YAMAHA®

AUTHORIZED PRODUCT MANUAL

V50

DIGITAL SYNTHESIZER

DIGITAL SYNTHESIZER

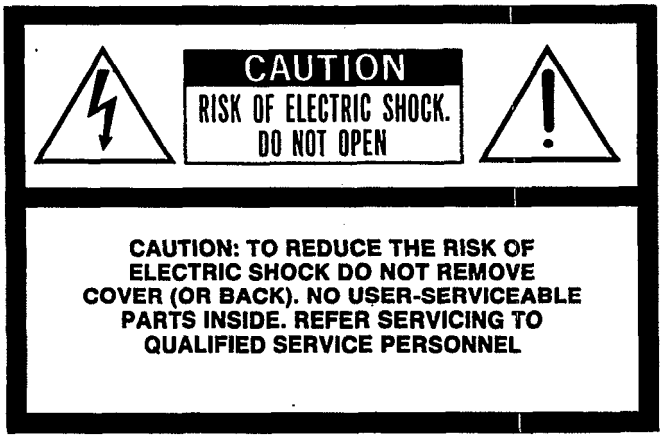
Operating Manual

YAMAHA

SUPPLEMENTAL MARKING INFORMATION

This information on safety is provided to comply with U.S.A. laws, but should be observed by users in all countries.

Yamaha Digital Musical Instrument Products will have either a label similar to the graphic shown below or a molded/stamped facsimile of the graphic on its enclosure. The explanation of these graphics appears on this page. Please observe all cautions indicated.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.

The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

FCC INFORMATION

While the following statements are provided to comply with FCC Regulations in the United States, the corrective measures listed below are applicable worldwide.

This series of Yamaha professional music equipment uses frequencies that appear in the radio frequency range and if installed in the immediate proximity of some types of audio or video devices (within three meters), interference may occur. This series of Yamaha professional music equipment has been type tested and found to comply with the specifications set for a class B computing device in accordance with those specifications listed in subpart J of part 15 of the FCC rules. These rules are designed to provide a reasonable measure of protection against such interference. However, this does not guarantee that interference will not occur. If your professional music equipment should be suspected of causing interference with other electronic devices, verification can be made by turning your professional music equipment off and on. If the interference continues when your equipment is off, the equipment is not the source of interference. If your equipment does appear to be the source of the interference, you should try to correct the situation by using one or more of the following measures:

Relocate either the equipment or the electronic device that is being affected by the interference. Utilize power outlets for the professional music equipment and the device being affected that are on different branch (circuit breaker or fuse) circuits, or install AC line filters.

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

If these corrective measures do not produce satisfactory results, please contact your authorized Yamaha professional products dealer for suggestions and/or corrective measures.

If you cannot locate a franchised Yamaha professional products dealer in your general area contact the Electronic Service Department, Yamaha Corporation of America, 6600 Orangethorpe Ave., Buena Park, CA 90620, U.S.A.

If for any reason, you should need additional information relating to radio or TV interference, you may find a booklet prepared by the Federal Communications Commission helpful:
"How to Identify and Resolve Radio – TV Interference Problems". This booklet is available from the U.S. Government Printing Office, Washington D.C. 20402 – Stock No. 004-000-00345-4.

IMPORTANT NOTICE FOR THE UNITED KINGDOM

Connecting the Plug and Cord

IMPORTANT. The wires in this mains lead are coloured in accordance with the following code:

BLUE : NEUTRAL

BROWN : LIVE

As the colours of the wires in the mains lead of this apparatus may not correspond with the coloured markings identifying the terminals in your plug proceed as follows:

The wire which is coloured BLUE must be connected to the terminal which is marked with the letter N or coloured BLACK.

V50 DIGITAL SYNTHESIZER

Operating Manual

INTRODUCTION

Thank you for purchasing the Yamaha V50 Digital Synthesizer. The V50 is a MIDI-equipped synthesizer utilizing FM tone generation. In addition to its synthesizer functions, the V50 features a built-in sequencer and rhythm machine, and can act as an all-in- one music production system.

In order to make full use of the V50's capabilities and enjoy long and trouble-free use, please read this manual carefully before use.

FEATURES

Some of the V50's many features are:

- **FM tone generation**
  Sound is produced using Yamaha's unique FM tone generation technology (4 operator, 8 algorithm). One of 8 waveforms can be selected for the output of each operator, for a wide variety of sounds.
- **16-note/8-timbre simultaneous notes**
  In single play mode a single voice can be played with up to 16 simultaneous notes, and in performance play mode the 16 notes can be distributed among up to eight different voices. In addition, DVA (dynamic voice allocation) mode will automatically determine the maximum number of simultaneous notes for each voice, allowing you to concentrate on your playing.
- **100 preset voices and performances**
  100 voices and 100 performances are built into the permanent memory of the V50 covering a wide variety of sounds from piano to brass to special effects.
- **100 voice and performance memories**
  100 voice memories and 100 performance memories are provided for you to store your own creations.
- **8-track 16000-note (approximate) sequencer**
  In addition to the rhythm tracks, an 8-track sequencer is built into the V50. By recording musical parts track by track you can build up an ensemble of up to 8 instruments using just a single V50. Up to 8 songs (within a total of approximately 16000 notes) can occupy the V50's memory and be played back in succession.
- **Rhythm machine with PCM-recorded sounds**
  A rhythm machine with 61 PCM-recorded sounds is built in. In addition to traditional drum kit instruments, the 61 sounds include ethnic instruments and synthesized percussion. These sounds can be used in synchronization with the sequencer playback.
- **Card slot, disk drive**
  Voice and performance data, and data for the sequencer and rhythm machine can be stored on card or floppy disk. (However, sequencer data cannot be stored on card.) An MDR function is provided,. allowing you to store system exclusive data from external MIDI devices on a V50 disk.
- **Micro tuning**
  Tunings other than the conventional equal temperament can be used. Tunings such as Werkmeister and 1/4 tone are built in, and you can program the pitch of each key to create your own tunings.
- **Performance effects**
  Three performance effects are built in; delay, pan, and chord. Four settings of each effect can be memorized.
- **Digital effects**
  A digital effects unit is built in, providing effects such as digital reverb and digital delay. An effect can be specified for each voice or performance, allowing you to use a digital effect as part of the voice or performance data.
- **User-editable power-on character display**
  You can specify a greeting message to be displayed whenever the power is turned on.

CONTENTS

PRECAUTIONS

The V50 is a precision electronic instrument. To ensure long and trouble-free use, please read the following precautions.

Location
Avoid placing the V50 in direct sunlight, or in locations where it will be subjected to temperature extremes, moisture, excessive dust, or heavy vibration.

Handling
Avoid applying excessive force to the switches, dropping or rough handling of the unit. While the circuitry is of reliable integrated circuit design, the V50 should be treated with care.

Power cable
Always grip the plug directly when removing it from an AC outlet. Removing the plug from the AC outlet by pulling the cable can result in damage to the cable, and possibly a short circuit. It is also a good idea to disconnect the V50 from the AC outlet if you don't plan to use it for an extended period of time.

Turning the power on
If one or more devices are connected to the V50 via MIDI cable, turn on the power switches starting with the transmitting devices (keyboards, sequencers, etc.)

Connections
To avoid damage to speakers, make all audio connections with the power of the V50 and other units turned off.

MIDI cables
Use cables specifically intended for MIDI. Using MIDI cables longer than 15 meters (45 feet) can result in data errors.

Cleaning
Use only a mild detergent on a cloth, and dry with a soft cloth. Never use solvents (such as benzine or thinner) since they can melt or discolor the finish.

Electrical storms (lightning)
Computer circuitry, including that in the V50, is sensitive to voltage spikes. For this reason, the V50 should be turned off and unplugged from the AC receptacle in the event of an electrical storm. This precaution will minimize the chance that a high voltage spike caused by lightning will damage the unit.

Electromagnetic fields
Computer circuitry is also sensitive to electromagnetic radiation. Television sets, radio receivers, transmitters and transceivers, and wireless microphone or intercom systems are all potential sources of such radiation. The V50 should not be placed too close to such devices.

Backup battery
The V50 has a backup battery that allows it to retain its voice and performance data even when disconnected from the AC outlet. The life of this battery is approximately 5 years. When the backup battery runs low, the first line of the LCD will show "Change int battery!". When the backup battery runs completely out, the voice and performance data will be lost, so immediately save the data to an optional RAM card or to disk. Contact the dealer where you purchased your V50 or a Yamaha service center to have the battery replaced. When the battery is replaced, the voice and performance data will be lost, so be sure to store the data to RAM card or disk.

Floppy disk drive
When moving the V50, be sure to insert the included dummy disk or an ordinary floppy disk (only if the data is not essential) into the disk drive to protect the floppy disk drive heads.

Floppy disks
Use 3.5" 2DD (double sided double density) disks. NEVER remove the disk while the drive is accessing the disk (when the disk LED is on). Do not leave disks where there is a strong magnetic field (near speakers or video monitors), or in direct sunlight. Do not bend or put pressure on disks. Do not open the disk shutter and touch the disk surface. We recommend that you copy (backup) important data on one or more disks.

HOW TO USE THIS MANUAL

This manual is divided into chapters 1—6 and an appendix.

If you are using the V50 for the first time, we suggest you read chapter 1. This will give you a basic understanding of all operations. You can refer to the remaining chapters as necessary, when you want to take full advantage of the V50's functions.

Chapter	Subject	First-time users	Experienced FM users	Experienced V50 users
1. Introducing the V50	Important points to know when using the V50, and basic operation	Please read this section		Not absolutely necessary to read
2. Performance Edit	Explains how to edit a performance	Read when you want to edit a performance		Read when necessary
3. Voice Edit	Explains how to edit a voice	Read when you want to edit a voice	Skim through	Read when necessary
4. Using the rhythm machine	Explains how to use the rhythm machine	Read when you want to use the rhythm machine		
5. Using the sequencer	Explains how to use the sequencer	Read when you want to use the sequencer		
6. Utility functions	Explains how to store, use the disk and card, and make MIDI settings	Read when necessary		
Appendix	Explains the preset voices	Read when necessary		
MIDI format	Explains the MIDI data format of the V50	Read when necessary		

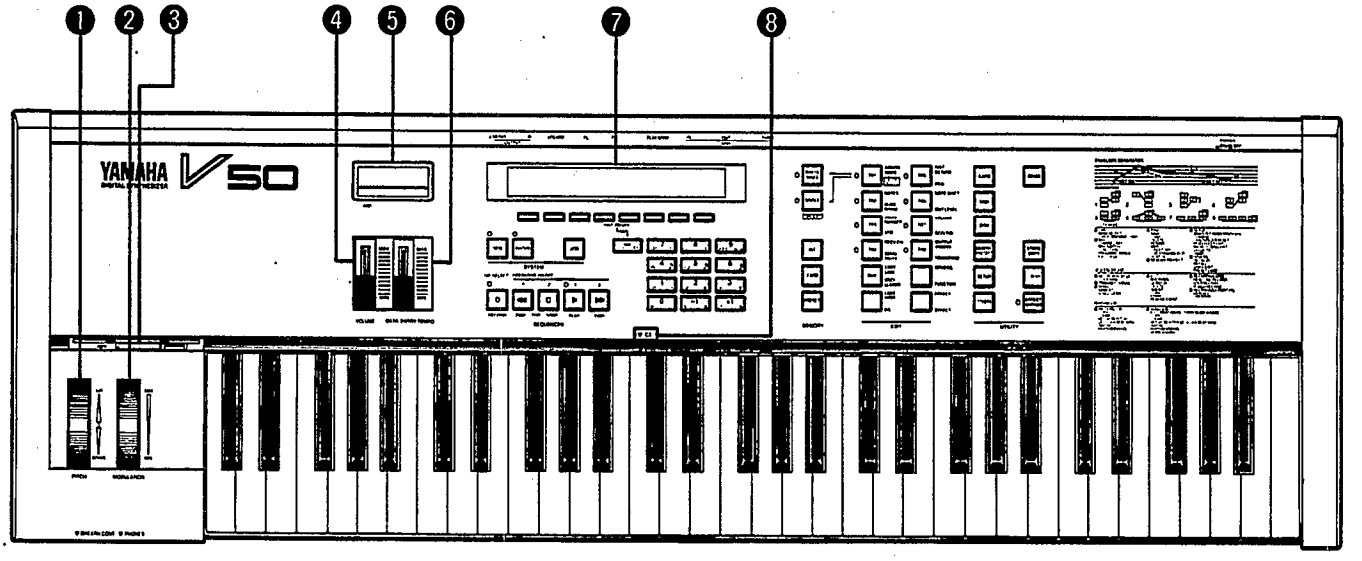
CHAPTER 1. INTRODUCING THE V50

This chapter begins with explaining the parts of the V50, and then tells how to make connections and play the sounds. To take full advantage of the V50, please be sure to read this chapter.

FRONT AND REAR PANELS

We begin by explaining the various parts of the V50. The use of each section will be explained in chapter 2 and later chapters. Here we will give simple explanations of what each part does.

The keyboard



❶ **Pitch bend wheel (PITCH)**
This raises or lowers the pitch while playing. When you release the wheel, it will return to the center position (the normal pitch). Rotating the wheel away from you will raise the pitch, and rotating the wheel toward you will lower the pitch.

❷ **Modulation wheel (MODULATION)**
This regulates the amount of cyclic change in tone (wah-wah), cyclic change in volume (tremolo), or cyclic change in pitch (vibrato). Rotating the wheel away from you will cause a deeper effect, and rotating it all the way towards you will result in no effect.

❸ **Floppy disk drive**
This is where you insert a 3.5" floppy disk to store voice or performance data, or data from the sequencer or rhythm machine. Insert the disk with the label facing up, from the end with the metal shutter. To remove the disk, press the button at the lower right of the drive.

❹ **Volume slider (VOLUME)**
This slider regulates the volume. Moving the slider all the way towards you results in a volume of 0, and moving it all the way away from you will result in full volume.

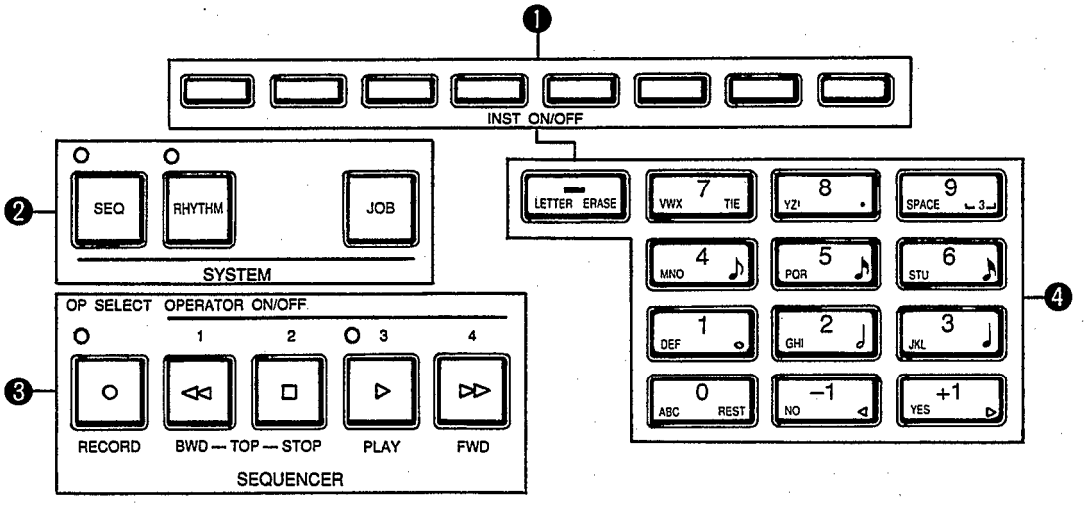
❺ **Data entry slider (DATA ENTRY/TEMPO)**
This slider is used when setting various data to enter larger or smaller numbers or turn settings off or on. While the rhythm machine or sequencer is playing, this slider regulates the tempo.

❻ **Card slot (CARD)**
This is the slot in which to insert a RAM or ROM card. Cards can be used to save voice, performance, or rhythm data. Turn the power off before inserting or removing a card.

❼ **Display**
This displays the names of selected voices or performances, data values, on/off settings, etc.

❽ **C3 key mark**
Each key of the keyboard has a name consisting of an alphabetical character A–G and a number −2 — 8 indicating the octave. (For example G-1, C#1, E4, G5, A6, etc.) This mark indicates the position of C3.

Key panel (the keys below the display)



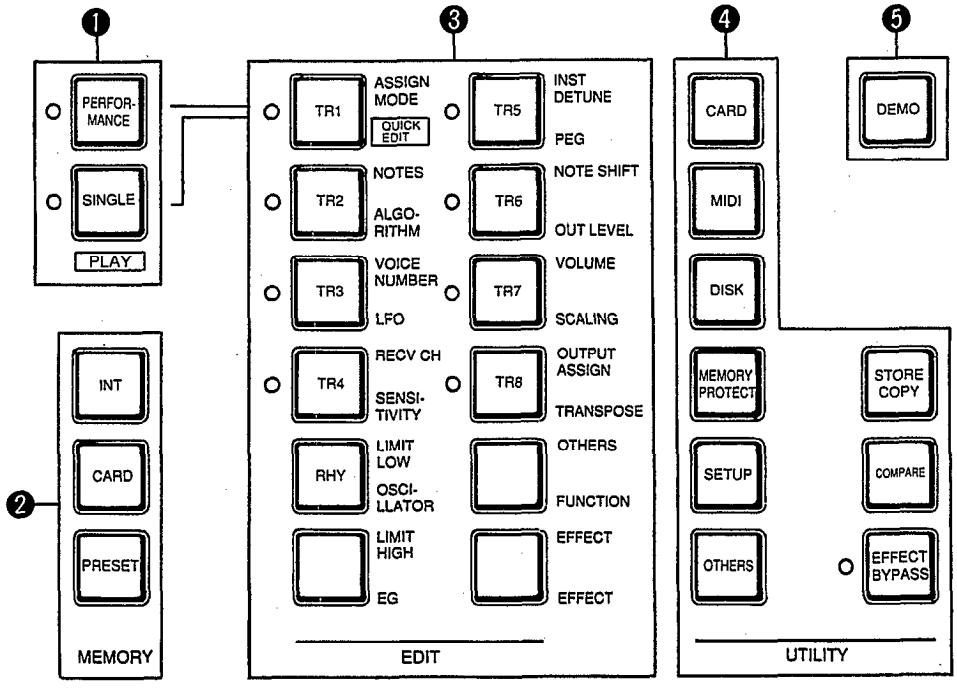
❶ **Function keys**
These keys have various functions when editing voices or performances, or editing sequencer or rhythm machine data. The display will indicate the current function of each key.

❷ **System keys**
These are used with the sequencer or rhythm machine, or when editing sequencer or rhythm machine data. When you press **SEQ** you will enter sequencer play mode. When you press **RHYTHM** you will enter rhythm play mode (pattern play mode or song play mode). In sequencer or rhythm machine mode, pressing **JOB** will display menus of various settings for each mode.

❸ **Sequencer, rhythm machine keys**
In sequencer or rhythm machine mode, these keys start, stop, backward, or fast forward, just as the controls on a cassette recorder. Pressing [□] and [◁◁] together will move to the beginning of the song. In rhythm pattern mode, this will move to the beginning of the pattern. When editing a voice, the [◁◁], [□], [▷], and [▷▷] keys will switch operators 1, 2, 3, and 4 off or on. [○] selects the operator to be edited.

❹ **Numeric keys**
Use these keys to specify voice or performance numbers, or values for various settings. They are also used to enter characters for a voice name, etc., and to specify the note length when recording a sequence. The [−1] [+1] keys are also used when replying to prompts in the display.

Key panel (the keys to the right of the display)



1 Play keys

These keys are used to switch between performance play and single play modes.

Press **PERFORMANCE** to change to performance play mode. Press **SINGLE** to change to single play mode.

2 Memory keys

These keys select between "Preset", "Card", or "Internal" voices, performances, and rhythm patterns. (However, there are no "Card" rhythm patterns.)

3 Edit keys

When editing voices or performances, these keys specify the parameter to be edited. During sequencer playback, these keys switch each track on/off. They are also used to select tracks for recording.

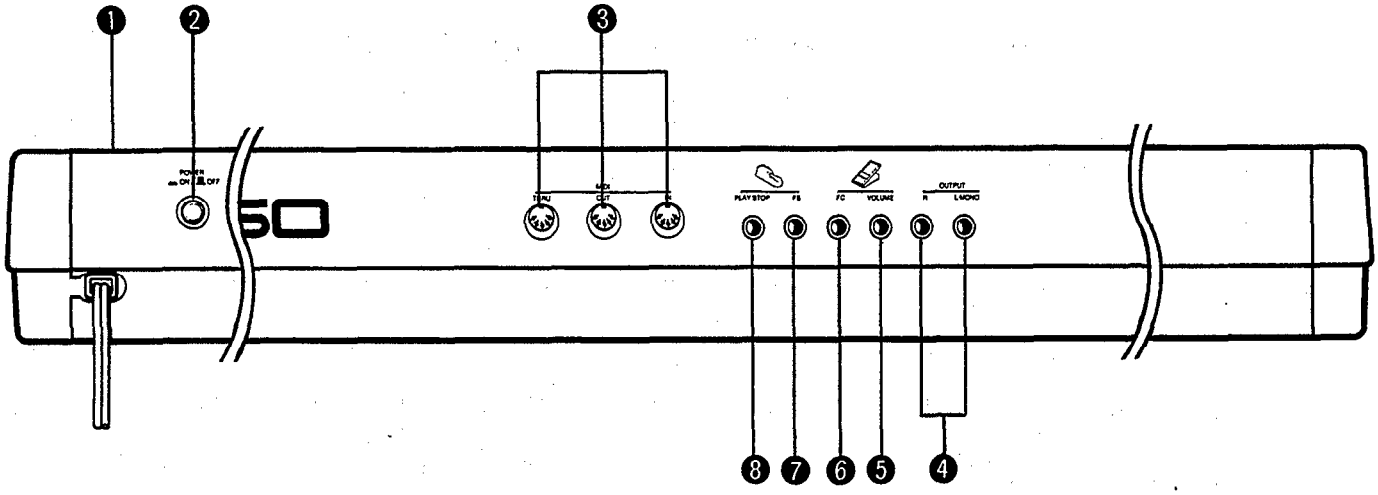
4 Utility keys

These keys are used when making various settings or for various operations affecting the entire V50.

5 Demo key

Use this key to play the preset V50 demo.

Rear panel



1 Power cable
Insert this plug into an **AC** outlet of the correct voltage.

2 Power switch (POWER)
This is the power switch. The power is on when this switch is pressed in. The front panel display will light when the power is turned on.

3 MIDI terminals (IN, OUT, THRU)
Connect MIDI cables to these terminals. IN receives MIDI signals, OUT transmits MIDI signals, and THRU re-transmits the MIDI signals that were received at the IN terminal.

4 Audio Outputs (L/MONO, R)
These jacks output the sound. If you have two amplifiers, connect the left channel to L/MONO and the right channel to R. If you have only one amplifier, connect it to L/MONO.

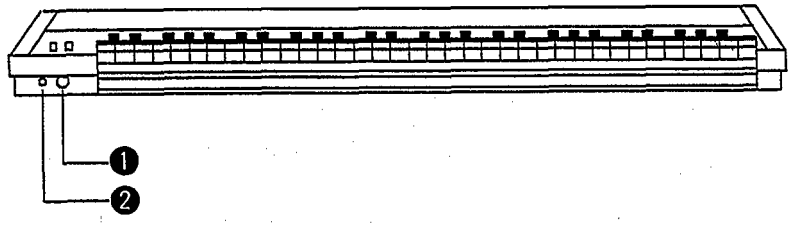
5 Volume pedal jack (VOLUME)
An optional volume pedal can be connected here.

6 Foot controller jack (FC)
An optional foot controller (FC7, FC9, etc.) can be connected here to regulate tone, pitch, or volume.

7 Foot switch jack (FS)
An optional foot switch (FC4, FC5, etc.) can be connected here to turn sustain (sustaining notes) the portamento (smoothly changing pitch) on/off.

8 Sequencer switch jack (PLAY/STOP)
An optional foot switch (FC4, FC5, etc.) can be connected here to start or stop sequencer playback. (This will function in the same way as the front panel keys [▷] and [□].)

Front side



1 Headphone output (PHONES)
A pair of stereo headphones can be connected here. The connector is a standard stereo headphone output jack, and corresponds to the rear panel L and R output jacks. (Use headphones of 8 – 150 ohms impedance.)

