F4 F5 F6
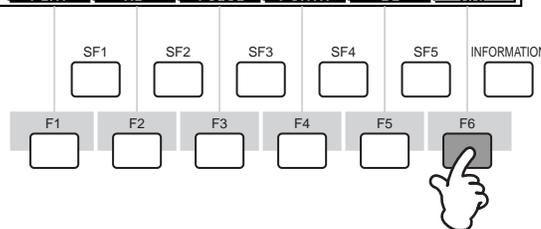
❷ Select an Arpeggio Bank.

Move the cursor to the Bank parameter and select.

❸ Select an Arpeggio Type.

Move the cursor to the Type parameter and select.

❹ Set the Tempo for Arpeggio playback.

Move the cursor to the Tempo parameter and set it.

❺ Set the Velocity Limit for Arpeggio playback.

Move the cursor to the Velocity Limit parameter and set it.

Low Limit   High Limit
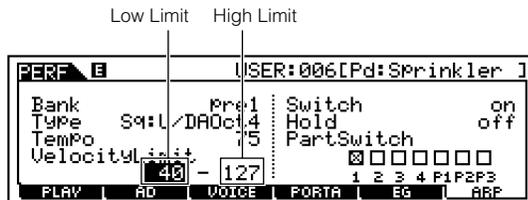
The Arpeggio is played back only when the key is played at a velocity within this range (stronger than normal).

❻ Set the Arpeggio part switch. (Performance only)

You can set the Arpeggio playback on or off for each part. Move the cursor to the box of the desired part and checkmark the box to turn the part on.
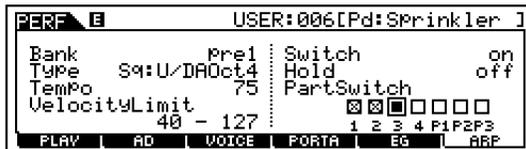
❼ Store the Arpeggio settings to the desired User Performance (page 73).

Using as a Master Keyboard

What is the Master Mode?

The S90 is loaded with such a wealth of different features, functions and operations, you may find it difficult to locate and call up the particular feature you need. This is where the Master mode comes in handy. You can use it to memorize the operations you use most often in each mode, and call them up instantly anytime you need them with a single button press. The S90 has space for a total of 128 of your own User Master settings.

Master number	Setting examples
Master 001	Voice mode Voice number 102
Master 002	Voice mode Voice number 88
Master 003	Performance mode Performance number 043 *Zone Switch Off
Master 004	Performance mode Performance number 059 *Zone Switch Off
Master 005	Performance mode Performance number 077 *Zone Switch On MIDI ch1 MIDI ch2 MIDI ch3 MIDI ch4 Tone Generator block
Master 006	Performance mode Performance number 093 *Zone Switch On MIDI ch8 MIDI ch9 Tone Generator block
Master 007	Sequence Play mode Mix template number 7
⋮	⋮
Master 128	Sequence Play mode Mix template number 24
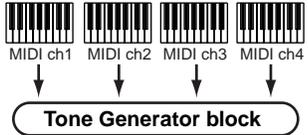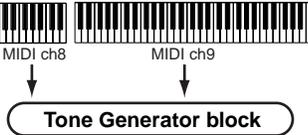
* Parameters other than those shown above (e.g., Slider settings) can be stored (Master Common Edit [F2] Ref. #58).

Four Zones

In the Master mode, the keyboard can be divided into a maximum of four separate Zones (as shown below) — each with its own MIDI channel setting. In this way, you can use just a single keyboard to control several different instrument parts independently. Moreover, you can have these independent Zones control different channels on connected MIDI devices as well. You can set these four Zones and store them as a User Master in the Master mode.

NOTE MIDI channel of each Zone for internal tone generator (including plug-in board) is available only when the Mode is set to Sequence Play (SeqPlay) from the MEMORY display.
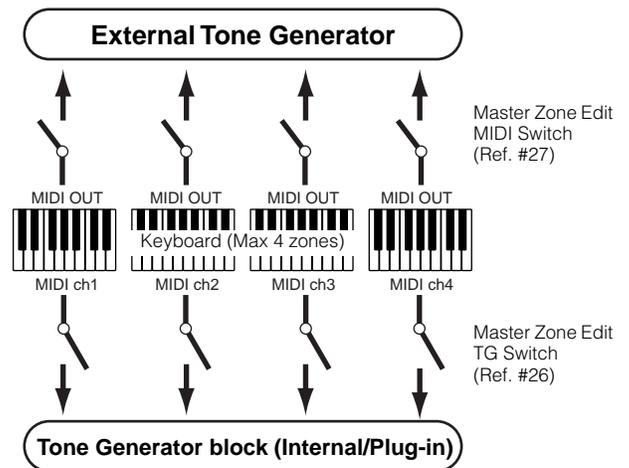
The four Zones can also be configured as Voice "layers" — letting you have more than one Voice sound at the same time when you play within a single Zone. (See the example below.)
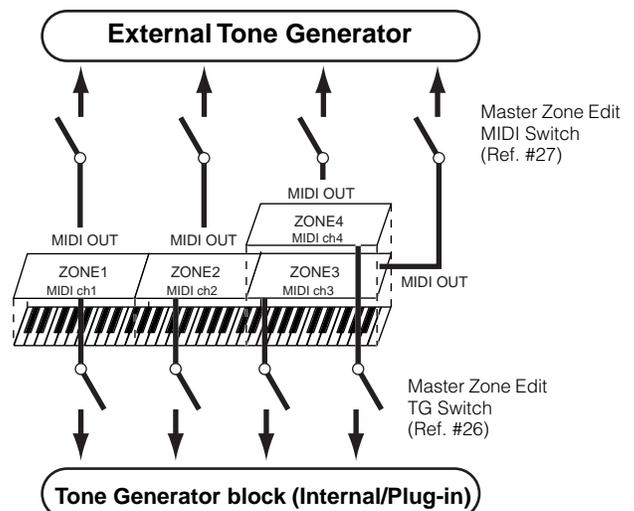
■ Split

You can use the Zone settings to create a "Split" — dividing the keyboard into two key ranges, at a specific note (split point).
In the example below, the keyboard is split at C3, with the lower range used to trigger Arpeggios, and the upper range used conventionally to play a Voice.
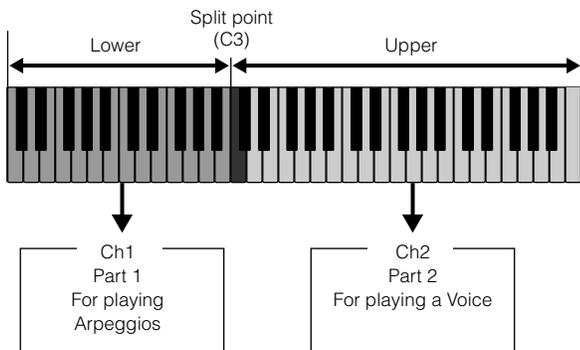
■ Layer

You can also use the Zone settings to create a "Layer" — in which the keyboard is used to play two separate parts simultaneously, in unison with each other.
In the example below, the keyboard plays two Voices in unison — one an internal Voice, and the other a Plug-in Voice.
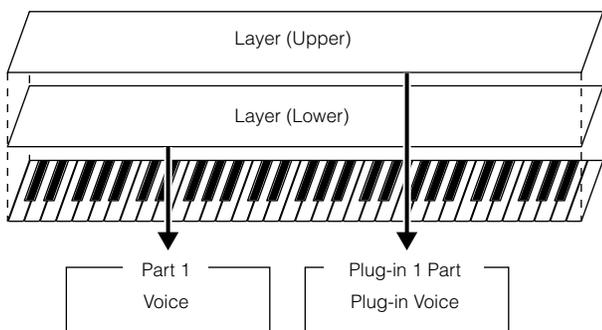
Playing the Master Demo (Selecting Masters)

The S90 has so many powerful features, functions, and modes, it may seem difficult to understand them all and grasp how they work together. One good place to start learning about the various pieces in the S90 puzzle is the Master mode.
We've programmed a variety of Master programs to show you how this powerful feature can be used. Try some of these out now. (You'll be setting up your own Master programs later in this Guide.)

❶ Enter the Master mode.
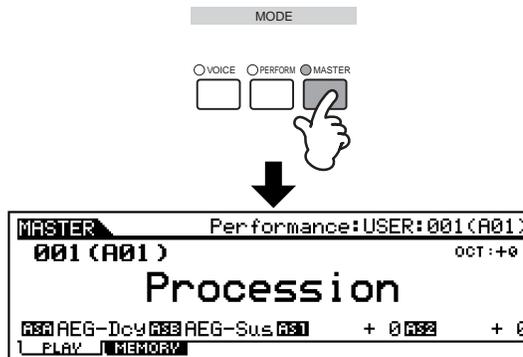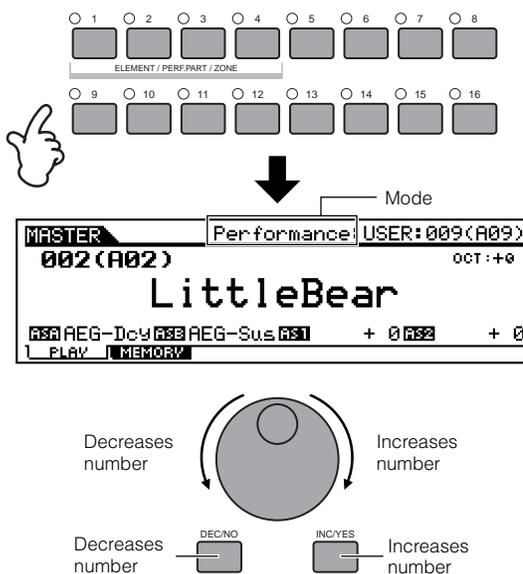
❷ Select a Master.

❸ Play the selected Master program.

When the Mode is set to Voice or Performance, play the keyboard.
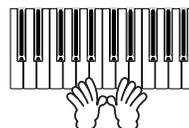
When the Mode is set to Sequence Play, press the [PLAY/STOP] button.
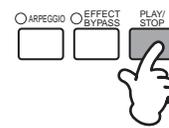
Memorize to a Master

The selected mode and program are memorized to a Master in the Master Play mode.

❶ Enter the Master mode and select a Master number (page 49).

❷ Call up the MEMORY display by pressing the [F2] button.

```
MASTER                    001[Procession]
Mode    Performance  ZoneSwitch      off
Memory      USER:001
      [Co:Procession]

  PLAY   MEMORY
```

SF1   SF2   SF3   SF4   SF5   INFORMATION

F1   F2   F3   F4   F5   F6

❸ Select the mode to be memorized.

DEC/NO   INC/YES

Mode

```
MASTER                    001[3LayerS700]
Mode        Voice    ZoneSwitch      off
            PRE1:001
      [AP:3LayerS700]

  PLAY   MEMORY
```
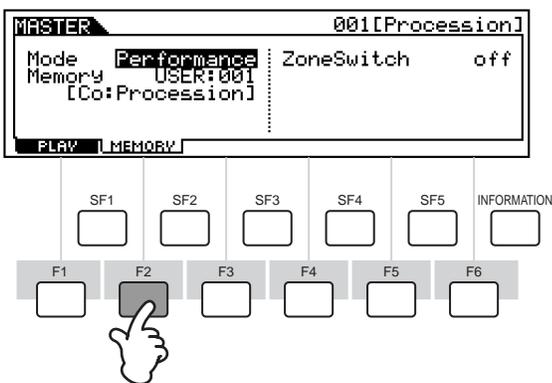
❹ Select the desired program /template to be memorized (pages 36-38).

○ DRUM KITS ○ PRE 1 ○ PRE 2 ○ PRE 3 ○ GM   ○ USER   ○ PLG 1 ○ PLG 2 ○ PLG 3

FAVORITES A. PIANO KEYBOARD ORGAN GUITAR/PLUCKED BASS STRINGS BRASS REED/PIPE

COMMON   ○ A   ○ B   ○ C   ○ D   ○ E   ○ F   ○ G   ○ H

SYN LEAD SYN PAD/CHOIR SYN COMP CHROMATIC PERCUSSION DRUM/PERCUSSION SE MUSICAL FX COMBI

DEC/NO   INC/YES

○ 1   ○ 2   ○ 3   ○ 4   ○ 5   ○ 6   ○ 7   ○ 8

ELEMENT / PERF.PART / ZONE

or

○ 9   ○ 10   ○ 11   ○ 12   ○ 13   ○ 14   ○ 15   ○ 16

Program

```
MASTER                    001[Soft Touch]
Mode        Voice    ZoneSwitch      off
Memory      PRE1:002
      [AP:Soft Touch]

  PLAY   MEMORY
```

❺ Name the Master.

You can name the Master in the Master Edit mode (page 34).
You can also set the functions assigned to the Control Sliders (Common [F2] Ref. #58, Zone [F5] Ref. #134).

❻ Store the settings as a User Master (page 73).

Using Zones — Creating a Layer/ Split with an external tone generator

In the example below, we'll set up three Zones as shown below. We'll program a split at the note C3. In the lower range (B2 and lower), a bass voice and cymbal voice will sound. In the upper range (C3 and above), we'll layer piano and vibraphone voices — played from an external MIDI tone generator. Using this sophisticated setup, you can easily sound like an entire jazz group, with just your two hands.
In the example instructions here, we'll use the Voice mode for the Master.
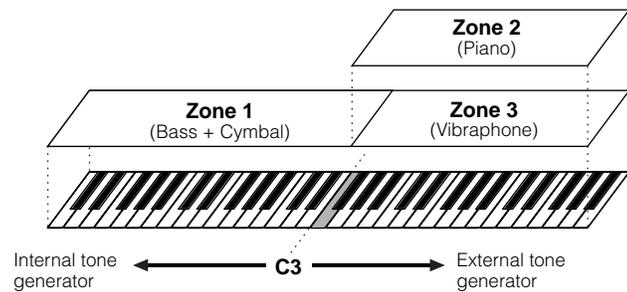
❶ Select a Voice in the Master Play mode.

Set the Mode to Voice, then select the PRE1 bank and voice 123.
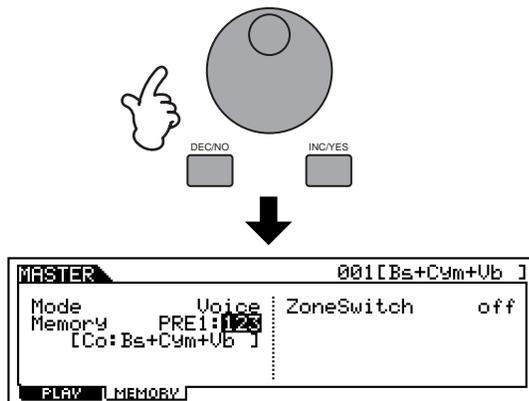
❷ Set the Zone Switch to on.
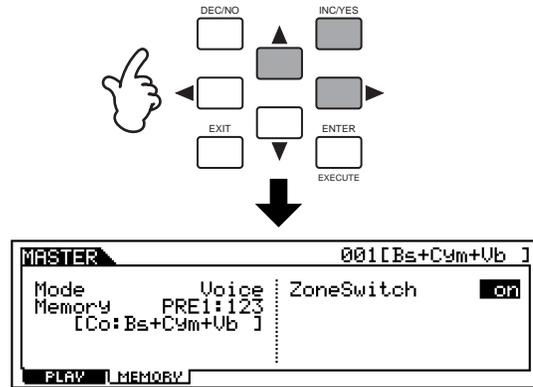
❸ Enter the Master Edit mode.
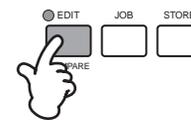
Common Edit and Individual zone Edit

To edit parameters common to all of the zones, press the [DRUM KITS] button (which serves as a "COMMON" button here).

To edit parameters of the individual zones, select the desired zone with the corresponding NUMBER button, [1] - [4].
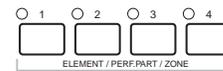
DNOTE This operation is available only when the Zone Switch is set to on in the [F2] (MEMORY) display in the Master Play mode.

❹ Call up the display for Zone editing.

Press any of the buttons.
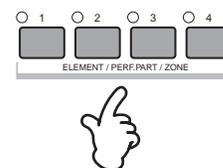
➎ Call up the TRANS display.
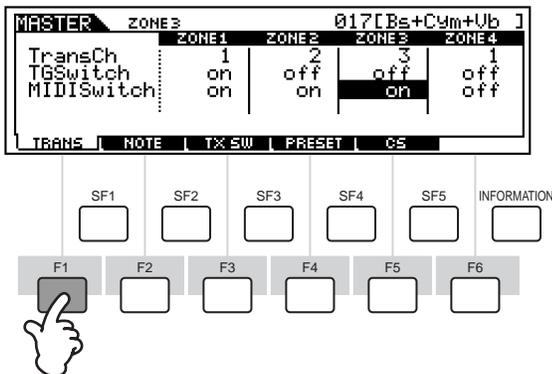
① Set the TG Switch of Zone 1 to on and set those for all other Zones to off. This enables the data played only in Zone 1 to affect the S90 voices; other Zones will not play the S90.

② Set the MIDI Switch of the Zone 2 and 3 to on and set the ones of the other Zones to off. This is for transmitting the data played in Zones 2 and 3 to the external tone generator.

③ Set the MIDI transmit channel of Zone 1 to 1. Set the MIDI transmit channel of Zones 2 and 3 to match the Receive channel of the external tone generator (slave).

④ Make sure the external tone generator is set to multi-timbral operation (different voices for each of the 16 MIDI channels), and select the appropriate voices on the tone generator, corresponding to the MIDI channels you set in ③ above.

➏ Call up the NOTE display.
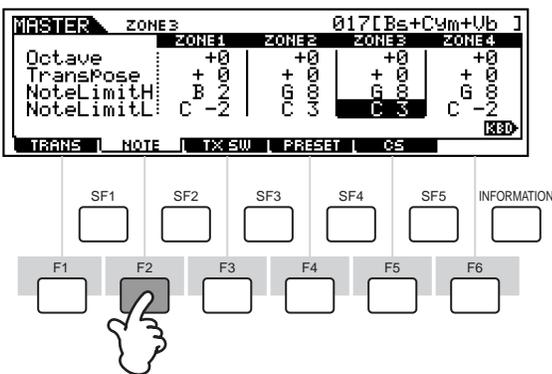
① Set the Note Limit H (High) of Zone 1 to B2. Set the Note Limit L (Low) of Zone 1 to C-2.

② Set the Note Limit H (High) of Zones 2 and 3 to G8. Set the Note Limit L (Low) of Zones 2 and 3 to C3.

Each Zone will sound the assigned voice within the note range set above.

♪ NOTE You can also set other parameters if necessary.

➐ Store the settings to a Master (page 73).

Control Number settings (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 MIDI Control number for each slider. In the example below, the Control sliders have been set to 11 (Expression). In this way, you can use the sliders to adjust the relative volume balance among the Zones.
This setting is available only when the Zone Switch is set to on from the Memory display in the Master Play mode.
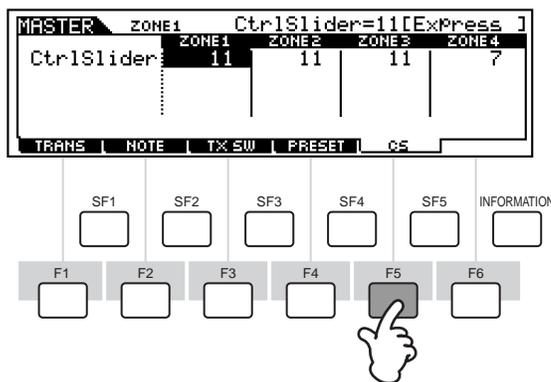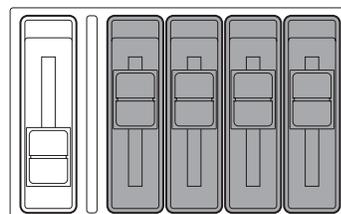
Using Controllers

The S90 gives you an amazing amount of control options. Not only is it equipped with the conventional Pitch Bend and Modulation Wheels, it also features special sliders — and has an additional set of rear-panel jacks for connecting foot controllers and footswitches. You can connect controllers to the rear panel jacks to control various parameters by foot as well as by hand. This section explains the basic functions of each controller.

Pitch Bend Wheel & Modulation Wheel

The Pitch Bend wheel's prime function is to control pitch. Move the wheel up or down to bend the pitch up or down.
The Modulation wheel is generally used to add modulation effects (tremolo, vibrato, filter variations, etc.) to the sound. The more you move Modulation wheel up, the greater the modulation that is applied to the sound.

Pitch Bend Wheel   Modulation Wheel

Pitch Up

Deeper

Pitch Down

PITCH   MODULATION
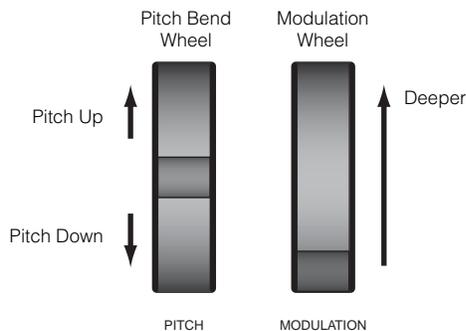
NOTE Pitch Bend Range can be set for each Voice/Performance (Ref. #14). The wheel can also be assigned to other parameters (page 55).

NOTE Even if a different parameter is assigned to the wheel, Pitch Bend messages are still transmitted through MIDI OUT when it is being used.

NOTE Modulation depth can also be set beforehand. Also, the wheel can be assigned to different parameters, such as volume or pan (page 55).

Control Sliders (CS)

These sliders let you change various aspects of the Voice's sound in real time — while you play. You can change which particular group of functions or parameters the sliders are assigned to by pressing the [CONTROL FUNCTION] button. Selecting the ASSIGN group (A, B, 1, 2) lets you control a group of user-assignable functions.

NOTE You can also determine which row of Controls is automatically made active when you select a particular program (Ref. #12, 58).

NOTE Common system parameters are assigned to Sliders [A] and [B] ([F4]→[SF2] Ref. #128). Voice-specific parameters are assigned to Sliders [1] and [2] (page 55). Sliders [1] and [2] can be assigned to Control Set Source (page 55).

NOTE A preset of suitable parameter settings is assigned to each Voice. By using each Sliders [1] and [2], you are in effect adjusting these settings by a certain amount. If these parameters are already preset at their minimum or maximum settings, the settings cannot be exceeded.

Control Sliders & Tracks (when selecting VOLUME)

In the Voice mode, these are used to control the volume of each of the four Elements (page 26).
In the Performance mode, these are used to control the volume of the four parts. In the Sequence Play mode, these let you adjust the volume of specific tracks (parts), depending on which group of tracks is currently selected.

	CS1	CS2	CS3	CS4
When the selected tracks (parts) are 1-4:	1	2	3	4
When the selected tracks (parts) are 5-8:	5	6	7	8
When the selected tracks (parts) are 9-12:	9	10	11	12
When the selected tracks (parts) are 13-16:	13	14	15	16

When the Zone Switch is set to on in the Master Play mode, various functions (Control Number) can be assigned to these Control Sliders (Master Zone Edit [F5] Ref. #134).

Example of Control Slider Settings

❶ Select the row of functions you wish to control by pressing the [CONTROL FUNCTION] button. The corresponding indicator lights, showing you which row is active. For example if you want to use the Sliders to control Pan, Reverb, Chorus and Tempo, press the [CONTROL FUNCTION] button (repeatedly if necessary) until the top indicator is lit.

① Pan, Effect Send and Tempo
② Filter and EG
③ Assign
④ Master EQ
⑤ Volume
⑥ Zone

Press this repeatedly to select each function row.

CONTROL FUNCTION	PAN	REVERB	CHORUS	TEMPO
	CUTOFF	RESONANCE	ATTACK	RELEASE
	ASSIGN A	ASSIGN B	ASSIGN 1	ASSIGN 2
	MEQ LOW	MEQ LOW MID	MEQ HI MID	MEQ HIGH
	VOLUME 1	VOLUME 2	VOLUME 3	VOLUME 4
	ZONE 1	ZONE 2	ZONE 3	ZONE 4
	CS 1	CS 2	CS 3	CS 4
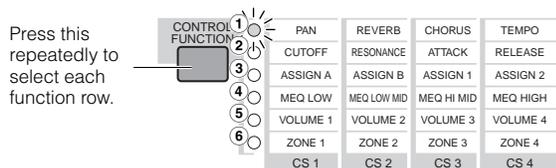
❷ Move the appropriate slider ([CS1] - [CS4]) to adjust the desired function.
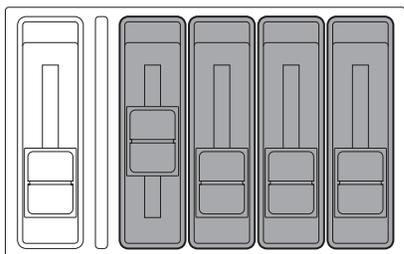
The available functions are shown at the top of the display, and the value changes as you move the corresponding Slider. For example, to change the amount of Reverb (in the top row), move Slider 2 (CS2). To change the Pan position, move Slider 1 (CS1).

```
VOICE  E                          TCH= 1
CONTROL FUNCTION
  Pan  C    Rev  13  Cho    0  TmP 138
```

(A)   (B)
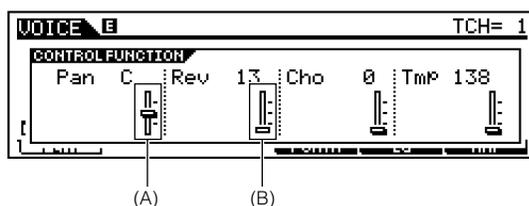
If the "Pan" slider in the display is dark (A), any tweaking you do to the Slider immediately affects the sound. However if the Slider in the display is light (B), moving the slider will not have any effect until you reach the current setting.
Control Sliders can be used for controlling Zones (page 52) or as remote controls for an external sequencer (page 57).

Foot Controller

An optional Foot Controller (such as the FC7), connected to the FOOT CONTROLLER jacks (page 13) on the rear panel, can be assigned to a number of controller parameters. By using a foot controller for parameter control, both your hands are left free to play the keyboard (or to operate other controllers), — exceptionally convenient when you're playing live.

♪ NOTE Foot Controller parameters can be set for each Voice (page 55).

Footswitch (assignable)

An optional Yamaha FC4 or FC5 Foot Switch connected to the rear panel FOOT SWITCH ASSIGNABLE jack (page 13) 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 Arpeggiator on or off.

♪ NOTE The parameter assigned to the Footswitch is set in the Utility mode ([F4]→ [SF3] Ref. #130).

Footswitch (sustain)

An optional FC4 or FC5 Footswitch connected to the SUSTAIN jack on the rear panel (page 13) lets you control sustain — particularly useful when playing piano and strings voices.

♪ NOTE You cannot assign a function other than Sustain to the SUSTAIN jack.

Breath Controller

You can connect an optional Breath Controller (BC3) to the BREATH jack (page 13) on the rear panel. Then use it to control a large number of the S90's parameters, particularly those controlled by a wind player's breath: dynamics, timbre, pitch and so on. The Breath Controller is ideally suited for realistic expression with wind instrument type Voices.

♪ NOTE Breath Controller parameters can be set for each Voice.

Aftertouch

Aftertouch lets you change the sound (adding vibrato, for example) by applying further pressure to a note on the keyboard while it is being held down. This allows real-time expression and control. Aftertouch can be used to control a wide variety of parameters (page 55).

Control Sets (Voice Common Edit [F4])

Keyboard aftertouch, the controllers and some of the sliders on the front panel can be assigned to control various parameters other than the ones set as defaults, as explained on page 53. For example, the Modulation wheel could be assigned to control filter resonance, while aftertouch could be used to apply vibrato. This provides enormous flexibility in controlling parameters and setting up the controllers to suit the kind of sound being played.

These controller assignments are known as Control Sets. As the following illustration shows, you can assign up to six different Control Sets per Voice.
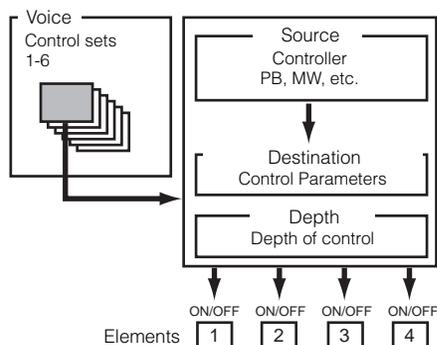
Within each Control Set, the controller is known as the Source (Src) and the parameter controlled by the Source is known as the Destination (Dest). There are various Dest parameters available; some will apply to the Voice as a whole, while some will be specific to each of its Elements. Details are given in the Controls List of the separate Data List.

NOTE Details about the available Dest parameter settings are given in the Destination Parameter List of the separate Data List.

NOTE The Element Switches (Voice Common Edit [F4] Ref. #117) will be disabled if the Dest parameter setting is not specified for the Elements (i.e., to settings 00 to 33).

NOTE Elements ON/OFF switch is available only when a Normal Voice is selected.

■ Using one source to control several destinations

By creating Control Sets, you can change sounds in a variety of ways.

For example, set the Src (Source) parameter of Control Set 1 to MW (Modulation Wheel) and the Dest (Destination) parameter to ELFO-PM (Element LFO Pitch Modulation Depth). Then set the Src parameter of Control Set 2 also to MW, but set the Dest parameter to ELM PAN (Element Pan). You will also need to specify the Element to be controlled and also the depth (amount) of control.

In this example, when you move the Modulation Wheel upward, the amount of Pitch Modulation increases accordingly, and the Element is panned from left to right. In this way, you can have the sound change in several different ways, simply by adjusting a single controller.
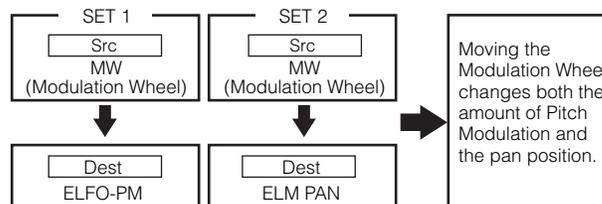
■ Using several sources to control one destination

Continuing from the example above, now create another Control Set where Src is set to FC (Foot Controller) and Dest is set to ELFO-PM (Element LFO Pitch Modulation Depth). Again, specify the Element to be controlled and also the depth of control.

Doing this assigns Pitch Modulation to both the Modulation wheel and Foot Controller. In this way, you can assign several different Src controllers to a single Dest parameter.
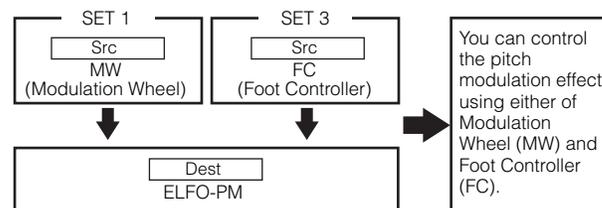
By assigning all six Control Sets, you will have a stunning degree of real-time control over the synthesizer's sounds.

■ Control Sets and External MIDI Control

In a Control Set, the controllers are assigned to the internal parameters of the synthesizer. However, some controllers were originally designed for a particular purpose, and send pre-defined MIDI Control Change messages when used, regardless of their Control Set allocations within the synthesizer. For example, the Pitch Bend Wheel, Modulation Wheel and keyboard aftertouch were originally designed to control pitch bend, modulation and aftertouch. Therefore, when you use these controllers, pitch bend, modulation and aftertouch information is always sent to the MIDI Out.
Let's say the Pan parameter is assigned to the Pitch Bend Wheel in a Control Set. Now, when you move the Pitch Bend Wheel, the internal tone generator of the synthesizer will pan the sound; however, at the same time, the original pre-defined Pitch Bend messages will still be sent to the MIDI Out.
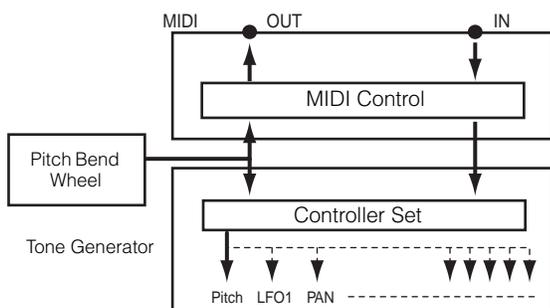
The controllers can also send MIDI Control Change messages to control the parameters of external MIDI devices. These assignments can be set in the Utility Mode.

♪ NOTE Since Pitch Bend Wheel, Modulation Wheel and keyboard aftertouch are pre-defined with specific MIDI controls, other MIDI Control Change numbers cannot be assigned to them.

You can also set up a controller such that it sends one kind of Control message to the synthesizer's internal tone generator yet another kind to the MIDI Out.
For example, in a Control Set you could assign resonance to Assignable 1 Slider. Then, in the Utility Mode, you could assign Control Number 1 (Modulation) to the same controller. Now, when you use the controller, resonance will be applied to the sound of the internal tone generator; however, at the same time, modulation information will be sent to the external MIDI device connected to the MIDI Out.

Primary control number and function

MW/AC1/FC (Variable control)	FS (on/off switch)
7 Volume	64 Hold 1 (Sustain)
10 Pan	65 Portamento Switch
11 Expression	66 Sostenuto
71 Harmonic Contents (Resonance)	96 Arpeggio Switch
72 Release Time	97 Arpeggio Hold
73 Attack Time	98 PLAY/STOP
74 Brightness	99 Program Change INC
75 Decay Time	100 Program Change DEC
91 Reverb Send Level	101 Octave Reset
93 Chorus Send Level	

Remote Control for external sequencer

The Remote Control function lets you use the hardware controls on the panel of the S90 to control fundamental operations on the sequencing software of your computer. You can mute your tracks, control the sequencer transport (Play/Stop), mix both MIDI and audio tracks (up to 16) with the S90's control sliders, pan the tracks, control EQ, and tweak effect sends — all without ever touching the mouse. Not only is this a more convenient and efficient way to work — since it gives you dedicated controls for the functions you use the most — it also (with the control sliders) gives you finer control over crucial level parameters. If you've ever used a mixing console or a hardware sequencer, you'll love being able to finally control your sequencing software with buttons and sliders.

Setting Up

Before you can use the Remote Control function, you'll need to set up the system as described below.

❶ Connect your computer to the S90 via USB cable. See page 17.

❷ Install the setup file.

Install the USB MIDI driver and the setup file for the sequence software (contained in the included CD-ROM) to your computer. For details on how to install, see the separate Installation Guide.

❸ Select the template for your particular sequence software in the Utility mode on the S90.

① **Enter the Utility mode.**
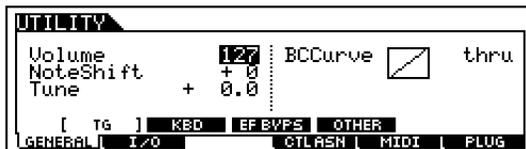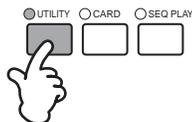
② **Call up the OTHER display in the MIDI menu ([F5] → [SF4]).**
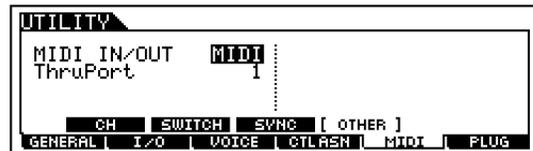
③ **Move the cursor to the MIDI IN/OUT parameter and set to USB.**

④ **Call up the REMOTE display in the CTLASN menu ([F4] → [SF4]).**

⑤ **Select the Template type, then press the [ENTER] button.**

Using the Remote Control function

❶ Turn the Remote Control function on by pressing the [REMOTE CONTROL] button so that its lamp flashes.

❷ Operate the Control sliders or the buttons on the S90's panel as required.

① **Select a track on your computer's sequencer from the S90.**

The [1] ~ [16] buttons correspond to the respective numbered tracks on your computer's sequence software.
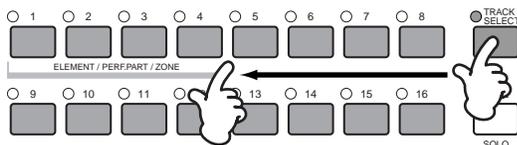
② **Turn the track of the sequencer on or off (mute).**

The [1] ~ [16] buttons correspond to the respective numbered tracks on your computer's sequence software.
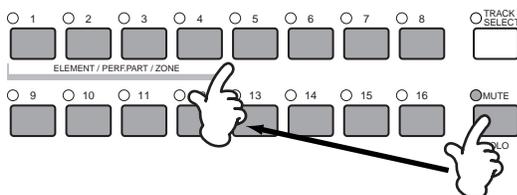
③ **Control the level of selected track of the sequencer by using the Control sliders (page 59).**
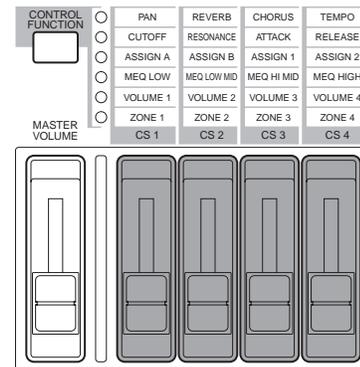
④ **Control the transport functions on the sequencer.**

The operations below can be used to control Play, Stop, Forward and Rewind on the computer sequence software.

PLAY/STOP
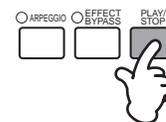
FORWARD/REWIND
(CHAIN display in Sequence Play mode)
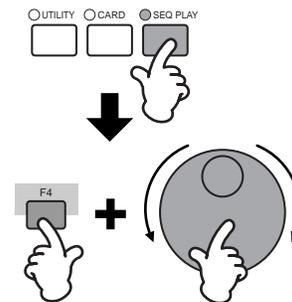
Remote Control Assignments

Functions to be controlled by the S90 differ depending on the software you use. When the appropriate template is selected, the following functions on the corresponding software can be controlled.

