YAMAHA

MU90R
TONE GENERATOR

OWNER'S MANUAL

SPECIAL MESSAGE SECTION

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

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

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

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

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

Some Yamaha products may have benches and/or accessory mounting fixtures that are either supplied with the product or as optional accessories. Some of these items are designed to be dealer assembled or installed. Please make sure that benches are stable and any optional fixtures (where applicable) are well secured BEFORE using. Benches supplied by Yamaha are designed for seating only. No other uses are recommended.

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

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

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

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

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

Warning: Do not attempt to disassemble, or incinerate any battery. Keep all batteries away from children. Dispose of used batteries promptly and as regulated by the laws in your area.

Note: Check with any retailer of household type batteries in your area for battery disposal information.

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

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

Model _____

Serial No. _____

Purchase Date _____

PLEASE KEEP THIS MANUAL

Welcome to the MU90R

Congratulations and thank you for purchasing the Yamaha MU90R Tone Generator!

The MU90R is an advanced tone generator providing **779 high-quality Voices**, full **General MIDI compatibility** — including Yamaha's new **XG-MIDI (Extended General MIDI)** — plus flexible **computer interfacing** in a rack-mount unit.

With the convenient built-in **host computer interface** and **MIDI terminals**, the MU90R is ideal for any computer music system — from connection to a simple laptop to integration in a complete MIDI studio. With its large LCD and the intuitive graphic controls on the display, the MU90R is remarkably easy to use.

The MU90R also features **completely independent dual MIDI inputs, 32 Part multi-timbral capacity** and full **64-note polyphony** for playback of even the most sophisticated song data. A special **Performance mode** gives you flexible four-Voice operation, for live performance applications. Built-in **digital multi-effects** give you enormous versatility in "sweetening" the sound. Plus, the convenient **A/D inputs** allow you to connect a microphone, electric guitar or other instrument, and mix those signals with the MU90R's Voices. What's more, the MU90R provides a host of comprehensive, yet easy-to-use **editing tools** for getting just the sound you need.

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How to Use This Manual

You are probably eager to try out your new MU90R Tone Generator right away and hear what it can do, rather than have to read through a lot of instructions before you can even get a sound out of it.

However, to get the most out of your MU90R, we strongly suggest that you read the following sections in the order given:

1) **Precautions**
   This gives you important information on how to care for your new MU90R, how to avoid damaging, and how to ensure long-term, reliable operation.

2) **The Controls of the MU90R**
   This section introduces you to the panel controls and connectors.

3) **The MU90R — What It Is and What It Can Do**
   This briefly provides an overview of the functions and features of the MU90R and offers some important hints on how you can use it effectively.

4) **Guided Tour**
   This very important section gets you started using your new MU90R. It helps you set up the instrument, play it, and use some of the more important functions and features. The hands-on experience you gain in this section will help you navigate through the other sections of the manual.

5) **Setting Up the MU90R in Your Music System;**
   Using the MU90R with a Computer
   These sections (within the Guided Tour) provide all you need to know to effectively integrate the MU90R into your present computer music system.

6) **Reference**
   Once you're familiar with everything above, lightly go over this comprehensive guide to all editing functions. You won't need (or want) to read everything at once, but it is there for you to refer to when you need information about a certain feature or function.

7) **Appendix**
   Finally, use the sections in the Appendix as necessary. For example, the Index will come in handy when you need to quickly find information on a specific topic. Other sections, such as the **Glossary, Troubleshooting** and **Error Messages** provide additional useful information.

PRECAUTIONS

PLEASE READ CAREFULLY BEFORE PROCEEDING

* Please keep these precautions 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:

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

- 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.

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

- Use the specified adaptor (PA-3B) only. Using the wrong adaptor can result in damage to the instrument or overheating.

- Before cleaning the instrument, always remove the electric plug from the outlet. Never insert or remove an electric plug with wet hands.

- Check the electric plug periodically and remove any dirt or dust which may have accumulated on it.

⚠ *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:

- Do not place the AC adaptor cord near heat sources such as heaters or radiators, and do not excessively bend or otherwise damage the cord, place heavy objects on it, or place it in a position where anyone could walk on, trip over, or roll anything over it.

- When removing the electric plug from an outlet, always hold the plug itself and not the cord.

- 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.

- Remove the adaptor plug from the outlet when the instrument is not to be used for extended periods of time, or during electrical storms.

- 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.

- 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 near other electrical products such as televisions, radios, or speakers, since this might cause interference which can affect proper operation of the other products.

- Do not place the instrument in an unstable position where it might accidentally fall over.

- Before moving the instrument, remove all connected adaptor and other cables.

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

- Use only the stand/rack 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 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.

■REPLACING THE BACKUP BATTERY

- This instrument contains a non-rechargeable internal backup battery which permits internal data to remain stored even when the power is off. When the backup battery needs replacing, the message "Battery Low!" will display in the display. When this happens, immediately back up your data (using an external device such as the floppy disk-based Yamaha MIDI Data Filer MDF2), then have qualified Yamaha service personnel replace the backup battery.

- Do not attempt to replace the backup battery yourself, in order to prevent the possible serious hazards. Always have qualified Yamaha service personnel replace the backup battery.

- Never place the backup battery in a location that a child can reach, since a child might accidentally swallow the battery. If this should happen, consult a physician immediately.

■SAVING USER DATA

- Save all data to an external device such as the Yamaha MIDI Data Filer MDF2, in order to help prevent the loss of important data due to a malfunction or user operating error.

> 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.

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The Controls of the MU90R

Front Panel
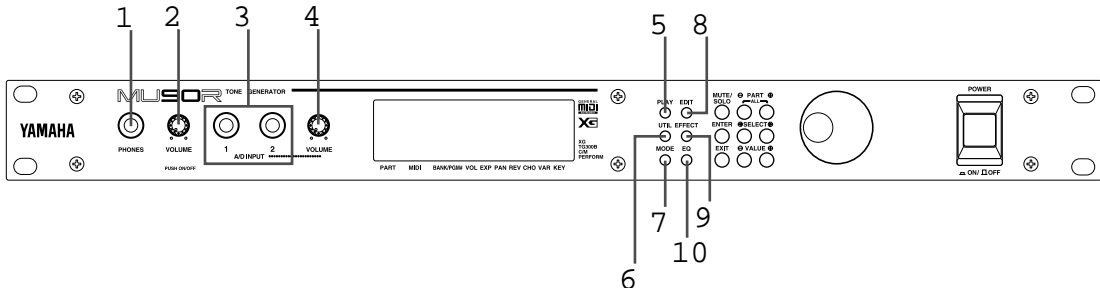
1 PHONES jack

For connection to a set of stereo headphones (1/4").

2 VOLUME control

Turning this adjusts the overall volume of the MU90R.

3 A/D INPUT 1, 2 jacks

For connection of a microphone, electric guitar or other electronic instruments (mono 1/4" plugs).

4 A/D INPUT level control

For control of the level of the A/D inputs.

5 PLAY button

For entering the Play mode and switching among the different Play displays. (See page 39.)

6 UTIL (UTILITY) button

For entering the Utility mode. (See page 114.)

7 MODE button

For entering the Sound Module mode. (See page 126.)

8 EDIT button

For entering the Edit mode. (See pages 49 and 89.)

9 EFFECT button

For entering the Effect Edit mode. (See page 101.)

10 EQ button

For entering the EQ Edit mode. (See page 112.)

11   14   17   18
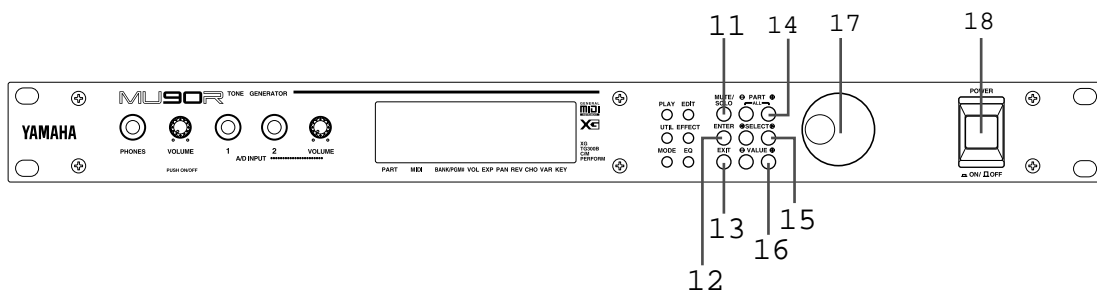
11 MUTE/SOLO button

Pressing this alternately mutes or solos the selected Part. (See page 25.)

12 ENTER button

For calling up menu items in the display and for executing certain functions and operations. Double-clicking this (pressing it twice quickly) calls up the System Exclusive hexadecimal message for the current function and parameter value.

13 EXIT button

For leaving various display pages and returning to previous displays. Also for canceling certain functions and operations.

14 PART -/+ buttons

For selecting different Parts. In the Effect Edit mode, these can be used to switch among the different effects. Pressing these together enters and exits from All Part control. (See page 46.)

15 SELECT </> buttons

For selecting the various menu items, parameters and controls on the display.

16 VALUE -/+ buttons

For changing the value of a selected parameter or control.

17 DATA dial

For adjusting/changing values of the selection function or parameter. Rotate this clockwise to increase the value.

18 POWER switch

Pressing this turns the power on and off.

Rear Panel
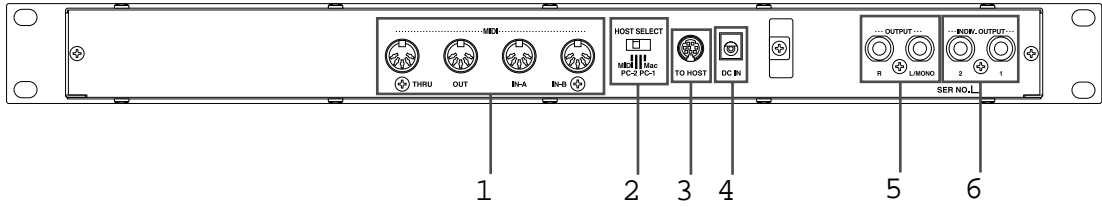
1 MIDI THRU, MIDI OUT and MIDI IN A/B terminals

For connection to other MIDI devices, such as a MIDI keyboard, tone genera-
tor, sequencer, or to a computer that has a MIDI interface. MIDI IN A and B
are independent MIDI ports, allowing full 32-channel MIDI input. MIDI OUT
is for data dumps to another MIDI device, while MIDI THRU is for "daisy-
chain" connection of additional MU90Rs or other MIDI instruments. (See
page 14 for more information on MIDI connections.)

2 HOST SELECT switch

For selecting the type of host computer. (See page 29.)

3 TO HOST terminal

For connection to a host computer that does not have a MIDI interface. (See
page 31.)

4 DC IN jack

For connection to the PA-3B AC power adaptor.

5 OUTPUT L, R jacks

For connection to a stereo amplifier/speaker system. When using a mono sys-
tem, connect it to the L/MONO jack.

6 INDIV. OUTPUT 1, 2 jacks

For independent output of selected Parts (1/4"). Parts selected for output
through these jacks are not output through the main OUTPUT or PHONES
jacks. (See pages 72 and 79.)

The MU90R — What It Is and What It Can Do

What It Is...

The MU90R is a fulll-featured and easy-to-use tone generator. It features full General MIDI Level 1 compatibility with 128 General MIDI Voices and 9 drum kits. It also provides new XG-MIDI (Extended General MIDI) compatibility, with a total of 586 Voices and 20 drum kits. The MU90R has 64-note polyphony and is 32-Part multi-timbral. In other words, the MU90R has 32 different Parts, each with its own Voice, so that up to 32 different Voices can be sounded simultaneously. Since the MU90R features dual MIDI input ports (A and B), 16 Parts can be played from one MIDI port and the remaining 16 from the other port.

The MU90R also has a TO HOST terminal for easy interfacing with a computer, allowing you to play the Voices using your favorite music software. This is where the advanced multi-timbral capabilities come in, letting you playing sophisticated arrangements using up to 32 different Voices at the same time.

The MU90R also features a special Performance mode, in which four Parts are played simultaneously over a single MIDI channel. Connected to a MIDI keyboard, this effectively gives you four tone generators in one. The MU90R gives you 100 factory-programmed Preset Performances plus 100 Internal Performance locations for your own original Performances.

About General MIDI

General MIDI is a new addition to the worldwide MIDI standard. MIDI, as you know, stands for Musical Instrument Digital Interface, and makes it possible for various electronic musical instruments and other devices to "communicate" with each other. For example, by connecting a sequencer to the MU90R's MIDI IN terminal, you could play back a song on the sequencer using the Voices of the MU90R.

So, where does General MIDI fit in all of this? One of the most important features of General MIDI is in the standardization of Voices. This means that a song recorded in the General MIDI format can be played back on any General MIDI compatible tone generator and sound just as the composer intended. For example, if there is an alto sax solo in the song, it will be played by an alto sax Voice on the General MIDI tone generator (and not by a tuba or harpsichord!). Since the MU90R is fully compatible with General MIDI, you can take advantage of the vast wealth of musical material recorded in that format.

What It Can Do...

Here are a few ideas on how you can use the MU90R. The list below is not comprehensive, but is meant to be a general guide to the possibilities and provide a starting point or springboard for your own creative ideas and explorations.

Using With MIDI Keyboard

Use the MU90R as supplementary tone generator with your MIDI keyboard and play the Voices of both instruments in a layer together. Or, use the convenient Performance mode, and play four Voices on the MU90R at once. You can split the four Voices across the keyboard, playing each from a different register. Or you can create sophisticated velocity splits, in which a different Voice is heard depending on how strongly you play the keyboard. Or use keyboard and velocity splits together for even greater flexibility.

Using With a Computer or Sequencer

Home Studio Setup

The MU90R integrates instantly and easily into any existing setup. If you have a MIDI keyboard, computer and sequencing software, the MU90R with its high-quality Voices and multi-timbral capabilities can expand your home studio system.

Take It With You

If you have a laptop computer (and sequencing software), simply connect the MU90R, plug in some headphones and you've got a complete, high-powered music making system that's exceptionally easy to use. Use it for composing, arranging, practicing or making/playing demos for your band.

Multimedia

Since it's compatible with General MIDI, the MU90R is a natural for multimedia applications. Since the computer interface is built-in to the MU90R, it hooks up instantly and easily to the computer's serial port or printer port, without the need for any other equipment.

About the Modes of the MU90R

The MU90R has two main operating modes: Multi and Performance. In Multi mode, the MU90R is a 32-Part multi-timbral tone generator; in Performance mode, the MU90R effectively functions as four tone generators controlled over a single MIDI channel.

Which mode the MU90R is in depends on the selected Sound Module mode. If XG, TG300B or C/M are selected, the MU90R automatically sets itself to the Multi mode. When PFM is selected, the MU90R is in the Performance mode.

```
Sound Module Mode
        ├──── X G
        ├──── TG300B
        ├──── C/M
        └──── Performance
```

The bottom right of the display indicates the currently selected Sound Module mode.
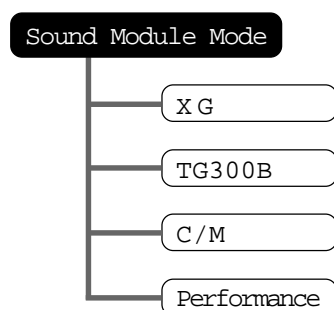
Selected Sound Module mode.
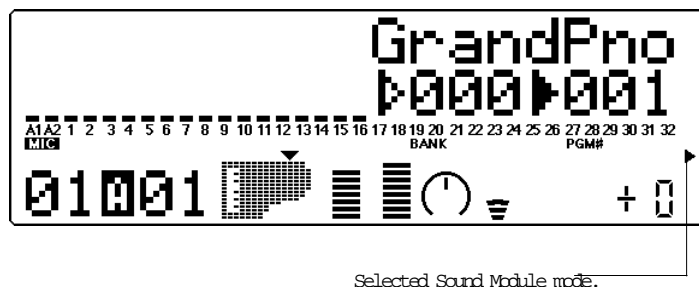
Play Modes and the Part Controls

Once the operating mode of the MU90R is set (Multi or Performance), there are two main ways you can use the MU90R: playing and editing. In the Play modes, you play the Voices; in the various Edit modes, you change their settings.

Within the Play modes are the Part controls. These let you make basic settings for the Parts. The Single Part controls allow you to make independent settings for each Part, while the All Part controls allow you to change the overall settings of all Parts. (See pages 41 and 46 for more information.)

Play Mode

Part 1 … 32	All	Part A/D
Receive Channel	Device Number	Receive Channel
Bank Number		Source Variation
Program Number		A/D Source
Volume	Master Volume	Volume
Expression	Master Attenuator	Expression
Pan		Pan
Reverb Send	Reverb Return	Reverb Send
Chorus Send	Chorus Return	Chorus Send
Variation Send	Variation Return	Variation Send
Note Shift	Transpose	
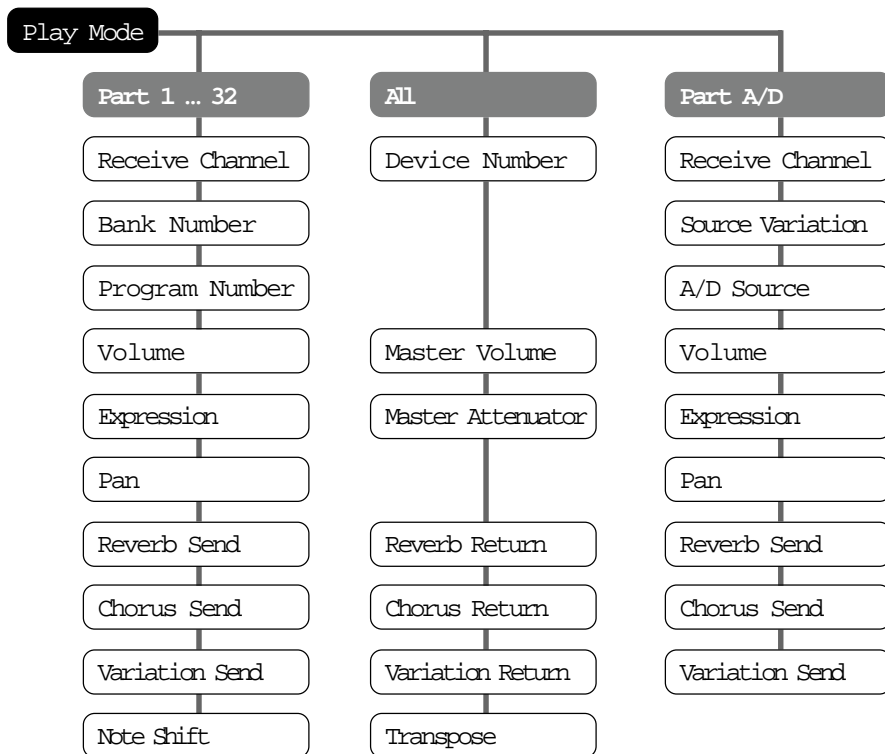
The MU90R has several different Edit modes, each with various menus and operations:

Part Edit Mode

Filter
- LPF Cutoff Frequency
- LPF Resonance
- HPF Cutoff Frequency

EG
- EG Attack Time
- EG Decay Time
- EG Release Time
- Pitch EG Initial Level
- Pitch EG Attack Time
- Pitch EG Release Level
- Pitch EG Release Time

EQ

- EQ Low Frequency
- EQ Low Gain
- EQ High Frequency
- EQ High Gain

Vibrato

- Vibrato Rate
- Vibrato Depth
- Vibrato Delay

Others

- Detune
- Part Mode
- Mono/Poly Mode
- Portamento Switch
- Portamento Time
- Element Reserve
- Note Limit Low
- Note Limit High
- Dry Level (VarConnect=SYS)
- Velocity Sensitivity Depth
- Velocity Sensitivity Offset
- Velocity Limit Low
- Velocity Limit High
- Pitch Bend Control

MW LFO Pitch Modulation Depth

AC1 Control Change Number

AC1 Filter Control

AC1 Amplitude Control

Output Select

Performance Edit Mode

Common

Performance Name

Portamento Switch

Portamento Time

MW LFO Pitch Modulation Depth

MW LFO Filter Modulation Depth

Pitch Bend Control

A/D Part

AC1 Control Change Number

AC1 Filter Control

AC1 Amplitude Control

AC1 LFO Filter Modulation Depth

Part

Filter

LPF Cutoff Frequency

LPF Resonance

HPF Cutoff Frequency

EG

- EG Attack Time
- EG Decay Time
- EG Release Time
- Pitch EG Initial Level
- Pitch EG Attack Time
- Pitch EG Release Level
- Pitch EG Release Time

EQ

- EQ Low Frequency
- EQ Low Gain
- EQ High Frequency
- EQ High Gain

Vibrato

- Vibrato Rate
- Vibrato Depth
- Vibrato Delay

Others

- Detune
- Mono/Poly Mode
- Note Limit Low
- Note Limit High
- Dry Level (VarConnect=SYS)
- Velocity Sensitivity Depth

Velocity Sensitivity Offset

Velocity Limit Low

Velocity Limit High

Copy

Store

Recall

For more information on each of these modes and their menus, see the respective sections in the **Reference** section.

Utility Mode

The Utility mode lets you set functions related to the overall operation of the MU90R, such as Master Tune, display Contrast and reception of certain MIDI messages that affect the entire instrument. Included also are miscellaneous operations, such as sending bulk data to a data storage device, initializing of the MU90R settings, and playing the special Demo song.

Part Edit Mode

The Part Edit mode allows you to change certain settings for each individual Part, such as those of the Filter, EG (Envelope Generator), and many other settings. The internal Voices can be sounded during editing, allowing you to hear the effects of your edits.

MEMO

GUIDED TOUR

When using your MU90R for the first time, read through this short section of the manual. It guides you step-by-step in using many of the basic operations: setting the instrument up, connecting it properly to other equipment, and — most importantly — playing it.

Setting Up Your MU90R

In this introductory section, you'll learn how to set up the MU90R for use with a MIDI keyboard. (Setting up for use with a computer is covered on page 29.)

What You'll Need

☞ The MU90R and the included power adaptor.
☞ A MIDI keyboard, electronic piano, or any instrument that can output MIDI data.
☞ An amplifier/speaker system, preferably stereo. Alternately, you can use a set of stereo headphones.
☞ Audio connecting cables.
☞ A MIDI cable.

Making the Connections

CAUTION!
Before making any connections, make sure that all equipment to be connected is turned off, and that the MU90R power adaptor is not connected to an electrical outlet.

Operation

1 Connect one end of the MIDI cable to the MIDI OUT terminal of the MIDI keyboard and the other to MIDI IN-A of the MU90R (as shown in the illustration below).

2 Connect the audio cables from the R and L/MONO OUTPUT jacks of the MU90R to the appropriate inputs on the amplifier speaker system (as shown in the illustration below). You can also connect cables to the INDIV. OUTPUT jacks.

   If the amplifier has only one input, use the L/MONO jack on the MU90R. If you are using stereo headphones, connect them to the front panel PHONES jack.

3 Set the HOST SELECT switch on the MU90R to MIDI.

4 Connect the power adaptor to the DC IN terminal on the MU90R and plug the adaptor into an appropriate electrical outlet.

CAUTION!
● Do not attempt to use an AC adaptor other than the PA-3B. The use of an incompatible adaptor may result in irreparable damage to the MU90R, and even pose a serious shock hazard.
● Be sure to disconnect the power adaptor from the outlet when the MU90R is not in use.
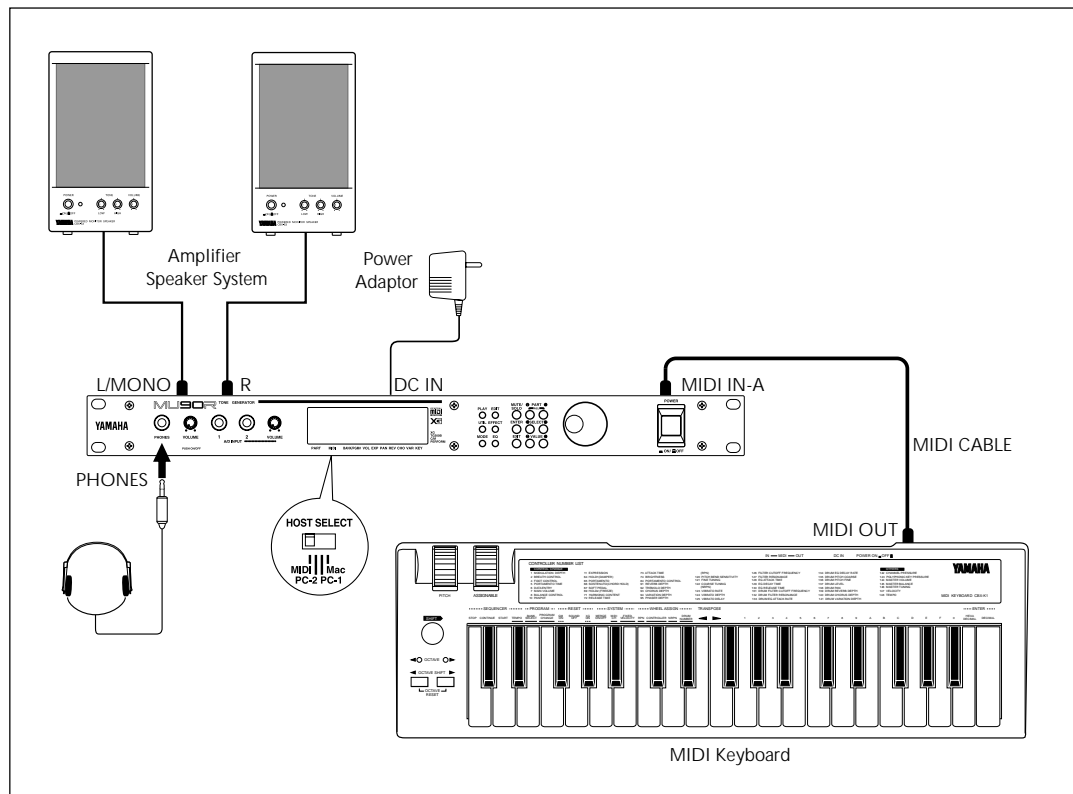
Powering Up and Playing the Demo Song

Once you've connected everything properly, you're ready to turn the MU90R on and start playing it. However, a small word of caution before you begin: Follow the instructions given below to avoid possible damage to your equipment and speakers.

Powering Up

Operation

1 If you haven't done so already, press the **POWER** switch on the MU90R.

After the greeting display, the following display will appear:

2 Turn on the power of your MIDI keyboard.

3 Make sure that all volume controls (on the MU90R and the connected amplifier) are turned down. Then, turn on the power of your amplifier speaker system.

4 Finally, set the volume control on the MU90R to about the midway position and set the volume on the amplifier to a suitable level.

Playing the Demo Song

Now that you've set everything up properly, try playing the built-in Demo Song. This showcases the high-quality Voices and the AWM2 tone generation system of the MU90R.

Operation

1 Press the **UTIL** button.

```
 SYSTEM   DUMPOUT
 INITIAL  DEMO
MIC                            ▶
```
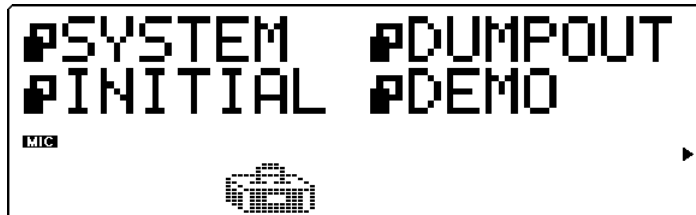
2 Select "DEMO" with the **SELECT** buttons and press the **ENTER** button.

3 Press the **ENTER** button to start the Demo Song.

The Demo Song starts playing immediately and repeats indefinitely until stopped (in step 4 below). After a while, playback of the individual Parts of the song is shown graphically by the "level meter" bars in the display.

NOTE
During Demo Song playback, all panel controls (except the **EXIT** button and the **VOLUME** control) cannot be used.

4 To stop playback of the song, press the **EXIT** button.

EXIT

5 To exit from the Demo Song function, press the **EXIT** button again.

Playing Your MU90R With a MIDI Keyboard

Operation

Play some notes on your MIDI keyboard.

If you've carefully followed all instructions up to now, one of the "level meter" bars in the display should move — and you should be able to hear the sound of the MU90R as you play.

The "level meter" bar indicates the "level" (velocity) of the incoming MIDI data.

GrandPno
▷000▶001

A1A2 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
MIC   BANK   PGM#

01 001 ▷ ▏ ≡ ≡ ⌒ ≂   ÷ 0
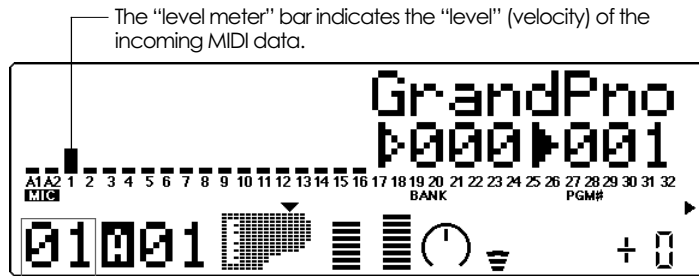
The number under the moving "level meter" indicates the Part number.

NOTE
If your MIDI keyboard is transmitting on channel 1, the Voice of Part 1 should sound. If it is transmitting on another channel, another Part's Voice will sound. For the sake of these introductory instructions, set your keyboard so that it transmits on channel 1. (Refer to the owner's manual of that instrument if necessary.)

Selecting Voices

In this brief section, you'll learn how to select other Voices. You can do this directly from the panel of the MU90R or remotely, from your MIDI keyboard.

```
Operation
```

1 First, select a Part. Use the **PART** buttons to select Part 1. Press the appropriate button until "01" appears in the PART section of the display.

⊖**PART**⊕
⌐**ALL**⌐

```
GrandPno
▶000▶001
```

```
01001
```
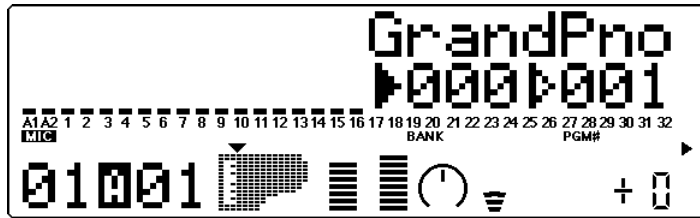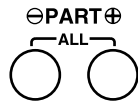
2 Use the **SELECT** buttons to move the arrow cursor to the right side of the instrument icon, as shown below.

Solid arrow at Voice number (currently selected).

Arrow cursor (indicates currently selected control). The arrow is directly above "PGM#" on the panel, indicating that Program Number is currently selected.

Voice name.

Voice number (program number).

```
GrandPno
▶000▶001
```

```
01001                      +0
```

GENERAL
MIDI
INSTRUMENT

XG

XG
TG300B
C/M
PERFORM

PLAY   EDIT   MUTE/ ⊖ PART ⊕
SOLO   ⌐ALL⌐

UTIL EFFECT   ENTER ⊛SELECT⊛

MODE   EQ   EXIT   ⊖ VALUE ⊕

PART MIDI BANK/PGM# VOL EXP PAN REV CHO VAR KEY

Instrument icon of current Voice.
MIDI receive channel for current Part.
Part number. (This is selectable only with the **PART** buttons.)
Use these to move arrow cursor.

3 Use the **VALUE** buttons or data dial to change the Voice number. In the display below, Voice number 26 has been selected.

⊖**VALUE**⊕

SteelGtr
▷000▷026

A1A2 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
MIC   BANK   PGM#
01M01

Play this new Voice from the keyboard. Try selecting other Voices and play them as well. (For a list of all the available Voices, refer to the **SOUND LIST & MIDI DATA** booklet.

HINT
You can rapidly move through the values by holding down one of the **VALUE** buttons. You can move even more rapidly by holding down one button and then pressing and holding down the other. For example, to rapidly advance (increase) the value, hold down the **VALUE** +◯ button and simultaneously press and hold down the **VALUE** −◯ button.

Changing the Voice Bank

In the current Sound Module mode (XG), several banks of Voices are available. Each bank can contain up to 128 different Voices.

Operation

1 Use the **SELECT** buttons to move the arrow cursor to the left side of the instrument icon, as shown below.

Solid arrow at Bank number (currently selected).
Bank number.

GrandPno
▷000▷001

A1A2 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
MIC   BANK   PGM#
01M01   **+ 0**
PART   MIDI   BANK/PGM#   VOL EXP PAN REV CHO VAR KEY

GENERAL
MIDI
XG

XG
TG300B
C/M
PERFORM

PLAY   EDIT
UTIL   EFFECT
MODE   EQ

MUTE/   ⊖ PART ⊕
SOLO   ALL
ENTER   ◀SELECT▶
EXIT   ⊖ VALUE ⊕

Use these to move arrow cursor.

Arrow cursor (indicates currently selected control).
The arrow is directly above "BANK" on the panel,
indicating that Bank number is currently selected.

2 Use the **VALUE** buttons or data dial to change the Bank number.

3 Finally, use the **SELECT** buttons again to move the arrow cursor back to the right side of the instrument icon — for Voice selection.

```
                                    GrandPno
                                   ▶000▶001
A1A2 1  2  3  4  5  6  7  8  9 10 11 12 1314 15 16 17 1819 20 21 22 23 24 25 26 2728 29 30 31 32
MIC                                         BANK              PGM#
                                                                        ▶
01A01 ▣▶ ▤ ▤ ⌒ ▾            ÷0
```
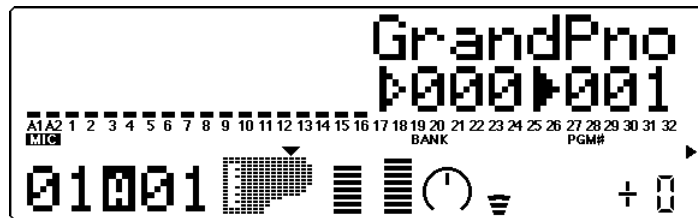
Selecting Voices From Your MIDI Keyboard

You can also select Voices remotely from the connected MIDI keyboard. Though the actual operation may differ depending on the keyboard used, the general procedure is the same. (Refer to the owner's manual of your instrument for specific instructions.)

Operation

1 Make sure that your keyboard is set up to send Program Change messages.

2 Use the panel controls to select a program on your keyboard.

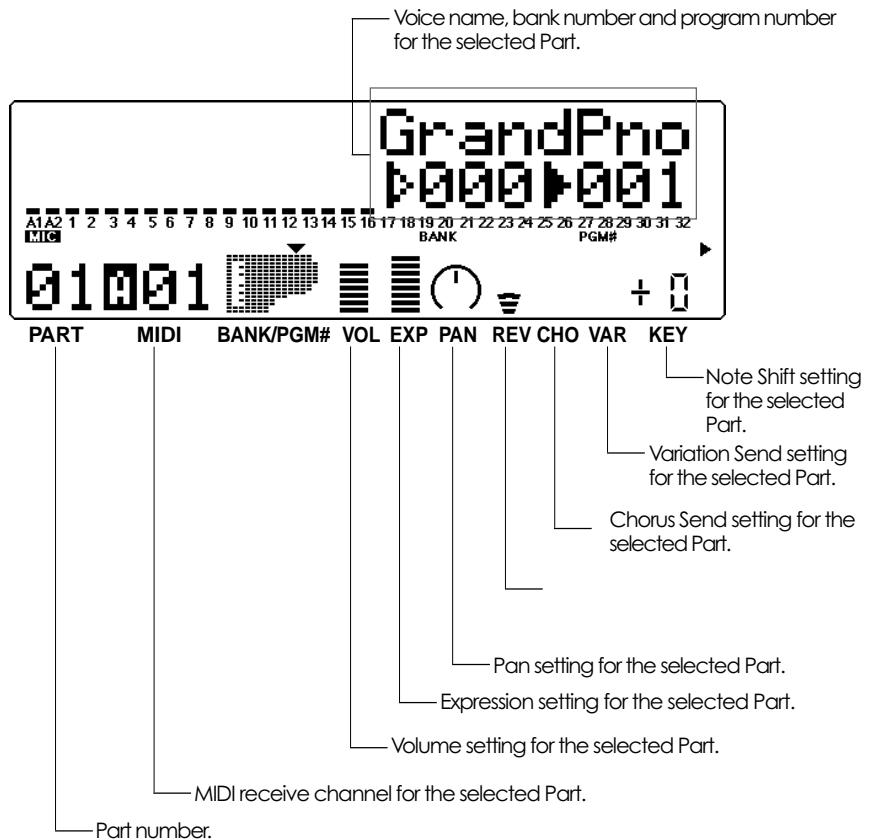Generally, if everything has been set up properly, the Voice number and name on the MU90R will change, and will be the same number as the program number you selected on your keyboard.