2 Breath controller jack (BREATH CONT)
An optional breath controller (BC1, BC2) can be connected here to affect volume or tone according to the force of your breath.

CONNECTIONS

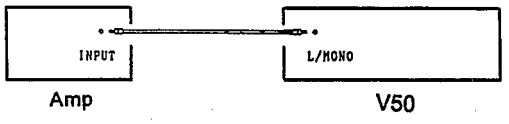
To produce sound, you must connect the V50 to an external amp/speaker system or use a pair of headphones. This section shows some typical setups. (The "amps" in the diagram refer to a keyboard amp that has a speaker built in.)

Note:

Be sure to turn the power of both units off before connecting the V50 to the amp. Failing to do so can damage the amp.

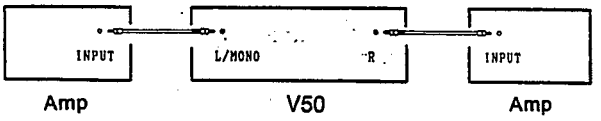
Using a single amp

When using just one amp, connect the L/MONO jack to the input of the amp as shown in the figure.



Using two amps

When using two amps, connect the L/MONO output jack to the amp for the left channel, and the R output jack to the amp for the right channel.



Equipment that can be connected to the V50 outputs

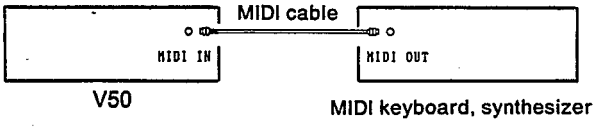
The example above uses keyboard amps (speakers with built-in amps), but other types of equipment can be connected to the V50 outputs, as follows.

- Combination amp/speaker units
- Multitrack recorders or cassette decks. However, be sure to use the line inputs. Connecting the output of the V50 to the mic inputs could damage the equipment. When connecting to a cassette deck etc., you will need an adaptor to convert the phone plug into the pin plug that is found on most cassette decks.
- Mixers (e.g., the MV802 or DMP7). Be sure to use the line inputs.

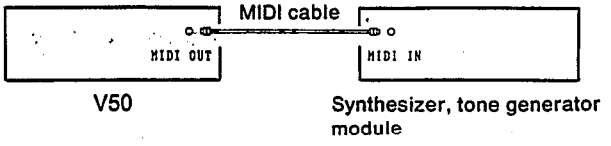
Connecting other equipment via MIDI

Here are some ways to connect other equipment to the V50 using the MIDI terminals.

- Controlling the V50 from another MIDI device (a keyboard or synthesizer such as the KX or DX series).



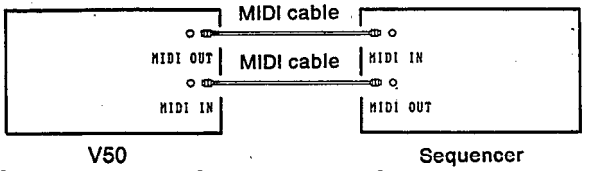
- Controlling another MIDI device (a synthesizer or tone generator module such as the DX or TX series) from the V50.



Note:

This is also how you will make connections when using the V50 sequencer to control external synthesizers or tone generator modules.

- Connecting an external sequencer (such as the QX series) and using it to record and playback.



There are many other ways to make MIDI connections, depending on your equipment and needs.

The MIDI THRU terminal re-transmits the MIDI signals received at MIDI IN. This makes it possible for more than one MIDI device to be controlled at once.

MAKING SOUND

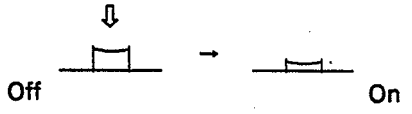
Now that connections are complete, we will explain how to make some sounds.

Turn the power on

Turn on each device in your setup in the following order.

(1) Check the following four items.
   (1) Are all power cables correctly inserted into an AC outlet?
   (2) Are all connections correct?
   (3) Are the amplifiers set to minimum volume?
   (4) Is the V50 volume slider set to MIN?

(2) The round button on the right side of the rear panel is the power switch. Press it in to turn the V50 power on.



The display will light up, and show the following message. (You can modify the message in the lower line of the display as explained on page 22.)

```
**** YAMAHA Digital Synthesizer V50 ****
>>>>       Nice to meet you !!       <<<<
```

In a short time this will change to a display similar to the following.

```
PFI00 "U"Lead 1  EFCT=Dly L/R: 40 Tch= 1
  P09/ P09/P20/ P20 /P20/ P21 /P21/ P21
```

* This display will be whatever was displayed when the V50 was last turned off, so details may be slightly different.

(3) Turn the amp (keyboard amp, etc.) power on. (The amp power is turned on last to protect the speakers from possible damage.)

Note:

- When several MIDI devices are connected, turn them on beginning with the transmitting device.
- When turning the power off, reverse this order. Turn off the amp, and then turn off the V50.

Any sound?

Now we will produce some sound.

(1) Raise the volume of the amp. (The manual for your amp will give details.)
(2) Gradually raise the volume slider to increase the V50 volume.
(3) Press a key.

Is the V50 sounding? If not, check the following.
(1) Is the power of the V50 and the amp turned on?
(2) Are the V50 and the amp correctly connected?
(3) Are the volumes of V50 and amp raised?

If after checking these three items you still hear no sound, try the steps given on the following page. If you still hear no sound, see page 122.

Now let's try out the various sounds of the V50.

TRY OUT THE SOUNDS

When you purchase the V50, the following 200 sounds are available for you to play.
(1) 100 preset performances
(2) 100 preset voices

Later, we will explain what a "voice" and "performance" is. For now, just try playing the sounds.

Note:

In addition to these presets, there are 100 internal performances and 100 internal voices. At the time of purchase, these contain the same sounds as the preset voices and performances.

100 preset performances

(1) Press PERFORMANCE., located at the right of the display. If the display already. shows something similiar to the following, there is no need to press PERFORMANCE, and you can move on to step (2).

If "PF..." is already displayed

```
PFI00 "V"Lead 1  EFCT=Dly L/R: 40 Tch= 1
  P09/ P09/P20/ P20 /P20/ P21 /P21/ P21
```

(2) Press PRESET. The display will show "PF??".

```
PFP?? "V"Lead 1  EFCT=Dly L/R: 40 Tch= 1
  P09/ P09/P20/ P20 /P20/ P21 /P21/ P21
```

(3) Use the numeric keys to enter a two-digit number. The 100 preset performances are numbered 00 – 99. For example if you press 0, 0, the display will indicate that preset performance 00 has been selected, as follows.

```
PFP00 "V"Lead 1  EFCT=Dly L/R: 40 Tch= 1
  P09/ P09/P20/ P20 /P20/ P21 /P21/ P21
```

- Play the keyboard and you will hear the sound of preset performance 00.

(4) Using the same proceedure as in step (3), use the numeric keys to enter a different two-digit number to select another performance. Play the keyboard and you will hear a different sound.

```
PFP12 WarmStrgs  EFCT=RevPlat: 60 Tch= 1
  P33/ P33/  * /  * /  * /  * /  * /  *
```

(5) This time press −1 +1.

- Pressing +1 will select the performance of the next number.
- Pressing −1 will select the performance of the previous number.
- For instance if preset performance 12 is selected, pressing +1 will select preset performance 13.

```
PFP13 12stGuitar EFCT=E.Rev  : 80 Tch= 1
  P50/ P51/ P51/ P51/  * /  * /  * /  *
```

As you have learned, there are two ways to select numbers; by directly entering the number using the numeric keys, or by incrementing or decrementing the currently selected number using −1 +1.

Preset performances from 94–99 are intended for multi-timbral playback using the V50 sequencer. When playing the keyboard with these performances selected, some of the sounds may be identical to other performances, and not all of the instruments shown in the lower line of the display will sound in response to the V50 keyboard.

The polyphony of each performance will depend on how voices are combined, and the performance effects that are used.

100 preset voices

(1) Press SINGLE, located at the right of the display. If the display already shows something similiar to the following, there is no need to press SINGLE, and you can move on to step (2).

If "PLAY SINGLE" is already displayed

```
PLAY SINGLE      EFCT=RevHall: 77  Pb= 2
I00  Strings 1   Fs=sus   [Tr  FcMw    ]
```

(2) Press [PRESET]. The lower left of the display will show "P??", as follows.

- Select a preset voice number (00 – 99) in the same way as you selected a preset performance. Use the numeric keys to directly enter a two-digit number, or use [−1] [+1] to step through preset performances one by one.

This should give you an idea of the types of sounds the V50 can produce. Using the simple procedures you have just learned, you will be able to select and play a variety of sounds. Those who want to take full advantage of the V50 can continue reading to learn more.

Pressing [PERFORMANCE] when already in performance play mode, or pressing [SINGLE] when already in single play mode will make the display show "Sending PC No.---". The display will return to normal when you release the button. This function allows you to transmit a "Program Change" message from MIDI OUT. This function is meaningless when using the V50 by itself. For details, see page 103.

Note:

Since voice and performance memories are numbered from 00 to 99, selecting a memory usually requires you to enter a two-digit number. However, the "Bank Hold" feature allows you to select memories by pressing a single button. While holding [−], press [7]. to turn Bank Hold on. When Bank Hold is on, pressing a single numeric key will immediately select the memory in the group of 10's that is currently selected. For example if memory 23 was selected when you turned Bank Hold on, pressing [9]. would immediately select 29, and pressing 4 would immediately select 24. While holding [−], press [8]. to turn Bank Hold off.

DEMONSTRATION PLAYBACK

Playing interesting sounds is not all you can do with the V50. Next we will explain how to hear a demo playback that uses the V50 sequencer and rhythm machine, which should give you an idea of the possibilities of the V50.

There are two types of demo: demos stored in the memory of the V50 and demos stored on disk. We will give separate explainations how to load each type.

When you load demo data, the data already in the V50 will be replaced by the demo data. When you select "Demo Disk", "Chain Play", or "V.Edit", the internal voice and performance data will also be replaced. If V50 memory already contains data that you don't want to loose, save the data to card or disk.

Playing the internal demo

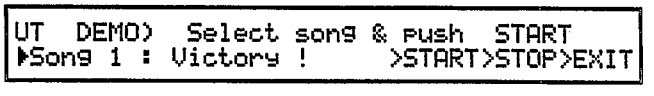
Here's how to playback the internal demo.

(1) Press [DEMO] to get the following display.

(2) Press the [ ] (function key) located under " > ROM Play" in the display.

The upper line of the display will ask "Are you sure?".

(3) Press the function key ([ ]) below [YES]. After displaying "*** BUSY ***" for a short time, the following display will appear.



(4) Use [−1] [+1] to select the demo song. The song titles will be shown in the lower line of the display.

(5) Press [▷] to begin playing the demo song. To stop playback, press [□]. To resume playback, press [▷] again. Press [□] and [▷] together to return to the beginning of the song.

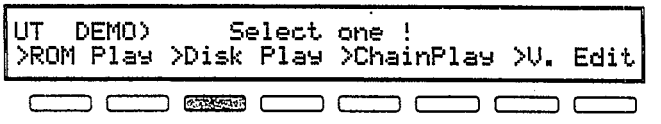
Playing the disk demo

Here's how to playback the disk demo. (Not only the demo data included with the V50, but *any* data you save to disk by selecting "ALL" can be loaded and played using the procedures explained here.)

(1) Press [DEMO] to get the following display.

(2) Insert the demo disk into the disk drive. (Making sure that the label is facing up, and the metal shutter is pointing toward the drive, push the disk in until you hear it click into place.)

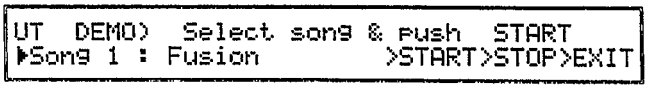
(3) Press the [ ] (function key) located under " > Disk Play" in the display.



The upper line of the display will ask "Are you sure?".

(4) Press the function key ([ ]) below [YES].

After displaying "*** BUSY ***" for a short time, you will get the following display.



(5) Use [−1] [+1] to select the song. The song titles will be shown in the lower line of the display.

(6) Press [▷] to begin playing the demo song. To stop playback, press [□]. To resume playback, press

[▷] again. Press [□] and [▷] together to return to the beginning of the song.

In step (3), pressing the [ ] (function key) located under “Chain Play” will make all the demo songs play sucessively, starting with the first. Also, if this data has been saved by selecting “ALL” when saving sequencer data, as later explained, you can use the same steps with disks other than the included demo disks. However only the “ALL” files at the beginning of the disk can be selected by this “Disk Play” function.

Voice edit demo

Here’s how to execute the voice edit demo.

- As already explained above, press [DEMO], and then press the [ ] (function key) located under “V.Edit” in the display.
- The display will show "Are you sure?".
- Press the [ ] (function key) located under “Yes”.
- The voice edit demo will begin.
- Use the data entry slider to adjust the speed of the voice edit demo.

BASIC CONCEPTS OF THE V50

By now you probably have a basic idea of the possibilities of the V50. Reading this section will give you more detailed knowledge.

Internal structure of the V50

The V50 contains three devices; a synthesizer, rhythm machine, and sequencer. In general, you may think of them as being independent of each other.

Synthesizer ... A device that produces various sounds using an FM tone generator. The synthesizer can be thought of as consisting of the “keyboard” on which you play, and the “tone generator” which actually produces the sounds.

Rhythm machine ... A device that contains PCM recordings of actual rhythm instrument sounds. The wide variety of sounds include traditional drum kit instruments, synthesized drums, and ethnic instruments.

Sequencer ... A device to record an actual musical performance. A musical performance recorded in this way can be played back at any time.

Four play modes

Just as the internal structure of the V50 can be divided into synthesizer, rhythm machine, and sequencer, the play modes of the V50 can be divided into the following four modes.

(1) Performance play mode
Play performances (combinations of more than one voice). Details of “voices” and “performances” are given on page 18.

(2) Single play mode
Play just one voice at a time.

(3) Rhythm machine play mode
Play rhythm patterns or songs (combinations of rhythm patterns). Chapter 4 has details of rhythm machine operation.

(4) Sequencer play mode
Play back a recorded musical performance. Chapter 5 has details of sequencer operation.

BASIC OPERATION OF THE V50

First we will explain basic operations when playing or editing voices, performances, the sequencer, or rhythm machine. Operations can be broadly divided into the following.

- *Switching modes*
- *Using the function keys to select an operation*
- *Setting numbers*
- *Entering characters*

Switching modes

Here's how to switch between performance play mode, single play mode, rhythm machine mode, and sequencer mode.

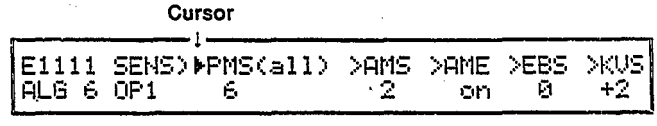
Note:

- You cannot switch modes while using the compare function when editing a voice or performance.
- If you press [SINGLE] when already in single play mode, or press [PERFORMANCE] when already in performance play mode, the display will show "** Sending PC No ---" as long as you continue holding the switch. This allows you to send a program change message as explained on page 103.

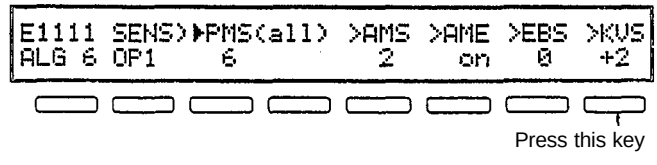
- To select performance play mode, press [PERFORMANCE]. The performance last used in performance play mode will be selected. Now you can press [PRESET], [INT], or [CARD], and use the numeric keys or [−1] [+1] to select another performance.
- To select single play mode, press [SINGLE]. The voice last used while in single play mode will be selected. Now you can press [PRESET], [INT], or [CARD], and use the numeric keys or [−1] [+1] to select another voice.
- To select rhythm machine mode, press [RHYTHM]. (You will enter rhythm pattern play mode or rhythm song play mode.)
- To select sequencer mode, press [SEQ].

Using the function keys to select operations

Use the function keys to select various items or functions from the menu displayed while editing or playing each mode. The following display gives an example using the voice edit Sensitivity setting.

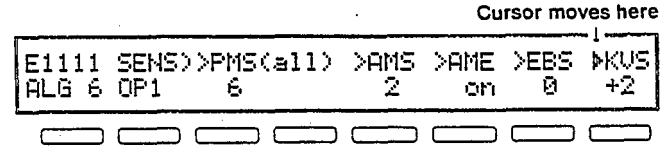


If you want to modify the "KVS" setting (key velocity sensitivity), press the function key at the far right.



The cursor will move to "KVS", and you will be able to modify the KVS setting as we will explain in the next section.

In some cases, pressing a function key located below a "> ~ ~" in the lower line will show an additional menu. The concept to remember is that each function key is related to the lower line of the display.



Setting numerical values

When playing or editing in each mode, here's how to set numerical values for various items shown in the display. There are three ways to set numerical values.

(1) Using the numeric keys
Directly input the value using the [0] – [9] keys and the [–] key. The number of decimal places for each value will differ. If you need to enter a single-digit number in an item that has two decimal places, add a "0" to the beginning of the value. (For example, if you want to input a value of 8 in an item that has a range of 0-99, press [0] then [8].) If you enter a value that is larger than the maximum, the maximum value will be displayed.

(2) Using the data entry slider
Moving the data entry slider will modify the value between its minimum and maximum range.

(3) Using [–1] [+1]
Pressing [–1] will decrease the value by one. Pressing [+1] will increase the value by one.

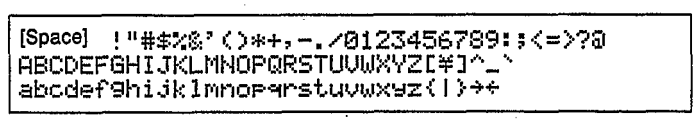
When entering numerical values, use the method most appropriate for each situation. Settings with on/off values (instead of numbers) can be made using methods (2) or (3).

Inputting characters

Here's how to enter names for voices or performances, or song names for the rhythm machine or sequencer. When entering characters, the lower line of the display will show a **"←"** and **"→"**. The function keys below these arrows will move the cursor (an underline), indicating where the next character will be input.

(1) Using the numeric keys
Use the [0] – [9] keys and the [–] key to directly input characters. There are three characters printed on the lower left of each key. For example the key [0] has "ABC" printed on it. The first time you press this key, "0" will be entered. Press it a second time for "a", press it a third time for "b", and press it a fourth time for "c". The [–] (LETTER) key switches between uppercase and lowercase letters. When inputting lowercase letters the display will be "name". When inputting uppercase letters the display will be "NAME". The [9] key enters a space.

(2) Using the data entry slider
Moving the data entry slider will scroll through the following characters.



(3) Using [–1] [+1]
Pressing [–1] [+1] will move through the characters shown above.

When entering characters, use the method (or combination of methods) most appropriate for each situation.

"Voice" and "performance" are important words to understand when learning about the V50. Please take the time to understand them thoroughly.

Voices

In the V50, the word "voice" is used to mean "a certain sound". For example, the V50 contains a "piano voice", a "guitar voice", and so on. Each voice has a number and name, which are known as "voice numbers" and "voice names". Voices can be thought of in the following groups.

- **Preset voices**
  The V50 contains 100 voices, which are called "preset voices". It is not possible to erase or rewrite these preset voices.
- **Internal voices**
  100 voices that you may create can be stored in the V50. These are called "internal voices". It is possible to modify a preset voice and store it as an internal voice.
- **Card voices**
  100 voices can be stored in a RAM card, and used in the same way as preset or internal voices. These voices are called "card voices". ROM cards (commercially available cards with voices already written into them) are also refered to as card voices.

Types of voice

Types of voice	Voice numbers	Number
Preset voices	P00 ~ P99	100 voices
Internal voices	I00 ~ I99	100 voices
Card voices	C00~C99	100 voices

• Card voices can be used only when a card is inserted in the card slot.

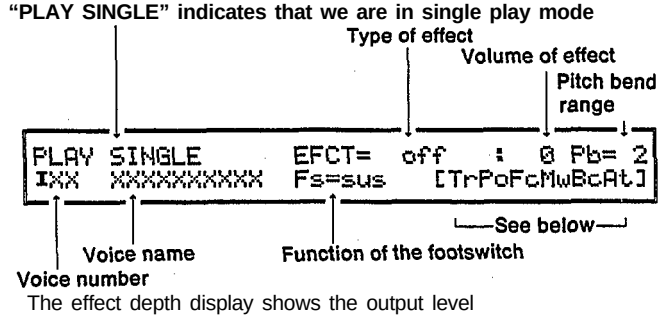
Single play mode and maximum simultaneous notes

We have learned that a voice is "a certain sound". Playing using just one sound is called "single play mode". In single play mode, you can select any one of the preset, internal, or card voices (if a card is inserted in the card slot).

In single play mode, you will be able to play chords of up to 16 notes. When you press the 17th key, the note you played first will disappear, and the newly played note will sound. (This is called "last-note priority".) Another way to describe an instrument that can play a chord of up to 16 notes is to say that the instrument has "16-note polyphony", or that the instrument is "16-note polyphonic".

Single play mode display

In single play mode the display will show the following information.



The effect depth display shows the output level of the effect when ">Stereo Mix" is on, and shows the effect balance when ">Stereo Mix" is off.

TrPoFcMwBcAt has the following meaning.

Tr..... Displayed when transpose is set to a value other than C3.
Po..... Displayed when portamento time is set to a value greater than 0.
Mw..... Displayed when settings allow volume, tone, pitch, etc. to be controlled by the modulation wheel.
Bc..... Displayed when settings allow volume, tone, pitch, etc. to be controlled by the breath controller.
At..... Displayed when settings allow volume, tone, pitch, etc. to be controlled by aftertouch.

Single play mode LEDs

When you play the keyboard in single play mode, the LED at the left of **TR1** will light briefly (approximately 0.2 seconds).

Performances

In the V50, the word “performance” is used to mean “a combination of several voices”. For example, playing the keyboard might sound a piano voice and a guitar voice at the same time, or different voices might sound over different areas of the keyboard. As with voices, each performance has a “performance name” and a “performance number”. When using the sequencer to play several voices at once, you will use a performance.

Performances can be divided into the following.

- **Preset performances**
  The V50 contains 100 performances, which are called “preset performances”. It is not possible to erase or rewrite these preset performances.
- **Internal performances**
  100 performances that you may create can be stored in the V50. These are called “internal performances”. It is possible to modify a preset performance and store it as an internal performance.
- **Card performances**
  100 performances can be stored in a RAM card, and used in the same way as preset or internal performances. These performances are called “card performances”.

Types of performance

Types of performance	Performance numbers	Number
Preset performances	P00 ~ P99	100 performances
Internal performance	I00 ~ I99	100 performances
Card performances	C00 ~ C99	100 performances

* Card performances can be used only when a card is inserted in the card slot.

Performance play mode and maximum simultaneous notes

We have learned that playing just one voice at a time is called “single play mode”. We have also learned that playing preset, internal, or card performances is called “performance play mode”.

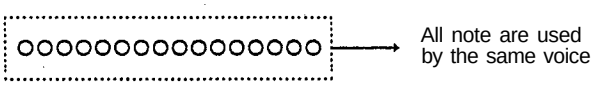
Note:

The preset sounds of the V50 are designed to be most effective when played in a performance. Except when editing a voice, we suggest that you usually play the V50 in performance play mode.

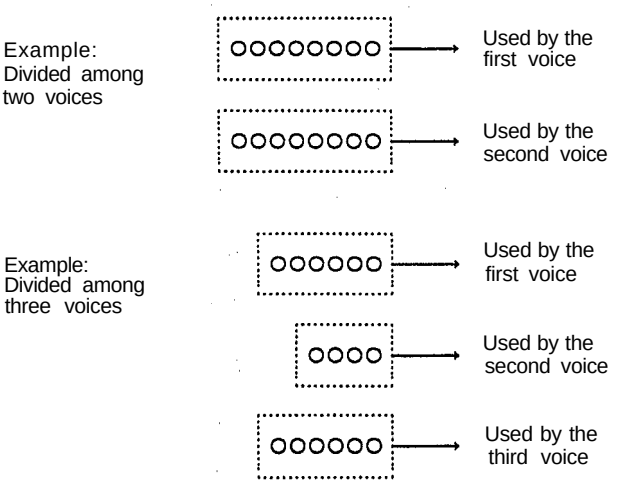
We explained above that the maximum number of notes that can be played simultaneously is 16. This is also the maximum number of notes that can be played in performance play mode. To put it another way, a performance is a setup that determines which voices these 16 notes will play. This is illustrated in the following figure.