📝 NOTE For certain software programs, it may be necessary to install the setting file in the included CD-ROM.

Logic Audio Platinum Ver5

When the template is set to "Logic," the following functions can be controlled by the S90.

	These control the track selected via the NUMBER [1] - [16] buttons.				
Each parameters	Set via [CONTROL FUNCTION]	CS1	CS2	CS2	CS4
	1st row	PAN	SEND1	SEND2	SEND3
	2nd row	PAN	EQ1 Freq	EQ1 Gain	EQ1 Q
	3rd row	PAN	EQ2 Freq	EQ2 Gain	EQ2 Q
	4th row	PAN	EQ3 Freq	EQ3 Gain	EQ3 Q
VOLUME (5th row)	These control the four tracks selected via the NUMBER [1] - [16] buttons.				
	Selected tracks	CS1	CS2	CS3	CS4
	1 ~ 4	VOLUME 1	VOLUME 2	VOLUME 3	VOLUME 4
	5 ~ 8	VOLUME 5	VOLUME 6	VOLUME 7	VOLUME 8
	9 ~ 12	VOLUME 9	VOLUME 10	VOLUME 11	VOLUME 12
	13 ~ 16	VOLUME 13	VOLUME 14	VOLUME 15	VOLUME 16
SEQ TRANS-PORT	These control PLAY, STOP, ◄◄, ►► of the computer sequence software.				
TRACK MUTE	When the [MUTE] button on the S90 is turned on, the NUMBER [1] - [16] buttons control the track mute settings of the computer sequence software.				
TRACK SELECT	When the [TRACK SELECT] button on the S90 is turned on, the NUMBER [1] - [16] buttons select the track of the computer sequence software.				

Cubase VST/32, Cubase VST 5.1r1, SQ01

When the template is set to "Cubase/SQ01" the following functions can be controlled by the S90.

	These control the track selected via the NUMBER [1] - [16] buttons.				
Each parameters	Set via [CONTROL FUNCTION]	CS1	CS2	CS2	CS4
	1st row	PAN	SEND1	SEND2	SEND3
	2nd row	PAN	EQLo Freq	EQLo Gain	EQLo Q
	3rd row	PAN	EQMidLo Fre	EQMidLo Gai	EQMidLo Q
	4th row	PAN	EQHi Freq	EQ3Hi Gain	EQ3Hi Q
VOLUME (5th row)	These control the four tracks selected via the NUMBER [1] - [16] buttons.				
	Selected tracks	CS1	CS2	CS3	CS4
	1 ~ 4	VOLUME 1	VOLUME 2	VOLUME 3	VOLUME 4
	5 ~ 8	VOLUME 5	VOLUME 6	VOLUME 7	VOLUME 8
	9 ~ 12	VOLUME 9	VOLUME 10	VOLUME 11	VOLUME 12
	13 ~ 16	VOLUME 13	VOLUME 14	VOLUME 15	VOLUME 16
SEQ TRANS-PORT	These control PLAY, STOP, ◄◄, ►► of the computer sequence software.				
TRACK MUTE	When the [MUTE] button on the S90 is turned on, the NUMBER [1] - [16] buttons control the track mute settings of the computer sequence software.				
TRACK SELECT	When the [TRACK SELECT] button on the S90 is turned on, the NUMBER [1] - [16] buttons select the track of the computer sequence software.				

SONAR2/Cakewalk ProAudio Ver9.0

When the template is set to "SONAR," the following functions can be controlled by the S90.

	These control the track selected via the NUMBER [1] - [16] buttons.				
Each parameters	Set via [CONTROL FUNCTION]	CS1	CS2	CS2	CS4
	1st row	PAN	SEND1	SEND2	SEND3
	2nd row	---	---	---	---
	3rd row	---	---	---	---
	4th row	---	---	---	---
VOLUME (5th row)	These control the four tracks selected via the NUMBER [1] - [16] buttons.				
	Selected tracks	CS1	CS2	CS3	CS4
	1 ~ 4	VOLUME 1	VOLUME 2	VOLUME 3	VOLUME 4
	5 ~ 8	VOLUME 5	VOLUME 6	VOLUME 7	VOLUME 8
	9 ~ 12	VOLUME 9	VOLUME 10	VOLUME 11	VOLUME 12
	13 ~ 16	VOLUME 13	VOLUME 14	VOLUME 15	VOLUME 16
SEQ TRANS-PORT	Control PLAY, STOP, ◄◄, ►► of the computer sequence software.				
TRACK MUTE	When the [MUTE] button on the S90 is turned on, the NUMBER [1] - [16] buttons control the track mute settings of the computer sequence software.				
TRACK SELECT	When the [TRACK SELECT] buttons on the S90 is turned on, the NUMBER [1] - [16] buttons select the track of the computer sequence software.				

Pro Tools V5.0

When the template is set to "ProTools," the following functions can be controlled by the S90.

Each parameters	Not available.				
VOLUME (5th row)	These control the four tracks selected via the NUMBER [1] - [16] buttons.				
	Selected tracks	CS1	CS2	CS3	CS4
	1 ~ 4	VOLUME 1	VOLUME 2	VOLUME 3	VOLUME 4
	5 ~ 8	VOLUME 5	VOLUME 6	VOLUME 7	VOLUME 8
	9 ~ 12	VOLUME 9	VOLUME 10	VOLUME 11	VOLUME 12
	13 ~ 16	VOLUME 13	VOLUME14	VOLUME 15	VOLUME 16
SEQ TRANS-PORT	These control PLAY, STOP, ◄◄, ►► of the computer sequence software.				
TRACK MUTE	When the [MUTE] button on the S90 is turned on, the NUMBER [1] - [16] buttons control the track mute settings of the computer sequence software.				
TRACK SELECT	When the [TRACK SELECT] button on the S90 is turned on, the NUMBER [1] - [16] buttons select the track of the computer sequence software.				

Voice Edit

The following procedure shows you the fundamentals in creating and editing Voices.
Of course, this is just one example; you are free to set any parameters in any way you like. Details about each
parameter are given in the Reference section of this manual (page 98).

🎵 **NOTE** All parameter settings are stored along with the Voice itself.

1

In Voice Play mode, select the Voice you wish to edit.

2

Enter the Voice Edit mode.

3

Set the common parameters

● Set the parameters common to all Elements in the Voice (volume, pitch, tone, etc.) You can also set parameters related to Arpeggio, Controllers, Effects, and so on.

4

Set the element parameters

● From the OSC (Oscillator) screens, select the Waves used by the Elements in the Voice, as well as the volume, pan, note range and other basic parameters.

● From the PITCH screens, set the tuning and other pitch-related parameters used by the Elements. Also set the PEG (Pitch Envelope Generator) parameters as necessary.

● From the FILTER screens, adjust the parameters of the filters used by the Elements. Also set the FEG (Filter Envelope Generator) parameters as necessary.

● From the AMP (Amplitude) screens, set the volume and other output level-related parameters used by the Elements. Also set the AEG (Amplitude Envelope Generator) parameters as necessary.

● From the LFO (Low Frequency Oscillator) screens, set the modulation-related parameters used by the Elements.

● From the EQ (Equalizer) screens, adjust the sounds as necessary.

5

Set the effect parameters.

6

Store the edited Voice.

❶ Selecting a Voice to Edit

Enter the Voice Play mode by pressing a [VOICE] button.

MODE

○VOICE ○PERFORM ○MASTER
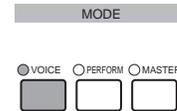
Select the Voice Number of the Voice you wish to edit (page 36).

🎵 **NOTE** When you're creating a Voice by editing an existing one, it helps to select a Voice with a sound that's relatively similar to the one you intend to create. In this way, you can avoid having to make large changes and many parameter edits — allowing you to create a Voice quickly and easily. If you are creating a Voice from scratch, use the convenient Initialize function (in the Voice Job mode) to initialize a Voice in internal user memory. For details, see page 70.

❷ Entering the Voice Edit Mode

All Voice creation and editing is carried out in Voice Edit Mode.
To enter the Voice Edit mode, press the [EDIT] button while in the Voice Play mode.

MODE

○VOICE ○PERFORM ○MASTER

○UTILITY ○CARD ○SEQ PLAY

○EDIT   JOB   STORE

COMPARE

○ARPEGGIO ○EFFECT BYPASS   PLAY/ STOP
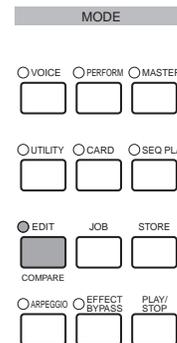
Common Edit and Editing Individual Elements
Switching Elements (or Keys) On/Off (Mute)

Voices can consist of up to four Elements (page 26). Use Common Edit to edit the settings common to all four Elements.

To edit parameters common to all four elements, press the [DRUM KITS] button (which serves as a "COMMON" button here).

```
      ○ DRUM KITS
      ┌─────┐
      │     │
      └─────┘
      FAVORITES
      ┌─────┐
      │COMMON│
      └─────┘
```

To edit parameters of the individual elements, select the desired element with the corresponding NUMBER button ([1] - [4]).

```
  ○ 1    ○ 2    ○ 3    ○ 4
 ┌──┐  ┌──┐  ┌──┐  ┌──┐            Element selection
 └──┘  └──┘  └──┘  └──┘
     ELEMENT / PERF.PART / ZONE
  ○ 9    ○ 10   ○ 11   ○ 12
 ┌──┐  ┌──┐  ┌──┐  ┌──┐            Element mute setting
 └──┘  └──┘  └──┘  └──┘
```
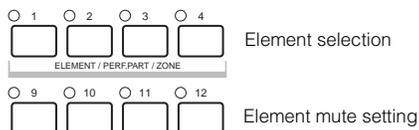
You can mute other elements (those you aren't editing and don't wish to hear) by using the NUMBER [9] - [12] buttons (Normal Voice only). Muted elements are indicated by lit buttons; the indicator of the button corresponding to the muted element lights.

To solo an element

```
 ○1  ○2  ○3  ○4  ○5  ○6  ○7  ○8   ○TRACK
                                    SELECT
┌─┐ ┌─┐ ┌─┐ ┌─┐ ┌─┐ ┌─┐ ┌─┐ ┌─┐  ┌──┐
└─┘ └─┘ └─┘ └─┘ └─┘ └─┘ └─┘ └─┘  └──┘
   ELEMENT / PERF.PART / ZONE
 ○9  ○10 ○11 ●12 ○13 ○14 ○15 ○16  ✶MUTE
┌─┐ ┌─┐ ┌─┐ ┌─┐ ┌─┐ ┌─┐ ┌─┐ ┌─┐  ┌──┐
└─┘ └─┘ └─┘ └─┘ └─┘ └─┘ └─┘ └─┘  └──┘
```
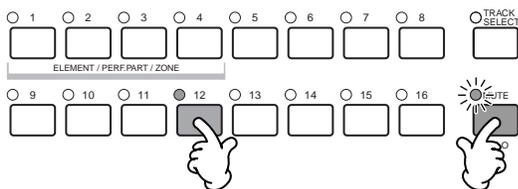
Simultaneously hold down the [MUTE] button and press one of the NUMBER buttons [9] to [12] to solo the corresponding element.

Once you've selected an element for soloing, the [MUTE] button's lamp flashes, indicating the Solo function is active. While Solo is active, you can change the soloed element simply by pressing the corresponding NUMBER button [9] to [12].
To exit from the Solo function, press the [MUTE] button again.

Switching Between Screens and Entering Settings

❶ Select the menu you wish to edit by pressing the [F1] - [F6] and [SF1] - [SF5] buttons.

❷ Select the desired parameter by using [▲ ▼ ◀ ▶] buttons.

❸ Use the [INC/YES] and [DEC/NO] buttons to set each parameter value.

♪ NOTE For details about the Edit indicator, see page 39.

Compare Function

Use this to listen to the difference between the Voice/Performance with your edited settings and the same Voice/Performance prior to editing.

❶ Press the [COMPARE (EDIT)] button while in Edit mode. The EDIT LED will flash and the settings prior to editing will temporarily be reinstated for comparison purposes.
(The 🄲 indicator is shown at the top of the display in place of the 🄴 indicator.)

♪ NOTE While the Compare function is enabled, the [DEC/NO] and [INC/YES] buttons cannot be used for editing.

❷ Press the [EDIT] button again to disable the Compare function and restore your recently edited settings.

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

❸ Set the Common Parameters

Each Voice consists of up to four Elements. Here, the parameters common to all Elements are explained.

● GENERAL [F1]

For setting general parameters in Common Edit, such as the Voice Name.

● OUTPUT [F2]

For setting the Voice output parameters such as the output level (volume) and pan position.

● ARP [F3]

By setting these parameters, you can control how the Voice is arpeggiated (page 45).

● CTL SET [F4]

For assigning various functions to the controllers on the front/rear panel. For example, you can assign parameters to the Pitch Bend Wheel and a Foot Controller so that you can change the tone of the Voice in real time (page 55).

● LFO [F5]

For setting the LFO parameters. The LFO uses a low frequency waveform to vary the pitch/filter/amplitude characteristics, and can be used to create vibrato, wah, tremolo and other effect.

● EFFECT [F6]

For setting the Effects parameters for the Voice. There are two Insertion Effects plus two System Effects (Reverb and Chorus).

❹ Set the Element Parameters

Element Edit Process
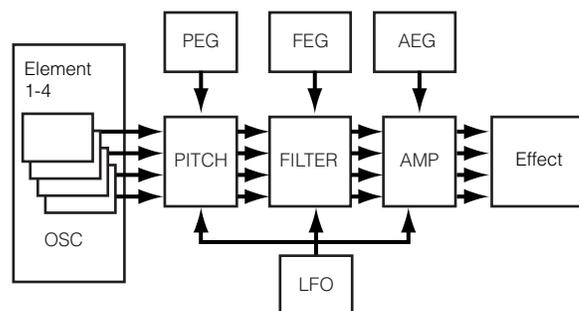
● OSC (Oscillator) [F1]

You can set the various parameters controlling the waveforms on which the Voice is based. You can select the Wave used for the Element, the volume and note range of each Element and so on.

ElementSw (Element Switch)
Determines whether each Element sounds or not.

WaveNo. (Wave Number)
Select the Wave for each Element.

NoteLimit (Note Limit Low/High)
VelocityLimit (Velocity Limit Low/High)
Set the note range for each Element (the range of notes on the keyboard over which the Element will sound) and also the velocity response (the range of note velocities within which the Element will sound). You can assign different settings for each Element. With these parameters, you can layer Elements and control their output.
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.
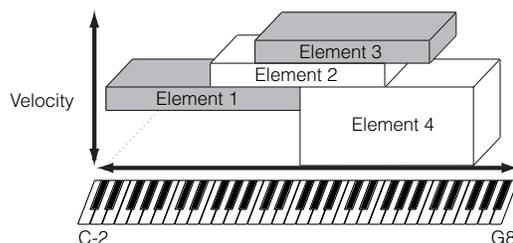
NOTE In the Performance mode, similar settings can be assigned for each Part (Ref. #42, 43).

● PITCH [F2]

You can set the basic pitch parameters for each Element. You can detune 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) [F2] → [SF3]

Using the PEG, you can control the transition in pitch from the moment a note is pressed on the keyboard to the point at which it is released. As illustrated below, the Pitch Envelope consists of five Time (transition speed) parameters and five Level (pitch) parameters. This is useful for creating automatic changes in pitch. Furthermore, different PEG parameters can be set for each Element.
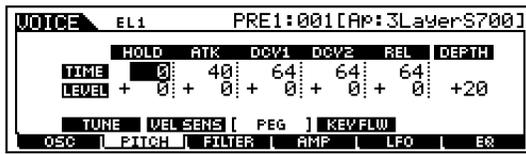
```
VOICE    EL1        PRE1:001[Ap:3LayerS700]
         HOLD  ATK   DCY1  DCY2  REL  DEPTH
TIME      0    40    64    64    64
LEVEL  +  0  +  0  +  0  +  0  +  0    +20
       TUNE  VEL SENS [   PEG   ] KEY FLW
   OSC  | PITCH | FILTER | AMP | LFO | EQ
```

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	Decay 1 time	Decay 2 time	Release time	---
LEVEL	Hold level	Attack level	Decay 1 level	Decay 2 (Sustain) level	Release level	Depth
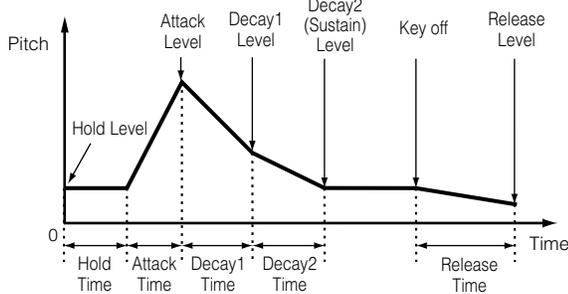
● FILTER [F3]

You can use the filter to change the tonal characteristics of each Element, by adjusting overtones (harmonic tones) included in the waveform of the Element.

Cutoff Frequency and Resonance

Filters work by allowing the portion of the signal lower than a given frequency to pass, and cutting the portion of the signal above that frequency. This frequency is referred to as the cutoff frequency. You can produce a relatively bright or darker sound by setting the cutoff. Resonance, on the other hand, boosts the level of the signal at the cutoff frequency. By emphasizing the overtones in this area, this can produce a distinctive "peaky" tone, making the sound brighter and harder.
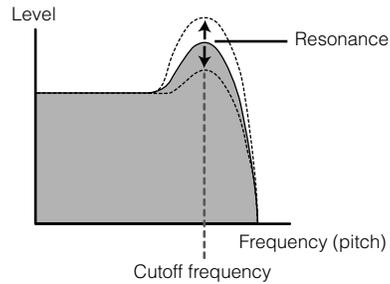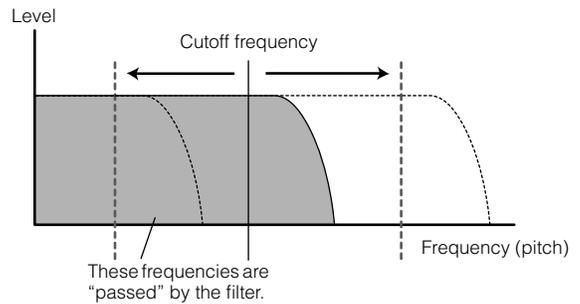
About the Filter types

The Low Pass Filter is shown in the illustration above — however, the S90 features other Filter types as well.

LPF24D (Low Pass Filter 24dB/oct Digital)
A 4-pole (-24db/oct) dynamic LPF with a strong resonance.
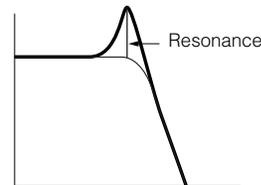
LPF24A (Low Pass Filter 24dB/oct Analog)
A 4-pole (-24db/oct) dynamic LPF with a character similar to those found on analog synthesizers
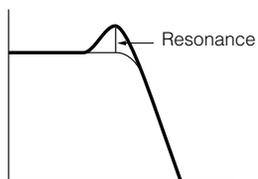
LPF18 (Low Pass Filter18dB/oct)
A 3-pole (-18db/oct) dynamic LPF.

LPF18s (Low Pass Filter [18dB/oct Staggered)
Also a 3-pole (-18db/oct) dynamic LPF, but with a shallower frequency curve.
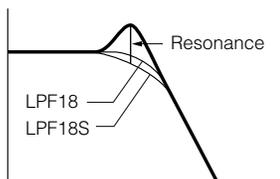
LPF12 (Low Pass Filter12dB/oct)
A 2-pole (-12db/oct) dynamic LPF, designed to be used in combination with an HPF (High Pass Filter).
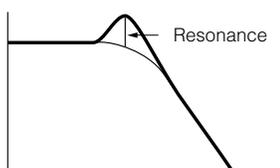
LPF6 (Low Pass Filter 6dB/oct)
A 1-pole (-6db/oct) dynamic LPF with no resonance, designed to be used in combination with an HPF (High Pass Filter).
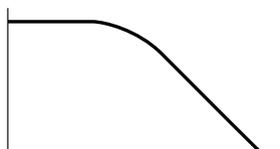
HPF24D (High Pass Filter 24dB/oct Digital)
A 4-pole (-24db/oct) dynamic HPF with strong resonance.
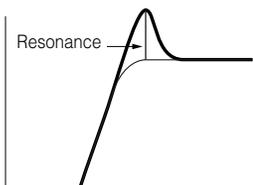
HPF12 (High Pass Filter 12dB/oct)
A 2-pole (-12db/oct) dynamic HPF.
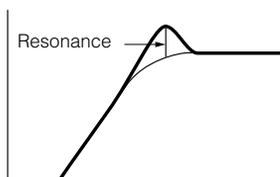
BPF12D (Band Pass Filter 12dB/oct Digital)
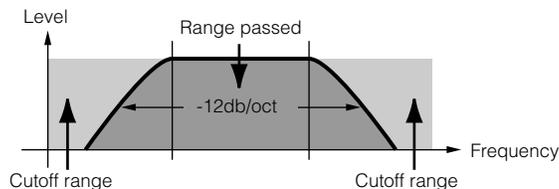
BPF12s (Band Pass Filter 12dB/oct Staggered)
Basically same as BPF12D, but with a shallower frequency curve.

BPF6 (Band Pass Filter 6dB/oct)
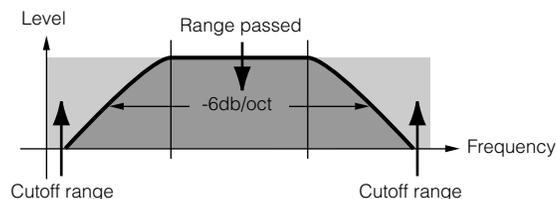
BPFw (Band Pass Filter Wide)
Also the combination of –12dB/oct HPF and LPF, but allows a wider frequency band.
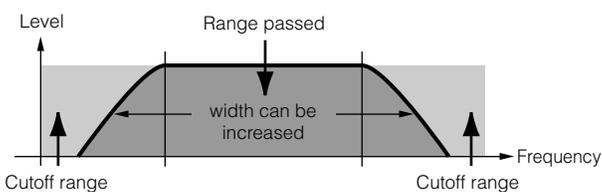
BEF12 (Band Elimination Filter 12dB/oct)
BEF6 (Band Elimination Filter 6dB/oct)
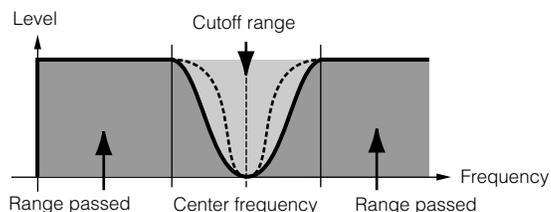
Dual LPF
A combination of two sets of –12dB/oct LPF in parallel.
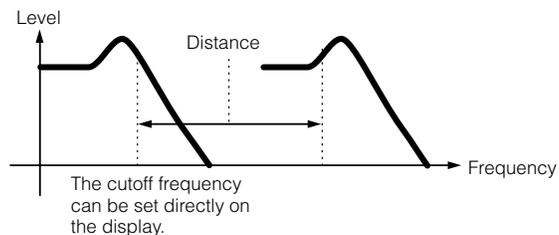
Dual HPF
A combination of two sets of –12dB/oct HPF in parallel.

Level

Distance

Frequency

The cutoff frequency can be
set directly on the display.
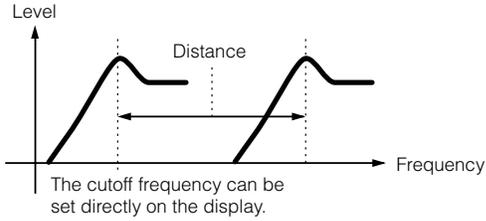
Dual BPF
A combination of two sets of –6dB/oct BPF in parallel.

Level

Distance

Frequency

The cutoff frequency can be
set directly on the display.
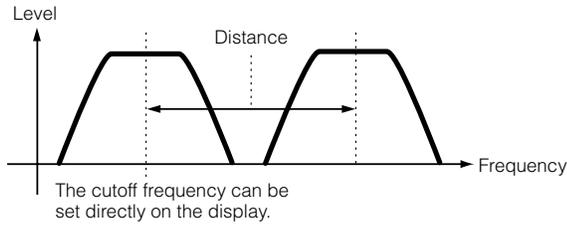
Dual BEF
A combination of two sets of –6dB/oct BEF in parallel.

Level

Frequency

Distance

The cutoff frequency can be
set directly on the display.
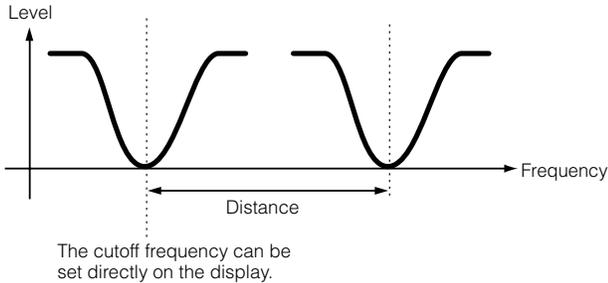
LPF12 (Low Pass Filter 12dB/oct) + HPF12 (High Pass Filter)
A combination of a LPF and HPF.

Level

Distance

Frequency

The cutoff frequency can be
set directly on the display.
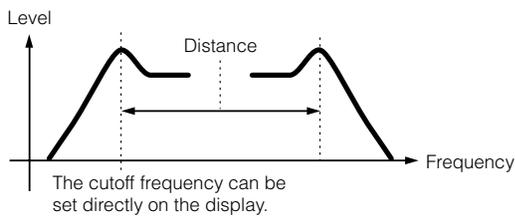
LPF12 (Low Pass Filter 12dB/oct) + BPF6 (Band Pass Filter)
A combination of a LPF and BPF.

Level

Frequency
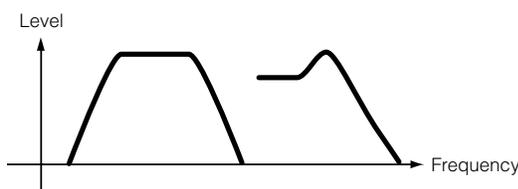
HPF12 (High Pass Filter 12dB/oct) + BPF6 (Band Pass Filter)
A combination of a HPF and BPF.

Level

Frequency
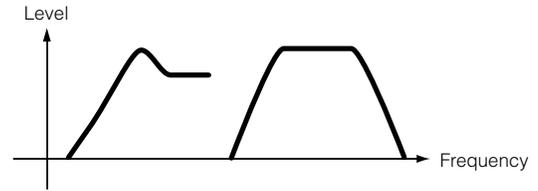
thru
The filters are bypassed and the entire signal is unaffected.

♪ NOTE Filter parameters are also available in Part editing.

You can also set the Filter Envelope Generator (FEG) for time variance of how the filter works, which results in a dynamic change in tonal characteristics. Here, we'll show you how the FEG works.

FEG (Filter Envelope Generator) [F3] → [SF3]
Using the FEG, you can control the transition in tone from the moment a note is pressed on the keyboard to the point at which it is released. As illustrated at right, the Filter Envelope consists of five Time (transition speed) parameters and five Level parameters (for the amount of filtering). 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 effects, for example. Furthermore, different FEG parameters can be set for each Element.
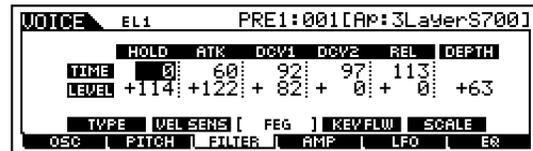
VOICE EL1 PRE1:001[AP:3LayerS700]
HOLD ATK DCY1 DCY2 REL DEPTH
TIME 0 60 92 97 113
LEVEL +114 +122 + 82 + 0 + 0 +63
TYPE VEL SENS [FEG] KEY FLW SCALE
OSC PITCH FILTER AMP LFO EG

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	Decay 1 time	Decay 2 time	Release time	---
LEVEL	Hold level	Attack level	Decay 1 level	Decay 2 (Sustain) level	Release level	Depth

● AMP (Amplitude) [F4]

You can set the volume of each Element after the OSC (Oscillator), PITCH and FILTER parameters have been applied, as well as the final overall volume of the signal sent to the outputs.

The signal of each Element is sent at the specified volume to the next Effect section.

Also, by setting the AEG (Amplitude Envelope Generator), you can control how the volume changes over time.

AEG (Amplitude Envelope Generator) [F4] → [SF3]

Using the AEG, you can control the transition in volume from the moment a note is pressed on the keyboard to the point at which it is released. As illustrated below, the Amplitude Envelope consists of four Time (transition speed) parameters and three Level parameters (for the amount of filtering). 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.
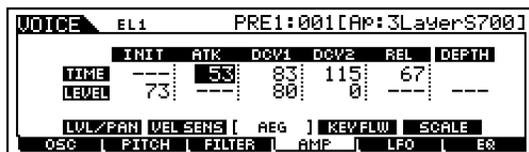
The full names of the available parameters are shown in the chart below, as they appear in the display.

	INIT	ATK	DCY1	DCY2	REL	DEPTH
TIME	---	Attack time	Decay 1 time	Decay 2 time	Release time	---
LEVEL	Initial level	---	Decay 1 level	Decay2 (Sustain) level	---	
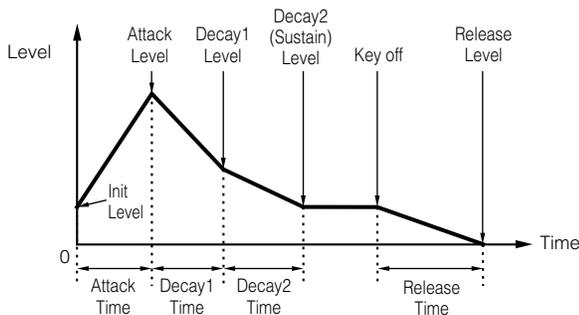
● LFO (Low Frequency Oscillator) [F5]

As its name suggests, the LFO creates waveforms of a low frequency.

These waveforms 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 (Ref. #159-174).

● EQ (Equalizer) [F6]

Adjusting the sound can serve to draw out the special characteristics of the sound and help achieve the proper balance among the Elements (Ref. #210-215).

❺ Set the Effect Parameters

For an application example showing how to use the effect, see page 67.

❻ Storing Edited Voices

Up to 128 new/edited Normal Voices and 16 new/edited Drum Voices can be stored to internal user memory.
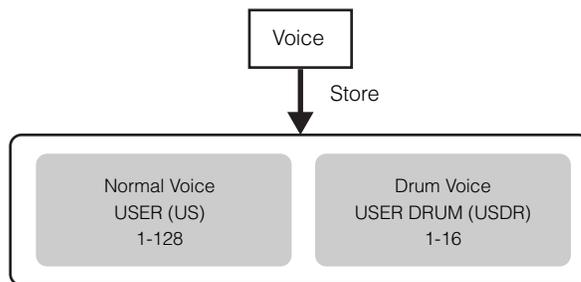
⚠ When storing a Voice, any existing data at the storage location will be lost. You should always back up important data to Memory card or computer.

♪NOTE For details about storing Voices, see page 73.

About Board Custom Voice Editing

You can edit Board Custom voices of the Plug-in Board by using the Editor software included with the board.

♪NOTE Select the Part Number of the Editor software to "1" when using the software with the Voice mode. Also make sure to match the basic MIDI receive channel of the S90 (Ref. #176) to the MIDI channel of the Editor software.

The original Board Custom voices you've edited can be saved and controlled from the computer.

⚠ Make sure to save the edited data to a memory card, since any edited data in the DRAM of the Plug-in board will be lost when you turn off the power on the S90 (page 82).

♪NOTE For details about how to use the Editor software included with the Plug-in board, refer to the Online help of the Voice Editor.

♪NOTE Editing the above parameters may or may not have much effect on the sound, depending on the particular Plug-in board you've installed.

Using Effects

In the final stage of programing, you can set the effects parameters to further change the sound's character.

Effect structure

The S90's effect processing features the following effect units.

■ System Effects (Reverb, Chorus, Variation)

System Effects are applied to the overall sound, whether it be a voice, an entire performance setup, a song, etc. 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 12 different Reverb types are available.

Chorus

The Chorus effects use modulation to create a rich ensemble sound — as if one part were being played by several instruments simultaneously. A total of 25 different Chorus types are available.

Variation

The Variation effects provide a wide variety of sound transformations and enhancements. A total of 25 different Variation types are available. Variation is not available in the Voice mode.

■ Insertion Effects (1, 2)

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. You can also set the balance so that only the effect sound is heard, by setting Wet to 100 %. The S90 features two Insertion effect systems — one with a total of 104 internal effect types and the other with 25.

■ Plug-in Insertion Effects

This is a special effect system, only available when an effect-type Plug-in Board (page 22) is installed. Plug-in Board effects are not available in the Voice mode.

■ Master Equalizer

Usually an equalizer is used to correct the sound output from amps or speakers to match the special character of the room. The sound is divided into several frequency bands, then by raising or lowering the level for each band, the correction is made. Adjusting the sound you play according to the genre— classical music being more refined, pops music more crisp, and rock music more dynamic—can also serve to draw out the special characteristics of the music and make your performance more enjoyable.
The S90 possesses a high grade five-band digital equalizer function. The four sliders can be used to adjust the gain of the four bands (among five).

Example of Effect Settings

Here we'll show an example of editing effect settings in the Voice Edit mode (page 60). In this example, we'll change the Insertion1 setting of the Voice Or: BreathPipe (PRE1: E13) from Thru to FLANGER (a jet-like sound).

❶ Select the Voice Number of the Voice you wish to edit (Here, Or: BreathPipe = PRE1: E13), then enter the Voice Edit mode (pages 36 and 60).

❷ Press the [COMMON] button to select the Common Edit display (page 61).

❸ Press the [F6]→[SF1] buttons to call up the CONNECT display.

❹ Use the [▲ ▼ ◀ ▶] button to select the INS1 (INS1 Type) screen.

---
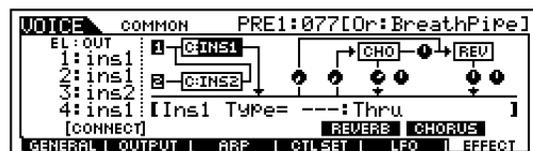
❺ Use the data dial to select "FLG: FLANGER1" then play the keyboard. Try out other different Effect Types, referring to the Effect Type List in the separate Data List.

♪**NOTE** You can listen to and compare the difference between the edited Voice with your edited settings and the same Voice prior to editing (page 61).

♪**NOTE** To bypass effect processing, press the [EFFECT BYPASS] button (the LED lights).

♪**NOTE** In the effect parameter screens ([SF2]-[SF5]), you can make various detailed parameter settings. You can scroll through the screens by using the [◀ ▶] buttons. For information on the Effect Parameters, refer to the separate Data List.

❻ If you wish to save your new settings, store the settings as a single Voice before you leave the Voice Edit mode. For details about storing Voices, see page 73.

Effect connection

● In the Voice mode:

Three different Insertion connection types are available, as shown below.
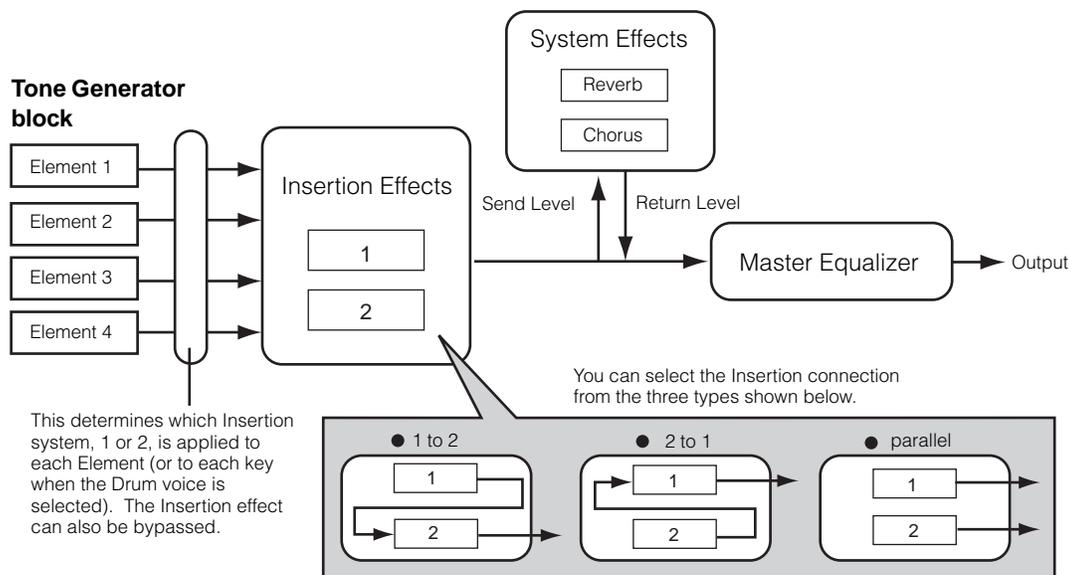
♪**NOTE** The parallel connection type is not available for Plug-in voices.

● **In the Performance mode:**

The diagram below indicates the internal signal flow when the Vocal Harmony Plug-in Board (PLG100-VH) is installed to slot 1.

Select the part to which the Insertion effect is applied from parts 1-4 and Plug-in parts 2-3. The connection type depends on the setting of the Voice assigned to the selected part.