Changing Some of the Settings — Part Controls

You can make changes to each individual Part by using the Part controls. These are always displayed in the Play mode, giving you at-a-glance confirmation of the various basic settings of the MU90R. Let's take a look at the Play display again:

Voice name, bank number and program number for the selected Part.

GrandPno
▶000▶001

A1 A2 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
MIC   BANK   PGM#

01001

PART   MIDI   BANK/PGM# VOL EXP PAN   REV CHO VAR KEY

Note Shift setting for the selected Part.

Variation Send setting for the selected Part.

Chorus Send setting for the selected Part.

Pan setting for the selected Part.

Expression setting for the selected Part.

Volume setting for the selected Part.

MIDI receive channel for the selected Part.

Part number.

Each of these settings can be made independently for each of the Parts. For example, each Part could have a different Volume setting, or a different Pan setting. Try going through the brief sections below and making some changes in the Part controls yourself.

Selecting Another Part and Changing its MIDI Channel

Here we'll select Part 2 and change its MIDI channel to 1, so that it matches the MIDI channel of Part 1. This allows you to play the Voices of both Part 1 and Part 2 over MIDI channel 1.

Operation

1 Use the **PART** buttons to select Part 2.

```
                                        GrandPno
                                        ▷000▷001
▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬▬
A1A2 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
MIC                                       BANK              PGM#
                                                                         ▶
02002                                               ÷ 0
```
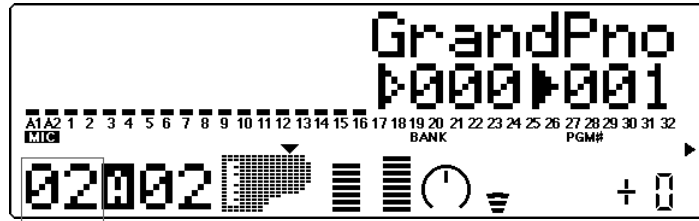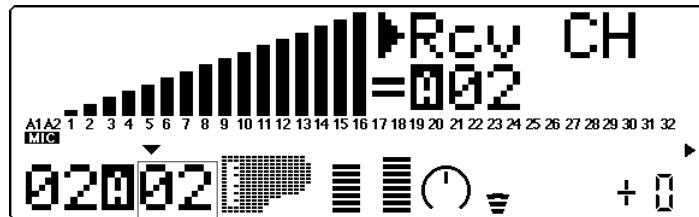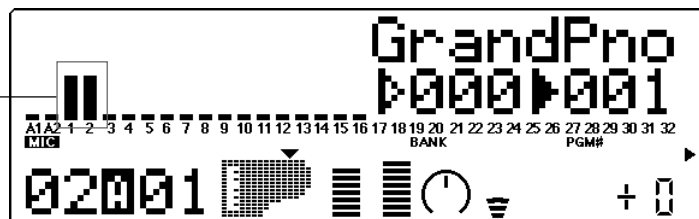
└─ Part 2.

2 Use the **SELECT** buttons to call up the "Rcv CH" display below.

```
                                        ▶Rcv CH
                                        =002
A1A2 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
MIC                                                                      ▶
02002                                               ÷ 0
```

└─ Current MIDI Receive Channel.

3 Use the **VALUE** buttons or data dial to change the MIDI Receive Channel to "A01."

4 Finally, use the **SELECT** buttons to move the arrow cursor back to the instrument icon (so that the Voice name is displayed), and play the MIDI keyboard again.

```
                                        GrandPno
                                        ▷000▷001
A1A2 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
MIC                                       BANK              PGM#
                                                                         ▶
02001                                               ÷ 0
```

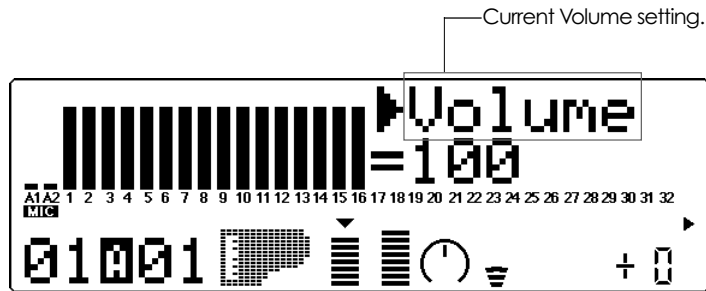└─ Both "level meters" move together.

If both Parts 1 and 2 have been set to MIDI channel 1, both of their "level meters" should move together as you play. And, if the two Parts are set to different Voices, you should hear two different Voices sound at the same time. (To change the Voice for a Part, refer back to **Selecting Voices** above.)
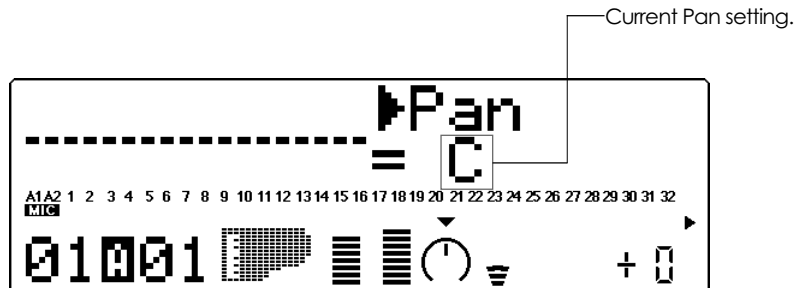
Changing the Volume and Pan Settings of a Part

Now that you're playing two Voices at the same time, you may want to adjust their settings. Here, we'll change the Volume and Pan settings of one Part's Voice.

Operation

1 Use the **PART** buttons to select the desired Part (Part 1 or 2).

2 Use the **SELECT** buttons to call up the "Volume" display below.

Current Volume setting.

▶Volume
=100

A1A2 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
MIC
01◻01

3 Use the **VALUE** buttons or data dial to change the setting, and play the keyboard as you make changes.

4 Now that you've adjusted the Volume balance of the two Voices, change one of the Part's Pan setting. Use the **SELECT** buttons to call up the "Pan" display below.

Current Pan setting.

▶Pan
= C

A1A2 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
MIC
01◻01

5 Use the **VALUE** buttons or data dial to change the setting, and play the keyboard again as you make changes.

If you want, try making changes to some of the other Part controls. The procedure is the same: 1) Use the **PART** buttons to select a Part, 2) use the **SELECT** buttons to choose the desired control, and 3) use the **VALUE** buttons or data dial to change the setting. For more information on the Part controls, .

Using Mute/Solo

The MU90R has convenient Mute and Solo functions for selectively muting or soloing any of the 32 Parts and A/D Parts A1 and A2. This is especially useful when playing back several Parts from a connected computer or sequencer. Mute lets you silence one Part to hear how all of the other Parts sound without it. Solo lets you isolate a single Part, to hear how that Part sounds by itself.

Mute and Solo are effective tools that help you as you edit the Parts, since they allow you to better hear how the changes you make affect specific Voices as well as the overall sound.
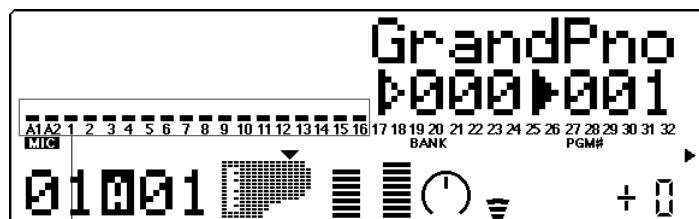

Operation

While playing the keyboard (or during playback of a song from a sequencer), press the MUTE button. Each press cycles through the three functions: Mute, Solo and Normal operation.
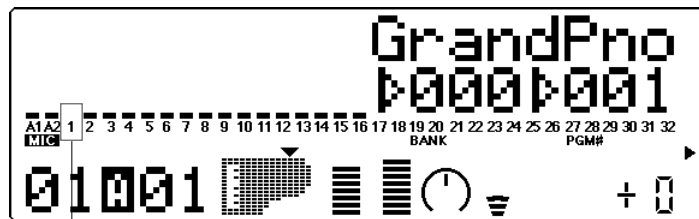
The selected Part is muted, while all other Parts sound normally.
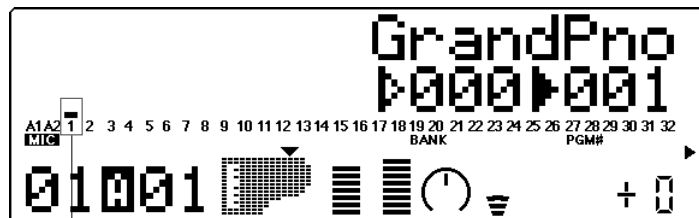
The selected Part is soloed, while all other Parts are muted.


All Parts sound normally.

Using the A/D Input

The MU90R features a special A/D (Analog-to-Digital) Input function that allows you to connect a microphone, electric guitar or other instrument and mix in those signals with the MU90R's Voices. A/D Input is perfect for singing along with your keyboard performance, since it allows you to blend the two signals without the need for an external mixer. Or you can use it to sing or play guitar over backing tracks played from a MIDI sequencer. There are two A/D Parts — A1 and A2 — and they include several different pre-programmed settings that take advantage of the built-in effects of the MU90R.
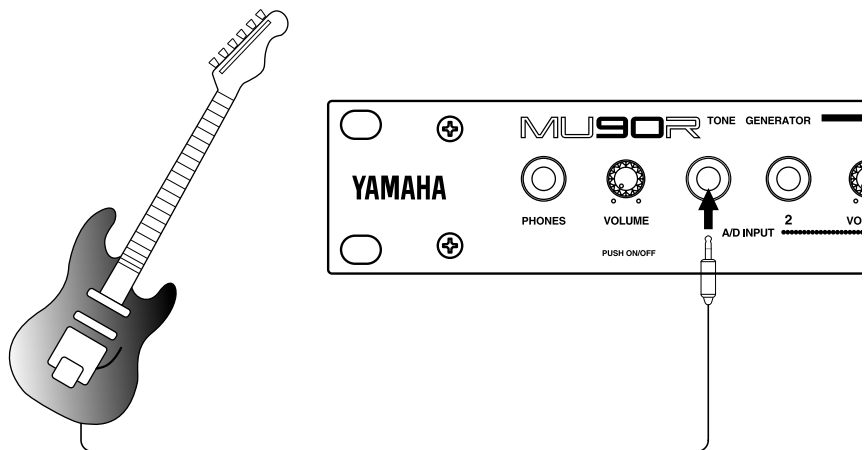
The MU90R has two inputs on the front panel. The signals from these are mixed.

Operation

1 Turn down the A/D INPUT control on the front panel.
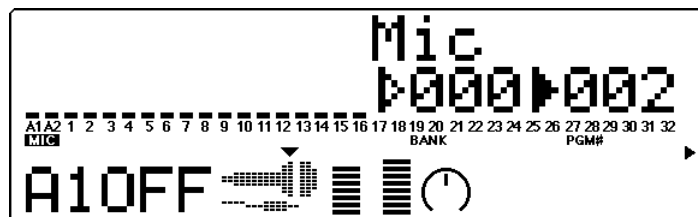
1 2 VOLUME
A/D INPUT •••••••••••••••••••••
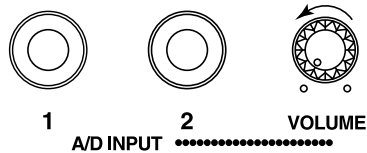
2 Connect the microphone, instrument or audio source to the A/D INPUT jack(s) on the front panel. (Depending on the equipment you intend to connect, converting adaptors may be necessary.)

3 Use the **PART** buttons to select Part A1.

```
                          Off
                      ▷000▷001
A1A2 1  2  3  4  5  6  7  8  9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
MIC                                          BANK                    PGM#
A1OFF
```
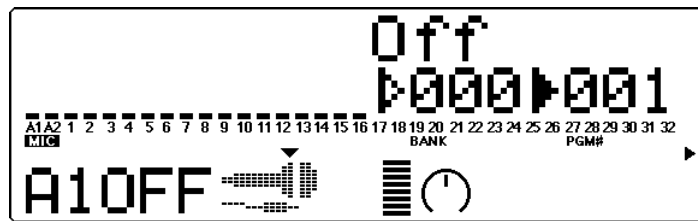
4 Use the **SELECT** buttons to move the arrow cursor to PGM#, as shown below, and use the **VALUE** buttons or data dial to select number 002.

```
                          Mic
                      ▷000▶002
A1A2 1  2  3  4  5  6  7  8  9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
MIC                                          BANK                    PGM#
A1OFF
```

5 Move the arrow cursor to BANK (with the **SELECT** buttons) and use the **VALUE** buttons or data dial to select the type of input: Mic, Guitar, Keyboard, Audio, Stereo Keyboard or Stereo Audio. This determines the gain level of the input. Select the type corresponding to the input you'll use.

```
                        Guitar
                      ▶001▷002
A1A2 1  2  3  4  5  6  7  8  9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
MIC                                          BANK                    PGM#
A1OFF
```

6 Slowly bring up the A/D INPUT control on the front panel and play the instrument (or sing into the microphone) until the level is appropriate.

7 Now, move the arrow cursor back to PGM# (with the **SELECT** buttons) and try selecting some different A/D programs (with the **VALUE** buttons or data dial).
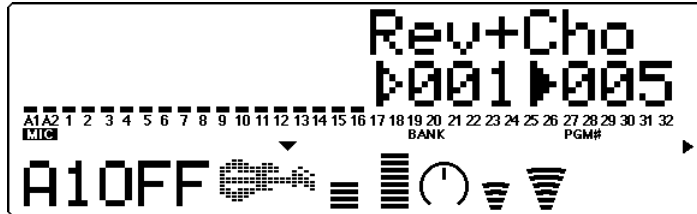
The available programs have been specially programmed to suit the type of input selected. For example, programs for Mic input include Karaoke and Vocal; Guitar input programs include Tube, Stack and Phaser. Explore some of these settings on your own with a microphone and different instruments.

Setting Up the MU90R in Your Music System

As you learned in the section **The MU90R — What It Is and What It Can Do** on page 4, the MU90R can be integrated into a variety of setups. It would be impossible to cover all connection possibilities in a short manual as this; however, the section below will help in quickly setting up the MU90R and using it in your system.

Connecting With a Computer

The MU90R features a built-in host computer interface, allowing you to directly connect it to your computer — eliminating the need of installing a special MIDI interface to your computer. The MU90R can be used with the following computers: Apple Macintosh and IBM PC.

If your computer has a MIDI interface you may want to connect the MU90R to it, rather than using the host computer interface on the MU90R. (See the section "**Connecting to Other MIDI Devices**" on page 31.)

Depending on the computer or interface used, set the **HOST SELECT** switch to the appropriate setting: **MIDI**, **PC-1**, **PC-2** (IBM and clones), or **Mac** (Macintosh). For information on the types of cables that can be used for connection, see the section "**MIDI/Computer Connecting Cables**" on page 35.

Macintosh

Follow these instructions if you have an Apple Macintosh not equipped with an external MIDI interface. Connect the **TO HOST** terminal on the MU90R to the Modem or Printer port on the Macintosh.

```
Operation
```
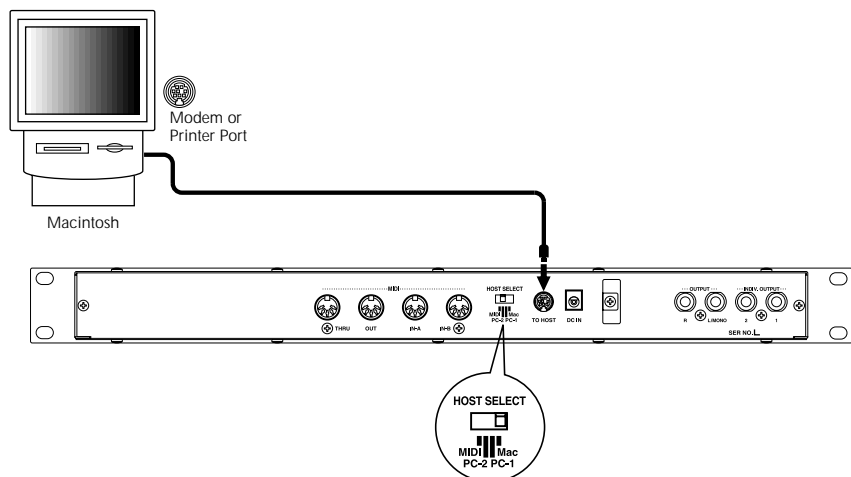
1 Set the **HOST SELECT** switch to **Mac**.

2 Connect the MU90R to the host computer, as shown in the illustration above. Use a standard Macintosh cable (8-pin Mini DIN on both ends; see page 35).

3 Turn on the the host computer, then the MU90R.

4 Start up your music software, and set up the appropriate options on the software for operation with the MU90R.

The options you may have to set include:

MIDI Interface Type   ☞   Standard MIDI Interface

MIDI Time Piece   ☞   On (for controlling all 32 Parts of the MU90R)

Clock   ☞   1 MHz

Other options and settings may have to be made as well. Refer to the owner's manual of your particular music software for more information.

```
IBM PC /AT and Clones
```

Follow these instructions if you have an IBM PC/AT or compatible computer not equipped with an external MIDI interface. Connect the **TO HOST** terminal on the MU90R to one of the computer's serial ports, COM 1 or COM 2.

Serial Port

IBM PC/AT or Compatible Computer
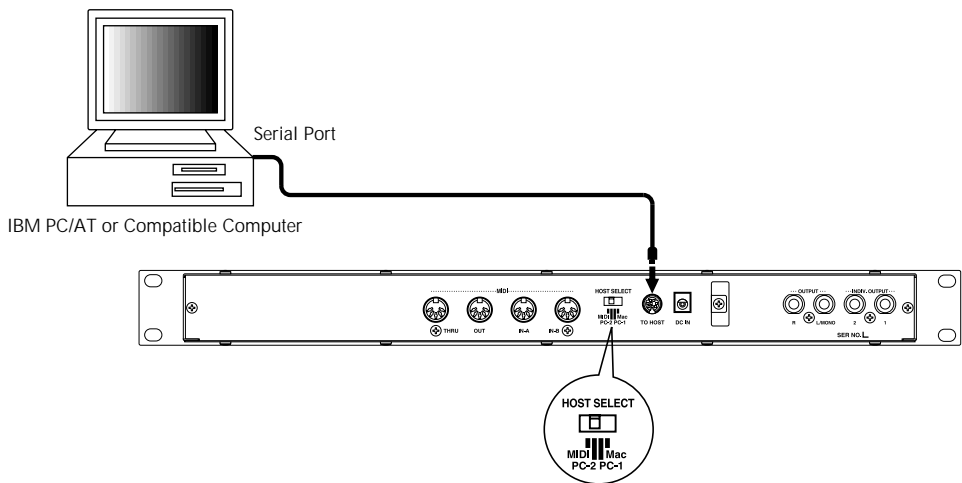
```
NOTE
Your music software must be able to recognize the TO HOST connection. Consult your
Yamaha dealer for more details. If your software is not compatible, you can still use the
MU90R by installing a MIDI interface (internal card or external) to the computer.
```

Operation

1 Set the **HOST SELECT** switch to **PC-2**.

2 Connect the MU90R to the host computer, as shown in the illustration above. Use a standard computer cable (8-pin Mini DIN to 9-pin D-SUB; see page 35).

3 Turn on the the host computer, then the MU90R.

4 Start up your music software, and set up the appropriate options on the software for operation with the MU90R.

Refer to the owner's manual of your particular music software for more information.

Connecting to Other MIDI Devices

The MU90R is equipped with MIDI IN and OUT terminals, allowing you to use it in any MIDI system. Example uses for the built-in MIDI interface include:

☞ Connecting to a **MIDI keyboard** (for playing the sounds of the MU90R from that keyboard).
☞ Connecting to a **computer equipped with a MIDI interface** (either internal or external).
☞ Connecting to a **hardware sequencer** (such as the Yamaha QY700).
☞ Connecting to a **MIDI data storage device** (such as the Yamaha MDF2 MIDI Data Filer).

MIDI CABLE

MIDI OUT

MDF2

HOST SELECT

MIDI Mac
PC-2 PC-1

MIDI IN-A or IN-B

MIDI CABLE

MIDI OUT

MIDI Keyboard

HOST SELECT

MIDI Mac
PC-2 PC-1

MIDI IN-B
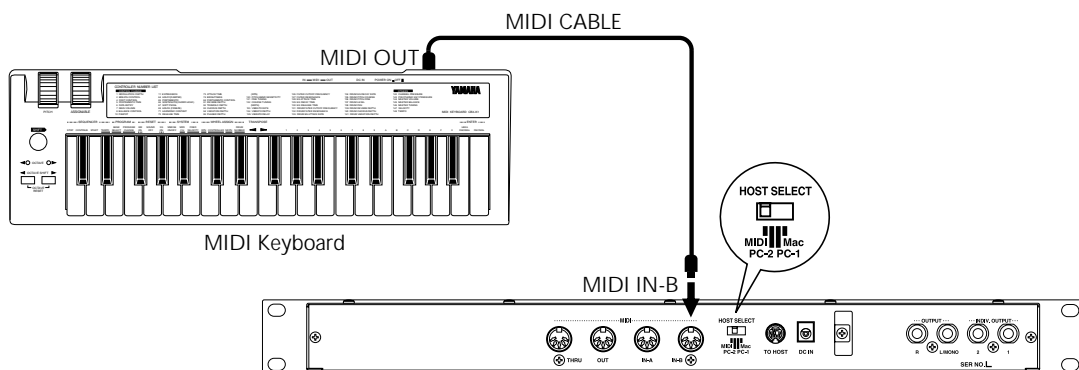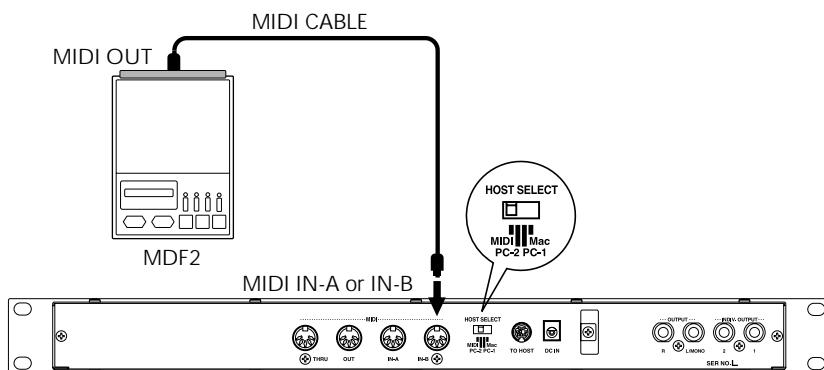
```
Operation

1  Set the HOST SELECT switch to MIDI.

2  Connect the MU90R to the appropriate MIDI device, as shown
   in the illustrations above. Use a standard MIDI cable (see page
   35).

3  Turn on the the connected device, then the MU90R.

4  If you are using a computer, start up your music software, and
   set up the appropriate options on the software for operation with
   the MU90R.
```

Using the MU90R with a MIDI Data Storage Device

You can also use the MU90R with a MIDI data storage device, such as the Yamaha MDF2 MIDI Data Filer. This lets you save or back up whatever changes you've made in the settings of the Utility and Part Edit modes, as well as changes to the EQ built-in effects and Performances. Then, when you want to recall those settings, you can transfer the appropriate data from the storage device.

The MDF2 also allows you to play compatible song data on the MU90R directly from the MDF2 itself, without the need of a sequencer.

Make sure that the MU90R is properly connected to the data storage device (via MIDI). Use the Dump Out function (page 119) to send data to the device. Also refer to the owner's manual of your data storage device for specific operating instructions in receiving or sending data.

MIDI CABLE

MIDI IN

HOST SELECT

MIDI Mac
PC-2 PC-1

MDF2

MIDI OUT
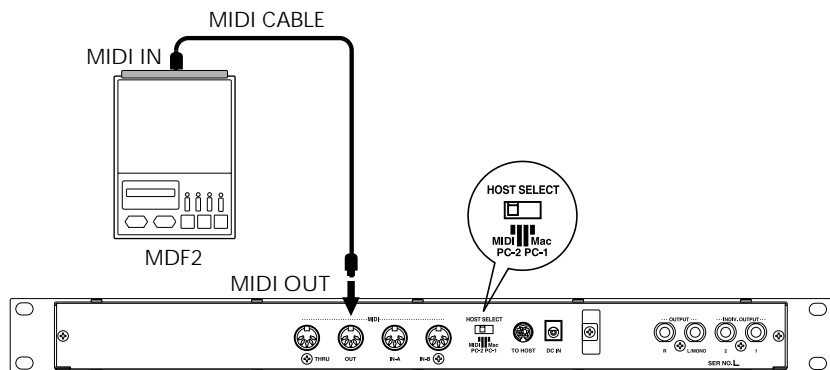
Data Flow Block Diagram

When HOST SELECT switch is set to MIDI (31,250 bps):

TO HOST   IN-B   IN-A   OUT   THRU

Sound Module A1~16CH

Sound Module B1~16CH
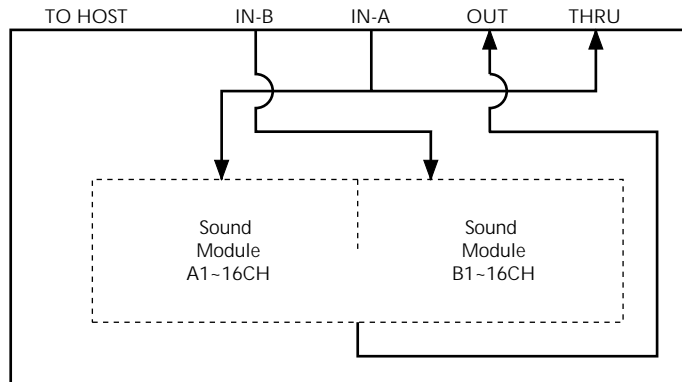
When HOST SELECT switch is set to
PC-1/MAC (31,250 bps) or PC-2 (38,400 bps):

TO HOST   IN-B   IN-A   OUT   THRU

Sound Module A1~16CH

Sound Module B1~16CH
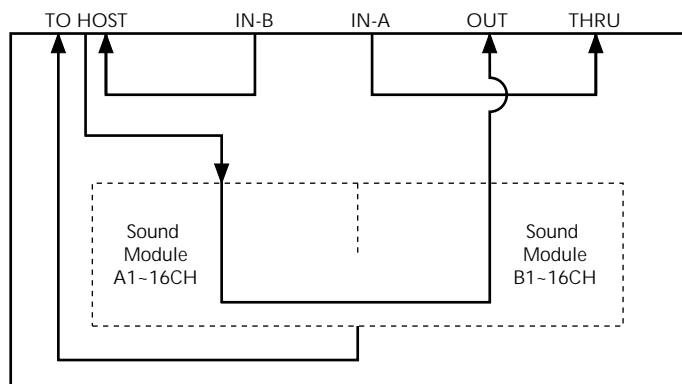
MIDI/Computer Connecting Cables

MIDI

Standard MIDI cable. Maximum length 15 meters.

DIN 5-PIN
4 — 4
2 — 2 (GND)
5 — 5
DIN 5-PIN
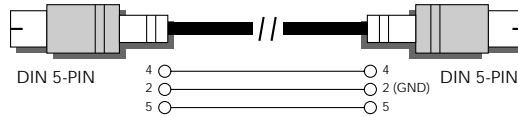
Mac

Apple Macintosh Peripheral cable (M0197). Maximum length 2 meters.

MINI DIN
8-PIN
1 — 2 (HSK i)
2 — 1 (HSK o)
3 — 5 (RxD –)
4 — 4 (GND)
5 — 3 (TxD –)
6 — 8 (RxD +)
7 — 7 (GP i)
8 — 6 (TxD +)
MINI DIN
8-PIN
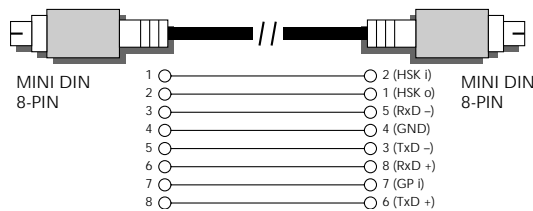
PC-1

8-pin MINI DIN to D-SUB 25-pin cable. If your PC-1 type computer has a
9-pin serial port, use the PC-2 type cable. Maximum length 1.8 meters.

MINI DIN
8-PIN
1 — 5 (CTS)
2 — 4 (RTS)
3 — 3 (RxD)
4 — 7 (GND)
8
5 — 2 (TxD)
D-SUB
25-PIN
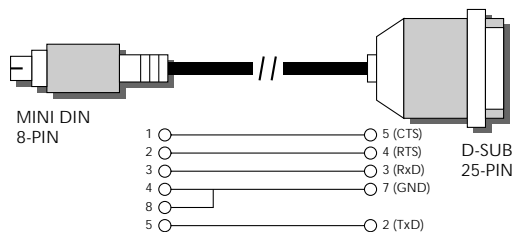
PC-2

8-pin MINI DIN to D-SUB 9-pin cable. Maximum length 1.8 meters.

MINI DIN
8-PIN
1 — 8 (CTS)
2 — 7 (RTS)
3 — 2 (RxD)
4 — 5 (GND)
8
5 — 3 (TxD)
D-SUB
9-PIN
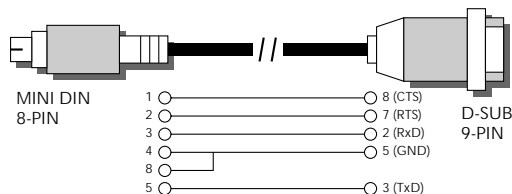
This concludes your basic tour of the important functions of the MU90R. To find out
more about how to best use your MU90R, look through the **Reference** section that fol-
lows and try out some of the functions and operations that interest you.

MEMO

REFERENCE

The Reference section of this manual covers in detail all of the functions of the MU90R. Refer to it when you need information about a specific function, feature or operation.
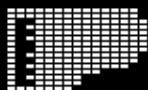
Multi Mode

In the Multi mode, the MU90R performs as a multi-timbral tone generator capable of playing up to 32 Parts simultaneously, over 32 MIDI channels. Normally, the MU90R should be set to Multi mode when using it with a sequencer and General MIDI song data. There are three Multi modes: XG, TG300B and C/M. Each mode provides compatibility with different music software and hardware.

XG: This stands for Extended General MIDI and provides the full potential of the MU90R, giving you access to all 586 Voices.

TG300B: This mode provides compatibility with the GM-B mode of the TG300 Tone Generator.

C/M: This mode provides compatibility with most computer music software not supported by the other two Multi modes.

NOTE
When set to the **TG300B** mode, the MU90R may not be able to play TG300-specific song data with complete accuracy. However, MIDI data designed for other computer music tone generators is compatible with the MU90R.

To set the Multi mode:

1 Press the **MODE** button.

```
SOUND MODULE=
▶XG TG300 C/M PFM
MIC                          ▶
              XG
```

2 Use theg **SELECT** buttons to select the desired Multi mode: XG, TG300B or C/M.

3 Press the **EXIT** button or the **PLAY** button to return to the Play display.

```
                  GrandPno
                  ▶000▶001
A1A2 1  2  3  4  5  6  7  8  9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
MIC                                    BANK              PGM#          XG
01 001                              + 0      TG300B
                                                          C/M
                                                          PERFORMANCE
```
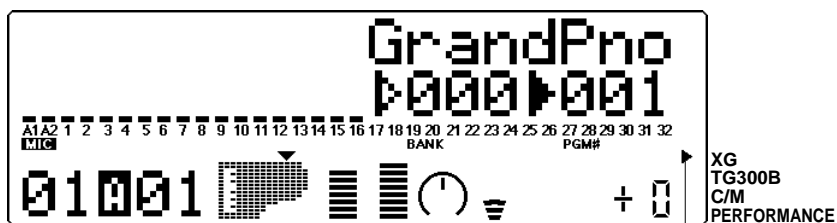
Indicates currently selected mode.

The currently selected mode setting is shown by the arrow at the bottom right of the display.

Multi Play Mode

The Play mode (with the main Play display shown below) is the normal operating mode of the MU90R. To select the Play mode from any other mode, press the **PLAY** button. (The Play mode is also automatically selected when you turn on the MU90R.)

Velocity "level meters" for each Part.

Voice number and name for currently selected Part.

Current Part number.

MIDI port (A or B) and channel number for currently selected Part.
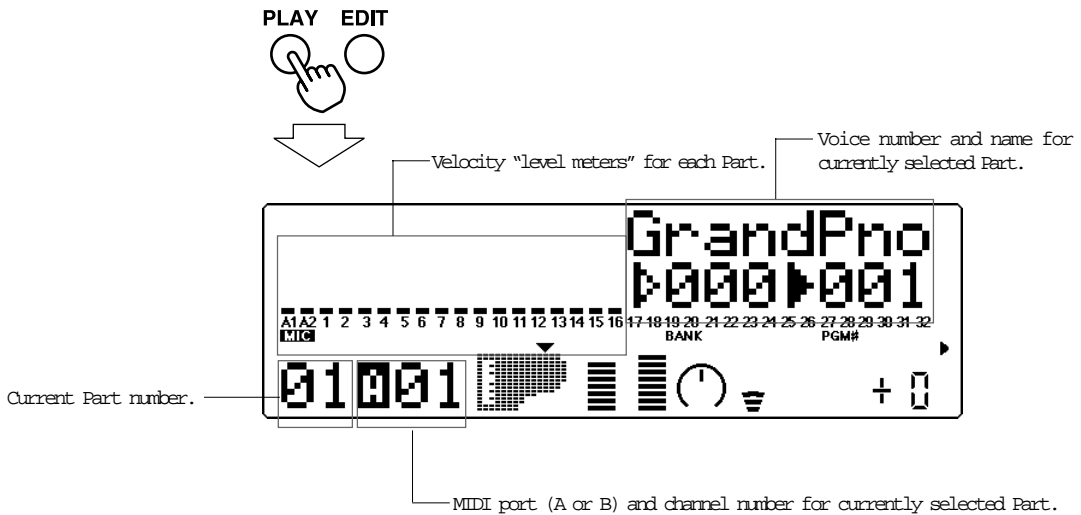
NOTE
Applications that are capable of controlling 32 Parts (e.g., Performer) are set to a clock rate of 1 MHz.