Single play mode and performance play mode

If we use “o” to indicate the capability to produce one note, single play mode would look as follows.



In contrast, performance play mode can divide up the 16 notes among more than one voice.



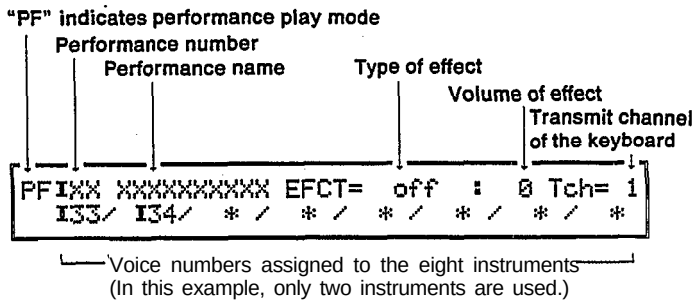
In performance play mode, the V50 uses eight “instruments”, to which “note-producing capability” is assigned. This means that up to eight different voices can be used at once.

Note:

In addition to assigning "note-producing capability" to each instrument, it is also possible to make the V50 do this automatically. See page 24.

Performance play mode display

In performance play mode, the display will show the following information.



Performance play mode LEDs

When you play the keyboard in performance play mode, the LED to the left of [TR1] – [TR8] will briefly (about 0.5 seconds) blink green, to indicate the corresponding instrument 1 – 8 that is sounding.

Switching instruments on/off

In performance play mode it is possible to switch an instrument on or off. While pressing [–], press the function key([ ]) below the instrument that you want to switch off. The voice display will change to "xxx", and that instrument will no longer sound. When you play the keyboard while an instrument is turned off, the corresponding LED to the left of [TR1] – [TR8] will blink red. Turn the instrument back on again in the same way that you turned it off.

Note:

Turning an instrument on/off is temporary, and selecting another performance will turn the instruments back on.

If you turn all the instruments in a performance off, there will be no sound.

When to use single play or performance play mode

By now you probably understand the difference between single play mode and performance play mode. Here are a few points to help you decide when to use each mode.

Single play mode

(1) When you want to use just one voice
(2) When you are using a sequencer or external keyboard to play just one voice

Performance play mode

(1) When you want several voices to sound when a single key is pressed
(2) When you want to play different voices from different areas of the keyboard (This is known as "keyboard split".)
(3) When you are using a sequencer to play several voices at once.

There are many other ways to use the two modes, depending on your setup and musical needs.

EFFECTS

The V50 has a built-in digital effects unit. This effect unit contains the following functions.

Number	Effect
0	Off
1	Reverb Hall (RevHall)
2	Reverb Room (RevRoom)
3	Reverb Plate (RevPlate)
4	Delay
5	Delay L/R (Dly L/R)
6	Stereo Echo (StEcho)
7	Distortion Rev. (DistRev)
8	Distortion Echo (DstEcho)
9	Gate Reverb (GateRev)
10	Reverse Gate (RvsGate)
11	Early Ref (E.Ref)
12	Tone Control (Tone)
13	Delay & Reverb (DlyRev1)
14	Delay L/R & Rev (DlyRev2)
15	Dist. & Delay (DistDly)
16	Church
17	Club
18	Stage
19	Bath Room
20	Metal
21	Tunnel
22	Doubler 1
23	Doubler 2
24	Feed Back Gate
25	F. Back Reverse
26	Feed Back E/R
27	Delay & Tone1
28	Dly L/R & Tone1
29	Tone Control2
30	Delay & Tone2
31	Dly L/R & Tone2
32	Distortion

These effects can be used on the synthesizer (performance, voice) and also on the rhythm machine. Each voice and performance can have its own effect settings, allowing you to select the effect that that sounds best for each voice or performance. However since the V50 has only one effects unit, if you use the sequencer, rhythm machine, and keyboard at the same time, the same effect will apply to all.

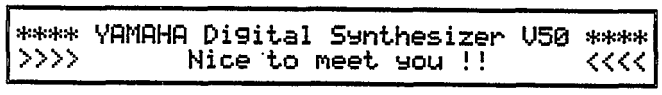
Pressing **BYPASS** (located at the lower right of the panel) will temporarily turn the effect off/on. When the LED is off, effect bypass is off (effect is on).

Note:

As you will learn later, each performance includes a "performance effect". This has nothing to do with the effects unit explained here. Be sure not to confuse these two.

CHANGING THE POWER-ON DISPLAY

When you purchased the V50, the following message will appear for about 2 seconds each time the power is turned on.



You can modify the lower line of this display to whatever message you like, for example your name or the name of your band.

(1) While pressing DEMO, press STORE/COPY to get the following display.

(2) Input your message of up to 40 characters into the lower line of the display. (Page 17 explains how to input characters.) The next time the power is turned on, your message will be displayed.

COMPATIBILITY WITH OTHER DEVICES

Data compatibility with other devices

V50 data is compatible with other Yamaha devices as follows.

Voice data is compatible with the DX11, YS100, YS200, B200, TQ5, DX21, DX100, TX81Z, and WT11. However, when V50 data is transmitted to one of these devices, functions not found on these devices will be ignored. For example, if V50 voice data is transmitted to a DX11, the V50 effect data will be ignored.

Sequence data saved to disk by the QX5FD can be read by the V50 disk, and the V50 can also receive sequence data from the QX5FD via MIDI bulk dump. However QX5FD data such as macro data and relative tempo will be ignored by the V50.

Cartridges

By attaching a separately sold ADP2 adaptor, you will be able to use the ROM or RAM cartridges for the Yamaha DX11 in the V50 cartridge slot. A cartridge connected in this way can be used to read data. However it is not possible to store V50 data to a cartridge (i.e., save).

CHAPTER 2. PERFORMANCE EDIT

This chapter explains how to create and edit performances.

ABOUT PERFORMANCE EDITING

Here we will explain the procedure for editing a performance. When you are in performance play mode, press an editing ([TR1] – [TR8], [RHY], [ ]) to enter performance edit mode.

There are two main ways to edit a performance.

(1) Modify an already existing performance to create a new performance.
(2) Create a completely new performance from scratch.

When using method (l), select the performance to start with in performance play mode, and then begin editing. When using method (2), use the "Init" function in [OTHERS] to set a performance to an initial state, and then begin editing.

Note:

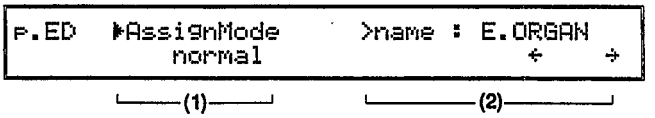
When you finish editing a performance, don't forget to store the newly created performance. Page 119 explains how.

If after editing a performance you select another performance without storing the data you edited, the performance will return to its original data. If this happens, you can use the "Recall" function in [OTHERS] to recall the data you were working on. This function is explained on page 117.

- While editing a performance, the "Compare" function allows you to compare the sound you are now working on with the original data. This function is explained on page 121.
- While editing a performance, you can hold [ ] and press one of the function keys [–] under the display to turn off an instrument you don't wish to hear, just as in performance play mode. To turn the instrument back on, repeat this procedure. This, is provided as a convenience while editing a performance. It is not possible to store a performance with a instrument turned off. (When you store it, the instrument will be turned back on.)

Assign mode, performance name

Press TR1 (ASSIGN MODE).



(1) Assign mode

■ **Function**
Set the key assign.

■ **Settings**
normal, alternate, DVA

■ **Explanation**
This determines the instrument that will be played when a key is pressed.

normal
Normal assign is when each instrument plays as it receives data on its own receive channel (see page 25). The maximum number of notes for each instrument will be determined by the note setting (see page 24).

alternate
Alternate assign is when instruments with the same receive channel as instrument 1 will play alternately.

DVA
Dynamic Voice Allocation is when each instrument plays in response to data on its own receive channel (see page 25). The maximum number of notes for each instrument will be determined *automatically* as needed. When using a sequencer to play the V50 it is usually a good idea to set the assign mode to DVA.

Note:
When using alternate assign, the keyboard transmit channel (see page 99) must match the receive channel of instrument 1.

Data such as control change, pitch bend, and aftertouch will be received on the receive channel of instrument 1, and will apply to each instrument that is alternate assigned.

When this mode is changed, settings for Max Note and Reserve Notes will be set to match the number of instruments being used.

Performance name

■ **Function**
Give a name to a performance

■ **Settings**
Up to 10 characters

■ **Explanation**
Use this function to give a name to a performance. (Page 17 explains how to enter characters.) When editing an existing performance, the original performance name will be displayed. When editing a performance from an initialized condition, the initialized name will be displayed.

Notes

Press TR2 (NOTES).

If assign mode has been set to normal or alternate

The upper line will show the receive channel and voice of the instrument where the cursor is located.

■ **Function**
Set the maximum number of notes for each instrument

■ **Settings**
0 – 16 (total of all instruments must not be greater than 16)

■ **Explanation**
This determines the maximum number of notes that an instrument will be able to play simultaneously. For example, if maximum notes is set at 4, the instrument will be able to play chords with up to 4 notes. When you play a fifth note, the first- played note will disappear, and the last played note will sound.

Note:
When using a voice whose envelope generator is set to a low RR (release rate) so that the sound lingers for a while after the key is released, it is a good idea to set a slightly higher maximum notes setting for that voice. This will prevent the decay from being cut off unnaturally.

If assign mode has been set to DVA

The upper line will show the voice of the instrument where the cursor is located.

■ **Function**
Set the number of reserved notes for each instrument.

■ **Settings**
off, 0 – 16 (total of all instruments must not be greater than 16) "off" indicates that the instrument is not used. “0” indicates that 0 notes are reserved.)

■ **Explanation**
When more than 16 keys are being pressed, these settings determine the minimum number of notes reserved (i.e., guaranteed) for each instrument.

Voice number

Press **TR3** (VOICE NUMBER). The upper line of the display will show the receive channel and voice of the instrument where the cursor is located.

■ **Function**
Select the voice to be used by each instrument.

■ **Settings**
I00 – I99, P00 – P99, C00 – C99

■ **Explanation**
This selects the voice to be used by each instrument.

Note:

A voice number cannot be selected for an instrument whose maximum note setting is 0 (or when DVA is used, whose reserved note setting is “off”).

Also, card voices cannot be used in an internal performance. Internal performances can use only preset voices and internal voices. In the same way, card performances cannot use internal voices. Card performances can use only preset voices and card voices.

Receive channel

Press **TR4** (RECV CH). The upper line of the display will show the keyboard transmit channel, and the voice of the instrument where the cursor is located.

■ **Function**
Set the MIDI channel received by each instrument.

■ **Settings**
1-16, omn

■ **Explanation**
Each instrument will sound only when data arrives on the channel specified here. When “omn” is selected, the instrument will sound in response to data arriving on any channel.

Normally, the V50 keyboard transmits on channel 1. When creating a performance to be played from the V50 keyboard (not from the sequencer or an external keyboard), be sure to set the receive channel of all instruments to 1 or “omn” (omni). (It is possible to change the V50 keyboard transmit channel.)

When using the sequencer, make sure that the receive channel of each instrument matches the transmit channel of each track of the sequencer.

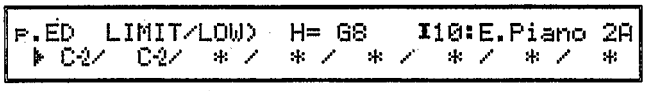
Note:

A receive channel cannot be set for instruments whose maximum note setting is 0 (or when DVA is used whose reserved note setting is "off").

If assign mode is set to alternate assign, only the receive channel of instrument 1 will be used.

Note limit (low)

Press **RHY** (LIMIT/LOW). The upper line of the display will show the note limit (high) setting and voice of the instrument where the cursor is located.



■ **Function**
Set the keyboard playing range (lower limit) of each instrument.

■ Settings
C-2 – G8

■ **Explanation**

Each instrument will play notes over the range specified by this note limit (low) and the next note limit (high). Notes outside of this range will not be played.

Normally, the low note limit is set to C-2 and the high note limit is set to G8. When creating a performance with key splits so that different voices are played by different areas of the keyboard, change the low and high note limits. For example, if you want instrument 1 to be played by notes from C-2 up to B2, and instrument 2 to be played by notes from C3 up to G8, set the low/high limits of instrument 1 to C-2/B2, and the low/high limits of instrument 2 to C3/G8.

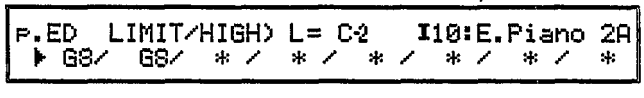
Note:

A note limit cannot be set for instruments whose maximum note setting is 0 (or when DVA is used, whose reserved note setting is "off").

When using key splits, make sure that the receive channel of each instrument matches the transmit channel.

Note limit (high)

Press [ ] (LIMIT/HIGH). The upper line of the display will show the note limit (low) setting and voice of the instrument where the cursor is located.



■ **Function**

Set the keyboard playing range (upper limit) of each instrument.

■ **Settings**

C-2 – G8

Explanation

Each instrument will play notes over the range specified by the previously discussed note limit (low) and this limit (high). Notes outside of this range will not be played.

Normally, the low note limit is set to C-2 and the high note limit is set to G8. When creating a performance with key splits so that different voices are played by different areas of the keyboard, change the low and high note limits.

Note:

A note limit cannot be set for instruments whose maximum note setting is 0 (or when DVA is used, whose reserved note setting is "off").

When using key splits, make sure that the receive channel of each instrument matches the transmit channel.

Detune

Press [TR5] (INST DETUNE). The upper line of the display will show the keyboard transmit channel, and the voice of the instrument where the cursor is located.

■ **Function**

Slightly change the tuning of each instrument.

■ **Settings**

–7 – +7

■ **Explanation**

When this is set to 0, the instrument will play the correct pitch for the key that was pressed. If you are creating a performance that plays more than one instrument for each note, slightly detuning each instrument will create a natural chorus effect, giving a spacious feel to the sound. Especially when layering two or more of the same voice, detuning can make some very thick sounds.

Note:

Detune cannot be set for instruments whose maximum note setting is 0 (or when DVA is used, whose reserved note setting is "off").

If the performance plays more than one instrument for each note, make sure that the receive channel of each instrument matches the transmit channel.

This detune function is intended to change the *relative* pitch of the instruments. Setting all instruments to the same detune value will not be useful.

Note shift

Press **TR6** (NOTE SHIFT). The upper line of the display will show the keyboard transmit channel, and the voice of the instrument where the cursor is located.

■ Function

Transpose the pitch of each instrument in half-steps.

■ Settings

– 24 – +24

■ Explanation

When note shift is set to 0, the instrument will play the pitch specified by the note message that arrives on its record channel. When note shift is set – 1 – –24 the pitch will be lower, and when set + 1 – +24 the pitch will be higher.

This setting is in units of a half-step. For example, if set to – 12 the pitch will be one octave lower, and if set to +24 the pitch will be two octaves higher.

This note shift function can be useful when you need to play a song in a different key than usual, or when you need to play notes that are higher or lower than your keyboard extends. Another way to use note shift when playing more than one voice at once is to shift the voices apart to form a chord, or to play parallel octaves.

Note:

Note shift cannot be set for instruments whose maximum note setting is 0 (or when DVA is used, whose reserved note setting is "off").

If the performance plays more than one instrument for each note, make sure that the receive channel of each instrument matches the transmit channel.

Volume

Press **TR7** (VOLUME).

■ Function

This determines the volume of each instrument.

■ Settings

0 – 99

■ Explanation

0 is a volume of 0, and 99 is maximum volume. (The vertical bar at the right of each number graphically indicates the volume for each instrument.) This setting determines the volume balance of the instruments in a performance.

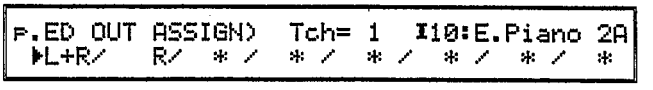
Note:

Volume cannot be set for instruments whose maximum note setting is 0 (or when DVA is used, whose reserved note setting is "off").

When a control change message that affects volume is received by an instrument, its volume will be changed.

Output assign

Press **TR8** (OUTPUT ASSIGN). The upper line of the display will show the keyboard transmit channel, and the voice of the instrument where the cursor is located.



■ Function

Set the output for each instrument.

■ Settings

off, L, R, L+R

■ Explanation

When output assign is set to "off", that instrument will not sound. When set to L, that instrument will sound from the L output, and when set to R, from the R output. When set to L + R, it will sound from both L and R outputs.

Note:

Output assign cannot be set for instruments whose maximum note setting is 0 (or when DVA is used, whose reserved note setting is "off").

When only the L output is connected, both L and R will be sent from the L output.

The performance effect “pan” applies only to instruments set to either L or R. (“pan” will not apply to instruments whose output assign is set to L + R.)

LFO select

Press [ ] (OTHERS). (There is also a key marked "OTHERS" in the utility section, but in this chapter we will be refering to the OTHERS key in the edit section.

When this indicator appears in the display, you can press the same key (in this case, the [ ] (OTHERS) key) to get a different screen.

■ Function

Select the LFO to be used by each instrument.

■ Settings

off, 1,2,vib

■ Explanation

The V50 has two LFOs and eight vibrato generators. Here you select which of these will be used by each instrument. (The LFO is explained on page 41.)

The LFO settings used in the two lowest numbered instruments (i.e., instruments not set to a notes setting of 0) are available for use by the eight instruments.

LFO settings can be selected for each voice from the following.

off..... The voice will not be affected by an LFO.

1..... The voice will use the LFO settings of the first instrument in the performance (the instrument shown at the far left of the display).

2..... The voice will use the LFO settings of the second instrument in the performance.

vib ..... The voice will use its own LFO settings, but AMS settings (for tremolo or wah-wah) will be ignored, and only pitch modulation will be used. The LFO waveform will be set to triangle, and PMS to approximately 5.

Note:

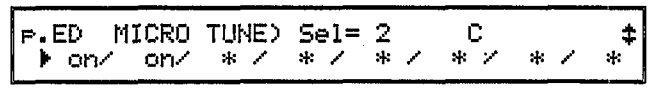
LFO cannot be set for instruments whose maximum note setting is 0 (or when DVA is used, whose reserved note setting is "off").

If there is only one instrument whose maximum notes setting is greater than 0, you will be able to select only "off" or the number of the instrument itself. (If you try to select other values, "–" will be displayed, and the result will be the same as if you had selected "off".)

If the maximum notes settings for instruments 1 or 2 are set to 0 (or when DVA is used, a reserved note setting of "off"), the "1" or "2" in the above explanation and display will be replaced by the lowest-numbered instruments that are set to a non-zero note setting.

Micro tuning on/off

Press [ ] (OTHERS) twice. The upper line of the display will show the currently selected type of micro tuning.



■ Function

Select whether or not to use micro tuning for each instrument.

■ Settings

off, on

Explanation

Each instrument can be assigned to use a selected micro tuning. (Use the next function to select a micro tuning.)

off..... The instrument will not use micro tuning, and will play the standard equal tempered scale.

on..... The instrument will use the micro tuning selected for this performance (see the next function). Aside from equal temperament, only one micro tuning can be used in a performance.

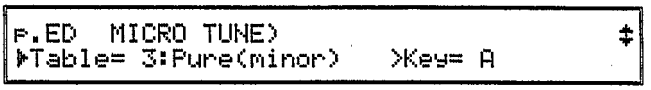
Note:

Micro tune on/off cannot be set for instruments whose maximum note setting is 0 (or when DVA is used, whose reserved note setting is "off").

It is not possible to use two or more tunings (other than equal temperament) in one performance.

Micro tuning select

Press [ ] (OTHERS) three times.



■ **Function**

Select the micro tuning to be used in this performance.

■ **Settings**

Octave, Full Kbd., 1: Equal - 11: l/8 Tone.

■ **Explanation**

This selects the micro tuning that will be used by an instrument whose micro tuning on/off (the previously explained function) is set to "on".

As shown in the following chart, 2 original micro tunings created by you, and 11 preset micro tunings are available.

For preset micro tunings 2 – 5 you will also be able to set the key (tonic) of the tuning to match the key signature of the piece you will be playing.

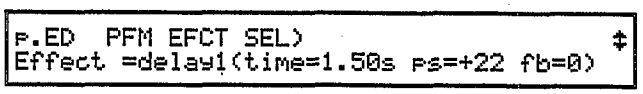
Note:

If in the previously explained micro tuning on/off function, no instruments have been set to micro tuning "on", selecting a micro tuning here will have no effect.

No.	Temperament	Key	Comments
	User octave	–	You can create your own original tuning as explained on page 114.
	User full	–	
1	Equal temperament	–	The "compromise" tuning used for most of the last 200 years of Western music, and found on most electronic keyboards. Each semitone is exactly 1/12th of an octave, and music can be played in any key with equal ease. However, none of the intervals are perfectly in tune.
2	Pure major	C - B	This tuning is designed so that most of the intervals (especially the major third and perfect fifth) in the major scale are pure. (This means that other intervals will be correspondingly out of tune.) You need to specify the key (C-B) you will be playing in. Since the V50 allows you to memorize a micro tuning for each performance, you can store identical performances with micro tunings of different keys, and transpose at the touch of a button.
3	Pure minor	A – G#	The same as Pure Major, but designed for the minor scale.
4	Mean tone	C - B	This is an adjustment of the Pure and Pythagorean tunings. The interval between the root and fifth is tuned slightly flat, so that the interval between the root and second degree is exactly halfway between a major and minor pure second — i.e., an average or "mean".
5	Pythagorean	C - B	This scale is derived by tuning pure perfect fifths upward from the root. This causes the octave to be flat, so one of the fourths is mistuned to compensate. (In the key of C, the A♭ – E♭ interval.)
6	Werckmeister	–	Andreas Werckmeister, a contemporary of Bach, designed this tuning so that keyboard instruments could be played in any key. Each key has a unique character.
7	Kirnberger	–	Johan Philipp Kirnberger was also concerned with tempering the scale to allow performances in any key.
8	Vallotti & Young	–	Francescantonio Vallotti and Thomas Young (both mid-1700s) devised this adjustment to the Pythagorean tuning in which the first six fifths are lower by the same amount.
9	l/4 shifted equal	–	The Equal Tempered scale shifted upward one quarter step.
10	l/4 tone	–	Twenty-four equally spaced notes per octave. (Play twenty-four notes to move one octave.)
11	l/8 tone	–	Forth-eight equally spaced notes per octave. (Play forty-eight notes to move one octave.)

Performance effect select

Press [ ] (OTHERS) four times.



■ **Function**
Select a performance effect.

■ **Settings**
off, delay1, pan1, chord1, ... delay4, pan4, chord4

■ **Explanation**
This setting determines the effect used by this performance.
There are three types of effect, and four memories (four different settings) for each type of effect. I.e., the V50 remembers a total of 12 different performance effects. (To set each effect memory, see page 111.) Select one of the twelve performance effects from the following.

delay (1 – 4)
You will hear an "echo" or "delayed repeat" of the same note (or a different note) that you played.

pan (1 – 4)
When both L and R outputs are used, the sound will move from side to side..

chord (1 – 4)
Playing a single note will produce a chord.

- Page 111 explains how to set the performance effect memories.
- If you set the performance effect to "off", there will be no effect.
- The "delay" and "chord" performance effects apply only to the lowest-numbered instrument that is sounding.
- The "pan" performance effect applies to all instruments whose output assign is either L or R.

Note:

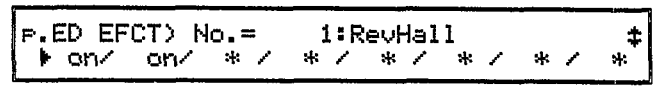
If the maximum notes setting is less than the number of notes in the chord of the "chord" performance effect memory, the chord will not sound correctly.

Instruments whose output assign is set "off" or "L + R" will not be affected by the "pan" performance effect.

This "performance effect" has no connection with the "DSP effect" discussed in the following item. Please do not confuse them.

Effect on/off

Press **EFFECT**. The upper line of the display will show the type of currently selected effect. If **BYPASS** is pressed (the LED is lit), the display will show "BYPASS".



■ **Function**
Turn the effect on/off for each instrument.