System Effects
Reverb
Chorus
Variation

Tone Generator block

Parts 1-4, Plug-in parts 2-3

Insertion Effects
1
2

Send Level   Return Level

Master Equalizer → Output

Insertion Effect (Plug-in)

PLG 100-VH

Select the part to which the Plug-in Insertion effect is applied from parts 1-4, Plug-in parts 2-3 and A/D Input part.

A/D
• External audio source
• Microphone sound

DNOTE The Vocal Harmony Plug-in Board (PLG100-VH) can be installed only to slot 1. It cannot be installed to slot 2 or 3.

● **In the Sequence Play/Mixing mode:**

The diagram below indicates the internal signal flow when the Vocal Harmony Plug-in Board (PLG100-VH) is installed to slot 1 and the Multi part Plug-in Board (PLG-100XG) is installed to slot 3.

Select the part to which the Insertion effect is applied. The connection type depends on the setting of the Voice assigned to the selected part.

System Effects
Reverb
Chorus
Variation

Tone Generator block

Part 1~16

Part 17-32 *
(When the Multi-part Plug-in board has been installed)

Plug-in Part 2
(When the Single part Plug-in board has been installed)

Insertion Effects
1
2

Send Level   Return Level

Master Equalizer → Output

Insertion Effect (Plug-in)

PLG100-VH

Select the part to which the Plug-in Insertion effect is applied.

A/D
• External audio source
• Microphone sound

* Please note that the Insertion Effect, Insertion Effect (Plug-in), and the System Effects cannot be applied to parts 17 ~ 32 (using the Multi-part Plug-in board). The signal from parts 17 ~ 32 is directly sent to the Master Equalizer.

Using the Jobs

You can perform various operations (Jobs) in the Job mode. For example, you can initialize Voices/Performances to their original settings (including those currently being edited) or copy Elements/Parts.

Job (PAGES)

MODE	JOB					
	Initialize	Recall	Copy	Bulk Dump	Performance Copy	Factory Set
	F1	F2	F3	F4	F6	-
VOICE	Yes	Yes	Yes	Yes		
PERFORMANCE	Yes	Yes	Yes	Yes		
MASTER	Yes			Yes		
MIXING ([SEQ PLAY] → [F6])	Yes			Yes	Yes	
UTILITY						page 72

Performing a Job

❶ In each mode, select the Voice/Performance/Master Number or Mixing you wish to perform the Job on.

❷ Press the [JOB] button to enter the Job mode.

❸ Use the function buttons and switch to the screen showing the Job you wish to perform (excluding Utility mode).

```
VOICE  JOB        PRE1:001[AP:3LayerS700]

Initialize Current Voice
       ⊠ALL ⊠Common ⊠EL1   ⊠EL3
                    ⊠EL2   ⊠EL4


  INIT  RECALL  COPY   BULK
```
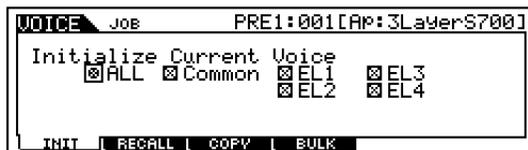
❹ Use the [DEC/NO], [INC/YES] and [▲ ▼ ◄ ►] buttons to select the parameter you wish to perform the Job on.

❺ When you press the [ENTER] button, a confirmation prompt appears.

❻ Press the [INC/YES] button to confirm. A "Completed" message appears when the Job has been completed, and operation returns to the original screen.

   Press the [DEC/NO] button to cancel the Job.

⚠ Never attempt to turn off the power while data is being written to Flash ROM (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 may cause the system to freeze (due to corruption of data in the Flash ROM).

❼ Press one of the MODE buttons (or the [EXIT] button) to exit the Job mode and return to the Play mode.

Resetting (initializing) parameters of a Voice/Performance to their default settings [F1]

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

Select parameter Type to be Initialized

Target	Settings in the LCD					
	Normal Voice	Drum Voice	Plug-in Voice	Performance	Mixing	Master
Whole currently selected data	ALL					
Common data for currently selected program	Common					
Part/Element/ Key/Zone/Mixing data for currently selected program	EL1-EL4	EL/key (Note Name)	EL	Part1-4/ PLG1-3	Part1-16/ PLG1-3	ZONE*

* Parameters available when the parameter type to be initialized is set to Split or Layer. They can be designated the MIDI transmit channel or the Split Point as a result of the job.

   UpperCh, LowerCh
   When the Parameter Type above is set to "Zone - Split," you can set separate MIDI transmit channels for the upper and lower keyboard sections (right of Split Point and left of Split Point, respectively).When the Parameter Type above is set to "Zone - Layer," you can set separate MIDI transmit channels for two layers.

   SplitPoint
   This is available only when the parameter type to be initialized is set to "Split." The range is C - 2 ~ G8.

Edit Recall [F2]

If you are editing a voice/performance and select a different voice/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 voice/performance with your latest edits intact.

Using the Copy function [F3]

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.

Source Voice

Destination Voice
(currently selected Voice)
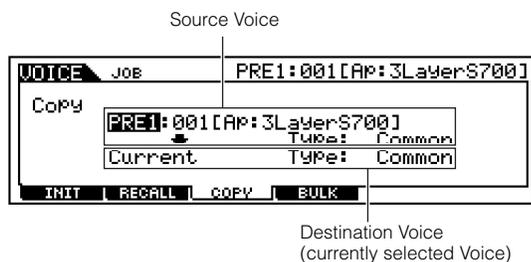
Source voice
Select a Voice and data type to be copied.

❏ Data type

When a Normal voice is selected:
Common, Element 1 ~ 4

When a Drum voice is selected:
Common, Drum key C0 ~ C6

When a Plug-in voice is selected:
Common, Element

📝 **NOTE** If the source Voice type (Normal/Drum/Plug-in) differs from one of the Voice you are currently editing (destination), you will only be able to copy Common parameters.

**Data type of Destination voice
(currently selected voice)**
If the source is a Normal or Drum Voice and data type is set to Element or Drum Key, you can set the data type of the destination Voice.

❏ Data type

When a Normal voice is selected:
Common, Element 1 ~ 4

When a Drum voice is selected:
Common, Drum key C0 ~ C6

📝 **NOTE** If you choose to copy Common parameters from the source, this display will change to "Common."

Performance

From this display you can copy Common and Part parameter settings from any performance to the performance you are editing. This is useful if you are creating a performance and wish to use some parameter settings from another performance.

Source performance

Destination performance
(currently selected performance)
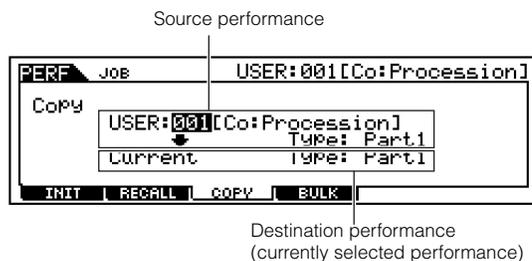
Source performance
Select a performance and data type to be copied.

❏ Data type   Part 1 ~ 4, Plug 1 ~ 3

**Data type of Destination performance
(currently selected performance)**
Set the Part of the destination Performance.

❏ Data type   Part 1 ~ 4, Plug 1 ~ 3, Arp, Effect (Reverb, Chorus)

📝 **NOTE** If you choose Arp (Arpeggio) or Effect, the Arpeggio data or Effect settings for the Voice assigned to the source Part will be copied.

Saving Data to an External Device (Bulk Dump) [F4]

You can backup your custom settings of all Programs (voices, performances and other settings) by using Bulk Dump to transmit the data to your computer or some other external MIDI device.

♪NOTE In order to perform a Bulk Dump, the appropriate MIDI Device Number must be set (Utility [F5]→[SF1] Ref. #178).

♪NOTE After receiving the current voice/performance as bulk data, the data will be lost if you select another voice/performance or Mode. To avoid losing the data, you should use Store function to store your received data (page 73).

Copying Performance Part parameter settings to Parts in the Mixing mode (Performance Copy) [F5]

This convenient operation lets you copy certain settings of the four parts in a performance to the Mixing program currently being edited. This would come in handy when a certain performance has settings that you want to use in your Mixing program. Use this Job to simply copy the settings you need. The MIDI receive channel settings are set to match the basic channel settings (Utility [F5]→[SF1] Ref. #176). 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.

```
SEQPLAY  MIX JOB
Copy From Performance
  USER:001[Co:Procession]
    □Rev □Cho □Var □Arp □MEQ
    InsEFPart      □Voice □Plug-EF
  ♦ Current Mix Part  1,2,3
  ■INIT         ■BULK ■PFCOPY
```

Factory Set (Restore Factory Defaults)

This lets you restore the synthesizer's default Internal Voices (User Memory) and Performances, as well as its System and other settings.
Once you edit any settings, the corresponding factory defaults will be overwritten and lost.
Use the procedure below to restore the factory default settings.

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

❶ In the Utility mode (page 29), press the [JOB] button to enter the Utility Job mode.

❷ Press the [ENTER] button. (The display prompts you for confirmation.)

♪NOTE To cancel the Job, press the [DEC/NO] button.

❸ 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.

❹ Press the [UTILITY] button to exit from the Utility Job mode back to the Utility mode.

♪NOTE All settings in the Utility mode that are related to the Plug-in boards and the mLAN8E are stored only to the memory on those respective devices, and not to the User memory of the S90. Because of this, the Factory Set operation cannot be used to restore settings for those devices.

Saving the Settings (Store)

You can store (save) your original parameter settings to User Memory. The procedure is as follows.

⚠ When you perform this, the settings for the destination data will be overwritten. Important data should always be backed up to computer, a separate memory card or some other storage device (page 82).

♪NOTE When changing the Name, refer to page 34.

♪NOTE The edited Mixing data can be stored by using the Put function (page 79).

❶ Press the [STORE] button after editing a Voice/ Performance. The Store screen appears.

ex. Voice

```
VOICE  STORE      PRE1:001[Ap:3LayerS700]
Voice Store
      to   USER:001[Ap:BriteS700 ]

                   PRESS [ENTER] TO STORE.
```
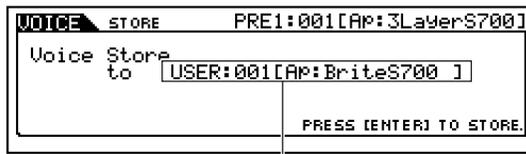
Destination Program (Voice)

❷ Use [DEC/NO] and [INC/YES] buttons to select the destination program.

❸ When you press the [ENTER] button, you will be prompted for confirmation.

```
VOICE  STORE      PRE1:001[Ap:3LayerS700]
MESSAGE
       Are you sure?   [YES]/[NO]

                   PRESS [ENTER] TO STORE.
```
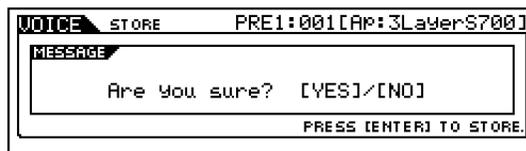
♪NOTE You can press the [DEC/NO] button to cancel the Store operation and return to the original screen.

❹ Press the [INC/YES] button to confirm. When it has been completed, a "Completed" message appears, and operation returns to the original screen.

⚠ Never attempt to turn off the power while data is being written to Flash ROM (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 may cause the system to freeze (due to corruption of data in the Flash ROM).

Plug-in Voices

Up to three Plug-in boards can be installed to the S90. If the Plug-in Board has been correctly installed, the corresponding SLOT lamp will light.

```
PROGRAM   ○SLOT 1  ○SLOT 2  ○SLOT 3

○PRE 3  ○ GM  ○USER  ○PLG 1  ○PLG 2  ○PLG 3      ○
                                                 CATEGORY
                                                 SEARCH
ORGAN  GUITAR/  BASS  STRINGS  BRASS  REED/PIPE
       PLUCKED
```
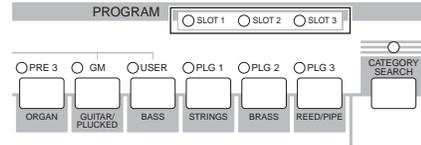
The Plug-in voices can be edited via the S90's panel operation in much the same way as User voices. After editing, up to 64 Plug-in voices for each Plug-in slot can be stored.

Editing and saving Board voices

Included among the Board voices is a special set of voices — called Board Custom voices — which can be edited by a computer connected to the S90, using special editing software included with the Plug-in board.
Because the Plug-in boards do not have SRAM and the edited voice data will be lost when turning the power off, the edited Board Custom voice data should be saved to a Memory Card inserted to the S90. The Board Custom voice data saved to the memory card can be loaded automatically when turning the power on by using the Auto Load function.

❶ Edit the Board voice by using the Editor software.

❷ Transmit the edited data to the memory (DRAM) on the Plug-in board.

❶ Edit

Computer with application software

❷ Transmit

Plug-in board

S90
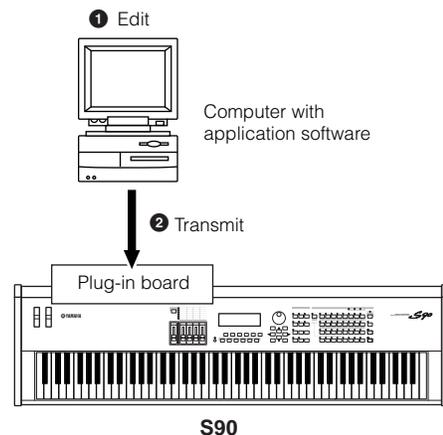
❸ Save the data in the memory (DRAM) to the memory card.

Memory card

❸

Plug-in board

S90
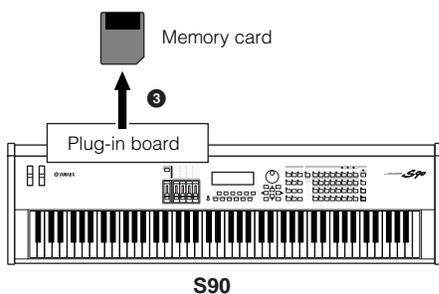
❹ If necessary, set Auto Load to on in the Utility mode (page 84).

Set this to on.
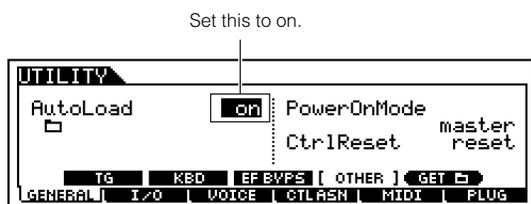
❺ When turning the power on next time, the Board Custom voice data saved to the memory card is automatically loaded to the memory on the Plug-in board.

Playing the Songs

You can directly play back the Song files stored on Memory Card. Up to 100 Song files can be played back end-to-end by using the Chain Step feature. This Chain Step data can also be saved to Memory Card (page 82).

♪NOTE Make sure to insert a Memory Card containing appropriate Song data to the Card Slot.

⚠ Make sure to read the section "Using Memory Cards" on page 82.

♪NOTE The S90 is compatible with and can play back Standard MIDI Files or Format 0. If necessary, you can use the included File Utility software to convert Standard MIDI files on your computer from format 1 to format 0.

⚠ Never attempt to remove/insert the Memory Card while in the SEQ PLAY mode.

Setting the Chain (CHAIN)

Chain Step Number

Change each Chain Step by using the [▲]/ [▼] buttons.

Chain Step
Number   Mix Template
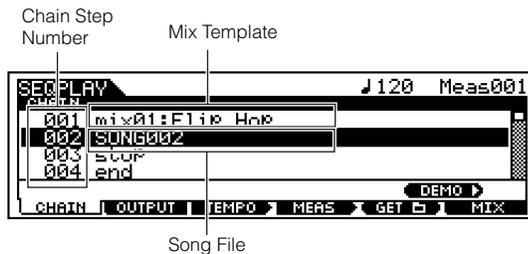
Song File

♪NOTE You can jump to the next Chain Step and change the Chain settings in advance, even while a Song is being played back.

♪NOTE When a Song is being played back, a [F] indicator appears for the current Song.

Song File/Mix Template

Assign a Song file to the Chain Step. Any Song files with the ".MID" extension can be selected. Mix Templates (page 79) can also be selected to call up the tone generator settings for each part.
For continuous (chained) playback of multiple Chain Steps, you can specify how to play this Chain Step after playback of a previous one by selecting one of the commands: "skip," "end," or "stop."
If you select "skip," the Chain Step is skipped and playback will jump to the next Chain Step. If you choose to skip the 100th Chain Step, playback will jump back to the first Chain Step after the 99th Chain Step. If you select "end," when the Song reaches this Chain Step, chained playback is stopped and you are returned to the first Chain Step.

If you select "stop," the Song stops when it reaches this Chain Step.

❏ **Settings**: skip, end, stop, song file, mix template

♪NOTE You need to have already specified (in Card mode) the directory containing the song files you wish to select.

❶ Press the [SEQ PLAY] button to enter the Sequence Play mode.

❷ Use the [▲] and [▼] buttons to select the chain step number.

❸ Use the [DEC/NO] and [INC/YES] buttons to assign the song file/mix template or skip/end/stop to the chain step.

♪NOTE Song files on the same directory can be played back with chain.

❹ Repeat steps 2 and 3 above to set up the chain.

Song Playback

❶ Select the desired Song file for playback, in the same manner as you did ❶ to ❸ above.

♪NOTE When playing back a single Song, you do not need to select a Chain Step Number (any Chain Step screen can be open).

❷ Set the tempo (if necessary).

❸ Follow the two secondary steps below if the Play directory and the Current directory are not the same. (You can check this from the INFORMATION screen.)

♪NOTE Keep in mind that the Play directory (for Sequence playback) and the Current directory (in the Card mode) can be set to different folders. For proper Chain Step operation, they must be set to the same folder.

① Press the [F5] button from the CHAIN screen. A confirmation message appears.

② Execute the operation by pressing the [INC/YES] button.

❹ Press the [PLAY/STOP] button to playback the Song.

❺ Press the [PLAY/STOP] button again to stop the Song playback.

Chained Playback

❶ Use the [▲] and [▼] buttons to select the Chain Step Number of the first Song you wish to play back, or of the Mix Template.

❷ Set the tempo (if necessary).

❸ Follow the two secondary steps below if the Play directory and the Current directory are not the same. (You can check this from the INFORMATION screen.)

> **NOTE** Keep in mind that the Play directory (for Sequence playback) and the Current directory (in the Card mode) can be set to different folders. For proper Chain Step operation, they must be set to the same folder.

> ① Press the [F5] button from the CHAIN screen. A confirmation message appears.

> ② Execute the operation by pressing the [INC/YES] button.

❹ Press the [PLAY/STOP] button to play back the Song. When the Chain Step playback has finished, the Song of the next Chain Step Number will automatically be started. Songs can be played back continuously this way.

❺ Press the [PLAY/STOP] button again to stop the chained playback.
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.

Move through the measures
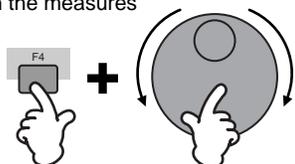
The measure be specified when releasing the [F4] button.

Change the tempo
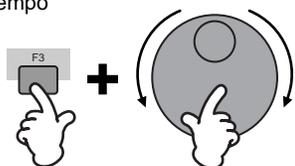
Song track on/off — Solo and Mute

To mute a track
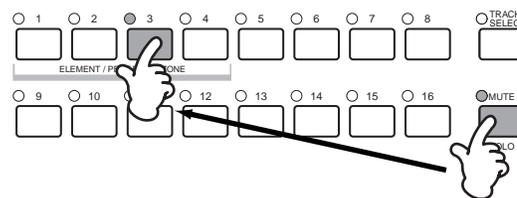
❶ Press the [MUTE] button so that its lamp lights.

❷ Press any of the NUMBER [1] - [16] buttons to select the track number to be muted.

To solo a track
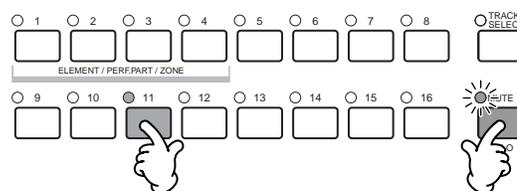
Simultaneously hold down the [MUTE] button and press one of the NUMBER buttons [1] to [16] to solo the corresponding track.

Once you've selected a track 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].
To exit from the Solo function, press the [MUTE] button again.

Song track selection

In order to edit the Mixing data, you'll need to select a track for editing.
Press the [TRACK SELECT] button so that its indicator lights and press any of the NUMBER [1] - [16] buttons to select a track to be edited.
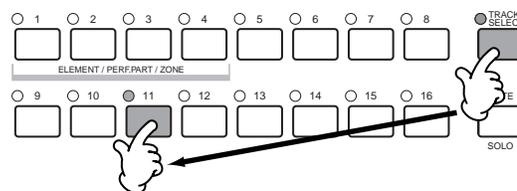
> **NOTE** The keyboard transmit channel in the Sequence Play mode corresponds to the track number you select here.

Song editing in the Sequence Play mode

● **[F2] Sequence Play Output Channel**

From this display you can confirm the MIDI channel, and determine which MIDI port the channel data is sent to.

```
SEQPLAY   001[SONG001 ]    ♩120  Meas001
CHAIN

OUT CH │ 1│ 2│ 3│ 4│ 5│ 6│ 7│ 8│ 9│10│11│12│13│14│15│16│
PORT   │off│off│off│off│off│off│off│off│off│off│off│off│off│off│off│
   CHAIN  OUTPUT  TEMPO ▶ MEAS ▼ GET 🖿 ▶  MIX
```

OUT CH (Output Channel)
Indicates channel transmission to the MIDI OUT terminal (Display only).

♪**NOTE** In the Sequence play mode, the MIDI data created by playing the keyboard/wheels is sent to the tone generator block or the external MIDI devices via the MIDI output channel of the currently selected track.

Port
Determines the MIDI transmission port for the corresponding channel. This is useful for sending data to external tone generators over multiple MIDI ports in an extended MIDI setup. Keep in mind that this parameter is available 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). The internal tone generator parts of the S90 are automatically fixed at port 1.

❏ Settings   off, 1 ~ 3

♪**NOTE** Port data can be output only through the USB terminal.

Mixing mode

In this mode, you can set up mixing data, and set various parameters for the tone generator parts — including the desired voice, as well as its level, pan, EQ, effect and other settings.
How the Mixing mode affects the tone generator parts, and how it is affected by other elements is made clear by the following diagram.
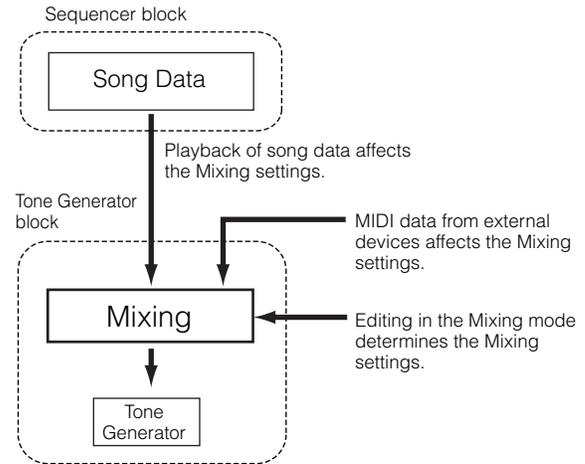
Mixing parameters are not actually part of the song data, but rather are settings for the tone generator, as it is played back by the song data. As such, the Mixing parameter settings are not recorded to the song tracks.

♪**NOTE** Even if the selected song has no sequence data, this Mixing data can be stored (put) to Mix template as system data (page 79). Playing back such song data transmits the mixing setup to the external MIDI instrument.

Mixing mode (Simple Mixer functions)

♪**NOTE** The parameters that have the same name in the Mixing mode and in the Mixing Edit mode have the same functions and settings.

Basic Procedure

❶ In the CHAIN display, press the [F6] (MIX) button to enter the Mixing mode.

❷ Select the desired Mix Template for editing (page 79), then exit from the TEMPLATE display.

❸ Select a display for the parts you wish to mix by using the [F6] button.

Internal Tone Generator Parts 1~16

[F6]

Multi Part Plug-in Parts 17~32
(When the Multi Part Plug-in board has been installed)

[F6]

Single Part Plug-in Parts 1~3
When the Single Part Plug-in board has been installed)

[F6]
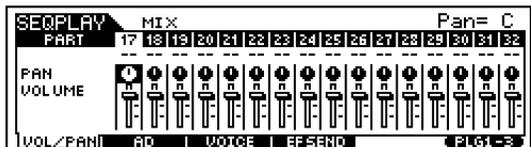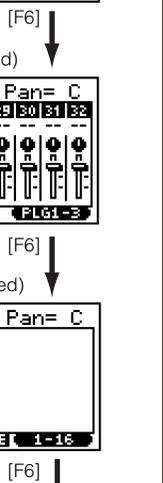
♪ NOTE Please note that the Multi-Part Plug-in Part (17 ~ 32) settings apply not to one individual song but to all templates.

❹ Select the menu you wish to edit by pressing the [F1] - [F5] buttons, then edit parameters in each display.

♪ NOTE If you wish to edit more detailed Mixing parameters, you can enter the Mixing Edit mode by pressing the [EDIT] button. For details, refer to page 98 in the "Reference" section.

❺ Save (put) the settings edited in step ❹ to the Flash Memory as required.

❻ Press the [EXIT] button to exit from the Mixing mode and return to the CHAIN display.

● **[F1] VOL/PAN**

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

♪ NOTE You can select a part by moving the cursor or by using the NUMBER buttons while the [TRACK SELECT] indicator is on (page 76).

♪ NOTE You can also adjust the Volume/Pan by using the Control Sliders. See page 53 for details.

PAN
Determines the stereo pan position for each part.

VOLUME
Determines the volume for each part.

● **[F2] AD**

From this display you can set various mixing parameters for the A/D part, input via the A/D INPUT jack or the mLAN terminal (when the optional mLAN8E has been installed).

Same as in the Performance Play mode. See page 44.

● **[F3] VOICE**

From this display you can select a voice for each part.

♪ NOTE You can select a part by moving the cursor or by using the NUMBER buttons while the [TRACK SELECT] indicator is on (page 76).

♪ NOTE The Category Search function can also be used to select voices here (with the exception of the Multi-part Plug-in parts 17 - 32).

● **[F4] SEND (Effect Send)**

From this display you can make basic effect settings for each track — the Reverb, Chorus and Variation Send levels, as well as the Dry Level.

```
SEQPLAY   MIX              RevSend= 12
 PART    1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
        AP AP AP AP AP AP AP AP AP AP AP AP AP AP AP AP
REV SEND
CHO SEND
VAR SEND
DRY LVL
VOL/PAN   AD    VOICE  EFSEND TEMPLATE 17-32
```

● **[F5] TEMPLATE**

This convenient function lets you store your mixing settings as a template — allowing you to easily set up similar mixes by calling up the proper template, then tweaking it as needed. You can also assign the template to Chain steps in Sequence Play mode to call up the settings according to the playback. Templates are part of the System data (page 27) in the Utility mode and cannot be saved as part of the Song data.

```
SEQPLAY   MIX
  Template
     1[Flip Hop ] ◆◆ Current
                        ◆ GET   ◆ PUT
VOL/PAN   AD    VOICE  EFSEND TEMPLATE
```

Template Number

Template Name

Pressing the [SF4] button lets you call up the template selected at left.

Press the [SF5] button lets your save the current setting to the template selected at left.

NOTE Since the Mixing templates are stored as System data (page 27) in the Flash ROM, the data is maintained even when the power is turned off.

Template number
Determines the template number. Up to 50 templates can be created.

Template name
Determines the name of the template. For details about naming, see page 34 in the "Basic Operations" section.

Mixing Edit mode (Detailed Mixer functions)

Common edit and Part edit

Use Common Edit to edit the settings common to all parts. There are two types of Mixing displays: those for Common Edit, and those for editing individual parts.
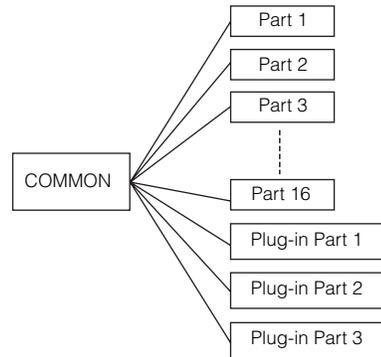
Indicates a Common Edit display.

```
SEQPLAY   COMMON
              LOW  LOWMID HIGHMID  HIGH
MEQ OFFSET   + 0    + 0    + 0    + 0

  [MEQ OFS]                        OTHER
GENERAL   MEQ    ARP   CTLASN      EFFECT
```
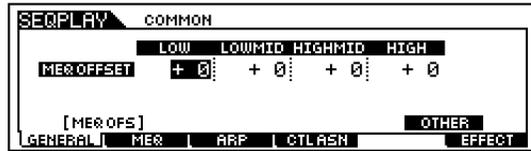
Indicates a display for editing Part(s).

```
SEQPLAY   PART01  PRE1:001[AP:3LayerS700]
           PART01 PART02 PART03 PART04
Bank        PRE1   PRE1   PRE1   PRE1

          (A01)  (A01)  (A01)  (A01)
Number      001    001    001    001
  [ VOICE ]  MODE  LIMIT  PORTA  OTHER
VOICE  OUTPUT  OUTSEL  TONE  RCVSW   17-32
```
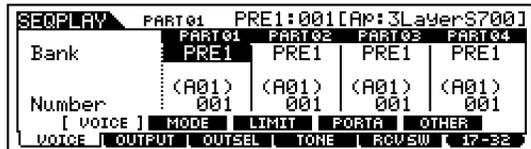
NOTE Common Edit operations cannot be performed on the Multi-part Plug-in parts 17 - 32.

Basic Procedure

❶ In the CHAIN display, press the [F6] button to enter the Mixing mode.

❷ Select the desired Mix Template for editing.

❸ Press the [EDIT] button to enter the Mixing Edit mode. (The indicator lights.)

❹ Select a part to be edited.
To edit parameters common to all parts, press the [DRUM KITS] button (which serves as a "COMMON" button here).

DRUM KITS
FAVORITES
COMMON

To edit parameters of the individual parts, select the desired part with the corresponding NUMBER button ([1] - [16]). You can select parts for the Plug-in board by using the [F6] button (as shown below).
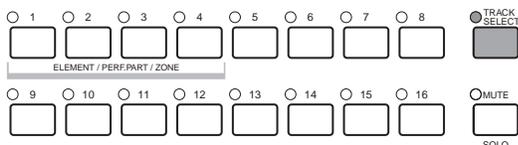
1 2 3 4 5 6 7 8 TRACK SELECT
ELEMENT / PERF.PART / ZONE
9 10 11 12 13 14 15 16 MUTE
SOLO

Internal Tone Generator Parts 1~16

[F6]

Multi Part Plug-in Parts 17~32
(When the Multi Part Plug-in board has been installed)

[F6]

Single Part Plug-in Parts 1~3
(When the Single Part Plug-in board has been installed)

[F6]
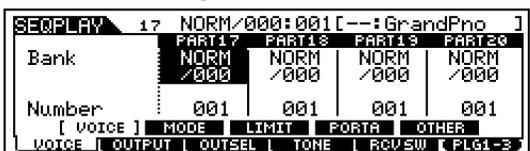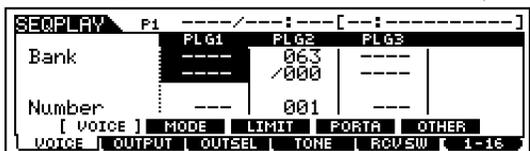
🎵 NOTE Please note that the Multi-Part Plug-in Part (17 ~ 32) settings apply not to one individual template but to all Mixings.

❺ Select the menu you wish to edit by pressing the [F1] - [F5] buttons and edit parameters in each display.

❻ Save (put) the settings edited in step ❺ to the Mix Template as required.

❼ Press the [EXIT] button to exit from the Mixing mode and return to the CHAIN display.

For details about each parameter, see the "Reference" section (page 98). In the following section, we'll show you how to get started with Mixing Edit.

Using the S90 as a Multi-timbral Tone Generator (Mixing Edit)

Mixing mode lets you configure the S90 as a Multi-timbral tone generator for use with computer-based music software or internal/external sequencers. If each track in a song file uses a different MIDI channel, then the Parts in a Mixing setup can be each assigned to those MIDI channels correspondingly. Therefore, you can play back a song file on an external sequencer and have different Voices playing on different tracks simultaneously.
In the following example, we will create a Mixing setup suited to playing back a song file consisting of three Parts: piano, bass and drums. The piano track is assigned to MIDI channel 1, the bass track to channel 2, and the drums to channel 10.

🎵 NOTE The particular part(s) can be switched on/off temporarily (Mute) (page 76).

🎵 NOTE For details about MIDI channels, see page 118.
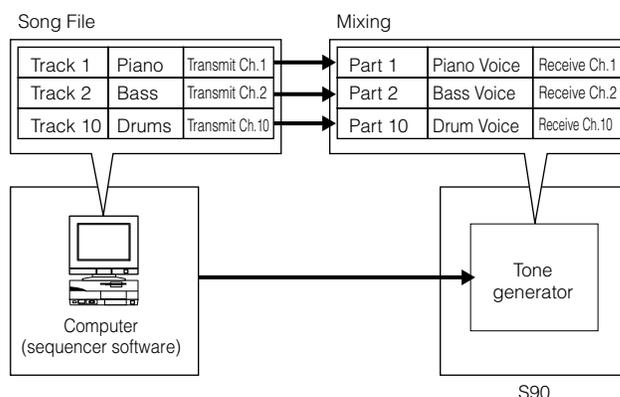
🎵 NOTE You can use the included sequencer software (Windows only; see the attached Installation Guide) to play multiple Parts on the S90. Before doing that, however, make sure that all connections between the computer and the S90 have been properly made (page 17).

❶ After pressing the [SEQ PLAY] button, press [F6] (MIX) to enter the Mixing mode, then enter the edit mode (page 29).

♪NOTE Before entering the Mixing Edit mode, you need to select a Mixing Template for editing (page 79).

♪NOTE You can initialize the Mixing settings, if necessary (page 70).

❷ If the Common Edit display is shown, press the appropriate NUMBER button [1] - [16] to switch to the Part Edit display.

Here, we'll select Part 1 for the piano, Part 2 for bass and Part 10 for drums. First, let's select Part 1.

❸ Press [F1] → [SF1] to switch to the VOICE screen, then specify the Voice to be used as the piano Part.

```
SEQPLAY   PART01   PRE1:003[AP:PowerGrand]
                PART01  PART02  PART03  PART04
Bank            PRE1    PRE1    PRE1    PRE1
               (A03)   (A01)   (A01)   (A01)
Number          003     001     001     001
      [ VOICE ]  MODE    LIMIT   PORTA   OTHER
 VOICE | OUTPUT | OUTSEL | TONE  | RCVSW | 17-32
```
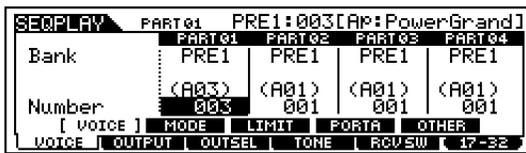
❹ Similarly, assign Part 2 to the Bass Voice and Part 10 to the Drum Voice.

❺ Press [F2] → [SF1] to switch to the VOLUME screen, then set the volume for each Part as well as its Pan position, Chorus and Reverb Send levels, if necessary. For details, see Ref. #43 - 48.

```
SEQPLAY   PART01   PRE1:003[AP:PowerGrand]
                PART01  PART02  PART03  PART04
Volume          100     100     100     100
Pan             C       C       C       C
VoiceELPan      on      on      on      on
      [VOL/PAN] EFSEND
 VOICE | OUTPUT | OUTSEL | TONE  | RCVSW | 17-32
```
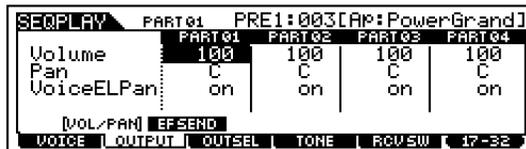
❻ Press [F1] → [SF2] and switch to the MODE screen. Set the relevant parameters to the appropriate values: 1, 2, and 10.

```
SEQPLAY   PART01   PRE1:003[AP:PowerGrand]
                PART01  PART02  PART03  PART04
Mono/Poly       Poly    Poly    Poly    Poly
ArpSwitch       off     off     off     off
ReceiveCh       1       2       3       4
      VOICE [ MODE ] LIMIT   PORTA   OTHER
 VOICE | OUTPUT | OUTSEL | TONE  | RCVSW | 17-32
```
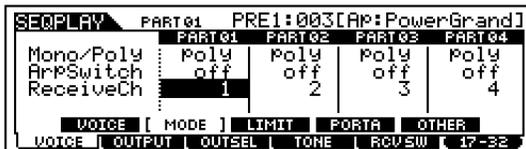
❼ Use the [▲] and [▼] buttons and switch to the Mono/Poly setting. Set the parameter to "Poly" (polyphonic).

```
SEQPLAY   PART01   PRE1:003[AP:PowerGrand]
                PART01  PART02  PART03  PART04
Mono/Poly       Poly    Poly    Poly    Poly
ArpSwitch       off     off     off     off
ReceiveCh       1       2       3       4
      VOICE [ MODE ] LIMIT   PORTA   OTHER
 VOICE | OUTPUT | OUTSEL | TONE  | RCVSW | 17-32
```
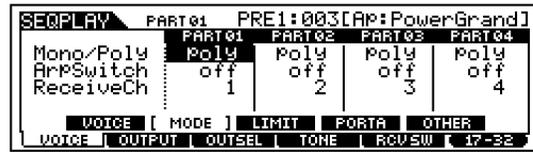
♪NOTE For Parts that have single-note passages only and do not require polyphony, the Mode parameter can be set to "mono" (monophonic).