Play Displays

The Play mode has three basic displays, that can be changed according to your preference. Simply press the **PLAY** button repeatedly, and the display alternates as shown below:

1)
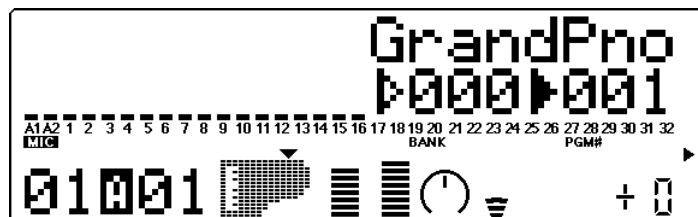
Shows full "level meter" indication for the A1 and A2 A/D Parts and Parts 1 — 16. Currently selected parameter (here, Voice number and name) is displayed at the right side.

Parts 17 — 32 can be displayed by selecting one of those Parts with the **PART** buttons. For example, when Part 18 is selected, the changes as shown below:

2)
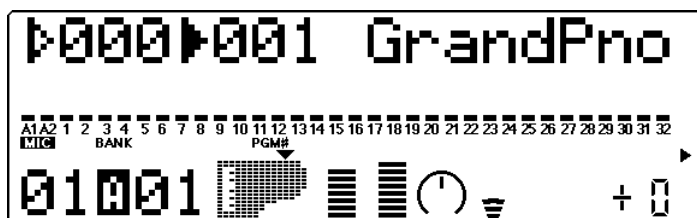
Shows half "level meter" indication for the A1 and A2 A/D Parts and all 32 Parts. Currently selected parameter (here, Voice number and name) is displayed at top.

3)
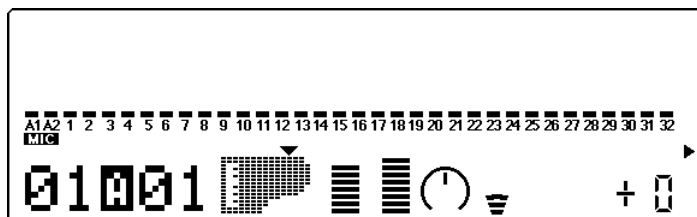
Shows full "level meter" indication for the A1 and A2 A/D Parts and all 32 Parts. Currently selected parameter is not displayed.

Part Controls

The Part controls in the Play mode give you tools for adjusting the basic sound and settings for each Part. The MU90R lets you adjust the various settings for each Part individually (Single Part control) or together (All Part control). Each of these types is explained in greater detail below.

NOTE
In the Multi mode, no settings can be permanently saved to the internal memory of the MU90R. However, you can use the Dump Out function to save Multi settings to a MIDI data storage device. (See page 119.)

Single Part Control

The Single Part controls include: MIDI Receive Channel, Bank Number, Program Number, Volume, Expression, Pan, Reverb Send, Chorus Send, Variation Send and Note Shift.

Selecting Single Part Control

Single Part control is automatically called up when the MU90R is turned on. If All Part is selected, simply press both **PART** buttons simultaneously (or press the **EXIT** button) to return to Single Part.
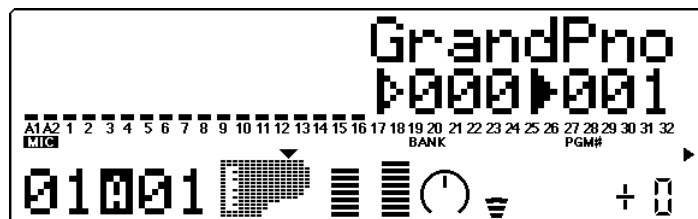
Editing in Single Part

Operation

1 Select the Part to be edited by using the **PART** buttons.

2 Select the desired control for the selected Part by using the **SELECT** buttons.

3 Change the value of the selected control by using the **VALUE** buttons or data dial.

MIDI Receive Port/Channel

This determines the MIDI IN port (A or B) and the receive channel (1 — 16) for the selected Part.

Graphically indicates current Receive Channel setting.
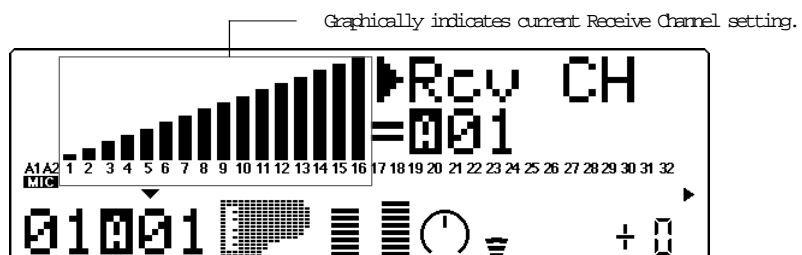
Settings: A1 — A16, B1 — B16

41

Bank Number

This determines the bank number of the selected Part's Voice. Each bank contains 128 Voices. (Refer to the **SOUND LIST & MIDI DATA** booklet.)
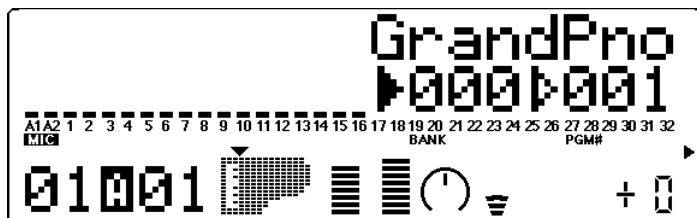
A1/A2 (A/D Input) part:
          000 — 003
Normal part:
     XG: 000, 001, 003, 006, 008, 012, 014, 016 — 020, 024 — 028, 032 — 043, 045, 064 — 072, 096 — 101, SFX
     TG300B: 000 — 011, 016 — 019, 024 — 026, 032, 033, 040, 080, 126, 127
     C/M: Fixed (only one bank)
Drum part:
     XG: 126, 127
     TG300B: 000
     C/M: Fixed (only one bank)

For more information on selecting banks, see Display Bank Select parameter,

Program (Voice) Number

This determines the Voice for the selected Part. (Refer to the **SOUND LIST & MIDI DATA** booklet.)
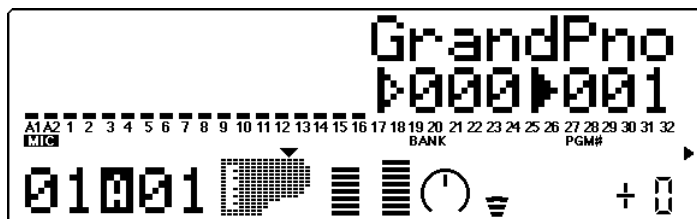
Range: 001 — 128

Volume

This determines the Volume setting for the selected Part's Voice.

Graphically indicates current Volume setting.
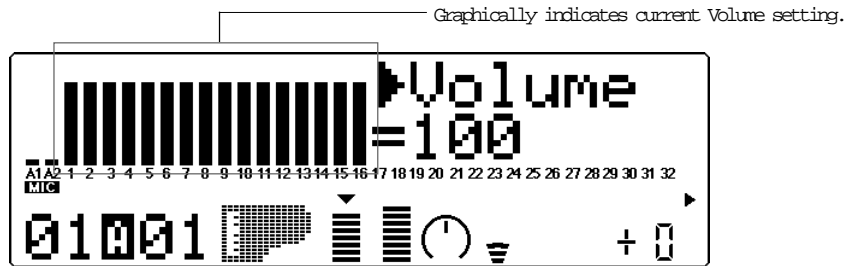
Range: 000 — 127

Expression (Expresn)

This determines the Expression setting for the selected Part's Voice.

Graphically indicates current Expression setting.
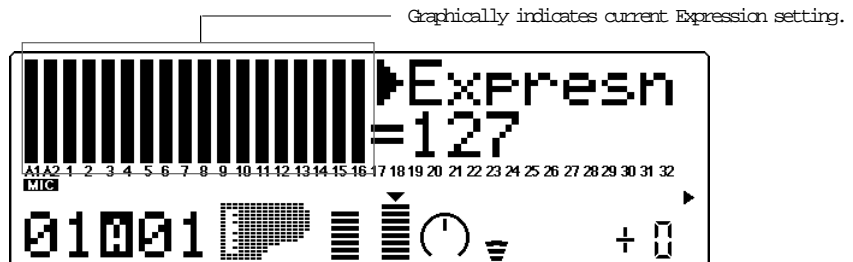
Range: 000 — 127

Pan

This determines the stereo position of the selected Part's Voice. A setting of "Rnd" (Random) randomly assigns the Voice to a pan position. This is useful when you want to have different Voices sound from different random parts of the stereo image. (The Random setting does not affect the A/D input Parts.)

Graphically indicates current Pan setting.
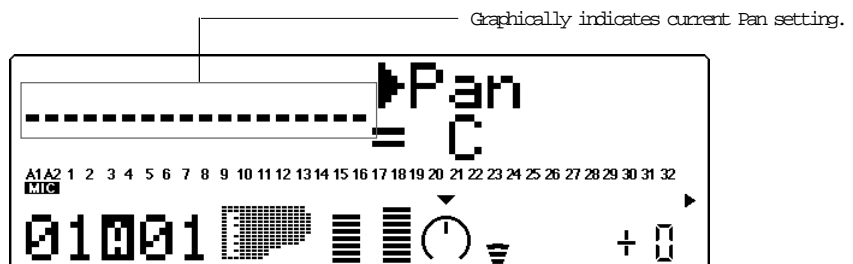
Settings: Rnd (Random), L63 — C — R63

Reverb Send (RevSend)

This determines the level of the selected Part's Voice that is sent to the Reverb effect. A value of 000 results in a completely "dry" Voice sound.

Graphically indicates current Reverb Send setting.
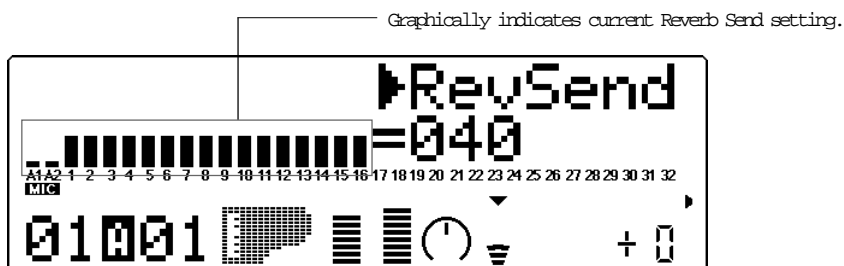
Range: 000 — 127

NOTE
Keep in mind that the Reverb effect must be properly enabled and set for this parameter to work as intended. (See page 101.)

Chorus Send (ChoSend)

This determines the level of the selected Part's Voice that is sent to the Chorus effect. A value of 000 results in a completely "dry" Voice sound (no Chorus effect).

Graphically indicates current Chorus Send setting.
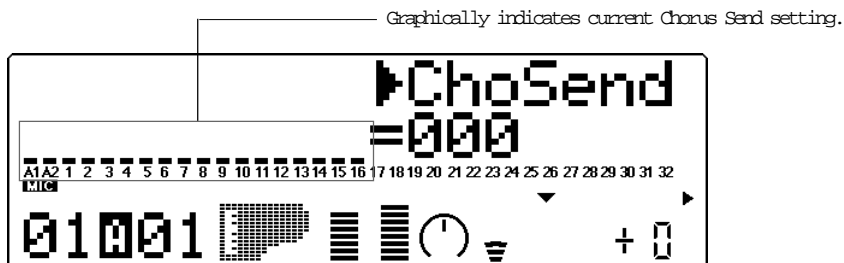
Range: 000 — 127

NOTE
Keep in mind that the Chorus effect must be properly enabled and set for this parameter to work as intended. (See page 103.)

Variation Send (VarSend)

This determines whether the selected Part's Voice is sent to the Variation effect or not. A setting of "off" results in no Variation effect being applied to the Voice.
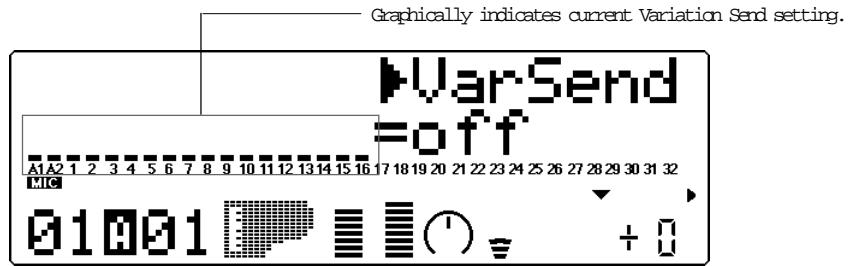
Graphically indicates current Variation Send setting.

▶VarSend
=off

A1A2 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
MIC

01⊠01 ▶ ≡ ≣ ◔ ≋   ┼ ▯

Settings: **off, on** (when **Variation Connection** is set to **INS**);
           000 — 127 (when **Variation Connection** is set to **SYS**)

Note Shift (NoteSft)

This determines the key transposition setting for the Part's Voice.

Graphically indicates current Note Shift setting.

▶NoteSft
=+00

A1A2 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
MIC

01⊠01 ▶ ≡ ≣ ◔ ≋   ┼ ▯
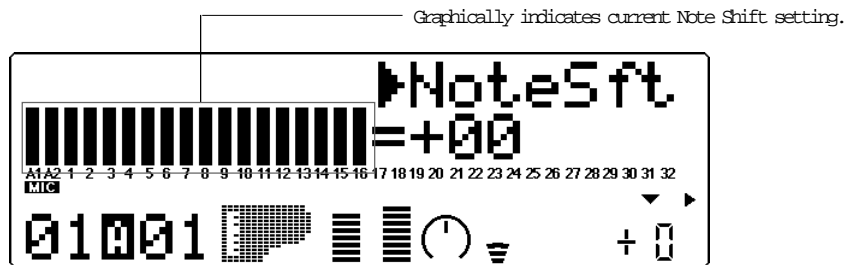
Range: –24 — +24 semitones

All Part Control

The All Part controls include: Device Number, Master Volume, Master Attenuator, Reverb Return, Chorus Return, Variation Return and Transpose.

Keep in mind that these controls affect all Parts equally, and either add to or subtract from their individual values. For example, if Note Shift on one Part is set to –12, and Transpose (in All Part) is set to +12, that Part's pitch value will actually be 0 or normal.

Selecting All Part Control

To select All Part control, press both **PART** buttons simultaneously. (or press the **EXIT** button). ("All" appears in the PART section of the display.)
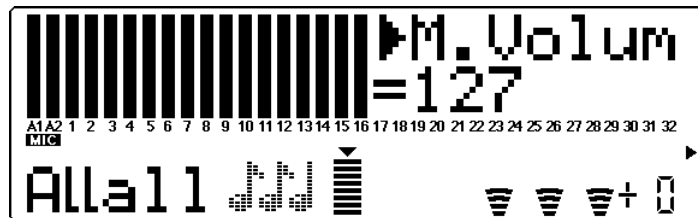
Editing in All Part

Operation

1 Select the desired control for all Parts by using the **SELECT** buttons.

2 Change the value of the selected control by using the **VALUE** buttons or data dial.

Device Number (DevNo.)

Graphically indicates current Device Number setting.
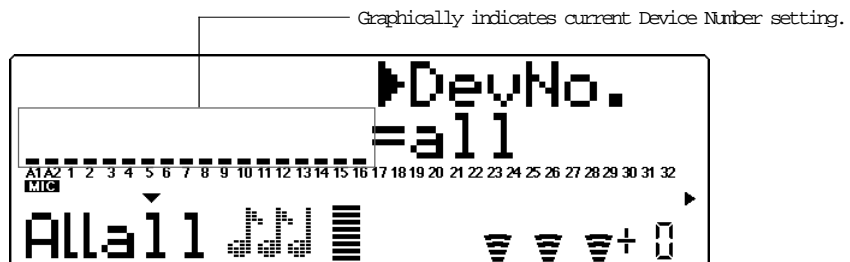
Settings: 1 — 16, all

This determines the Device Number for the MU90R, a kind of MIDI "identification" number to distinguish between multiple units. For

example, if you are using more than one MU90R, set a different De-
vice Number for each. This is especially important when using the
data dump features. (See page 119.) If you have only one MU90R,
set this to "all."

Master Volume (M.Volum)

Graphically indicates current Master Volume setting.

```
▶M.Volum
=127
A1A2 1  2  3  4  5  6  7  8  9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
MIC
Allall            ⬎ ⬎ ⬎+ 0
```
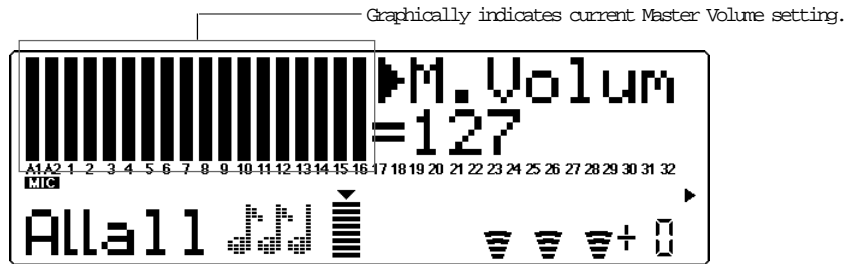
Range: 000 — 127
This determines the overall Volume of the Parts.

Master Attenuator (M.Attn)

Graphically indicates current Master Attenuator setting.

```
▶M.Attn
=000
A1A2 1  2  3  4  5  6  7  8  9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
MIC
Allall            ⬎ ⬎ ⬎+ 0
```
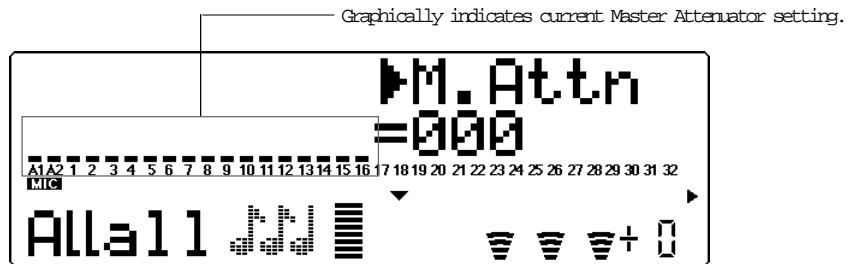
Range: 000 (maximum volume) — 127 (minimum volume)
This determines the level of all Parts, but functions as an attenuator; the
greater the value, the lower the volume. This is useful when you are
playing several songs and want to keep their overall level consistent.

Reverb Return (RevRtn)

Graphically indicates current Reverb Return setting.

```
▶RevRtn
=064
A1A2 1  2  3  4  5  6  7  8  9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
MIC
Allall            ⬎ ⬎ ⬎+ 0
```
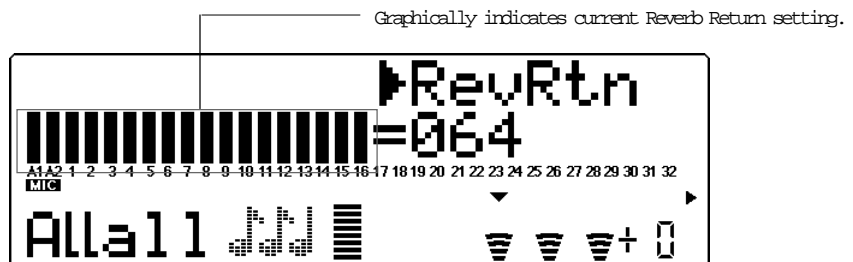
Range: 000 — 127
This determines the amount of Reverb return in the overall mix.

Chorus Return (ChoRtn)

Graphically indicates current Chorus Return setting.

▶ChoRtn
=064

A1A2 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
MIC

AllAll ▼ +0
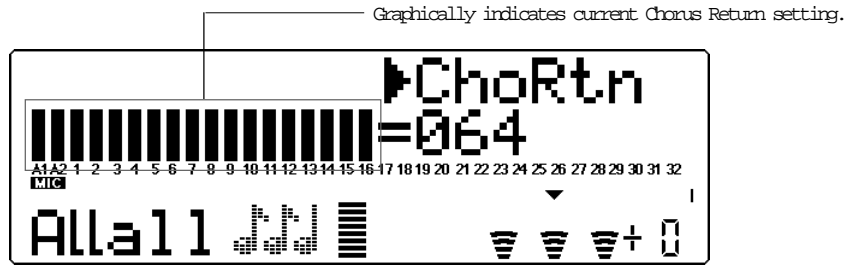
Range: 000 — 127

This determines the amount of Chorus return in the overall mix.
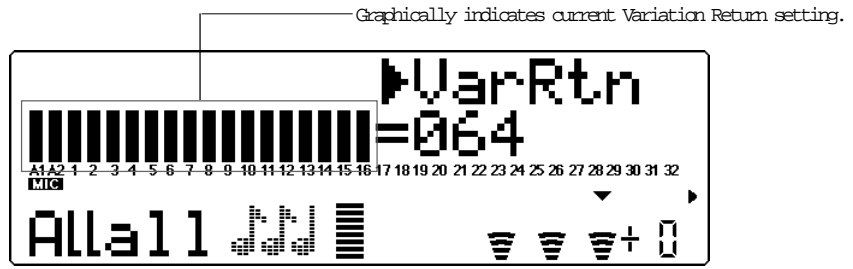
Variation Return (VarRtn)

Graphically indicates current Variation Return setting.

▶VarRtn
=064

A1A2 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
MIC

AllAll ▼ +0

Range: 000 — 127

This determines the amount of Variation return in the overall mix. Variation Return is only available when the **Variation Connection** parameter is set to **SYS**. (See page 106.)

Transpose (Trans)

Graphically indicates current Transpose setting.

▶Trans
=+00

A1A2 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
MIC

AllAll ▼ +0
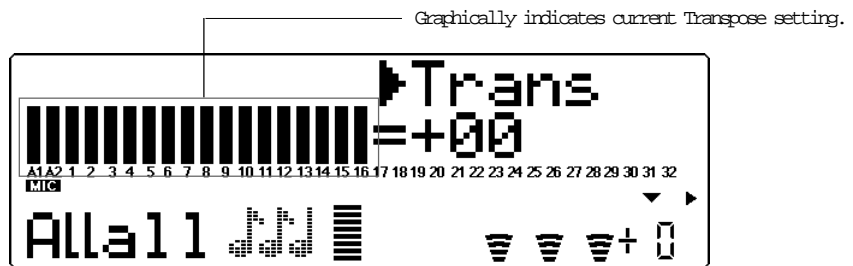
Range: –24 — +24 semitones

This determines the overall Transpose setting of the Parts.

Multi Edit Mode

The Multi Edit mode features various parameters for controlling the Filter, the EG (Envelope Generator), the EQ, and Vibrato. It also features a variety of other miscellaneous controls grouped in the Others parameters. When a Drum Part is selected, Drum-related parameters are also available.

To enter the Multi Edit mode, press the **EDIT** button. When a normal Part is selected, the following menu appears:

When a Drum Part is selected, the following menu appears:

Filter
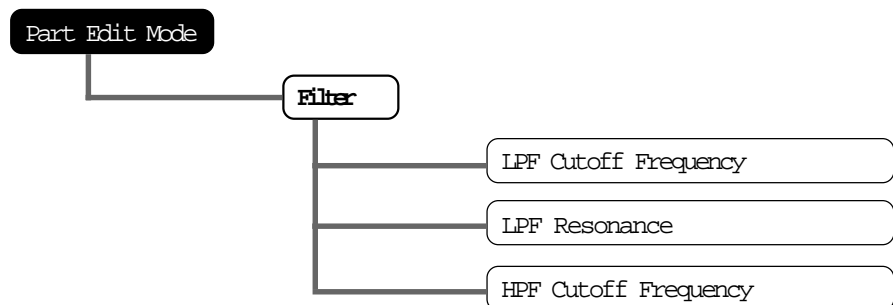
The MU90R features a digital filter that can be used to change the timbre of the Voices. The filter is affected (together with the level) by the EG (Envelope Generator), which allows you to change the timbre over time as well. (See **EG**, page 52.)

LPF Cutoff Frequency (LPF Cutoff)

This determines the cutoff frequency of the low pass filter (LPF). The LPF filters out frequencies higher than the cutoff point and "passes" the lower frequencies. Lower cutoff values create a deeper, more rounded tone, while higher values create a brighter tone.

Graphically shows LPF Cutoff Frequency setting for each Part.
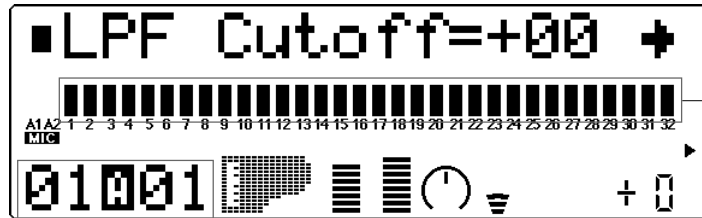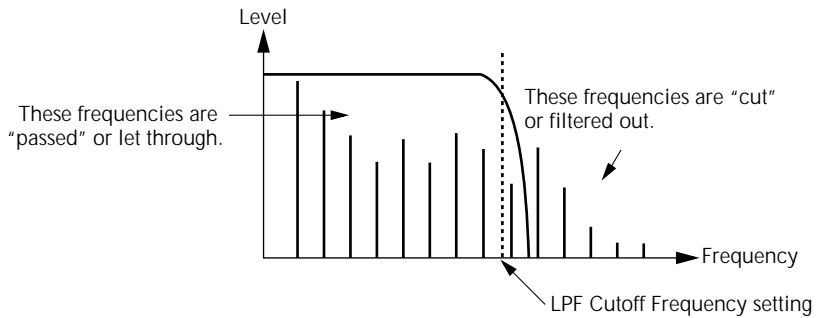
■LPF Cutoff=+00 ↕

01001

Selected Part and MIDI channel

Range: –64 — +63

These frequencies are "passed" or let through.

These frequencies are "cut" or filtered out.

Level

Frequency

LPF Cutoff Frequency setting

LPF Resonance (LPF Reso)

This determines the amount of filter resonance or emphasis of the LPF Cutoff Frequency above. Higher values make the filter effect more pronounced and stronger, creating a resonant peak around the cutoff frequency.

Graphically shows LPF Resonance setting for each Part.
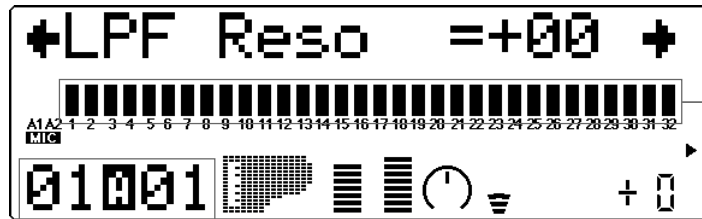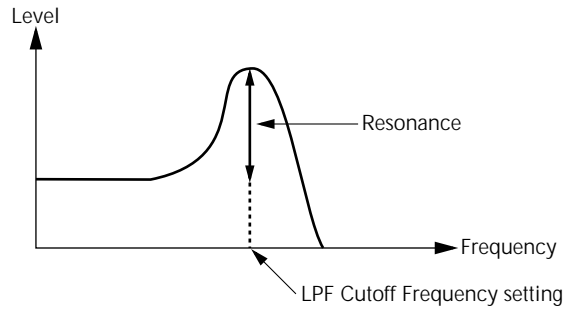
↕LPF Reso =+00 ↕

01001

Selected Part and MIDI channel

Range: –64 — +63

Level

Resonance

Frequency

LPF Cutoff Frequency setting

HPF Cutoff Frequency (HPF Cutoff)

This determines the cutoff frequency of the high pass filter (HPF). The HPF filters out frequencies lower than the cutoff point and "passes" the higher frequencies. Lower cutoff values preserve the fundamental and lower overtones of the sound, while higher values create a thinner, brighter tone.

Graphically shows HPF Cutoff Frequency setting for each Part.

◆HPF Cutoff=+00 ■

A1A2 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
MIC

01฿01 +0

Selected Part and MIDI channel

Range: –64 — +63

Level

These frequencies are "passed" or let through.

These frequencies are "cut" or filtered out.

Frequency

HPF Cutoff Frequency setting

EG (Envelope Generator)

```
┌─────────────────┐
│ Part Edit Mode  │
└─────────────────┘
        │
        │        ┌──────────┐
        └────────│   EG     │
                 └──────────┘
                      │
                      │      ┌───────────────────────────┐
                      ├──────│ EG Attack Time            │
                      │      └───────────────────────────┘
                      │      ┌───────────────────────────┐
                      ├──────│ EG Decay Time             │
                      │      └───────────────────────────┘
                      │      ┌───────────────────────────┐
                      ├──────│ EG Release Time           │
                      │      └───────────────────────────┘
                      │      ┌───────────────────────────┐
                      ├──────│ Pitch EG Initial Level    │
                      │      └───────────────────────────┘
                      │      ┌───────────────────────────┐
                      ├──────│ Pitch EG Attack Time      │
                      │      └───────────────────────────┘
                      │      ┌───────────────────────────┐
                      ├──────│ Pitch EG Release Level    │
                      │      └───────────────────────────┘
                      │      ┌───────────────────────────┐
                      └──────│ Pitch EG Release Time     │
                             └───────────────────────────┘
```
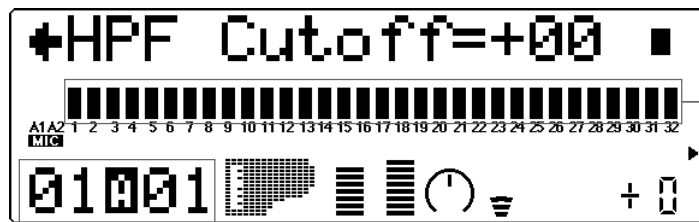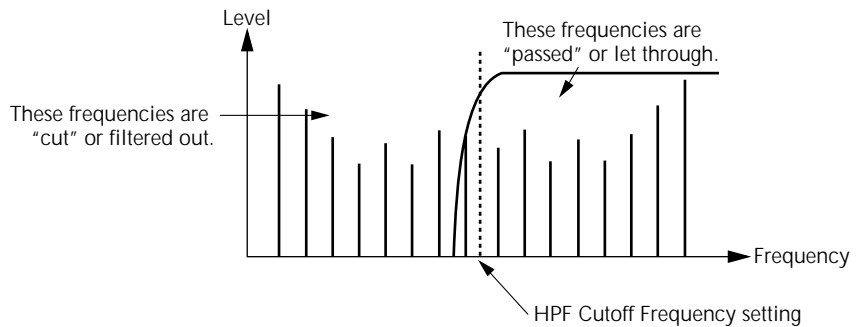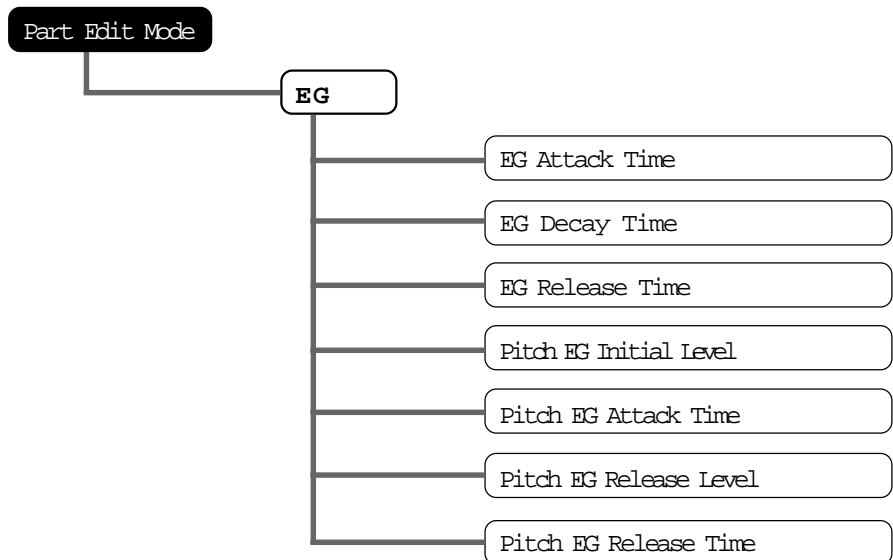
The EG parameters allow you to shape the sound of a Part's Voice — or, in other words, set how the level and timbre of the Voice changes over time. This section also includes independent Pitch Envelope Generator (PEG) parameters for controlling how the pitch of a Part's Voice changes over time.

The relationship of the main EG parameters — Attack, Decay and Release — are shown in the illustration below. These parameters not only affect the sound level, but also the timbre (with the Filter parameters; see page 49).

1) Short Attack, Decay, Release times:

52

2) Long Attack, Decay, Release times:

Level

Attack   Decay   Release

Max.

Min.   Time

Key is pressed   Key is released
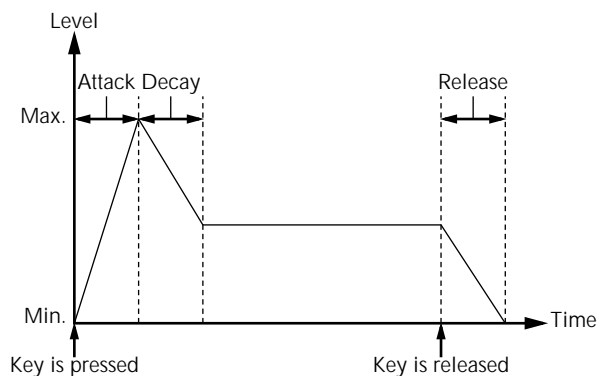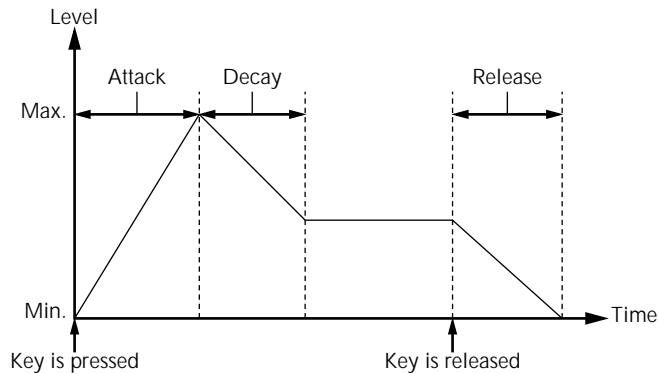
Even though the key is held for the same length of time in both examples,
the sound of the second example slowly reaches full volume and decays
over a longer time. It also sustains longer after the key is released.

Keep in mind that the EG parameters affect each other, and are af-
fected by how long a note is held. For example, if Decay is set to a
low value and the note is held for a long time, you may not be able
to hear changes made to the Release parameter.

EG Attack Time

Graphically shows EG Attack Time setting for each Part.

■Attack Time=+00↔

A1 A2 1   2   3   4   5   6   7   8   9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
MIC
                                                                                ▶
01■01   + 0
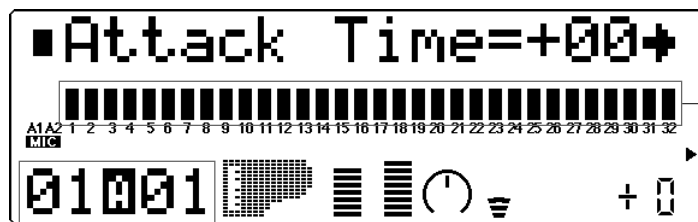
Selected Part and MIDI channel

Range: –64 — +63

This determines the Attack Time of the EG, or how long it takes for
the sound to reach full volume when a note is played. For the Filter,
this determines how long it takes for the sound to be affected by the
maximum Filter values.