■ **Settings**
off, on

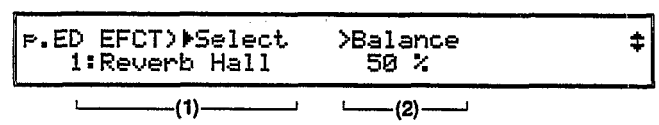
■ **Explanation**
When set to "on", the selected effect (see the next function) will apply to that instrument.

Note:

Effect on/off cannot be set for instruments whose maximum note setting is 0 (or when DVA is used whose reserve note setting is "off").

Effect select, effect balance

Press **EFFECT** twice. If **BYPASS** is pressed (the LED is lit), the display will show "BYPASS".



(1) Effect select

■ **Function**
Select the type of effect to use.

■ **Settings**
Select one of the following types of effect.

0: off
No effect

1: Reverb Hall
Reverberation of a large hall

2: Reverb Room
Reverberation of a smaller room

3: Reverb Plate
Reverberation typical of a plate reverb unit

4: Delay
Delayed sound

5: Delay L/R
Delayed sound spread to left/right

6: Stereo Echo
Echo spread left/right

7: Distortion Rev.
Combination of distortion and reverb

8: **Distortion Echo**
Combination of distortion and echo

9: Gate Reverb
Reverberation with "artificially" fast cutoff

10: Reverse Gate
Reverberation simulating backwards tape playback

11: Early Ref
Adds early acoustic reflections to the sound

12: Tone Control 1
Simulated equalizer

13: Delay & Rev.
Combination of delay and reverb

14: DelayL/R & Rev.
Combination of delay L/R and reverb

15: Dist. & Delay
Combination of distortion and delay

16: Church
Reverberation simulating a church

17: Club
Reverberation simulating a music club

18: Stage
Reverberation simulating a larger live music club

19: Bath Room
Reverberation simulating a bathroom

20: Metal
Metallic reverberation

21: Tunnel
Reverberation simulating a tunnel

22: Doubler 1
Doubling effect

23: Doubler 2
Doubling effect (spread left and right)

24: Feed Back Gate
Gate reverb with feedback

25: F. Back Reverse
Reverse gate with feedback

26: Feed Back E/R
Early reflections with feedback

27: Delay & Tone1
Combination of delay and tone control 1

28: Dly L/R & Tone1
Combination of delay L/R and tone control 1

29: Tone Control 2
Tone control using low pass filter and high pass filter

30: Delay & Tone2
Combination of delay and tone control 2

31: Dly L/R & Tone2
Combination of delay L/R and tone control 2

32: Distortion
Distortion effect

Note:
Settings for "Balance", "Out Level" and "Stereo Mix" will vary for each effect.

(2) Effect balance

■ **Function**
Set the-volume balance of the unprocessed sound and the effect.

■ **Settings**
0% - 100%

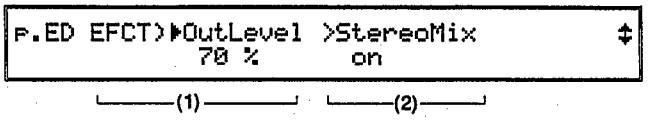
■ **Explanation**
As you increase the setting, the effect sound will become louder. As you decrease the setting, the unprocessed sound will become louder.

Note:
At a setting of 0% the effect will not be heard, and you will hear only the unprocessed sound. At a setting of 100% the unprocessed sound will not be heard, and you will hear only the sound of the effect.

Since the number keys enter two-digit numbers, it is not possible to directly enter a value of 100. If you need to enter a value of 100, use the data entry slider or – 1/ + 1 keys after entering 99.

Effect output level, stereo mix

Press **EFFECT** three times. (If effect select is turned off, you will not be able to select this function.)



(1) Effect output level

■ **Function**
Set the output volume of the effect.

■ **Settings**
0% – 100%

■ **Explanation**
This determines the combined volume of the unprocessed sound and the effect explained in the previous function. 100% is maximum, and at 0% there will be no sound.

Note:
At a setting of 0% you will hear neither the unprocessed sound nor the effect sound. (However if the stereo mix explained in the next function is "on", you will hear only the unprocessed sound.) If this level is too high, the sound may distort. If so, lower the level.

(2) Stereo mix

■ **Function**
Add the sound from the effects unit to the unprocessed stereo mix.

■ **Settings**
off, on

■ **Explanation**
The input signal to the effects unit is monaural. This means that when stereo mix is set to "off", instruments in a performance will be heard in mono even if their output assign setting is L or R.

By setting stereo mix to "on", the effect sound (monaural) will be *added* to the unprocessed L/R performance mix (stereo). This allows you to retain the feeling of stereo while using an effect. (This will make the stereo field appear a bit narrower.)

The following diagram shows the flow of the unprocessed and effect signals.

Effect parameters

Press [EFFECT] four times. (If effect select is turned off, you will not be able to select this function.)

■ **Function**
Make individual adjustments for each effect.

■ **Settings**
Each type of effect has different settings (see following chart).

■ **Explanation**
This is where you make individual adjustments for each effect, as shown in the following chart. It is also possible to copy the settings for an effect from another performance or voice (see page 120).

Settings for 1: Reverb Hail, 2: Reverb Room, 3: Reverb Plate, 16: Church, 17: Club, 18: Stage, 19: Bath Room, 20: Metal

Parameter	Settings	Comment
Time	0.3 sec – 10.0 sec	Specify the time it takes for the reverb to decay. Long settings (long reverb times) cause a slower decay.
LPF	1.25 KHz– 12.0KHz, thru	Specify the low pass filter settings. Frequencies above the specified setting will be removed. When "thru" is selected, this filter will not be used.
Delay	0.1 ms–50 ms	Specify the time until the first reflection (the beginning of reverberation). As this setting is increased, there will be a longer wait before reverberation begins.

Settings for 4: Delay

Parameter	Settings	Comment
Time	0 ms–300 ms	Specify the time until the first delayed sound. As this setting is increased, there will be a longer wait before the delayed sound appears.
FB Delay	0 ms–300 ms	Specify the time between repeats (i.e., "feed back") of the delayed sound. As this setting is increased, there will a longer time between one delayed sound and the next.
FB Gain	0%-99%	Specify the amount of feedback. For a setting of 0%. there will be only a single delayed sound.

Settings for 5: Delay L/R, 6: Stereo Echo

Parameter	Settings	Comment
Lch Dly	0 ms–300 ms	Specify the delay time for the left channel. As this setting is increased, there will be a longer wait until the first delayed sound from the left channel.
Rch Dly	0 ms–300 ms	Specify the delay time for the right channel. As this setting is increased, there will be a longer wait until the first delayed sound from the right channel.
FB Gain	0%–99%	Specify the amount of feedback. For a setting of 0%, there will be only a single delayed sound.

Settings for 7:Distortion Rev.

Parameter	Settings	Comment
Time	0.3 sec–18.3 sec	Specify the time it takes for the reverb to decay. Long settings (long reverb times) cause a slower decay.
Dist.	0%–100%	Specify the amount of distortion. Higher settings will cause more distortion.
Reverb	0%–100%	Specify the amount of reverb. This determines the balance of reverb and distortion.

Settings for 8: Distortion Echo, 15: Dist. & Delay

Parameter	Settings	Comment
Time	0 ms–300 ms	Specify the time until the first delayed sound. As this setting is increased, there will be a longer wait before the delayed sound appears.
FB Gain	0%–99%	Specify the amount of feedback. For higher settings, there will be more delay repeats.
Dist.	0%–100%	Specify the amount of distortion. Higher settings will cause more distortion.

Settings for 9: Gate Reverb, 10: Reverse Gate, 11: Early Ref

Parameter	Settings	Comment
Size	0.5–3.2	Specify the size of a hypothetical room. Larger settings will cause a more spacious effect.
LPF	1.25 KHz–12.0 KHz, thru	Specify the low pass filter settings. Frequencies above the specified setting will be removed. When "thru" is selected, this filter will not be used.
Delay	0.1 ms–50 ms	Specify the time until the effect begins. As this setting is increased, there will be a longer wait before the delayed sound appears.

Settings for 12: Tone Control

Parameter	Settings	Comment
Low	–12dB–+12dB	Low frequency control (shelving band pass filter at 800Hz). Positive settings boost, and negative settings cut.
Middle	–12dB–+12dB	Middle frequency control (presence band pass filter at 1260Hz). Positive settings boost, and negative settings cut.
High	–12dB–+12dB	High frequency control (shelving band pass filter at 3KHz). Positive settings boost, and negative settings cut.

Settings for 13: Delay & Rev.

Parameter	Settings	Comment
RevTime	0.3 sec.–10.0 sec	Specify the time it takes for the reverb to decay. Long settings (long reverb times) cause a slower decay.
Delay	0 ms.–152 ms	Specify the delay time. As this setting is increased, there will be a longer wait before the delayed sound appears.
FB Gain	0%.–99%	Specify the amount of delay feedback. As this setting is increased, there will be more delay repeats.

bf ft10m Settings for 14:DelayL/R & Rev.

Parameter	Settings	Comment
RevTime	0.3 sec.–10.0 sec	Specify the time it takes for the reverb to decay. Long settings (long reverb times) cause a slower decay.
Lch Dly	0 ms.–300 ms	Specify the delay time for the left channel. As this setting is increased, there will be a longer wait until the first delayed sound appears from the left channel.
Rch Dly	0 ms.–300 ms	Specify the delay time for the right channel. As this setting is increased, there will be a longer wait until the first delayed sound appears from the right channel.

Settings for 21: Tunnel

Parameter	Settings	Comment
RevTime	0.3 ms–10.0 ms	Specify the time it takes for the reverb to decay. Long settings (long reverb times) cause a slower decay.
Delay	0.1 ms–300 ms	Specify the delay time. As this setting is increased, there will be a longer wait before the delayed sound appears.
FB Gain	0%–99%	Specify the amount of delay feedback. As this setting is increased, there will be more delay repeats.

Settings for 22: Doubler 1

Parameter	Settings	Comment
DlyTime	0.1 ms–50 ms	Specify the time until the delayed sound. As this setting is increased, there will be a longer wait before the delayed sound appears.
HPF	160 Hz– 1000 Hz, thru	Specify the high pass filter setting. Frequencies below the specified frequency will be cut.
LPF	1.25KHz–12.0KHz	Specify the low pass filter setting. Frequencies above the specified frequency will be cut.

Settings for 23: Doubler 2

Parameter	Settings	Comment
Lch Dly	0.1 ms–50 ms	Specify the delay time for the left channel. As this setting is increased, there will be a longer wait before before the delayed sound appears from the left channel.
Rch Dly	0.1 ms–50 ms	Specify the delay time for the right channel. As this setting is increased, there will be a longer wait before before the delayed sound appears from the right channel.
LPF	1.25KHz–12.0KHz	Specify the low pass filter setting. Frequencies above the specified frequency will be cut.

Settings for 24: Feed Back Gate, 25: F. Back Reverse, 26: Feed Back E/R

Parameter	Settings	Comment
Size	0.5–3.2	Specify the size of a hypothetical room. Larger settings will cause a more spacious effect.
LPF	1.25KHz–12.0KHz	Specify the low pass filter setting. Frequencies above the specified frequency will be cut.
FB Gain	0%–99%	Specify the amount of delay feedback. As this setting is increased, there will be more delay repeats.

Settings for 27: Delay & Tone1, 28: Dly L/R & Tone1, 30: Delay & Tone2, 31: Dly L/R & Tone2

Parameter	Settings	Comment
Bril	0–12	Specify the brightness of the sound. Larger settings will result in a brighter sound.
Delay	0.1 ms–300 ms	Specify the delay time. As this setting is increased, there will be a longer wait before the delayed sound appears.
FB Gain	0%-99%	Specify the amount of delay feedback. As this setting is increased, there will be more delay repeats. For a setting of 0%. there will be no second or subsequent delay sound.

Settings for 29: Tone Control 2

Parameter	Settings	Comment
HPF	160Hz–1000Hz, thru	Specify the high pass filter setting. Frequencies below the specified frequency will be cut.
Middle	–12dB–+12dB	Mid range control. + is boost, - is cut. (This is a presence-type band pass filter with the frequency fixed at 1260Hz.)
LPF	1.25KHz–12.0KHz	Specify the cutoff frequency for the low pass filter. Frequencies above the specified frequency will be cut.

Settings for 32: Distortion

Parameter	Settings	Comment
Dist.	0%–100%	Specify the amount of distortion. Higher settings will cause more distortion.
HPF	160 Hz–1000 Hz, thru	Specify the high pass filter ting. Frequencies below the specified frequency will be cut.
LPF	1.25KHz-12.0KHz	Specify the cutoff frequency for the low pass filter. Frequencies above the specified frequency will be cut.

CHAPTER 3. VOICE EDIT

This chapter explains how to create and modify voices. You will learn to use FM tone generation to make your own original sounds.

THE BASICS OF FM TONE GENERATION

Here we will briefly explain the FM tone generator system used in the V50 and in most Yamaha synthesizers.

Operators

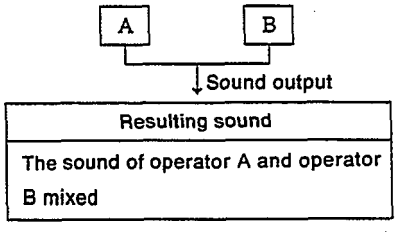
The heart of FM synthesis is the "operator". An operator is an oscillator – a device that produces a signal. The V50 has four of these operators, and a voice is created using these four operators. Each operator can be controlled in three ways.

Output level ..... The level (volume) of the signal produced by the operator
Pitch ..... The pitch of the signal produced by the operator
Waveform ..... The shape of the signal produced by the operator

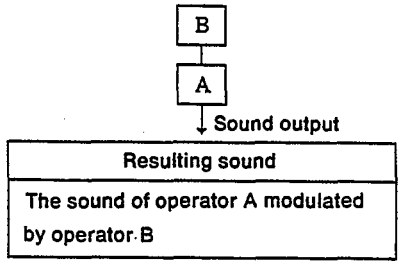
Combinations of operators

We have mentioned that these four operators are combined to make a voice. To keep things simple, we will be using only two operators in our example. There are two ways in which these two operators (A and B) can be arranged.

(1) Two operators arranged horizontally



(2) Two operators arranged vertically



In the case of (1), the two sounds of the operators A and B are mixed. In the case of (2), the upper operator B modulates the sound of the lower operator A. The sound you hear is the modulated sound of operator A, and operator B cannot be heard. To summarize,

Arranged horizontally.... Both operators produce sound.
Arranged vertically ..... The upper operator modifies the sound of the lower operator. The lower operator produces sound.

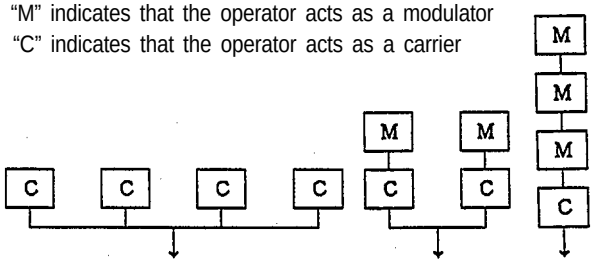
Carrier and modulator

When arranged vertically, the two operators act in two entirely different ways; either as a "carrier" or as a "modulator".

Modulator ..... An operator which modulates the sound of another operator (B in the diagram).
Carrier ..... An operator which produces sound (A in the diagram).

When arranged horizontally, both operators act as carriers. (They both produce sound.) The V50 has four operators. When these four operators are arranged in various ways, each operator acts either as a carrier or as a modulator as shown in the following diagram.

"M" indicates that the operator acts as a modulator
"C" indicates that the operator acts as a carrier



When all operators are arranged horizontally, each one acts as a carrier. When all operators are arranged vertically, the lowest one acts as a carrier and the other three act as modulators.

Algorithm

An arrangement of operators is called an "algorithm". The V50 has eight algorithms. These eight algorithms (numbered 1 – 8) are shown on the right side of the front panel. Each operator 'in an algorithm is numbered 1 – 4. Page 40 explains the characteristic sounds possible with each algorithm.

Factors determining the tone of a voice

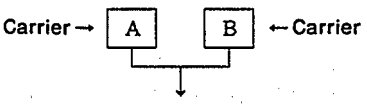
There are many settings that affect the tone of a voice, but the following six are the most important.

(1) Algorithm (ALGORITHM)

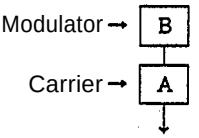
It is important to choose an appropriate algorithm for the sound you want to create. This selection determines whether each operator acts as a carrier or as a modulator.

(2) Output level of each operator (OUTPUT LEVEL)

The output level of a carrier operator will determine volume, and the output level of a modulator operator will determine the brightness of the sound produced by the operator (carrier) it is modulating.



The output levels of operators A and B determine the mixture (balance) of the two sounds.



The output level of operator B determines the brightness of the sound produced by operator A. The output level of operator A determines the volume.

Pitch of each operator (OSCILLATOR FREQUENCY)

The resulting tone is affected by the relative pitch of the operators.

Waveform of each operator

Each operator can produce one of 8 different waveforms. Each waveform has a different harmonic content (a different tone), allowing you to select the most suitable waveform for the sound you want.

Envelope generator (ENVELOPE GENERATOR)

All instruments (piano, organ, brass, etc.) have a characteristic rise and fall in the sound. To simulate this, each operator has a function that regulates its output over time. This is known as the "envelope generator", or "EG" for short.

It will take a bit of practice to use these six elements to create the sound you want, but as you become more experienced you will find that creating voices enjoyable and rewarding.

ABOUT VOICE EDITING

Broadly speaking, there are two ways to edit voices.

(1) Partially modify an existing voice to create a new voice.
(2) Create a completely new voice from scratch.

When first learning how to edit voices, it will be easier to start with method (1). You can modify internal, card, or preset voices. Remember that the voice you create can be stored only as an internal voice or card voice. (It is not possible to store a voice into preset voice memory.)

When using method (1), enter single play mode and select the voice you want to edit. When using method (2), you must first create an "initialized" voice using the OTHERS function "Init" (initialize) (see page 117).

Note:

After editing a voice, do not forget to store it (see page 119). If after editing a voice, you select another voice without storing the voice you edited, your edits will be replaced by the previous voice data. However, you can recall the data you were editing by using the recall function in OTHERS (see page 117).

Initialized voice

"Initialized" means that many of the settings are set to their minimum or most basic value. The initialized voice will produce the simplest possible sound (a sine wave) from operator 1.

While editing a voice, you can compare the results of your editing with the original voice by using the "compare" function (see page 121).

OPERATOR ON/OFF

Whenever you are editing a voice, the upper left of the display will show a row of numbers such as "1111"

From left to right, these indicate whether operators 1 – 4 are on ("1") or off ("0"). Operators can be turned on/off using ◁◁ (operator 1), ▫ (operator 2), ▷ (operator 3), and ▷▷ (operator 4).

Operator 1 2 3 4

◁◁ ▫ ▷ ▷▷

When an operator is turned off, that operator will not produce a signal. This means that if you turn all four operators off, there will be no sound at all.

Turning an operator on/off is often useful when you need to check the sound of just one operator, or check the effect of an operator that is acting as a modulator.

Note:

This operator on/off function is provided as a convenience when editing. It is not possible to store a voice with an operator turned off. (The voice will be stored with all operators turned on.) If a certain operator is unnecessary in the voice you are creating, you can set its output level to 0 (see page 48).

About quick edit

"Quick edit" is not one of the settings within a voice. It is a function which allows you to make several settings at the same time. For instance, it allows you to adjust the envelope generator or the output level of all operators at once. It is very useful when making minor overall modifications to a voice.

The indicator displayed to the right of the " → " shows the relative change. Initially, the indicator will show that nothing has been changed, and that the settings are in their original state. As you move the data entry slider or use the [−1] [+1] buttons, you will see the indicator change as follows.

If you leave quick edit mode and then return to quick edit mode, the indicator will show ⁜ again, and you can use quick edit to modify the settings from the new "original" state. The exact value for each operator is displayed at the right.

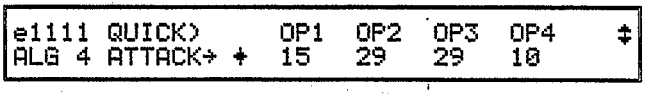
Note:

Remember that quick edit is not one of the settings within a voice, and there is no "quick edit" value which is stored as part of the voice.

The quick edit data range is approximately ± 50. This means that for some settings, the minimum or maximum values may not be reached even though the quick edit setting is at minimum or maximum.

Quick edit (attack)

Press [TR1] (QUICK EDIT).



■ **Function**

Simultaneously modifies the AR and D1R of all operators.

■ **Explanation**

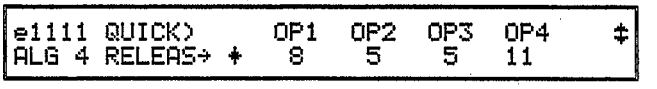
If you decrease the value below the initial position of the indicator, the envelope generator AR (ATTACK RATE) and D1R (DECAY 1 RATE) settings for all operators will be reduced, resulting in a slower attack. If you increase the value, the AR and D1R will be increased, resulting in a faster attack. (The display shows only the AR for each operator.)

Note:

When you use this quick edit function, the envelope generator AR and D1R of all operators will be changed.

Quick edit (release)

Press [TR1] (QUICK EDIT) twice.



■ **Function**

Simultaneously modifies the RR of all operators.

■ **Explanation**

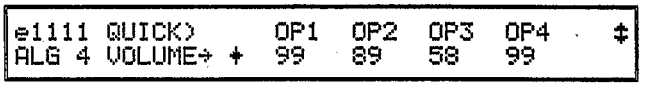
If you decrease the value below the initial position of the indicator, the envelope generator RR (RELEASE RATE) settings for all operators will be reduced, resulting in a slower decay. If you increase the value, the RR will be increased, resulting in a faster decay. (The display shows the RR for each operator.)

Note:

When you use this quick edit function, the envelope generator RR of all operators will be changed.

Quick edit (volume)

Press [TR1] (QUICK EDIT) three times.



■ **Function**

Simultaneously modifies the output level of all operators that are acting as carriers.

■ **Explanation**

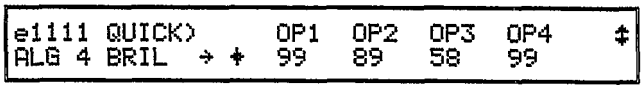
If you decrease the value below the initial position of the indicator, the output level settings for all operators that are acting as carriers will be reduced, resulting in a lower volume. If you increase the value, the output level settings will be increased, resulting in a louder volume. (The display shows the output level values for each operator.)

Note:

When you use this quick edit function, the output level of all operators acting as carriers will be changed.

Quick edit (brilliance)

Press **TR1** (QUICK EDIT) four times



■ Function

Simultaneously modifies the output level of all operators that are acting as modulators.

■ Explanation

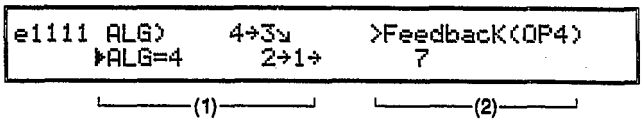
If you decrease the value below the initial position of the indicator, the output level settings for all operators that are acting as modulators will be reduced, resulting in a more muted tone. If you increase the value, the output level settings will be increased, resulting in a brighter tone. (The display shows the output level values for each operator.)

Note:

When you use this quick edit function, the output level of all operators acting as modulators will be changed.

Algorithm, feedback

Press **TR2** (ALGORITHM).



(1) Algorithm

■ Function

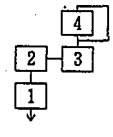
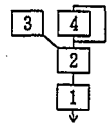
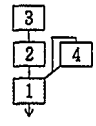
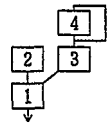
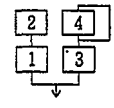
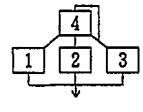
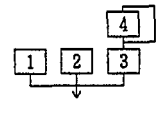
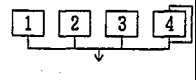
Select the algorithm to use.

■ Settings

1 – 8

■ Explanation

The algorithm is an arrangement of the 4 operators. The eight algorithms are printed on the upper right of the front panel. Select one of the following algorithms.