❽ Press the [F1] → [SF3] to call up the NoteLimit (Note Limit) and VelLimit (Velocity Limit) settings, and check whether or not the Part of each Voice is set appropriately — in other words, make sure that the Note or Velocity settings do not prevent the Voice from being played normally. Except in special cases, you should generally avoid setting limits on the note and velocity ranges, in order to ensure that notes are sounded properly and are not cut off.

```
SEQPLAY   PART01   PRE1:003[AP:PowerGrand]
                PART01  PART02  PART03  PART04
NoteLimitH      G 8     G 8     G 8     G 8
NoteLimitL      C -2    C -2    C -2    C -2
VelLimitH       127     127     127     127
VelLimitL       1       1       1       1
      VOICE   MODE [ LIMIT ] PORTA   OTHER  KBD
 VOICE | OUTPUT | OUTSEL | TONE  | RCVSW | 17-32
```
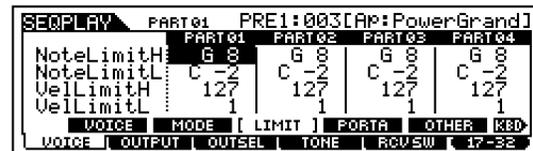
♪NOTE There are many other Part-specific parameters in the Mixing Edit mode. For details, see the "Reference" section.

❾ Before exiting the Edit Mode, you need to save the settings for the Mix Template. For details about saving Mix Templates, see page 79.

Now, when you select this Mix Template in the Sequence Play mode, you can play back the song file on computer (sequencer), and the piano, bass and drum Parts will be played back according to each track's MIDI channel.

Using Memory Cards

In the Card mode, you can use a Memory Card (commercially available SmartMedia™ cards) for saving and loading data from/to the instrument, as well as perform other data-exchange operations. With the included File Utility software, you can use a computer to manage data on Memory Card. You can also use it to exchange data between the computer and Memory Card.

⚠ Never attempt to remove/insert the Memory Card in the card mode.

⊅ NOTE To select the Song file you wish to play, use the Sequence Play mode. In the Card mode, designate the folder that includes the Song files for playback (page 83).

Handling the Memory Card (SmartMedia™*)

Be sure to handle Memory Cards with care. Follow the important precautions below.

* SmartMedia is a trademark of Toshiba Corporation.

■ Compatible Memory Card Type
3.3V(3V) Memory Cards can be used. 5V type Memory Cards are not compatible with this instrument.

■ Memory Capacity
There are seven types of Memory Cards: 2MB/4MB/8MB/16MB/32MB/64MB/128MB.

■ Inserting/Removing Memory Cards

To insert a Memory Card:
Hold the Memory Card so that the connector section (gold) of the Memory Card is facing downward and forward, towards the Memory Card slot. Carefully insert the Memory Card into the slot, slowly pushing it all the way in until it is fitted in place.

• Don't insert the Memory Card in wrong direction.

• Don't insert anything other than a Memory Card in the slot.

To remove a Memory Card:
Before removing the Memory Card, be sure to confirm that the Memory Card is not in use, or it is not being accessed by the instrument. Then pull the Memory Card out slowly by hand. If the Memory Card is being accessed*, a message indicating that it is in use appears on the instrument's display.

* This includes saving, loading, formatting and deleting. Also, be aware that the instrument will automatically access the Memory Card to check the media type when it is inserted while the instrument is turned on.

⚠ Never attempt to remove the Memory Card or turn the power off during accessing. Doing so can damage the data on the instrument/Memory Card and possibly the Memory Card itself.

■ Formatting Memory Cards
Before using a Memory Card with your instrument it must first be formatted. Once it is formatted all data on it will be erased. Be sure to check if the data is unnecessary or not, beforehand.

⊅ NOTE The Memory Cards formatted with this instrument may become unusable with other instruments.

■ About Memory Cards

Handle Memory Cards with care!
There are times when static electricity affects Memory Cards. Before you handle Memory Cards, to reduce the possibility of static electricity, touch a metal object, such as a door knob and aluminum sash.
Be sure to remove the Memory Card from the Memory Card slot when it is not in use for a long time.
Do not expose the Memory Card to direct sunlight, extremely high or low temperatures, or excessive humidity, dust or liquids.
Do not place heavy objects on a Memory Card or bend or apply pressure to the Memory Card in any way.
Do not touch the metal part (gold) of the Memory Card or put any metallic plate onto the metal part.
Do not expose the Memory Card to magnetic fields, such as those produced by televisions, speakers, motors, etc., since magnetic fields can partially or completely erase data on the Memory Card, rendering it unreadable.
Do not attach anything other than the provided labels to a Memory Card. Also make sure that labels are attached in the proper location.

To protect your data (Write-protect):
To prevent inadvertent erasure of important data, stick the write-protect seal (provided in the Memory Card package) onto the designated area (within a circle) of the Memory Card. To save data on the Memory Card, make sure to remove the write-protect seal from the Card. Do not reuse the seal that is peeled off.

■ Data Backup
For maximum data security Yamaha recommends that you keep two copies of important data on separate Memory Cards. This gives you a backup if one Memory Card is lost or damaged.

■ Burglarproof Lock
This instrument is equipped with a burglarproof lock for the Memory Card. If necessary, mount the burglarproof lock onto the instrument.

To mount the burglarproof lock:

❶ Remove the metallic part using a Phillips screwdriver.

❷ Turn the metallic part upside down and then mount it again.

Basic Procedure

❶ Press the [CARD] button to enter the Card mode. (The indicator lights.)

❷ Select the desired menu by using the [F1] - [F6] buttons and execute each operation (Save, Load, and so on).

❸ Press any other mode button to exit from the Card mode.

File/Folder selection

The illustrations and instructions below show you how to select files and folders on the Memory Card within the Card mode.

Move the cursor to the desired file or folder by using the [INC/YES] and [DEC/NO] buttons or the data dial.

To return to the next highest level, press the [EXIT] button.

To go to the next lowest level, highlight the desired folder

Move the cursor to the desired file or folder by using the [INC/YES] and [DEC/NO] buttons or the data dial.

NOTE Make sure that the desired song file (the one to be assigned to the Chain Step in the Sequence Play mode) is contained in the appropriate folder (Current) selected in the Card mode. Since the song file name is not indicated in the S90 display, make sure to assign a properly descriptive or appropriate name to the folder containing the file. You can check through the folders and files using the File Utility software. (Refer to the separate Installation Guide.)

New Folder Creation

From the Save display (called up via the [F2] button) and the Rename display (called up via the [F4] button), you can create new folders. This function lets you conveniently and easily organize the numerous important data files you create on the S90.
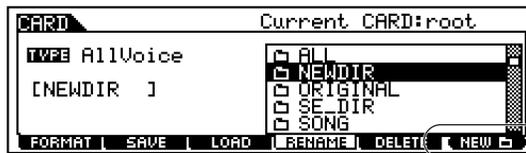
You can create a new folder by pressing the [F6] button and naming it.

File types that can be handled by the S90

File types that can be saved from the S90 to a Memory Card

Display	Extension	Explanation
All	.W4A	All data in the S90's internal User Memory are treated as a single file, and can be saved to a Memory Card.
All Voice	.W4V	All the User Voice data in the S90's internal User Memory are treated as a single file, and can be saved to a Memory Card.
Plugin All Bulk1,2,3	.W2B	All the data in a Plug-in board are treated as a single file, and can be saved to a Memory Card.
Chain (Sequence chain)	.W4C	Chain data are treated as a single file, and can be saved as such. This data is used for playing back multiple songs in succession.
Voice Editor (Voice data for Voice Editor)	.W4E	All the User Voice data can be treated as a single file and saved to a Memory Card. The saved file can be loaded to the Voice Editor software (included in the CD-ROM) on your computer.

File types that can be loaded from a Memory Card to the S90

Display	Extension	Explanation
All	.W4A	A file that is saved to a Memory Card as "All" type can be loaded and restored to the S90.
All Voice	.W4V	A file that is saved to a Memory Card as "All Voice" type can be loaded and restored to the S90.
Voice	.W4A/.W4V	A specified voice in a file that is saved to a Memory Card as "All" or "All Voice" type can be individually selected and loaded to the S90.
Performance	.W4A	A specified performance in a file that is saved to a Memory Card as "ALL" type can be individually selected and loaded to the S90.
Plugin All Bulk1,2,3	.W2B	A file that is saved to a Memory Card as "Plugin All Bulk 1, 2, 3" type can be loaded and restored to the Plug-in board installed to the S90.
Usr ARP	.W2G	A file that is saved to a Memory Card from the MOTIF as "Usr ARP" type can be loaded and restored to the S90.
Chain (Sequence chain)	.W4C	A file that is saved to a Memory Card as "Chain" type can be loaded to the S90.
Voice Editor	.W4E	The Voice data edited via the included Voice Editor software on your computer can be loaded to the S90.

■ File types that can be loaded from the Memory Card to the S90 when turning the power on (Auto Load file)

Among the file types described on page 83, "All", "Plugin All Bulk 1", "Plugin All Bulk 2" and "Plugin All Bulk 3" can be loaded from the Memory Card to the S90's User Memory automatically when turning the power on.

⚠ Data will be loaded automatically and any existing data in memory will be overwritten, therefore, you should save important data to Memory Card beforehand.

❶ Name 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.

File type	File name
All	AUTOLOAD.W4A
Plugin All Bulk 1 (for slot 1)	AUTOLD1.W2B
Plugin All Bulk 2 (for slot 2)	AUTOLD2.W2B
Plugin All Bulk 3 (for slot 3)	AUTOLD3.W2B

🎵NOTE After you've finished naming the appropriate files, keep the corresponding folder selected in the display and go to step ❷.

❷ Press the [UTILITY] button to enter the Utility mode.

❸ Press the [F1] button, then press the [SF4] button to show the Auto Load file display.

❹ Set "Auto Load" to on, and press the [SF5] button.

Set this to on.
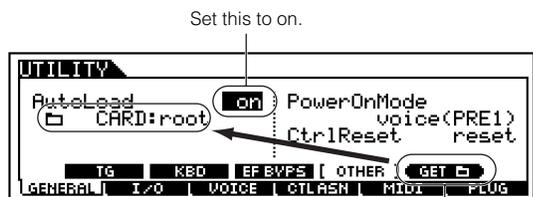
Press the [SF5] button to register the folder selected in step #1 (the folder containing the desired files for auto loading).

❺ To apply the newly made parameter settings, exit from the Utility mode.

⚠ Never attempt to turn off the power while data is being written to Flash ROM (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 may cause the system to freeze (due to corruption of data in the Flash ROM).

❻ Turn the power off.

❼ Before turning the power on next time, make sure that the appropriate data is available to the S90. In other words, make sure Memory Card specified in step ❶ is properly inserted.

❽ Turn the power on. The S90 searches the specified folder for the auto-load files (the files you named and saved in step ❶), and automatically loads them to User memory.

🎵NOTE Any files in the folder registered in step ❹ that do not have appropriate auto-load names are ignored.

■ File names

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.
For specific instructions on naming files, see page 34.

[F1] Formatting Memory Cards (FORMAT)

The explanations here apply to step ❷ of the Basic Procedure on page 83.

Before you can use a new Memory Card with the S90, you will need to format it. Use this operation to format the memory card and assign a Volume Label to it.

⚠ While formatting is in progress, do not eject the Memory Card or turn off the power to the S90.

⚠ If data is already saved on the memory card, be careful not to format it. If you format the memory card, all the previously recorded data will be deleted.

❶ Name the Volume Label. For instructions on naming, see page 34 in the "Basic Operations" section.

❷ Press the [ENTER] button. (The display prompts you for confirmation.)

🎵NOTE To cancel the Format operation, press the [DEC/NO] button.

❸ Press the [INC/YES] button to execute the Format operation. After formatting has been completed, a "Completed" message appears and operation returns to the original display.

[F2] Saving the S90 data to Memory Card (SAVE)

This operation lets you save files to a Memory Card. The explanations here apply to step ❷ of the Basic Procedure on page 83.

❶ Select the file type to be saved in the Save display (page 83).

```
CARD              Current CARD:root
TYPE All          ▭ ALL
                  ▭ NEWDIR
[ALL        ]  ➡ ▭ NEWDIR01
                  ▭ ORIGINAL
                  ▭ SE_DIR
FORMAT | SAVE | LOAD | RENAME | DELETE | NEW ▭
```

If you wish to create a new file, move the cursor to this position and enter the desired name. For instructions on naming, see page 34 in the "Basic Operations" section.

If you wish to create a new folder, press the [SF6] button to name a new folder. For instructions on naming, see page 34 in the "Basic Operations" section.

❷ If you wish to overwrite the existing file, move the cursor to the desired file to which the data is saved by using the Cursor buttons or the data dial.

⚠ While the data is being saved, do not eject the Memory Card or turn off the power of the S90.

❸ Press the [ENTER] button to execute the Save operation.

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, or press the [DEC/NO] button to cancel it.

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

[F3] Loading the S90 Data from Memory Card (Load)

This operation lets you load files from a memory card to the S90.
The explanations here apply to step ❷ of the Basic Procedure on page 83.

❶ Select a file type (page 83) and a file to be loaded.

When the file type is set to All, All Voice, Plugin All Bank 1 ~ 3, Usr ARP, Chain or Voice Editor, go to step ❸. For any other file types, go to step ❷.

🎵NOTE When "All" is selected as a file type to be loaded, "▢ without System" appears in the display. If this box is checked and the Load is executed, all data with the exception of the system settings in the Utility mode are loaded.

```
CARD              Current CARD:root
TYPE All          ▭ SE_DIR
                  ▭ SONG
▢ without System  ▭ THEVOL1
                  ▭ VOICE
                  ▭ AUTOLOAD.W4A
FORMAT | SAVE | LOAD | RENAME | DELETE
```
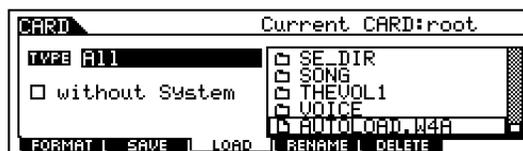
❷ Specify the data to be loaded and the destination location in the User memory of the S90.
When the file (data) type is set to Voice, for example, follow the instructions as shown below.

This is an "virtual" folder, shown in the display to contain the file(s) you'll be loading.

```
CARD              Current CARD:root
TYPE Voice        ▭ THEVOL1
                  ▭ VOICE
                  ▭ ALL      W4V
                  ▭ AUTOLOAD.W4A
                  ▭ AUTOLOAD.W4V
FORMAT | SAVE | LOAD | RENAME | DELETE
```

[ENTER] button

```
CARD              USER:001[AP:BriteS700 ]
TYPE Voice        ▭ 001:BriteS700
                  ▭ 002:Old Blues
USER:001(A01) ◀   ▭ 003:S700&DIdEP
                  ▭ 004:S700&DX
                  ▭ 005:Bell Piano
FORMAT | SAVE | LOAD | RENAME | DELETE
```
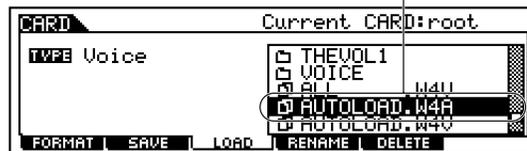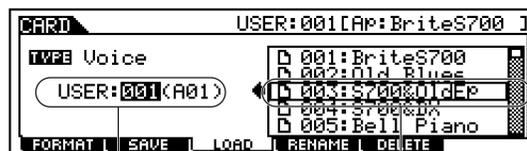
Specify the destination location in the User memory of the S90.

Select a voice number to be loaded.

When the file (data) type is set to Performance, an "virtual" file appears — just as with Voice above. Select the imaginary file and press the [ENTER] button to call up the list of Performance. Then select the desired Performance and specify the destination User memory location.

❸ Press the [ENTER] button to execute the Load operation. After the data has been loaded, a "Completed" message appears and operation returns to the original display.

⚠ Never eject the Memory Card or turn off the power of the S90 while data is being loaded.

⚠ Loading data to the S90 automatically erases and replaces any existing data in the User memory. Make sure to save any important data to a memory card BEFORE performing any Load operations.

🎵NOTE The S90 features a convenient Auto-load function that automatically loads user-specified files when you turn the power on. For details, see page 84.

[F4] Renaming the Files (RENAME)

From this display you can rename files in the selected memory card, using up to eight alphabetic and numeric characters.

Select the desired file type.

Rename the selected file here. See "Basic Operation" on page 34.

Select the file to be renamed.

If you wish to create a new folder in which the data is, press the [F6] button to name a new folder. For instructions on naming, see "Basic Operation" on page 34.

🎵NOTE Files are named according to the MS-DOS naming convention (page 84).

[F5] Deleting the Files (DELETE)

From this display you can delete files from the selected memory card. Select the desired file as shown below, then press the [ENTER] button.

Select the desired file type.
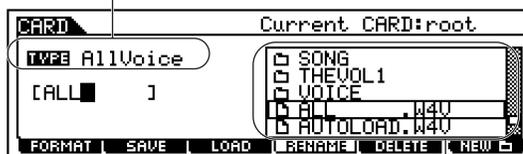
Select the file to be deleted.

Touch Sensitivity

Different types of keyboard sensitivity can be selected to match different playing styles and preferences.

❶ Press the [UTILITY] button to enter the Utility mode.

❷ Press the [F1] → [SF2] buttons to select the KBD screen.

❸ Use the [▲ ▼ ◄ ►] buttons to select the Vel Curve, then press the [INC/YES] and [DEC/NO] buttons to select the desired setting (see below).

❹ Press the [EXIT] button to exit from the Utility mode.

⚠ Never attempt to turn off the power while data is being written to Flash ROM (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 may cause the system to freeze (due to corruption of data in the Flash ROM).

norm (Normal)
The velocity is in proportion to playing strength (how hard you play the keyboard).

soft
This curve provides increased response, especially for lower velocities. In other words, playing softly results in higher response than the "norm" curve. Use this curve if you want greater control in the low velocity range.

hard
This curve effectively lessens the overall response compared to the "norm" curve. Use this curve if you tend to play strongly and want the sound change to be less sensitive.

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), no matter what your playing strength. For example, you can use this to emulate the key response of conventional organs, or ensure that the sound change is absolutely uniform, no matter how hard or softly you play.

📝 NOTE You can also set sensitivity types for the Breath Controller (UTILITY [F1] → [SF1] BCCurve).

Function Tree

The Reference Numbers let you easily and quickly cross-reference the corresponding parameters in the Parameter Table (page 92) and Reference section (page 98). For more on the Information display, see page 33; for more on the Category Search function, see page 38. For Job operations, see page 70; for Store operations, see page 73; for Card operations, see page 82.

Column 1

Function Sub-Function		Parameter Name (Display)	Ref. #	Page
■ Voice Play Mode				
[VOICE]→Voice Selection (page 36) **Settings...MIDI Data Table 8-1 and 8-2 in the separate Data List**				
[F1] (PLAY)			–	36
[F2] (BANK)				
		Bank	36	99
[F4] (PORTA)				
		Mono/Poly	3	98
		PortaSw	7	98
		PortaTime	8	98
		PortaMode	10	98
[F5] (EG)				
		AEG/FEG	–	40
[F6] (ARP)				
		Bank	74	101
		Type	75	101
		Tempo	76	101
		VelocityLimit	82	101
		Switch	77	101
		Hold	78	101
■ Voice Edit Mode (Normal)				
Common...Settings that apply to all four Elements **[VOICE]→Normal Voice Selection (page 36)→[EDIT]→[COMMON]** **Settings...MIDI Data Table 8-1 in the separate Data List**				
[F1] (GENERAL)				
[SF1]	NAME	MainCtgry	1	98
		SubCtgry	1	98
		Name	2	98
[SF2]	PLY MODE	Mono/Poly	3	98
		KeyAsgnMode	4	98
		M.TuningNo.	5	98
[SF3]	MEQ OFS	MEQ OFFSET (LOW/ LOWMID/HIGHMID/ HIGH)	6	98
[SF4]	PORTA	Switch	7	98
		Time	8	98
		Mode	10	98
		TimeMode	11	98
[SF5]	OTHER	CSAssign	12	98
		ChoCtrl	13	98
		PB Upper	14	98
		PB Lower	14	98
		AssignA	15	98
		AssignB	15	98
		Assign1	15	98
		Assign2	15	98
[F2] (OUTPUT)				
		Volume	43	100
		Pan	44	100
		RevSend	46	100
		ChoSend	47	100
[F3] (ARP)				
[SF1]	TYPE	Bank	74	101
		Type	75	101
		Tempo	76	101
		Switch	77	101
		Hold	78	101
		KeyMode	79	101
		VelMode	80	101
[SF2]	LIMIT	NoteLimit	81	101
		VelocityLimit	82	101
[SF3]	PLAY FX	UnitMultiply	83	101
		VelocityRate	84	101
		GateTimeRate	85	101
[F4] (CTL SET)				
[SF1]	SET1/2	ElementSw	117	103
		Source	118	103
		Dest	119	103
		Depth	120	103

Column 2

Function Sub-Function		Parameter Name (Display)	Ref. #	Page
[SF2]	SET3/4	ElementSw	117	103
		Source	118	103
		Dest	119	103
		Depth	120	103
[SF3]	SET5/6	ElementSw	117	103
		Source	118	103
		Dest	119	103
		Depth	120	103
[F5] (LFO)				
[SF1]	WAVE	Wave	159	105
		Speed	160	105
		TempoSync	161	105
		TempoSpeed	162	105
		KeyOnReset	163	105
		Phase	164	105
[SF2]	DELAY	Delay	165	105
		FadeIn	166	105
		Hold	167	105
		FadeOut	168	105
[SF3]	DEST1	ElementSw	169	105
		Dest	170	105
		Depth	171	105
[SF4]	DEST2	ElementSw	169	105
		Dest	170	105
		Depth	171	105
[SF5]	DEST3	ElementSw	169	105
		Dest	170	105
		Depth	171	105
[F6] (EFFECT)				
[SF1]	CONNECT	EL: (INS EF) OUT 1-4	190	106
		InsEF Connect	191	106
		Ins1 Ctgry	192	106
		Ins1 Type	192	106
		Ins2 Ctgry	193	106
		Ins2 Type	193	106
		Reverb Type	194	106
		Chorus Type	194	106
		Reverb Send	195	106
		Chorus Send	195	106
		Reverb Return	196	106
		Chorus Return	196	106
		Reverb Pan	197	106
		Chorus Pan	197	106
		Chorus to Reverb	198	106
[SF2]	INS1	(Effect Parameters)	205	107
[SF3]	INS2	(Effect Parameters)	205	107
[SF4]	REVERB	(Effect Parameters)	205	107
[SF5]	CHORUS	(Effect Parameters)	205	107
Element...Settings of individual four Elements **[VOICE]→Normal Voice Selection (page 36)→[EDIT]→[1]-[4]** **Settings...MIDI Data Table 8-2 in the separate Data List**				
[F1] (OSC)				
[SF1]	WAVE	ElementSw	28	99
		WaveNo.	29	99
		WaveCtgry	29	99
[SF2]	OUTPUT	KeyOnDelay	30	99
		InsEffectOut	31	99
[SF3]	LIMIT	NoteLimit	32	99
		VelocityLimit	33	99
		VelCrossFade	34	99
[F2] (PITCH)				
[SF1]	TUNE	Coarse	59	100
		Fine	60	100
		Random	61	100
[SF2]	VEL SENS	EGTime	62	100
		Segment	63	100
		EGLevel	64	100
		Curve	65	100
		Pitch	66	100
[SF3]	PEG	TIME/LEVEL	67/68	100
		Depth	69	100

Column 3

Function Sub-Function		Parameter Name (Display)	Ref. #	Page
[SF4]	KEY FLW	PitchSens	70	101
		CenterKey	71	101
		EGTimeSens	72	101
		CenterKey	73	101
[F3] (FILTER)				
[SF1]	TYPE	Type	90	101
		Gain	91	102
		Cutoff	92	102
		Resonance	93	102
		Width	94	102
		Distance	95	102
		HPFCutoff	96	102
		HPFKeyFlw	97	102
[SF2]	VEL SENS	EGTime	98	102
		Segment	99	102
		EGLevel	100	102
		Curve	65	100
		Cutoff	101	102
		Resonance	102	102
[SF3]	FEG	TIME/LEVEL	103/104	102
		Depth	105	102
[SF4]	KEY FLW	CutoffSens	106	102
		CenterKey	107	102
		EGTimeSens	108	102
		CenterKey	109	102
[SF5]	SCALE	BREAKPOINT	110	102
		OFFSET	111	102
[F4] (AMP)				
[SF1]	LVL/PAN	Level	135	103
		Pan	44	100
		AlternatePan	136	104
		RandomPan	137	104
		ScalingPan	138	104
[SF2]	VEL SENS	EGTime	139	104
		Segment	140	104
		EGLevel	141	104
		Curve	142	104
[SF3]	AEG	TIME/LEVEL	143/144	104
[SF4]	KEY FLW	LevelSens	145	104
		CenterKey	146	104
		EGTimeSens	147	104
		CenterKey	148	104
[SF5]	SCALE	BREAKPOINT	149	104
		OFFSET	150	104
[F5] (LFO)				
		Wave	159	105
		Speed	160	105
		KeyOnReset	163	105
		KeyOnDelay	165	105
		PMod	172	105
		FMod	173	105
		AMod	174	105
[F6] (EQ)				
		Type	210	107
		L.Freq/Gain (Type=EQ L/H)	211	107
		H.Freq/Gain (Type=EQ L/H)	212	107
		Freq (Type=P.EQ)	213	107
		Gain (Type=P.EQ)	214	107
		Q (Type=P.EQ)	215	107
■ Voice Edit Mode (DRUM)				
Common...Settings that apply to all drum keys **[VOICE]→Drum Voice Selection (page 36)→[EDIT]→[COMMON]** **Settings...MIDI Data Table 9-1 in the separate Data List**				
[F1] (GENERAL)				
[SF1]	NAME	MainCtgry	1	98
		SubCtgry	1	98
		Name	2	98
[SF3]	MEQ OFS	MEQ OFFSET (LOW/ LOWMID/HIGHMID/ HIGH)	6	98

Function Sub-Function		Parameter Name (Display)	Ref. #	Page
[SF5]	OTHER	CSAssign	12	98
		ChoCtrl	13	98
		PB Upper	14	98
		PB Lower	14	98
		AssignA	15	98
		AssignB	15	98
		Assign1	15	98
		Assign2	15	98
[F2] (OUTPUT)				
		Volume	43	100
		Pan	44	100
		RevSend	46	100
		ChoSend	47	100
		InsRevSend	49	100
		InsChoSend	50	100
[F3] (ARP)				
[SF1]	TYPE	Bank	74	101
		Type	75	101
		Tempo	76	101
		Switch	77	101
		Hold	78	101
		KeyMode	79	101
		VelMode	80	101
[SF2]	LIMIT	NoteLimit	81	101
		VelocityLimit	82	101
[SF3]	PLAY FX	UnitMultiply	83	101
		VelocityRate	84	101
		GateTimeRate	85	101
[F4] (CTL SET)				
[SF1]	SET1/2	Source	118	103
		Dest	119	103
		Depth	120	103
[SF2]	SET3/4	Source	118	103
		Dest	119	103
		Depth	120	103
[SF3]	SET5/6	Source	118	103
		Dest	119	103
		Depth	120	103
[F6] (EFFECT)				
[SF1]	CONNECT	KEY: (INS EF) OUT	190	106
		InsEF Connect	191	106
		Ins1 Ctgry	192	106
		Ins1 Type	192	106
		Ins2 Ctgry	193	106
		Ins2 Type	193	106
		Reverb Type	194	106
		Chorus Type	194	106
		Reverb Send	195	106
		Chorus Send	195	106
		Reverb Return	196	106
		Chorus Return	196	106
		Reverb Pan	197	106
		Chorus Pan	197	106
		Chorus to Reverb	198	106
[SF2]	INS1	(Effect Parameters)	205	107
[SF3]	INS2	(Effect Parameters)	205	107
[SF4]	REVERB	(Effect Parameters)	205	107
[SF5]	CHORUS	(Effect Parameters)	205	107

Key...Settings of individual drum keys
[VOICE]→Drum Voice Selection (page 36)→[EDIT]→[1]→[INC]/[DEC]
(Drum key can be selected by pressing the appropriate key)
Settings...MIDI Data Table 9-2 in the separate Data List

Function Sub-Function		Parameter Name (Display)	Ref. #	Page
[F1] (OSC)				
[SF1]	WAVE	Type	35	99
		ElementSw	28	99
		Bank	36	99
		Number	29	99
		Category	29	99
[SF2]	OUTPUT	InsEffectOut	31	99
		RevSend	46	100
		ChoSend	47	100
		OutputSel	117	103
[SF5]	OTHER	AssignMode	4	98
		RcvNoteOff	37	99
		AltnateGroup	38	99
[F2] (PITCH)				
[SF1]	TUNE	Coarse	60	100
		Fine	61	100
[SF2]	VEL SENS	Pitch	66	100
[F3] (FILTER)				
[SF1]	CUTOFF	LPFCutoff	112	102
		LPFReso	113	102
		HPFCutoff	96	102
[SF2]	VEL SENS	LPFCutoff	114	102

Function Sub-Function		Parameter Name (Display)	Ref. #	Page
[F4] (AMP)				
[SF1]	LVL/PAN	Level	135	103
		Pan	44	100
		AlternatePan	136	104
		RandomPan	137	104
[SF2]	VEL SENS	Level	151	104
[SF3]	AEG	AttackTime	143	104
		DecayTime	143	104
		DecayLevel1	144	104
		Decay2Time	143	104
[F6] (EQ)				
		Type	210	107
		L.Freq/Gain (Type=EQ L/H)	211	107
		H.Freq/Gain (Type=EQ L/H)	212	107
		Freq (Type=P.EQ)	213	107
		Gain (Type=P.EQ)	214	107
		Q (Type=P.EQ)	215	107

■ Voice Edit Mode (Plug-in)

Common
[VOICE]→Plug-in Voice Selection (page 36)→[EDIT]→[COMMON]
Settings...MIDI Data Table 10 in the separate Data List

Function Sub-Function		Parameter Name (Display)	Ref. #	Page
[F1] (GENERAL)				
[SF1]	NAME	MainCtgry	1	98
		SubCtgry	1	98
		Name	2	98
[SF2]	PLY MODE	Mono/Poly	3	98
		KeyAsgnMode	4	98
[SF3]	MEQ OFS	MEQ OFFSET (LOW/LOWMID/HIGHMID/HIGH)	6	98
[SF4]	PORTA	Switch	7	98
		Time	8	98
[SF5]	OTHER	CSAssign	12	98
		ChoCtrl	13	98
		PB Range	14	98
		AssignA	15	98
		AssignB	15	98
		Assign1	15	98
		Assign2	15	98
[F2] (OUTPUT)				
		Volume	43	100
		Pan	44	100
		RevSend	46	100
		ChoSend	47	100
[F3] (ARP)				
[SF1]	TYPE	Bank	74	101
		Type	75	101
		Tempo	76	101
		Switch	77	101
		Hold	78	101
		KeyMode	79	101
		VelMode	80	101
[SF2]	LIMIT	NoteLimit	81	101
		VelocityLimit	82	101
[SF3]	PLAY FX	UnitMultiply	83	101
		VelocityRate	84	101
		GateTimeRate	85	101
[F4] (CTL SET)				
[SF1]	SET1/2	Source	118	103
		Dest	119	103
		Depth	120	103
[SF2]	MW	Filter	121	103
		PMod	122	103
		FMod	123	103
		AMod	124	103
[SF3]	AT	Pitch	125	103
		Filter	121	103
		PMod	122	103
		FMod	123	103
		AMod	124	103
[SF4]	AC	Src	126	103
		Filter	121	103
		PMod	122	103
		FMod	123	103
		AMod	124	103
[F6] (EFFECT)				
[SF1]	CONNECT	InsEF Connect	191	106
		Ins1 Ctgry	192	106
		Ins1 Type	192	106
		Ins2 Ctgry	193	106
		Ins2 Type	193	106
		Reverb Type	194	106

Function Sub-Function		Parameter Name (Display)	Ref. #	Page
		Chorus Type	194	106
		Reverb Send	195	106
		Chorus Send	195	106
		Reverb Return	196	106
		Chorus Return	196	106
		Reverb Pan	197	106
		Chorus Pan	197	106
		Chorus to Reverb	198	106
[SF2]	INS1	(Effect Parameters)	205	107
[SF3]	INS2	(Effect Parameters)	205	107
[SF4]	REVERB	(Effect Parameters)	205	107
[SF5]	CHORUS	(Effect Parameters)	205	107

Element
[VOICE]→Plug-in Voice Selection (page 36)→[EDIT]→[1]
Settings...MIDI Data Table 10 in the separate Data List

Function Sub-Function		Parameter Name (Display)	Ref. #	Page
[F1] (OSC)				
[SF1]	WAVE	Bank	36	99
		Number	29	99
[SF5]	OTHER	VelocityDepth	39	99
		VelocityOffset	40	99
		NoteShift	41	99
[F2] (PITCH)				
	(PEG)	TIME/LEVEL	67/68	100
[F3] (FILTER)				
		HPFCutoff	96	102
[F4] (NATIVE)				
		(Native Parameters)	152	104
[F5] (LFO)				
		Speed	160	105
		Delay	165	105
		PMod	172	105
[F6] (EQ)				
		L.Freq/Gain	211	107
		H.Freq/Gain	212	107

■ Performance Play Mode

[PERFORM]→Performance Selection (page 41)
Settings...MIDI Data Table 6 and 7 in the separate Data List

Function Sub-Function		Parameter Name (Display)	Ref. #	Page
[F1] (PLAY)				
			–	41
[F2] (AD)				
		Volume	–	44
		Pan	–	44
		RevSend	–	44
		ChoSend	–	44
		VarSend	–	44
		DryLevel	–	44
		Mono/Stereo	–	44
		OutputSel	–	44
[F3] (VOICE)				
[SF1]	ADD INT	(Voice Bank)	–	43
[SF2]	ADD PLG	(Voice Bank)	–	43
[SF3]	DELETE	(Delete Voice)	–	43
[SF4]	LIMIT L	(Note Limit Low)	–	43
[SF5]	LIMIT H	(Note Limit High)	–	43
[F4] (PORTA)				
		PortaSw	7	98
		PortaTime	8	98
		PartSwitch	9	98
[F5] (EG)				
		AEG/FEG	–	44
[F6] (ARP)				
		Bank	74	101
		Type	75	101
		Tempo	76	101
		VelocityLimit	82	101
		Switch	77	101
		Hold	78	101
		PartSwitch	–	44

■ Performance Edit Mode

Common...Settings that apply to all four Parts
[PERFORM]→Performance Selection (page 41)→[EDIT]→[COMMON]
Settings...MIDI Data Table 6 in the separate Data List

Function Sub-Function		Parameter Name (Display)	Ref. #	Page
[F1] (GENERAL)				
[SF1]	NAME	MainCtgry	1	98
		SubCtgry	1	98
		Name	2	98
[SF3]	MEQ OFS	MEQ OFFSET (LOW/LOWMID/HIGHMID/HIGH)	6	98
[SF4]	PORTA	PortaSw	7	98
		PortaTime	8	98
		PartSwitch	9	98

Function Sub-Function		Parameter Name (Display)	Ref. #	Page
[SF5]	OTHER	CSAssign	12	98
		ChoCtrl	13	98
		AssignA	15	98
		AssignB	15	98
		Assign1	15	98
		Assign2	15	98
[F2] (OUT/MEQ)				
[SF1]	OUT	Volume	43	100
		Pan	44	100
		RevSend	46	100
		ChoSend	47	100
[SF2]	MEQ	SHAPE/FREQ/GAIN/Q (LOW/LOWMID/HIGH/HIGHMID/HIGH)	51	100
[F3] (ARP)				
[SF1]	TYPE	Bank	74	101
		Type	75	101
		Tempo	76	101
		Switch	77	101
		Hold	78	101
		KeyMode	79	101
		VelMode	80	101
[SF2]	LIMIT	NoteLimit	81	101
		VelocityLimit	82	101
[SF3]	PLAY FX	UnitMultiply	83	101
		VelocityRate	84	101
		GateTimeRate	85	101
[SF4]	OUT CH	OutputSwitch	86	101
		TransmitCh	87	101
[F4] (CTL ASN)				
		BC	88	101
		AS1	88	101
		AS2	88	101
		FC1	88	101
		FC2	88	101
[F6] (EFFECT)				
[SF1]	CONNECT	EFF PART→VCE INS	199	106
		EFF PART→PLG-EF	200	106
		PlugEF Type	200	106
		Variation Type	201	107
		Variation Return	202	107
		Variation Pan	203	107
		Variation to Reverb	204	107
		Variation to Chorus	204	107
		Chorus Type	194	106
		Chorus Return	196	106
		Chorus Pan	197	106
		Chorus to Reverb	198	106
		Reverb Type	194	106
		Reverb Return	196	106
		Reverb Pan	197	106
[SF2]	PLG-EF	(Plug-in Effect Parameters)	200	106
[SF3]	VAR	(Effect Parameters)	205	107
[SF4]	REVERB	(Effect Parameters)	205	107
[SF5]	CHORUS	(Effect Parameters)	205	107

Part...Settings of individual four Parts
[PERFORM]→Performance Selection (page 41)→[EDIT]→[1]-[4]
Settings...MIDI Data Table 7 in the separate Data List