EG Decay Time

Graphically shows EG Decay Time setting for each Part.

```
✦Decay Time =+00✦
```
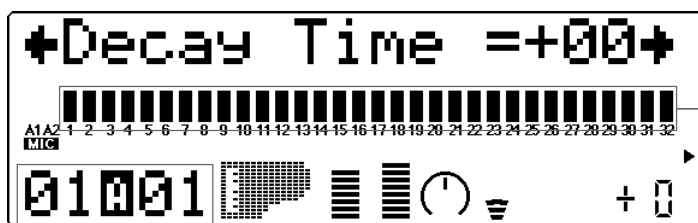
Selected Part and MIDI channel

Range: –64 — +63

This determines the Decay Time of the EG, or how rapidly the sound dies out as a note is held. For the Filter, this determines how long it takes for the Filter effect to die out.

EG Release Time

Graphically shows EG Release Time setting for each Part.

```
✦ReleaseTime=+00✦
```
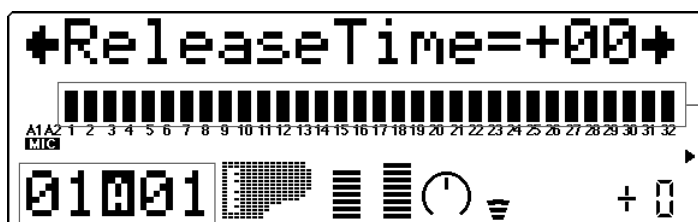
Selected Part and MIDI channel

Range: –64 — +63

This determines the Release Time of the EG, or how long the sound sustains after a note is released. For the Filter, this determines how long the Filter effect continues after a note is released.

`Pitch EG Parameters`

The Pitch EG parameters determine how the pitch of a Part's Voice changes over time. This lets you produce subtle or pronounced pitch changes as a note is played.

In the example Pitch EG settings below, a played note is gradually bent up to its normal pitch, and kept there as the note is held. When the note is released, the pitch rapidly climbs up.
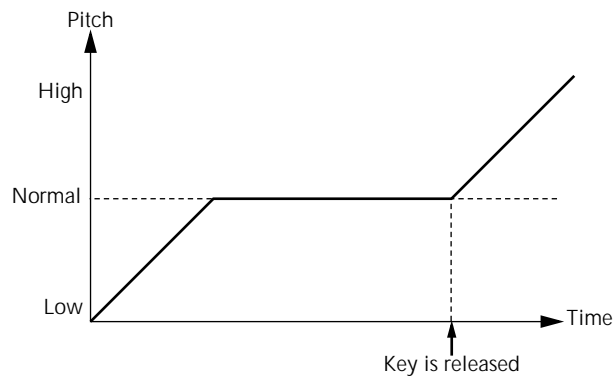
NOTE
The Pitch EG parameters may have little or no effect, depending on the particular Voice used and the settings made to the main EG parameters.

Pitch EG Initial Level (PEGInitLvl)

Graphically shows Pitch EG Initial Level setting for each Part.
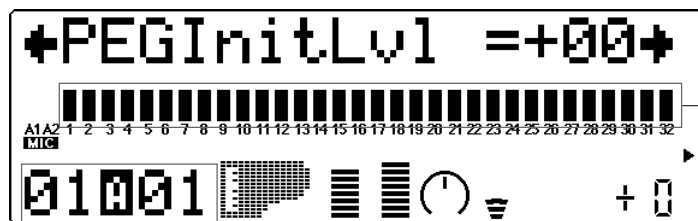
Selected Part and MIDI channel

Range: –64 — +63

This determines the initial pitch of the Part's Voice, when the note is first played. A setting of 00 corresponds to normal pitch.

Pitch EG Attack Time (PEGAtakTime)

Graphically shows Pitch EG Attack Time setting for each Part.

```
◆PEGAtakTime=+00◆
▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮
A1A2 1  2  3  4  5  6  7  8  9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
MIC                                                                              ▶
01A01 ▰▰ ▮ ▮ ◠ ≡          ÷0
```

Selected Part and MIDI channel
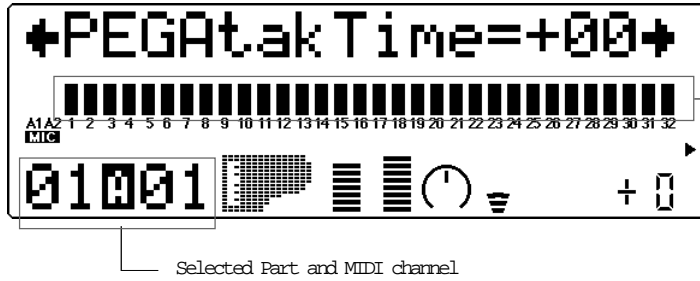
Range: –64 — +63

This determines the Attack Time of the Pitch EG, or how long it takes for the pitch to return to normal (from the pitch value set in Initial Level above).

Pitch EG Release Level (PEGReleLvel)

Graphically shows Pitch EG Release Level setting for each Part.

```
◆PEGReleLvl =+00◆
▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮
A1A2 1  2  3  4  5  6  7  8  9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
MIC                                                                              ▶
01A01 ▰▰ ▮ ▮ ◠ ≡          ÷0
```

Selected Part and MIDI channel
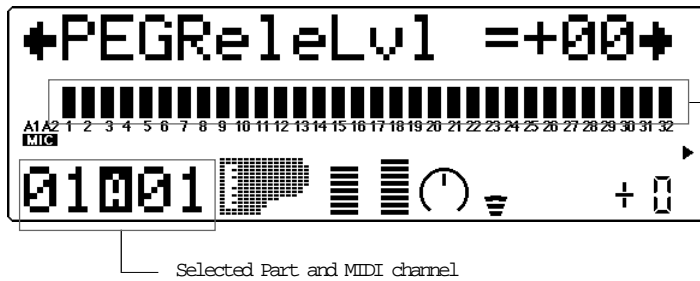
Range: –64 — +63

This determines the final pitch of the Part's Voice, or the pitch that is reached after the note is released. A setting of 00 corresponds to normal pitch.

NOTE
The Pitch EG Release Level and Time parameters may have no effect if the Voice itself does not sustain after the note is released. (Short percussive Voices may fall into this category.) Also make sure that the main EG Release Time is set to an appropriate value so that the sound sustains.

Pitch EG Release Time (PEGReleTime)

Graphically shows Pitch EG Release Time setting for each Part.

```
◆PEGReleTime=+00■
▐▌▐▌▐▌▐▌▐▌▐▌▐▌▐▌▐▌▐▌▐▌▐▌▐▌▐▌▐▌▐▌▐▌▐▌▐▌▐▌
A1A2 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
MIC                                                        ▶
01◼01
```

Selected Part and MIDI channel
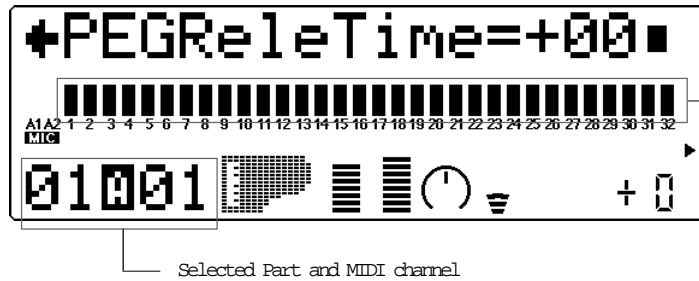
Range: −64 — +63

This determines the Release Time of the Pitch EG, or how long it takes for the pitch to change to the pitch value set in Release Level above.

EQ (Equalizer)

```
┌─────────────────┐
│ Part Edit Mode  │
└─────────────────┘
        │
        │      ┌─────────┐
        └──────│   EQ    │
               └─────────┘
                    │
                    │        ┌──────────────────────┐
                    ├────────│ EQ Low Frequency      │
                    │        └──────────────────────┘
                    │        ┌──────────────────────┐
                    ├────────│ EQ Low Gain           │
                    │        └──────────────────────┘
                    │        ┌──────────────────────┐
                    ├────────│ EQ High Frequency     │
                    │        └──────────────────────┘
                    │        ┌──────────────────────┐
                    └────────│ EQ High Gain          │
                             └──────────────────────┘
```
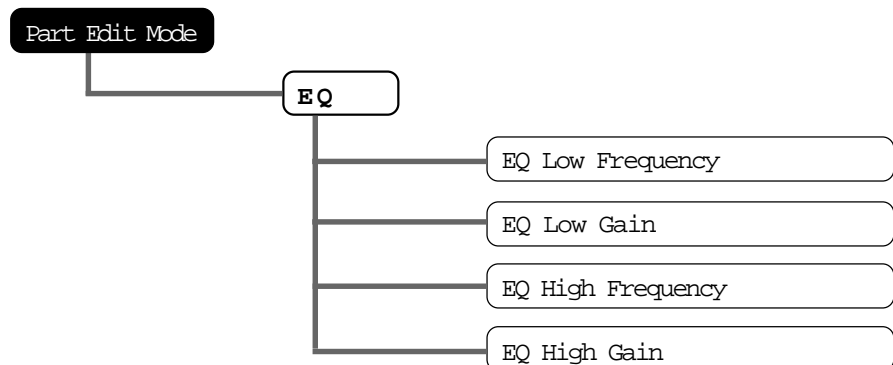
The EQ parameters let you adjust and set the tonal quality of a Part's Voice, such as boosting the bass sound, or making it brighter. This is a two-band equalizer with wide frequency variation for each band, and is independent of the overall EQ controls (see page 112).

EQ Low Frequency (Low Freq)

This determines the frequency which is boosted or cut (in the Low Gain parameter below) for each Part.

Graphically shows the Low Frequency setting for each Part.

```
■Low Freq  = 80 ◆
A1A2 1  2  3  4  5  6  7  8  9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
MIC                                                                    ▶
01001
```
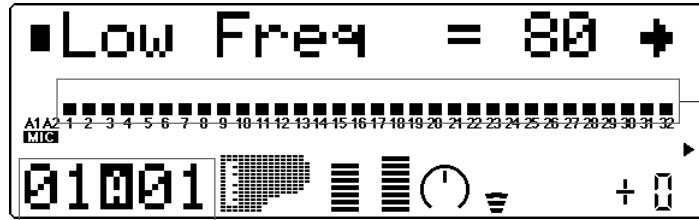
Selected Part and MIDI channel

Range: 32 Hz — 2.0 kHz

EQ Low Gain

This determines the level of the selected frequency (in Low Freq above). Positive values boost the level of the selected frequency and negative values attenuate it.

Graphically shows the Low Gain setting for each Part.

```
◆Low Gain  =+00 ◆
A1A2 1  2  3  4  5  6  7  8  9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
MIC                                                                    ▶
01001
```
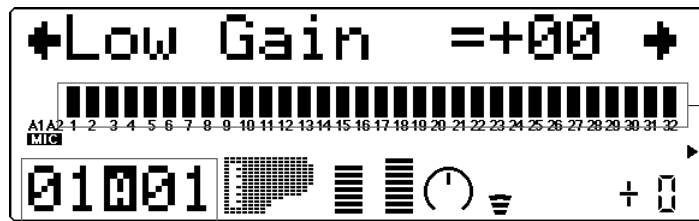
Selected Part and MIDI channel

Range: –64 — +00 — +63

EQ High Frequency (High Freq)

This determines the frequency which is boosted or cut (in the High Gain parameter below) for each Part.

Graphically shows the High Frequency setting for each Part.

```
◆High Freq = 10k◆
A1A2 1  2  3  4  5  6  7  8  9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
MIC                                                                    ▶
01001
```
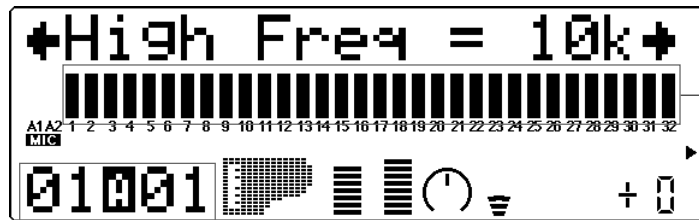
Selected Part and MIDI channel

Range: 500 Hz — 16 kHz

EQ High Gain

> This determines the level of the selected frequency (in High Freq above). Positive values boost the level of the selected frequency and negative values attenuate it.

Graphically shows the High Gain setting for each Part.

```
◆High Gain =+00  ■
█████████████████████████████████████
A1A2 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
MIC                                              ▶
01001 ▮▮ ▤ ▤ ◠ ▾        ÷0
```
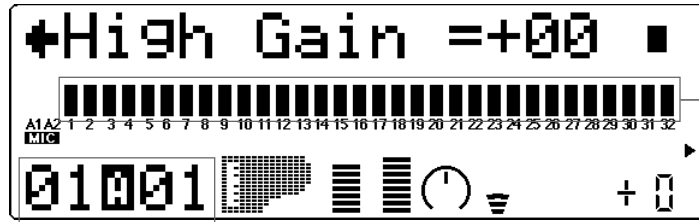
Selected Part and MIDI channel

Range: –64 — +00 — +63

Vibrato

Part Edit Mode

Vibrato

Vibrato Rate

Vibrato Depth

Vibrato Delay
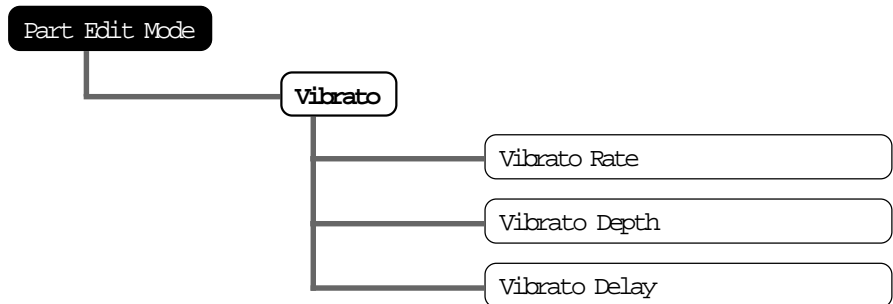
Vibrato produces a quavering, vibrating sound in the Part's Voice, by regularly modulating the pitch. You can control the speed and depth of the Vibrato, as well as the time it takes before the Vibrato effect is applied.

Vibrato Rate

Graphically shows Vibrato Rate setting for each Part.

```
■Rate    =+00        ◆
███████████████████████████████████████
A1A2 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
MIC                                              ▶
01001 ▮▮ ▤ ▤ ◠ ▾        ÷0
```
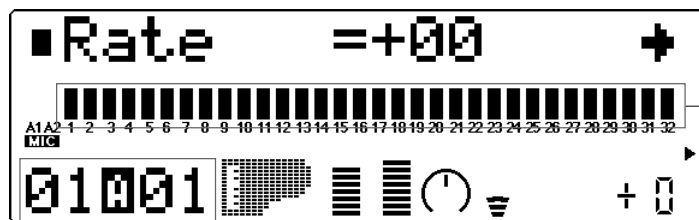
Selected Part and MIDI channel

Range: –64 — +63

This determines the speed of the Vibrato effect. Higher values result in a faster Vibrato sound.

Vibrato Depth

Graphically shows Vibrato Depth setting for each Part.

Selected Part and MIDI channel
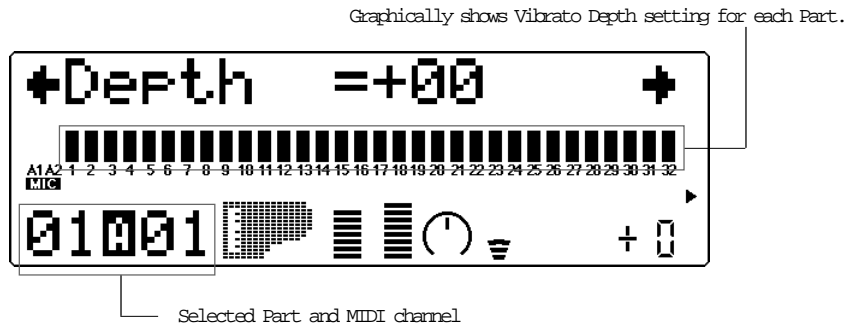
Range: –64 — +63

This determines the depth of the Vibrato effect. Higher values result in a stronger, more pronounced Vibrato sound.

Vibrato Delay

Graphically shows Vibrato Delay setting for each Part.

Selected Part and MIDI channel
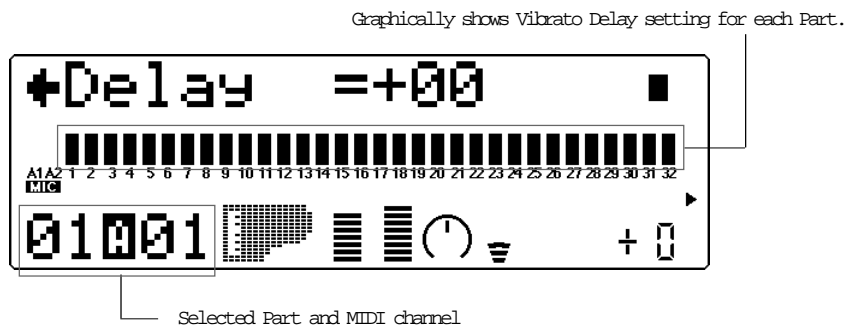
Range: –64 — +63

This determines the delay in the onset of the Vibrato effect. Delay is effective especially on stringed instrument Voices. For example, violin players often use delayed vibrato, especially while playing long notes. The Delay parameter is useful in recreating this effect, producing a more natural, lifelike sound. Higher values result in a longer Delay time.

Others

```
┌─────────────────┐
│ Part Edit Mode  │
└─────────────────┘
        │
        └──────────────┤ Others │
                         │
                         ├──────────────( Detune )
                         │
                         ├──────────────( Part Mode )
                         │
                         ├──────────────( Mono/Poly Mode )
                         │
                         ├──────────────( Portamento Switch )
                         │
                         ├──────────────( Portamento Time )
                         │
                         ├──────────────( Element Reserve )
                         │
                         ├──────────────( Note Limit Low )
                         │
                         ├──────────────( Note Limit High )
                         │
                         ├──────────────( Dry Level (VarConnect=SYS) )
                         │
                         ├──────────────( Velocity Sensitivity Depth )
                         │
                         ├──────────────( Velocity Sensitivity Offset )
                         │
                         ├──────────────( Velocity Limit Low )
                         │
                         ├──────────────( Velocity Limit High )
                         │
                         ├──────────────( Pitch Bend Control )
                         │
                         ├──────────────( MW LFO Pitch Modulation Depth )
                         │
                         ├──────────────( AC1 Control Change Number )
                         │
                         ├──────────────( AC1 Filter Control )
                         │
                         ├──────────────( AC1 Amplitude Control )
                         │
                         └──────────────( Output Select )
```

The Others section of parameters contains miscellaneous controls, including those related to tuning, Part Mode, velocity, portamento, note range, etc.

Detune

Graphically shows Detune setting for each Part.

```
■Detune =+00.0   ✛
████████████████████████████
A1A2 1  2  3  4  5  6  7  8  9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
MIC                                                                                          ▶
01■01 ▣▶ ☰ ☰ ◠ ☰      ✛0
```

Selected Part and MIDI channel
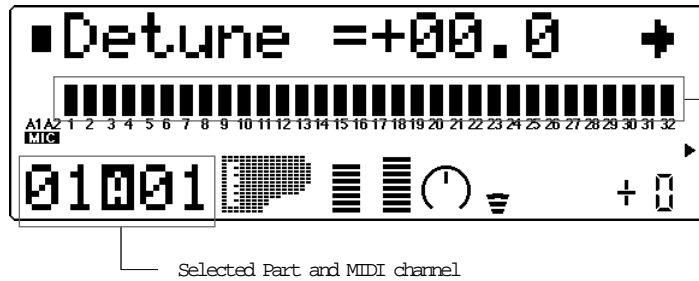
Range: –12.8 — +12.7

This determines the fine tuning of the Part's Voice.

HINT

Detune could be used to slightly detune a Voice compared to the tuning of the rest of the Voices for a richer sound. It could also be used to detune two different Voices being played in unison. For example if two different Parts are set to the same MIDI channel (see page 41) and same Voice, a naturally thick chorusing effect can be obtained by slightly detuning each Voice in opposite directions here.

Part Mode

Height of bars indicates selected Part Mode setting for each Part.
(A single bar indicates "normal" setting.)

```
✛PartMode=normal✛
┃━━━━━┃━━━━━━━━━━━━━┃━━━━━━
A1A2 1  2  3  4  5  6  7  8  9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
MIC                                                                                          ▶
01■01 ▣▶ ☰ ☰ ◠ ☰      ✛0
```

Selected Part and MIDI channel
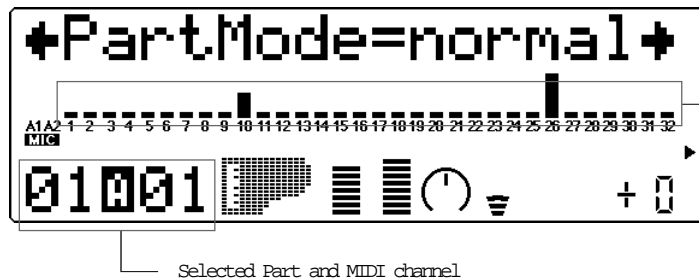
Settings: normal, drum, drumS1 — S4

(When Sound Module mode is set to **C/M**, both Parts 10 and 26 are set to **drumS1**.)

This determines the mode for the Part. A setting of **normal** allows selection of the normal instrument Voices. (See the **SOUND LIST & MIDI DATA** booklet.) The **drum** setting allows selection of the drum kits. (See the **SOUND LIST & MIDI DATA** booklet.) The **drumS1 — S4** settings are locations for storing specially programmed drum setups. These setups can be edited by using the Drum Setup controls in the Multi Edit mode. (See page 73.) The **drum** and **drumS1 — S4** settings are not available in the Performance mode (all Parts are fixed to "normal").

The Part Mode settings differ depending on the Sound Module mode selected, as described below.

For **XG** (Extended General MIDI) mode:

All settings described above are available. When **normal** is selected, any of the basic or the extended set of Voices can be used for the Part.

For **TG300B** mode:

The settings **normal** and **drumS1 — S4** are available; **drum** cannot be selected. When **normal** is selected, either the basic or the extended set of Voices (for the TG300B mode) can be used for the Part.

For **C/M** mode:

The Part Mode settings are fixed in this mode and cannot be changed: Parts 10 and 26 are set to **drumS1**, and all other Parts are set to **normal**. The MIDI Receive Channel setting for Parts 1 and 17 is set to **off**. The 128 Voices of C/M Type 1 can be used for Parts 1 — 9 and 17 — 25; the 64 Voices of C/M Type 2 can be used for Parts 11 — 16 and 27 — 32.

For **PFM** (Performance) mode:

All four Parts are set to **normal**; none of the **drum** settings are available. Any of the basic or the extended set of Voices can be used for each Part.

NOTE
When two or more different Parts are set to the same editable drum setup (**drumS1 — S4**), any edits made to that drum setup automatically affect all those Parts. For example, when two Parts are set to **drumS1**, any changes made to **drumS1** affect both Parts.

Mono/Poly Mode

Height of bars indicates selected Mono/Poly Mode setting for each Part.
(A single bar indicates "mono" setting, while full height indicates "poly.")
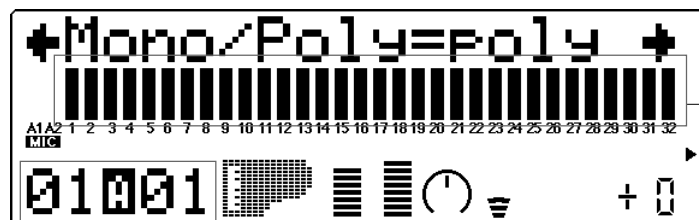
Selected Part and MIDI channel

Settings: mono, poly

This determines whether the Part's Voice is played monophonically (only one note at a time) or polyphonically (up to 64 notes at a time). This parameter is not available when the Part Mode is set to Drum.

Portamento Parameters

Portamento is a function that creates a smooth pitch glide from one note to another.

Portamento Switch (PortametSw)

This determines whether Portamento is on or off for the Part. (This parameter is not available for Drum Parts.)

Height of bars indicates selected Portamento Switch setting for each Part.
(A single bar indicates "off" setting, while full height indicates "on.")
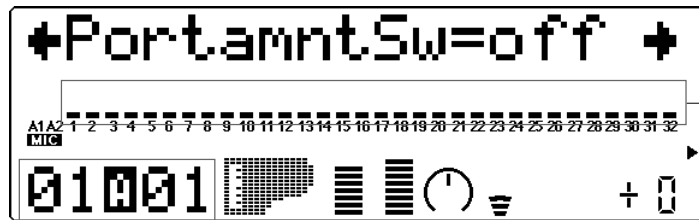
Selected Part and MIDI channel

Settings: off, on

Portamento Time (PortametTm)

This determines the time of the Portamento effect, or how long it takes to glide the pitch from one note to the next. Higher values result in a longer pitch glide time. (This parameter is not available for Drum Parts.)

Graphically shows Portamento Time setting for each Part.
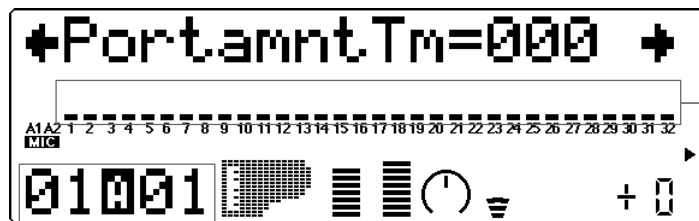
Selected Part and MIDI channel

Range: 000 — 127

Element Reserve (ElemReserv)

This determines the minimum number of sound elements that are reserved for the Part. This setting ensures that when the maximum simultaneous polyphony of 64 notes (or elements) is exceeded, the selected Part will still play up to the number of elements set here. For example, if the Element Reserve of a Part is set to 10, the sounds for that Part (up to 10 simultaneous notes) will not be cut off, even if the maximum polyphony is exceeded. The total number of Element Reserve values for all of the Parts cannot exceed 64.

This parameter is useful when playing back dense song data, and it ensures that the most important Parts in the song data will play properly without being cut off.

Graphically shows the Element Reserve setting for each Part.

◆ElemReserv=02 ◆

A1A2 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
MIC

01 001
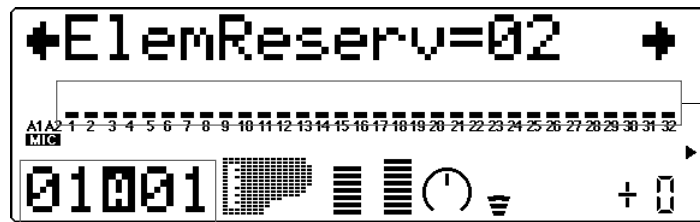
Selected Part and MIDI channel

Range: 00 — 32

Note Limit Parameters

The Note Limit Low and High parameters allow you to set the range of notes for a Part's Voice. Notes outside the range will not be played.

> HINT
> Note Limit can be used to set up keyboard splits. Set two Parts to the same MIDI channel (see page 41), but give them Note Limit settings so that one Part is played from the left side of the keyboard and the other is played from the right.

Note Limit Low (NoteLimitL)

Graphically shows Note Limit Low setting for each Part.

◆NoteLimitL=C-2 ◆

A1A2 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
MIC

01 001
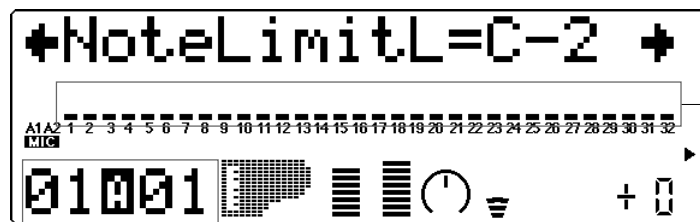
Selected Part and MIDI channel

Range: C-2 — G8

This determines the lowest responding note for the Part. Notes below this value will not be played.

Note Limit High (NoteLimitH)

Graphically shows Note Limit High setting for each Part.

NoteLimitH=G8

A1A2 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
MIC

01 01
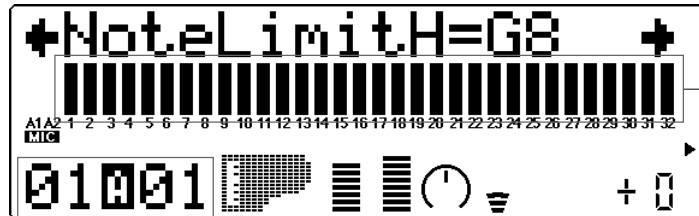
Selected Part and MIDI channel

Range: C-2 — G8

This determines the highest responding note for the Part. Notes above this value will not be played.

Dry Level

Dry Level =127

A1A2 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
MIC

01 01
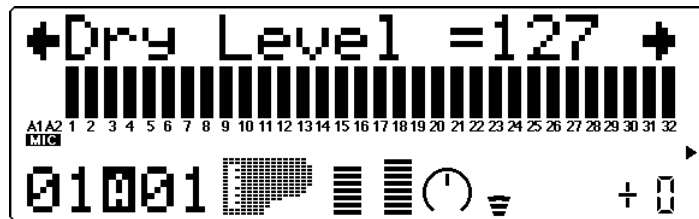
Range: 000 — 127

This determines the level of the unprocessed sound of the Voice (sound with no effect processing). This parameter is only available when the **Variation Connection** parameter is set to **SYS**. (See page 106.)

Velocity Sensitivity Depth (VelSensDpt)

Graphically shows Velocity Sensitivity Depth setting for each Part.

VelSensDpt=064

A1A2 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
MIC

01 01

Selected Part and MIDI channel

Range: 000 — 127
This determines the degree to which velocity affects the Part's Voice. Higher values make the Voice more sensitive to changes in velocity.

Velocity Sensitivity Offset (VelSensOfs)

Graphically shows Velocity Sensitivity Offset setting for each Part.
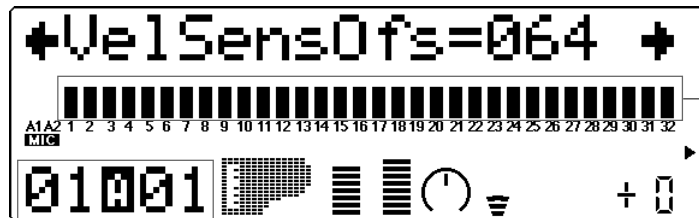
Selected Part and MIDI channel

Range: 000 — 127
This determines the volume range over which velocity affects. For lower values, the velocity affects a volume range from minimum to medium-loud. For higher values, velocity affects a range from medium-soft to maximum.
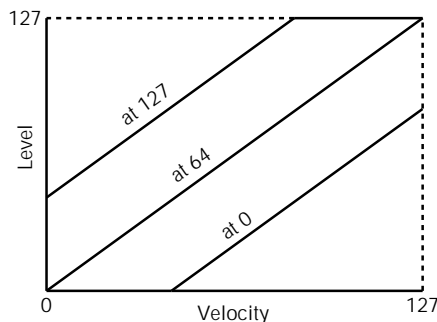
NOTE
Depending on the Voice used, if Velocity Sensitivity Offset is set to too low of a value, the Voice may not sound, no matter how strong the velocity.

Velocity Limit Parameters
The Velocity Limit Low and High parameters allow you to set the effective velocity range for a Part's Voice. Velocity values outside the range will not be played. (Velocity is generally the strength at which notes are played from a MIDI keyboard.)

HINT
Velocity Limit can be used to set up velocity splits. A velocity split allows you to have one Part's Voice sound when you play the connected keyboard strongly, and a different Voice sound when you play softly. Set two Parts to the same MIDI channel (see page 41), but give them different Velocity Limit settings so that one or the other sounds depending on how strongly you play the keyboard.

Velocity Limit Low (VelLimitLo)

Graphically shows Velocity Limit Low setting for each Part.

◆VelLimitLo=001 ◆

A1A2 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
MIC

01 01 ▶ ≣ ≣ ⌒ ≋ ÷0

Selected Part and MIDI channel
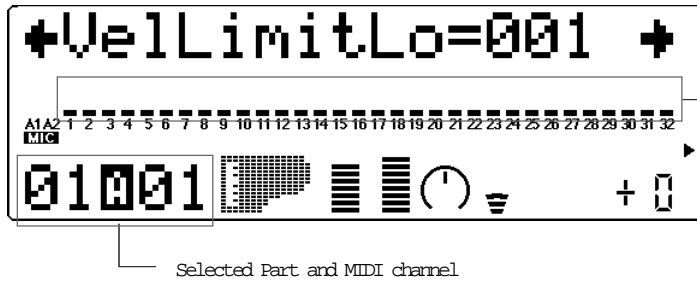
Range: 000 — 127

This determines the lowest velocity value at which the Part's Voice will play. The higher the value, the harder the keyboard must be played for the Voice to sound.

Velocity Limit High (VelLimitHi)

Graphically shows Velocity Limit High setting for each Part.

◆VelLimitHi=127 ◆

A1A2 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
MIC

01 01 ▶ ≣ ≣ ⌒ ≋ ÷0

Selected Part and MIDI channel
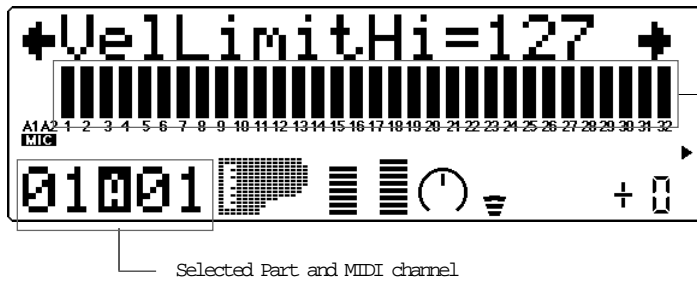
Range: 000 — 127

This determines the highest velocity value at which the Part's Voice will play. The lower the value, the less strength needed (in playing the keyboard) to get maximum volume.

```
1    no                              no   127
     sound                           sound
     |_____███████████████████_____|
              ↑                    ↑
          VelLimitLo           VelLimitHi
```

6 8

Pitch Bend Control (PitBndCtrl)

Graphically shows Pitch Bend Control setting for each Part.

```
┌─────────────────────────────────┐
│ ←PitBndCtrl=+02 →               │
│                                 │
│ ▐▐▐▐▐▐▐▐▐▐▐▐▐▐▐▐▐▐▐▐▐▐▐▐▐▐▐▐▐▐▐ │
│ A1A2 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 │
│ MIC                           ▶ │
│ 01001  ⬛ ☰ ☰ ◠ ≡    ÷0         │
└─────────────────────────────────┘
```
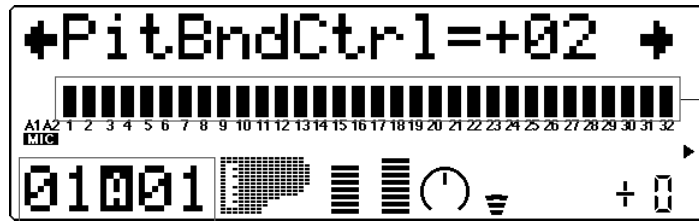
Selected Part and MIDI channel

Range: –24 — +24 semitones (+/– 2 octaves)

This determines the Pitch Bend range for the Part's Voice. (Pitch Bend is usually controlled by a pitch bend wheel on a MIDI keyboard.)

Modulation Wheel — LFO Pitch Modulation Depth (MW LFOPMod)

Graphically shows LFO Pitch Modulation Depth setting for each Part.

```
┌─────────────────────────────────┐
│ ←MW LFOPMod=010 →               │
│                                 │
│ ▬ ▬ ▬ ▬ ▬ ▬ ▬ ▬ ▬ ▬ ▬ ▬ ▬ ▬ ▬ ▬│
│ A1A2 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 │
│ MIC                           ▶ │
│ 01001  ⬛ ☰ ☰ ◠ ≡    ÷0         │
└─────────────────────────────────┘
```
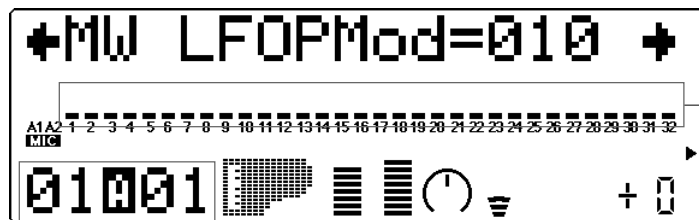
Selected Part and MIDI channel

Range: 000 — 127

This determines how widely the pitch is modulated by the LFO (low frequency oscillator). This is generally controlled from a modulation wheel on a MIDI keyboard and produces a vibrato effect. The higher the value, the deeper the pitch modulation, and hence, the more pronounced the vibrato effect.