	**Algorithm 1:** Since all four operators are arranged vertically, this algorithm is especially suitable for sounds with complex harmonics, such as string or acoustic piano sounds. For example, frequency ratio settings of 1.00:1.00:3.00:5.00 would be suitable for an electric guitar or bass.
	**Algorithm 2:** As with algorithm 1, this algorithm is suitable for creating sounds with complex harmonics. In addition to being suitable for struck strings or pianos, the feedback of operator 4 can be used to create a unique brass sound. It may be useful to start with frequency ratio settings of 1.00:1.00 for operators 1 and 2, and try out various settings for operators 3 and 4.
	**Algorithm 3:** This algorithm is good for resonant brass sounds or strings with emphasis on the sound of the bow. Use operators 1 and 4 to create the basic part of the sound, and operator 3 to create the “resonance” or “bow scrape”. Try frequency settings of 2.82 or 3.14 for operator ???.
	**Algorithm 4:** As with algorithm 3, this algorithm allows you to add interesting details to realistic sounds. Since there is no feedback on operator 2, it is suitable for flute and other wind sounds. Set the output level of operator 4 to 99 to create noise, and use it as the breath sound of a flute.
	**Algorithm 5:** This algorithm has two carriers, and allows you to create detuned strings or electric pianos. Another possibility is using operators 1 and 2 to make a flute sound, and operators 3 and 4 to make a brass sound. This may be the algorithm with the broadest possibilities.
	**Algorithm 6:** Since the feedback of operator 4 applies to operators 1, 2, and 3, it is the algorithm most suited for brass sounds. Giving operators 1, 2, and 3 the same EG settings and making the AR of operator 4 a bit slower will create an effective brass sound. This algorithm is also useful for creating powerful synth lead sounds.
	**Algorithm 7:** This algorithm has three carriers, and operators 1 and 2 will produce the exact sound of the selected waveform. Organs are a good possibility, and you can try making a click sound with operator 4, or making a hard electric organ by using operators 3 and 4 to create distortion.
	**Algorithm 8:** All operators will produce the exact sound of the waveform selected for each, making this algorithm especially suitable for organ sounds. Modifying frequency and detune will give interest to the sound.

(2) Feedback

■ Function

Set the feedback level.

■ Settings

0 – 7

■ Explanation

Feedback is a function that allows the output of operator 4 to modulate operator 4 itself. Raising the feedback level has an effect similar to connecting two operators as carrier and modulator, and will increase the brightness of the sound. This is especially useful when making voices such as brass or strings, or noise effects. If feedback is set to 0, the operator will function in the same way as the other operators without feedback.

Note:

Feedback will have no effect unless the output level of operator 4 is raised.

LFO (wave, speed, delay, key sync, PMD, AMD)

Press TR3 (LFO).

```
e1111 LFO)▶WAVE >SPD>DLY>SYNC >PMD >AMD
ALG 4     triangl 29   17    off  17   51
          └─(1)─┘ └(2)┘ └(3)┘ └(4)─┘ └(5)┘ └(6)┘
```

The LFO causes repeating change in tone, volume, or pitch.

Repeating change in tone (wah): The tone will alternately become brighter and softer.

Repeating change in volume (tremolo): The volume will alternately become louder and softer.

Repeating change in pitch (vibrato): The pitch will alternately become higher and lower.

(1) Wave

■ Function

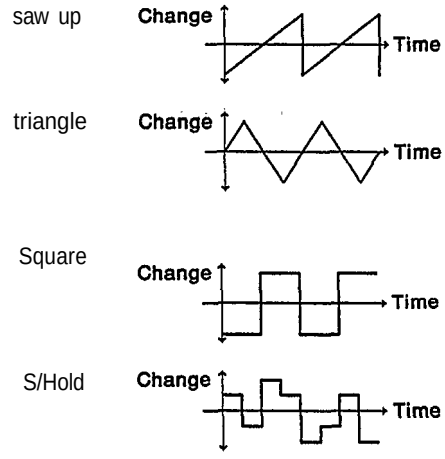
Select a waveform or "shape" for the repeating change.

■ Settings

saw up, square, triangle, S/Hold

■ Explanation

The wave selected here will determine the "shape" of the vibrato, tremolo, or wah. Select from the following four waveforms. S/Hold (sample and hold) causes random change.



(2) Speed

■ Function

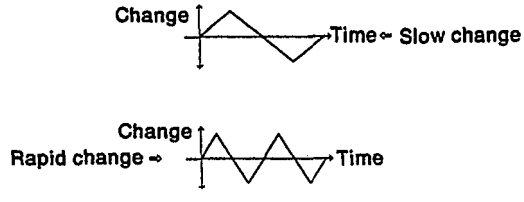
Set the speed of the repeating change (vibrato, tremolo, wah).

■ Settings

0 – 99

■ Explanation

A value of 0 gives the slowest change, and as the value is increased, the speed of change increases.



(3) Delay

■ Function

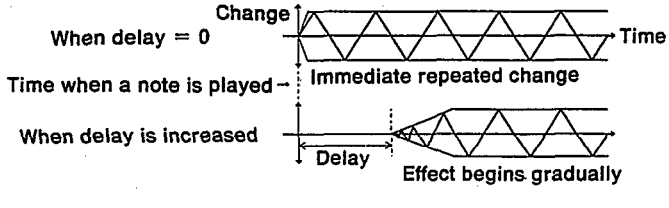
Set how soon the repeated change will begin.

■ Settings

0 – 99

■ Explanation

A value of 0 makes the repeated change begin immediately (i.e., no LFO delay), and as the value is increased, the repeated change will begin more gradually, as shown in the diagram.



(4) Key sync

■ Function

Make the LFO start from the same position for each note.

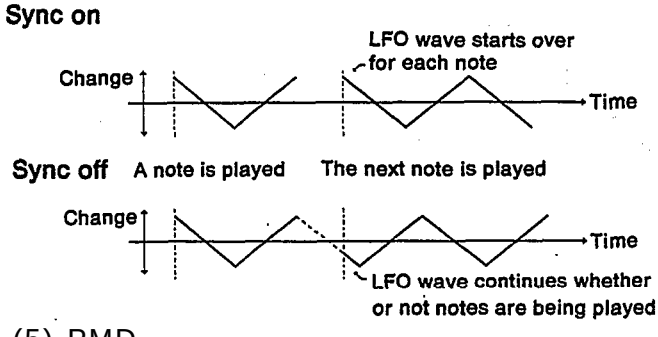
■ Settings

off, on

■ Explanation

When key sync is on, the LFO waveform will start over again from the same position each time you play another note. When key sync is off, the LFO waveform will continue repeating in the same way whether or not notes are being played.

If you want each new note to have the same type of attack, set key sync on. When simulating rotary speakers, phasers, etc., set key sync off.



(5) PMD

■ Function

Set the depth of vibrato (pitch modulation).

■ Settings

0 – 99

■ Explanation

A setting of 0 gives minimum effect, a setting of 99 gives maximum effect.

There will be times when you want a voice to always have vibrato, and other times when you want to be able to bring in vibrato using a modulation wheel or breath controller. This PMD setting is the depth of vibrato that will *always* be present in the voice. If you want to bring in vibrato using a modulation wheel or breath controller, leave this PMD setting at 0.

Note:

When the sensitivity setting for PMS (see page 43) is at 0, there will be no vibrato even if you raise the PMD value.

If you want to bring in vibrato using a modulation wheel or breath controller, raise the pitch setting (MW Pitch, BC Pitch, etc.) for that controller.

Ways to add vibrato

Type of vibrato	PMD setting	PMS setting	*setting
Always present	raised	raised	0
Add using a controller	0	raise	raise

* indicates

When using the foot controller
[ ] (FUNCTION) FC Pitch setting
When using the modulation wheel
[ ] (FUNCTION) MW Pitch setting
When using the breath controller
[ ] (FUNCTION) BC Pitch setting
When using aftertouch
[ ] (FUNCTION) AT Pitch setting

(6) AMD

■ Function

Set the depth of tremolo or wah.

■ Settings

0 – 99

■ Explanation

A setting of 0 gives minimum effect, a setting of 99 gives maximum effect.

There will be times when you want a voice to always have tremolo or wah, and other times when you want to be able to bring in tremolo or wah using a modulation wheel or breath controller. This AMD setting is the depth of tremolo or wah that will *always* be present in the voice. If you want to bring in tremolo or wah using a modulation wheel or breath controller, leave this AMD setting at 0.

When the AMS of an operator acting as a carrier is raised, this AMD setting regulates tremolo.

When the AMS of an operator acting as a modulator is raised, this AMD setting regulates wah.

Note:

When the sensitivity setting for AMS (see page 43) is at 0 or off, there will be no tremolo or wah even if you raise this AMD value.

If you want to bring in tremolo or wah using a modulation wheel or breath controller, raise the amplitude setting (MW Amplitude, BC Amplitude, etc.) for that controller.

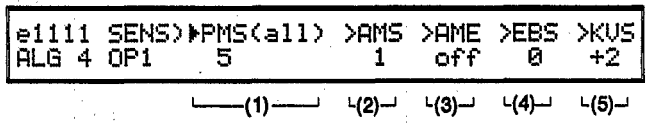
Ways to add tremolo

	AMD setting	AMS setting		* setting
		Carrier	Modulator	
Always present	Raise	on	off	0
Add using a controller	0	on	off	Raise

* indicates
When using the foot controller
[ ] (FUNCTION) FC Amplitude setting
When using the modulation wheel
[ ] (FUNCTION) MW Amplitude setting
When using the breath controller
[ ] (FUNCTION) BC Amplitude setting
When using aftertouch
[ ] (FUNCTION) AT Amplitude setting

Sensitivity (PMS, AMS, AME, EBS, KVS)

Press [TR4] (SENSITIVITY).



(1) PMS (pitch modulation sensitivity)

■ **Function**
Determine the overall depth of vibrato

■ **Settings**
0 – 7

■ **Explanation**
A setting of 0 gives no effect, and a setting of 99 gives maximum effect.

This determines the overall depth of the vibrato resulting from the LFO settings for PMD (see page 41) and the pitch settings for each controller.
For details of how to add vibrato, see page 42.

Note:
If PMD and the pitch settings of the controllers (modulation wheel, breath controller, etc.) are 0, this PMS setting will have no effect.

(2) AMS (amplitude modulation sensitivity)

■ **Function**
Determine the overall depth of tremolo or wah.

■ **Settings**
0 – 3

■ **Explanation**
A setting of 0 gives no effect, and a setting of 99 gives maximum effect.

This determines the overall depth of the tremolo or wah resulting from the LFO settings for AMD (see page 42) and the amplitude settings for each controller. For details of how to add tremolo or wah, see page 42.

Note:
If operator output levels are set extremely low, this AMS setting will not have very much effect.

(3) AME (amplitude modulation enable)

■ **Function**
Determine which operators will be affected by amplitude modulation.

■ **Settings**
off, on

■ **Explanation**
This determines the operators that will be affected by amplitude modulation. Repeatedly press [ ] to step through the operators, and program the values for each.

If AME is turned on for an operator that is acting as a carrier, tremolo (change in volume) will result. If AME is turned on for an operator that is acting as a modulator, wah (change in tone) will result.

Note:
If AMS is 0, there will be no effect even if AME is turned on. In the same way, even if AMS is raised, there will be no effect if AME is turned off.

This AMS setting will have no effect unless AMD or the amplitude value for one or more controllers (modulation wheel, breath controller, etc.) is raised.

Some settings may cause small amounts of noise.

(4) EBS (EG bias sensitivity)

■ **Function**
Allow aftertouch or breath controller to affect tone and volume.

■ **Settings**
0 - 7

■ **Explanation**
A setting of 0 gives no effect, and a setting of 7 gives maximum effect.

When using using aftertouch or breath controller to modify the volume or tone, raise this setting. (This is not a repeating change like tremolo or wah.) For example if this setting is raised for an operator that is acting as a modulator, and the aftertouch AT EG Bias setting is raised, pressing down on the keyboard after playing a note (i.e., “aftertouch”) would affect the tone.

This EG bias sensitivity setting is made independently for each of the four operators. Repeatedly press [ ] to step through operators 1→2→3→4, and program the values for each.

When this value is raised for a carrier operator, aftertouch or breath control can affect the volume. When this value is raised for a modulator operator, aftertouch or breath controller can affect the tone.

Note:

If the AT EG Bias setting (see page 53) or the BC EG Bias setting (see page 52) are not raised, this EBS setting will have no effect.

When the EBS for an operator is raised, the overall output level of that operator will decrease. Aftertouch or breath controller will then be able to raise or lower the output level of the operator, and affect the volume or tone.

(5) KVS (key velocity sensitivity)

■ Function

Allow the force (velocity) of a note to affect operator output level.

■ Settings

– 7 – + 7

■ Explanation

Settings of +1–+7 will make the volume (or brightness) increase as you play more strongly. Settings of –1––7 will make the volume (or brightness) decrease as you play more strongly.

This key velocity sensitivity setting is made independently for each of the four operators. Repeatedly press [○] to step through operators **1→2→3→4,** and program the values for each.

When the key velocity sensitivity for a carrier operator is raised, the force with which a note is played will affect the volume. When the key velocity sensitivity for a modulator operator is raised, the force with which a note is played will affect the tone.

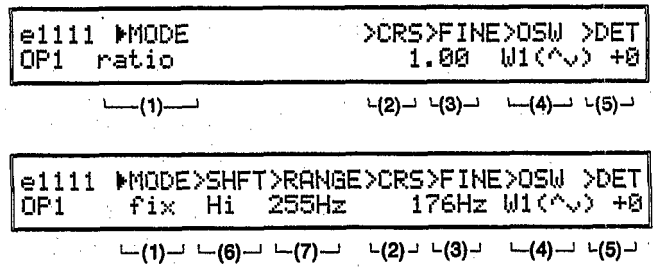
Note:

If the operator output level is extremely low, this setting will have little effect.

"Key velocity" is actually detected by measuring the "speed" at which you play a note.

Oscillator
(mode, coarse, fine, wave, detune, shift, range)

Press [RHY] (OSCILLATOR).



Oscillator settings determine the pitch and waveform that is output by each operator. These oscillator settings are made independently for each of the four operators. Repeatedly press [○] to step through operators **1→2→3→4,** and program the values for each.

The items in the display will depend on the setting of the oscillator's mode (see (1), below). If "ratio" has been selected, (2) – (5) will be displayed. If "fix" has been selected, (2) – (7) will be displayed.

(1) Mode

■ Function

Select the mode of each operator's oscillator.

■ Settings

fix, ratio

■ Explanation

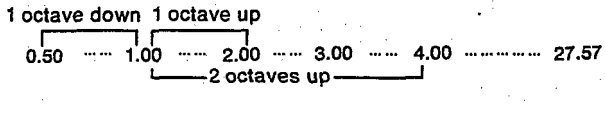
Select one of the following two modes.

fix mode

The same pitch will be produced no matter which note you play. This is often convenient when making special effects, or percussion instruments. Specify the pitch in Hz (hertz: the number of times the waveform repeats every second).

ratio mode

The note you play will determine the pitch that is produced. Use this mode when creating normal, pitched instruments. With a setting of 1 representing an A3 pitch of 440Hz, specify the pitch over a range of 0.50 – 27.57. Modifying this setting will change the pitch as shown in the diagram.



(2) Coarse

■ **Function**
Set the approximate frequency (pitch)

■ **Settings**
0.5 – 27.57 in ratio mode, 8 – 32640 in fix mode.

■ **Explanation**
This determines the approximate pitch produced by the operator. (Make exact settings using the next item, (3) Fine.)

Note:

For fix mode, the "range", and the "shift", setting give you additional control over the range of the fixed frequency. See page 44.

(3) Fine

■ **Function**
Set the exact frequency (pitch).

■ **Settings**
0.5 – 27.57 in ratio mode, 8 – 32640 in fix mode.

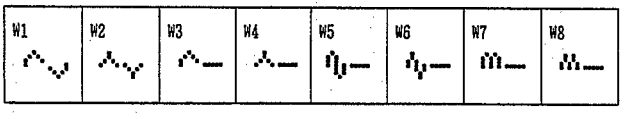
■ **Explanation**
This adjusts the exact pitch produced by the operator. (The size of each step will depend on the frequency range selected by the coarse setting.)

(4) Wave

■ **Function**
Select the wave produced by each operator.

■ **Settings**
W1 – W8

■ **Explanation**
Select one of the following eight waves.



(5) Detune

■ **Function**
Make fine adjustments in the pitch of each operator.

■ **Settings**
−3~+3

■ **Explanation**
When this is set to 0, the operator will produce the exact pitch indicated by the coarse and fine frequency settings. Detune allows you to make fine adjustments in the pitch of each operator. The exact range will differ for different pitches, but in the case of C3, a detune setting of -3 results in a pitch change of -2.6 cents, and a setting of +3 results in a pitch change of +2.6 cents. (1 cent is 1/100 of a half step.)

By setting slight differences in the pitch of operators, you can create chorusing effects to broaden the sound.

Note:

Detune is intended to create differences in the *relative* pitches of the operators. Setting all operators to the same detune setting is not very useful.

(6) Shift

■ **Function**
In “fix” mode, select a broad frequency range.

■ **Settings**
LO, HI

■ **Explanation**
When LO is selected, the fix range will be 1Hz – 100Hz. When HI is selected, the fix range will be 255Hz – 32KHz.

(7) Range

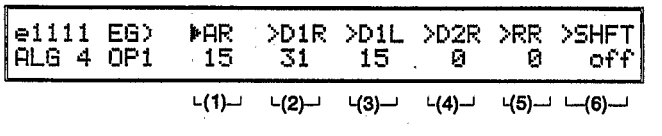
■ **Function**
In “fix” mode, select a frequency range.

■ **Settings**
When shift = LO, 1Hz- 100Hz, when shift = HI, 255Hz – 32KHz

■ **Explanation**
When shift is set to LO, a range of 1Hz – 100H can be selected. When shift is set to HI, a range of 255Hz – 32KHz can be selected.

Envelope generator (AR, D1R, D2L, D2R, RR, shift)

Press [ ] (EG).



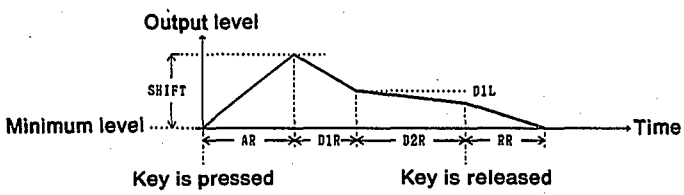
The envelope generator changes the output level of each operator over time, and creates changes in volume and tone from the time the note is played to when the sound disappears. Two words are especially important to understand when setting the envelope generator.

Rate ..... The speed of change from one level to another level.
Level .... An output level.

These envelope generator settings are made separately for each operator 1 – 4. The number of the operator currently being set is shown in the lower left of the display. Repeatedly press [○] to step through operators **1→2→3→4,** and make settings for each.

As shown in the diagram, an envelope generator uses four "rates" and one "level" to modify the output of each operator over time. (A similar diagram is printed on the right side of the V50 front panel.)

It is possible to copy the settings of an envelope generator to another operator (see page 120).



Attack rate (AR) ..... The speed of the change from minimum to maximum level, starting when a key is pressed.
Decay 1 Rate (D1R) ..... The speed of the change from maximum to D1L level, starting when maximum level is reached.
Decay 2 Rate (D2R) ..... The speed of the decay from D1L level.
Release Rate (RR) ..... The speed of the decay starting when the key is released.
Decay 1 Level (D1L) ..... The level after decaying from the maximum level.

These settings result in a change as follows.

(1) When a key is pressed, the output level rises at the rate of AR to the maximum level.
(2) When the maximum level is reached, the ouput level decreases at the rate of D1R to the level D1L.
(3) While the key remains depressed, the level will continue to decrease at the rate of D2R.
(4) When the key is released, the level will decrease at the rate of RR.

(1) AR

■ Function
Set the rate at which the output level rises to maximum.

■ Settings
0 – 31

■ Explanation
A setting of 0 is infinitely slow, and a setting of 31 is the fastest attack.

(2) D1R

■ Function
Set the rate at which the level decreases to D1L.

■ Settings
0 – 31

■ Explanation
Higher settings create a greater feeling of attack, and lower settings create a slower decay.

Note:
If the D1L is close to the maximum of 15, this D1R setting will have little effect.

(3) D1L

■ Function
Set the level to which the output will decay after reaching maximum.

■ Settings
0 – 15

■ Explanation
When D2R is 0, this D1L level will be the level of the sustained sound.

(4) D2R

■ Function
Set the rate at which the level decreases after reaching D1L.

■ Settings
0 – 31

■ Explanation
When this D2R is 0, the output will stay at the D1L level as long as the key is depressed.

(5) RR

■ Function
The rate of the decay after the key is released.

■ Settings
l – 15

■ Explanation
Larger settings result in a faster (shorter) decay.

(6) Shift (EG shift)

■ Function
Select the width of change produced by the envelope generator.

■ Settings
off, 48, 24, 12

■ **Explanation**

This EG shift setting selects the level difference between maximum and minimum levels.

off ..... The minimum level of the EG is 96dB below the maximum level.

48 ..... The minimum level of the EG is 48dB below the maximum level.

24 ..... The minimum level of the EG is 24dB below the maximum level.

12 ..... The minimum level of the EG is 12dB below the maximum level.

Settings of 12-48 will mean that the operator will be producing sound even when no key is pressed. (This is normally used on modulator operators.)

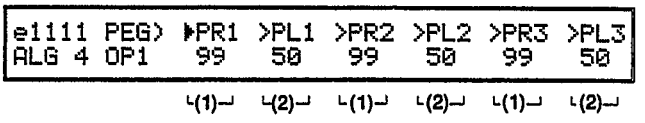
Note:

If a setting other than "off" is used on an operator that is functioning as a carrier, the sound will continue even when no key is pressed.

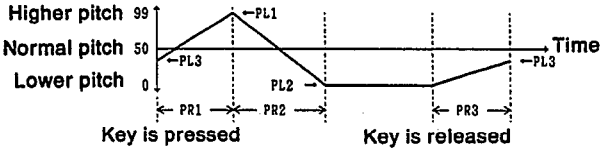
Operator 1 is permanently set to "off".

Pitch envelope generator (PR1, PL1, PR2, PL2, PR3, PL3)

Press **TR5** (PEG)



The pitch envelope generator modifies the pitch over time. It applies to the entire voice (all operators). The pitch envelope generator uses three rates and three levels, as shown in the diagram.



PR1 ..... Rate of pitch change from PL3 to PL1 starting when key is pressed.

PR2 ..... Rate of pitch change from PL1 to PL2.

PR3 ..... Rate of pitch change to PL3 starting when key is released.

PL1 ..... Pitch level moved toward when key is pressed.

PL2 ..... Pitch level maintained while key remains pressed.

PL3 ..... Pitch level moved toward when key is relased.

(1) PR1, PR2, PR3

■ **Function**

Set the rates of PEG pitch change.

■ **Settings**

0 – 99

■ **Explanation**

Higher settings result in faster change. Lower settings result in slower change.

PR1 is the rate of pitch change from PL3 to PL1 starting when the key is pressed.

PR2 is the rate of pitch change from PL1 to PL2.

PR3 is the rate of pitch change to PL3 starting when the key is released.

(2) PL1, PL2, PL3

■ **Function**

Set the levels of PEG pitch change.

■ **Settings**

0 – 99

■ **Explanation**

A setting of 50 is the correct pitch of the key that was pressed. A setting of 99 is 4 octaves higher, and a setting of 0 is 4 octaves lower.

When you press the key, the pitch will move toward PL1.

If you continue pressing the key, the pitch level PL2 will be maintained.

When you release the key, the pitch will move toward PL3.

Note:

If the pitch envelope generator is used to create extreme variations in pitch, it will be difficult to hear the "true" pitch of the sound.

If extremely high or low pitch levels are set, the pitch change may appear uneven.

Output level

Press TR6 (OUT LEVEL)

■ **Function**

Set the output level for each operator.

■ **Settings**

0-99

■ **Explanation**

At a setting of 0 there will be no output, and a setting of 99 is maximum.

The output level of an operator that is acting as a *carrier* will determine the volume. The output level of an operator that is acting as a *modulator* will determine the tone of the operators below it.

If you do not need to use an operator, you can set its output level to 0.

Note:

If you set the output level of all carrier operators to 0, there will be no sound.

Keyboard scaling (rate)

Press TR7 (SCALING)

Keyboard rate scaling adjusts the rate of change of the envelope generator for each operator across the keyboard.

■ **Function**

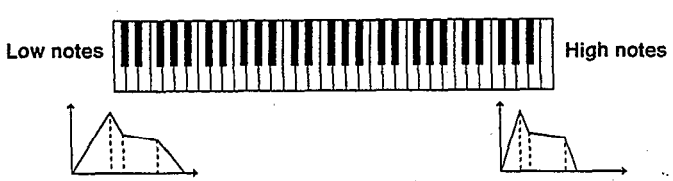
Set how the envelope generator rates are adjusted across the keyboard.