Function Sub-Function		Parameter Name (Display)	Ref. #	Page
[F1] (VOICE)				
[SF1]	VOICE	PartSw	28	99
		Bank	36	99
		Number	29	99
[SF2]	MODE	Mono/Poly	3	98
		ArpSwitch	77	101
[SF3]	LIMIT	NoteLimitH	32	99
		NoteLimitL	32	99
		VelLimitH	33	99
		VelLimitH	33	99
[SF4]	PORTA	Switch	7	98
		Time	8	98
		Mode	10	98
[SF5]	OTHER	PB Upper	14	98
		PB Lower	14	98
		VelSensDpt	39	99
		VelSensOfs	40	99
[F2] (OUTPUT)				
[SF1]	VOL/PAN	Volume	43	100
		Pan	44	100
		VoiceELPan	45	100
[SF2]	EF SEND	RevSend	46	100
		ChoSend	47	100
		VarSend	48	100
		DryLevel	52	100

Function Sub-Function		Parameter Name (Display)	Ref. #	Page
[F3] (OUTSEL)				
		OutputSel	115	103
		InsEF	116	103
[F4] (TONE)				
[SF1]	TUNE	NoteShift	41	99
		Detune	153	104
[SF2]	FILTER	Cutoff	92	102
		Resonance	93	102
		FEGDepth	154	104
[SF3]	FEG	Attack	155	105
		Decay	155	105
		Sustain	156	105
		Release	155	105
[SF4]	AEG	Attack	157	105
		Decay	157	105
		Sustain	158	105
		Release	157	105
[F5] (RCV SW)				
		CtrlChange	175	105
		PB	175	105
		MW	175	105
		ChAT	175	105
		BC	175	105
		AS1	175	105
		AS2	175	105
		FC1	175	105
		FC2	175	105
		Exp	175	105
		Sus	175	105
		FS	175	105
[SF5]		(1PART/4PART)	175	105
[F6]		(PLG1-3/PART1-4)	175	105

■ **Sequence Play Mode**

CHAIN
[SEQ PLAY]→Chain Step settings (page 75)/DEMO (←→ [EXIT])→[PLAY/STOP]

Function Sub-Function		Parameter Name (Display)	Ref. #	Page
[F1] (CHAIN)				
		Sequence Chain	–	75
[SF5]		DEMO/PLAY/STOP	–	19, 75
[F2] (OUTPUT)				
[F3]		(TEMPO)	–	76
[F4]		(MEAS)	–	76
[F5]		(GET FOLDER)	–	75
[F6]		MIX (Press [F6] to enter the Mixing mode below.)	–	77

■ **Sequence Play Mixing Mode**

Mixing...Settings of the tone generation parameters of each part in Sequence Play mode
[SEQ PLAY]→Chain Step settings (page 75)→[F6] (MIX)

Function Sub-Function		Parameter Name (Display)	Ref. #	Page
[F1] (VOL/PAN)				
		Volume	43	100
		Pan	44	100
[F2] (AD)				
		Volume	–	78
		Pan	–	78
		RevSend	–	78
		ChoSend	–	78
		VarSend	–	78
		DryLevel	–	78
		Mono/Stereo	–	78
		OutputSel	–	78
[F3] (VOICE)				
		VOICE NUM	–	78
		BANK MSB/LSB	–	78
[F4] (EF SEND)				
		REV SEND	46	100
		CHO SEND	47	100
		VAR SEND	48	100
		DRY LEVEL	52	100
[F5] (TEMPLATE)				
		Template	–	79
[SF4]		(GET)	–	79
[SF5]		(PUT)	–	79
[F6]		(PLG1-3/PART1-16/17-32)	–	79

Function Sub-Function		Parameter Name (Display)	Ref. #	Page
■ **Sequence Play Mixing Edit Mode**				
Common...Settings that apply to all 16 Parts [SEQ PLAY]→Chain Step settings (page 75)→[F6] (MIX)→[EDIT]→[COMMON] Settings...MIDI Data Table 11 in the separate Data List				
[F1] (GENERAL)				
[SF1]	MEQ OFS	MEQ OFFSET (LOW/LOWMID/HIGHMID/HIGH)	6	98
[SF5]	OTHER	CSAssign	12	98
		ChoCtrl	13	98
		AssignA	15	98
		AssignB	15	98
		Assign1	15	98
		Assign2	15	98
[F2] (MEQ)				
		SHAPE/FREQ/GAIN/Q (LOW/LOWMID/HIGH/HIGHMID/HIGH)	51	100
[F3] (ARP)				
[SF1]	TYPE	Bank	75	101
		Type	76	101
		Switch	77	101
		Hold	78	101
		KeyMode	79	101
		VelMode	80	101
[SF2]	LIMIT	NoteLimit	81	101
		VelocityLimit	82	101
[SF3]	PLAY FX	UnitMultiply	83	101
		VelocityRate	84	101
		GateTimeRate	85	101
[SF4]	OUT CH	OutputSwitch	86	101
		TransmitCh	87	101
[F4] (CTL ASN)				
		BC	88	101
		AS1	88	101
		AS2	88	101
		FC1	88	101
		FC2	88	101
[F6] (EFFECT)				
[SF1]	CONNECT	EFF PART→VCE INS	199	106
		EFF PART→PLG-EF	200	106
		PlugEF Type	200	106
		Variation Type	201	107
		Variation Return	202	107
		Variation Pan	203	107
		Variation to Reverb	204	107
		Variation to Chorus	204	107
		Chorus Type	194	106
		Chorus Return	196	106
		Chorus Pan	197	106
		Chorus to Reverb	198	106
		Reverb Type	194	106
		Reverb Return	196	106
		Reverb Pan	197	106
[SF2]	PLG-EF	(Plug-in Effect Parameters)	200	106
[SF3]	VAR	(Effect Parameters)	205	107
[SF4]	REVERB	(Effect Parameters)	205	107
[SF5]	CHORUS	(Effect Parameters)	205	107
Part...Settings of individual 16 Parts [SEQ PLAY]→Chain Step Settings (page 75)→[F6] (MIX)→[EDIT]→[1]-[16] *Settings...MIDI Data Table 12 in the separate Data List				
[F1] (VOICE)				
[SF1]	VOICE	Bank	36	99
		Number	29	99
[SF2]	MODE	Mono/Poly	3	98
		ArpSwitch	77	101
		ReceiveCh	42	99
[SF3]	LIMIT	NoteLimitH	32	99
		NoteLimitL	32	99
		VelLimitH	33	99
		VelLimitL	33	99
[SF4]	PORTA	Switch	7	98
		Time	8	98
		Mode	10	98
[SF5]	OTHER	PB Upper	14	98
		PB Lower	14	98
		VelSensDpt	39	99
		VelSensOfs	40	99
[F2] (OUTPUT)				
[SF1]	VOL/PAN	Volume	43	100
		Pan	44	100

Function Sub-Function		Parameter Name (Display)	Ref. #	Page
		VoiceELPan	45	100
[SF2]	EF SEND	RevSend	46	100
		ChoSend	47	100
		VarSend	48	100
		DryLevel	52	100
[F3] (OUTSEL)				
		OutputSel	115	103
		InsEF	116	103
[F4] (TONE)				
[SF1]	TUNE	NoteShift	41	99
		Detune	153	104
[SF2]	FILTER	Cutoff	92	102
		Resonance	93	102
		FEGDepth	154	104
[SF3]	FEG	Attack	155	105
		Decay	155	105
		Sustain	156	105
		Release	155	105
[SF4]	AEG	Attack	157	105
		Decay	157	105
		Sustain	158	105
		Release	157	105
[F5] (RCV SW)				
		BankSel	175	105
		PgmChange	175	105
		CtrlChange	175	105
		PB	175	105
		MW	175	105
		ChAT	175	105
		BC	175	105
		AS1	175	105
		AS2	175	105
		FC1	175	105
		FC2	175	105
		Vol	175	105
		Pan	175	105
		Sus	175	105
		FS	175	105
[SF5]		(1PART/4PART)	175	105
[F6]		(PLG1-3/PART1-4)	175	105

■ Master Play Mode

[MASTER]→Master Selection (page 49)
Settings...MIDI Data Table 5 in the separate Data List

[F1] (PLAY)				
			–	49
[F2] (MEMORY)				
		Mode	–	50
		(Program Number)	–	50
		ZoneSwitch	–	50

■ Master Edit Mode

Common...Settings that apply to all 4 Zones
[MASTER]→Master Selection (page 49)→[EDIT]→[COMMON]
Settings...MIDI Data Table 5 in the separate Data List

[F1] (NAME)				
		Name	2	98
[F2] (OTHER)				
		Slider	58	100

Zone...Settings of individual 4 Zones
[MASTER]→Master Selection (page 49)→[F2] (MEMORY)
ZoneSwitch=on→[EDIT]→[1]-[4]→scrolled by [▲ ▼](TX SW)
Settings...MIDI Data Table 5 in the separate Data List

[F1] (TRANS)				
		TransCh	25	99
		TGSwitch	26	99
		MIDISwitch	27	99
[F2] (NOTE)				
		Octave	17	98
		Transpose	18	98
		NoteLimitH	32	99
		NoteLimitL	32	99
[F3] (TX SW)				
		Bank (TG)	89	101
		PC (TG)	89	101
		Bank (MIDI)	89	101
		PC (MIDI)	89	101
		PB	89	101
		MW	89	101
		ChAT	89	101
		BC	89	101
		Slider	89	101
		FC1	89	101
		FC2	89	101

Function Sub-Function		Parameter Name (Display)	Ref. #	Page
		Vol	89	101
		Pan	89	101
		Sus	89	101
		FS	89	101
[SF5]		(1ZONE/4ZONE)	89	101
[F4] (PRESET)				
		Bank MSB	132	103
		Bank LSB	132	103
		PgmChange	133	103
		Volume	43	100
		Pan	44	100
[F5] (CS)				
		CtrlSlider	134	103

■ Utility Mode [UTILITY]

Settings... MIDI Data Table 4 in the separate Data List.

[F1] (GENERAL)				
[SF1]	TG	Volume	43	100
		NoteShift	41	99
		Tune	216	107
		BCCurve	16	98
[SF2]	KBD	Octave	17	98
		Transpose	18	98
		VelCurve	19	98
		FixedVelociy	20	99
[SF3]	EF BYPS	Insertion Internal	21	99
		Insertion PLG-EF	21	99
		System Reverb	21	99
		System Chorus	21	99
		System Variation	21	99
[SF4]	OTHER	AutoLoad	22	99
		PowerOnMode	23	99
		CtrlReset	24	99
[SF5]		(GET FOLDER)	22	99
[F2] (I/O)				
[SF1]	INPUT	A/D Source	53	100
		Mic/Line	54	100
[SF2]	OUTPUT	L&RGain	55	100
		AssignLGain	56	100
		AssignRGain	56	100
[SF3]	MLAN	(mLAN)	57	100
[F3] (VOICE) →[VOICE] →[UTILITY]				
[SF1]	MEQ	SHAPE/FREQ/GAIN/Q (LOW/LOWMID/HIGH/ HIGHMID/HIGH)	51	100
[SF2]	ARP CH	OutputSwitch	86	101
		TransmitCh	87	101
[SF3]	CTL ASN	AS1	88	101
		AS2	88	101
		BC	88	101
		FC1	88	101
		FC2	88	101
[F4] (CTL ASN)				
[SF1]	ARP	Switch	127	103
		Hold	127	103
[SF2]	ASSIGN	ASA	128	103
		Dest	129	103
		ASB	128	103
		Dest	129	103
[SF3]	FT SW	FS	130	103
[SF4]	REMOTE	Remote Template	131	103
[F5] (MIDI)				
[SF1]	CH	BasicRcvCh	176	105
		KBDTransCh	177	105
		DeviceNo.	178	105
		FileUtilID	179	106
[SF2]	SWITCH	BankSel	180	106
		PgmChange	181	106
		CtrlChange	182	106
		LocalCtrl	183	106
		RcvBulk	184	106
[SF3]	SYNC	MIDI Sync	185	106
		ClockOut	186	106
		SeqCtrl	187	106
[SF4]	OTHER	MIDI IN/OUT	188	106
		ThruPort	189	106
[F6] (PLUG)				
[SF1]	STATUS	PolyExpand	206	107
[SF2]	MIDI	DEV NO.	178	105
		PORT NO.	207	107
		GM/XG	208	107
[SF3]	NATIVE1	(Native Parameter)	209	107
[SF4]	NATIVE2	(Native Parameter)	209	107
[SF5]	NATIVE3	(Native Parameter)	209	107

Parameter Table

This convenient table lets you quickly and easily find any desired parameter — spotting its location in the various Edit modes of the S90 and confirming how to call it up.

The setting displays for parameters are selected with the Function buttons ([F1] - [F6]) and the Sub Function buttons ([SF1] - [SF5]). The table below makes it exceptionally easy to call up the desired parameter in the intended mode. You can also easily see in which modes similar or related parameters are distributed.

The table may come in handy when you want to duplicate settings for one parameter in the Voice mode, for example, to the same parameter in the Performance mode, or when you want to make more detailed and complex settings in the Performance mode while maintaining the Voice mode settings.

Page references and parameter reference numbers are given for each parameter as well, making it easy to find the corresponding explanation in the Owner's Manual. While using the S90, simply note the currently selected mode, the edit status (Common, Part, etc.), and the Function number — then refer to this table.

■ Using the table

- The parameters are organized in the display according to the corresponding Function buttons ([F1] - [F6]) — each of which is represented by the dark rows in the table. For example, you can see that the Mono/Poly parameter (third parameter in the F1 section) belongs to the [F1] button. Likewise, Pan (second parameter in the F2 section) is called up by first pressing [F2].

- The dark row of each function button shows the name of that button's tab for the corresponding mode (indicated by the column title). For example, Mono/Poly is in the GENERAL tab (for Voice Edit - Common), and in the VOICE tab (for Performance Edit and Seq. Play Mixing Edit).

- Taking a look at the Mono/Poly row, there are four corresponding [SF2] entries. This means that Mono/Poly can be called up by pressing [SF2] after pressing [F1] in the corresponding Edit mode.

- In general, most of the table entries are in bold letters, indicating that the parameter can be found at the specified location (button press). Normal type for an entry indicates that the parameter is not available in for the corresponding Function button, but can be found at another Function button. For example, the ArpSwitch parameter entry near the bottom of the F1 section reads "F3→SF1," indicating that (for the Voice Edit - Common mode) it can be called up by pressing [F3] followed by [SF1].

- When a similar effect can be gained or different parameters share a common aspect, an entry is put in parentheses. The page references and parameter reference numbers are for standard (bold) parameters; when you find an entry in parentheses, check the corresponding Function button's section in the table as well.

- Entries labeled "Direct" indicate that there are no Sub Function tabs on the corresponding display and the parameter can be set directly from the Function display.

■ Example Uses

- **When you want to check which parameters are available in a certain mode:**
Look down the column of Voice Edit - Element - Normal to see which parameters have entries. If there is an entry, the parameter exists in the corresponding mode.

- **When you want to find a certain parameter in the table:**
Refer to the Parameter/Function List on page 98. This lists all parameters in alphabetical order, and shows which Function key each is assigned to. Once you know the Function key, go to the section of the table corresponding to that key.

- **When you want to check which Edit modes contain a certain parameter:**
Find the desired parameter and look across to see which columns have entries. For example, LFO Speed (second parameter in the F5 section) can be found in both Voice Edit - Common (Normal) and Voice Edit - Element. You can also easily see that the parameter isn't available for Drum Voices.

- **When you want to check or edit a certain parameter's settings in a specific mode:**
Let's say you want to edit the Pan setting in a Performance, but you only want to change one particular sound (Element) and not the entire Performance. First, make sure you're at "home base" in one of the Play modes. (If you've called up the Performance Common display where Pan is set for the entire performance, make sure to exit from that display.) Then, check the row of entries for Pan in the table (in the F2 section) and look in the Voice Edit - Element - Normal columns. You'll see that the Pan entry there shows "[F4]→ [SF1]." This indicates that to edit Pan for an Element, you call up the Voice Edit Element mode, then press [F4] followed by [SF1].

... Can be edited by Quick Edit function (editing in Play mode).

... Can be edited by Control Sliders in real time.

... Can be edited by Quick Edit function and Control Sliders in real time.

Column groups: **VOICE EDIT** → COMMON (NORMAL / DRUM / PLUG-IN), ELEMENT/KEY (NORMAL / DRUM / PLUG-IN); **PERFORMANCE EDIT** → COMMON, PART; **SEQ PLAY MIXING EDIT** → COMMON, PART; **MASTER EDIT** → COMMON, ZONE; **UTILITY**.

Display	VE COMMON NORMAL	VE COMMON DRUM	VE COMMON PLUG-IN	VE ELEM/KEY NORMAL	VE ELEM/KEY DRUM	VE ELEM/KEY PLUG-IN	PERF COMMON	PERF PART	SEQ COMMON	SEQ PART	MASTER COMMON	MASTER ZONE	UTILITY	No.	Page
F1 (Tab Name)	GENERAL			OSC			GENERAL	VOICE	GENERAL	VOICE	NAME	TRANS	GENERAL		
MainCtgry/SubCtgry	SF1	SF1	SF1				SF1							1	98
Name	SF1	SF1	SF1				SF1				Direct			2	98
Mono/Poly	SF2		SF2					SF2		SF2				3	98
KeyAsgnMode/AssignMode	SF2		SF2		SF5									4	98
M.TuningNo.	SF2													5	98
MEQ OFFSET	SF3	SF3	SF3				SF3		SF1					6	98
(PORTA) Switch	SF4		SF4				SF4	SF4		SF4				7	98
(PORTA) Time	SF4		SF4				SF4	SF4		SF4				8	98
(PORTA) PartSwitch							SF4							9	98
(PORTA) Mode	SF4							SF4		SF4				10	98
(PORTA) TimeMode	SF4													11	98
CSAssign	SF5	SF5	SF5				SF5		SF5		(F2 Direct)			12	98
ChoCtrl	SF5	SF5	SF5				SF5		SF5					13	98
PB Upper/Lower, PB Range	SF5	SF5	SF5					SF5		SF5				14	98
AssignA/B/1/2	SF5	SF5	SF5				SF5		SF5					15	98
BCCurve													SF1	16	98
Octave												F2 Direct	SF2	17	98
Transpose												F2 Direct	SF2	18	98
VelCurve													SF2	19	98
Fixed Velocity													SF2	20	99
(EF BYPS)													SF3	21	99
AutoLoad													SF4	22	99
PowerOnMode													SF4	23	99
CtrlReset													SF4	24	99
TransCh											Direct	(F5→SF1)		25	99
TGSwitch											Direct	(F5→SF2)		26	99
MIDISwitch											Direct			27	99
ElementSw/PartSw				SF1	SF1		SF1							28	99
WaveNo./Ctgry/Number				SF1	SF1	SF1	SF1			SF1				29	99
KeyOnDelay				SF2										30	99
InsEffect(Eff)Out				SF2	SF2									31	99
NoteLimit (L/H)				SF3				SF3		SF3		F2 Direct		32	99
VelocityLimit (L/H)				SF3				SF3		SF3				33	99
VelCrossFade				SF3										34	99
Type					SF1									35	99
Bank				SF1	SF1		SF1			SF1				36	99
RevSend	F2 Direct	F2 Direct		SF2										46	100
ChoSend	F2 Direct	F2 Direct		SF2										47	100
OutputSel				SF2				F3 Direct		F3 Direct				115	103
RcvNoteOff				SF5										37	99
AltnateGroup				SF5										38	99
VelocityDepth					SF5			SF5						39	99
VelocityOffset					SF5			SF5						40	99
Volume	(F2 Direct)	(F2 Direct)	(F2 Direct)	(F4→SF1)	(F4→SF1)		(F2→SF1)	(F2→SF1)		(F2→SF1)		(F4 Direct)	SF1	43	100
NoteShift					SF5			F4→SF1		F4→SF1			SF1	41	99
Tune													SF1	216	107
ArpSwitch (Switch)	F3→SF1	F3→SF1	F3→SF1				F3→SF1	SF2		SF2				77	101
ReceiveCh										SF2		(F5→SF1)		42	99
F2 (Tab Name)	OUTPUT			PITCH			OUT/MEQ	OUTPUT	MEQ	OUTPUT	OTHER	NOTE	I/O		
Volume	Direct	Direct	Direct	(F4→SF1)	(F4→SF1)		SF1	SF1		SF1		(F4 Direct)	F1→SF1	43	100
Pan	Direct	Direct	Direct	F4→SF1	F4→SF1		SF1	SF1		SF1		(F4 Direct)		44	100
VoiceELPan							SF1			SF1				45	100
RevSend	Direct	Direct	Direct		F1→SF2		SF1	SF2		SF2				46	100
ChoSend	Direct	Direct	Direct		F1→SF2		SF1	SF2		SF2				47	100
VarSend								SF2		SF2				48	100
InsRevSend		Direct												49	100
InsChoSend		Direct												50	100
SHAPE/FREQ/GAIN/Q	(UTILITY)	(UTILITY)	(UTILITY)				SF2		Direct				F3→SF1	51	100
DryLevel								SF2		SF2				52	100
A/DSource													SF1	53	100
Mic/Line													SF1	54	100
L&RGain													SF2	55	100
AssignL/RGain													SF2	56	100
(MLAN)													SF2	57	100

Parameter Table **93**

Display	VOICE EDIT						PERFORMANCE EDIT		SEQ PLAY MIXING EDIT		MASTER EDIT		UTILITY	No.	Page
	COMMON			ELEMENT/KEY			COMMON	PART	COMMON	PART	COMMON	ZONE			
	NORMAL	DRUM	PLUG-IN	NORMAL	DRUM	PLUG-IN									
Slider	(F1→SF5)	(F1→SF5)	(F1→SF5)				(F1→SF5)		(F1→SF5)		Direct			58	100
Octave											Direct	F1→SF2		17	98
Transpose											Direct	F1→SF2		18	98
NoteLimitL/H				F1→SF3				F1→SF3		F1→SF3	Direct			32	99
Coarse				SF1	SF1									59	100
Fine				SF1	SF1			(F4→SF1)		(F4→SF1)			(F1→SF1)	60	100
Random				SF1										61	100
EGTime				SF2										62	100
Segment				SF2										63	100
EGLevel				SF2										64	100
Curve				SF2										65	100
Pitch (VEL SENS)				SF2	SF2									66	100
(PEG) TIME				SF3		Direct								67	100
(PEG) LEVEL				SF3		Direct								68	100
(PEG) Depth				SF3										69	100
PitchSens				SF4										70	101
CenterKey				SF4										71	101
EGTimeSens				SF4										72	101
CenterKey				SF4										73	101
F3 (Tab Name)		ARP			FILTER		ARP	OUTSEL	ARP	OUTSEL		TX SW	VOICE		
Bank	SF1	SF1	SF1				SF1		SF1					74	101
Type	SF1	SF1	SF1				SF1		SF1					75	101
Tempo	SF1	SF1	SF1				SF1							76	101
Switch (ArpSwitch)	SF1	SF1	SF1				SF1	F1→SF2	SF1	F1→SF2				77	101
Hold	SF1	SF1	SF1				SF1		SF1					78	101
KeyMode	SF1	SF1	SF1				SF1		SF1					79	101
VelMode	SF1	SF1	SF1				SF1		SF1					80	101
NoteLimit	SF2	SF2	SF2				SF2		SF2					81	101
VelocityLimit	SF2	SF2	SF2				SF2		SF2					82	101
UnitMultiply	SF3	SF3	SF3				SF3		SF3					83	101
VelocityRate	SF3	SF3	SF3				SF3		SF3					84	101
GateTimeRate	SF3	SF3	SF3				SF3		SF3					85	101
OutputSwitch	(UTILITY)	(UTILITY)	(UTILITY)				SF4		SF4				SF2	86	101
TransmitCh	(UTILITY)	(UTILITY)	(UTILITY)				SF4		SF4				SF2	87	101
SHAPE/FREQ/GAIN/Q	(UTILITY)	(UTILITY)	(UTILITY)				F2→SF2		F2 Direct				SF1	51	100
BC/AS1/AS2/FC1/FC2	(UTILITY)	(UTILITY)	(UTILITY)				F4 Direct					(F5 Direct)	SF3	88	101
(Transmit Switch)												Selected by [▲/▼]	(F5→SF2)	89	101
Type				SF1										90	101
Gain				SF1										91	102
Cutoff				SF1	(SF1)			F4→SF2		F4→SF2				92	102
Resonance				SF1	(SF1)			F4→SF2		F4→SF2				93	102
Width				SF1										94	102
Distance				SF1										95	102
HPFCutoff				SF1	SF1	SF1								96	102
HPFKeyFlw				SF1										97	102
EGTime				SF2										98	102
Segment				SF2										99	102
EGLevel				SF2										100	102
Curve				SF2										65	100
Cutoff (VEL SENS)				SF2										101	102
Resonance (VEL SENS)				SF2										102	102
(FEG) TIME				SF3				(F4→SF3)		(F4→SF3)				103	102
(FEG) LEVEL				SF3				(F4→SF3)		(F4→SF3)				104	102
(FEG) Depth				SF3				F4→SF2		F4→SF2				105	102
CutoffSens				SF4										106	102
CenterKey				SF4										107	102
EGTimeSens				SF4										108	102
CenterKey				SF4										109	102
(Scaling) BREAKPOINT				SF5										110	102
(Scaling) OFFSET				SF5										111	102
LPFCutoff				(SF1)	SF1									112	102
LPFReso				(SF1)	SF1									113	102
LPFCutoff (VEL SENS)				(SF2)	SF2									114	102
OutputSel							F1→SF2		Direct		Direct			115	103
(InsEF)									Direct		Direct			116	103
F4 (Tab Name)		CTL SET (SET 1/2, 3/4, 5/6)		AMP		NATIVE	CTLASN	TONE	CTLASN	TONE		PRESET	CTLASN		
ElementSw	SF1, 2, 3													117	103
Source	SF1, 2, 3	SF1, 2, 3	SF1											118	103
Dest	SF1, 2, 3	SF1, 2, 3	SF1											119	103
Depth	SF1, 2, 3	SF1, 2, 3	SF1											120	103

Display	VOICE EDIT COMMON NORMAL	COMMON DRUM	COMMON PLUG-IN	ELEMENT/KEY NORMAL	ELEMENT/KEY DRUM	ELEMENT/KEY PLUG-IN	PERFORMANCE EDIT COMMON	PART	SEQ PLAY MIXING EDIT COMMON	PART	MASTER EDIT COMMON	ZONE	UTILITY	No.	Page
Filter (MW)			SF2											121	103
AMod/PMod/FMod (MW)			SF2											122-124	103
Pitch			SF3											125	103
Filter (AT)			SF3											121	103
AMod/PMod/FMod (AT)			SF3											122-124	103
Src			SF4											126	103
Filter (AC)			SF4											121	103
AMod/PMod/FMod (AC)			SF4											122-124	103
BC/AS1/AS2/FC1/FC2	(UTILITY)	(UTILITY)	(UTILITY)				Direct		Direct			(F5 Direct)	F3→SF3	88	101
(ARP) Switch/Hold													SF1	127	103
ASA/ASB												(F5 Direct)	SF2	128	103
Dest													SF2	129	103
FS													SF3	130	103
Set Remote Template Type													SF4	131	103
BankMSB/LSB											Direct			132	103
PgmChange											Direct			133	103
Volume	(F2 Direct)	(F2 Direct)	(F2 Direct)	(SF1)	(SF1)		(F2→SF1)	(F2→SF1)		(F2→SF1)	Direct	(F1→SF1)		43	100
Pan	(F2 Direct)	(F2 Direct)	(F2 Direct)	SF1	SF1		(F2→SF1)	(F2→SF1)		(F2→SF1)	Direct			44	100
Level	(F2 Direct)	(F2 Direct)	(F2 Direct)	SF1	SF1		(F2→SF1)	(F2→SF1)		(F2→SF1)	(Direct)	(F1→SF1)		135	103
AlternatePan				SF1	SF1									136	104
RandomPan				SF1	SF1									137	104
ScalingPan				SF1										138	104
EGTime				SF2										139	104
Segment				SF2										140	104
EGLevel				SF2										141	104
Curve				SF2										142	104
(AEG) TIME				SF3	SF3									143	104
(AEG) LEVEL				SF3	SF3									144	104
LevelSens				SF4										145	104
CenterKey				SF4										146	104
EGTimeSens				SF4										147	104
CenterKey				SF4										148	104
(Scaling) BREAKPOINT				SF5										149	104
(Scaling) OFFSET				SF5										150	104
Level (VEL SENS)					SF2									151	104
(Native Parameters)						Direct or selected by [◄/►]								152	104
NoteShift						F1→SF5		SF1		SF1			F1→SF1	41	99
Detune				(F2→SF1)	(F2→SF1)			SF1		SF1			(F1→SF1)	153	104
Cutoff				F3→SF1	(F3→SF1)		SF2	SF2		SF2				92	102
Resonance				F3→SF1	(F3→SF1)		SF2	SF2		SF2				93	102
FEGDepth				F3→SF3			SF2	SF2		SF2				154	104
(FEG) Attack/Decay/Release (Time)				(F3→SF3)			SF3	SF3		SF3				155	105
(FEG) Sustain (Level)				(F3→SF3)			SF3	SF3		SF3				156	105
(AEG) Attack/Decay/Release (Time)				(F4→SF3)			SF4	SF4		SF4				157	105
(AEG) Sustain (Level)				(F4→SF3)			SF4	SF4		SF4				158	105
F5 (Tab Name)	**LFO**			**LFO**			**RCV SW**		**RCV SW**		**CS**		**MIDI**		
Wave	SF1			Direct										159	105
Speed	SF1			Direct		Direct								160	105
TempoSync	SF1													161	105
TempoSpeed	SF1													162	105
KeyOnReset	SF1			Direct										163	105
Phase	SF1													164	105
(KeyOn)Delay	SF2			Direct		Direct								165	105
FadeIn	SF2													166	105
Hold	SF2													167	105
FadeOut	SF2													168	105
ElementSw	SF3/4/5													169	105
Dest	SF3/4/5													170	105
Depth	SF3/4/5													171	105
PMod (LFO)				Direct		Direct								172	105
FMod (LFO)				Direct										173	105
AMod (LFO)				Direct										174	105
(Part Receive Switch)							Selected by [▲/▼]		Selected by [▲/▼]					175	105
BasicRcvCh	(UTILITY)	(UTILITY)	(UTILITY)				(UTILITY)			(F1→SF2)			SF1	176	105
KBDTransCh	(UTILITY)	(UTILITY)	(UTILITY)				(UTILITY)					(F1 Direct)	SF1	177	105
DeviceNo.	(UTILITY)	(UTILITY)	(UTILITY)				(UTILITY)						SF1 (F6→SF2)	178	105
FileUtilID													SF1	179	106

Display	VOICE EDIT						PERFORMANCE EDIT		SEQ PLAY MIXING EDIT		MASTER EDIT		UTILITY	No.	Page
	COMMON			ELEMENT/KEY			COMMON	PART	COMMON	PART	COMMON	ZONE			
	NORMAL	DRUM	PLUG-IN	NORMAL	DRUM	PLUG-IN									
BankSel													SF2	180	106
PgmChange												(F3→Selected by [▲/▼])	SF2	181	106
CtrlChange												(Selected by [▲/▼])	SF2	182	106
LocalCtrl												(F1 Direct)	SF2	183	106
RcvBulk													SF2	184	106
MIDI Sync													SF3	185	106
ClockOut													SF3	186	106
SeqCtrl													SF3	187	106
MIDI IN/OUT													SF4	188	106
ThruPort													SF4	189	106
CtrlSlider							(F4 Direct)				Direct	(F3→SF3/ F4→SF2)		134	103
F6 (Tab Name)	**EFFECT**			**EQ**			**EFFECT**	**1-4/PLG1-3**	**EFFECT**	**1-4/PLG1-3**			**PLUG**		
EL: OUT 1-4/KEY: OUT	SF1	SF1												190	106
InsEF Connect	SF1	SF1	SF1											191	106
Ins1 Ctgry/Type	SF1	SF1	SF1											192	106
Ins2 Ctgry/Type	SF1	SF1	SF1											193	106
Reverb/Chorus Type	SF1	SF1	SF1				SF1		SF1					194	106
Reverb/Chorus Send	SF1	SF1	SF1											195	106
Reverb/Chorus Return	SF1	SF1	SF1				SF1		SF1					196	106
Reverb/Chorus Pan	SF1	SF1	SF1				SF1		SF1					197	106
Chorus to Reverb	SF1	SF1	SF1				SF1		SF1					198	106
EFF PART→VCE INS							SF1		SF1					199	106
EFF PART→PLG-EF							SF1		SF1					200	106
Variation Type/Return/Pan							SF1		SF1					201-203	107
Variation to Chorus/Reverb							SF1		SF1					204	107
(Effect Parameters)	SF2/3/4/5	SF2/3/4/5	SF2/3/4/5				**SF2/3/4/5**		**SF2/3/4/5**					205	107
PolyExpand													SF1	206	107
DEV NO.	(UTILITY)	(UTILITY)	(UTILITY)				(UTILITY)						SF2 (F5→SF1)	178	105
PORT NO.													SF2	207	107
GM/XG													SF2	208	107
(Native System Parameter)													SF3/4/5	209	107
Type				Direct	Direct									210	107
L.Freq/Gain (Type=EQ L/H)				Direct	Direct	Direct								211	107
H.Freq/Gain (Type=EQ L/H)				Direct	Direct	Direct								212	107
Freq (Type=P.EQ)				Direct	Direct									213	107
Gain (Type=P.EQ)				Direct	Direct									214	107
Q (Type=P.EQ)				Direct	Direct									215	107

🎵**NOTE** For parameters in different modes having the same name, the available parameter values and settings for that parameter may differ depending on the mode.

🎵**NOTE** For details on effect parameters, refer to the separate Data List.

🎵**NOTE** For Job operations, see page 70; for Store operations, see page 73; for Card operations, see page 82.

🎵**NOTE** For information on the Sequence Play mode, see page 75.

🎵**NOTE** In the Performance/Mixing mode, the Voice Common Arpeggio/Effect/Controller settings are ignored, and the Performance/Mixing settings become effective. The Chorus/Reverb Effect and Arpeggio settings of the Voice mode can be copied to the Performance/Mixing mode by using the Job function (page 70).

🎵**NOTE** You can use the Control Sliders as Quick Edit controls for the parameters below. However, this does not directly change the corresponding Element/Part parameter values; it simply alters the values temporarily.

- Cutoff
- Resonance
- Attack
- Release

🎵**NOTE** Using any Quick Edit controls on the parameters below does not directly change the corresponding parameter values; it simply alters the values temporarily.

Element
- FEG Time/Level/Depth
- AEG Time/Level/Depth
Part
FEG/AEG ([F4]→[SF3]/[SF4])

The Reference numbers can be found on the following pages:

Reference No.	Reference Page
1 - 19	98
20 - 42	99
43 - 69	100
70 - 90	101
91 - 114	102
115 - 135	103
136 - 154	104
155 - 178	105
179 - 200	106
201 - 221	107

Parameter/Function List

⑧ Reference (Function List)

This list clearly and concisely explains the function of every parameter. Following the table are various footnotes, providing further details and explanations for those items marked with an asterisk (*). The "Related Page" column also provides cross-references for operation examples, other details and relevant parameters. The Reference Numbers in the manual correspond to the relevant items in the Function Tree (page 88) and the Parameter Table (page 92). By checking the Reference Numbers, you can quickly and easily find the corresponding function and parameter in the charts.

NOTE For information on the Display Indications and mode selection, see page 30. For information on the Play mode, see pages 36, 41, 48.