Assignable Controller 1 Control Change Number (AC1 CC No.)
This determines the which MIDI control change number is assigned to the Assignable Controller (AC1) for the selected Part. AC1 can be used to affect the Filter (page 71), volume (Amplitude; page 72), LFO (page 69) or the Variation effect (page 104). Make sure that parameters you don't want to be affected by AC1 are properly set to 00.

Graphically shows the AC 1 Control Change Number setting for each Part.
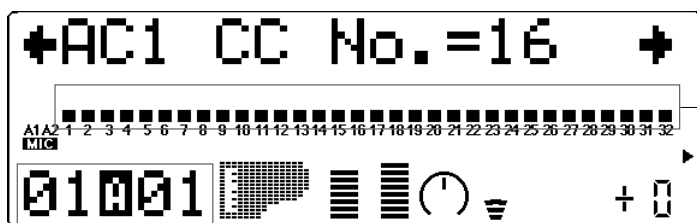
Selected Part and MIDI channel

Range: 00 — 95

HINT
Though this parameter allows you to assign any control change number from 0 to 95, only a few of these are in common use. The controllers most likely to be encountered include:
    01 — Modulation wheel or lever
    02 — Breath controller
    04 — Foot controller
    07 — Volume controller
Some or all of these may be available on your MIDI instrument, and can be used to control certain functions on the MU90R in real time. Some MIDI instruments allow you to change the control change number for a particular controller: for example, setting the modulation wheel (normally 01) to control Volume (07). Refer to the owner's manual of your particular instrument for more information.

Assignable Controller 1 Filter Control (AC1 FilCtrl)

This determines the degree to which Assignable Controller 1 (AC1) affects the Cuttoff Frequency of the Low Pass Filter for each Part. For maximum effect, this should be set to one of the extreme values, negative or positive. A setting of 00 results in no control over the Filter, even when AC1 is operated (or control change data is received). Negative settings affect the Filter negatively; in other words, when the controller is at the minimum position, control over the Filter is greatest. (The control number used for AC1 is set in the Assignable Controller 1 Control Change Number parameter above.)

Graphically shows the AC 1 Filter Control setting for each Part.

◆AC1FilCtrl=+00 ◆

A1A2 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
MIC

01□01
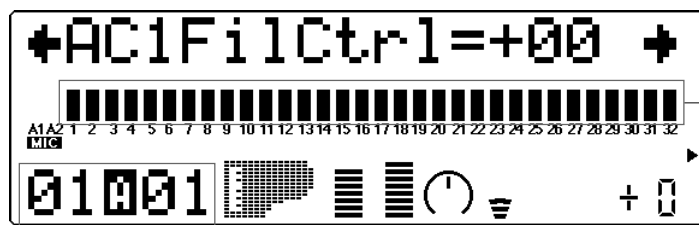
Selected Part and MIDI channel

Range: –64 — +63

In the illustration below, a foot controller is used as Assignable Controller 1.

For positive values: For negative values:

Minimum   Maximum   Maximum   Minimum
effect   effect   effect   effect
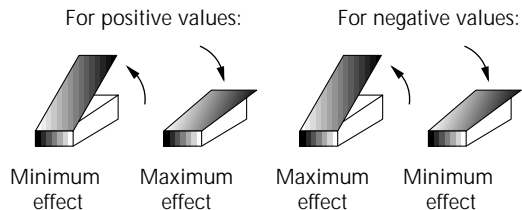
HINT
Positive and negative values can be most effectively used by setting two different Parts to opposite settings. In this way, moving the controller (for example, a foot controller) one way will affect one Part and moving it the opposite way will affect the other Part.

Assignable Controller 1 Amplitude Control (AC1 AmpCtrl)

This determines the degree to which Assignable Controller 1 (AC1) affects the volume (Amplitude) for each Part. For maximum effect, this should be set to one of the extreme values, negative or positive. A setting of 00 results in no volume control, even when AC1 is operated (or control change data is received). Negative settings affect the volume negatively; in other words, when the controller is at the minimum position, control over the volume is greatest. (The control number used for AC1 is set in the Assignable Controller 1 Control Change Number parameter above.)

Graphically shows the AC 1 Amplitude Control setting for each Part.
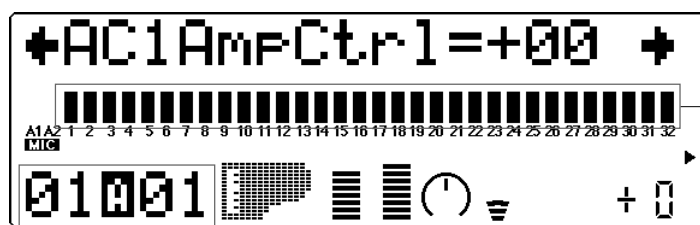
Selected Part and MIDI channel

Range: 64 — +63

NOTE
For more information on using positive and negative values, see the illustration and hint in Assignable Controller 1 Filter Control (page 71).

Output Select (OutPtSel)

This determines the output configuration for the selected Part. When set to "stereo," the Part is output (with effects) through the main OUTPUT and PHONES jacks. When set to one of the "ind" (individual) settings, it is output through the INDIV. OUTPUT jacks. In this case, only Insertion effects can be applied; System effects cannot be applied to the INDIV. OUTPUT jacks. When set to "ind1+2," the Part is output in stereo (1: left, 2: right). Settings of "ind1" and "ind2" output the Part in mono to the corresponding jack. (Parts output through the INDIV. OUTPUT jacks cannot be heard through the PHONES jack.)

Graphically shows the Output Select setting for each Part.

```
◆OutPtSel=stereo■
```

A1A2 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
MIC

```
01001
```

Selected Part and MIDI channel
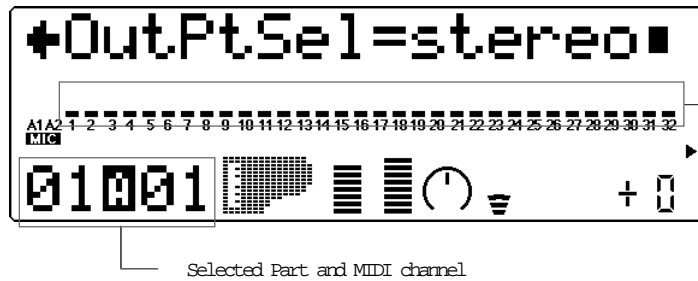
Settings: stereo, ind1+2, ind1, ind2

NOTE
● The Output Select Lock parameter (page 116) must be set to "off" in order to change this setting via MIDI.
● When the Part Mode parameter (page 62) is set to "drum" or "drum S1 – S4", this setting is inactive.

Drum Setup Controls

The Drum Setup controls allow you to make a wide variety of settings for the drum sounds in a Drum Part. These settings include Pitch controls, Level, Pan, effect send, filter controls and EG (Envelope Generator), among others. Moreover, these parameters can be set to completely independent values for each of the drum sounds in a Part.

Calling Up the Drum Setup Menu

To call up the Drum Setup menu, select a Part for which a Drum Part has been assigned. The Drum Setup controls automatically come up in the Edit mode. For example, if Part 10 is assigned a Drum Part, the Drum Setup menu will appear in the main Edit menu:

```
▶FILTER ▶EG ▶DRUM
▶VIBRATO ▶OTHERS
```

A1A2 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
MIC

```
10010
```

Use the **SELECT** buttons to select "DRUM" in the display, and press the **ENTER** button.

Use these to select the note number.
(Can also be selected by pressing appropriate key on connected MIDI keyboard.)

Currently selected parameter name and value.

Currently selected note and assigned drum sound.

▶C0 :Seq Click H
■PitchCoarse=+00↨

GENERAL
MIDI INSTRUMENT
XG

XG
TG300B
C/M
PERFORM

10 10   + 0

PART   MIDI   BANK/PGM# VOL EXP PAN REV CHO VAR KEY

PLAY EDIT

UTIL EFFECT

MODE EQ

MUTE/
SOLO

ENTER

EXIT

⊖ PART ⊕
◀━ALL━▶

◀SELECT▶

⊖ VALUE ⊕

Use these to select the parameter.

Use these to change the parameter value.

Operation

1 Select the desired note number and its assigned drum sound with the **PART** buttons.
For a list of the available sounds and their note assignments, see the **SOUND LIST & MIDI DATA** booklet.

HINT
You can also select the desired note number by simply pressing the appropriate key on a connected MIDI keyboard. This function can be enabled or disabled by using the **MUTE/ SOLO** button.

2 Select the desired parameter with the **SELECT** buttons.
Refer to the descriptions below for details on the individual parameters.

3 Change the parameter value with the **VALUE** buttons or data dial.

MULTI MODE

Drum Setup Parameters

The Drum Setup parameters are only available when the Part Mode has been set to DrumS1 — S4. (See page 62.)

Pitch Coarse
  Range: −64 — +63
    This determines the coarse pitch setting of the selected drum sound.

Pitch Fine
  Range: −64 — +63
    This determines the fine pitch setting of the selected drum sound.

Velocity Pitch Sensitivity (VelPchSens)
    This determines the degree to which pitch changes of the selected drum sound respond to velocity. In other words, you can control how much the pitch of the sound changes by how hard or soft you play the keys of a connected keyboard. Positive values raise the pitch and negative values lower the pitch. A value of 00 results in no pitch change, whatever velocity is received.

  Range: −16 — +16

Level
  Range: 000 — 127
    This determines the volume of the selected drum sound.

Pan
  Settings: Rnd (Random), L63 — C — R63
    This determines the stereo position of the selected drum sound. A setting of "Rnd" (Random) randomly assigns the drum to a pan position. This is useful when you want to have different drums sound from different random parts of the stereo image.

Reverb Send (Rev Send)
  Range: 000 — 127
    This determines the level of the selected drum sound that is sent to the Reverb effect. A value of 000 results in a completely "dry" drum sound, no matter how much Reverb is applied to the Drum Part.

NOTE
Keep in mind that the Reverb effect must be properly enabled and set for this parameter to work as intended. (See page 101.) Also, the parameters Reverb Send in Single Part control (page 44) and Reverb Return in All Part control (page 47) must be set to appropriate values.

Chorus Send (Cho Send)

Range:　000 — 127

This determines the level of the selected drum sound that is sent to the Chorus effect. A value of 000 results in a completely "dry" drum sound, no matter how much Chorus is applied to the Drum Part.

NOTE
Keep in mind that the Chorus effect must be properly enabled and set for this parameter to work as intended. (See page 103.) Also, the parameters Chorus Send in Single Part control (page 44) and Chorus Return in All Part control (page 48) must be set to appropriate values.

Variation Send (Var Send)

This determines the level of the selected drum sound that is sent to the Variation effect. A setting of off results in a completely "dry" drum sound, no matter how much Variation is applied to the Drum Part.

Settings: **off, on** (when **Variation Connection** is set to **INS**);
　　　　　000 — 127 (when **Variation Connection** is set to **SYS**)

NOTE
Keep in mind that the Variation effect must be properly enabled and set for this parameter to work as intended. (See page 104.) Also, the parameters Variation Send in Single Part control (page 44) and Variation Return in All Part control (page 48) must be set to appropriate values.

LPF Cutoff Frequency (LPF Cutoff)

This determines the cutoff frequency of the low pass filter (LPF) for the selected drum sound. The LPF filters out frequencies higher than the cutoff point and "passes" the lower frequencies. Lower cutoff values create a deeper, more rounded tone, while higher values create a brighter tone. (For more information, see LPF Cutoff Frequency on page 50.)

Range:　–64 — +63 (XG mode),
　　　　　000 — 127 (TG300B or C/M mode)

LPF Resonance (LPF Reso)

This determines the amount of filter resonance or emphasis of the LPF Cutoff Frequency above for the selected drum sound. Higher values make the filter effect more pronounced and stronger, creating a resonant peak around the cutoff frequency. (For more information, see LPF Resonance on page 50.)

Range:　–64 — +63 (XG mode),
　　　　　000 — 127 (TG300B or C/M mode)

Velocity LPF Cutoff Sensitivity (VelLPFSens)

This determines the degree to which the LPF Cutoff Frequency for the selected drum sound changes in response to velocity. In other words, you can shift the LPF Cutoff Frequency of the filter up or down (and thus change the timbre of the sound) depending on how hard or soft you play the keys of a connected keyboard. Positive values raise the LPF Cutoff Frequency and negative values lower it. A value of 00 results in no frequency change, whatever velocity is received.

Range: –16 — +16

HPF Cutoff Frequency (HPF Cutoff)

This determines the cutoff frequency of the high pass filter (HPF) for the selected drum sound. The HPF filters out frequencies lower than the cutoff point and "passes" the higher frequencies. Lower cutoff values preserve the fundamental and lower overtones of the sound, while higher values create a thinner, brighter tone. (For more information, see HPF Cutoff Frequency on page 51.)

Range: –64 — +63

EQ Low Frequency (Low Freq)

This determines the frequency which is boosted or cut (in the Low Gain parameter below) for the selected drum sound.

Range: 32 Hz — 2.0 kHz

EQ Low Gain

This determines the level of the selected frequency (in Low Freq above). Positive values boost the level of the selected frequency and negative values attenuate it for the selected drum sound.

Range: –64 — +63

EQ High Frequency (High Freq)

This determines the frequency which is boosted or cut (in the High Gain parameter below) for the selected drum sound.

Range: 500 Hz — 16 kHz

EQ High Gain

This determines the level of the selected frequency (in High Freq above) for the selected drum sound. Positive values boost the level of the selected frequency and negative values attenuate it.

Range: –64 — +63

EG Attack

Range: –64 — +63 (XG mode),

000 — 127 (TG300B or C/M mode)

This determines the Attack Time of the EG (Envelope Generator), or how long it takes for the sound of the selected drum sound to reach full volume when a note is played. (See page 52 for more information about the EG function; also see illustration below.)

EG Decay 1

Range: –64 — +63 (XG mode),

000 — 127 (TG300B or C/M mode)

This determines the Decay 1 time of the EG, or how rapidly the sound dies down to the Decay 2 level. (See illustration below.) Higher values result in a longer Decay time.

EG Decay 2

Range: –64 — +63 (XG mode),

000 — 127 (TG300B or C/M mode)

This determines the Decay 2 time of the EG, or how rapidly the sound dies out completely. (See illustration below.) Higher values result in a longer Decay time.
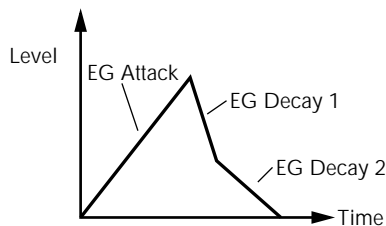
Alternate Group

Settings: off, 001 — 127

This determines the group assignment of the selected drum sound. Drums assigned to the same group cannot be sounded simultaneously. In other words, if one drum in a group is sounding while a second in the same group is played, the first drum sound will be cut off and the second will sound.

Receive Note On (RcvNoteOn)

Settings: on, off

This determines how the selected drum sound responds to MIDI Note On messages. Normally, this should be set to **on** so that the corresponding drum sound plays when a MIDI Note On message is received. Set this to **off** when you want to keep the selected drum sound from playing.

Receive Note Off

Settings: on, off

This determines how the selected drum sound responds to MIDI Note Off messages. When this is set to on, the selected sound will stop in response to the corresponding MIDI Note Off message. An on setting is good for some sustained sounds (like a whistle), or for key-controlled cymbal "chokes." For most drum sounds, however, this should be set to off so that the drum sound plays back in its entirety (is not cut off).

Output Select (OutPtSel)

This determines the output configuration for the selected drum sound. When set to "stereo," the drum sound is output (with effects) through the main OUTPUT and PHONES jacks. When set to one of the "ind" (individual) settings, it is output (without effects) through the INDIV. OUTPUT jacks. When set to "ind1+2," the drum sound is output in stereo (1: left, 2: right). Settings of "ind1" and "ind2" output the drum sound in mono to the corresponding jack. (Drum sounds output through the INDIV. OUTPUT jacks cannot be heard through the PHONES jack.)

Settings: stereo, ind1+2, ind1, ind2

Performance Mode

In the Performance mode, the MU90R performs as a four-Part tone generator, with all Parts controlled over a single MIDI channel. The Performance mode is so named because it's ideally suited to live performance situations. It allows you to play four different Voices at the same time from your MIDI keyboard — either in a layer, or in sophisticated keyboard and velocity splits. It also gives you comprehensive control over each of the four Parts for maximum perform-ance flexibility. A total of 200 Performances are available: 100 Preset and 100 Internal.

NOTE
Drum Parts are not available in the Performance mode.

Performance Play Mode

To set the Performance mode and call up Performance Play:

1. Press the **MODE** button.

```
SOUND MODULE=
▶XG TG300 C/M PFM
 MIC                              ▶
            XG
```

2. Use the **SELECT** button to select "PFM" (PERFORMANCE).

3. Press the **EXIT** button or the **PLAY** button to return to the Play display.
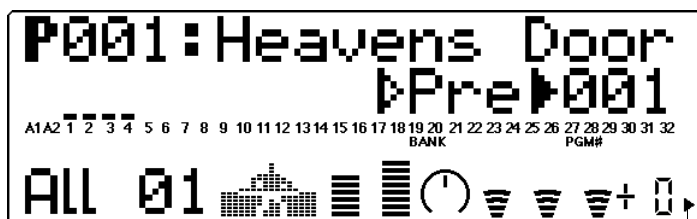
```
P001:Heavens Door
              ▶Pre▶001
A1A2 1 2 3 4  5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
                        BANK                    PGM#
                                                        XG
All  01 ⣀⣤⣶▓ ▤ ▤ ◔ ⬇ ⬇ ⬇+ 0 ▶   TG300B
                                                        C/M
                                                        PERFORMANCE

            Indicates Performance mode. ⎯⎯⎯⎯⎯⎯
```

Selecting a Performance and its Individual Parts

To call up a Preset or Internal Performance and select individual Parts of that Performance:

1 From the Performance Play mode (see section above), press the **PART** buttons simultaneously, so that the All Part display is shown.

```
P001:Heavens Door
         ▶Pre▶001
```

Indicates All Part display.

NOTE
The display is automatically set to All Part when the Performance Play mode is selected.

2 Use the **SELECT** buttons to select the Bank parameter, then use the **VALUE** buttons or data dial to select the desired bank, Preset (Pre) or Internal (Int).

Preset bank:

```
P001:Heavens Door
         ▶Pre▶001
```

Bottom half of keyboard player icon is shown in reverse display to indicate Preset Performance bank.

Internal bank:

```
I001:ConcertGrand
         ▶Int▶001
```
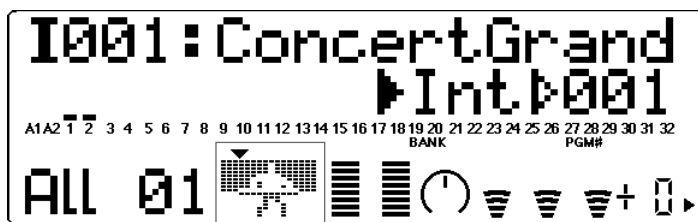
Top half of keyboard player icon is shown in reverse display to indicate Internal Performance bank.

3 Use the **SELECT** buttons to select the Program Number parameter, then use the **VALUE** buttons or data dial to select the desired Performance number.

Performance number

```
I010:Aquamarine
            ▷Int▷010
A1A2 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
                              BANK                    PGM#
All 01
```
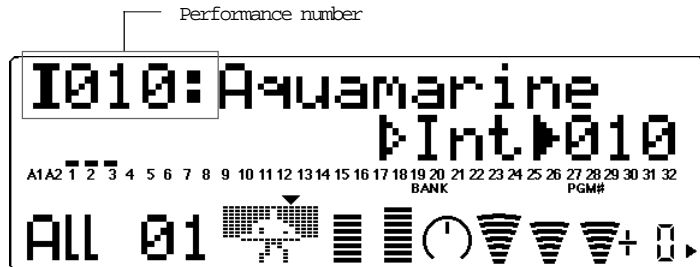
4 From the All Part display, press the **PART** buttons simultaneously, so that the Single Part display is shown.

```
I010      Choral
            ▷041▷055
A1A2 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
                              BANK                    PGM#
01
```

Indicates currently selected Part.
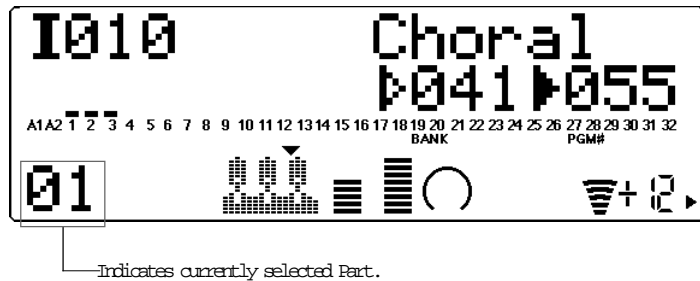
5 Select the desired Part by using the **PART** buttons.

6 Select the desired Voice bank for the Part by using the **SELECT** buttons to select the Bank parameter, and using the **VALUE** buttons or data dial to change the bank number.

7 Select the desired Voice for the Part by using the **SELECT** buttons to select the Program Number parameter, and using the **VALUE** buttons or data dial to change the Voice number.

To return to the All Part display from the Single Part display, either press the **PART** buttons simultaneously, or press the **EXIT** button.

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Performance Part Control

Single Part

Bank Number

```
P010          GrandPno
              ▶000▶001
A1A2 1 2 3 4  5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
                              BANK                    PGM#
01          ▦P ▤ ▤ ◯ ▾ ▿   ÷ 0 ▸
```

Settings:

    A1 part: 000 — 003, 018, 019

    A2 part: 000 — 003

    1 — 4 part: 000, 001, 003, 006, 008, 012, 014, 016 — 020, 024, 025, 027, 028, 032 — 043, 045, 064 — 072, 096 — 101, SFX

This determines the bank number of the selected Part's Voice. Each bank contains 128 Voices. (Refer to the **SOUND LIST & MIDI DATA** booklet.)

Program (Voice) Number

```
P010          GrandPno
              ▶000▶001
A1A2 1 2 3 4  5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
                              BANK                    PGM#
01          ▦P ▤ ▤ ◯ ▾ ▿   ÷ 0 ▸
```

Range: 001 — 100

This determines the Voice for the selected Part. (Refer to the **SOUND LIST & MIDI DATA** booklet.)

Volume

Graphically indicates current Volume setting.

```
P010              ▶Volume
                   =090
A1A2 1  2  3  4   5  6  7  8  9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
01
```

Range: 000 — 127

This determines the Volume setting for the selected Part's Voice.

Pan

Graphically indicates current Pan setting.

```
P010              ▶Pan
                   = C
A1A2 1  2  3  4   5  6  7  8  9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
01
```

Settings: Rnd (Random), L63 — C — R63

This determines the stereo position of the selected Part's Voice. A
setting of "Rnd" (Random) randomly assigns the Voice to a pan po-
sition. This is useful when you want to have different Voices sound
from different random parts of the stereo image.

Reverb Send (RevSend)

Graphically indicates current Reverb Send setting.

```
P010              ▶RevSend
                   =027
A1A2 1  2  3  4   5  6  7  8  9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
01
```

Range: 000 — 127

This determines the level of the selected Part's Voice that is sent to the
Reverb effect. A value of 000 results in a completely "dry" Voice sound.

NOTE
Keep in mind that the Reverb effect must be properly enabled and set for this parameter to
work as intended. (See page 101.)

Chorus Send (ChoSend)

Graphically indicates current Chorus Send setting.

Range: 000 — 127

> This determines the level of the selected Part's Voice that is sent to the Chorus effect. A value of 000 results in a completely "dry" Voice sound (no Chorus effect).

NOTE
Keep in mind that the Chorus effect must be properly enabled and set for this parameter to work as intended. (See page 103.)

Variation Send (VarSend)

Graphically indicates current Variation Send setting.
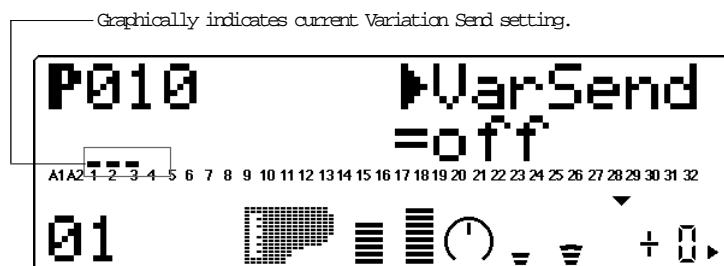
Settings: **off, on** (when **Variation Connection** is set to **INS)**;
000 — 127 (when **Variation Connection** is set to **SYS)**

> This determines whether the selected Part's Voice is sent to the Variation effect or not. A setting of **off** or **000** results in no Variation effect being applied to the Voice.

Note Shift (NoteSft)

Graphically indicates current Note Shift setting.
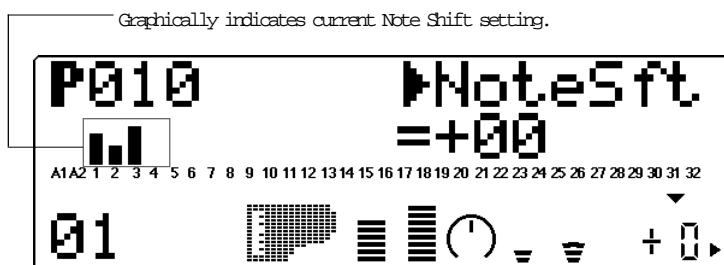
Range: –24 — +24 semitones

> This determines the key transposition setting for the Part's Voice.

All Part

System MIDI Channel (Sys CH)

Graphically indicates current System MIDI Channel setting.

```
P001          ▶Sys CH
              =01
A1A2 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
All  01
```
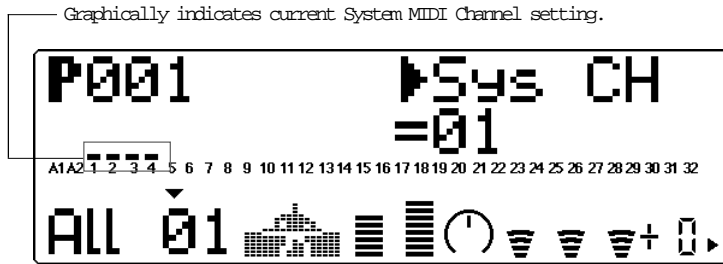
Settings: 01 — 16, all

> This determines the MIDI receive channel for all Parts of the Per-
> formance. When this is set to "all," the Performance responds over
> any incoming MIDI channel.

Performance Bank

```
P001:Heavens Door
              ▶Pre▶001
A1A2 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
                          BANK              PGM#
All  01
```
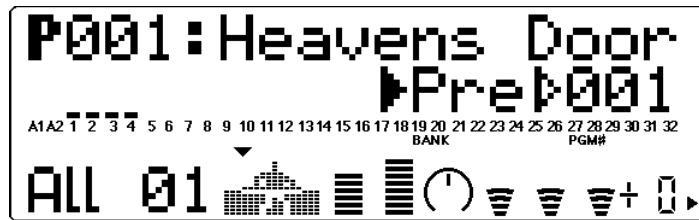
Settings: Pre (Preset), Int (Internal)

> This determines the bank of Performance programs: Preset or Inter-
> nal. Preset Performances are those that have been created and
> loaded at the factory; the Internal bank is reserved for user-created
> Performances.

Performance Number

```
P001:Heavens Door
              ▶Pre▶001
A1A2 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
                          BANK              PGM#
All  01
```

Range: 001 — 100

> This determines the Performance number.

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Performance Volume (Pfm Vol)

Graphically indicates current Performance Volume setting.

```
P001          ▶Pfm Vol
               =092
A1A2 1  2  3  4  5  6  7  8  9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
                            ▼
ALL 01
```
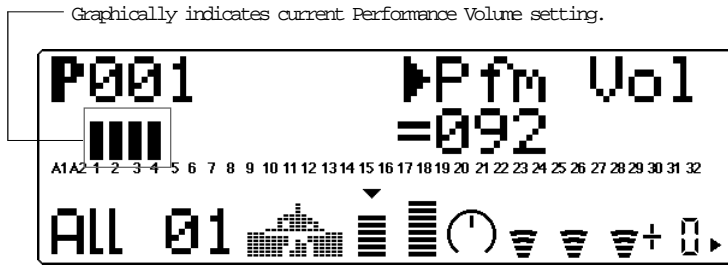
Range: 000 — 127

This determines the overall Volume of the Performance.

Performance Pan (Pfm Pan)

Graphically indicates current Performance Pan setting.

```
P001          ▶Pfm Pan
               = C
A1A2 1  2  3  4  5  6  7  8  9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
                            ▼
ALL 01
```
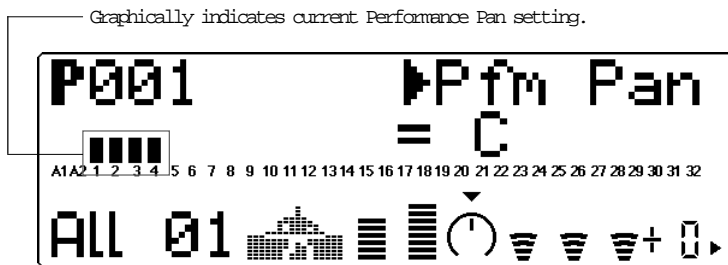
Range: L63 — C — R63

This determines the overall Pan position of the Performance.

Reverb Return (RevRtn)

Graphically indicates current Reverb Return setting.

```
P001          ▶RevRtn
               =064
A1A2 1  2  3  4  5  6  7  8  9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
                            ▼
ALL 01
```

Range: 000 — 127

This determines the amount of Reverb return for the Performance in the overall mix.

Chorus Return (ChoRtn)

Graphically indicates current Chorus Return setting.

```
P001              ▶ChoRtn
                   =064
A1A2 1  2  3  4  5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
                                                          ▼
ALL 01
```
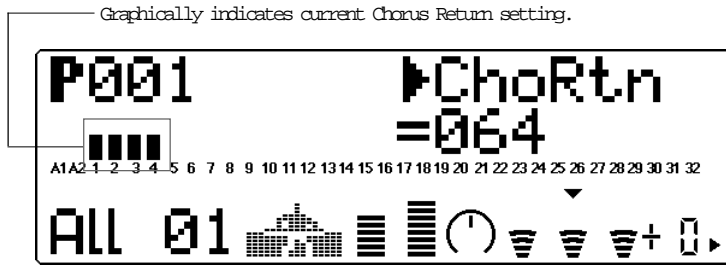
Range: 000 — 127

This determines the amount of Chorus return for the Performance in the overall mix.

Variation Return (VarRtn)

Graphically indicates current Variation Return setting.

```
P001              ▶VarRtn
                   =064
A1A2 1  2  3  4  5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
                                                    ▼
ALL 01
```
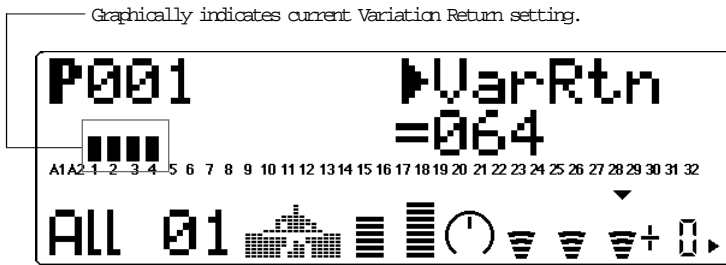
Range: 000 — 127

This determines the amount of Variation return in the overall mix of the Performance. Variation Return is only available when the **Variation Connection** parameter is set to **SYS**. (See page 106.)

System Transpose (SysTran)

Graphically indicates current Transpose setting.

```
P001              ▶SysTran
                   =+00
A1A2 1  2  3  4  5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
                                                       ▼
ALL 01
```
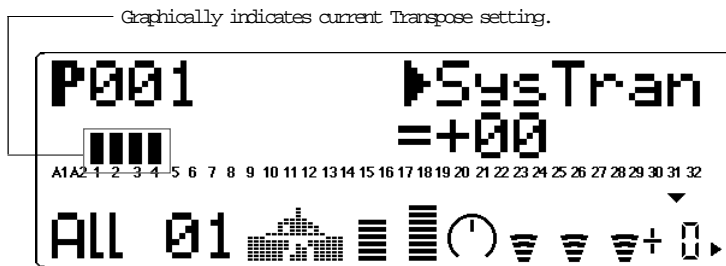
Range: –24 — +24 semitones

This determines the overall Transpose setting of the Performance.

Performance Edit Mode

The Performance Edit mode features various functions and parameters, grouped in the following sections: Common (related to the Performance as a whole), Part (related to each of the four Parts), and the Copy and Store operations.

To enter the Performance Edit mode, press the **EDIT** button (from the Performance Play mode). The following menu appears:
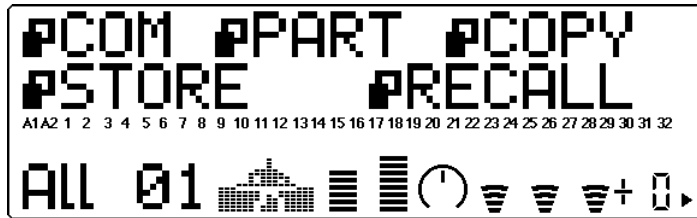
Common

The Common parameters allow you to name a Performance, enable the A/D Parts for a Performance, and set the control change number for realtime parameter control.

Performance Name (Perform Name)

This allows you to give a name to your edited Performance.

Operation

1 From the Performance Name display, press the **ENTER** button.

Performance name

Performance Name
[Heavens Door]

A1A2 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32

ALL 01

2 Use the **SELECT** buttons to select the character position (flashing character) in the name and use the **VALUE** buttons or data dial to change the character at that position.

Use these to move among character positions.

Flashes to indicate character position.

Performance Name
[Heavens Door]

A1A2 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32

ALL 01

PART   MIDI   BANK/PGM# VOL EXP PAN REV CHO VAR KEY

GENERAL MIDI

XG

XG
TG300B
C/M
PERFORM

PLAY   EDIT

UTIL   EFFECT

MODE   EQ

MUTE/ ⊖ PART ⊕
SOLO   ⎯ALL⎯

ENTER ◄SELECT►

EXIT   ⊖ VALUE ⊕
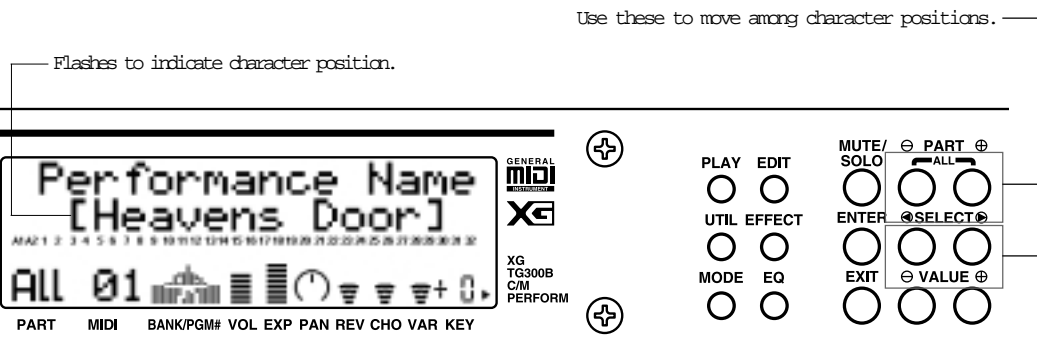
Use these to change character at selected position.