■ **Settings**

0 – 3

■ **Explanation**

A setting of 0 has almost no rate scaling effect, and a setting of 3 has maximum scaling effect. The following diagram shows the result of keyboard rate scaling.

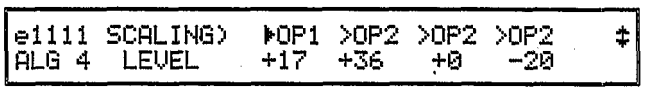


When low notes are played, the envelope changes gradually, and when high notes are played, the envelope changes rapidly.

If keyboard rate scaling is applied to carrier operators, low notes will have a gradual attack and a long release, and high notes will have a sharp attack and short release. If keyboard rate scaling is applied to modulator operators, low notes will have a slow change in tone, and high notes will have a rapid change in tone.

Keyboard scaling (level)

Press TR7 (SCALING) twice.



■ **Function**

Set how the output level of each operator is adjusted across the keyboard.

■ **Settings**

–99–+99

■ **Explanation**

A setting of 0 has no effect, and 99 or -99 have maximum effect. The following diagram shows the result of keyboard level scaling for a setting of + 1–+99. (Settings of – l– – 99 will have the opposite effect.)

Low notes will have a higher output level, and high notes will have a lower output level.

If keyboard level scaling is applied to carrier operators, higher notes will have lower volume. If keyboard level scaling is applied to modulator operators, higher notes will have softer tone.

Transpose

Press TR8 (TRANSPOSE)

■ **Function**
Transpose the pitch played by C3 in half steps.

■ **Settings**
C1 – C5

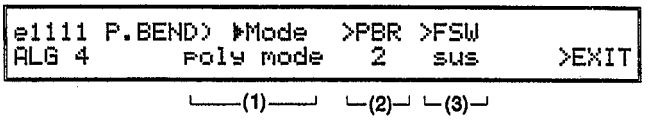
■ **Explanation**
The V50 front panel has a mark indicating "C3", located roughly at the center of the keyboard. This transpose function modifies the pitch played by the C key below the "C3" mark.

Normally this is set to C3.

Pressing a key C1 – C5 will specify the new transpose setting.

Poly/mono mode select, pitch bend wheel range, foot switch

After pressing ☐ (FUNCTION), press the ☐ below "PBetc" in the display.



Press the ☐ below " > EXIT" in the display to return to the previous display.

(1) Poly/mono mode select

■ **Function**
Select poly or mono mode.

■ **Settings**
poly mode, mono mode

■ **Explanation**
In poly mode you can play chords. (Last note priority is used.) In mono mode only one note at a time will sound.

(2) Pitch bend wheel range

■ **Function**
Set the range of pitch change produced by the pitch bend wheel.

■ **Settings**
0 – 12

■ **Explanation**
The pitch bend wheel is located at the left of the keyboard.

It allows you to change the pitch while playing. Moving the wheel away from you will smoothly raise the pitch. Moving the wheel toward you will smoothly lower the pitch.

This pitch bend wheel range setting determines the maximum pitch change when the pitch bend wheel is moved all the way in either direction.

When this is set to 0, the pitch bend wheel will have no effect. When this is set to 12, the pitch bend wheel will have maximum effect. Pitch bend wheel range can be set from 0 – 12 in half-steps. This means that a setting of 12 will allow the pitch bend wheel to raise or lower the pitch one octave.

(3) Foot switch

■ **Function**
Select the function of the foot switch.

■ **Settings**
por, sus

■ **Explanation**
An on/off foot switch (similar to the pedal of a piano) can be connected to the V50 rear panel FS jack, and can function in one of two ways. (Use a foot switch such as the FC-4 or FC-5, sold separately.)

por (Portamento)
When portamento mode (an explanation follows) is set to "Full Time Porta", the portamento effect will apply only while the foot switch is pressed.

sus (Sustain)
When you press the foot switch while a note is pressed, and then release the note, it will continue sounding as though the key had not been released.

Note:

If portamento mode is set to "Fingered Porta", the foot switch will have no effect on portamento.

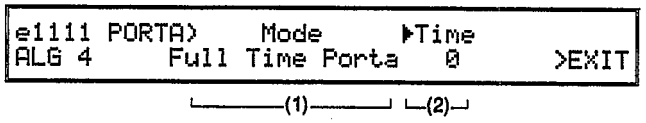
If the portamento time is set to 0, there will be no portamento effect.

In performance play mode, the foot switch setting of instrument 1 will apply.

The portamento effect will apply when a foot switch is not connected, or when the foot switch is set to "sus".

Portamento (mode, time)

After pressing [ ] (FUNCTION), press the [ ] below "Port" in the display.



Portamento is a smooth change from the pitch of one note to the pitch of the next played note. The portamento effect is determined by the portamento mode and the portamento time.

Press the [ ] below " >EXIT" in the display to return to the previous display.'

(1) Portamento mode

■ **Function**
Select the portamento mode.

■ **Settings**
Full Time Porta, Fingerd Porta

■ **Explanation**
When poly/mono mode is set to "poly", you will be able to select only "Full Time Porta". When "mono" mode has been selected, you will be able to select either "Full Time Porta" or "Fingered Porta"

Full Time Porta
Portamento will always apply.

Fingered Porta
Portamento will apply only when you play legato (press the next note before releasing the previous note).

(2) Portamento time

■ **Function**
Set the time of the portamento effect.

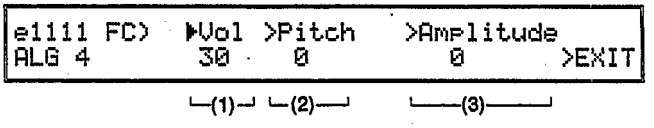
■ **Settings**
0 – 99

■ **Explanation**
This sets the time required for the pitch to move to the pitch of the next played key. A portamento time setting of 0 results in instant pitch change, i.e. no portamento. Higher settings of portamento time result in more gradual pitch change.

Note:
When you don't want to use portamento, set the portamento time to 0. If a foot switch is connected to the rear panel FS jack, and if the foot switch is set to "por" (portamento), portamento will apply only while the foot switch is pressed.

Foot controller (volume, pitch, amplitude)

After pressing [ ] (FUNCTION), press the [ ] below "FC" in the display.



An optional foot controller (FC7, FC9, etc.) can be connected to the rear panel FC jack, and used to modify the depth of vibrato, tremolo, wah, etc., or adjust volume or tone while playing.

Press the [ ] below " > EXIT" in the display to return to the previous display.

(1) Volume

■ **Function**
Set the amount of volume regulated by the foot controller.

■ **Setting**
0 – 99

■ **Explanation**
This allows you to regulate volume using the foot controller. As you advance the foot controller, the volume will increase. When the setting is 0, the foot controller will have no effect, and when the setting is 99, it will have maximum effect.

Note:
If a foot controller is not connected, the result will be the same as when the foot controller is fully depressed.

If you do not want to control volume using the foot controller, set this to 0.

When a foot controller is connected to the rear panel VOLUME jack, in single play mode it will act as a volume pedal to adjust master volume independently of this setting. In performance play mode it will act as a volume pedal only for the instruments whose receive channel matches the transmit channel.

(2) Pitch

■ **Function**
Set the amount of vibrato depth regulated by the foot controller.

■ **Setting:**
0 – 99

■ **Explanation**
This allows you to regulate vibrato depth using the foot controller. As you advance the foot controller, the depth of vibrato will increase. When the setting is 0, the foot controller will have no effect, and when the setting is 99, it will have maximum effect.

Note:

Unless the sensitivity "P Mod Sens" setting (see page 43) is raised, raising this setting will have no effect.

If a foot controller is not connected, the result will be the same as when the foot controller is fully depressed. This means that if you raise this setting, vibrato will be applied continuously.

If you do not want to control vibrato using the foot controller, set this to 0.

(3) Amplitude

■ **Function**
Set the amount of tremolo or wah regulated by the foot controller.

■ **Setting:**
0 – 99

■ **Explanation**
This allows you to regulate tremolo or wah using the foot controller. As you advance the foot controller, the amount of tremolo or wah will increase. When the setting is 0, the foot controller will have no effect, and when the setting is 99, it will have maximum effect.

Note:

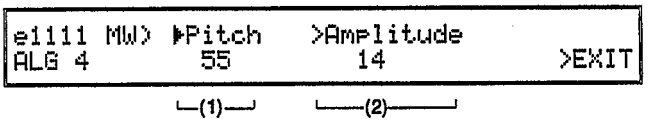
Unless the TR4 (SENSITIVITY). AMS setting is raised, and the AME of the appropriate operators is on, raising this setting will have no effect (see page 43.

If a foot controller is not connected, the result will be the same as when the foot controller is fully depressed. This means that if you raise this setting, tremolo or wah will be applied continuously.

If you do not want to control tremolo or wah using the foot controller, set this to 0.

Modulation wheel (pitch, amplitude)

After pressing [ ] (FUNCTION), press the [ ] below "MW" in the display.



The modulation wheel is located to the left of the keyboard, and allows you to adjust the depth of vibrato, tremolo, wah, etc. while playing.

Press the [ ] below " > EXIT" in the display to return to the previous display.

(1) Pitch

■ **Function**
Set the amount of vibrato depth regulated by the modulation wheel.

■ **Setting**
0 – 99

■ **Explanation**
This allows you to regulate vibrato depth using the modulation wheel. As you advance the modulation wheel, the depth of vibrato will increase. When the setting is 0, the modulation wheel will have no effect, and when the setting is 99, it will have maximum effect.

Note:

Unless the sensitivity "P Mod Sens" setting (see page 43) is raised, raising this setting will have no effect.

If you do not want to control vibrato using the modulation wheels set this to 0.

(2) Amplitude

■ **Function**
Set the amount of tremolo or wah regulated by the modulation wheel.

■ **Setting**
0 – 99

■ **Explanation**
This allows you to regulate tremolo or wah using the modulation wheel. As you advance the modulation wheel, the amount of tremolo or wah will increase. When the setting is 0, the modulation wheel will have no effect, and when the setting is 99, it will have maximum effect.

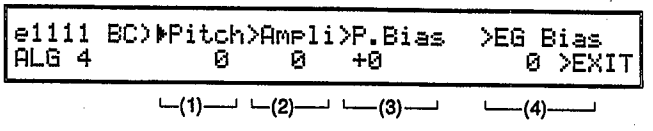
Note:

Unless the sensitivity AMS setting is raised, and the AME of the appropriate operators is on, raising this setting will have no effect (see page 43).

If you do not want to control tremolo or wah using the foot controller, set this to 0.

Breath controller (pitch, amplitude, pitch bias, EG bias)

After pressing [ ] (FUNCTION), press the [ ] below "BC" in the display.



An optional breath controller (BC1, BC2) can be connected to the BREATH CONT terminal at the left of the keyboard, and used to regulate the depth of vibrato, tremolo, wah, etc., or tone or volume while playing.

Press the [ ] below " >EXIT" in the display to return to the previous display.

(1) Pitch

■ Function

Set the amount of vibrato depth regulated by the breath controller.

■ Setting

0-99

■ Explanation

This allows you to regulate vibrato depth using the breath controller. As you blow into the breath controller, the depth of vibrato will increase. When the setting is 0, the breath controller will have no effect, and when the setting is 99, it will have maximum effect.

Note:

Unless the sensitivity "P Mod Sens" setting (see page 43) is raised, raising this setting will have no effect.

If you do not want to control vibrato depth using the breath controller, set this to 0.

(2) Amplitude

■ Function

Set the amount of tremolo or wah regulated by the breath controller.

■ Setting

0 – 99

■ Explanation

This allows you to regulate tremolo or wah using the breath controller. As you blow into the breath controller, the amount of tremolo or wah will increase. When the setting is 0, the breath controller will have no effect, and when the setting is 99, it will have maximum effect.

Note:

Unless the TR4 (SENSITIVITY) AMS setting is raised, and the AME of the appropriate operators is on, raising this setting will have no effect (see page 43).

If you do not want to control tremolo or wah using the breath controller, set this to 0.

(3) Pitch bias

■ Function

Set how the breath controller will affect pitch.

■ Setting

–50 – +50

■ Explanation

This allows you to directly affect the pitch by how hard you blow into the breath controller. When the setting is 0, the breath controller will have no effect. When the setting is – 1– – 50 blowing into the breath controller will lower the pitch, and when the setting is +1 – + 50 blowing into the breath controller will raise the pitch. The maximum range of pitch change is approximately + / – 4 octaves.

Note:

If you do not want the breath controller to affect the pitch, set this to 0.

(4) EG bias

■ Function

Set how the breath controller will affect volume or tone.

■ Settings

0 – 99

■ Explanation

This allows you to affect the output level of the operators by how hard you blow into the breath controller. For a setting of 0, the breath controller will have no effect, and for a setting of 99, it will have maximum effect.

You will need to raise the sensitivity EBS setting (see page 43) for the operators that you want the breath controller to affect. If you raise the EBS setting for carrier operators, the breath controller will affect volume. If you raise the EBS setting for modulator operators, the breath controller will affect tone.

Note:

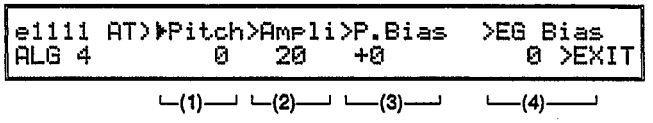
Unless the sensitivity EBS setting is raised for the operators you want to affect, the breath controller will have no effect.

Note:

If you do not want the breath controller to affect volume or tone, set this to 0.

Aftertouch (pitch, amplitude, pitch bias, EC bias)

After pressing [ ] (FUNCTION), press the [ ] below "AT" in the display.



Pressing down on the keyboard after playing a note (i.e., "aftertouch") can regulate the depth of vibrato, tremolo, or wah, and also tone, volume, or pitch while playing. Aftertouch applies equally to the entire keyboard even if you press down on only a single key.

Press the [ ] below " > EXIT" in the display to return to the previous display.

(1) Pitch

■ Function

Set the amount of vibrato depth regulated by aftertouch.

■ Setting

0 – 99

■ Explanation

This allows you to regulate vibrato depth using aftertouch. As you press down on the keyboard, the depth of vibrato will increase. When the setting is 0, aftertouch will have no effect, and when the setting is 99, it will have maximum effect.

Note:

Unless the sensitivity "P Mos Sens" setting (see page 43) is raised, raising this setting will have no effect.

If you do not want to control vibrato depth using aftertouch, set this to 0.

(2) Amplitude

■ Function

Set the amount of tremolo or wah regulated by aftertouch.

■ Setting

0 – 99.

■ Explanation

This allows you to regulate tremolo or wah using aftertouch. As you press down on the keyboard, the amount of tremolo or wah will increase. When the setting is 0, aftertouch will have no effect, and when the setting is 99, it will have maximum effect.

Note:

Unless the sensitivity AMS setting is raised, and the AME of the appropriate operators is on, raising this setting will have no effect (see page 43).

If you do not want to control tremolo or wah using aftertouch, set this to 0.

(3) Pitch bias

■ Function

Set how aftertouch will affect pitch.

■ Setting

–50 – +50

■ Explanation

This allows you to directly affect the pitch using aftertouch. When the setting is 0, aftertouch will have no effect. When the setting is – 1– –50 aftertouch will lower the pitch, and when the setting is + 1– + 50 aftertouch will raise the pitch. The maximum range of pitch change is approximately ±4 octaves.

Note:

If you do not want aftertouch to affect the pitch, set this to 0.

(4) EG bias

■ Function

Set how aftertouch will affect volume or tone.

■ Settings

0 – 99

■ Explanation

This allows you to affect the output level of the operators using aftertouch. For a setting of 0, aftertouch will have no effect, and for a setting of 99, it will have maximum effect.

You will need to raise the [TR4] (SENSITIVITY) EBS setting (see page 43) for the operators that you want aftertouch to affect. If you raise the EBS setting

for carrier operators, aftertouch will affect volume. If you raise the EBS setting for modulator operators, aftertouch will affect tone.

Note:

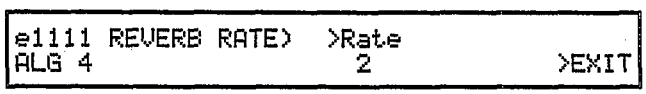
Unless the sensitivity EBS setting is raised for the operators you want to affect, aftertouch will have no effect.

Note:

If you do not want aftertouch to affect volume or tone, set this to 0.

Reverb

After pressing [ ] (FUNCTION), press the [ ] below "REVR" in the display.



Press the [ ] below " > EXIT" in the display to return to the previous display.

■ **Function**
Set a simulated reverb effect.

■ **Settings**
off, 0 – 7

■ **Explanation**
A setting of "off" gives no effect. A setting of 1 gives the most effect (long reverb) and a setting of 7 gives the shortest effect (short reverb).

Note:

This effect has no connection with the reverb produced by the V50 DSP effect unit. When the output level of operator 1 drops below a certain level (– 18dB), this "reverb" effect slows the RR (RELEASE RATE) to artificially create a "reverb-type" or "simulated reverb" effect. When using this, be aware of the following points.

If the RR setting of operator 1 is low (a slow decay), the output level will take a long time to drop below – 18dB, and the reverb effect will not be heard.

If the AR setting of operator 1 is 0, the output level will already be below – 18dB, causing this "reverb" to start immediately, and making the sound linger for a long time.

Voice name

After pressing [ ] (FUNCTION), press the [ ] below "NAME" in the display.

Press the [ ] below " > EXIT" in the display to return to the previous display.

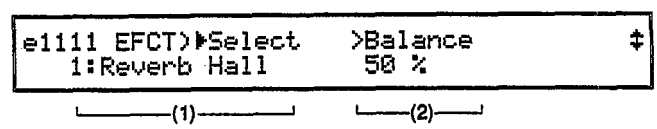
■ **Function**
Set a voice name.

■ **Settings**
Up to 10 characters

■ **Explanation**
This allows you to set a voice name for the voice you are editing. Page 17 explains how to enter characters.

Effect select, effect balance

Press [ ] (EFFECT).



(1) Effect select

■ **Function**
Select the type of DSP effect to use with this voice.

■ **Settings**
off, or one of the following types of effect

■ **Explanation**
Select one of the following types of effect.

0: off
No effect

1: Reverb Hall
Reverberation of a large hall

2: Reverb Room
Reverberation of a smaller room

3: Reverb Plate
Reverberation typical of a plate reverb unit

4: Delay
Delayed sound

5: Delay L/R
Delayed sound spread to left/right

6: Stereo Echo
Echo spread left/right

7: Distortion Rev.
Combination of distortion and reverb

8: Distortion Echo
Combination of distortion and echo

9: Gate Reverb
Reverberation with "artificially" fast cutoff

10: Reverse Gate
Reverberation simulating backwards tape playback

11: Early Ref
Adds early acoustic reflections to the sound

12: Tone Control
Simulated equalizer

13: Delay & Reverb
Combination of delay and reverb

14: Delay L/R & Rev.
Combination of delay L/R and reverb

15: Dist. & Delay
Combination of distortion and delay

16: Church
Reverberation simulating a church

17: Club
Reverberation simulating a music club

18: Stage
Reverberation simulating a larger live music club.

19: Bath Room
Reverberation simulating a bathroom

20: Metal
Metallic reverberation

21: Tunnel
Reverberation simulating a tunnel

22: Doubler 1
Doubling effect

23: Doubler 2
Doubling effect (spread left and right)

24: Feed Back Gate
Gate reverb with feedback

25: F. Back Reverse
Reverse gate with feedback

26: Feed Back E/R
Early reflections with feedback

27: Delay & Tone1
Combination of delay and tone control 1

28: Dly L/R & Tone1
Combination of delay L/R and tone control 1

29: Tone Control 2
Tone control using low pass filter and high pass filter

30: Delay & Tone2
Combination of delay and tone control 2

31: Dly L/R & Tone2
Combination of delay L/R and tone control 2

(2) Effect balance

■ **Function**
Set the volume balance of the effect and the unprocessed sound.

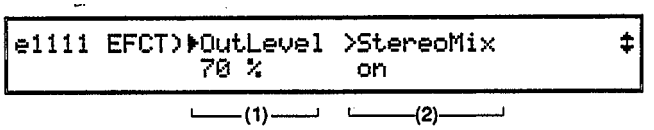
■ **Settings**
0% – 100%

■ **Explanation**
Higher settings will increase the volume of the effect (processed sound). Lower settings will increase the volume of the unprocessed sound.

Note:
At a setting of 0%, no effect (processed sound) will be heard. At a setting of 100%, you will hear only the effect, and the direct unprocessed sound will not be heard.

Effect output level, stereo mix

Press [ ] (EFFECT) twice. (If the previous item effect select has been set to "off", this will not be displayed.)



(1) Effect output level

■ **Function**
Adjust the volume of the effect and unprocessed sound.

■ **Settings**
0% – 100%

■ **Explanation**

The combined volume of the effect and the unprocessed sound is adjusted by this setting. 100% is maximum, and at 0% there will be no sound.

Note:

At a setting of 0%, neither the unprocessed nor the processed sound will be heard. (However if the next item stereo mix is on, then only the unprocessed sound will be heard.

Note

If the DSP sound is distorted, decrease the (DSP) Effect Output Level or the Synthesizer Volume.

(2) Stereo mix

■ **Function**

Mix the processed sound with the unprocessed stereo sound.

■ **Settings**

off, on

■ **Explanation**

Effect input processing is done in monaural. This means that when stereo mix is "off", the stereo output signal from the performance assign settings of each instrument will be output in mono.

When this is set to “on”, the mono processed sound will be mixed with the original stereo output signal, and output in stereo. This allows you to retain the stereo signal while using an effect. (However, the stereo positioning will appear to be slightly narrower.)

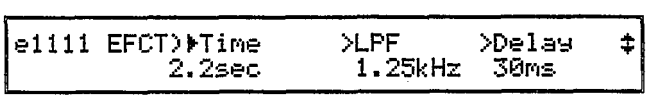
Page 32 has a signal flow diagram of the processed and unprocessed sound.

Note:

When the DSP effect is on, and Stereo Mix is off, the L/R assignments of the performance are not used. This means that the performance effect PAN will have no effect.

Effect parameters

Press [ ] (EFFECT) three times. (If the previous item effect select has been set to "off", this will not be displayed.)



■ **Function**

Make detailed settings for the effect.

■ **Settings**

Each type of effect has different settings.

■ **Explanation**

Make detailed settings for the effect as explained in the charts on page 32.

It is possible to copy effect settings to another performance or voice (see page 120).

CHAPTER 4. USING THE RHYTHM MACHINE

This chapter will explain how to use the V50 rhythm machine.

ABOUT THE RHYTHM MACHINE

The rhythm machine tone generator

The tone generator of the rhythm machine uses the following 61 rhythm instruments.

BD 1	GateSD	F.Tom4	Crash	Timb1H	Ago HI
BD 2	E. SD	E.Toml	FMprc1	Timb1L	Ago LO
BD 3	Rim 1	E.Tom2	FMprc2	Whst1S	Tambrn
H. BD	Rim 2	E.Tom3	FMprc3	Whst1L	Claves
GateBD	Tom 1	E.Tom4	GlsCsh	CgaHMT	Cstnt
E. BD	Tom 2	HHclos	BellTr	CgaHOP	VbrSlp
SD 1	Tom 3	HHopen	TimpnH	Cga LO	
SD 2	Tom 4	HH1/4o	TimphL	Bgo HI	
Pic1SD	F.Tom1	HHpdl	Claps	Bgo LO	
H. SD 1	F.Tom2	Ride	Shaker	CuicaH	
H. SD 2	F.Tom3	Edge	Cowbel	CuicaL	

The rhythm machine tone generator is completely independent of the synthesizer tone generator, and is not affected by the number of notes being played by the synthesizer. Up to 8 notes can be produced simultaneously by the rhythm machine tone generator.

Rhythm patterns and rhythm songs

When learning to use the V50 rhythm machine, it is important to understand what we mean by "rhythm pattern" and "rhythm song". A rhythm song is a song consisting of many rhythm patterns, as in the following example.

For our example, we will create three rhythm patterns as follows.

1 [boom tap tap tap].....(1measure)
2 [ding ding chacha ding]..... (1 measure)
3 [dum ta dum ta dum dum tata tata]..... (2 measures)

If we connect these three rhythm patterns in the order of "1, 2, 1, 2, 1, 2, 3" to create a rhythm song as follows.