Ref. #	Display	Parameter Name	Explanation	Related Page	
1	MainCtgry/SubCtgry	Main/Sub Category (Voice/Performance)	Sets the Name (up to 10 characters) and Categories.	34, 35, 84	
2	Name	Name 1-10 (Voice/Performance/ Master)			
3	Mono/Poly	Mono/Poly Mode	Selects whether a voice/part is played back monophonically (single notes only) or polyphonically (multiple simultaneous notes).		
4	KeyAsgnMode (AssignMode)	Same Note Number Key On Assign Mode	This setting applies when the same note number (key) is received by the tone generator. When set to "single," the previous sound is cut off to accommodate the next. When set to "multi," the note sounds for its original duration.		*1
5	M.TuningNo.	Micro Tuning	Determines the tuning system for the voice. Normally, this should be set to 00 (Equal temperament); however thirty-one additional tuning systems are available for a variety of tuning applications and effects.		*2
6	MEQ OFFSET	Master EQ Offset	Adjusts the master (global) EQ settings. The settings made here are applied as offsets to the EQ settings (with the exception of "MID"). These can be also edited with the Control Sliders.	67	*3
7	(PORTA) Switch (Sw)	Portamento Switch	Determines whether Portamento (a smooth transition in pitch from one note to the next) is on or off.		
8	(PORTA) Time	Portamento Time	Determines the Portamento pitch transition time. Higher values result in longer transition times. Higher values result in longer transition times. The effect is applied according to the "TimeMode" setting.		*4
9	(PORTA) PartSwitch	Part Switch	Determines whether Portamento is on or off for each individual part.		
10	(PORTA) Mode	Portamento Mode	With the "fingered/fingr" setting, Portamento is only applied when you play legato (playing the next note before releasing the previous one). With the "fulltime/full" setting, Portamento is always applied.		*4 *5
11	(PORTA) TimeMode	Portamento Time Mode	When "TimeMode" is set to "rate (normal voice)," the transition time will vary in proportion to the interval from one note to next. Setting this to "time" makes the parameter a true time scale setting, specified by the "Time" parameter.		*4
12	CSAssign	Control Function Select	Determines which row of CONTROL FUNCTION parameters is automatically selected when calling up the program.	53	*6
13	ChoCtrl	Chorus Control	Determines the depth of the Chorus effect, as controlled by the Slider assigned to Chorus Send.		
14	PB Upper/Lower, PB Range	Pitch Bend Range	Determines the amount (in semitones; 12: one octave) by which the pitch is varied when you move the Pitch Bend wheel up/down. When selecting a Plug-in Voice, the Upper and Lower ranges cannot be independently set here.	53	
15	AssignA/B/1/2	Assign A/B/1/2	This lets you directly set and memorize the value for each Assign Controller (A, B, 1, and 2), from the Slider.	53	*7
16	BCCurve	BC (Breath Controller) Curve	These curves determine how the sound of the S90 responds to use of a Breath Controller. The specific aspect of the sound that is affected by Breath Control and the selected curve is set in the Controller Set display ([F4]→[SF1/2/3]) from the Normal Voice Common Edit mode.	87	
17	Octave	Master Octave Shift	Determines the amount in octaves by which the range of the keyboard is shifted up or down. This setting can be reset by the footswitch (UTILITY [F4]→[SF3] FS=101).	56	*8
18	Transpose	Master Transpose	Transposes the pitch of the keyboard up or down (in semitones). This affects the transmitted MIDI data.		
19	VelCurve	Velocity Curve	This determines the particular Velocity Curve, or how the strength of the notes played will affect the sound output. When set to "fixed," the velocity of the note you play is fixed at the value set in Fixed Velocity (below).	87	

Ref. #	Display	Parameter Name	Explanation	Related Page	
20	FixedVelocity	Fixed Velocity	When Velocity Curve (above) is set to "fixed," this determines the velocity value. This affects the transmitted MIDI data.	87	
21	(EF BYPS)	Effect Bypass	Select the specific effect(s) to be bypassed when the [EFFECT BYPASS] button is turned on.	67	
22	AutoLoad	Auto Load	Determines whether the Auto Load function is on or off. When this is on, the S90 will automatically load the specified files (from memory card) to User memory — whenever the power is turned on. Press the [SF5] button to register the folder containing the desired files for auto loading.	84	
23	PowerOnMode	Power On Mode	Determines the default power-on mode (and memory bank) — letting you select which condition is automatically called up when you turn the power on. The first program number of the specified bank is selected automatically.		*9
24	CtrlReset	Controller Reset	Determines whether the current condition of the controller (Modulation Wheel, Foot Controller, Aftertouch, etc.) is maintained or reset when you switch between Voices.		
25	TransCh	Transmit Channel	Determines the MIDI channel for each zone over which the S90 sends MIDI data (to an external sequencer, tone generator, or other device).	48	
26	TGSwitch	Tone Generator Switch	Determines whether or not MIDI messages for each zone are transmitted to each Part's tone generator block.	48	
27	MIDISwitch	MIDI Switch	Determines whether or not MIDI messages for each zone are transmitted to an external MIDI or USB terminal.	48	
28	ElementSw/PartSw	Element Switch/Part Switch	Determines the method by which each Element/Key/Part is output. In the Drum Key edit mode, this is only available when the "Type" is set to "pre wave." In the Performance mode, you can select a total seven parts four parts from the internal tone generator, and three from the installed Plug-in Boards.		
29	WaveNo./Ctgry/ Number	Wave Number/Category/ Voice Number	Normal Element Edit...Select the desired wave/category (page 35) used for the Element. Drum Key Edit...Select a Wave/Normal Voice Number/Category. Performance/Mixing Part Edit...Selects the desired voice number used for each Part (see the separate Data List). Plug-in Element Edit...Select the desired Board voice number		*10
30	KeyOnDelay	Key On Delay	Determines the time (delay) between the moment you press a note on the keyboard and the point at which the sound is played.		
31	InsEffect(Eff)Out	Insertion Effect Out	Determines which Insertion effect (1 or 2) is used to process each individual element/key. The "thru" setting lets you bypass the Insertion effects for the specific element/key (This parameter is the same as "EL/KEY: OUT ([F6]→[SF1])" in Normal Common Edit. Making a setting here automatically changes the setting of that parameter as well.)	67	
32	NoteLimit (L/H)	Note Limit Low/High	Determines the lowest and highest notes of the keyboard range.	62	*11 *12
33	VelocityLimit (L/H)	Velocity Limit Low/High	Determines the minimum and maximum values of the velocity range within which each Element will respond.	62	*13
34	VelCrossFade	Velocity Limit Cross Fade	Determines how smoothly or abruptly Elements switch between each other in response to velocity. (This only applies to Elements that have been set for velocity splits with Velocity Limit above.) Minimum values create an abrupt change between Elements, while maximum values let you smoothly change Elements depending on your playing strength.		
35	Type	Wave Type	Determines whether a Wave or a Normal voice is to be used for the selected key.		*14
36	Bank	Bank	Drum Key Edit...This parameter is available when Type (above) is set to "voice." Any of the Normal voice banks can be selected. Plug-in voices cannot be selected. Plug-in Element Edit...Determines the Board Voice Bank . Performance/Mixing Part Edit...Determines the Voice Bank (page 36) for each part.		
37	RcvNoteOff	Receive Note Off	Determines whether Note Off (Key Off) messages are received (on) or not (off).		*17
38	AltnateGroup	Alternate Group	Assigns the same number to the drum notes you don't want to have sound simultaneously (such as open and closed hi-hats).		
39	VelocityDepth (VelSensDpt)	Velocity Sensitivity Depth	Determines the velocity sensitivity, or how much the level of the voice changes in response to your playing strength (velocity).		*19
40	VelocityOffset (VelSensOfs)	Velocity Sensitivity Offset	Determines the amount by which received velocities are adjusted for the actual velocity effect.		
41	NoteShift	Note Shift	Determines the pitch (key transpose) setting in semitones (12: one octave). This doesn't affect the transmitted MIDI data.		
42	ReceiveCh	Receive Channel	Each Part receives MIDI messages according to the channel set here. Select "off" for Parts that you do not want to respond to MIDI.		*63

Ref. #	Display	Parameter Name	Explanation	Related Page	
43	Volume	Volume	Adjusts the output level.		
44	Pan	Pan	Determines the stereo pan position. L63 (hard left) -C (Cener) -R63 (hard right)		*15 *21
45	VoiceELPan	Voice Element Pan	Determines whether the individual pan settings for each Element (made in the Voice Edit mode) are applied or not.		*22
46	RevSend	Reverb Send	Determines the Send level of the signal sent from Insertion Effect 1/2 (or the bypassed signal) to the Reverb effect.	67	*15
47	ChoSend	Chorus Send	Determines the Send level of the signal sent from Insertion Effect 1/2 (or the bypassed signal) to the Chorus effect.	67	*16
48	VarSend	Variation Send	Determines the send level for the Variation effect of the selected part, giving you detailed control over the Variation balance among the parts.	67	
49	InsRevSend	Insertion Reverb Send	Determines the Send level for the entire Drum voice (all keys), sent from Insertion Effect 1/2 to the Reverb effect.	67	*20
50	InsChoSend	Insertion Chorus Send	Determines the Send level for the entire Drum voice (all keys), sent from Insertion Effect 1/2 to the Chorus effect.	67	
51	SHAPE/FREQ/ GAIN/Q	Master EQ Shape/ Frequency/Gain/Q	Adjusts the tonal qualities of the sound. You can apply five-band equalization to all parts of the selected part or all elements of the selected voice.		*23 *24
52	DryLevel	Dry Level	Determines the level of the unprocessed (dry) sound of the selected part, letting you control the overall effect balance among the parts.		
53	A/DSource	A/D Source	The S90 features two different input connections for transferring analog audio from an external device: the A/D INPUT jacks or the mLAN terminal (when an optional mLAN8E is installed). One or the other must be set; the two cannot be used at the same time.	44	
54	Mic/Line	Mic/Line	When using the A/D INPUT jacks, this determines the input source: microphone (mic) or line.		
55	L&RGain	OUTPUT L&R Gain	Set the output gain of each jack. When this is set to a lower value, you can control the fine volume by using the MASTER VOLUME.		
56	AssignL/RGain	ASSIGNABLE OUTPUT L&R Gain			
57	(MLAN)	mLAN Settings	Set parameters related to an optionally installed mLAN8E.	126	*25
58	Slider	Control Function Select	Determines the status of the CONTROL FUNCTION, when switching Master programs.	53	*6
59	Coarse	Pitch Coarse	Determines the pitch setting in semitones (12: one octave).		*18
60	Fine	Pitch Fine	Determines the fine tuning.		
61	Random	Random Pitch	Randomly varies the pitch of the Element for each note you play. 127...maximum pitch change 0...no pitch change.		
62	EGTime	PEG Time Velocity Sensitivity	Determines the degree to which velocity affects the pitch change of the Pitch EG. Positive settings will cause the pitch change to become faster when you play the keyboard harder (for a large Velocity value). Negative values will have the opposite effect .This affects only the specified Segments.		*27
63	Segment	PEG Time Segment			*26
64	EGLevel	PEG Level Velocity Sensitivity	Determines the sensitivity of the PEG Level (the width of the PEG change) to velocity. The Curve parameter lets you select from five different preset velocity curves (graphically indicated in the display), each determining how velocity affects the Pitch EG.		*27
65	Curve	Velocity Sensitivity Curve			
66	Pitch (VEL SENS)	Pitch Velocity Sensitivity	Determines the sensitivity of the PEG Level (the degree of the PEG change) to velocity.		
67	(PEG) TIME	PEG Time	Determines the transition in pitch from the moment a note is pressed on the keyboard to the point at which the sound stops.	63	
68	(PEG) LEVEL	PEG Level			
69	(PEG) Depth	PEG Depth			

Ref. #	Display	Parameter Name	Explanation	Related Page	
70	PitchSens	Pitch Key Follow Sensitivity	Determines the sensitivity of the Key Follow effect (the interval of adjacent notes). At +100, adjacent notes are pitched one semitone (100 cents) apart. At 0, all notes are the same pitch (for the percussion sounds,etc.). At +50, one octave is stretched out over twenty-four notes. For negative values, the settings are reversed.		*28
71	CenterKey	Pitch Key Follow Center Key	Determines the basic pitch (note number) used by the PitchSens parameter (above). The note number in this setting is the same pitch as normal (100%).		*28 *12
72	EGTimeSens	PEG Time Key Follow Sensitivity	Determines the sensitivity of the PEG time (the speed of the PEG change) to velocity.		*28
73	CenterKey	PEG Time Key Follow Center Key	Determines the basic pitch (note number) used by the EGTimeSens parameter (above). When the center note is played, the PEG time behaves according to its actual settings. For other notes, the speed varies in proportion to the key played and its interval away from the center key.		*28 *12
74	Bank	Arpeggio Type Bank	Determines the Arpeggio bank. pre1: preset 1, pre2: preset 2, user: User Arpeggio data (page 83) saved by MOTIF series (when loaded from a Memory Card)	45	*29
75	Type	Arpeggio Type	Determines the Arpeggio type. The two-letter prefix before the name indicates the general Arpeggio category.	45	*29 *34
76	Tempo	Arpeggio Tempo	Determines the Arpeggio Tempo. When MIDI sync (Utility [F5]→[SF3]) is turned on, "MIDI" is displayed here and cannot be set. In the Sequence Play mode, the tempo is synchronized to that of the song (page 76).	45	
77	Switch (ArpSwitch)	Arpeggio Switch	Determines whether Arpeggio is on or off. You can control the switch by using the Foot Switch (Utility [F4]→[SF3] FS=96).	45	*30
78	Hold	Arpeggio Hold	Determines whether Arpeggio playback is "held" or not. When 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. You can control this setting by using the Foot Switch (Utility [F4]→[SF3] FS=97).	45	*31
79	KeyMode	Arpeggio Key Mode	Determines how the Arpeggio plays back when playing the keyboard.		*32 *33 *34
80	VelMode	Arpeggio Velocity Mode	Determines the playback velocity of the Arpeggio, or how it responds to your own playing strength.		*35
81	NoteLimit	Arpeggio Note Limit Low/High	Determines the lowest and highest notes in the Arpeggio's note range.		*36 *12
82	VelocityLimit	Arpeggio Velocity Limit Low/High	Determines the lowest and highest velocity in the Arpeggio's velocity range. This lets you control when the Arpeggio sounds by your playing strength.	47	*13
83	UnitMultiply	Arpeggio Unit Multiply	Adjust the Arpeggio playback time. For example, if you set a value of 200%, the playback time will be doubled and the tempo halved. If you set a value of 50%, the playback time will be halved and the tempo doubled.		
84	VelocityRate	Arpeggio Velocity Rate	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.		*37 *38
85	GateTimeRate	Arpeggio Gate Time Rate	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.		*37
86	OutputSwitch	Arpeggio MIDI Out Switch	When set to on, Arpeggio playback data is output from the MIDI terminal.		
87	TransmitCh	Arpeggio MIDI Transmit Channel	Determines the MIDI transmit channel for Arpeggio playback data. KbdCh...Arpeggio playback data is transmitted by KBDTransCh ([F5]→[SF1] Keyboard Transmit Channel) in the Utility mode (Performance/Mixing)		*39
88	BC/AS1/AS2/FC1/FC2	BC/Assign1/Assign2/FC1/FC2 Control Number	Sets the control number for the Breath Controller (BC), Assign 1/2 sliders (AS1/2), and Foot Controllers 1/2 (FC1/2).	53	*40
89	(Transmit Switch)	Transmit Switch	When the relevant parameter is set to "on," playing the selected zone will transmit the corresponding MIDI data, such as Control Change and Program Change messages. Pressing the [F5] button switches between display of all four Zones and one single Zone (in which all transmit channel settings are shown). In the four-Zone display, use the cursor buttons to scroll.		
90	Type	Filter Type	Determines the filter type. The parameters differ depending on the selected type.	63	*41

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Ref. #	Display	Parameter Name	Explanation	Related Page	
91	Gain	Filter Gain	Determines the Gain (the amount of boost applied to the signal sent to the Filter).		
92	Cutoff	Filter Cutoff Frequency	Determines the cutoff frequency for the Filter, or the central frequency around which the Filter is applied.	63	*42
93	Resonance	Filter Resonance	Determines the amount of Resonance (harmonic emphasis) applied to the signal at the cutoff frequency.	63	*41
94	Width	Filter Width	With the BPFw, this parameter is used to adjust the width of the band of signal frequencies passed by the filter.	64	
95	Distance	Distance	Determines the distance between the Cutoff frequencies, for the Dual Filter types. (The two filters in combination are connected in parallel fashion.)	63	
96	HPFCutoff	HPF Cutoff Frequency	Determines the central frequency for the Key Follow parameter (below) of the HPF. This parameter is available only when a filter type "LPF12" or "LPF6" is selected (Normal Voice).	64	
97	HPFKeyFlw	HPF Cutoff Frequency Key Follow	Determines the Key Follow setting for the HPF Cutoff frequency (Type=LPF12/LPF6 only). This parameter varies the center frequency according to the position of the notes played on the keyboard. Positive settings raise the center frequency for higher notes and lower it for lower notes. Negative settings have the opposite effect.		
98	EGTime	FEG Time Velocity Sensitivity	Determines the degree to which velocity affects the pitch change of the Filter EG. Positive settings cause the pitch change to become faster when you play the keyboard harder (for a large Velocity value). Negative values have the opposite effect. This affects only the specified Segments.		*27
99	Segment	FEG Time Segment			*26
100	EGLevel	FEG Level Velocity Sensitivity	Determines the sensitivity of the PEG Level (the width of the FEG change) to velocity. The Curve parameter lets you select from five different preset velocity curves (graphically indicated in the display), each determining how velocity affects the Filter EG.		*27
101	Cutoff (VEL SENS)	Filter Cutoff Velocity Sensitivity	Determines the sensitivity of the Cutoff frequency to velocity.		
102	Resonance (VEL SENS)	Filter Resonance Velocity Sensitivity	Determines the sensitivity of the Resonance to velocity.		
103	(FEG) TIME	FEG Time	Determines the transition in tone (cutoff frequency) from the moment a note is pressed on the keyboard to the point at which the sound stops.	65	
104	(FEG) LEVEL	FEG Level		65	
105	(FEG) Depth	FEG Depth		65	
106	CutoffSens	Filter Cutoff Key Follow Sensitivity	Determines the Filter Key Follow (Filter Scaling) Sensitivity , or how much the level of the cutoff frequency changes in response to the note positions on the keyboard (scale).		
107	CenterKey	Filter Cutoff Key Follow Center Key	Indicates that the central note for Cutoff Sensitivity above is C3. At C3, the cutoff frequency behaves according to its actual settings. For other notes, the level varies in proportion to the key played and its interval away from the center key. (Display only; cannot be changed here.)		
108	EGTimeSens	FEG Time Key Follow Sensitivity	Determines the sensitivity of the FEG Rate settings (the speed of the FEG change) to note position.		*28
109	CenterKey	FEG Time Key Follow Center Key	Determines the basic pitch (note number) used by the EGTimeSens parameter (above). When the center note is played, the FEG time behaves according to its actual settings. For other notes, the speed varies in proportion to the key played and its interval away from the center key.		*12 *28
110	(Scaling) BREAKPOINT	Filter Cutoff Scaling Break Point	Determines the Break Points for Filter Scaling (how the filter cutoff frequency responds to note position) and Offset Levels.		*12 *43 *45
111	(Scaling) OFFSET	Filter Cutoff Scaling Offset			*43 *45
112	LPFCutoff	Low Pass Filter Cutoff	Determines the cutoff frequency for the low pass filter.	63	*17
113	LPFReso	Low Pass Filter Resonance	Determines the amount of filter resonance or emphasis of the Cutoff Frequency.	63	
114	LPFCutoff (VEL SENS)	Low Pass Filter Cutoff Velocity Sensitivity	Determines the sensitivity of the low pass filter cutoff frequency to velocity.		

Ref. #	Display	Parameter Name	Explanation	Related Page	
115	OutputSel	Output Select	Determines the specific output(s) for the individual part (Performance/Mixing Part Edit). Determines the specific output(s) for the individual Drum key signal (Drum Key Edit).		*16 *46
116	(InsEF)	Insertion Effect	Indicates whether the Insertion effect is applied or not for each part. This is for display purposes only and cannot be set here.		
117	ElementSw	Controller Set 1-6 Element Switch	Determines whether or not the selected controller affects each individual element. "-"...disabled.	55	*47
118	Source	Controller Set 1-6 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.	55	*48 *49
119	Dest	Controller Set 1-6 Destination	Determines the parameter that is controlled by the Source controller (above).	55	*50
120	Depth	Controller Set 1-6 Depth	Determines the degree to which the Source controller affects the Destination parameter.	55	
121	Filter	MW/AT(CAT)/AC(AC1) Filter Control	Determines the depth of control of the Modulation Wheel ([SF2])/Aftertouch ([SF3])/Assignable Controller ([SF4]) over the filter cutoff frequency.		
122	PMod	MW/AT(CAT)/AC(AC1) LFO Pitch Modulation Depth	Determines the depth of control of the Modulation Wheel ([SF2])/Aftertouch ([SF3])/Assignable Controller ([SF4]) has over pitch modulation (vibrato effect).		
123	FMod	MW/AT(CAT)/AC(AC1) LFO Filter Modulation Depth	Determines the depth of control of the Modulation Wheel ([SF2])/Aftertouch ([SF3])/Assignable Controller ([SF4]) has over filter cutoff modulation (wah effect).		
124	AMod	MW/AT(CAT)/AC(AC1) LFO Amplitude Modulation Depth	Determines the depth of control of the Modulation Wheel ([SF2])/Aftertouch ([SF3])/Assignable Controller ([SF4]) has over amplitude modulation (tremolo effect).		
125	Pitch (AT)	AT (CAT) Pitch Control	Determines the depth of control of keyboard aftertouch over pitch. You can set a value (in semitones) of up to two octaves.		
126	Src	AC Source (AC1 Control Number)	Determines the MIDI Control number used to control the filter, PMod, FMod, and Amod.		
127	(ARP) Switch/Hold	Arpeggio Switch/Hold Control Number	Determines the Control Number that controls the Arpeggio playback on/off and Arpeggio Hold on/off.		
128	ASA/ASB	Assignable A/B Slider Control Number	Determines the Control number to be controlled by the ASSIGN A/B sliders. This is available when controlling an external MIDI device.		
129	Dest	Assignable A/B Slider Destination	Determines the function to be controlled by the Control Change number set above. See the separate Data List.		*50
130	FS	FS Control Number/ FS Function Assignment	Assign a specific function and control number to the Footswitch.	56	*51
131	Set Remote Template Type	Set Remote Mode Template Type	Select the template for your particular sequence software.	57	
132	BankMSB/LSB	Bank Select MSB/LSB	Select the Voice for each zone by specifying these three MIDI messages. Refer to the Voice List in the separate Data List.		
133	PgmChange	Program Change (Program Number 1-128)			
134	CtrlSlider	Control Slider Control Number	Determine which Control numbers are used for the Sliders for each zone. These settings are available only when the ZoneSwitch (Master Play Mode [F2]) is set to on and the CONTORL FUNCTION on the panel is set to "zone."	53	*6
135	Level	Element Level	Adjusts the output level for the selected Element/drum key, letting you control the level balance among the Elements/keys.		

Ref. #	Display	Parameter Name	Explanation	Related Page	
136	AlternatePan	Alternate Pan Depth	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 is used as the basic Pan position.		*17
137	RandomPan	Random Pan Depth	Determines the amount by which the sound of the selected Element is panned randomly left and right for each note you press. The main Pan setting is used for the basic Pan position.		
138	ScalingPan	Scaling Pan Depth	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 is used for the basic Pan position.		
139	EGTime	AEG Time Velocity Sensitivity	Determines the degree to which velocity affects the Amplitude EG. Positive settings cause the AEG change to become faster when you play the keyboard harder (for a large Velocity value). Negative values have the opposite effect. This affects only the specified Segments.		*27
140	Segment	AEG Time Segment			*26
141	EGLevel	AEG Level Velocity Sensitivity	Determines the sensitivity of the AEG Level (the volume of the AEG change) to velocity. The Curve parameter lets you select from five different preset velocity curves (graphically indicated in the display), each determining how velocity affects the Amplitude EG.		*27
142	Curve	Velocity Sensitivity Curve			
143	(AEG) TIME	AEG Time	Determines the transition in volume (Amplitude) from the moment a note is pressed on the keyboard to the point at which the sound stops. This lets you reproduce many characteristics of natural acoustic instruments — such as the quick attack and decay of percussion sounds, or the long release of a sustained piano tone. Keep in mind that different sounds have varying degrees of natural decay. For example, a piano sound gradually decreases in volume as you hold the key; however, an organ sound stays at the same volume. Also, the larger the value of the AEG Release Time, the longer the sustain.	66	
144	(AEG) LEVEL	AEG Level		66	
145	LevelSens	Amplitude (Level) Key Follow Sensitivity	Determines the Level Key Follow (Level Scaling) Sensitivity , or how much the volume changes in response to the particular notes played on the keyboard.		
146	CenterKey	Amplitude Key Follow Center Key	Indicates that the central note for Level Sensitivity above is C3. At C3, the volume behaves according to its actual settings. For other notes, the level varies in proportion to the key played and its interval away from the center key. (Display only; cannot be changed here.)		*28
147	EGTimeSens	AEG Time Key Follow Sensitivity	Determines the sensitivity of the AEG time (the speed of the AEG change) to velocity.		
148	CenterKey	AEG Time Key Follow Center Key	Determines the basic pitch (note number) used by the EGTimeSens parameter (above). When the center note is played, the AEG time behaves according to its actual settings. For other notes, the speed varies in proportion to the key played and its interval away from the center key.		*12 *28
149	(Scaling) BREAKPOINT	Amplitude Scaling Break Point	Determines the Break Points for Amplitude Scaling (how the volume responds to note position) and Offset Levels.		*12 *44 *45
150	(Scaling) OFFSET	Amplitude Scaling Offset			*44 *45
151	Level (VEL SENS)	Level Velocity Sensitivity	Determines how the volume responds to velocity. A setting of "0" results in maximum velocity, without regard to how strongly the key is pressed. A setting of "32" resultsd in normal velocity response, while for a setting of "64," the tone generator plays only when maximum velocity (127) is received.		
152	(Native Parameters)	Plug-in Native Parameters	For editing the native parameters (those parameters exclusive to the particular board). Use the [<>] buttons to scroll through the display. 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. For details on the current lineup of available Plug-in Boards, see page 21.		
153	Detune	Detune	Determines the fine tuning.		
154	FEGDepth	FEG Depth	Determines the Filter Envelope Generator depth (amount of Cutoff frequency) for each part.		*52

Ref. #	Display	Parameter Name	Explanation	Related Page	
155	(FEG) Attack/Decay/Release (Time)	FEG Attack/Decay/Release Time	Set the FEG (Filter Envelope Generator)/AEG (Amplitude Envelope Generator) parameters for each part. The parameters offset the same parameters in Voice Element Edit (F3→[SF3]/[F4]→[SF3]).		*53
156	(FEG) Sustain (Level)	FEG Sustain Level			
157	(AEG) Attack/Decay/Release (Time)	AEG Attack/Decay/Release Time			*54
158	(AEG) Sustain (Level)	AEG Sustain Level			
159	Wave	LFO Wave	Determines the LFO waveform used to vary the sound. user...applies the user wave you edited on the Voice Editor (see the separate Installation Guide). For details, see the Voice Editor Owner's Manual (PDF).	66	*55
160	Speed	LFO Speed	Determines the speed of the LFO waveform. The higher the value, the faster the speed.		*56
161	TempoSync	LFO Tempo Sync	Determines whether or not the LFO is synchronized to the tempo of the Arpeggio or sequencer (song).		
162	TempoSpeed	LFO Tempo Speed	Allows you to make detailed note value settings that determines how the LFO pulses in sync with the Arpeggio or sequencer when the TempoSync parameter above is set to on.		*57
163	KeyOnReset	Key On Reset	Determines whether or not the LFO is reset each time a note is pressed. Three settings are available (Voice Edit Common).		*58
164	Phase	LFO Phase	Determines the starting phase point for the LFO Wave when a note is played.		*59
165	(KeyOn)Delay	LFO (Key On) Delay Time	Determines the delay time before the LFO comes into effect.		
166	FadeIn	LFO 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.		*60
167	Hold	LFO Hold Time	Determines the length of time during which the LFO is held at its maximum level.		
168	FadeOut	LFO Fade-out Time	Determines the amount of time for the LFO effect to fade out (after the Delay time has elapsed).		
169	ElementSw	LFO Destination 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.		
170	Dest	LFO Destination	Determines the parameters which are to be controlled (modulated) by the LFO Wave.		
171	Depth	LFO Depth	Determines the LFO Wave Depth.		
172	PMod (LFO)	LFO Pitch Modulation Depth	Determines the amount (depth) by which the LFO waveform varies (modulates) the pitch of the sound.		
173	FMod (LFO)	LFO Filter Modulation Depth	Determines the amount (depth) by which the LFO waveform varies (modulates) the Filter Cutoff frequency.		
174	AMod (LFO)	LFO Amplitude Modulation Depth	Determines the amount (depth) by which the LFO waveform varies (modulates) the amplitude of the sound.		
175	(Part Receive Switch)	Part Receive Switch	Set how each individual part responds to various MIDI messages, such as Control Change and Program Change messages.		*61
176	BasicRcvCh	Basic Receive Channel	Determines the MIDI channel over which the S90 receives MIDI data (from an external MIDI equipment. This parameter is available for the Voice/Performance mode. When this is set to "omni," the data of any channel can be received.		*62
177	KBDTransCh	Keyboard Transmit Channel (Voice/Performance Mode)	Determines the MIDI channel over which the S90 sends MIDI data (to an external MIDI device). This parameter is available for the Voice /Performance mode.		
178	DeviceNo./DEV NO.	Device No.	Determines the MIDI Device Number. This number must match the Device Number of the external MIDI device when transmitting/receiving system exclusive messages.		

Ref. #	Display	Parameter Name	Explanation	Related Page	
179	FileUtilID	File Utility ID	This File Utility ID number and the Device Number (above) must match the ones of the File Utility software (see the separate Installation Guide) in order to properly transfer files between the S90 and a connected computer.		
180	BankSel	Transmit/Receive Bank Select	This switch enables or disables Bank Select/Program Change messages, both in transmission and reception. When this is set to "on," the S90 responds to incoming Bank Select messages,and it also transmits appropriate Bank Select messages (when using the panel).		
181	PgmChange	Transmit/Receive Program Change			
182	CtrlChange	Control Change (AEG Sustain)	Lets you set the S90 to properly respond to either type of GM System data, Level 1 or Level 2 — particularly regarding AEG Sustain. When using GM Level 2, set this to Mode 1, and the S90 responds to the messages as parameter change data. When using GM Level 1, set this to Mode 2, and the S90 responds to the messages as control change data.		
183	LocalCtrl	Local Control	When this is set to "off," the keyboard and controllers are internally disconnected from the synthesizer's tone generator section.	18	*64 *65
184	RcvBulk	Receive Bulk	Determines whether or not Bulk Dump data can be received. protect...not received, on...received		
185	MIDI Sync	MIDI Sync	Determines whether Song/Arpeggio playback is synchronized to the S90's internal clock (int) or an external MIDI clock (MIDI).		
186	ClockOut	Clock Out	Determines whether MIDI clock [F8] messages will be transmitted via the MIDI OUT/USB terminal.		
187	SeqCtrl	Sequencer Control	Determines whether Sequencer Control signals – start, continue, stop, and song position pointer – will be received and/or transmitted via the MIDI OUT/USB terminal.		*66
188	MIDI IN/OUT	MIDI IN/OUT	Determines which physical output terminal(s) will be used for transmitting/receiving MIDI data: MIDI IN/OUT/THRU, USB, or mLAN (when the optional mLAN8E has been installed).	16	*67
189	ThruPort	Thru Port	Many computer sequencers are capable of transmitting data over several MIDI ports, effectively breaking the 16-channel barrier. When using the USB terminal for MIDI reception, MIDI messages received via the USB connector can be passed through the MIDI OUT connector of the S90 to other connected devices. Set the port number here. This is available when the MIDI IN/OUT is set to "USB."	22	
190	EL: OUT 1-4/KEY: OUT	EL 1-4/KEY Insertion Effect Out	Determines which Insertion effect (1 or 2) is used to process each individual element/key. The "thru" setting lets you bypass the Insertion effects for the specific element/key. (This parameter is the same as "InsEFOut" in Normal Element/Key Edit ([F1]→[SF2]). Making a setting here automatically changes the setting of that parameter as well.)	67	
191	InsEF Connect	Insertion Effect Connection Type	Determines the effect routing for Insertion effects 1 and 2. The setting changes are shown on the diagram in the display, giving you a clear picture of how the signal is routed. para...parallel	67	*68
192	Ins1 Ctgry/Type	Insertion 1 Category/Type	Determines the effect type for Insertion 1. Refer to the Effect Types List in the separate Data List.	67	
193	Ins2 Ctgry/Type	Insertion 2 Category/Type		67	
194	Reverb/Chorus Type	Reverb Type/Chorus Type	Determines the effect type for Reverb/Chorus. Refer to the Effect Types List in the separate Data List.	67	
195	Reverb/Chorus Send	Reverb Send/Chorus Send	Determines the level of the sound (from Insertion 1 or 2, or the bypassed signal) that is sent to Reverb/Chorus effect. A setting of "0" results in no Reverb processing of the sound.	67	
196	Reverb/Chorus Return	Reverb Return/Chorus Return	Determines the Return level of the Reverb/Chorus Effect.	67	
197	Reverb/Chorus Pan	Reverb Pan/Chorus Pan	Determines the pan position setting for the Reverb/Chorus effect. L64 (hard left) ~ c (center) ~ R63 (hard right)	67	
198	Chorus to Reverb	Send Chorus to Reverb	Determines the Send level of the signal sent from the Chorus Effect to the Reverb Effect.	67	
199	EFF PART→VCE INS	Insertion Effect Part (Voice)	Determines the part to which the Insertion effect is applied. The Insertion connection type (page 69) depends on the voice of the selected part.	67	
200	EFF PART→PLG-EF PlugEF Type	Plug-in Insertion Effect Part/Type	Determines the part to which the Insertion effect is applied and the Insertion effect type. This parameter is available only when a special Effect Plug-in board (VH) has been installed. In the PLG-EF display ([SF2]), you can make various detailed settings. (Refer to the owner's manual of your particular Plug-in Board.)	67	

Ref. #	Display	Parameter Name	Explanation	Related Page	
201	Variation Type	Variation Type	Determines the Variation effect type. Refer to the Effect Types List in the separate Data List.	69	
202	Variation Return	Variation Return	Determines the Return level of the Variation Effect.	69	
203	Variation Pan	Variation Pan	Determines the pan position of the Variation effect sound.		
204	Variation to Reverb/ Chorus	Variation to Reverb/Chorus	Determines the Send level of the signal sent from the Variation Effect to the Reverb/Chorus Effect.		
205	(Effect Parameters)	Effect Parameters	The number of parameters and values available differs depending on the currently selected effect type. For more information, see the Effect Parameter List in the separate Data List.		
206	PolyExpand	Poly Expand	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 in two or three different Parts). When this is set to "on," the two boards effectively function together as one board (used in a single part) — giving you double the amount of polyphonic notes you can play at one time.		
207	PORT NO.	Port No.	Determines the MIDI Port number over which the Plug-in board receives MIDI data. One port can be set for the Multi-part Plug-in board and two ports can be set for the Single part Plug-in board. The Port number for the Effect Plug-in board (VH) is fixed to 1.		
208	GM/XG	GM/XG	Determines whether "GM on" and "XG on" messages are recognized (on) or not (off) . This parameter is available only when the Multi-part Plug-in board has been installed to slot 3.		
209	(Native System Parameters)		Set the Native System parameters of the Plug-in board installed to each slot. For details on these parameters, refer to the owner's manual of your particular Plug-in Board.		
210	Type	EQ Type	Determines the Equalizer Type. The S90 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.		*69
211	L.Freq/Gain (Type=EQ L/H)	EQ Low Frequency/Low Gain			*17
212	H.Freq/Gain (Type=EQ L/H)	EQ High Frequency/High Gain			
213	Freq (Type=P.EQ)	Frequency			
214	Gain (Type=P.EQ)	Gain			
215	Q (Type=P.EQ)	EQ Resonance			
216	Tune	Master Tune	Adjusts the tone generator tuning (100: one semitone).		
217	FORMAT/Volume Label	Format/Volume Label	Formats a Memory Card. You can name the Volume Label.	82	
218	SAVE	Save	Saves the settings to Memory Card as a file.	82	
219	LOAD	Load	Loads files from Memory Card to your synthesizer.	82	
220	RENAME	Rename	Renames files using up to eight characters.	82	
221	DELETE	Delete	Deletes files saved on Memory Card.	82	

*1

When the Alternate Group (AltGrp) parameter is set to a setting other than "off," this parameter is unavailable, and "---" is shown in the display (Drum Key Edit).

*2

Micro Tuning Type

No.	Type	Key	Comments
00	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 equal ease. However, none of the intervals are perfectly in tune.
01~12	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.
13~24	Pure minor	A~G#	The same as Pure Major, but designed for the minor scale.
25	Werckmeister		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.
26	Kirnberger		Johann Philipp Kirnberger was also concerned with tempering the scale to allow performances in any key.
27	Vallotti & Young		Francescatonio Vallotti and Thomas Young (both mid-1700s) devised this adjustment to the Pythagorean tuning in which the first six fifths are lowered by the same amount.
28	1/4 shifted		This is the normal equal tempered scale shifted up 50 cents.
29	1/4 tone		Twenty-four equally spaced notes per octave. (Play twenty-four notes to move one octave.)
30	1/8 tone		Forty-eight equally spaced notes per octave. (Play forty-eight notes to move one octave.)
31	Indian	C~B	Usually observed in Indian music (white keys [C~B] only).

*3

Voice...Offsets to the EQ settings in the Utility ([F3]→[SF1]).

Performance/Mixing...Offsets to the Master EQ settings (Common [F2]→[SF2]).

*4

These Portamento parameters above are not available for the part to which the Drum voice is assigned.

*5

The Mode setting is not available for the Plug-in part.

*6

CONTROL FUNCTION SELECT (CS Assign)

❶ **pan**
❷ **tone**
❸ **assign**
❹ **MEQofs**
❺ **vol**
❻ **zone** (Master mode only. The setting "zone" above is available only when the Zone Switch is set to on in the [F2] MEMORY display in the Master Play mode.)

> **NOTE** **Voice/Performance/Mixing**...Set by each common edit [F1]→[SF5] (CSAssign)
> **Master**...Set by the common edit [F2] (Slider)

*7

Moving the Slider will not have any effect until you reach the current setting.

*8

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.

*9

Power On Mode Settings

Display	Mode	Program
performance	Performance Play	USER: 001
voice (USER)	Voice Play	USER: 001
voice (PRE1)	Voice Play	PRE1: 001
GM	Voice Play	GM: 001
master	Master Play	USER: 001

*10

These settings depend on the particular Plug-in board; refer to the relevant owner's manual for details.

*11

You can also create a lower and an upper range with a "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/part/zone.

*12

You can also set the range directly from the keyboard, by holding down the [INFORMATION] button and pressing the desired low and high keys.

*13

You can also create separate low and high ranges, 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/part/zone.