Up to 12 characters can be used for the Performance name. Available characters include all letters of the alphabet, in both upper and lower case, numbers from 0 to 9, and a variety of miscellaneous characters.

(Space) ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
0123456789!"#$%&'( )*+,-./:
;<=>?@[¥]^_`{|}→←

3 Press the **EXIT** button to return to the previous display (or press the **PLAY** button to return to the Play display).

After creating and naming a Performance, you'll probably want to save that Performance for future recall. For instructions on saving a Performance, refer to the Store operation on page 98.

Portamento Switch (PortamnSw)

Same as the corresponding parameter in the Multi Edit mode. (See page 64.)

Portamento Time (PortamnTm)

Same as the corresponding parameter in the Multi Edit mode. (See page 64.)

Modulation Wheel
— LFO Pitch Modulation Depth (MW LFOPMod)

Same as the corresponding parameter in the Multi Edit mode. (See page 69.)

Modulation Wheel
— LFO Filter Modulation Depth (MW LFOFMod)

This determines how widely the Filter (pages 49 and 94) is modulated by the LFO (low frequency oscillator). This is generally controlled from a modulation wheel on a MIDI keyboard, and depending on the Voice used, it creates a "swoosh" or "wah-wah" filter sweep effect. Higher values result in deeper filter modulation, creating a more pronounced filter sweep effect.

Graphically shows the LFO Filter Modulation Depth setting.

```
<COMMON>
◆MW LFOFMod=000 ◆
A1A2 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
ALL 01
```

Range: 000 — 127

Pitch Bend Control (PitBndCtrl)

Same as the corresponding parameter in the Multi Edit mode. (See page 69.)

A/D Part

```
<COMMON>
◆AD Part =off ◆
A1A2 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
ALL 01
```
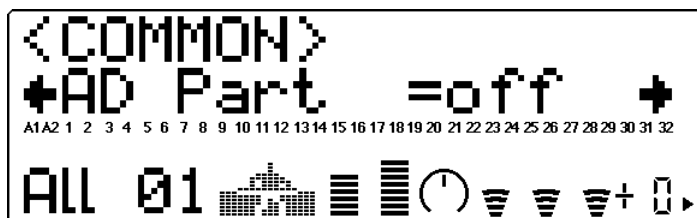
Height of bars indicates A/D Part setting. (A single bar indicates "off" setting, while full height indicates "on.")

Settings: off, on

> This determines whether A/D Parts are enabled for the Performance or not. When set to "on," Parts 3 and 4 are automatically set as A/D Parts (A1 and A2).

HINT
You can use the MU90R strictly as an effect processor for the A/D input (for example, your guitar or microphone) by Soloing the appropriate A/D Part (A1 or A2).

Assignable Controller 1 Control Change Number (AC1 CC No.)

> Same as the corresponding parameter in the Multi Edit mode (page 70), with the exception that AC1 in the Performance mode can also control LFO filter modulation (see Assignable Controller 1 LFO Filter Modulation Depth below).

Assignable Controller 1 Filter Control (AC1 FilCtrl)

> Same as the corresponding parameter in the Multi Edit mode. (See page 71.)

Assignable Controller 1 Amplitude Control (AC1 AmpCtrl)

> Same as the corresponding parameter in the Multi Edit mode. (See page 72.)

Assignable Controller 1 LFO Filter Modulation Depth (AC1LFOFMod)

> This determines the degree to which Assignable Controller 1 (AC1) affects the LFO modulation of the Filter. This creates a regular and continuous "wah-wah" or filter sweep effect. The higher the value, the greater the LFO filter modulation. (The control number used for AC1 is set in the Assignable Controller 1 Control Change Number parameter above.)

Graphically shows the AC 1 Filter Modulation Depth setting.

```
<COMMON>
+AC1LFOFMod=000     ■
A1A2 1  2  3  4  5  6  7  8  9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
ALL 01 ▄▄▆█ ▆ ▌ (ˡ) ▼ ▼ ▼± 0▶
```

Range: 000 — 127

Part

```
┌─────────────────────────┐
│ Performance Edit Mode   │
└─────────────────────────┘
        │
        └──┤ Part │
                │
                └──┤ Filter │
                        │
                        ├──( LPF Cutoff Frequency )
                        ├──( LPF Resonance )
                        └──( HPF Cutoff Frequency )
                │
                └──┤ EG │
                        │
                        ├──( EG Attack Time )
                        ├──( EG Decay Time )
                        ├──( EG Release Time )
                        ├──( Pitch EG Initial Level )
                        ├──( Pitch EG Attack Time )
                        ├──( Pitch EG Release Level )
                        └──( Pitch EG Release Time )
                │
                └──┤ E Q │
                        │
                        ├──( EQ Low Frequency )
                        ├──( EQ Low Gain )
                        ├──( EQ High Frequency )
                        └──( EQ High Gain )
                │
                └──┤ Vibrato │
                        │
                        ├──( Vibrato Rate )
                        ├──( Vibrato Depth )
                        └──( Vibrato Delay )
```

```
               ┌─────────┐
───────────────┤ Others  │
               └─────────┘
                    │
                    │      ╭──────────────────────────────╮
                    ├──────┤ Detune                       │
                    │      ╰──────────────────────────────╯
                    │      ╭──────────────────────────────╮
                    ├──────┤ Mono/Poly Mode               │
                    │      ╰──────────────────────────────╯
                    │      ╭──────────────────────────────╮
                    ├──────┤ Note Limit Low               │
                    │      ╰──────────────────────────────╯
                    │      ╭──────────────────────────────╮
                    ├──────┤ Note Limit High              │
                    │      ╰──────────────────────────────╯
                    │      ╭──────────────────────────────╮
                    ├──────┤ Dry Level (VarConnect=SYS)    │
                    │      ╰──────────────────────────────╯
                    │      ╭──────────────────────────────╮
                    ├──────┤ Velocity Sensitivity Depth   │
                    │      ╰──────────────────────────────╯
                    │      ╭──────────────────────────────╮
                    ├──────┤ Velocity Sensitivity Offset  │
                    │      ╰──────────────────────────────╯
                    │      ╭──────────────────────────────╮
                    ├──────┤ Velocity Limit Low           │
                    │      ╰──────────────────────────────╯
                    │      ╭──────────────────────────────╮
                    └──────┤ Velocity Limit High          │
                           ╰──────────────────────────────╯
```

The Part menu contains the Filter, EG, Vibrato and Others parameters for the Performance.

Filter

The Filter section of Performance Edit parameters are the same as the corresponding parameters in the Multi Edit mode. (See page 49.)

EG

The EG section of Performance Edit parameters are the same as the corresponding parameters in the Multi Edit mode. (See page 52.)

EQ

The EQ parameters let you adjust and set the tonal quality of a Performance Part's Voice, such as boosting the bass sound, or making it brighter. This is a two-band equalizer with wide frequency variation for each band, and is independent of the overall EQ controls (see page 57).

Vibrato

The Vibrato section of Performance Edit parameters are the same as the corresponding parameters in the Multi Edit mode. (See page 59.)

Others

The Others section of Performance Edit parameters contains miscellaneous controls, including those related to tuning, velocity, note range, etc. With a few additional parameters, these are the same as the parameters in the Multi Edit mode.

> NOTE
> The Part Edit parameter (available in Multi Edit) is not available in Performance Edit mode.
> No Drum Parts can be selected for a Performance.

Detune
Same as the corresponding parameter in the Multi Edit mode. (See page 62.)

Mono/Poly Mode
Same as the corresponding parameter in the Multi Edit mode. (See page 63.)

Note Limit Low (NoteLimitL)
Same as the corresponding parameter in the Multi Edit mode. (See page 65.)

Note Limit High (NoteLimitH)
Same as the corresponding parameter in the Multi Edit mode. (See page 66.)

Dry Level
Same as the corresponding parameter in the Multi Edit mode. (See page 66.) This parameter is only available when the **Variation Connection** parameter is set to **SYS**. (See page 106.)

Velocity Sensitivity Depth (VelSensDpt)
Same as the corresponding parameter in the Multi Edit mode. (See page 66.)

Velocity Sensitivity Offset (VelSensOfs)
Same as the corresponding parameter in the Multi Edit mode. (See page 67.)

Velocity Limit Low (VelLimitLo)

> Same as the corresponding parameter in the Multi Edit mode. (See page 68.)

Velocity Limit High (VelLimitHi)

> Same as the corresponding parameter in the Multi Edit mode. (See page 68.)

Copy and Store Operations

The Copy and Store operations allow you to save and organize the Performances you've created.

Copy

The Copy operation allows you to copy the settings of one Performance program (Preset or Internal) to another Performance number (Internal only).

Operation

1 From the Performance Edit menu, use the **SELECT** buttons to select "COPY." Then, press the **ENTER** button to call up the Copy operation.

ENTER
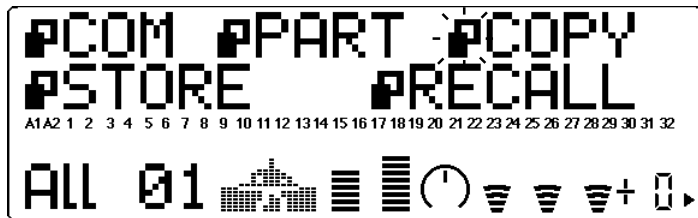
2 Use the **SELECT** buttons to select the desired parameter: memory location, source number or destination number. (The selected parameter flashes.) Then use the **VALUE** buttons or data dial to change the value.

Memory location (P = Preset, I = Internal)

Source Performance number

Use these to select desired parameter.

```
Perform Copy
From P001 To I001
A1A2 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
ALL 01
PART  MIDI  BANK/PGM# VOL EXP PAN REV CHO VAR KEY
```

GENERAL MIDI INSTRUMENT

XG

XG
TG300B
C/M
PERFORM

PLAY   EDIT

UTIL   EFFECT

MODE   EQ

MUTE/   ⊖ PART ⊕
SOLO   ┌ALL┐

ENTER   ◀SELECT▶

EXIT   ⊖ VALUE ⊕

Destination Performance number

Use these to change value.

3 Press the **ENTER** button to actually execute the Copy operation.
An "Executing.." message flashes in the display during the op-
eration. When the data has been copied, the MU90R returns to
the Performance Edit menu.
To cancel the operation without copying, press the **EXIT** button
(before pressing **ENTER**).

Store

Once you've edited or created a Performance, you can save that new Per-
formance for future recall by using the Store operation. Performances can
be saved to any one of the 100 Internal memory locations. With the excep-
tion of the Receive Channel and Transpose (Note Shift) settings made from
the Play screen, all parameter settings in the Play screen and in the Edit,
Effect and EQ modes are saved to the selected Performance number.

Operation

1 From the Performance Edit menu, use the **SELECT**   buttons
to select "STORE." Then, press the **ENTER** button to call up the
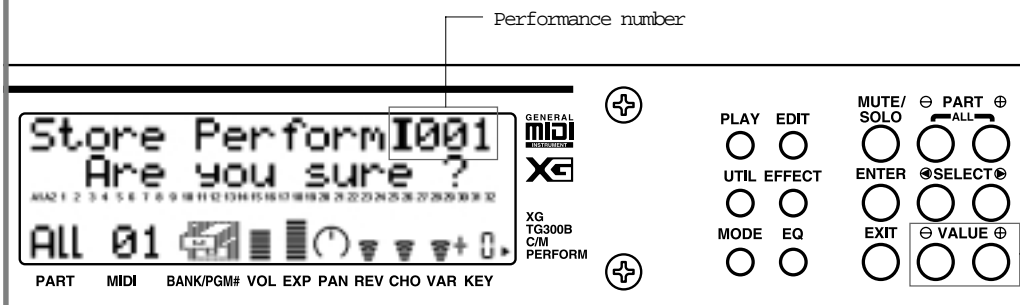Store operation.

```
▶COM ▶PART ▶COPY
▶STORE    ▶RECALL
A1A2 1  2  3  4  5  6  7  8  9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
ALL 01
```

ENTER

2 Use the **VALUE** buttons or data dial to change the destination Performance number.

Performance number

```
Store PerformⅠ001
  Are you sure ?
All 01
```

PART   MIDI   BANK/PGM# VOL EXP PAN REV CHO VAR KEY

GENERAL MIDI
XG

XG
TG300B
C/M
PERFORM

PLAY   EDIT

UTIL EFFECT

MODE   EQ

MUTE/   ⊖ PART ⊕
SOLO   ALL

ENTER ◉SELECT▸

EXIT ⊖ VALUE ⊕

Use these to change Performance number.

3 Press the **ENTER** button to actually execute the Store operation.
An "Executing..." message flashes in the display during the operation. When the data has been stored, the MU90R returns to the Performance Edit menu.
To cancel the operation without saving, press the **EXIT** button (before pressing **ENTER**).

Recall Function

Recall is a convenient function that allows you to recover an accidently deleted Performance. For example, if you are editing a Performance and inadvertently select a different Performance, the edited Performance would normally be lost. By using Recall before turning off the MU90R or editing another Performance, you can recover the previously edited Performance data.

To use Recall:

1 Select RECALL in the Performance Edit Mode menu, then press the **ENTER** button.
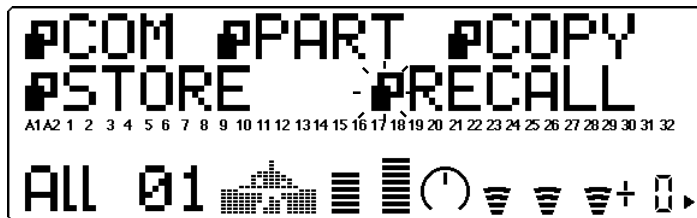
ENTER

The following display briefly appears:

2 At the "Are you sure?" prompt above, press the **ENTER** button again to execute the function.

If no previously edited Performance data exists, the following display briefly appears, indicating no Performance can be recalled.

◀ ·)) Effect Edit Mode

The MU90R features a built-in multi-effect processor with 6 independent digital effects: Reverb, Chorus, Variation, Insertion 1/2 and EQ. The first 5 of these are controlled in the Effect Edit mode.

In this section, only the effect Types and the global parameters common to all Types are covered. For descriptions and details on the parameters for each effect Type, refer to the separate **SOUND LIST & MIDI DATA** booklet.

To enter the Effect Edit mode, press the **EFFECT** button. The following menu appears:

```
┌─────────────────────────────────┐
│ ▶REV   ▶CHO   ▶VAR              │
│ ▶INS1  ▶INS2                    │
│ ▭MIC▭                        ▶  │
│            ◀·))                  │
└─────────────────────────────────┘
```

Reverb (REV)

Reverb recreates the sounds of various performance environments by adding an ambient wash of delays or reflections. Several different types of Reverb effects are available to simulate the ambience of different sized rooms.

Explanations of the Reverb Type and Reverb Pan parameters are given below. For descriptions and explanations for all other Reverb parameters, refer to the separate **SOUND LIST & MIDI DATA** booklet.

Type

```
┌─────────────────────────────────┐
│ ▶REVERB EDIT                    │
│ ▪Type=HALL 1               ✚   │
│ ▭MIC▭                        ▶  │
│            (·||·)                │
└─────────────────────────────────┘
```

Settings: NO EFFECT, HALL 1, HALL 2, ROOM 1, ROOM 2,
ROOM 3, STAGE 1, STAGE 2, PLATE, WHITE ROOM,
TUNNEL, CANYON, BASEMENT

This determines the Reverb Type. Each Reverb Type has different
values for the rest of the Reverb parameters; for example, Basement
has a Reverb Time of 0.6 seconds, while Canyon has a Reverb Time
of 12.0 seconds.

NOTE
When "**NO EFFECT**" is selected, Reverb is off and none of the other Reverb parameters are
available (with the exception of the Reverb Pan parameter).

HINT
Generally when using Reverb, you can simply select the particular Type needed, and use it
without bothering to adjust the other parameters. If fine tuning of the Reverb sound is neces-
sary, delve into the other parameters as needed.

Reverb Pan (RevPan)

```
▶REVERB EDIT
◆RevPan  = C        ■
MIC                          ▶
        (᠁)
```
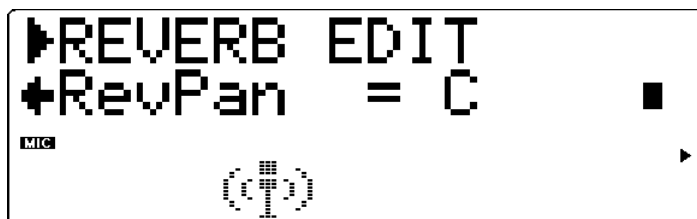
Range: L63 — C — R63

This determines the Pan position of the Reverb sound, or where it
appears in the stereo image.

For details on the parameters for each Reverb Type, refer to the
separate **SOUND LIST & MIDI DATA** booklet.

Chorus

The Chorus section uses pitch modulation to create a variety of rich, spacious-sounding effects, including Chorus, Flanger, Symphonic and Phaser.

Explanations of the Chorus Type and Chorus Pan parameters are given below. For descriptions and explanations for all other Chorus parameters, refer to the separate **SOUND LIST & MIDI DATA** booklet.

Type

```
▶CHORUS EDIT
■Type=CHORUS 1      ✦
MIC                            ▶
          ███ ███ ███
          ▐▐▐ ▐▐▐ ▐▐▐
```

Settings: NO EFFECT; CHORUS 1 — 4; CELESTE 1 — 4; FLANGER 1 — 3; SYMPHONIC; ENSEMBLE DETUNE; PHASER 1

This determines the Chorus Type. Depending on the Type selected, the specific parameters and values may differ.

Chorus 1 and 2 are used to subtly enhance the sound, and generally make it richer, fatter and warmer. Flanger uses modulation to create an animated, swirling motion effect, and produces a characteristic metallic sound. Symphonic also subtly enhances the sound by making a single instrument Voice sound like several. Phaser is similar to Flanger, but with a stronger and deeper modulation.

NOTE
When **NO EFFECT** is selected, Chorus is off and none of the other Chorus parameters are available (with the exception of the Chorus Pan and Send Chorus to Reverb parameters).

Chorus Pan (ChoPan)

```
▶CHORUS EDIT
✦ChoPan   = C        ✦
MIC                            ▶
          ███ ███ ███
          ▐▐▐ ▐▐▐ ▐▐▐
```
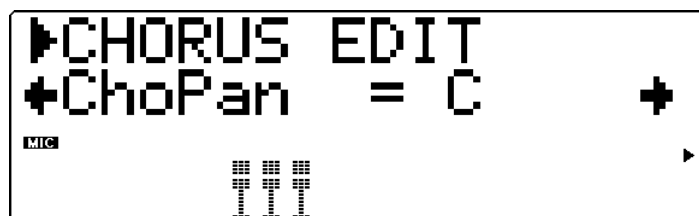
Range: L63 — C — R63

This determines the Pan position of the Chorus sound, or where it appears in the stereo image.

Send Chorus to Reverb (SendCho → Rev)

```
▶CHORUS EDIT
◆SendCho→Rev=000■
MIC                                          ▶
          ▦ ▦ ▦
          ▔▔▔▔▔
```

Range: 000 — 127

This determines the level of the Chorus signal sent to and processed by the Reverb effect. A setting of 000 results in none of the Chorus-processed signal going to the Reverb.

HINT
Setting this to a relatively high level gives you a more natural sound, since the Chorus-processed sound is also being processed by the reverb. More unusual effects can be created by having a long Reverb and setting this to 0, so that the Chorus sound is dry (no Reverb) and the original sound is "drenched" in Reverb.

For details on the parameters for each Chorus Type, refer to the separate **SOUND LIST & MIDI DATA** booklet.

Variation

The Variation section provides a wealth of additional effects for processing the Voices of the MU90R. It features some of the same effects found in the Reverb, Chorus and Insertion sections. This is not mere redundancy; it allows you to use two types of Reverb, Chorus or other effects on different Voices. For example, you may want to have the Flanger effect on one Voice and Phaser on another. Variation also gives you many special effects not found in the other sections, such as Delay, Gate Reverb, Wah and Pitch Change.

The Variation section of effects can be applied either to a single selected Part or to all Parts, depending on the connection setting: Insertion or System. (See **About the Effect Connections — System and Insertion** on page 106 for more information.)

Explanations of the Variation Type and other common parameters are given below. For specific descriptions of Variation Types and explanations for all other Variation parameters, refer to the separate **SOUND LIST & MIDI DATA** booklet.

Type

```
▶VARIATION EDIT
■Type=DELAY LCR  ✦
MIC                      ▶
      ▉‖)
```
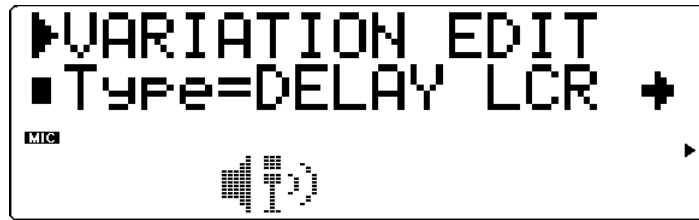
Settings: NO EFFECT; WHITE ROOM; TUNNNEL; CANYON; BASEMENT; DELAY L,C,R; DELAY L,R; ECHO; CROSS DELAY; ER 1 — 2; GATE REVERB; REVERSE GATE; KARAOKE 1 — 3; CHORUS 1 — 4; CELESTE 1 — 4; FLANGER 1 — 3; SYMPHONIC; ENSEMBLE; DETUNE; AMBIENCE; ROTARY SPEAKER; 2WAY ROTARY SPEAKER; TREMOLO; AUTO PAN; PHASER 1 — 2, DISTORTION; COMP+DISTORTION; OVER DRIVE; AMP SIMULATOR; 3BAND EQ (MONO); 2BAND EQ (STEREO); AUTO WAH (LFO); AUTO WAH+DIST; AUTO WAH+ODRV; TOUCH WAH 1; TOUCH WAH+DIST; TOUCH WAH+ODRV; TOUCH WAH 2; PITCH CHANGE 1 — 2; AURAL EXCITER (R); COMPRESSOR; NOISE GATE; VOICE CANCEL; THRU

NOTE
When **NO EFFECT** or **THRU** is selected for the Type, no Variation effect is applied, and only the common parameters shown below are available (with the exception of **Dry/Wet**).
The **NO EFFECT** setting cancels the Variation effect. When the Variation Connection is set to **SYS** (System), the sound can be heard with no effect. When the Variation Connection is set to **INS** (Insertion), no sound is output for the Part.
　　When set to **THRU**, the sound of the Part (or Parts) is output without any Variation effect. Generally, when Variation Connection is set to **INS** (Insertion), you should set the Type to **Thru**. When Variation Connection is set to **SYS** (System), you should set the Type to **NO EFFECT**.

Common Parameters (Insertion connection):

Dry/Wet

Range: D63>W — (D=W) — D<W63

Adjusts the level balance of original sound (dry, or **D**) and processed sound (wet, or **W**). A setting of (**D=W**) results in an equal balance of dry and wet sound.

Assignable Controller 1 Variation Control (AC1VarCtrl)
Range: 000 — 127
Determines the amount of effect the Assignable Controller has on the Variation effect.

Common Parameters (System connection):

Variation Pan (VarPan)
Range: L63 — C — R63
Determines the pan position of the Variation effect.

Send Variation to Chorus (SendVar→Cho)
Range: 000 — 127
Determines the amount of Variation effect sound that is sent to the Chorus effect.

Send Variation to Reverb (SendVar→Rev)
Range: 000 — 127
Determines the amount of Variation effect sound that is sent to the Reverb effect.

Variation Connection (VarConnect)
Settings: INS (Insertion), SYS (System)
Determines how the Variation effect is connected in the effect chain of the MU90R. When set to **SYS** (System), Variation is applied to all Parts, according to the amount of Variation Send set for each Part. When set to **INS** (Insertion), Variation is applied to only the selected Part, set in Send Variation parameters (see above).

NOTE
The common parameters above are common to nearly all the Variation effect types. (Exceptions are described in the separate **SOUND LIST & MIDI DATA** booklet.

Insertion 1, 2

The Insertion 1 and 2 effects provide additional effects for processing individual Parts.

Explanations of the Type, Dry/Wet Balance and Part parameters are given below. For descriptions and explanations for all other parameters, refer to the separate **SOUND LIST & MIDI DATA** booklet.

The Insertion effects are set up for Insertion routing and can be applied only to a single selected Part. Refer to **About the Effect Connections — System and Insertion** on page 106 for more information.

Type

```
▶INSERTION1 EDIT
■Type=DISTORTION→
MIC                                    ▶
```

Settings: THRU; HALL 1 — 2; ROOM 1 — 3; STAGE 1 — 2; PLATE; DELAY L,C,R; DELAY L,R; ECHO; CROSS DELAY; KARAOKE 1 — 3; CHORUS 1 — 4; CELESTE 1 — 4; FLANGER 1 — 3; SYMPHONIC; ENSEMBLE DETUNE; ROTARY SPEAKER; TREMOLO; AUTO PAN; PHASER 1; DISTORTION; OVER DRIVE; AMP SIMULATOR; 3BAND EQ (MONO); 2BAND EQ (STEREO); AUTO WAH (LFO); TOUCH WAH 1 — 2, AURAL EXCITER (R), COMPRESSOR; NOISE GATE

NOTE
When Thru is selected, no effect is applied, and none of the parameters are available (with the exception of the Part parameter).

Dry/Wet Balance
Range: D63>W — (D=W) — D<W63

This determines the balance between the direct, unprocessed signal (dry) and the processed sound (wet). Use this parameter together with the Output Level parameter above to obtain the desired overall sound.

Assignable Controller 1 Insertion 1/2 Control (AC1INS1/2Ctrl)

This determines the degree to which Assignable Controller 1 (AC1) affects the MIDI-controllable parametes of the Insertion effects. Each of the Insertion effect types have one parameter which can be controlled by the AC1. (For details, see the "Effect Parameter List" of the "SOUND LIST & MIDI DATA" booklet.) This parameter is not available in the performance mode.

```
▶INSERTION1 EDIT
◆AC1Ins1Ctrl=+00◆
MIC                    ▶
```

Range: –64 — +63

Insertion 1, 2 Part (INS 1, 2 Part)

```
▶INSERTION1 EDIT
◆Ins1 Part =off ■
MIC                    ▶
```

Range: Part 1 — 32, AD 1, AD 2, off

This determines the Part to which the Insertion effect is applied.
Insertion can be applied to only one Part at a time.

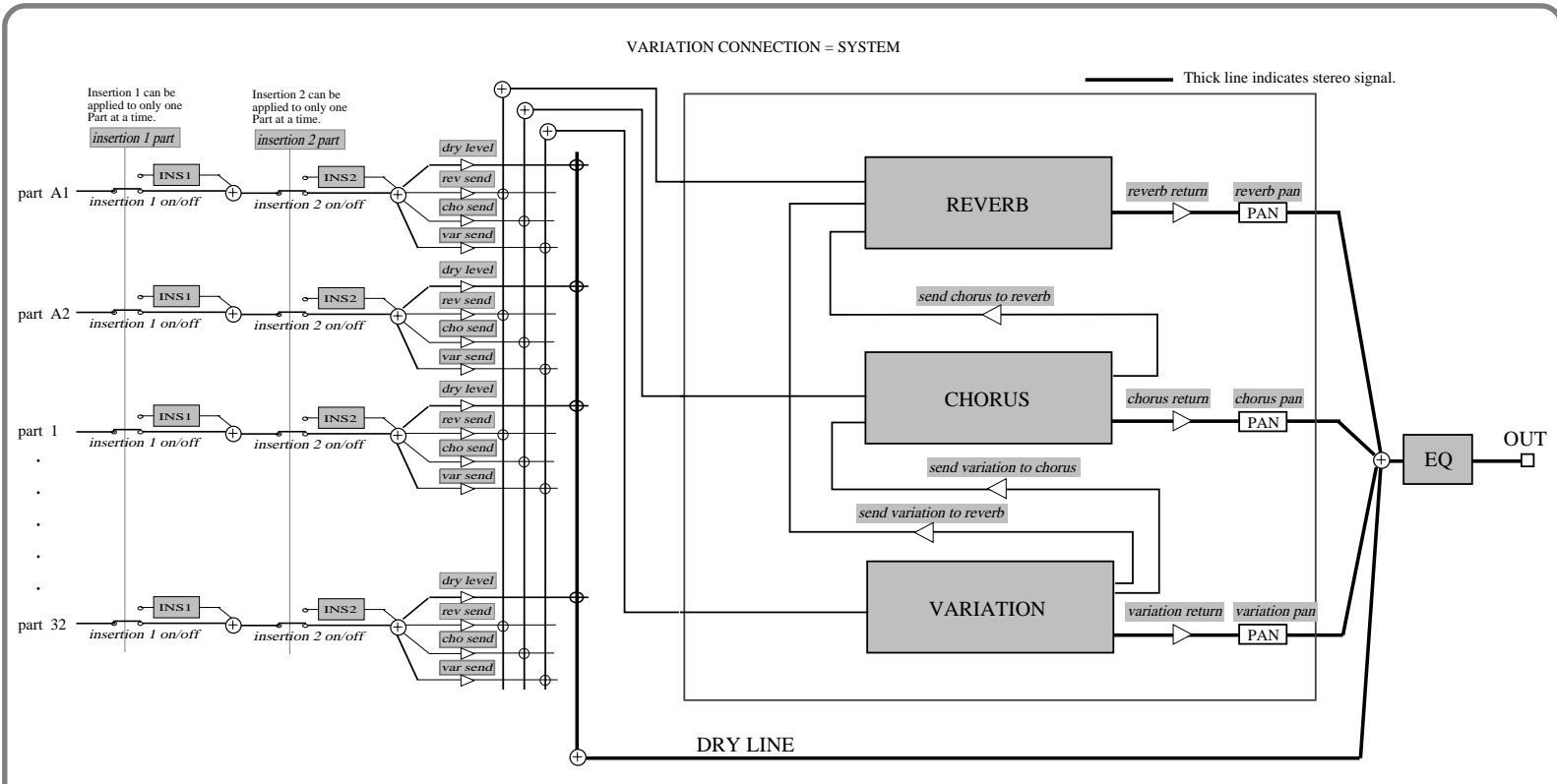# About the Effect Connections — System and Insertion

The multi-effects of the MU90R provide not only a wide range of sound processing controls, but also a flexible system for connecting them. Unlike simple effect routing schemes on conventional sound modules that process all voices with the same effects, the MU90R allows you to put independent, special effects on one or two Parts, as well as use overall effects for processing all 34 Parts together. For example, you can have a Distortion effect on a guitar Part and a rotary speaker effect for an organ Part, yet still use ambient effects such as Reverb and Chorus for processing the overall mix.

All the effect sections are connected or routed in one of two ways: **System** or **Insertion**. System applies the selected effect to all 34 Parts, while Insertion applies the selected effect to one specific Part. Reverb, Chorus, and EQ are all System effects, and Insertion 1 and 2 are Insertion effects. The Variation effect section, on the other hand, can be configured for either System or Insertion routing. (This is done from the **Variation Connection** parameter; see page 106.) Since System and Insertion are part of the XG MIDI (Extended General MIDI) format, you can create and play back song data using the same flexible effect routings on any tone generator or sound module having the **XG** mark.

NOTE
The **Variation Connection** default setting is Insertion.

The illustrations and explanations below cover the System and Insertion connections in greater detail.
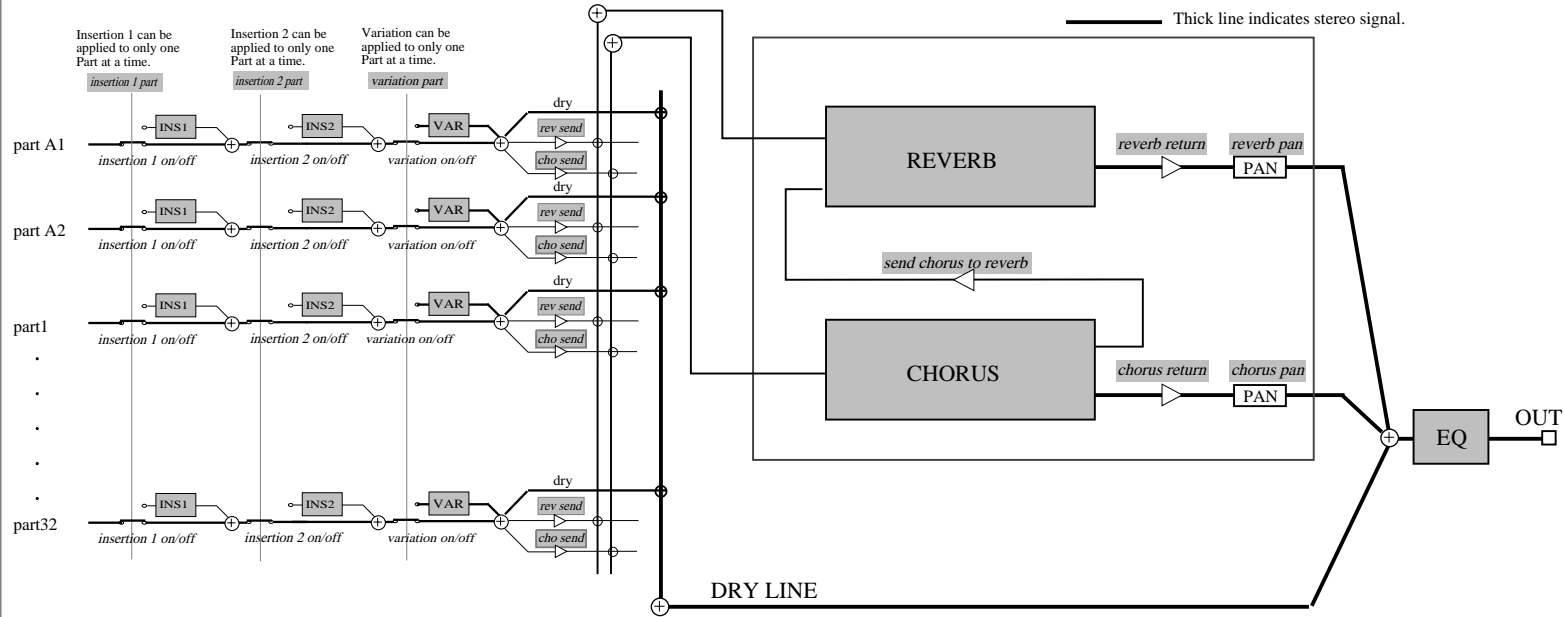
When Variation is set to System:

VARIATION CONNECTION = SYSTEM

Thick line indicates stereo signal.

Insertion 1 can be applied to only one Part at a time.

Insertion 2 can be applied to only one Part at a time.

insertion 1 part

insertion 2 part

part A1 — INS1 — *insertion 1 on/off* — INS2 — *insertion 2 on/off* — *dry level* / *rev send* / *cho send* / *var send*

part A2 — INS1 — *insertion 1 on/off* — INS2 — *insertion 2 on/off* — *dry level* / *rev send* / *cho send* / *var send*

part 1 — INS1 — *insertion 1 on/off* — INS2 — *insertion 2 on/off* — *dry level* / *rev send* / *cho send* / *var send*

part 32 — INS1 — *insertion 1 on/off* — INS2 — *insertion 2 on/off* — *dry level* / *rev send* / *cho send* / *var send*

REVERB — *reverb return* — *reverb pan* — PAN

send chorus to reverb

CHORUS — *chorus return* — *chorus pan* — PAN

send variation to chorus

send variation to reverb

VARIATION — *variation return* — *variation pan* — PAN

EQ — OUT

DRY LINE

NOTES

● The Parts to which Insertion 1, 2 are applied is determined by the **Part** parameter in the Insertion section (page 106).