Measure 1 (rhythm pattern 1)	Measure 2 (rhythm pattern 2)	Measure 3 (rhythm pattern 1)	Measure 4 (rhythm pattern 2)
boom tap tap tap	tick tick chacha tick	boom tap tap tap	tick tick chacha tick

Measure 5 (rhythm pattern 1)	Measure 6 (rhythm pattern 2)	Measures 7 and 8 (rhythm pattern 3)	
boom tap tap tap	tick tick chacha tick	dum ta dum ta	dum dum tata tata

Rhythm patterns

A rhythm pattern is a phrase 1 to 4 measures long. There are two types of rhythm patterns; preset patterns and internal memory patterns.

Preset patterns
Basic rhythm patterns preset which are ready to use. They will remain even when the power is turned off. 100 patterns are provided, numbered P00 – P99.

Internal patterns
Rhythm patterns which you may program. They will not remain in memory after the power is turned off. 100 patterns can be programmed, numbered I00 – I99.

Rhythm songs

Specify the playing order of several rhythm patterns to create a rhythm song. Up to 8 rhythm songs can be created.

Note:

The internal patterns and rhythm songs you create will not remain in memory after the power is turned off. If you want to keep the data you create, save it to disk or card (see page 97, 105).

The rhythm machine and sequencer

If sequencer data exists for the song selected when playing a rhythm song, the sequencer song will play together with the rhythm song.

If you want to play just the rhythm song by itself, press [TR1] – [TR8]. in sequencer mode to turn the sequencer tracks off, or select a song for which no sequencer data exists.

Since the rhythm machine can use patterns of differing time signatures, when a rhythm song with patterns of differing time signatures is played together with a sequencer song, it is possible that the measure numbers of the rhythm mode and sequencer mode will not match.

PLAYING RHYTHM PATTERNS

This is where you play rhythm patterns (preset patterns or internal patterns).

Note:

When the power is turned on, internal patterns are blank. To create internal patterns, see page 60.

(1) First press [RHYTHM]. You will get the following display (pattern play).

```
PTN PLAY) ▶Pattern  Time  Bar>Tempo>KBD
>toSONG     I00     4/4   2   120  RHY
```

If the display is as follows (song play), press the [ ] below "toPTN" to get the display shown above.

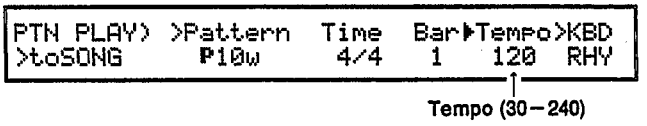
```
SONG PLAY)▶SONG     >Meas>Part>Tempo>KBD
>toPTN  1 :NewSong   001   001   120  RHY
```

(2) Making sure that the cursor is located at "Pattern", select the pattern you want to play. Press [INT] or [PRESET] to switch between preset patterns and intemal pattems. For example, if you have selected preset pattern 10, the display will be as follows.

```
PTN PLAY) ▶Pattern  Time  Bar>Tempo>KBD
>toSONG     P10w    4/4   1   120  RHY
                ↑
                └Selected pattern number
```

In this example, the "w" displayed after the "P10" indicates that data has been written into this pattern number. Pattern numbers not followed by a "w" have no data in them.

(3) Move the cursor to ">Tempo", and specify the playback tempo. The tempo is expressed as the number of quarter notes per minute. 30 is the slowest tempo, and 240 is the fastest tempo.

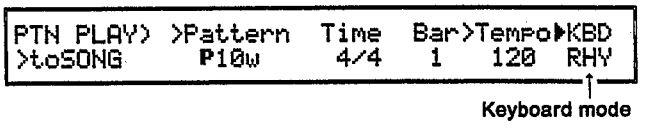


(4) Move the cursor to " > KBD", and select the function of the keyboard (the keyboard mode). This determines what the keyboard will do while you are playing rhythm patterns. Select from the following two choices.

RHY ..... The keyboard will play the rhythm sounds that have been assigned (arranged) across the keyboard.

SYN ..... The keyboard will play the performance or voice that was selected before you pressed [RHY].

When you enter record mode, you will automatically be able to hear the rhythm sounds. (I.e., you will temporarily be in rhythm machine mode.)



(5) Press [▷]. When playback starts, the " > toSONG" display will disappear, and the selected rhythm pattern will be repeatedly played back. The [TR1]–[TR8]. LEDs will light according to the instruments used. You can play the keyboard as specified in step (4).

(6) Press [□]. Pattern playback will stop immediately. To resume playback, press [▷]. To playback from the beginning, first press [◁◁] and [□] together, and then press [▷].

While playing rhythm patterns, you can do the following.

Change rhythm pattern numbers
Move the cursor to "Pattern" and select the next rhythm pattern. When the pattern currently being played finishes playing, the newly selected pattern will begin playing. (The rhythm pattern number of the newly selected pattern will blink until it actually begins playing.)

Change tempo
Move the cursor to "Tempo" and modify the tempo. Moving the data entry slider while pressing [RHYTHM] will also modify the tempo.

Change keyboard mode
Move the cursor to " > KBD" and change the setting to select whether the keyboard will play rhythm sounds or synthesizer sounds. This setting is effective only when in rhythm mode.

Whether the keyboard plays rhythm sounds or synthesizer sounds is determined by the transmit channel of the keyboard and the receive channel of each section. However, if this keyboard mode is set to "RHY", the keyboard will always play rhythm sounds when in rhythm mode *regardless* of the transmit channel and receive channel settings.

While playing back the rhythm machine, pressing [PERFORMANCE] or [SINGLE] will move to performance play mode or single play mode while continuing to play the rhythm machine. (In performance play mode and single play mode you will be able to select or edit performances or voices when in synthesizer edit mode.) To stop rhythm machine playback, press [PERFORMANCE], [SINGLE] or [RHYTHM] and then [□].

Note:
When in pattern mode, pressing [▷] will not start sequencer song playback. This means that when you stop pattern playback, return to sequencer mode, and press [▷], the sequencer playback and the rhythm pattern playback may go out of synchronization. To avoid this, press [◁◁] or [▷▷] when you enter sequencer mode, to reset the measure position. This will automatically adjust the rhythm pattern playback position.

When the rhythm machine is in song mode, the rhythm machine playback will automatically play the sequencer song, so there is no need for these steps.

Realtime recording and step recording

There are two ways to create rhythm patterns.

Realtime recording
While listening to the click sound, play the keyboard to record a rhythm pattern in realtime.

Step recording
Using a bar graph that divides a measure into small steps (32nd notes), specify the tuning for each rhythm instrument to play.

You can use any combination of these two methods. For instance, you might record the bass drum and hi-hat using step recording, and record the snare and toms using realtime recording, or use step recording to edit a pattern that was recorded in realtime.

Use the recording method most appropriate for each situation.

Before you begin recording

In both realtime recording and step recording, the parts you record will modify the existing pattern by adding or deleting sounds. For example, if a certain pattern contains a bass drum part of "dum dum dum dum", you may select this pattern and record additional sounds to this pattern.

Rhythm pattern recording can be divided into the following two situations.

(1) Recording a rhythm pattern from scratch.
You can record into a rhythm pattern that contains no data. If a pattern contains no data, a "w" will not be shown in the display. Patterns with a "w" indication such as "100w" have already been recorded.)

(2) Record using a rhythm pattern that has already been recorded.
You can record to a previously recorded rhythm pattern to modify it. The procedure will differ slightly depending on whether the pattern is an preset pattern or an internal pattern.

Recording using a preset pattern: Select a preset pattern number (P00 – P99) and begin recording. However, it is not possible to store your newly recorded data into a preset pattern. When you finish recording (after you press [□]), you will be asked which internal pattern you want to write the data into. Specify an internal pattern number I00 – I99 to write the pattern into. The preset pattern you used will not be modified in any way.

Recording using an internal pattern: Select an internal pattern number (I00 – I99) and begin recording. When you finish recording, the selected internal pattern will be replaced by the newly recorded pattern. If you want to record a new pattern while keeping the original pattern, use the pattern "copy" job (see page 66) to copy the original pattern to another location before recording.

To record a pattern in realtime, use the following procedure.

(1) Press [RHYTHM] to enter pattern play mode. (There is no need to do this if you are already in pattern play mode.) If you enter song play mode instead, press the [ ] below " > toPTN" in the display. The display will show as follows.

```
PTN PLAY> ▶Pattern  Time  Bar>Tempo>KBD
>toSONG     I00      4/4   2   120  RHY
```

(2) Press [▫], and you will be ready to record.

```
P.REC>>PTN >Time >Bar >Tempo >Qntz
▶Real  I00   4/4   2    120   1/16 >EXIT
```

You can press the [ ] below " >EXIT" in the display to return to the previous display.

(3) Make settings for the following six recording conditions.

Record mode .. Select "Real" (realtime recording) or "Step" (step recording). In this example we will select "Real".

PTN..... Select the pattern (I00 – I99 or P00 – P99) you want to record.

Time ..... Select a time signature from 1/4–8/4, 1/8–16/8, 1/16–32/16. However, if you are recording an already existing pattern, you will not be able to change the time signature.

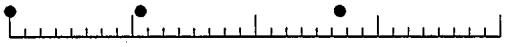
Bar..... Set the length of the pattern (1– 4 measures, i.e., "bars"). However if you are recording into an already existing pattern, you will not be able to change the pattern length.

Tempo ..... Set the tempo of the pattern (30 – 240 quarter notes per minute). Tempo can be changed after you start to record.

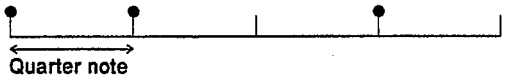
Qntz ..... Specify quantization. Quantization automatically corrects minor errors in timing. Select from l/4, l/6, l/8, l/12, l/16, l/24, l/32, or "off". When "off" is selected, quantization will not be used. (Notes will be recorded with an accuracy of 1/48th of a quarter note.) Quantization can be changed after you start to record, allowing you to use different quantization settings when recording each sound.

About quantization

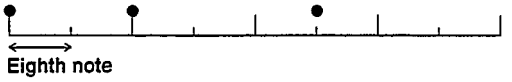
These examples show how quantization would correct minor timing errors if you recorded a pattern with a 4/4 time signature, playing notes at the timing indicated by "o" in the following diagram.



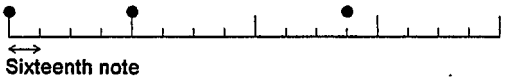
If quantization was set to "1/4", the notes would be moved to the nearest quarter note.



If quantization was set to "1/8", the notes would be moved to the nearest eighth note.



If quantization was set to "1/16", the notes would be moved to the nearest sixteenth note.



Note:

When recording triplets, use a quantization setting such as "1/12" or "1/24".

(4) Play the keyboard to hear the location of the sound you want to use. Each of the 61 notes of the keyboard has a different sound assigned to it. So you won't have to hunt for the correct sound while recording, make sure of the location of each sound you will be using.

(5) Press [▷]. The metronome (click) will begin sounding with the time signature you selected.

(6) Play the notes to sound the desired rhythm instruments at the correct timing. There is no need to play all the instruments at once. As the pattern repeats, you can add each instrument one by one. For example, you might record the bass drum first, next the hi-hat, etc.

If necessary, you can adjust the tempo and quantization. However quantization will become effective on the next repetition of the pattern. (The

newly selected quantization value will blink until it actually becomes effective.)

For patterns that are two or more measures (bars) long, check the "Bar" display while recording. 1 indicates the first measure, 2 indicates the second measure, and so on.

If you make a mistake, use [−] (ERASE). While pressing [−] (ERASE), play the note at the beat you wish to erase. The note will be erased from that point in the pattern. While pressing [−], you can continue holding down a note to erase it from the entire pattern.

(7) Press [■]. This will stop realtime recording. You will automatically return to pattern play mode. When you press [▷], the pattern you just recorded will play.

If you want to modify or correct the pattern, repeat steps (2) – (7).

If you have been recording a preset pattern, you will get the following display.

```
P.REC) Store Pattern
        ▶ptnI**                    >GO >EXIT
```

Select the internal pattern number in which to store your new pattern, and press the [ ] below " > GO". A message of "Are you sure?" will appear, so press [+1]. This completes realtime pattern recording.

STEP RECORDING

Use the following proceedure to step record a rhythm pattern.

(1) Press [RHYTHM] to enter pattern play mode. (There is no need to do so if you are already in this mode.) If you enter song play mode, press the [ ] below " > toPTN" in the lower left of the display. You will get the following display.

```
PTN PLAY) ▶Pattern  Time  Bar>Tempo>KBD
>toSONG     I00      4/4   2   120  RHY
```

(2) Press [○]. You are now ready to record.

```
P.REC)>PTN >Time >Bar >Tempo >Qntz
▶Real  I00   4/4   2    120   1/16 >EXIT
```

Pressing the [ ] below " > EXIT" will return you to the previous display.

(3) Make settings for the following six recording conditions.

Record mode
Select "Real" (realtime recording) or "Step" (step recording). In this example we will select "Step".

PTN
Select the pattern (I00 – I99 or P00 – P99) you want to record.

Time
Select a time signature from 1/4–8/4, 1/8–16/8, 1/16–32/16. However if you are recording an already existing pattern, you will not be able to change the time signature.

Bar
Set the length of the pattern (1 – 4 measures, i.e., "bars"). However, if you are recording an already existing pattern, you will not be able to change the pattern length.

Tempo
Set the tempo of the pattern (30 – 240 quarter notes per minute). Tempo can be changed after you start to record.

Qntz
Specify quantization. Quantization automatically corrects minor errors in timing. Select from 1/4, 1/6, 1/8, 1/12, 1/16, 1/24, 1/32, or "off". When "off" is selected, quantization will not be used. (Notes will be recorded with an accuracy of 1/48th of a quarter note.) Quantization can be changed after you start to record, allowing you to use different quantization settings when recording each sound.

(4) Press [▷] to get the following display.

```
Bar1:♪ |-------+-------+-------+-------|
 ptnI00  ▶Qntz  >BD1                ÷    ÷
```

Step recording is done using this "bar graph" display.

(5) Select the quantize setting, and play the desired sounds from the keyboard. (This procedure will be

explained in detail in the next section.) Repeat this procedure to record each sound.

(6) Press [□] to end step recording. You will return to pattern play mode for the pattern you just recorded. When you press [▷], the pattern you just recorded will play.

If you decide to modify or correct the pattern, repeat steps (2) – (6).

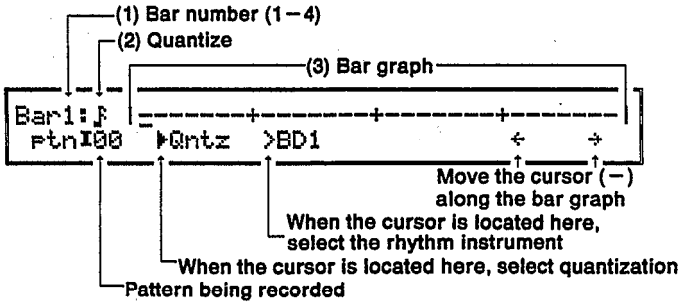
If you have been recording using a preset pattern, you will get the following display.

```
P.REC) Store Pattern
        ▶ptnI**              >GO >EXIT
```

Select a pattern number to write your newly recorded pattern into, and press the [ ] below " >GO". You will get a message of "Are you sure?", so press [+1]. This completes step recording.

USING THE BAR GRAPH

First we will explain the various items in the bar graph display. The bar graph shows the following information.



(1) Bar number

This shows the number of bars (measures) in this pattern. The bar graph (3) displays one measure at a time, so when creating a pattern of 2 or more measures, this number will indicate where you are in the pattern.

(2) Quantize

This shows the quantize setting you specified in the " > Qntz" setting before pressing [▷]. To change the quantize setting while recording, move the cursor to " > Qntz" and press one of the following keys.

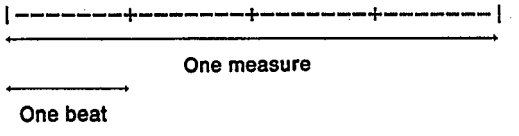
[3] (♩)..... Set quantization to 1/4 (quarter note)
[4] (♪)..... Set quantization to 1/8 (eighth note)
[5] (♬)..... Set quantization to 1/16 (sixteenth note)
[6] (𝅘𝅥𝅯)..... Set quantization to 1/32 (thirty-second note)
[9] (↬)..... Set quantization to 1/6, 1/12, or 1/24. When quantization is set to 1/4 (♩), pressing this key will set quantization to 1/6 (♩↬). When quantization is set to 1/8 (♪), pressing this key will set quantization to 1/12 (♪↬). When quantization is set to 1/16 (♬), pressing this key will set quantization to 1/24 (♬↬). Pressing this key again will erase the ↬ symbol.
[0]..... Turn quantization off.

Note:

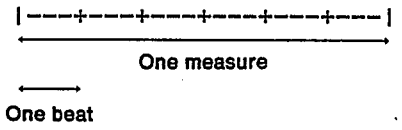
Quantization can be modified only when the cursor (–) is at the beginning of the bar graph. If the cursor is anywhere else when you modify the quantization, the displayed quantization value will blink (indicating that it is not yet active) until you return the cursor to the beginning of the bar graph.

(3) Bar graph

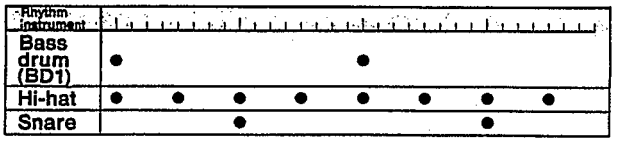
The bar graph displays the data of a single rhythm instrument for one measure. For example, if the time signature is 4/4, the bar graph will be as follows.



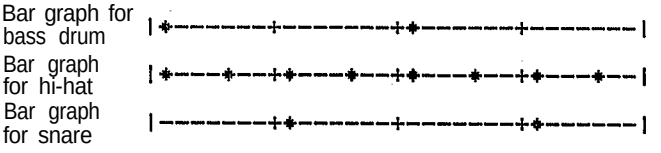
Or, if the time signature is 6/8, the bar graph will be as follows.



Each " – " or " + " indicates a 32nd note. This bar graph will display only a single instrument at a time. Suppose you are recording a rhythm pattern with three parts as shown in the following diagram.

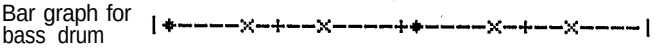


In this case you would input the bass drum, hi-hat, and snare as shown in the following three bar graphs.



The "◆" indicates a sound at a 32nd note interval.

Nearly any type of rhythm (in 32nd note steps) can be entered in this way. However, 32nd notes cannot create triplets or subtle rhythmic effects of playing slightly ahead of or behind the beat. In these situations where you need even finer rhythmic control, a 32nd note can be divided into six steps. For example, the following bar graph shows a bass drum entered as two steps of a triplet (♩↳₃).



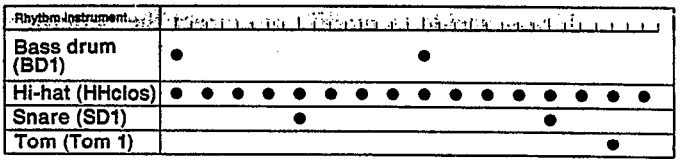
The "X" indicates that the actual timing of the note not precisely on an interval of a 32nd note, but is "several 1/6ths of a 32nd note" after the indicated position. Since the bar graph is in steps of a 32nd note, the precise actual position is indicated by a special character (see below).

When entering a pattern with quantize turned off, each of these 32nd notes will be subdivided into 6 steps. Pressing the [ ] switches below the "←" and "→" will move the cursor backwards and forwards through the pattern in steps of 1/6 of a 32nd note. The following special characters will indicate your exact position.

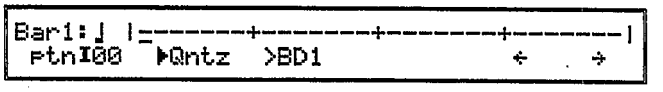
1 .... 1/6 position
2 .... 2/6 position
⋮ ⋮
6 .... 6/6 position

Press [◀◀] or [▶▶] to move the cursor in steps of a 32nd note.

Here is an example of using step recording to create a pattern. We will be creating the following 4/4 pattern of one measure.



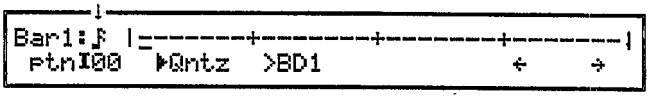
We begin with the following display.



(1) Set quantize: As you can see from the chart, the rhythm pattern in our example does not use 32nd notes. The shortest intervals are the 16th notes of the hi-hat, so we will use 16th note quantization to enter this pattern.

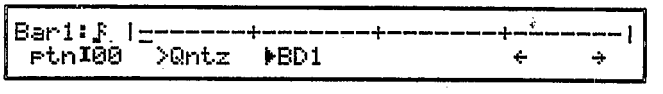
Make sure that the cursor is at "Qntz" (quantize) and press [5] (♪). (Quantize can also be set when making the recording condition settings in the previous display.)

The selected quantization is displayed here

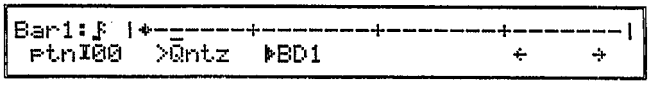


Press the [ ] keys below the "←" and "→" in the display, and notice how the cursor (–) moves to left and right. Since we have set quantization to 1/16, the cursor will skip every other " – " (32nd note). Before you continue, move the cursor back to the beginning of the bar graph.

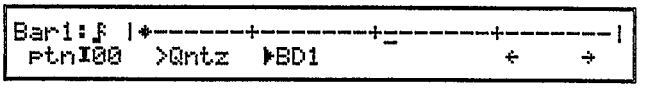
(2) Input the bass drum pattern: Move the cursor (▶) to "> BD1" to get the following display.



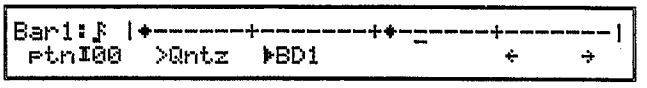
Play the A1 note on the keyboard. (In this example we assume that the rhythm assign (see page 69) is set to PRESET 1.) A ◆ appears where the cursor (_) was, and a bass drum note is input for the first beat.



Press the ▭ under the "→" seven times. The cursor (_) will move to the third beat.



Play the A1 note (BD1) again, entering a bass drum note at the third beat. The display will show as follows.

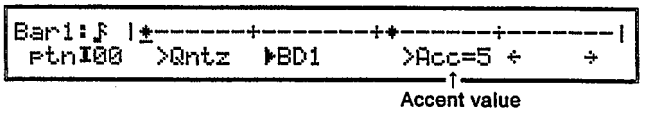


A bass drum has now been input on the first and third beats.

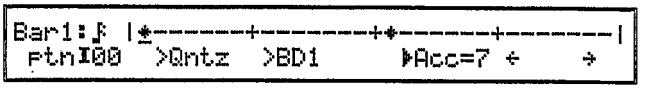
If you make a mistake

If you input a note in the wrong position, move the cursor (_) to the position of the wrong ◆, and play the same note again while pressing ▭ (ERASE). The ◆ will disappear, and the wrong note will be erased.

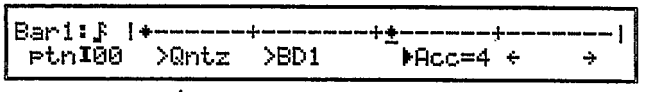
Move the cursor (_) back to the first beat to get the following display.



This "Acc" (accent) setting determines the dynamics force (volume) of that note. You can give each note a different volume from 0 (minimum) to 7 (maximum). In this example, we will set the bass drum of the first beat to 7, and the bass drum of the third beat to 4. With the cursor at the first beat, set "Acc = 7".

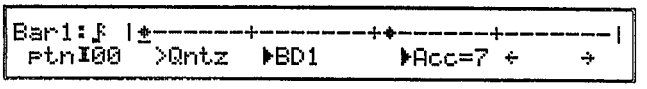


Move the cursor to the third beat and set "Acc = 4".

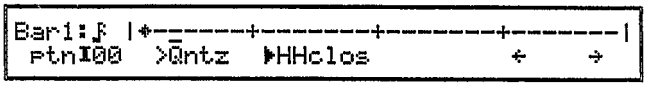


This completes the bass drum input for the pattern.