*14

When you have selected "voice" here, some parameters cannot be set.

*15

You can also adjust this parameter using the Control slider on the front panel (Common edit).

*16

In Drum Key edit, this is available only when Insertion Effect Output (above) is set to "thru."

*17

This parameter is effective for Waves (pre wav) selected in the [F1] - [SF1] Drum Key Oscillator Wave display (Drum Key edit).

*18

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. For example, let's assume the original Voice consists of a two-Element piano-like sound up to note C3 and a two-Element string-like sound from note C#3 upwards. Adjusting this Coarse setting by + 1 would not change the pitch of the piano-like sound to C#3. Instead, note C#3 of the original Voice (i.e., the string-like sound) would be used.

*19

Changes to velocity curve according to VelDepth (with Offset set to 64)

Velocity Depth
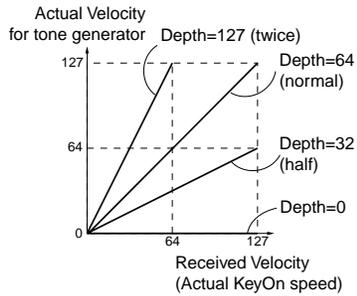
Changes to velocity curve according to VelOffset (with Depth set to 64)

Velocity Offset
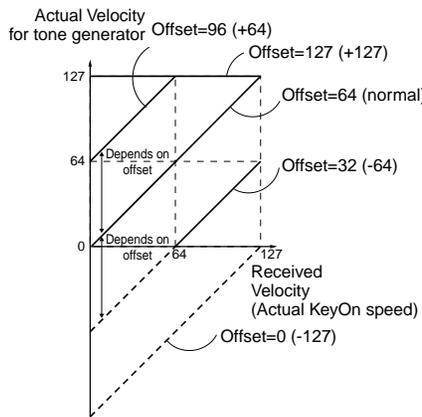
*20

Send level (to Reverb and Chorus) cannot be set independently for each Drum key; the value is fixed at 127 (maximum).

*21

A setting of "C" (center) maintains the individual Pan settings of each Element/Part (Common edit).

*22

This parameter is not available for the Plug-in parts.

*23

MEQ (Master Equalizer)
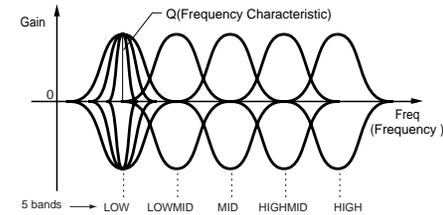
Shape
Determines whether the equalizer type used is Shelving (shelv) or Peaking (peak). The Peaking type attenuates/boosts the signal at the specified Frequency setting, whereas the Shelving type attenuates/boosts the signal at frequencies above or below the specified Frequency setting. This parameter is available for LOW, MID, and HIGH.
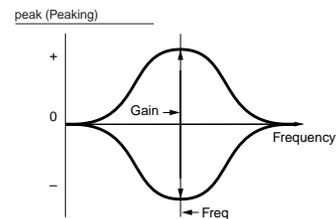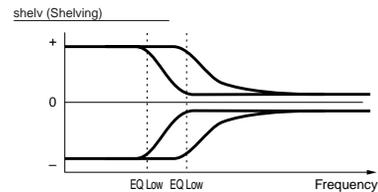
Freq (Frequency)
Determines the center frequency. Frequencies around this point are attenuated/ boosted by the Gain setting.

Gain
Determines the level gain for the Frequency (set above), or the amount the selected frequency band is attenuated or boosted.

Q (Frequency Characteristic)
This varies the signal level at the Frequency setting to create various frequency curve characteristics.
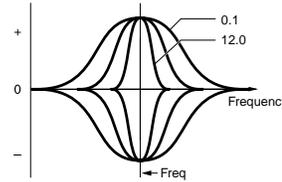
*24

You can set the parameters related Voice only when entering the Utility mode ([F3]→[SF1]) from the Voice mode.

*25

mLAN connection
From this display you can set parameters related to connection of an optional mLAN8E (page 126). The following display is available only when the optional mLAN8E has been installed.
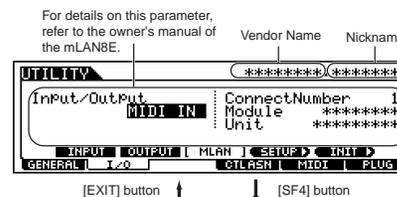
*26

All mLAN8E-related settings in the Utility mode are stored only to the memory on the mLAN8E itself, and not to the User memory of the S90. To initialize all the mLAN settings above, use the following procedure.
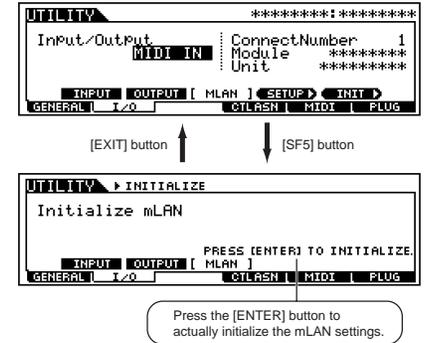
*26

Settings (Display)	Available Segment for EGTime
atk	attack time
atk+dcy	attack time/decay time
dcy	decay time
atk+rls	attack time/release time
all	all time

*27

Element control according to Velocity (ex. PEG)
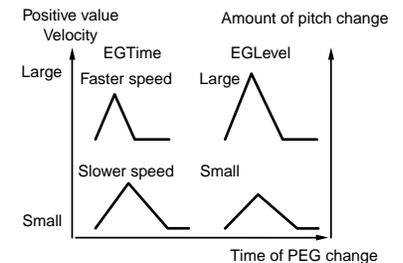
*28

Element control according to the note position on the keyboard (ex. PEG Time : Speed of PEG change)

Positive value

Negative value

Faster speed

+63

+30

Lower range

Higher range

-40

Slower speed

Basic pitch (center Key)
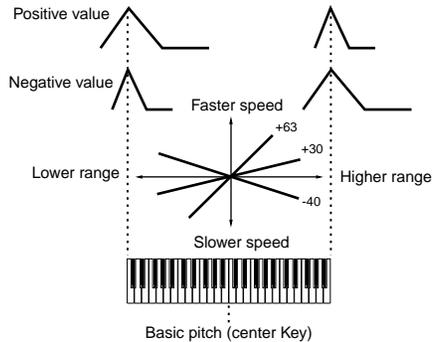
*29

When user arpeggio is selected, you can clear the selected arpeggio data by using the [SF5] button.

*30

You can also turn Arpeggio on/off from the front panel with the [ARPEGGIO ON/OFF] button (Voice Edit). Arpeggio Switch is not available for the Multi Plug-in Parts 17-32.

*31

sync-off

The first time you press a key, the first note of the arpeggiator pattern is played. From the second and subsequent key presses, the arpeggiator note that is played back depends on the arpeggiator tempo and the timing of the arpeggio pattern. For example, in the case of a 1-bar arpeggio pattern, if the second key press falls on the third beat of the bar, the arpeggio pattern plays back from the third beat onward. In other words, the first key press is used to start the arpeggio pattern and thereafter you can use the key to "mute" or "un-mute" the pattern by, respectively, holding it down or releasing it. This is particularly useful when the arpeggiator is being used to generate drum patterns.

*32

sort

Plays back notes in ascending order from the lowest key pressed to the highest.

thru

Plays back notes in the order in which the keys are pressed.

direct

Plays back the notes exactly as you play them. If changes to Voice parameters (such as Pan or Cutoff frequency) are included in the Arpeggio sequence data,they will be applied and reproduced whenever the Arpeggio plays back.

*33

With the "sort" and "thru" settings, the order in which notes are played back will depend on the Arpeggio sequence data.

*34

If the Arpeggio Category is set to Ct, you will not hear any sounds unless you select "direct" here.

*35

original

The Arpeggio plays back at the preset velocities.

thru

The Arpeggio plays back according to the velocity of your playing. For example, if you play the notes strongly, the playback volume of the Arpeggio increases.

*36

You can also create a lower and an upper trigger range for the Arpeggio, with a "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.

*37

The Velocity/Gate Time cannot be decreased beyond its normal minimum of 1; any values outside that range will automatically be limited to the minimum.

*38

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.

*39

You can set the parameters related Voice only when entering the Utility mode ([F3]→[SF2]) from the Voice mode.

*40

You can set the parameters related Voice only when entering the Utility mode ([F3]→[SF3]) from the Voice mode.

*41

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.

*42

This parameter is available for the LPF when the filter used by the part is a combination type of LPF and HPF (Performance/Mixing Part Edit).

*43

Filter Scaling Settings

The best way to understand Filter Scaling is by example. For the settings shown in the example table 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.

	1	2	3	4
BREAKPOINT	C#1	D#2	C3	A4
OFFSET	-4	+10	+17	+4
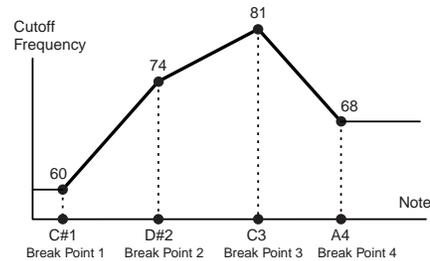
*44

Amplitude Scaling Settings

The best way to understand Amplitude Scaling is by example. For the settings shown in the example table below, 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.

	1	2	3	4
BREAKPOINT	C1	C2	C3	C4
OFFSET	-4	+10	+17	+4
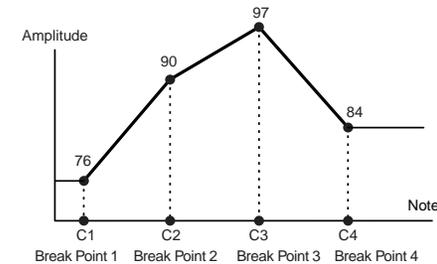
*45

BP1 to BP4 will be automatically be arranged in ascending order across the keyboard.

Regardless of the size of these Offsets, the minimum and maximum Cutoff/Volume limits (values of 0 and 127, respectively) cannot be exceeded.

Any note played below the BP1 note results in the BP1 Level setting. Likewise, any note played above the BP4 note results in the BP4 Level setting.

*46

L&R...OUTPUT L&R
asL&R...ASSIGNABLE OUTPUT L&R
asL...ASSIGNABLE OUTPUT L
asR...ASSIGNABLE OUTPUT R
drum...This setting is for Drum voice parts. When this is selected, the output destination settings for each Drum key are enabled.
as1&2...OUTPUT 1&2 on the mLAN8E
as3&4...OUTPUT 3&4 on the mLAN8E
as1/2/3/4...OUTPUT 1/2/3/4 on the mLAN8E

*47

This parameter is disabled if the Destination parameter below is set to a value from 00 to 33.

*48

PB	Pitch Bend Wheel
MW	Modulation Wheel
AT	Aftertouch
FC1/2	Foot Controller 1/2
FS	Foot Switch
BC	Breath Controller
AS1/2	ASSIGN 1/2 Slider

*49

The ASSIGN A and B sliders can each be assigned to one common function for the entire Voice mode, and not to different functions for each individual voice. Also see the Utility mode ([F4]→ [SF2]).

*50

For a complete list of the available parameters/ controls, refer to the separate Data List.

*51

For example, you can turn on the Arpeggio Switch only when pressing the Footswitch by setting the same control number for the Arpeggio Switch and the Footswitch (Utility [F4]→ [SF1][SF3]). (For switching the on and off, set the FS parameter to "96" in the Utility mode [F4]→ [SF3].)

*52

This parameter is not available for the Plug-in parts.

*53

This parameter is not available for Plug-in parts or parts to which Drum voices have been assigned.

*54

The Sustain Level/Release Time setting is not available for Plug-in parts or parts to which Drum voices have been assigned.

*55

LFO Wave

tri...triangle wave, **saw**...sawtooth wave, **squ**...square wave, **trpzd**...trapezoid wave, **S/H**...sample & hold (random)
In Element Edit, the "trpzd" and "S/H" parameters are not available.

*56
LFO Speed

Speed = fast

Speed = slow
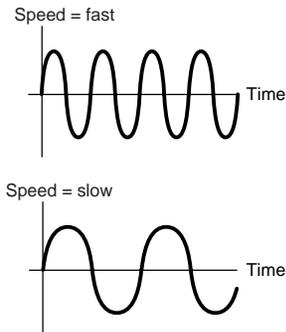
*57

LFO Tempo Speed 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)

The actual length of the note depends on the internal or external MIDI tempo (Utility [F5]→ [SF3]) setting.

*58
Key On Reset

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.

Key on
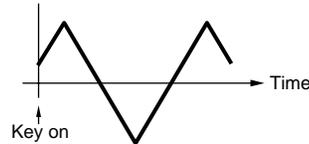
on (Element Edit)
each-on (Common Edit)
The LFO resets with each note you play and starts a waveform at the phase specified by the Phase parameter.

Key on
(first note)

Key on
(second note)
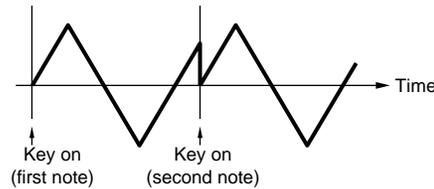
1st-on (Common Edit)
The LFO resets with every note you play and starts the waveform at the phase specified by the Phase parameter (below). However, if you play a second note while the first is being held, the LFO continues cycling according to the same phase as triggered by the first note. In other words, the LFO only resets if the first note is released before the second is played.

Key on
(first note)

Key on
(second note)
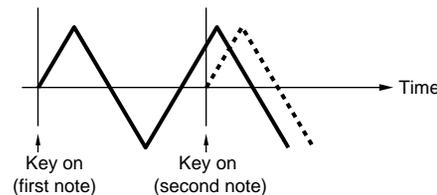
*59
LFO Phase

Determines the starting phase point for the LFO Wave when a note is played.

Phase 0°   90°   180°   270°
120°   240°
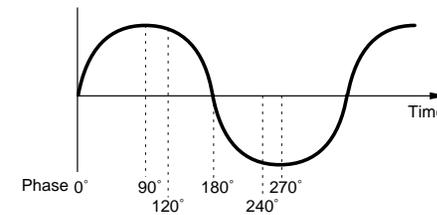
*60
LFO Delay

Delay

Short delay

Key on

Long delay

Key on

Fade-in Time

Fade in

Max

Low Fade-in value results in faster fade in

Delay

Key on

Max

High Fade-in value results in slower fade in

Delay

Key on

Hold Time

Hold

Max
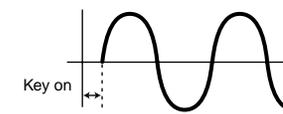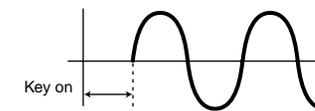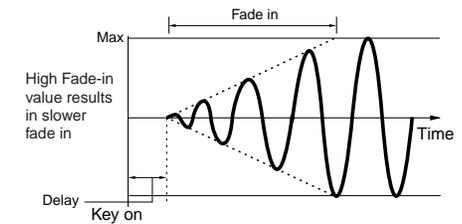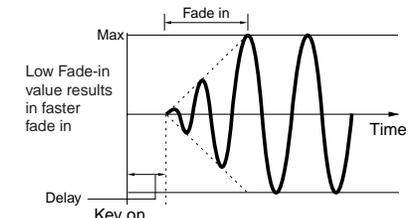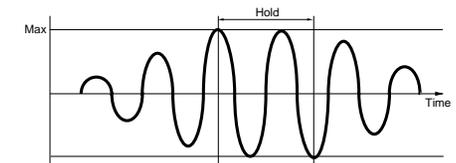
Fade Out

Low Fade-out value results in faster fade out

Hold   FadeOut

Max
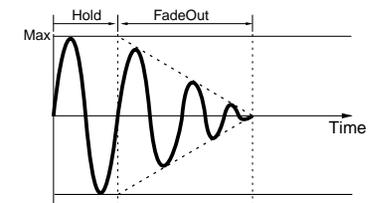
High Fade-out value results in slower fade out

Hold   FadeOut

Max
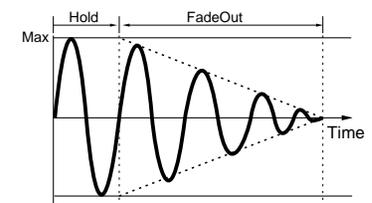
*61

Pressing the [SF5] button switches between display of all four Parts and one single Part (in which all receive switch settings are shown). In the four-Part display, use the cursor buttons to scroll.

*62

The ReceiveCh parameter in Sequence Play mode is set in the Mixing Part Edit ([F1]→[SF2]).

*63

The BasicRcvCh parameter in Voice/Performance Play mode is set in the Utility mode ([F5]→[SF1]).

*64

Even if the LocalCtrl is set to "off," the data will be transmitted through the MIDI OUT terminal. Also, the tone generator section will respond to messages received via MIDI IN.
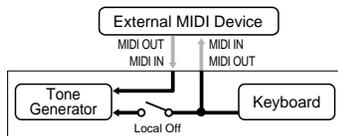
*65

In the Master mode, you can select whether or not to transmit MIDI messages for each zone (Master Edit [F1] TGSwitch).

*66

Sequencer Control

off...Not transmitted/recognized.
in...Recognized but not transmitted.
out...Transmitted but not recognized.
in/out...Transmitted/recognized.

*67

MIDI IN/OUT=MIDI
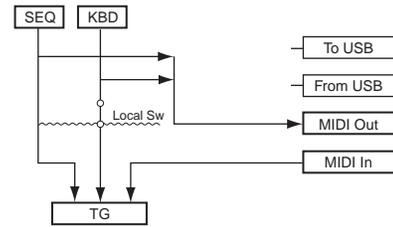
MIDI IN/OUT=USB
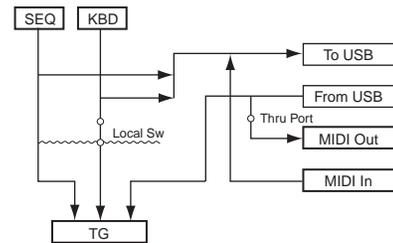
*68

The "para (parallel)" parameter is not available for the Plug-in voice.

*69

EQ (Equalizer)

EQ L/H (Low/High), Plug-in Element EQ
This is a "shelving" equalizer, which combines separate high and low frequency bands.
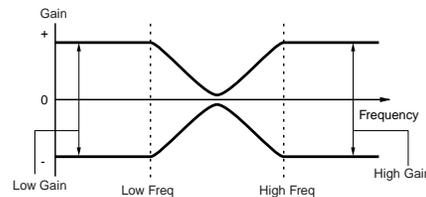
P.EQ (Parametric EQ)

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.
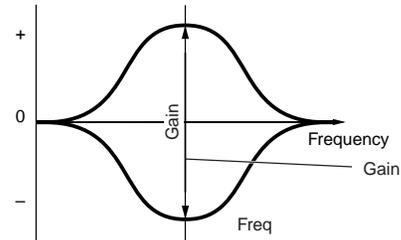
Q (Frequency Characteristic)

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.

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. To exit from the display, press the button again (or any other panel button).

Voice mode

```
VOICE                          TCH= 1
INFORMATION
  Bank      063/000 : Ins1:3 Band EQ
  EL 1234      poly : Ins2:3 Band EQ
  Porta         off : Rev :Rev Hall 1
  PB        - 2/+ 2 : Cho :Chorus 1
```

Bank
Indicates the Bank (MSB/LSB) of the currently selected Voice.

EL 1234
Indicates the currently selected voice, on/off status of four elements and mono/poly 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.

Ins1 (Insertion 1), Ins2 (Insertion 2), Rev (Reverb), Cho (Chorus)
Indicates the currently selected effect type for each effect block (page 67).

Performance mode

```
PERF                           TCH= 1
INFORMATION
  Bank      063/064 : InsPart 01 PLGoff
  1:PLG100-VH       : Rev:Rev Hall 1
  2:PLG150-AN       : Cho:TempoDelay 2
  3:PLG100-XG       : Var:Enhancer
```
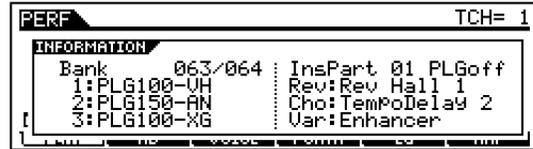
Bank
Indicates the Bank (MSB/LSB) of the currently selected Performance.

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 (Ref. #206) is set to on in the Utility mode, "P" is indicated at the left of the slot number.

InsPart (Insertion part), PLG (Plug-in Insertion part)
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), Var (Variation)
Indicates the currently selected effect type for each effect block (page 67).

Sequence Play mode

● Sequence Play mode

```
SEQPLAY                   ♩120  Meas---
INFORMATION
    Play Dir
      root/
    Current Dir
      root/
```
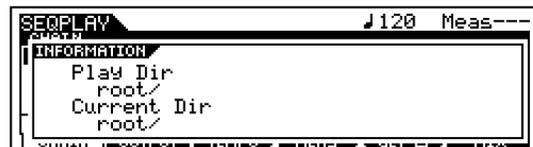
Play Dir (Play Directory)
Indicates the directory containing the file to be played back (page 75).

Current Dir (Current Directory)
Indicates the currently selected directory (page 83).

● **Sequence Play Mixing mode**
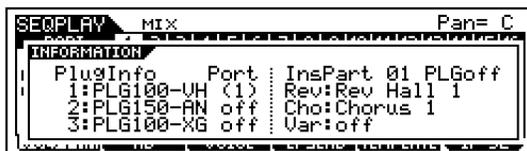
```
SEQPLAY    MIX                    Pan= C
INFORMATION
  PlugInfo    Port | InsPart 01 PLGoff
  1:PLG100-VH (1)  | Rev:Rev Hall 1
  2:PLG150-AN off  | Cho:Chorus 1
  3:PLG100-XG off  | Var:off
```

PlugInfo/Port (Plug-in board installation status)

Indicates the Plug-in board name and its MIDI port number (Ref. #207, page 77) at the right of the slot number. When PolyExpand (Ref. #206) is set to on in the Utility mode, "P" is indicated at the left of the slot number.

InsPart (Insertion part), PLG (Plug-in Insertion part)

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), Var (Variation)

Indicates the currently selected effect type for each effect block (page 67).

Utility mode
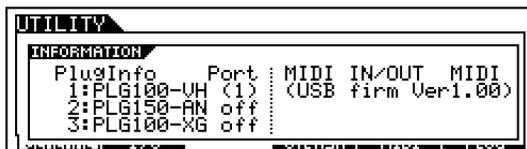
```
UTILITY
INFORMATION
  PlugInfo    Port | MIDI IN/OUT  MIDI
  1:PLG100-VH (1)  | (USB firm Ver1.00)
  2:PLG150-AN off  |
  3:PLG100-XG off  |
```

PlugInfo/Port (Plug-in board installation status)

Indicates the Plug-in board name and its MIDI port number (Ref. #207, page 77) at the right of the slot number. When PolyExpand (Ref. #206) 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: MIDI IN/OUT/THRU, USB, or mLAN (when the optional mLAN8E has been installed).

(USB firm Ver)

Indicates the USB interface firmware version.

Card mode

```
CARD                  Current CARD:root
INFORMATION
  Card Free   13.6MB/ 15.6MB
  Volume Label
  Current Dir
    root/
```

Card Free

Indicates the amount of currently available (unused) memory of the Memory card inserted to the Card slot.

Volume Label

Indicates the volume label of the Memory card inserted to the card slot.

Current Dir (Current Directory)

Indicates the currently selected directory.

Master mode

```
MASTER            Performance:USER:001(A01)
INFORMATION
  Mode      Performance
    USER:001[Co:Procession]
  ZoneSwitch   off
  ZoneTCH  1:1    2:1    3:1    4:1
```
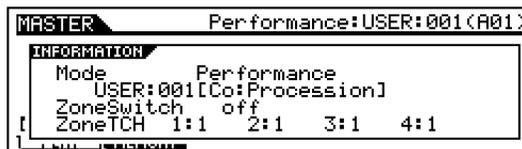
Mode

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).

Display Messages

Messages	Information
Are you sure? [YES]/[NO]	Confirms whether you want to execute a specified operation or not. Press [INC/YES] or [DEC/NO] as required.
Bad Card.	The card is unusable. Format the card and try again.
Bulk protected.	Bulk data was received when RcvBulk was set to "protect." (Utility [F5]→[SF2] Ref. #184)
Can't make folder.	No more directories can be created below the current level.
Card full.	The card is full and no more data can be saved. Use a new card, or make space by erasing unwanted data from the card.
Card not ready.	A card is not properly inserted in or connected to the S90.
Card read/write error.	An error occurred while reading or writing to/from or Memory card.
Card unformatted.	The card is not formatted, or the format is unusable by the S90. Check the card contents.
Card write protected.	The card is write protected.
Completed.	The specified load, save, format, or other job has been completed.
Device number is off.	Bulk data cannot be transmitted/received since the device number is off.
Device number mismatch.	Bulk data cannot be transmitted/received since the device numbers don't match.
Effect plug-in is not in slot 1.	The Effect Plug-in board does not work because it has not been installed to slot 1. The Effect Plug-in board should be installed to slot 1.
Executing...	Never attempt to turn off the power while data is being written to Flash ROM. Turning the power off in this state results in loss of all user data and may cause the system to freeze (due to corruption of data in the Flash ROM).
File not found.	The specified file was not found on the card during a load operation. Try again after re-inserting/re-connecting the card.
Folder is too deep.	Directories below this level cannot be accessed.
Illegal Card.	The format type of the Memory card is wrong.
Illegal file.	The file specified for loading is unusable by the S90.
Illegal file name.	The specified file name is unacceptable. Try entering a different name.
MIDI buffer full.	Failed to process the MIDI data because too much data was received at one time.
MIDI checksum error.	An error occurred when receiving bulk data.
MIDI data error.	An error occurred when receiving MIDI data.
mLAN connection error.	Indicates a problem in the mLAN8E connection. Check the on/off status of the LED lamps on the mLAN8E and refer to the Owner's Manual of the mLAN8E.
mLAN error (xxx).	Indicates an unspecified problem related to the mLAN8E.
mLAN network error.	Indicates a problem in the mLAN8E network. Check the on/off status of the LED lamps on the mLAN8E and refer to the Owner's Manual of the mLAN8E.
mLAN now in Mixer mode.	The mLAN8E board is set to the Mixer mode by your computer, and the S90 cannot control the mLAN8E.
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. The Multi-Part Plug-in board should be installed to slot 3.
Not empty folder.	You attempt to delete a folder that contains data.
Now checking plug-in board.	The S90 is checking the Plug-in board installation status when powering the S90 on.
Now loading... (xxxx)	Indicates that a file is being loaded.
Now saving... (xxxx)	Indicates that a file is being saved.
Now working...	Indicates that the S90 is currently engaged in some operation, such as writing to/reading from the card, etc.
Overwrite? [YES]/[NO]	A save operation will overwrite data on the card, and this message confirms whether it is OK to continue or not. Press [INC/YES] or [DEC/NO] as required.
Please keep power on.	Never attempt to turn off the power while data is being written to Flash ROM. Turning the power off in this state results in loss of all user data and may cause the system to freeze (due to corruption of data in the Flash ROM).

Messages	Information
Please stop sequencer.	Try this operation after stopping the sequencer.
PLG100 not supported.	The Plug-in All Bulk Save function does not apply to the PLG100 series boards.
Plug-in 1 communication error.	The Plug-in board that has been installed to slot 1 does not work.
Plug-in 2 communication error.	The Plug-in board that has been installed to slot 2 does not work.
Plug-in 3 communication error.	The Plug-in board that has been installed to slot 3 does not work.
Plug-in 1 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-in 2 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-in 3 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.
Read only file.	You have attempted to delete, rename, or overwrite a read-only file.
Receiving MIDI bulk.	The S90 is receiving MIDI bulk data.
System memory crashed.	Writing data to Flash ROM has failed because the power was turned off during the operation. User data has been initialized automatically. Turn the power off, then turn the power on again.
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 is transmitting MIDI bulk data.
Unknown file format.	The file format type is not supported by the S90.

About MIDI

MIDI is an acronym that stands for Musical Instrument Digital Interface, which allows electronic musical instruments to communicate with each other, by sending and receiving compatible Note, Control Change, Program Change and various other types of MIDI data, or messages.

The S90 can control a MIDI device by transmitting note related data and various types of controller data. The S90 can be controlled by the incoming MIDI messages which automatically determine tone generator mode, select MIDI channels, voices and effects, change parameter values, and of course play the voices specified for the various Parts.

Many MIDI messages are expressed in hexadecimal or binary numbers. Hexadecimal numbers may include the letter "H" as a suffix. The letter "n" indicates a certain whole number.

The chart below lists the corresponding decimal number for each hexadecimal/binary number.

Decimal	Hexadecimal	Binary
0	00	0000 0000
1	01	0000 0001
2	02	0000 0010
3	03	0000 0011
4	04	0000 0100
5	05	0000 0101
6	06	0000 0110
7	07	0000 0111
8	08	0000 1000
9	09	0000 1001
10	0A	0000 1010
11	0B	0000 1011
12	0C	0000 1100
13	0D	0000 1101
14	0E	0000 1110
15	0F	0000 1111
16	10	0001 0000
17	11	0001 0001
18	12	0001 0010
19	13	0001 0011
20	14	0001 0100
21	15	0001 0101
22	16	0001 0110
23	17	0001 0111
24	18	0001 1000
25	19	0001 1001
26	1A	0001 1010
27	1B	0001 1011
28	1C	0001 1100
29	1D	0001 1101
30	1E	0001 1110
31	1F	0001 1111
32	20	0010 0000
33	21	0010 0001
34	22	0010 0010
35	23	0010 0011
36	24	0010 0100
37	25	0010 0101
38	26	0010 0110
39	27	0010 0111
40	28	0010 1000
41	29	0010 1001
42	2A	0010 1010
43	2B	0010 1011
44	2C	0010 1100
45	2D	0010 1101
46	2E	0010 1110
47	2F	0010 1111
48	30	0011 0000
49	31	0011 0001
50	32	0011 0010
51	33	0011 0011
52	34	0011 0100
53	35	0011 0101
54	36	0011 0110
55	37	0011 0111
56	38	0011 1000
57	39	0011 1001
58	3A	0011 1010
59	3B	0011 1011
60	3C	0011 1100
61	3D	0011 1101
62	3E	0011 1110
63	3F	0011 1111

Decimal	Hexadecimal	Binary
64	40	0100 0000
65	41	0100 0001
66	42	0100 0010
67	43	0100 0011
68	44	0100 0100
69	45	0100 0101
70	46	0100 0110
71	47	0100 0111
72	48	0100 1000
73	49	0100 1001
74	4A	0100 1010
75	4B	0100 1011
76	4C	0100 1100
77	4D	0100 1101
78	4E	0100 1110
79	4F	0100 1111
80	50	0101 0000
81	51	0101 0001
82	52	0101 0010
83	53	0101 0011
84	54	0101 0100
85	55	0101 0101
86	56	0101 0110
87	57	0101 0111
88	58	0101 1000
89	59	0101 1001
90	5A	0101 1010
91	5B	0101 1011
92	5C	0101 1100
93	5D	0101 1101
94	5E	0101 1110
95	5F	0101 1111
96	60	0110 0000
97	61	0110 0001
98	62	0110 0010
99	63	0110 0011
100	64	0110 0100
101	65	0110 0101
102	66	0110 0110
103	67	0110 0111
104	68	0110 1000
105	69	0110 1001
106	6A	0110 1010
107	6B	0110 1011
108	6C	0110 1100
109	6D	0110 1101
110	6E	0110 1110
111	6F	0110 1111
112	70	0111 0000
113	71	0111 0001
114	72	0111 0010
115	73	0111 0011
116	74	0111 0100
117	75	0111 0101
118	76	0111 0110
119	77	0111 0111
120	78	0111 1000
121	79	0111 1001
122	7A	0111 1010
123	7B	0111 1011
124	7C	0111 1100
125	7D	0111 1101
126	7E	0111 1110
127	7F	0111 1111

NOTE
- For example, 144 - 159(Decimal)/9nH/1001 0000 - 1001 1111(Binary) indicate the note-on messages for the channels 1 through 16 respectively. 176 - 191/BnH/1011 0000 - 1011 1111 indicate the control change messages for the channels 1 through 16 respectively. 192 -207/CnH/1100 0000 - 1100 1111 indicate the program change messages for the channels 1 through 16 respectively. 240/F0H/1111 0000 is positioned at the beginning of data to indicate a system exclusive message. 247/F7H/1111 0111 is positioned at the end of the system exclusive message.

- aaH(Hexadecimal)/0aaaaaaa(Binary) indicates the data addresses. The data address consists of High, Mid and Low.
- bbH/0bbbbbbb indicates byte counts.
- ccH/0ccccccc indicates check sums.
- ddH/0ddddddd indicates data/value.

MIDI channels

MIDI performance data is assigned to one of sixteen MIDI channels. Using these channels, 1 - 16, the performance data for sixteen different instrument parts can be simultaneously sent over one MIDI cable.

Think of the MIDI channels as TV channels. Each TV station transmits its broadcasts over a specific channel. Your home TV set receives many different programs simultaneously from several TV stations and you select the appropriate channel to watch the desired program.
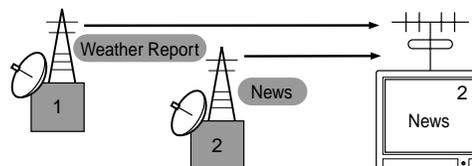
MIDI operates on the same basic principle.

The transmitting instrument sends MIDI data on a specific MIDI channel (MIDI Transmit Channel) via a single MIDI cable to the receiving instrument. If the receiving instrument's MIDI channel (MIDI Receive Channel) matches the Transmit Channel, the receiving instrument will sound according to the data sent by the transmitting instrument.

MIDI Transmit channel 2　　MIDI cable　　MIDI Receive channel 2
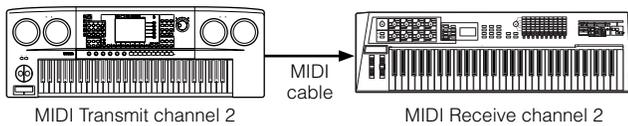
The S90 is a fully multi-timbral tone generator, allowing you to sound several different instrument parts simultaneously — from just the S90 — by assigning a different MIDI channel to each part.

MIDI Messages Transmitted/ Received by the S90

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 the S90 can receive/transmit.

NOTE The sequencer section transmits all control change messages recorded to a song.

CHANNEL MESSAGES

Channel messages are the data related to the performance on the keyboard for the specific channel.

■ Note On/Note Off (Key On/Key Off)

Messages which are generated when the keyboard is played.
Reception note range = C-2 (0) - G8 (127), C3 = 60
Velocity range = 1 - 127 (Only the Note On velocity is received)
Note On: Generated when a key is pressed.
Note Off: Generated when a key is released.
Each message includes a specific note number which corresponds to the key which is pressed, plus a velocity value based on how hard the key is struck.

■ Control Change

Control Change messages let you select a voice bank, control volume, panning, modulation, portamento time, brightness and various other controller parameters, through specific Control Change numbers which correspond to each of the various parameters.

Bank Select MSB (Control #000)
Bank Select LSB (Control #032)

Messages which select variation voice bank numbers by combining and sending the MSB and LSB from an external device.
MSB and LSB functions differently depending on the tone generator mode.
MSB numbers select voice type (Normal Voice or Drum Voice), and LSB numbers select voice banks.
(For more information about Banks and Programs, see Voice List in the "Data List" book.)
A new bank selection will not become effective until the next Program Change message is received.

NOTE When only the Program Change is received after entering any of the mode, the corresponding voice in the currently selected Type/Memory is called up.

NOTE The Master number and the Performance/Mixing/Voice mode can be changed only via the Parameter Change.

NOTE In the Performance mode, the Part Voice cannot be changed via the Program Change.

Modulation (Control #001)

Messages which control vibrato depth using the Modulation Wheel.
Setting the value to 127 produces maximum vibrato and 0 results in vibrato off.

Portamento Time (Control #005)

Messages which control the duration of portamento, or a continuous pitch glide between successively played notes. When the parameter Portamento Switch (Control #065) is set to on, the value set here can adjust the speed of pitch change.
Setting the value to 127 produces maximum portamento time and 0 results in minimum portamento time.

Data Entry MSB (Control #006)
Data Entry LSB (Control #038)

Messages which set the value for the parameter specified by RPN MSB/LSB (page 121) and NRPN MSB/LSB (page 120).
Parameter value is determined by combining MSB and LSB.

Main Volume (Control #007)

Messages which control the volume of each Part.
Setting the value to 127 produces maximum volume and 0 results in volume off.

Pan (Control #010)

Messages which control the stereo panning position of each Part (for stereo output).
Setting the value to 127 positions the sound to the far right and 0 positions the sound to the far left.

Expression (Control #011)

Messages which control intonation expression of each Part during performance.
Setting the value to 127 produces maximum volume and 0 results in volume off.

Hold1 (Control #064)

Messages which control sustain on/off.
Setting the value between 64 - 127 turns the sustain on, between 0 - 63 turns the sustain off.

Portamento Switch (Control #065)

Messages which control portamento on/off.
Setting the value between 64 -127 turns the portamento on, between 0 - 63 turns the portamento off.

Sostenuto (Control #066)

Messages which control sostenuto on/off.
Holding specific notes and then pressing and holding the sostenuto pedal will sustain those notes as you play subsequent notes, until the pedal is released.
Setting the value between 64 -127 turns the sostenuto on, between 0 - 63 turns the sostenuto off.