● Even though the System routing applies the selected effect to all Parts, you can control how much the Reverb, Chorus and Variation effects are applied to any individual Part (with the **Reverb Send, Chorus Send** and **Variation Send** parameters in the Single Part controls; see page 44). For the effects to be properly heard, the **Reverb Return, Chorus Return** and **Variation Return** parameters in the All Parts controls must also be set to appropriate values (see pages 47 − 48).

● The stereo position of the effects is controlled by the **Reverb Pan, Chorus Pan** and **Variation Pan** parameters; see pages 102, 103, 106.

● You can set Reverb, Chorus and Variation to be routed in parallel or in serial, and you can determine the amount of Variation effect that is sent to Chorus and Reverb, as well as the amount of Chorus that is sent to Reverb. This is done with the **Send Variation to Chorus** (page 106), **Send Variation to Reverb** (page 106), and **Send Chorus to Reverb** (page 104) parameters. When these are all set to **0**, all three effects are in parallel routing. Higher values for each provide varying degrees of serial routing.

VARIATION CONNECTION = INSERTION

Thick line indicates stereo signal.

Insertion 1 can be applied to only one Part at a time.

Insertion 2 can be applied to only one Part at a time.

Variation can be applied to only one Part at a time.

insertion 1 part *insertion 2 part* *variation part*

part A1 — INS1 — *insertion 1 on/off* — INS2 — *insertion 2 on/off* — VAR — *variation on/off* — dry / *rev send* / *cho send*

part A2 — INS1 — *insertion 1 on/off* — INS2 — *insertion 2 on/off* — VAR — *variation on/off* — dry / *rev send* / *cho send*

part1 — INS1 — *insertion 1 on/off* — INS2 — *insertion 2 on/off* — VAR — *variation on/off* — dry / *rev send* / *cho send*

part32 — INS1 — *insertion 1 on/off* — INS2 — *insertion 2 on/off* — VAR — *variation on/off* — dry / *rev send* / *cho send*

REVERB — *reverb return* — *reverb pan* — PAN

send chorus to reverb

CHORUS — *chorus return* — *chorus pan* — PAN

EQ — OUT

DRY LINE

NOTES

● As with System above, the Parts to which Insertion 1, 2 are applied is determined by the **Part** parameter in the Insertion section (page 106). Also, the Part to which Variation is applied is determined by the **Variation Send** control in the Single Part controls (page 44).

● As with System above, the effects cannot be properly heard unless the **Reverb Send, Chorus Send** and **Variation Send** parameters in the Single Part controls (page 44) and the **Reverb Return** and **Chorus Return** parameters in the All Parts controls are set to appropriate values.

● The stereo position of the effects is controlled by the **Reverb Pan** and **Chorus Pan** parameters. (See pages 102, 103.)

● You can set Reverb and Chorus to be routed in parallel or in serial, and you can determine the amount of Chorus that is sent to Reverb. This is done with the **Send Chorus to Reverb** parameter (see page 104). When this is set to **0**, Reverb and Chorus are in parallel routing. Higher values for each provide varying degrees of serial routing.
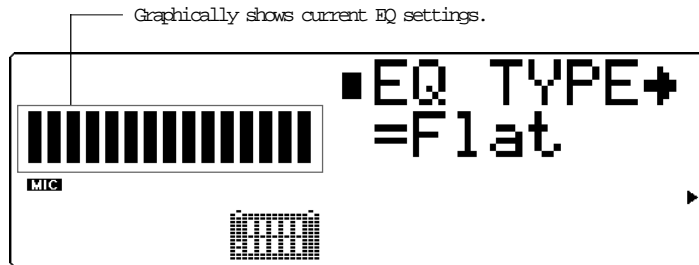
▦ Equalizer (EQ) Edit

The Equalizer (EQ) Edit parameters allow you to adjust the overall tone of the MU90R sound in five separate frequency bands. EQ presets are also provided for instantly calling up tone settings specially suited for different types of music.

```
        Low              Lo Mid   Mid   Hi Mid   High

0 dB

  Frequency ——————→
```
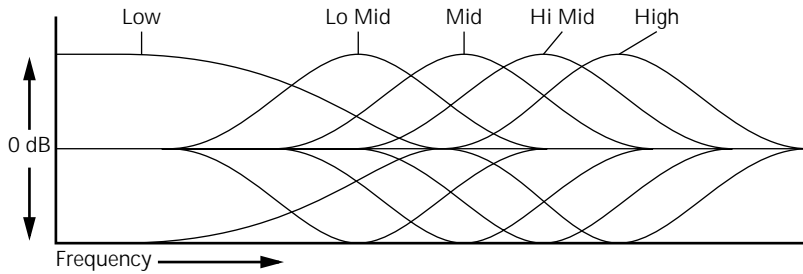
To enter the Equalizer Edit mode, press the **EQ** button.

EQ Type

Graphically shows current EQ settings.

```
■EQ TYPE�→
=Flat
```

Settings: Flat, Jazz, Pops, Rock, Concert
EQ Type provides five different preset EQ settings, specially programmed for specific types of music. The **Flat** setting is a "flat" EQ preset with no change in equalization. **Jazz**, **Pops**, **Rock** and **Concert** each have different EQ settings and frequency bands, specially suited for those types of music.

EQ Frequency Parameters

Thru: 80 Hz, 500 Hz, 1.0 kHz, 4.0 kHz, 8.0 kHz
Jazz: 50 Hz, 125 Hz, 900 Hz, 3.2 kHz, 6.3 kHz
Pops: 125 Hz, 315 Hz, 1.0 kHz, 2.0 kHz, 5.0 kHz
Rock: 125 Hz, 200 Hz, 1.2 kHz, 2.2 kHz, 6.3 kHz
Concert: 80 Hz, 315 Hz, 1.0 kHz, 6.3 kHz, 8.0 kHz

Graphically shows the current EQ settings.
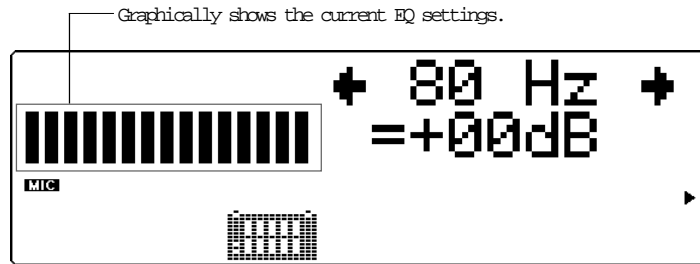
Range: −12 — +12 dB

The remaining EQ parameters let you set the level of each of the five frequency ranges: low, low-mid, mid, high-mid and high. The bars in the display show the EQ settings as a frequency "curve," with peaks indicating level boosts in the frequency range and valleys indicating level cuts. A setting of 00 dB corresponds to no level change.

NOTE
Changing the EQ Type automatically restores the default Frequency Parameter settings and cancels any Frequency Parameter settings you have made.

Utility Mode

The Utility mode lets you set functions related to the overall operation of the MU90R, such as Master Tune, display contrast and playing of the Demo Song. Included also are utility operations, such as various kinds of data transfer with an external data storage device, and initializing of the MU90R settings.

To enter the Utility mode, press the **UTIL** button. The following menu appears:

```
┌─────────────────────────────────┐
│ ⏻SYSTEM  ⏻DUMPOUT                │
│ ⏻INITIAL ⏻DEMO                   │
│ MIC                          ▶   │
│          🧰                      │
└─────────────────────────────────┘
```
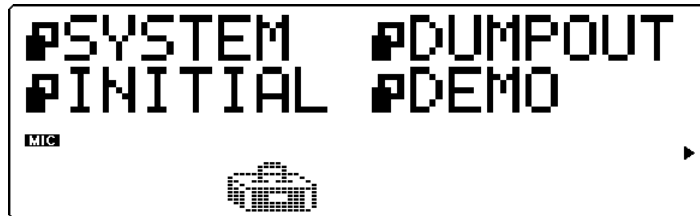
System Functions

The System functions provide various controls of the overall operation of the MU90R, such as Master Tune, Mute and A/D Part Lock, some MIDI receive filters and a display Contrast control.

Master Tune (M.Tune)

```
┌─────────────────────────────────┐
│ <SYSTEM>                         │
│ ■M.Tune   =+000.0♦               │
│ MIC                          ▶   │
│          ▦▦▦▦                    │
└─────────────────────────────────┘
```
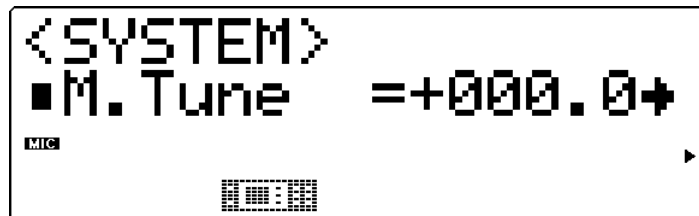
Range: –102.4 — +102.3 cents (approx. +/– 1 semitone)
This determines the overall fine tuning of the MU90R's Voices. It also affects the pitch of the individual drum/percussion sounds of the drum kits. Master Tune is especially useful for adjusting the pitch of the MU90R when playing with other instruments. The actual pitch of each Voice depends also on the other pitch related parameters: Key (in Play mode) and Detune (in Edit mode).

NOTE
At around 440 Hz, 1 Hz is approximately equal to 4 cents.

Mute Lock

```
<SYSTEM>
+Mute Lock =off +
MIC                        ▶
     ▨▨:▨▨
```

Settings: off, on

This determines whether or not the Part Mute status of the MU90R is reset when receiving a **GM System On** or **XG System On** message. Generally, this message is automatically transmitted to the MU90R as part of General MIDI song data. When Mute Lock is set to **off**, this resets the Mute status of the Parts on the MU90R. If you want to keep the current Mute settings and disable this reset, set Mute Lock to **on**. (For more information on the Mute function, see page 25.)

A/D Part Lock

```
<SYSTEM>
+AD PartLock=off+
MIC                        ▶
     ▨▨:▨▨
```
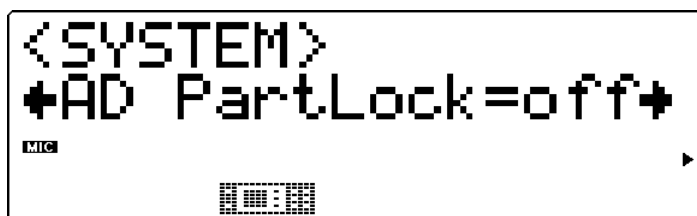
Settings: off, on

This determines whether or not the current parameter values and Variation effect settings of the A/D Parts are reset when receiving a **GM System On** or **XG System On** message. If you want to keep the current parameter values and Variation settings of the A/D Parts, set Mute Lock to **on**. (This parameter has no effect in the Performance mode.)

Multi Mode Equalizer Lock (Mlt EQ Lock)

```
<SYSTEM>
+Mlt EQ Lock=off+
MIC                        ▶
     ▨▨:▨▨
```

115

Settings: off, on

> This determines whether the Equalizer settings (page 57) are initialized or change in response to incoming MIDI messages. When this is set to "on," the current Equalizer settings are maintained, ignoring any EQ-related messages that are received with XG System On or GM System On messages, allowing you to protect your original Equalizer settings. When set to "off," the Equalizer changes according to incoming XG/GM System On messages. This setting affects the Multi mode only, and not the Performance mode.

Output Select Lock (OutSel Lock)

```
<SYSTEM>
◆OutSel Lock=off◆
MIC                          ▶
     ▥▥▥
```
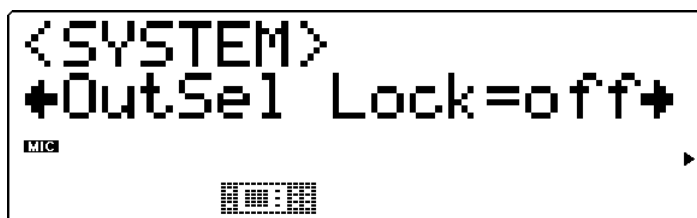
Settings: on, off

> This determines whether or not the Output Select settings (pages 72, 79) are reset when receiving a **GM System On** or **XG System On** message. It also determines whether the Output Select setting for a Part can be edited via MIDI or not. If you want to "lock" the Output Select settings and keep them from being changed, set this to "on."

Receive General MIDI Exclusive (RcvGMExcl)

```
<SYSTEM>
◆RcvGMExcl =on   ◆
MIC                          ▶
     ▥▥▥
```
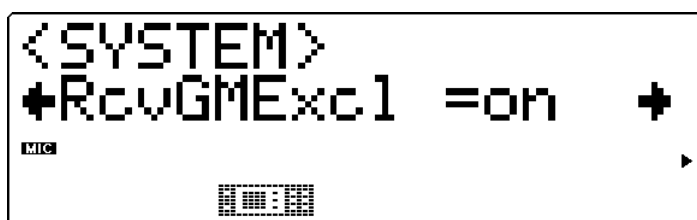
Settings: off, on

> This determines whether **GM System On** or **XG System On** messages are received or not. The **on** setting allows these messages to be received.

`Receive System Exclusive (RcvSysExcl)`

```
<SYSTEM>
◆RcvSysExcl=on    ◆
MIC                      ▶
      ▦▦▦▦
```
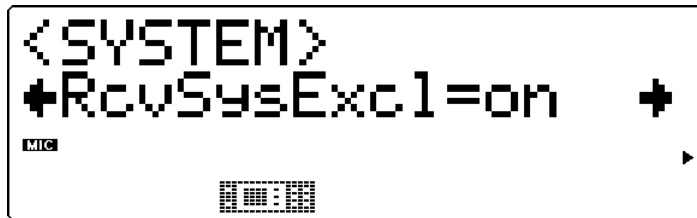
Settings: off, on

This determines whether System Exclusive messages are received or not. System Exclusive messages are data specifically (or "exclusively") related to the MU90R. The On setting allows these messages to be received. This should be to On when receiving bulk data from a MIDI data storage device. (See page 119.)

`Receive Bank Select (RcvBankSel)`

```
<SYSTEM>
◆RcvBankSel=on    ◆
MIC                      ▶
      ▦▦▦▦
```

Settings: off, on

This determines whether Bank Select messages are received or not. Bank Select messages can be sent from another MIDI device to change the banks of Voices on the MU90R. (See page 42.) The On setting allows Bank Select messages to be received.

`Contrast`

```
<SYSTEM>
◆Contrast   =2    ◆
MIC                      ▶
      ▦▦▦▦
```

Range: 1 — 8

This determines the contrast of the display. Adjust this as necessary for optimum visibility. (At extreme settings, the display may not be readable.)

Dump Interval (DumpIntrval)

```
<SYSTEM>
+DumpIntrval=150+
MIC                        ▶
      ▦▦▦
```

Settings: 50, 100, 150, 200, 300

> This determines the length of time the MU90R pauses when sending blocks of data in the Dump Out functions. If the receiving device fails to process the data or displays a "buffer full" type message, try setting this parameter to a higher value and send the data again.

Thru Port

```
<SYSTEM>
+Thru Port =1    +
MIC                        ▶
      ▦▦▦
```
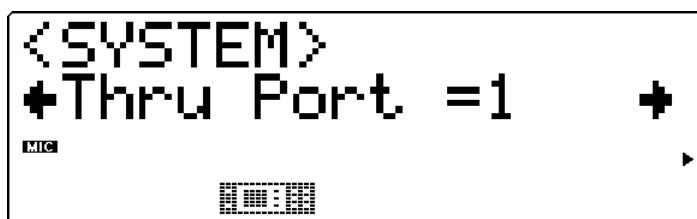
Range: 1 — 8

> Some MIDI devices and sequencers are capable of transmitting data over several MIDI "ports," effectively breaking the 16-channel barrier. When this data is received via the TO HOST terminal on the MU90R, this parameter determines which MIDI port's data will be routed through the MIDI OUT terminal. This allows you to connect another multi-timbral tone generator to the MU90R and play back data over 48 independent MIDI channels — 32 on the MU90R and another 16 on the connected tone generator.

Display Bank Select (DispBankSel)

> This determines whether the MU90R displays all Voice banks or not when changing banks. (For information on changing banks, see page 42.) When this is set to "1," the MU90R conveniently skips over banks that have the same Voice. In other words, when you step through the available banks, the display stops only on banks for which the Voice is unique or different (for the selected program number). If "2" is selected, all banks are displayed in succession, regardless of whether the Voices are the same or not. The Display Bank Select setting itself cannot be changed by incoming MIDI messages.

```
<SYSTEM>
◆DispBankSel=1      ■
MIC                        ▶
        ▨▨
```

Settings: 1 (displays only banks with unique Voices),
2 (displays all banks)

Dump Out Functions

The Dump Out functions allow you to save the various settings of the MU90R (such as settings for Parts, Performances, system, etc.) to a MIDI sequencer, computer or a MIDI data recorder (such as the Yamaha MDF2 MIDI Data Filer).
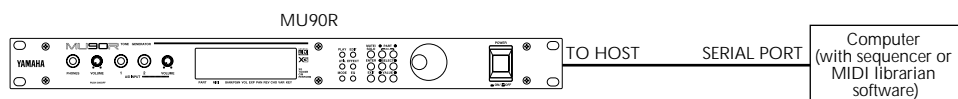
The following illustrations show example connections for the Dump Out functions.

Saving and Restoring Data via MIDI
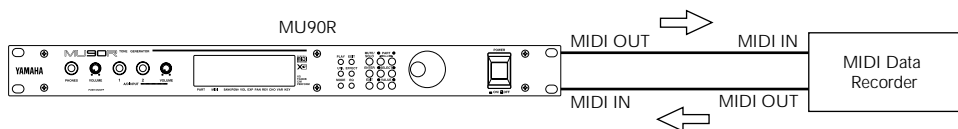
Bulk Dump data can be sent and received using the MIDI IN and MIDI OUT connections.

Saving and Restoring Data via TO HOST

Bulk Dump data can be sent and received using the MIDI IN and MIDI OUT connections.

Operation

1️⃣ Make sure that the MU90R is properly connected to the device and that the **HOST SELECT** switch is properly set.
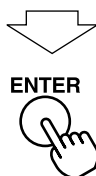
When using the MIDI terminals, connect the **MIDI OUT** of the MU90R to the **MIDI IN** of the data recorder. (See the illustrations above.) Also, set the **HOST SELECT** switch to **MIDI**.

When using the **TO HOST** terminal, make sure that the **HOST SELECT** switch is set corresponding to the device to be used. (Refer to page 29 for more on host computer connections.)

2️⃣ Press the **UTIL** button and select "DUMPOUT," then press the **ENTER** button.

```
▶SYSTEM    ▶DUMPOUT
▶INITIAL  ▶DEMO
MIC                          ▶
```

UTIL
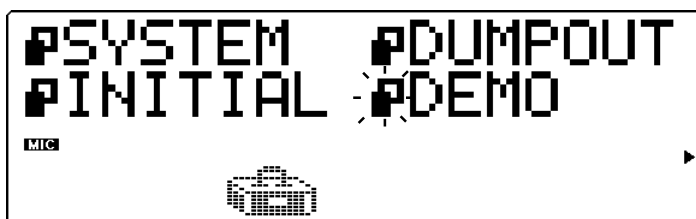
3️⃣ From the Dump Out menu, select the type of data to be sent: All, Multi or Performance. Then, press the **ENTER** button to call up the selected data dump.
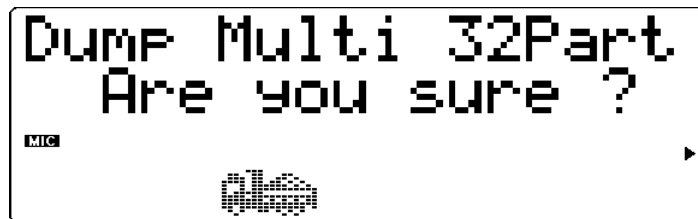
```
▶ALL      ▶MULTI
▶PERFORM
MIC                          ▶
```

ENTER

120

All

```
Dump All Data
  Are you sure ?
MIC                          ▶
      ░░▒▓▒░
```

This transmits all MU90R data (including Part, Performance, system, and all parameter values) to the connected device.

Multi

```
Dump Multi 32Part
  Are you sure ?
MIC                          ▶
      ░░▒▓▒░
```

Settings: 32 Parts, 16 Parts, 32 Parts + A/D, 16 Parts + A/D
This transmits the selected MU90R Multi Part data (including System, Effect and EQ data) to the connected device. (Use the **VALUE** buttons to select the type/amount of data to be transmitted.)

Performance (Perform)

```
Dump Perform ALL
  Are you sure ?
MIC                          ▶
      ░░▒▓▒░
```

Settings: ALL, I 001 — I 100 (Internal Performance numbers)
This transmits the selected MU90R Performance data to the connected device. (Use the **VALUE** buttons or data dial to select the type/amount of data to be transmitted.)

4 From the "Are you sure?" prompt, press the **ENTER** button to ex-
ecute the operation, or press the **EXIT** button to cancel it and re-
turn to the Dump Out menu.

A "Transmitting..." message appears in the display during the op-
eration. When the transmission is completed, the MU90R returns
to the Dump Out menu.

NOTE
If you have more than one MU90R connected in your MIDI system and wish to send differ-
ent sets of data to each, you can specify a different Device Number for each. (See page 46.)
You should set the Device Number on each MU90R you use, **before** dumping the data to a
data storage device. Then, when you reload the data to the connected MU90Rs, each unit
will automatically receive only the data that has the corresponding Device Number.

To reload the data from the data recorder back to the MU90R:
Make sure that the devices are properly connected (see the **Restoring Data**
illustrations on page 119), and execute the appropriate data transfer operation
from the data recorder. (Refer to the owner's manual of that device for instruc-
tions.) The MU90R automatically receives incoming bulk data.

Initialize Functions

The Initialize functions allow you to restore the factory settings of the
MU90R.

NOTE
Since the Initialize functions replace existing data, you should save any and all important
settings to a MIDI data storage device before using these functions. (See page 119.)

Operation

1 Press the **UTIL** button and select "**INITIAL**," then press the
ENTER button.

```
●SYSTEM  ●DUMPOUT
●INITIAL ●DEMO
MIC                    ▶
```

UTIL
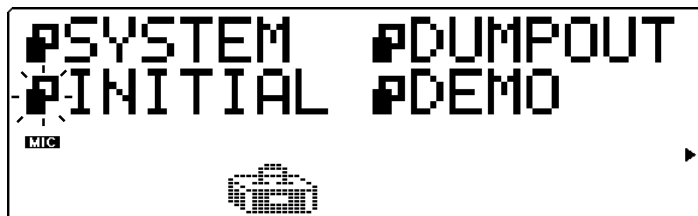
2 From the Initialize menu, select the type of data to be initialized: Factory Settings (FactSet), selected Sound Module mode (XGInit, GM Init, C/MInit, PFMInit) or Drum (DrumInit) Then, press the **ENTER** button to call up the selected data dump.
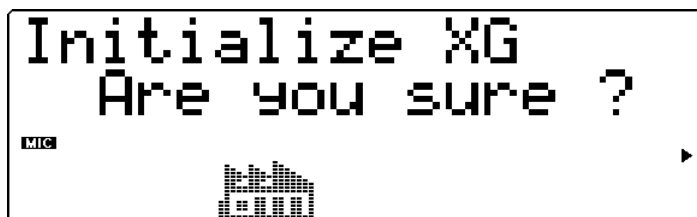
```
┏━━━━━━━━━━━━━━━━━━━━━━━━┓
┃ ▶FactSet ▶XG Init      ┃
┃ ▶DrumInit               ┃
┃ MIC                   ▶ ┃
┃          ▄▄▄            ┃
┗━━━━━━━━━━━━━━━━━━━━━━━━┛
```

ENTER

Factory Settings (FactSet)

```
┏━━━━━━━━━━━━━━━━━━━━━━━━┓
┃  Factory Set            ┃
┃    Are you sure ?       ┃
┃ MIC                   ▶ ┃
┃          ▄▄▄            ┃
┗━━━━━━━━━━━━━━━━━━━━━━━━┛
```

This restores the original factory settings of the MU90R.

Selected Sound Module Mode:

Extended General MIDI (XGInit)

```
┏━━━━━━━━━━━━━━━━━━━━━━━━┓
┃  Initialize XG          ┃
┃    Are you sure ?       ┃
┃ MIC                   ▶ ┃
┃          ▄▄▄            ┃
┗━━━━━━━━━━━━━━━━━━━━━━━━┛
```

General MIDI (GM Init)

```
Initialize GM
   Are you sure ?
MIC
                              ▶
```

Computer Music (C/MInit)

```
Initialize C/M
   Are you sure ?
MIC
                              ▶
```

Performance (PFMInit)

```
Initialize PFM
   Are you sure ?

                              ▶
```
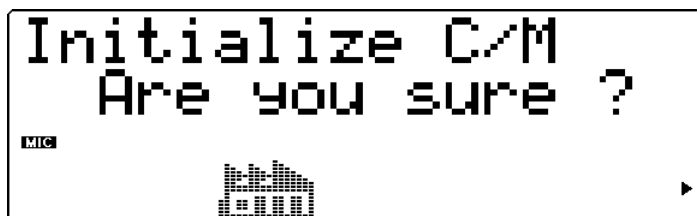
One of the four parameters above will be available, depending on the currently selected Sound Module mode: **XG**, **TG300B**, **C/M** or **PFM**. Initializing this parameter restores the original settings for the selected mode.

NOTES
● For the **PFMInit** setting, only the currently selected Performance will be initialized.
● For **XGInit** and **GM Init**, the initialized settings are the same as when the MU90R is reset upon receiving an **XG System On** or **GM System On** message.

Drum (DrumInit)

```
Initialize DrumS1
   Are you sure ?
MIC                           ▶
```

124

Range: DrumS1 — DrumS4
This restores the original drum settings for the selected Drum Setup S1 — S4. (Use the **VALUE** buttons or data dial to select the desired Drum Setup.)

> NOTE
> This parameter is not available when the MU90R is set to Performance mode.

3 From the "Are you sure?" prompt, press the **ENTER** button to execute the operation, or press the **EXIT** button to cancel it and return to the previous display.

An "Executing..." message appears in the display during the operation. When the operation is completed, the MU90R returns to the Initialize menu.

Demo Song Play (DEMO)

The Demo Song function in the Utility menu allows you to play the built-in Demo Song.

Operation

1 Press the **UTIL** button and select "DEMO," then press the **ENTER** button.

ENTER

2 Press the **ENTER** button to start the Demo Song.

The Demo Song starts playing immediately and repeats indefinitely until stopped (in step 4 below). Playback of the individual Parts of the song is shown graphically by the "level meter" bars in the display.

> NOTE
> During Demo Song playback, no panel controls (with the exception of the **EXIT** button and the **VOLUME** control) can be used.

3   To stop playback of the song, press the **EXIT** button.

EXIT

4   To exit from the Demo Song function, press the **EXIT** button again.

Sound Module Mode (MODE)

This lets you select the operating mode of the MU90R. Press the **MODE** button, then use the **SELECT** buttons to select the desired Sound Module mode: **XG** (Extended General MIDI), **TG300B** (General MIDI), **C/M** (Computer Music) or **PFM** (Performance). If **XG**, **TG300B** or **C/M** are selected, the MU90R automatically sets itself to the Multi mode. When **PFM** is selected, the MU90R is in the Performance mode. (See page 80.)

The bottom right of the display indicates the currently selected Sound Module mode.

```
SOUND MODULE=
▶XG TG300 C/M PFM
MIC                      ▶
        XG
```
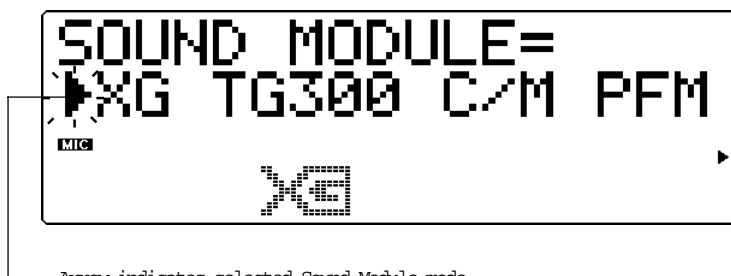
Arrow indicates selected Sound Module mode.

Press the **EXIT** button (or any one of the other mode select buttons: **PLAY**, **EDIT**, **UTIL**, **EFFECT** or **EQ**) to use the MU90R in the current mode.
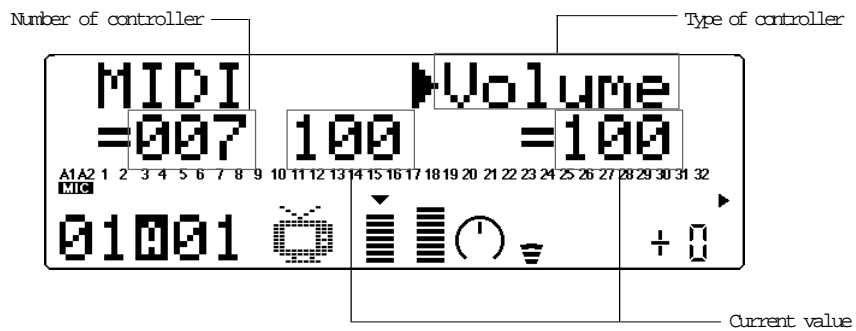
NOTE
When the MU90R is **not** set to the XG mode and an **XG System On** message is received, the MU90R changes to the XG mode after a slight pause of 0.5 seconds.

Show Control Change

This function allows you to view the currently used control change number, its type and its value (in decimal format). It also lets you transmit the displayed value with a single button press.

Operation

1 From the Multi Play mode or Performance Play mode, double-click the **ENTER** button (press it twice quickly). (The Show Control Change display appears.)

Number of controller ——

Type of controller ——

MIDI ▶Volume
=007 100   =100

A1A2 1 2   3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
MIC
01❚01   ▮▮(')   ÷0

Current value ——

2 To transmit the currently displayed message, press the **ENTER** button again. The message is transmitted via the MIDI or TO HOST terminals.

3 Press the **EXIT** button to return to the Play display.

Show Exclusive

This function allows you to view the current system exclusive message (in hexadecimal format). It also lets you transmit the displayed value with a single button press.

Operation

1 Double-click the **ENTER** button (press it twice quickly). (The Show Exclusive display appears.)

System Exclusive message (in hexadecimal format)

```
=F0 43104C 0A0010
00 F7
A1A2 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
MIC                                                                          ▶
01001  ▧  ▤▤  (')  ≡      +0
```

2 To transmit the currently displayed message, press the **ENTER** button again. The message is transmitted via the MIDI or TO HOST terminals.

3 Press the **EXIT** button to return to the previous display.

About Cable Messages

The MU90R can receive Cable messages (F5) when the TO HOST terminal is connected to the serial terminal of a computer. On the MU90R, MIDI receive channels A1 — A16 are controlled from Port 1, and channels B1 — B16 are controlled from Port 2. If the software you are using can address separate MIDI ports, data can be received over 32 channels simultaneously, allowing 32 parts to be played with only one serial cable. By connecting another multi-timbral tone generator to the MIDI OUT terminal of the MU90R and setting the Thru Port function (page 118) to a value other than 1 or 2, you can play back data over a total of 48 MIDI channels — 32 on the MU90R and another 16 on the connected tone generator.

MEMO

APPENDIX

X G

Chapter 1: Format Overview

Yamaha introduces a new tone-generator control format designed to meet the requirements of the coming multimedia environment. The new XG format — an extension of the existing GM format — provides broader capabilities suited to the demands of an increasingly sophisticated and diversified computerized environment. The new format enables a significantly higher level of musical expressiveness while at the same time ensuring the continued compatibility of existing sound data.

Yamaha shall use the XG format as the basis for forthcoming electronic instruments, music software, and tone-generating LSI circuitry, while working to maintain compatibility and scalability among Yamaha models.

Development Background

Tone generators are utilized in a wide range of devices, from musical instruments to communications devices and computer games. The first international MIDI standard arose from the need to enable consistent external control of tone generators on all device types, regardless of manufacturer or model. Because tone generator voice arrangements tended to vary considerably among manufacturers and models, however, different MIDI devices often produced different types of sound in response to identical MIDI instructions.

In 1991 the MIDI standard committee enacted additional specifications, referred to as the GM (General MIDI) standard, for the purpose of standardizing voice arrangements and improving MIDI uniformity. The GM standard significantly enhanced acoustics compatibility among complying devices, leading in turn to an expanding base of GM software applications. But the GM standard also has its limitations. It provides support for only 128 voices, whereas many users now perceive the need for a greater number of voices suited to a wider range of musical genres. Users have also indicated a desire for greater control over voice modifications and effects so as to enable a higher level of expressiveness.

The advent of the computer-based multimedia age has added yet a different perspective, bringing increased attention to both image and sound technologies. Developments in multimedia-related sound and music processing parallel recent advances in the area of image compression, and are pointing the way to the future of multimedia.

At present there are two fundamentally different approaches to the handling of sound and control data. One method is to digitally store sound data at the software side together with the control data, then send all of the data together to generate the playback. The second method is to have the software supply just control data to a tone generator on a computer or other such device. The tone generator processes the incoming data and generates the sound locally.

The first method offers highly realistic sound, but requires immense quantities of data and locks in a specific set of performance characteristics and voices. The second method requires far less data while allowing for entirely free variations in voices, tempos, and virtually all other performance characteristics. The second method is therefore ideal for interactive multimedia applications such as karaoke and repetitive computer-game sounds. MIDI-based applications are typical of this second type of approach. As multimedia technology advances, we face a pressing need to expand this approach to accomodate a larger number of voices and

greater degree of expressive control. This is why Yamaha is pleased to propose the new XG format — the tone generator format for the 21st century.

Basic Concepts

The XG format maintains the universality and compatibility of the MIDI and GM standards while significantly increasing the range of expressiveness. It is designed to ensure data continuity, and to provide equipment manufacturers with considerable flexibility in designing machines that satisfy its requirements.

Specifically, the XG format does the following.
- Enables production of extremely expressive sound data
- Significantly expands available voice types and variations
- Supports future compatibility of sound data among musical instruments, computers, and other devices
- Ensures that data will remain fully usable well into the future
- Supports standardized handling of new types of effects-inclusive data (such as karaoke data)

The XG format is founded on the following three principles:
- Compatibility
- Scalability
- Expandability

1   Compatibility
Any XG machine, regardless of model or manufacturer, will provide faithful reproduction of any XG sound data. Because the XG format maintains upward compatibility with the GM format, XG machines will also provide correct reproduction of GM sound data.

2   Scalability
Although the XG format provides detailed and extensive specification of voice sets and voice changes, it does not require XG machines to support the full range of functions. Designers are free to develop a wide range of products to meet various cost and performance objectives. Each XG machine will replay XG data in accordance with the machine's level of sophistication. If a model does not support a variation voice, it will automatically play the corresponding basic voice instead. If a model includes a graphic equalizer, it can take full advantage of graphic equalizer functions so as to control frequency characteristics to best suit the musical genre being played — from lively rock to soothing classical.

3   Expandability
The XG format remains open to enhancements and extensions that will allow it to remain in step with future product developments.

Additions to the GM format

The XG offers the following extensions to the GM format.

- **Voices:** The GM format supports 128 voices. The XG format provides for Bank Select messages that significantly expand the number of voices supported.