Harmonic Content (Control #071)

Messages which adjust the filter resonance set for each Part.
The value set here is an offset value which will be added to or subtracted from the voice data.
Higher values will result in a more characteristic, resonant sound.
Depending on the voice, the effective range may be narrower than the range available for adjustment.

Release Time (Control #072)

Messages which adjust the AEG release time set for each Part.
The value set here is an offset value which will be added to or subtracted from the voice data.

Attack Time (Control #073)

Messages which adjust the AEG attack time set for each Part.
The value set here is an offset value which will be added to or subtracted from the voice data.

Brightness (Control #074)

Messages which adjust the filter cutoff frequency set for each Part.
The value set here is an offset value which will be added to or subtracted from the voice data.
Lower values will result in a softer sound.
Depending on the voice, the effective range may be narrower than the range available for adjustment.

Decay Time (Control #075)

Messages which adjust the AEG decay time set for each Part. The value set here is an offset value which will be added to or subtracted from the voice data.

Effect1 Depth (Reverb Send Level) (Control #091)

Messages which adjust the send level for the Reverb effect.

Effect3 Depth (Chorus Send Level) (Control #093)

Messages which adjust the send level for the Chorus effect.

Data Increment (Control #096) Decrement (Control #097) for RPN

Messages which increase or decrease the MSB value of pitch bend sensitivity, fine tune, or coarse tune in steps of 1. You are required to assign one of those parameters using the RPN in the external device in advance.
The data byte is ignored.
When the maximum value or minimum value is reached, the value will not be incremented or decremented further. (Incrementing the fine tune will not cause the coarse tune to be incremented.)

NRPN (Non-Registered Parameter Number) LSB (Control #098) (Plug-in Board only) NRPN (Non-Registered Parameter Number) MSB (Control #099) (Plug-in Board only)

Messages which adjust a voice's vibrato, filter, EG, drum setup or other parameter settings.
First send the NRPN MSB and NRPN LSB to specify the parameter which is to be controlled. Then use Data Entry (page 119) to set the value of the specified parameter.
Note that once the NRPN has been set for a channel, subsequent data entry will be recognized as the same NRPN's value change. Therefore, after you use the NRPN, you should set a Null (7FH, 7FH) value to avoid an unexpected result.
For details, refer to the owner's manual of the relevant Plug-in Board.

**RPN (Registered Parameter Number) LSB
(Control #100)
RPN (Registered Parameter Number) MSB
(Control #101)**

Messages which offset, or add or subtract values from a
Part's pitch bend sensitivity, tuning, or other parameter
settings.

First send the RPN MSB and RPN LSB to specify the
parameter which is to be controlled. Then use Data
Increment/Decrement (page 120) 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 an
unexpected result.

The following RPN numbers can be received.

RPN MSB	RPN LSB	PARAMETER
00	00	Pitch Bend Sensitivity
00	01	Fine Tune
00	02	Coarse Tune
7F	7F	Null

■ Channel Mode Messages

The following Channel Mode Messages can be received.

2nd BYTE	3rd BYTE	MESSAGE
120	0	All Sounds Off
121	0	Reset All Controllers
123	0	All Notes Off
126	0 ~ 16	Mono
127	0	Poly

All Sounds Off (Control #120)

Clears all sounds currently sounding on the specified
channel. However, the status of channel messages such
as Note On and Hold On is maintained.

Reset All Controllers (Control #121)

The values of the following controllers will be reset to the
defaults.

CONTROLLER	VALUE
Pitch Bend Change	0 (center)
Aftertouch	0 (off)
Polyphonic Aftertouch	0 (off)
Modulation	0 (off)
Expression	127 (max)
Hold1	0 (off)
Portamento	0 (off)
Sostenuto	0 (off)
Soft Pedal	0 (off)
Portamento Control	Cancels the Portamento source key number
RPN	Number not specified; internal data will not change
NRPN	Number not specified; internal data will not change

All Notes Off (Control #123)

Clears all notes currently on for the specified channel.
However, if Hold1 or Sostenuto is on, notes will continue
sounding until these are turned off.

Mono (Control #126)

Performs the same function as when an All Sounds Off
message is received, and if the 3rd byte (mono number) is
in the range of 0 - 16, sets the corresponding channel to
Mono Mode (Mode 4: m = 1).

Poly (Control #127)

Performs the same function as when an All Sounds Off
message is received, and sets the corresponding channel
to Poly Mode.

■ Program Change

Messages which 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.

■ 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.
The S90 does not transmit this data from the keyboard; however, the S90 does properly respond to this data when received from an external device.

■ 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.
The S90 does not transmit this data from the keyboard; however, the data is transmitted from the S90's internal sequencer.

SYSTEM MESSAGES

System messages are the data related to the overall system of the device.

■ System Exclusive Messages

System Exclusive messages control various functions of the S90, including master volume and master tuning, tone generator mode, effect type and various other parameters.

General MIDI (GM) System On (Sequence Play mode only)

When "General MIDI system on" is received, the S90 will receive the MIDI messages which are compatible with GM System Level 1, and consequently will not receive NRPN and Bank Select messages.

F0 7E 7F 09 01 F7 (Hexadecimal)

🎵 NOTE Make sure that the interval between this message and the first note data of the song is at least a quarter note or greater in length.

Master Volume

When received, the Volume MSB will be effective for the System Parameter.

F0 7F 7F 04 01 ll mm F7 (Hexadecimal)

* mm (MSB) = appropriate volume value,
  ll (LSB)   = ignored

■ System Realtime Messages

System Realtime messages

Control the sequencer, including Start (FAH), Continue (FBH), Stop (FCH), MIDI clock (F8H) and Active Sensing messages (see below).

Active Sensing

Once FEH (Active Sensing) has been received, if no MIDI data is subsequently received for longer than an interval of approximately 300msec, the S90 will perform the same function as when All Sounds Off, All Notes Off, and Reset All Controllers messages are received, and will then return to a status in which FEH is not monitored

■ System Common Messages (Transmit only)

System Common messages also control the sequencer, including Song Select and Song Position Pointer messages.

🎵 NOTE Refer to the MIDI Data Format in the "Data List" book for more information on the various messages.

Installing Optional Hardware

Optional units that can be installed to the S90

Plug-in Boards   mLAN8E
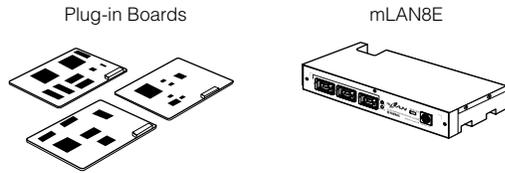
Installation locations

mLAN8E cover

YAMAHA S90

Plug-in Board cover
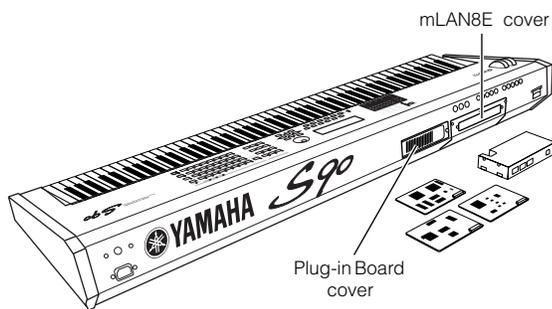
Up to three boards can be installed to the rear panel.

Installation Precautions

Before installing the optional hardware, make sure you have a Philips screwdriver.

⚠
- Before beginning installation, switch off the power to the S90 and connected peripherals, and unplug them from the power outlet. Then remove all cables connecting the S90 to other devices. (Leaving the power cord connected while working can result in electric shock. Leaving other cables connected can interfere with work.)
- Be careful not to drop any screws inside the instrument during installation (this can be prevented by keeping the optional units and cover away from the instrument while attaching). If this does happen, be sure to remove the screw(s) from inside the unit before turning the power on. Loose screws inside the instrument can cause improper operation or serious damage. If you are unable to retrieve a dropped screw, consult your Yamaha dealer for advice.
- Install the optional units carefully as described in the procedure below. Improper installation can cause shorts which may result in irreparable damage and pose a fire hazard.
- Do not disassemble, modify, or apply excessive force to board areas and connectors on optional units. Bending or tampering with boards and connectors may lead to electric shock, fire, or equipment failures.
- 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.

⚠
- 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.

Optional Plug-in Board Installation

A variety of optional Plug-in boards (page 21) sold separately let you expand the voice library of your instrument.
The following types of Plug-in boards can be used with your instrument.

- PLG150-AN
- PLG150-PF
- PLG150-VL
- PLG150-DX
- PLG150-DR
- PLG150-PC
- PLG100-XG
- PLG100-VH

Installing the Plug-in Board

The S90 has three slots on the rear panel, allowing you to install and use up to three separate Plug-in boards.

❶ Turn the S90 power off, and disconnect the AC power cord. Also, make sure to disconnect the S90 from any connected external devices.

❷ 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. It will be used when attaching the cover to the S90 again.
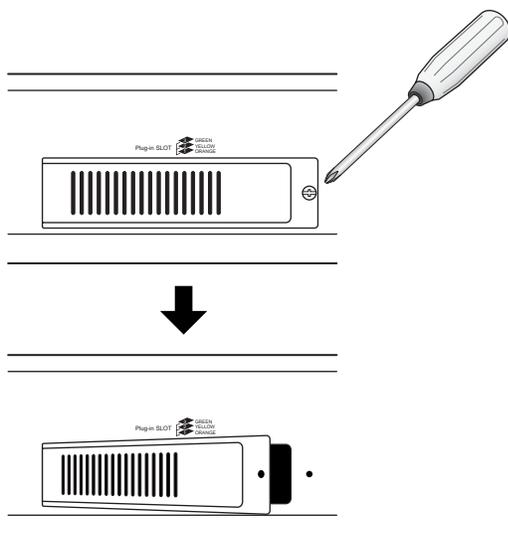
❸ Remove the ribbon cables that are to be connected to the Plug-in board from the inside of the S90. The slots are assigned to the color-coded cables as follows:

Slot 1 — Orange
Slot 2 — Yellow
Slot 3 — Green
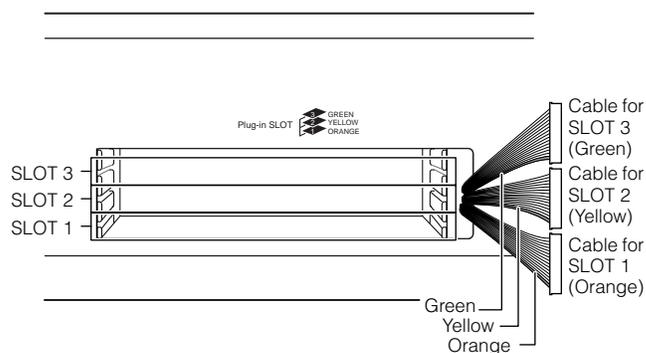
❹ Insert the board along the guide rails, with the connector side face up and toward you.

♪ NOTE The Vocal Harmony Plug-in board (PLG100-VH) can installed only to slot 1.

♪ NOTE The Multi part Plug-in board (PLG-100XG) can installed only to slot 3.

♪ NOTE The Single part Plug-in board can installed to any of three slots.

Securely insert the board into the appropriate slot, taking care that the board isn't jammed between slots.
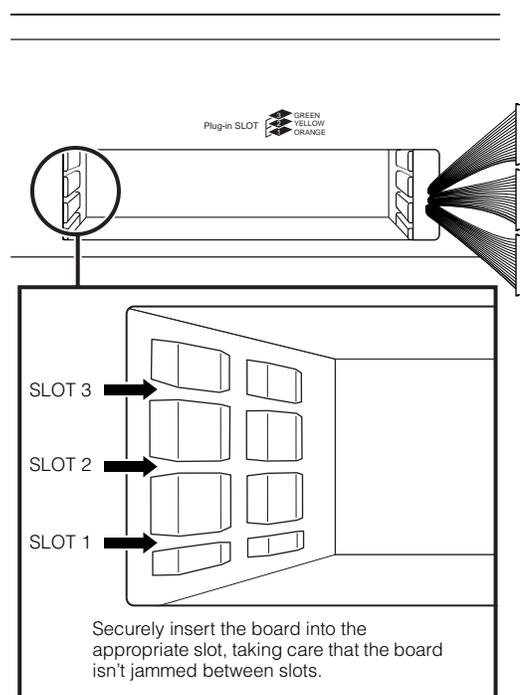
❺ Insert the Plug-in board into the expansion bay, slowly pushing it all the way in until it fits in place.

Plug-in SLOT — GREEN / YELLOW / ORANGE
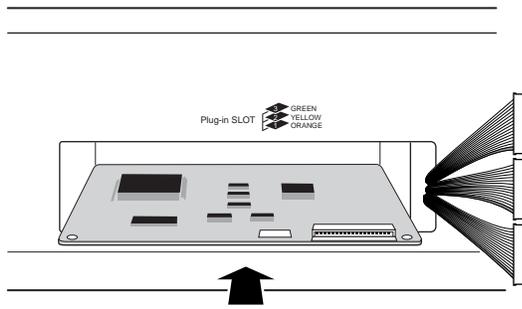
❻ Bring the cable end around and connect it to the board. Make sure to connect the proper cable, matching the color of the cable to the slot used. Also, take care not to pull on the cable too forcefully as you connect it to the board.

Plug-in Connector

Press the connectors together until the two notches lock into the sockets.

Notch

Connector from S90   Plug-in board

Plug-in SLOT — GREEN / YELLOW / ORANGE
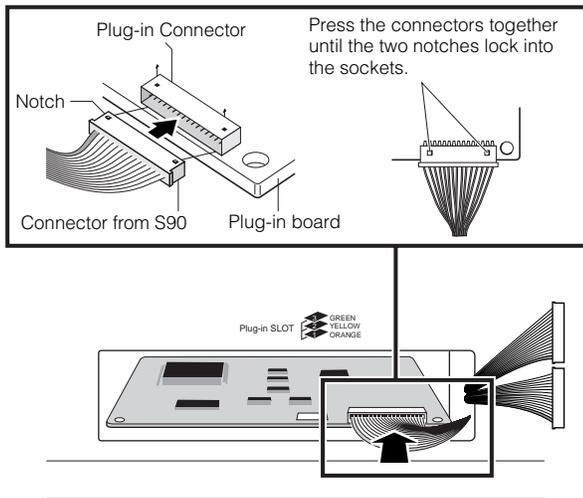
❼ Carefully put the ribbon cable back into the S90, making sure that no part of the cable sticks out of the instrument.

Plug-in SLOT — GREEN / YELLOW / ORANGE
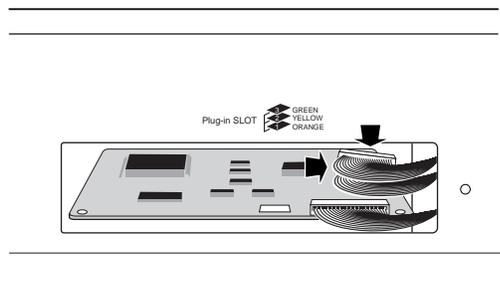
❽ Replace the cover with the screw you removed in step 2 above. Replacing the cover also serves to securely hold the Plug-in board(s) in place.

❾ Check that the installed Plug-in board is functioning properly. Turn on the power.

- A message appears indicating that the installed Plug-in Board is being checked. 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 an error message appears, the S90 freezes after a while, indicating that the installation was not successful. If this happens, turn off the power and carefully go through the installation procedure again.

Slot Indicator lamps

PROGRAM   SLOT 1   SLOT 2   SLOT 3

PRE 3   GM   USER   PLG 1   PLG 2   PLG 3   CATEGORY SEARCH

ORGAN   GUITAR/ PLUCKED   BASS   STRINGS   BRASS   REED/PIPE
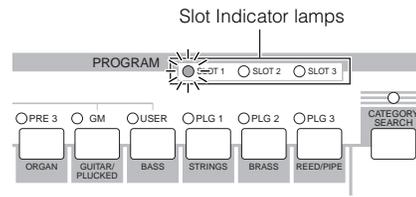
In this example, a Plug-in board has been installed to slot 1.

Installing Optional Hardware **125**

Optional mLAN8E Installation

With the mLAN8E board, you can conveniently and easily hook up your S90 to other mLAN-compatible instruments or devices.

Installing the mLAN8E

● Turn the S90 power off, and disconnect the AC power cord. Also, make sure to disconnect the S90 from any connected external devices.

● Turn over the S90 so you can have direct access to the underside. To protect the Knobs and Wheels, place the keyboard so the four corners are supported by something that provides sufficient support like magazines or cushions.

View of the keyboard from the bottom.

Please the supports at all four corners without touching the Wheels.
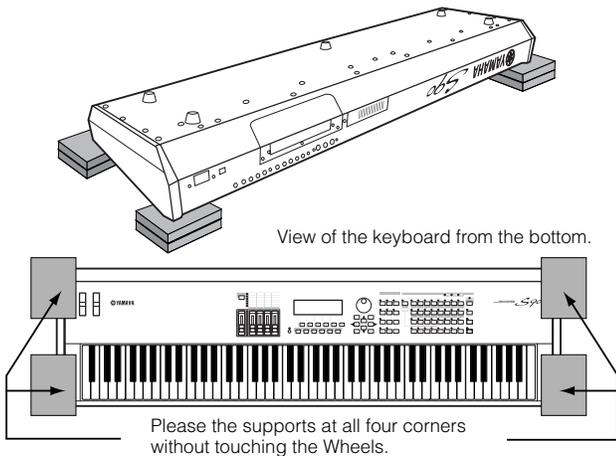
NOTE Be careful not to drop or bump the keyboard and make sure that it is well balanced before proceeding.

● With the rear panel of the upside-down instrument facing you (as shown in the top illustration of step ●), remove the cover of the rear panel. Unscrew the four screws (as shown below), and 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 again after installing the mLAN8E.

Rear panel of S90
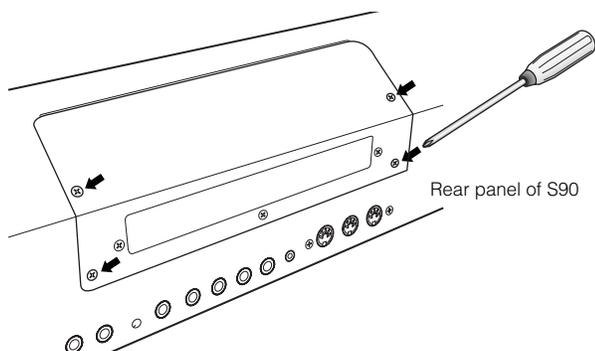
● Remove the three screws from the rear cover while holding it from inside the S90 with your left hand.
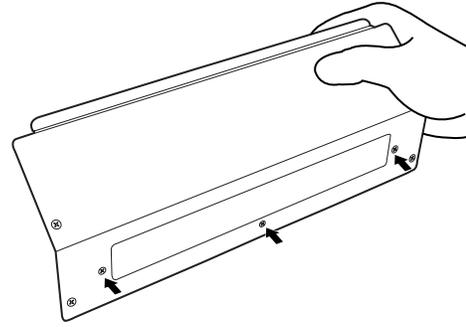
IMPORTANT Keep the removed screws in a safe place. They will be used when attaching the cover to the S90 again if the mLAN8E is removed in the future.

● Remove the mLAN8E from its package and connect the included flat ribbon cable. Securely fasten the flat ribbon cable to the rear panel of the mLAN8E. Make sure that the ribbon is at the top, as shown.
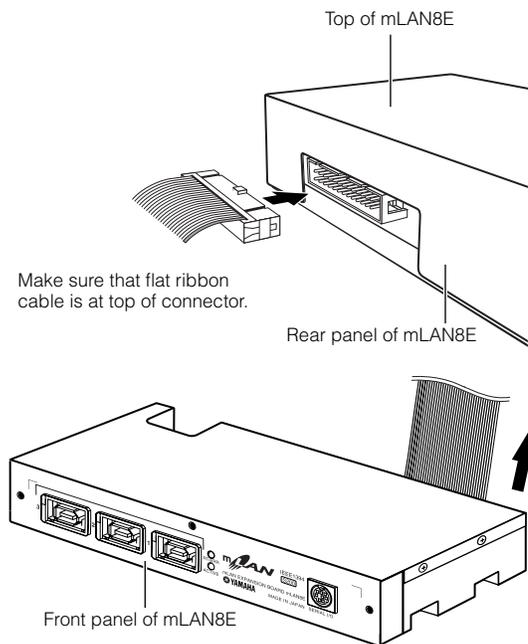
Top of mLAN8E

Make sure that flat ribbon cable is at top of connector.

Rear panel of mLAN8E

Front panel of mLAN8E

Make sure that flat ribbon cable sticks out from the top and that the panel printing "mLAN8E" can be seen.

❻ Fasten the mLAN8E to the rear cover you removed in step ❸. Attach the unit to the cover with the three screws you removed earlier (in step ❹). If you start replacing the screws from the center screw, it will be easier to replace the remaining screws.
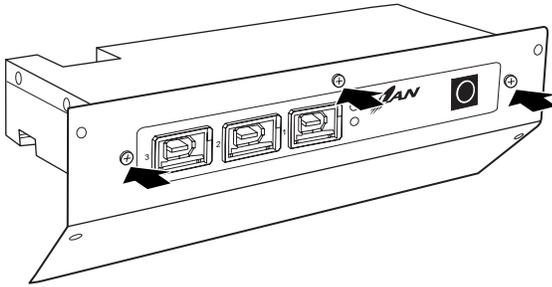
❼ Fasten the ribbon cable on the top of mLAN8E by using one of the tapes that came with mLAN8E.
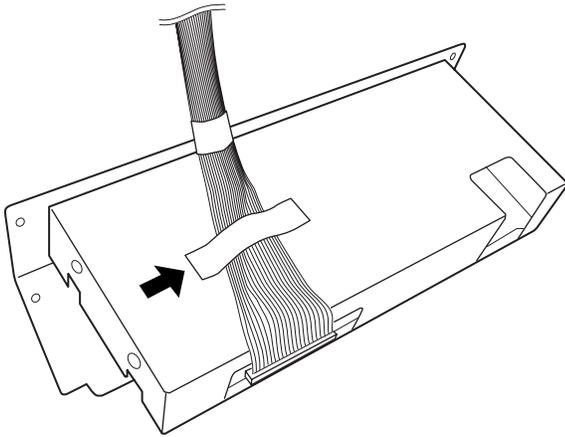
❽ Hold the mLAN8E upside down, and insert the connector on the other end of the flat ribbon cable, to the circuit board of the S90.

Align the connectors as shown.

Underside of the S90

Rear panel of the S90

Underside of mLAN8E

Front panel of mLAN8E
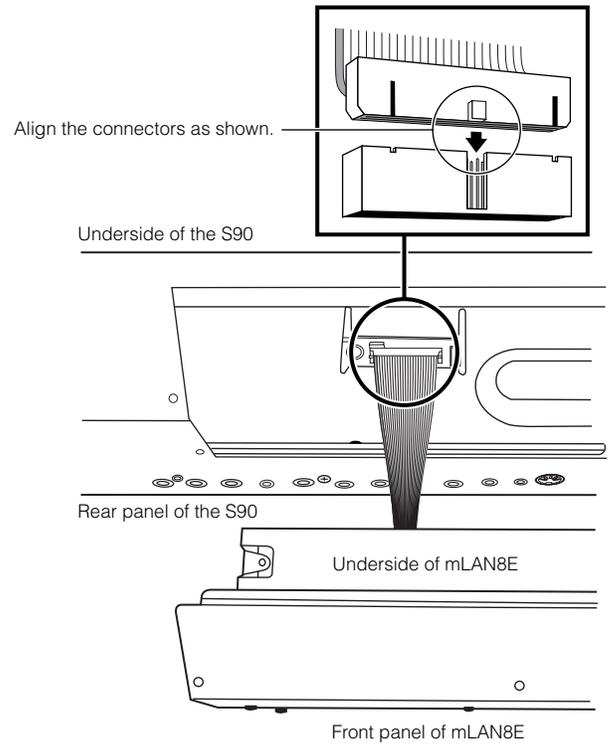
❾ Re-install the cover (with the affixed mLAN8E) to the S90.

Insert this in the S90's inside.
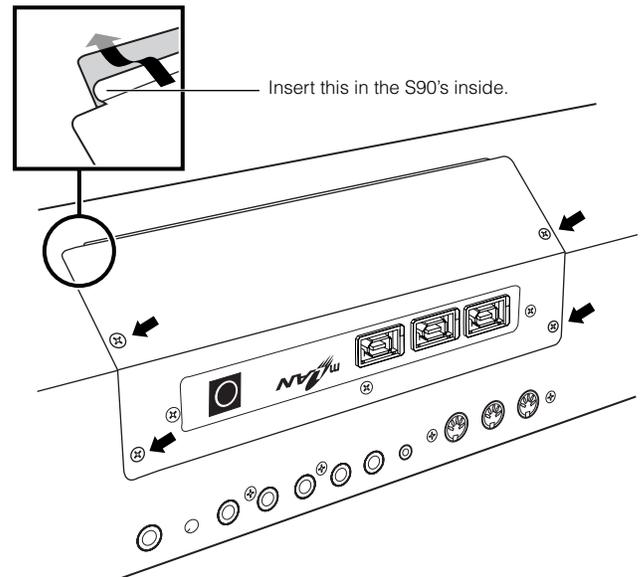
Troubleshooting

No sound? Wrong sound? When a problem like this occurs, please check the following points before assuming that the product is faulty. In many cases you'll find the solution to your problem here. If the problem persists, then contact your Yamaha dealer or service center (Page 138).

No sound.

- Is the power of the S90 and any external equipment connected to the S90 turned on? (Page 14)
- Have you made all the appropriate level settings – including the Master Volume on the S90 and the volume settings on any connected external equipment? (Page 14)
- Is the Foot Controller pressed down (when it is connected to the FOOT CONTROLLER jack)? (Page 18)
- Is the S90 properly connected to related external equipment (e.g., amplifier or speaker) via audio cables? (Page 15)
- When the voice produces no sound, is the Volume or Level in the Voice common edit set appropriately? (Ref. #43, #135)
- When the voice produces little or no sound, have you changed any of the CS slider settings? (The CS 1-4 sliders can control the element levels in the voice. If all these are set to "0," the voice will not sound.) (Page 53)
- When the voice produces no sound, are the parameters in the Voice element edit (e.g., element switch, note limit, velocity limit) set appropriately in the Voice common edit? (Page 62)
- When the voice produces no sound, are the effect and filter settings appropriate? (Inappropriate filter cutoff frequency settings can result in no sound.) (Pages 63, 67)
- When the performance produces no sound, has a voice been assigned to each part? (Ref. #29, #36)
- When the performance produces no sound, is the note limit of each part set appropriately? (Ref. #32)
- When the performance produces no sound, is the volume of each part set appropriately? (Ref. #43, #135)
- When the performance produces little or no sound, have you changed any of the CS slider settings? (The CS 1-4 sliders can control the part levels in the performance. If all these are set to "0," the performance will not sound.)   (Page 53)
- When the performance produces no sound, is the output select of each part set appropriately? (Ref. #115)
- When the song playback produces no sound, are any or all of the tracks muted? (Page 76)
- When the song playback produces no sound, are the output channel of each track in the play mode and the receive channel of each part in the Mixing mode set appropriately? (Page 77)
- When the song playback produces no sound, is the volume of each part in the Mixing mode set appropriately? (Page 78)
- When the song playback produces no sound, is the output select of each part in the Mixing mode set appropriately? (Page 77)
- When the arpeggio produces no sound, are the note limit and velocity limit set appropriately? (Ref. #81, #82)
- Is MIDI Local set to off in the Utility mode? (Ref. #183)

Distorted sound.

- Are the effect settings appropriate? (Ref. #190-#205)
- Are the filter settings appropriate? (Excessively high filter resonance settings can cause distortion.) (Ref. #91-#93)
- Is the MASTER VOLUME set so high that clipping is occurring? (Page 14)
- Is the volume of each element in the Voice mode or the volume of each part in the Performance mode or the volume of each track/part in the Song mode set too high? (Ref. #43, #135)

Sound level is too low.

- Are the MIDI volume or MIDI expression settings too low (by using the Foot Controller)? (Page 18)
- Is the cutoff frequency of the filters set too high/low? (Ref. #92, #96)

Sound is cut off.

- Are you exceeding the maximum polyphony of the S90? (Page 22)

Pitch or intervals are wrong.

- Is the Master Tune parameter in the Utility mode set at a value other than "0"? (Ref. #216)
- Is the Note Shift parameter in the Utility mode set at a value other than "0"? (Ref. #41)
- When the voice produces a wrong pitch, is the appropriate tuning system selected from Micro Tuning parameter in the Voice Edit mode? (Ref. #5)
- When the voice produces a wrong pitch, is the LFO Pitch Modulation Depth in the Voice Edit mode set too high? (Ref. #172)
- When the performance produces a wrong pitch, is the Note Shift parameter of each part set at a value other than "0"? (Ref. #41)
- When the performance produces a wrong pitch, is the Detune parameter of each part set at a value other than "0"? (Ref. #153)

Only one note sounds at a time.

- Is the Mono/Poly parameter in the Voice mode set to "mono"? (Ref. #3)

No effect is applied.

- Is the [EFFECT BYPASS] button turned off? (Page 12)
- Have any or all of the elements' Effect Output parameter been set to "thru"? (Ref. #190)
- Have any or all of the effect types been set to "thru" or "off" (in the Effect display of the Voice Edit mode)? (Ref. #192-#194)

An inappropriate or unexpected value results when using the keyboard and the [INFORMATION] button to change a setting.

- Has the Transpose parameter in Utility mode been set to a value other than 0? ([F1] → [SF2] Ref. #18)

Song cannot be started.

- Does the selected song contain data? (Page 75)
- Is the Remote Control turned on? (Page 12)
- Is the MIDI sync parameter set to MIDI (using external clock) in the Utility mode? (Ref. #185)
- Has the appropriate Play directory (for Sequence playback) been selected? (Page 75)

Can't save data to the Memory card .

● Is the Memory card being used write protected? (Write-protect should be set to off for saving data.) (Page 82)
● Is the Memory card being used properly formatted? (Page 82)

MIDI bulk data transmission/reception won't work properly.

● Is the Receive Bulk parameter set to "protect" in the Utility mode? (Ref. #184)

Plug-in board does not work.

● Is the lamp of the corresponding slot number to which the Plug-in board has been installed lit? (Pages 73 and 125)
● Has the Vocal Harmony Plug-in board been installed to slot 2 or 3? (The VH board should be installed to slot 1.)
(Page 124)
● Has the Multi-part Plug-in board been installed to slot 1 or 2? (The Multi-part Plug-in board should be installed to slot 3.)
(Page 124)

S90 hangs up or freezes during start up because of a malfunction or incorrect operation.

● While data is being written to Flash ROM (while an "Executing..." or "Please keep power on" message is shown),
power should never be turned off – this results in loss of all user data and may cause the system to freeze. If this
happens, turn the power off, then simultaneously hold down the [MASTER], [STORE], and [PRE1] buttons while
turning the power on again. If a "System memory crashed" message appears, refer to page 117.

Specifications

Keyboards		88 keys, Balanced Hammer Effect Keyboard (Initial Touch/Aftertouch)
Tone Generator block	Tone Generator	AWM2 (complying with the Modular Synthesis Plug-in System)
	Polyphony	64 notes + the polyphony of the Plug-in Board (if installed)
	Multi Timbral Capacity	16 parts (internal) + 3 or more Plug-in Board parts (1 for each Single Plug-in Board; 16 for Multi Plug-in Board), A/D Input
	Wave	110MB (when converted to 16- bit linear format), 1347 waveforms
	Voice	Preset: 384 normal voices + 48 drum kits GM : 128 normal voices + 1 drum kit User: 128 normal voices + 16 drum kits
	Plug-in Voice	Preset for the PLG150-AN/PF/DX/DR/PC: 64 Preset for the PLG-150VL: 192 User: 64 for each Plug-in slot
	Performance	User: 128 (up to 4 parts)
	Arpeggio	Preset 1 x 128 types Preset 2 x 128 types User x 128 types (read only) * MIDI Sync, MIDI transmit/receive channel, Velocity Limit, and Note Limit can be set.
	Filter	21 types
	Effect System	Reverb x 12 types, Chorus x 25 types, Insertion 1 x 25 types, Insertion 2 x 104 types, Variation x 25 types (available for Performance/Song), Master Equalizer (5 bands), Plug-in Insertion (available when the PLG100-VH has been installed to slot 1)
	Expandability	3 Slots for Modular Synthesis Plug-in Boards
Sequencer block	Sequence Play	SMF Format 0 (Direct Play only)
	Tempo	1 - 300
	Number of Sequence Chains	100 steps (100 Songs)
Others	Master	User: 128
	Sequence Software controlled via the Remote Control function (page 59)	
	Controllers	Pitch Bend wheel, Modulation wheel, Assignable Control Slider x 4, Data dial
	Display	240 x 64 dot graphic backlit LCD
	External Memory	SmartMedia™ (3.3V) * Up to 128MB can be used.
	Dimensions, Weight	1,357(W) x 386(D) x 163(H)mm, 23.0kg
	Supplied Accessories	Power cord, Owner's Manual Set TOOLS for S90 CD-ROM

Specifications and descriptions in this owner's manual are for information purposes only. Yamaha Corp. reserves the right to change or modify products or specifications at any time without prior notice. Since specifications, equipment or options may not be the same in every locale, please check with your Yamaha dealer.

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MEMO

For details of products, please contact your nearest Yamaha 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 Mexico S.A. De C.V.,
Departamento de ventas
Javier Rojo Gomez No.1149, Col. Gpe Del
Moral, Deleg. Iztapalapa, 09300 Mexico, D.F.
Tel: 686-00-33

BRAZIL
Yamaha Musical do Brasil LTDA.
Av. Rebouças 2636, São Paulo, Brasil
Tel: 011-853-1377

ARGENTINA
Yamaha de Panamá 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 de Panamá 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 Europa GmbH.
Siemensstraße 22-34, 25462 Rellingen, Germany
Tel: 04101-3030

SWITZERLAND
Yamaha Europa GmbH. Zweigniederlassung Zürich
Seefeldstrasse 94, 8008 Zürich, Switzerland
Tel: 01-383 3990

AUSTRIA
Yamaha Europa GmbH. Zweigniederlassung Wien
Schleiergasse 20, A-1100 Wien, Austria
Tel: 01-60203900

THE NETHERLANDS
Yamaha Music Nederland
Clarissenhof 5-b, 4133 AB Vianen, The Netherlands
Tel: 0347-358 040

BELGIUM
Yamaha Music Belgium
Rue de Geneve (Genevastraat) 10, 1140 - Brussels,
Belgium
Tel: 02-726 6032

FRANCE
Yamaha Musique France,
Division Professionnelle
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: 91-201-0700

GREECE
Philippe Nakas S.A.
Navarinou Street 13, P.Code 10680, Athens, Greece
Tel: 01-364-7111

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 8B
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
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OTHER EUROPEAN COUNTRIES
Yamaha Europa GmbH.
Siemensstraße 22-34, 25462 Rellingen, Germany
Tel: 04101-3030

AFRICA

Yamaha Corporation,
Asia-Pacific Music Marketing Group
Nakazawa-cho 10-1, Hamamatsu, Japan 430-8650
Tel: 053-460-2312

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OTHER COUNTRIES
Yamaha Music Gulf FZE
LB21-128 Jebel Ali Freezone
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ASIA

HONG KONG
Tom Lee Music Co., Ltd.
11/F., Silvercord Tower 1, 30 Canton Road,
Tsimshatsui, Kowloon, Hong Kong
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INDONESIA
PT. Yamaha Music Indonesia (Distributor)
PT. Nusantik
Gedung Yamaha Music Center, Jalan Jend. Gatot Subroto
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PHILIPPINES
Yupangco Music Corporation
339 Gil J. Puyat Avenue, P.O. Box 885 MCPO,
Makati, Metro Manila, Philippines
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SINGAPORE
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11 Ubi Road #06-00, Meiban Industrial Building, Singapore
Tel: 65-747-4374

TAIWAN
Yamaha KHS Music Co., Ltd.
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Taipei, Taiwan, R.O.C.
Tel: 02-2713-8999

THAILAND
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NEW ZEALAND
Music Houses of N.Z. Ltd.
146/148 Captain Springs Road, Te Papapa,
Auckland, New Zealand
Tel: 9-634-0099

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Asia-Pacific Music Marketing Group
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HEAD OFFICE **Yamaha Corporation, Pro Audio & Digital Musical Instrument Division**
Nakazawa-cho 10-1, Hamamatsu, Japan 430-8650
Tel: 053-460-2445

SY24

FCC INFORMATION (U.S.A.)

1. **IMPORTANT NOTICE: DO NOT MODIFY THIS UNIT!**
   This product, when installed as indicated in the instructions contained in this manual, meets FCC requirements. Modifications not expressly approved by Yamaha may void your authority, granted by the FCC, to use the product.

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

3. **NOTE:** This product has been tested and found to comply with the requirements listed in FCC Regulations, Part 15 for Class "B" digital devices. Compliance with these requirements provides a reasonable level of assurance that your use of this product in a residential environment will not result in harmful interference with other electronic devices. This equipment generates/uses radio frequencies and, if not installed and used according to the instructions found in the users manual, may cause interference harmful to the operation of other electronic devices. Compliance with FCC regulations does not guarantee that interference will not occur in all installations. If this product is found to be the source of interference, which can be determined by turning the unit "OFF" and "ON", please try to eliminate the problem by using one of the following measures:

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

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

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

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

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

* This applies only to products distributed by YAMAHA CORPORATION OF AMERICA. (class B)

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.

• This applies only to products distributed by Yamaha-Kemble Music (U.K.) Ltd. (3 wires)

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