1) Voice Extension by Bank-Select LSB
   Variations of basic GM voices are stored in banks. To select a variation, specify the desired bank by sending the appropriate Bank-Select LSB value. Each bank is associated with a specific type of variation, so that voices are easy to locate.

2) Bank-Select MSB adds an SFX bank
   The Bank-Select LSB method is not useful for extension of distinctive SFX voices that have no meaningful variation. For this reason the XG format supports a full SFX bank of extension effects, which you can select by sending a Bank-Select MSB value of 40H. Bank-Select MSB 7Eh or 7Fh, in contrast, can be used to set any channel to rhythm-part play.

- **Voice Modification:** The XG format allows creation of extremely expressive control data that can darken or lighten voices, delay or accelerate sound start-up, or implement many other types of control. Most controls are issued by Control Change commands, although System Exclusive messages are also used.

- **Effects:** The XG format offers high-level effects support, enabling control of effects types, circuit operation, and internal parameter settings for both basic and elaborate effects. Devices equipped with graphic equalizers will be able to modify ambience and sound to suit the specific type of music being played.

- **External Input:** Whereas existing tone generators create sound in response to internal data only, the XG format provides for real-time participation by adding support for input of external audio signals. External signals can be processed by the mixer in the same way as internal tone-generator data. A model that supports this function would allow you, for example, to create karaoke data that can automatically set the microphone echo used for playback.

New MIDI messages not available under GM format

1. Control Change
      Bank Select
      Portamento Time
      Portamento
      Sostenuto
      Soft Pedal
      Harmonic Content
      Release Time
      Attack Time
      Brightness
      Portamento Control
      Effects Send Level 1 (Reverb)
      Effects Send Level 2 (Chorus)
      Effects Send Level 3 (Variation)
      NRPN Part Parameter Control
      All Sound Off

2. Channel Mode Messages

3. Polyphonic Aftertouch

4. System Exclusive Messages
Parameter Change
System Parameters
Effect Parameters
Three categories of system effects are supported. One of these categories can be switched with insertion effects.
Graphic EQ and multiple insertion effects are supported as options.
Part Parameters
Filter cutoff and AEG value can be controlled by offset.
Display Parameters
External Input Control Parameters
Drum Setup Parameters
Bulk Dump
Parameter Request
Dump Request

Chapter 2: MIDI Specifications

1. Key On / Key Off

Status: 9nH/8nH

If multipart parameter "Rcv NOTE MESSAGE" is OFF, the part ignores these messages.

2. Program Change

Status: CnH
Default: 00H

If multipart parameter "Rcv PROGRAM CHANGE" is OFF, the part ignores this message.

Melody Voice
As indicated in XG Voice List. Voices can be added through use of Bank Select LSB. (Refer to description of Bank Select, below.)

Rhythm Voice
As indicated in XG Drum Map. Program Change message can be used to change the voice (drum kit). If the tone generator does not have a drum kit corresponding to the specified program number, it will ignore the message and continue to use the current drum kit.

Bank Select MSB/LSB should be set whenever this message is used, even when there's no need of changing the Bank.

3. Pitchbend

Status: EnH
Default: 40H 00H

If multipart parameter "Rcv PITCH BEND" is OFF, the part ignores this message.

4. Control Change

Status: BnH

If multipart parameter "Rcv CONTROL CHANGE" is OFF, the part will continue to accept Channel Mode messages but will ignore all other Control Change messages.

Bank Select MSB/LSB: 00H/20H

Cntrl#	Parameter	Data Range
0 32	Bank Select MSB Bank Select LSB	0:Normal 64:SFX voice 126:SFX kit 127:Drum 0 to 127 Default: 00 00H

If multipart parameter "Rcv BANK SELECT" is OFF, the part ignores this message.

The new bank selection does not become effective until receipt of the next Program Change message.

The Bank Select MSB selects melody voice, SFX voice, or rhythm kit. The MSB allows any channel to be designated for rhythm play.

Bank Select MSB values are as follows.

00H:	Melody voice
01H to 3FH:	not used
40H:	SFX voice
41H to 7DH:	not used
7EH:	SFX kit (SFX voices arranged over keyboard)
7FH:	Rhythm kit (Rhythm voices arranged over keyboard)

The Bank Select LSB selects from the extended melody voice set. (SFX kit and rhythm kit voices do not currently support Bank Select LSB extension sets.) Each bank is set for a specific type of variation, simplifying retrieval of the desired voice. Names of extensional voices, like basic voices, are defined (see Table 1). Other banks and voices may be added in the future.

Some models do not support all of the LSB-selectable extensional voices listed in Table 1. If support is included for one or more voices in an extensional bank, however, all the other program change numbers in that bank are filled with the corresponding voices of the Bank #0 (basic voices).

Note 1: Under default selection, Channel 10 plays rhythm voices, while other channels take Bank #0 melody voices. (Same as GM system - Level 1)

Note 2: Receipt of Bank Select MSB/LSB does not immediately change the voice. The channel stores the received Bank-Select MSB/LSB setting, but does not apply it until receipt of the next Program Change message.

Note 3: If the new Bank Select MSB is 00H (melody voice) but the tone generator does not support the melody voice corresponding to the last received Bank Select LSB, the channel reverts to the Bank Select LSB corresponding to its most recently played melody voice.

Note 4: If the new Bank Select MSB is 7FH (rhythm voice), the tone generator unconditionally uses LSB 00H. If the tone generator does not support a drum kit corresponding to the channel's most recently received Program Change, the channel will revert to the Program Change corresponding to its most recently played rhythm kit.

Note 5: If a Bank Select MSB value of 01H ~ 7EH (SFX voice, or unused MSB) is received and the tone generator does not have a voice corresponding to the last received LSB and Program Change, the tone generator will produce no sound for that channel regardless of subsequent key on messages.

(Commentary)   Users employing the XG Format to generate music data should note the following general points.

- The discussion and examples provided above are intended to clarify operating specifications relevant to tone-generator manufacture. During general operation the MSB, LSB and Program Change should always be sent together, keeping intervals of at least 1/480 between them.
- For melody voice play : If the channel cannot play from the bank selected by the last LSB specification, it will revert to the most recent playable LSB specifications.
- For rhythm voice play : If the channel cannot play the kit selected by the last received Program Number, it will revert to the most recent playable Program Number.

Modulation: 01H

Cntrl#	Parameter	Data Range
1	Modulation	0 to 127 Default: 00H

If multipart parameter "Rcv MODULATION" is OFF, the part ignores this message.
Upon initialization this message applies to vibrato depth, but content can be changed by use of System Exclusive message.

Portamento Time: 05H

Cntrl#	Parameter	Data Range
5	Portamento Time	0 to 127 Default: 00H

Sets the pitch change speed used when Portamento is ON. Has no affect on portamento control. A value of 0 produces the shortest portamento time; value 127 selects the longest time.

Data Entry MSB/LSB: 06H/26H

Cntrl#	Parameter	Data Range
6	Data Entry MSB	0 to 127
38	Data Entry LSB	0 to 127

Main Volume: 07H

Cntrl#	Parameter	Data Range
7	Volume	0 to 127 Default: 64H

If multipart parameter "Rcv VOLUME" is OFF, the part ignores this message.
Use this message to balance the volume among the different parts.

Panpot: 0AH

Cntrl#	Parameter	Data Range
10	Panpot	0 to 127 Default: 40H

If multipart parameter "Rcv PAN" is OFF, the part ignores this message.
Produces relative variations in pan among different installments of the rhythm part.

Expression: 0BH

Cntrl#	Parameter	Data Range
11	Expression	0 to 127 Default: 7FH

If multipart parameter "Rcv EXPRESSION" is OFF, the part ignores this message.
This message is used to control intonation expression (diminuendo and crescendo) during play.

Sustain: 40H

Cntrl#	Parameter	Data Range
64	Sustain	0 to 127 (0-63:Off 64-127:On) Default: 00H

This message should be effective in a release portion of voices after Note Off. (After Dumper Effect)
If multipart parameter "Rcv SUSTAIN" is OFF, the part ignores this message.

Portamento: 41H

Cntrl#	Parameter	Data Range
65	Portamento	0 to 127 (0-63:Off 64-127:On) Default: 00H

If multipart parameter "Rcv PORTAMENTO" is OFF, the part ignores this message.

Sostenuto: 42H

Cntrl#	Parameter	Data Range
66	Sostenuto	0 to 127 (0-63:Off 64-127:On) Default: 00H

If multipart parameter "Rcv SOSTENUTO" is OFF, the part ignores this message.

Soft Pedal: 43H

Cntrl#	Parameter	Data Range
67	Soft Pedal	0 to 127 (0-63:Off 64-127:On) Default: 00H

If multipart parameter "Rcv SOFT PEDAL" is OFF, the part ignores this message.

Harmonic Content: 47H

Cntrl#	Parameter	Data Range
71	Harmonic Content	0 to 127 (0:-64 64:+0 127:+63) Default: 40H

Applies adjustment to the resonance value set by the voice. This parameter specifies relative change, with value 64 producing zero adjustment. As values get higher the sound becomes increasingly eccentric. Note that for some voices the effective parameter range is narrower than the legal parameter range.

Release Time: 48H

Cntrl#	Parameter	Data Range
72	Release Time	0 to 127 (0:-64 64:+0 127:+63) Default: 40H

Applies adjustment to the envelope release time set by the voice. This parameter specifies relative change, with value 64 producing zero adjustment. For some voices the effective parameter range is narrower than the legal parameter range.

Attack Time: 49H

Cntrl#	Parameter	Data Range
73	Attack Time	0 to 127 (0:-64 64:+0 127:+63) Default: 40H

Applies adjustment to the envelope attack time set by the voice. This parameter specifies relative change, with value 64 producing zero adjustment. For some voices the effective parameter range is narrower than the legal parameter range.

Brightness: 4AH

Cntrl#	Parameter	Data Range
74	Brightness	0 to 127 (0:-64 64:+0 127:+63) Default: 40H

Applies adjustment to the filter cutoff frequency set by the voice. This parameter specifies relative change, with value 64 producing zero adjustment. For some voices the effective parameter range is narrower than the legal parameter range.

Portamento Control: 54H

Cntrl#	Parameter	Data Range
84	Portamento Control	0 to 127

Portamento Time is always 0.

Effect Send Level 1 (reverb):   5BH

Cntrl#	Parameter	Data Range
91	Effect 1 Depth	0 to 127 Default: 28H

Adjusts the reverb send level.

Effect Send Level 3 (chorus):   5DH

Cntrl#	Parameter	Data Range
93	Effect 3 Depth	0 to 127 Default: 00H

Adjusts the chorus send level.

Effect Send Level 4 (variation):   5EH

Cntrl#	Parameter	Data Range
94	Effect 4 Depth	0 to 127 Default: 00H

Adjusts the variation effect send level. Effective only if "Variation Connection = System".

Data Increment/Decrement: 60H/61H

Cntrl#	Parameter	Data Range
96	Increment	0 to 127
97	Decrement	0 to 127

The data byte would be ignored.

NRPN (Non-registered parameter number) LSB/MSB: 62H/63H

Cntrl#	Parameter	Data Range
98	NRPN LSB	0 to 127
99	NRPN MSB	0 to 127

If multipart parameter "Rcv NRPN" is OFF, the part ignores this message.
First send the NPRN MSB and LSB to select the control parameter, then set the value by Data Entry.
Once you have selected an NRPN on a given channel, the channel will apply subsequent Data Entry to the selected parameter. After making the necessary settings you should set RPN to Null to reduce the risk of operational errors.

The following NRPN values are supported.

NRPN	Data Entry		Parameter	Data Range
MSB	LSB	MSB		
01H	08H	mmH	Vibrato Rate	mm:00H-40H-7FH(-64-0-+63)
01H	09H	mmH	Vibrato Depth	mm:00H-40H-7FH(-64-0-+63)
01H	0AH	mmH	Vibrato Delay	mm:00H-40H-7FH(-64-0-+63)
01H	20H	mmH	Filter Cutoff Frequency	mm:00H-40H-7FH(-64-0-+63)
01H	21H	mmH	Filter Resonance	mm:00H-40H-7FH(-64-0-+63)
01H	63H	mmH	EG Attack Time	mm:00H-40H-7FH(-64-0-+63)
01H	64H	mmH	EG Decay Time	mm:00H-40H-7FH(-64-0-+63)
01H	66H	mmH	EG Release	mm:00H-40H-7FH(-64-0-+63)
14H	rrH	mmH	Drum Filter Cutoff Frequency	mm:00H-40H-7FH(-64-0-+63) rr:drum instrument note number
15H	rrH	mmH	Drum Filter Resonance	mm:00H-40H-7FH(-64-0-+63) rr:drum instrument note number
16H	rrH	mmH	Drum EG Attack Rate	mm:00H-40H-7FH(-64-0-+63) rr:drum instrument note number
17H	rrH	mmH	Drum EG Decay Rate	mm:00H-40H-7FH(-64-0-+63) rr:drum instrument note number
18H	rrH	mmH	Drum Pitch Coarse	mm:00H-40H-7FH(-64-0-+63) rr:drum instrument note number
19H	rrH	mmH	Drum Pitch Fine	mm:00H-40H-7FH(-64-0-+63) rr:drum instrument note number
1AH	rrH	mmH	Drum Level	mm:00H-7FH(0-Max) rr:drum instrument note number
1CH	rrH	mmH	Drum Pan	mm:00H-40H-7FH(Random,L-Center-R) rr:drum instrument note number
1DH	rrH	mmH	Drum Reverb Send Level	mm:00H-7FH(0-Max) rr:drum instrument note number
1EH	rrH	mmH	Drum Chorus Send Level	mm:00H-7FH(0-Max) rr:drum instrument note number
1FH	rrH	mmH	Drum Variation Send Level	mm:00H-7FH(0-Max) rr:drum instrument note number

If multipart parameter "Rcv NRPN" is OFF, the part ignores this message.
Note that MSB values 14H through 1FH (drum parameters) are effective only for rhythm parts.

RPN (Registered parameter number) LSB/MSB: 64H/65H

Cntrl#	Parameter	Data Range
100	RPN LSB	0 to 127
101	RPN MSB	0 to 127
		Default: 7F 7FH

If multipart parameter "Rcv RPN" is OFF, the part ignores this message.

The following parameters are supported.

RPN	Data Entry		Parameter	Data Range
MSB	LSB	MSB		
00H	00H	mmH	Pitchbend Sensitivity	mm: 00H-7FH (0-+127) Default: 02H

LSB value is ignored.

Minimum operational range is 00H00H-0CH00H (± octave).

00H	01H	mmH	Fine Tune	mm: 00H-40H-7FH (-64-0-+63) Default: 40 00H
00H	02H	mmH	Coarse Tune	mm: 00H-40H-7FH (-64-0-+63) Default: 40 00H
7FH	7FH		Null	—

5. Channel Mode Messages

All Sound Off: 78H

Cntrl#	Parameter	Data Range
120	—	0

Switches off sound from all parts.
Does not reset the settings established by Channel Messages.

Reset All Controllers: 79H

Cntrl#	Parameter	Data Range
121	—	0

Resets the following values to the default: Pitchbend, Modulation, Expression, Sustain, Portamento, Sostenuto, Registered Parameter Number
Resets Portamento Control. setting. Specifically, clears condition in which source (Portamento Control Message) has been received but target (new Key On) has not.

All Notes Off: 7BH

Cntrl#	Parameter	Data Range
123	—	0

Switches off all currently "on" notes in all parts. Any notes being held by sustain or sostenuto continue to sound until sustain/sostenuto goes off.

OMNI Off: 7CH

Cntrl#	Parameter	Data Range
124	—	0

Same processing as for All Notes Off.

OMNI On: 7DH

Cntrl#	Parameter	Data Range
125	—	0

Same processing as for All Notes Off. ("OMNI ON" operation not supported.)

MONO: 7EH

Cntrl#	Parameter	Data Range
126	Mono	0 to 16

Generates "All Sound Off" operation. If the value of the third byte (mono number) is 0~16, the channel changes to Mode 4 (m=1).

POLY: 7FH

Cntrl#	Parameter	Data Range
127	—	0

Generates "All Sound Off" operation, and sets the channel to Mode 3.

6. Channel Aftertouch

Status: DnH

The message is not effective under initial settings.

If multipart parameter "Rcv CHANNEL AFTERTOUCH" is Off, the part ignores this message.

7. Polyphonic Aftertouch

Status: AnH

If multipart parameter "Rcv POLYPHONIC AFTERTOUCH" is Off, the part ignores this message.

It is not necessary for the effect to apply to all note numbers (0~127).

8. Exclusive Messages

XG System On

F0H,43H,1nH,4CH,00H,00H,7EH,00H,F7H

11110000	F0	Exclusive status
01000011	43	YAMAHA ID
0001nnnn	1n	Device Number
01001100	4C	Model ID
00000000	00	Address High
00000000	00	Address Mid
01111110	7E	Address Low
00000000	00	Data
11110111	F7	End of Exclusive

This message switches SOUND MODULE MODE to XG and initializes all the parameters to the XG default settings, with the exception of Master Tune value.

Master Tune can be modified either with System Exclusive messages or on the front panel of a tone generator. Two System Exclusive messages are available i.e. MIDI Master Tuning (F0, 43, 1n, 27, 30, 00, 00, mm, ll, cc, F7) and XG Parameter Change Master Tune (F0, 43, 1n, 4C, 00, 00, 00, dd, dd, dd, dd, F7).

If the parameter is modified with F0, 43, 1n, 4C, 00, 00, 00, ... and then the XG System On comes, it will be reset to the value which has previously been modified with F0, 43, 1n, 27, ... or on the front panel e.g. :

Master Tune value	±0	Default
	+2	Modified either with F0, 43, 1n, 27, ... or on the front panel
	–4	Changed with F0, 43, 1n, 4C, 00, 00, 00 ...
	+2	Reset with XG System On, rather than to be initialized to ±0

On the other hand, the value set with F0, 43, 1n, 27, ... or on the front panel would not be reset to any earlier one with a reception of XG System On :

Master Tune value	±0	Default
	+2	Modified either with F0, 43, 1n, 27, ... , on the front panel, or with F0, 43, 1n, 4C, 00, 00, 00 ...
	–4	Changed either with F0, 43, 1n, 27, ... , or on the front panel
	–4	The value remains still with XG System On, rather than to be reset/initialized

With regard to the relation between the modification with F0, 43, 1n, 27, ... and the one on the front panel, the last executed one will take the priority.

The message requires approximately 50msec to execute, so sufficient time should be allowed before the next message is sent.

GM System On

F0H,7EH,7FH,09H,01H,F7H

11110000	F0	Exclusive status
01111110	7E	Universal Non-realtime ID
01111111	7F	Device ID
00001001	09	Sub ID1
00000001	01	Sub ID2
11110111	F7	End of Exclusive

Initializes all the parameters to the XG default settings, with the exception of Master Tune value.

As for the Master Tune, reception of this message should be implemented in the same way as the case with XG System On.

MIDI Master Volume

F0H,7FH,7FH,04H,01H,llH,mmH,F7H

11110000	F0	Exclusive status
01111111	7F	Universal Realtime ID
01111111	7F	Device ID
00000100	04	Sub ID1
00000001	01	Sub ID2
0lllllll	ll	Master Volume LSB
0mmmmmmm	mm	Master Volume MSB
11110111	F7	End of Exclusive

Changes volume of all channels. ("Universal System Exclusive")

MIDI Master Tuning

F0H,43H,1nH,27H,30H,00H,00H,mmH,llH,ccH,F7H

11110000	F0	Exclusive status
01000011	43	YAMAHA ID
0001nnnn	1n	Device Number
00100111	27	Model ID
00110000	30	Sub ID2
00000000	00	
00000000	00	
0mmmmmmm	mm	Master Tune MSB
0lllllll	ll	Master Tune LSB
0ccccccc	cc	Don't care
11110111	F7	End of Exclusive

Changes tuning of all channels.

Parameter Change

11110000	F0	Exclusive status
01000011	43	YAMAHA ID
0001nnnn	1n	Device Number
01001100	4C	Model ID
0aaaaaaa	aa	Address High
0aaaaaaa	aa	Address Mid
0aaaaaaa	aa	Address Low
0ddddddd	dd	Data
|	|	
0ddddddd	dd	Data
11110111	F7	End of Exclusive

Includes 2 or 4 bytes of data, depending on parameter size.

The following eight types of parameter change are provided.

1) System Data parameter change
2) Multi Effect Data parameter change
3) Multi EQ Data parameter change
4) Multi Part Data parameter change
5) Drums Setup Data parameter change
6) System Information
7) Display Data parameter change
8) AD Part Data parameter change

*6) System Information is sent in response to dump requests. Received parameter changes are ignored.

System Exclusive messages are not accepted if "Rcv System Exclusive" is OFF.

Bulk Dump

11110000	F0	Exclusive status
01000011	43	YAMAHA ID
0000nnnn	0n	Device Number
01001100	4C	Model ID
0bbbbbbb	bb	Byte Count MSB
0bbbbbbb	bb	Byte Count LSB
0aaaaaaa	aa	Address High
0aaaaaaa	aa	Address Mid
0aaaaaaa	aa	Address Low
0ddddddd	dd	Data
|	|	
0ddddddd	dd	Data
0ccccccc	cc	Checksum
11110111	F7	End of Exclusive

For information about "Address" and "Byte Count" fields, refer to Table 3.

Here the "Byte Count" refers to "Total Size" of Data shown on Table 3-n.
The "Address" in Bulk Dump / Dump Request refers to the address at the beginning of each block.
The "block" refers to a unit of data stream which is enclosed by "Total Size" on Table 3-n.

Checksum value is set such that the sum of Byte Count, Address, Data and Checksum has value zero in its seven least significant bits.

Parameter Request

11110000	F0	Exclusive status
01000011	43	YAMAHA ID
0011nnnn	3n	Device Number
01001100	4C	Model ID
0aaaaaaa	aa	Address High
0aaaaaaa	aa	Address Mid
0aaaaaaa	aa	Address Low
11110111	F7	End of Exclusive

Dump Request

11110000	F0	Exclusive status
01000011	43	YAMAHA ID
0010nnnn	2n	Device Number
01001100	4C	Model ID
0aaaaaaa	aa	Address High
0aaaaaaa	aa	Address Mid
0aaaaaaa	aa	Address Low
11110111	F7	End of Exclusive

Sending or receiving of dump request cannot be switched off except by setting "Exclusive" to OFF.

Troubleshooting

Even though the MU90R is exceptionally easy to use, it may occasionally not function as you expect it to. If that happens, check the possible problems and solutions below before assuming that the instrument is faulty.

Problem	Possible Cause and Solution
No power.	If you are using an AC adaptor, check that the adaptor is properly plugged into both the AC outlet and the MU90R (See page 14.)
No sound.	Check that: ● The panel volume control is set to an appropriate level. ● Other volume-related parameters are set to appropriate levels. (See Volume and Expression in the Single Part controls, page 43, and Master Volume and Master Attenuator in the All Part controls, page 47.) ● Mute or Solo are not active. (See page 25.) If a Part is being muted, or an empty Part is being soloed, you may not get any sound. ● The Variation effect settings are appropriate. No sound will be output at all if Variation Connection is set to INS (page 106), Variation Send is turned on for the Part (page 44), and NO EFFECT is selected for the Variation Type (page 105). The easiest solution in such a case is to turn off Variation Send for the Part. ● The EG Attack Time (page 53) is appropriately short, for short percussive sounds. ● The Velocity Sensitivity Offset (page 67) is appropriate. ● The Note Limit Low and Note Limit High (pages 65 — 66) settings are appropriate. If the former is set higher than the latter, no sound will be output. ● The Velocity Limit Low and Velocity Limit High (page 68) settings are appropriate. If the former is set too high and the latter too low, no sound may be output.
No sound when playing the MU90R from a computer, sequencer or external keyboard.	Check all MIDI connections, making sure that the MIDI OUT of the external device is connected to the MIDI IN of the MU90R, and that the MIDI IN of the external device is connected to the MIDI OUT of the MU90R. (See pages 31 — 32.) Or, if you are using the TO HOST terminal with a computer, make sure that the terminal is properly connected to the computer and that the HOST SELECT switch is properly set for your particular computer. (See pages 29 — 31.) Also, make sure that you have turned on the connected MIDI instrument or computer *before* turning on the MU90R. If you haven't, simply turning the MU90R off and back on again may solve the problem.
Notes are cut off or omitted.	The maximum polyphony of the MU90R may be exceeded. The MU90R can play no more than 64 notes at once. (Though 64 notes may seem to be more than enough, you may run short when playing a connected keyboard along with some densely arranged song data.)
Reverb, Chorus and/or Variation effects cannot be heard.	Check all Reverb-, Chorus- and Variation-related controls: Reverb Send, Chorus Send and Variation Send in Single Part controls (page 44); Reverb Return, Chorus Return and Variation Return (when Variation Connection is set to SYS) in All Part controls (pages 47 — 48). Also check the individual effect settings; if no Type has been selected, or if the parameter settings are too low, there may be no effect sound.
The A/D input sound (mic, guitar, etc.) cannot be heard.	Make sure that the appropriate A/D Part (A1 or A2) has been turned on and that the A/D INPUT control is set to an appropriate level. Also for best results, make sure that the A/D input type (Mic, Guitar, Keyboard, Audio) is set to match the input you are using.

Error Messages

Battery Low!
The battery voltage (for internal memory backup) may be too low. Bring the unit to your local Yamaha dealer or any other authorized Yamaha service personnel.

Illegal Data!
A data error resulted during reception of MIDI messages. Try transmitting the data again, or turn the MU90R off and back on again.

MIDI Buffer Full!
Too much MIDI data is being received by the MU90R at one time. Reduce the amount of data being sent to the MU90R.

HOST is OffLine!
This message appears when the host computer is not turned on, the connecting cable is not properly connected, or the sequencing software is not active.

SysEx Adrs ERROR!
The data of the received System Exclusive message is incorrect. Check the address of the message and try transmitting again.

SysEx Data ERROR!
The data of the received System Exclusive message is incorrect. Check the data of the message (as to whether it requires an MSB or LSB header) and try transmitting again.

SysEx Size ERROR!
The data of the received System Exclusive message is incorrect. Check the size of the message and try transmitting again.

Check Sum ERROR!
The checksum of the received System Exclusive message is incorrect. Check the checksum of the message and try transmitting again.

This Parameter isn't Excl Data
The selected parameter has no System Exclusive value and cannot be displayed with the Show Exclusive function.

No Parameter
The selected parameter for use with the Show Exclusive function does not exist as a valid parameter.

Rcv CH is OFF!
The selected parameter for use with the Show Exclusive function cannot be converted to a MIDI message value since the Receive Channel for the Part is off. Set the Receive Channel to an appropriate value.

Specifications

Tone Generation Method

> AWM2 (Advanced Wave Memory 2)

Maximum Simultaneous Polyphony

> 64-note

Sound Module Modes

> XG (Extended General MIDI), TG300B, C/M, and Performance

Multi-timbral Capacity

> 32-Part (on 32 MIDI channels; with element reserve priority for later notes and dynamic Voice allocation)

Internal Voice/Program Structure

Normal Programs

Total Voices	779
XG mode	586
TG300B mode	614
C/M mode	128 (Parts 1 — 9), 64 (Parts 11 — 16)

Drum Programs

Total Programs	30
XG mode	20
TG300B mode	10
C/M mode	1

Performance Programs

Up to four Voices plus all effect settings can be memorized to a Performance.

Preset Programs	100
User Programs	100

Effects

> Five sections of multi-effects: Reverb (12 Types), Chorus (14 Types), Variation (62 Types), Insertion 1, 2 (43 Types), and EQ (4 Types)

Demo Song

> 1 (not editable, stored in ROM)

Display

> Custom back-lit LCD

Controls

    VOLUME control; A/D INPUT level control; Mode select buttons: PLAY, UTIL (UTILITY), MODE, EDIT, EFFECT, EQ; other buttons: MUTE/SOLO, ENTER, EXIT, PART , SELECT , VALUE ; data dial; POWER button

Jacks and Terminals

    Front panel: PHONES jack (1/4"), A/D INPUT 1, 2 jacks (1/4"), Rear panel: INDIVIDUAL OUTPUT 1, 2 jacks; OUTPUT R, L/MONO jacks (Right, Left/Mono); DC IN jack; TO HOST terminal; HOST SELECT switch; MIDI IN A/B, MIDI OUT, and MIDI THRU terminals

Computer/MIDI Interface

    Direct connection to host computer port (RS-232C, RS-422) with optional cables (CCJ-PC1, CCJ-PC1, CCJ-MAC); MIDI terminals allow connection to MIDI sequencer or MIDI controller

Data Transfer (Baud) Rate

    MIDI — 31,250 bps (bits per second)
    Mac — 31,250 bps
    PC-1 — 31,250 bps
    PC-2 — 38,400 bps

Power Supply

    Yamaha PA-3B AC Adaptor (included)

Dimensions (W × D × H)

    $483 \times 229 \times 44$ mm (19" × 9" × 1-3/4")

Weight

    2.4 kg (5 lbs., 5 oz.)

Included Accessories

    Owner's Manual, Yamaha PA-3B AC Adaptor

* Specifications subject to change without notice.

Glossary

A/D input Abbreviation for analog-to-digital. The A/D inputs of the MU90R allow you to process analog inputs (such as a microphone, electric guitar, CD player, or another electronic instrument) with the digital effects of the MU90R and mix them with the internal Voices.

Assignable Controller 1 Certain functions on the MU90R (such as the Filter, Volume or Variation effect) can be changed in real time by controllers on a connected MIDI instrument. Assignable Controller 1 lets you determine which controller (for example: modulation wheel, breath controller, foot controller, etc.) is used for that purpose.

AWM2 Abbreviation for Advanced Wave Memory 2, an enhanced version of Yamaha's original tone generation system, featuring digital filters for superior sound.

bank A set of Voices or programs. The MIDI standard supports up to 128 banks, each of which can contain up to 128 Voices or programs.

edit Editing is the process of changing or adjusting the settings of the MU90R.

EG Abbreviation for Envelope Generator, a common control on electronic instruments that affects the "shape" (or envelope) of the sound in time. The MU90R provides two types of EGs: one for level and the other for pitch.

Filter A control for affecting the frequency content of a sound. Filters are used to selectively cut or boost certain frequency ranges in the sound — subtly enhancing the sound, or dramatically changing its character. On the MU90R, the Filter can be controlled in real time with the Assignable Controller 1.

General MIDI (GM) An addition to the MIDI standard which effectively ensures that any General MIDI-compatible song data can be properly played back on any General MIDI-compatible tone generator. The standard specifies that a GM-compatible tone generator must have at least 24-note polyphony, 16-part multi-timbral capacity and 128 standard voices. The MU90R exceeds this with 64-note polyphony, 32-part multi-timbral capacity and 779 Voices.

host computer The controlling computer in a computer music system. The host computer is connected to the MU90R (via the TO HOST or MIDI terminals) and runs the software necessary for recording and playing back song data, which is reproduced by the internal sound sources and effects of the MU90R.

LFO Abbreviation for low frequency oscillator, which generates a low frequency signal that is used to modulate certain aspects of the sound, such as pitch or level. Chorus, Flanger, Tremolo, Vibrato and other modulation effects use LFOs.

MIDI Acronym for Musical Instrument Digital Interface, a worldwide standard that allows MIDI-compatible instruments and devices to communicate with each other. For the instruments to communicate, they normally must be set to the same MIDI channel.

modulation wheel A controller found on most MIDI keyboards which is normally used to control pitch and other types of modulation. It can be used to control various aspects of the MU90R sound by proper setting of the Assignable Controller 1. (See pages 70 — 72.)

multi-timbral This refers to the capacity of a tone generator to produce several different sounds at once. The MU90R is a 32-Part multi-timbral tone generator, capable of playing 32 different instrument Voices at once, each over an independent MIDI channel.

Mute The Mute function of the MU90R allows you to silence one Part to hear how all of the other Parts sound without it.

parameter The word "parameter" refers to any adjustable setting of an electronic musical instrument. For example, the Vibrato function of the MU90R has three parameters: Rate, Depth, and Delay.

Part The Voices of the MU90R are assigned to separate Parts, and up to 32 of these Parts can sound simultaneously. Parts are analogous to the various instrumental parts in music: e.g., piano part, guitar part, etc.

Performance In the MU90R, "Performance" refers to an operation mode and the programs that are used in that mode. A Performance can contain up to four different Parts, all controllable over the same MIDI channel. The preset Performances of the MU90R are special multi-Part sound programs designed particularly for live performance and studio recording purposes.

Pitch Bend A function found on virtually all MIDI keyboards (usually controlled with a pitch bend wheel) that allows the pitch to be raised or lowered continously. The Pitch Bend Control parameter on the MU90R allows you to set the range over which the pitch can be changed.

polyphony The number of notes that can be sounded simultaneously by an electronic instrument. The MU90R has 64-note polyphony, ensuring that even the most complex song data will play back completely and accurately, with no "note robbing."

port To answer the need for more MIDI channels (the limit is 16), many MIDI interfaces offer two or more MIDI ports, each of which can address 16 MIDI channels. The MU90R is equipped with two independent MIDI ports (A and B), providing 32-channel operation. The two ports are also addressable via the TO HOST computer interface.

Portamento A function found on early synthesizers that creates a continuous pitch glide between successively played notes. On the MU90R, the time of the pitch glide can be adjusted.

return Related to effect operation, "return" refers to the effect-processed signal that is returned to the overall sound mix. For example, the parameter Reverb Return determines the amount of Reverb-processed signal that is blended with the overall sound mix of the MU90R. ("Return" is the companion function of "send" below.)

send Related to effect operation, "send" refers to the signal that is sent to an effect for processing. For example, the parameter Reverb Send determines the degree to which an individual Part is processed with the Reverb effect. ("Send" is the companion function of "return" above.)

sequencer A device used for recording, editing and playing back of MIDI data. Sequencers are generally of two types: "dedicated" sequencer units, and computer-based sequencing software. The MU90R can be used with either type.

Solo The Solo function of the MU90R allows you to isolate a single Part, to hear how that Part sounds by itself.

Sound Module mode The MU90R has four Sound Module modes, and these determine the basic operation of the unit as a tone generator. Three Multi modes (XG, TG300B and C/M) and one Performance mode (PFM) are available.

tone generator An electronic instrument that functions as a MIDI-controllable sound source. For the most part, the term "tone generator" refers to those devices that have no keyboard or other controller, but are meant to be connected to and played from a separate keyboard or computer.

Variation In the MU90R, "Variation" refers to the special section of various effects, including Reverb, Delay, Chorus, and many others. The Variation effects total 62, and can be used simultaneously with the other effect sections of the MU90R: Reverb, Chorus, Insertion 1, 2 and EQ.

velocity The speed at which a note is played (for example, on a keyboard). Normally, the faster (or harder) a key is struck, the higher the corresponding note's velocity — and, hence, the louder the sound produced. The MU90R features a variety of velocity-related parameters that provide extensive control over the velocity response of the Voices, and even allow you to set up sophisticated velocity splits, in which the Voices change in response to playing velocity.

Vibrato Vibrato is a quavering, vibrating sound, and is produced in the MU90R by regularly modulating the pitch of a Voice. The speed and depth of the Vibrato can be adjusted, as well as the time it takes before the Vibrato effect is applied.

Voice The basic sound unit (or sound program) of the MU90R. There are a total of 779 Voices available on the MU90R.

XG-MIDI An abbreviation for Extended General MIDI, a new standard created by Yamaha which significantly improves on the General MIDI standard by providing a greater variety of high-quality Voices and enhanced effect operation.

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MEMO