(3) Next we will input the hi-hat pattern. Move the cursor (_) to the beginning of the measure.



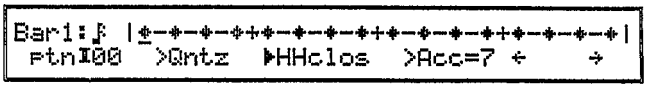
Play the note A2 (HHclos) on the keyboard. The instrument will change to hi-hat, and a hi-hat will be entered in the first beat. If at this time the cursor (▶) is at the position of the instrument name, the graph display wil change to show that instrument.



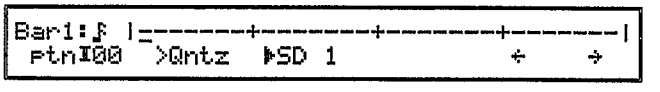
Input the hi-hat pattern in the same way as you input the bass drum pattern.

If necessary, add an accent to each note.

(4) Next we will enter the snare pattern. Move the cursor (_) to the beginning of the measure, and move the cursor (▶) to the instrument name position.

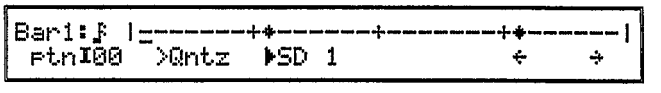


While pressing the ▭ below the instrument name, play the F#l note (SD1) on the keyboard. The display will automatically switch to show the snare drum pattern.



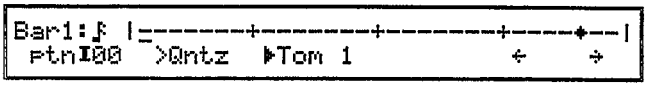
In this way, playing a note while pressing the ▭ below the instrument name will switch instruments without recording a note into the pattern.

Input the snare pattern as follows.



If necessary, add an accent to each note.

(5) Using the same proceedure, enter the tom (Tom 1: F2 key) pattern.



If necessary, add an accent to each note.

This completes our pattern.

Note:

In this example we have entered the entire pattern without changing the quantize setting, but it is also possible to change the quantize setting while recording a pattern. If quantize is changed, it will become effective from the next measure, and will blink until it becomes effective.

In this example, we have assumed that the rhythm instruments are assigned to the keyboard as when rhythm assign is set to “PRESET 1”.

PATTERN JOB FUNCTIONS

There are many ways to edit the patterns you create. We will start our explanation of pattern editing from the following display.

```
PTN PLAY) ▶Pattern  Time  Bar>Tempo>KBD
>toSONG     I00     4/4   2   120  RHY
```

If you are in song play mode, press the [ ] below “ > toPTN”, entering pattern mode. Press [JOB] to get the following display.

```
PATTERN JOB SELECT)      Select one !
     >Copy>Clr>Setup>Inst>Asgn      >EXIT
```

Pressing the [ ] below “ >EXIT” will return to the previous display.

Copy

Press the [ ] below “ > COPY”.

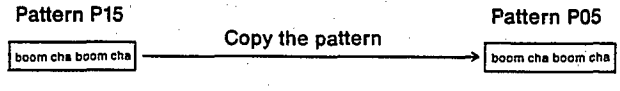
```
PTN COPY)
 ▶ptnI00w+ ptn***  →  ptnI**   >GO >EXIT
```

■ **Function**

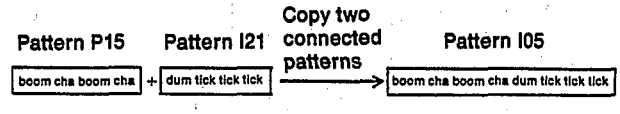
Copy a pattern to another pattern number.

■ **Explanation**

When only one pattern is specified as the copy source, the pattern will be copied to the internal pattern memory you specify.



If you specify two patterns as the copy source, the specified patterns will be connected and copied to the destination. (The total measures of the two source patterns will be the length of the new destination pattern.)



Copy sources may be preset patterns or internal patterns. After specifying the source pattern(s) and the ‘destination pattern, press the [ ] below “ > GO”.

You will get a message of "Are you sure?". When you press [+1], pattern copy will be executed.

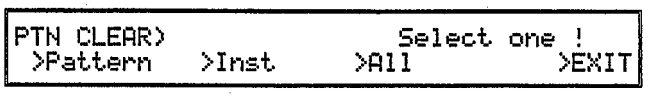
Note:

It is not posible to copy patterns to preset pattern memory.

When copying two patterns to another pattern, the two source patterns must have the same time signature. Also, the total length of the two source patterns must not exceed four measures. If the two source patterns contain an unusually large number of notes, it may be impossible to copy them to another pattern.

Clear

Press the [ ] below " > CLR".



(1) Pattern clear

■ **Function**
Clear the contents of the specified pattern.

■ **Explanation**
When you press the [ ] below " >Pattern", the pattern number will be displayed. After specifying the pattern number, press the [ ] below " > GO", and you will be asked "Are you sure?". When you press [+1], the specified pattern will be cleared.

Note:
It is not possible to clear a preset pattern.

(2) Instrument clear

■ **Function**
Clear only a specified instrument from a pattern.

■ **Explanation**
Press the [ ] below " > Inst", and the pattern number and the instrument to be cleared will be displayed. After specifying the pattern number and the name of the instrument to be cleared, press the [ ] below " >GO", and you will be asked "Are you sure?". When you press [+1], the specified pattern will be cleared.

Note:
It is not possible to execute this function for a preset pattern.

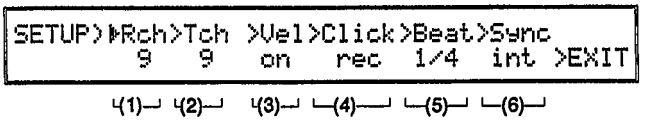
(3) All pattern clear

■ **Function**
Clear all internal pattern memories.

■ **Explanation**
Press the [ ] below " > All", and you will be asked "Are you sure?". When you press [+1], all the internal pattern memories will be cleared.

Setup

Press the [ ] below " > SETUP".



These settings are shared with the settings of the setup job in song play mode. They affect various overall operation of the rhythm machine, and will remain memorized even when the power is turned off.

(1) Receive channel

■ **Function**
Set the receive channel of the rhythm machine.

■ **Settings**
1 – 16, omn

■ Explanation
This specifies the MIDI channel that the rhythm machine will receive. Select a receive channel from the following.

1 – 16... The rhythm machine will produce sound only in response to data received on this channel. When controlling the rhythm machine from external MIDI devices, set this receive channel to match the transmit channel of the controlling device.

omn ..... The rhythm machine will produce sound in response to data received on any channel.

Note:
Even if the keyboard transmit channel (see page 99) and the MIDI channel received by the rhythm machine do not match, the keyboard will play the rhythm instruments while in rhythm mode *if* the "KBD" setting (see page 59) is set to "RHY".

(2) Transmit channel

■ **Function**
Set the transmit channel of the rhythm machine.

■ **Settings**
off, l – 16

■ **Explanation**
Set the MIDI channel transmitted by the rhythm machine. Select a transmit channel from the following.

off .....The rhythm machine will not transmit MIDI data.

1 – 16... The rhythm machine will transmit MIDI data on the specified channel. When using the rhythm machine to control an external rhythm machine, set this to the MIDI receive channel for the external rhythm machine.

(3) Velocity

■ Function
Determine whether or not the rhythm machine uses velocity data.

■ Settings
off, on

■ Explanation
This setting determines whether or not the velocity (the force with which you play a note) will affect the sound. When "off" is selected, notes will be played with an accent of 5. When “on” is selected, each note will be played with an accent determined by the key velocity.

(4) Click

■ Function
Determine when the click will be heard.

■ Settings
rec, play

■ Explanation
This setting determines when the built-in metronome will be heard. When “rec” is selected, the click will be heard only during realtime recording. When “play” is selected, the click will be heard during playback and realtime recording.

(5) Beat

■ Function
Set the time signature of the click.

■ Settings
1/4, 1/6, 1/8, 1/12, l/24, 1/32

■ Explanation
This setting determines the time signature of the click. (The first beat of the measure is indicated by a higher-pitched beep.)

(6) Sync mode

■ Function
Select the clock (timing source) for the rhythm machine.

■ Settings
int, MIDI

■ Explanation
This setting selects what will control the tempo of the rhythm machine. Select one of the following.

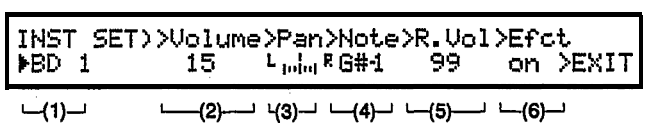
int ..... Tempo will be controlled by the internal clock. Normally this is the setting you will select.

MIDI... MIDI clock signals will determine the tempo. Select this setting when you want to control the tempo of the V50 rhythm machine from an external rhythm machine.

Note:
The clock selected here applies to both the rhythm machine and the sequencer. If you select “MIDI clock" here, the sequencer will also be set to MIDI clock. This setting can also be made from the sequencer mode (see page 89).

Inst settings

Press the [ ] below “ > INST”.



These settings are shared with the instrument settings of the setup job in song play mode.

(1) Instrument

■ Function
Select the rhythm instrument you wish to set.

■ Settings
BD 1 – VbrSlp

■ Explanation
The following settings (2) – (4) are made independently for each of the 61 rhythm instruments. This is where you select the rhythm instrument for which to make settings. Voice names can also be specified by playing the keyboard.

(2) Volume

■ Function
Set the volume of each instrument.

■ Settings
0 – 15

■ **Explanation**

Set the volume of the instrument you selected in (1). 0 is minimum and 15 is maximum volume.

(3) Pan

■ **Function**

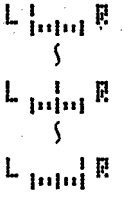
Set the pan position of each instrument.

■ **Settings**

L – R (7 steps)

■ **Explanation**

Set the pan position (the position of the sound when played in stereo) of the instrument you selected in (1) over the following seven steps.



..... Far left

..... Center

..... Far right

Note:

If only the L output is connected to an amp, you will hear the sound in mono, and this setting will have no effect. (You will hear the stereo sound if listening to headphones, however.)

(4) Note

■ **Function**

Set the MIDI note number of each instrument.

■ **Settings**

C-2 – C8

■ **Explanation**

Set the MIDI note number of the instrument you selected in (1).

(5) Rhythm volume

■ **Function**

Set the volume of the entire rhythm machine.

■ **Settings**

0 – 99

■ **Explanation**

This setting determines the volume for the entire rhythm machine. It has no connection with the instrument selected in (1).

Use this setting to adjust the volume balance of the rhythm machine and the synthesizer. 0 is minimum, 99 is maximum volume.

Note:

The synthesizer also has a setting for overall synthesizer volume. Use these two settings to adjust the volume balance between the rhythm machine and synthesizer.

(6) Effect select

■ **Function**

Determine how effect processing will apply to the rhythm machine.

■ **Settings**

off, on, mix

■ **Explanation**

This setting has no connection with the instrument selected in (1). It affects the entire rhythm machine.

This setting determines whether the effects unit will process the sound of the rhythm machine. The same effect will apply to both the rhythm machine and the synthesizer. It is not possible to use a different effect for the rhythm machine.

Select one of the following

off..... The rhythm machine sound will not be processed.

on ..... The rhythm machine sound will be processed, and stereo mix will not be used, meaning that all rhythm instruments will sound in the center of the stereo field.

mix ..... The rhythm machine sound will be processed, and stereo mix will be used, preserving the stereo placement of the rhythm instruments.

Rhythm assign

Press the [—] below " > ASGN".

These settings are shared with the settings made in the song play mode job rhythm assign. Rhythm assign determines which rhythm instrument will sound when each key is played; i.e., the instrument layout across the keyboard. This setting is remembered even when the power is turned off.

The V50 has three "instrument layouts" in permanent memory; PRESET 1 – 3. (These cannot be modified.) PRESET 1 – 3 are set as follows.

PRESET 1 is set to match the key assignments of the Yamaha RX series rhythm programmers. However,

sounds that the RX series assigns to keys outside of the 61-note range of the V50 have been assigned within the V50 key range.

PRESET 2 has a basic drum set assigned to the third octave (the octave begining with C3). The white keys of octave 1 have bass drum sounds, the white keys of octave 2 have snare drum sounds, and the white keys of octaves 4 and 5 have toms. Percussion sounds are assigned to the black keys. (There are some exceptions.)

PRESET 3 is set to match the key assignments of the Yamaha Clavinova series. However, since the sounds themselves are different, not all assignments are the same.

Normally you will select one of these presets. In the above display, you can check the rhythm instrument assignments by moving the cursor to "Key" and playing a key. The rhythm instrument assigned to that key will be displayed.

To create your own rhythm instrument assignment, select a user assign memory USER 1 or USER 2.

Move the cursor to "Key", and select a key. Then move the cursor to "instrument" and select a rhythm instrument. You can also select "none", in which case no rhythm instrument will sound when that key is played. Repeat these steps to assign instruments to the 61 keys.

You can create two entirely different setups (USER 1 and USER 2).

PLAYING RHYTHM SONGS

This section explains how to play a rhythm song.

Note:

When the power is turned on, the rhythm song memory is empty. To play a rhythm song, you must create a rhythm song or load an existing rhythm song from card or disk. Page 72 explains how to create a rhythm song. To load rhythm data, see page 98 (from card) or page 105 (from disk).

Here we will explain the procedure for playing a song from the beginning. If you want to play a rhythm song from a measure other than the beginning, you can specify the starting measure while making settings for steps (2)–(4). (Move the cursor to ">Meas" and specify the starting measure, or press [◀◀] [▶▶] to specify the starting measure:)

(1) Press [RHYTHM] to get the following display (rhythm song play).

```
SONG PLAY)▶SONG     >Meas Part>Tempo>KBD
>toPTN  1w:Moon       001  001   120  RHY
```

If the following display appears, press the [ ] below "toSONG" to get the above display.

```
PTN PLAY) ▶Pattern  Time  Bar>Tempo>KBD
>toSONG     I00      4/4   2   120  RHY
```

(2) With the cursor at "SONG", select one of the 8 rhythm songs.

```
SONG PLAY)▶SONG     >Meas Part>Tempo>KBD
>toPTN  1w:Moon       001  001   120  RHY
```

Song number ↑ ↑ Song name

The "w" after the rhythm song number indicates that data has already been written for this song. If no "w" is displayed, no data exists for that rhythm song.

(3) Move the cursor to ">Tempo" and set the playing tempo. The tempo is indicated as the number of quarter notes per minute. 30 is the slowest tempo, and 240 is the fastest tempo.

(4) Move the cursor to ">KBD" and set the function of the keyboard (the keyboard mode). This will determine what sounds the keyboard will play when you are in song play mode. Select one of the following two choices.

RHY .....The keyboard will play the rhythm sounds assigned to each key.

SYN ..... The keyboard will play the performance or voice selected before [RHY] was pressed.

(5) Press [▷] and the selected rhythm song will begin playing. The ">toPTN" display will disappear, and the currently playing measure number and pattern name will be displayed. When you play the keyboard, you will hear the sound selected in (4).

(6) Press [□] and the rhythm song will stop playing. To continue from where you stopped, press [▷]. To begin start from the beginning, press [□] and [◀◀] together, and then press [▷].

While a rhythm song is playing, you can do the following.

Change the tempo

When the cursor is at ">Tempo", you can change the tempo. You can also modify the tempo using the data entry slider while holding [RHYTHM].

Change the keyboard mode

When the cursor is at ">KBD", you can set the keyboard mode, selecting whether the keyboard will play rhythm sounds or synthesizer sounds. This setting is effective only when in rhythm mode.

Whether the keyboard plays rhythm sounds or synthesizer sounds is determined by the transmit channel of the keyboard and the receive channel of each section. If this keyboard mode is set to "RHY", the keyboard will always play rhythm sounds when in rhythm mode *regardless* of the transmit channel and receive channel settings.

While the rhythm machine is playing, you can press [PERFORMANCE] or [SINGLE] to move to performance play mode or single play mode while continuing to play the rhythm machine. (You will be able to select and edit performances or voices.) To stop rhythm machine playback, press [□]. However, when in synthesizer edit mode, return to play mode and then press [□].

CREATING RHYTHM SONGS

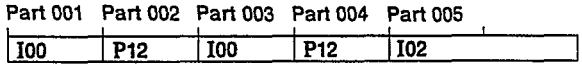
First we will explain some important points to remember when creating rhythm songs.

Parts and patterns

A rhythm song is created by inputting rhythm pattern numbers into "parts". These "parts" are numbered 001, 002, 003 ..., and are played back in order. Suppose we input the following rhythm patterns into the first five parts.

Part 001 = Pattern I00 (a one-measure pattern)
Part 002 = Pattern P12 (a one-measure pattern)
Part 003 = Pattern I00 (a one-measure pattern)
Part 004 = Pattern P12 (a one-measure pattern)
Part 005 = Pattern I02 (a two-measure pattern)

This would play back as follows.



Note:

Parts extend from 001 to 999. As in the above example, the number of parts in a song is not necessarily the same as the number of measures in the song.

Special non-pattern functions

We have explained that a pattern is assigned to each part, but in addition to this, repeat, volume change, tempo change, and mark data can also be assigned to a part.

(1) Repeat (begin, end)

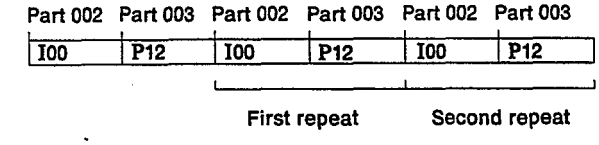
The area surrounded by a repeat begin ‖: and repeat end :‖ mark will be played the specified number of times. Specify a repeat as follows.

[‖:] [Parts to be repeated] [:‖ × Times]
Number of repeats

The following is an example of how repeat marks can be used.

Part 001 = ‖:
Part 002 = PTN 100
Part 003 = PTN P12
Part 004 = :‖ x 2

When this song is played, the actual playback will be as follows.



Note:

Repeat marks can be nested as follows.
[‖:] [part] — [part] [‖:] [part] — [part] [:‖] [:‖]

(2) Volume change

This specifies a change in the rhythm machine volume during the song. Specify a volume change as follows.

[Vol + Amount of change]
The amount of change in volume
+ indicates an increase in volume,
– indicates a decrease in volume

The following is an example of how volume changes can be used.

Part 001 = PTN 100
Part 002 = Vol + 25
Part 003 = PTN P12

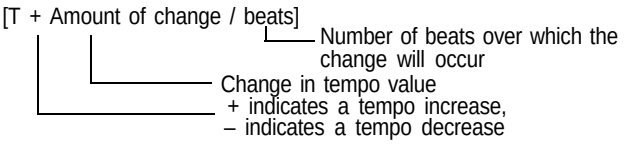
When this song is played, after playing the pattern for part 1, the volume will increase slightly, and the pattern for part 3 will be played.

Note:

Volume change is specified as an increase or decrease in the instrument setting rhythm volume (R.Vol). However it is not possible to exceed the present rhythm volume (R.Vol). If' you want to raise the volume in the middle of the song, insert a volume decrease at the beginning of the song.

(3) Tempo change

This specifies a change in rhythm tempo during a song. Specify a tempo change as follows.



This can be used as in the following example.

Part 001 = PTN 100
Part 002 = T + 20/4
Part 003 = PTN P12

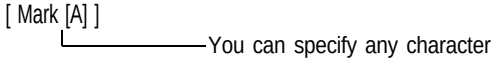
When this song is played, after the pattern of part 001 is played, the tempo will begin increasing while part 003 plays. (If the pattern used by part 003 is in a time signature of 4/4, the tempo change will end when the fourth beat ends.)

Note:

Tempo change is specified as an increase or decrease in the currently set tempo. If the tempo is already at the maximum of 240, it cannot be increased further. If tempo is already at the minimum of 30, it cannot be decreased further.

(4) Mark

It is often convenient to specify a "mark" in a song, and use the "search" function to jump to the specified location so that you can edit or playback from that point. Especially when creating long rhythm songs, it can be time-consuming to find the location you want. For example, setting a mark at the beginning of the chorus, or at the top of the second verse, will help you find sections you frequently need to locate. Specify a mark as follows.



This can be used as in the following example.

Part 256 = PTN 152
Part 257 = Mark [A]
Part 258 = PTN 168

Note:

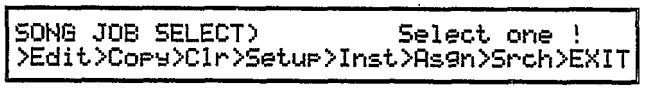
Any character can be used as a mark, and you can set as many as you like. However, only the first seven marks in the song can be searched for. To search for a part using the mark, see page 75 (while editing) or page 77 (while in play mode).

To create a rhythm song, use the rhythm edit functions in the following procedure.

If you are in pattern play mode, press the [ ] below "toSONG" to move to song play mode.

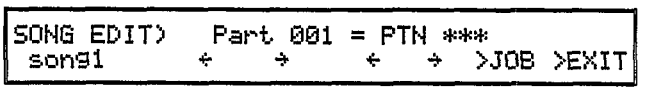
(1) Select the song number you want to create. Make sure that the cursor is located at ">SONG", and select a song 1–8. Songs that have already been written will be indicated by a "w" after the song number.

(2) Press [JOB] to get the following display.



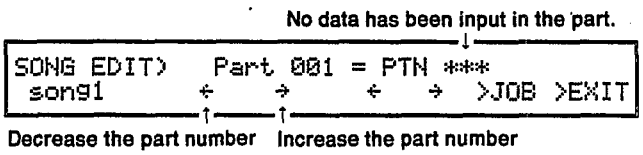
Pressing the [ ] below ">EXIT" will return you to the previous display.

(3) Press the [ ] below ">Edit" to get the following display.

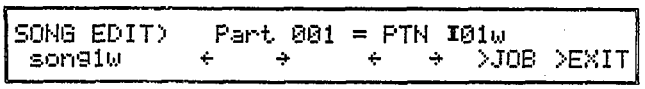


This is where you create a rhythm song. Parts for which no data has been input will be indicated by a blinking "= PTN ***".

(4) Select the part number using the [ ] keys below the left **"←"** and **"→"**. When creating a new song, be sure to start with part 001.



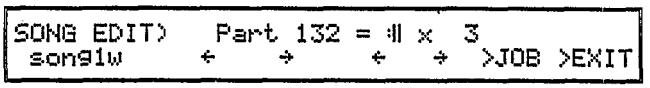
(5) Using the data entry slider, the numeric keys, or [−1] [+1], select the pattern to input. Pressing [INT] or [PRESET] will switch between internal patterns and preset patterns. Patterns will be selected as shown in the following display.



When entering repeat, volume change, tempo change, or mark data instead of a pattern, press the [ ] keys below the right **"←"** and **"→"** while the "=Pattern ***" display is blinking. The [ ] keys below the right **"←"** and **"→"** will step through " = PTN***", **"𝄆 "**, **" 𝄇 x 0"**, "Vol+0", "T+ 0/0", and "Mark **[]"**.

Select the data you want, and specify a number (repeat times, or amount of volume change) if necessary. Use the [ ] keys below the right **"←"** and **"→"** to move between the tempo change settings "value" and "beats".

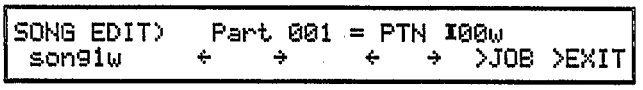
An example is shown in the following display.



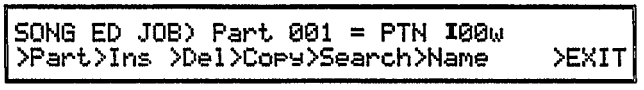
(6) Repeat steps (4) and (5) to specify the patterns for each part. The next section will explain how to delete a part that was entered by mistake, or to insert a new part between previously entered parts.

(7) When you have finished creating the rhythm song, press the [ ] below ">EXIT" twice. This ends rhythm song editing, and returns to song play mode.

While editing a rhythm song as explained in the previous section, several editing jobs can be performed. While editing a rhythm song, the display will be as follows.



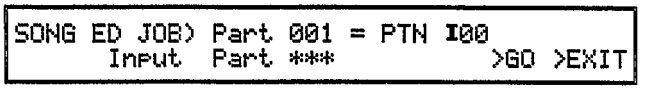
Press the [ ] below " > JOB" to get the following display.



This is where you select the editing operation.

Jump

Press the [ ] below " > Part".



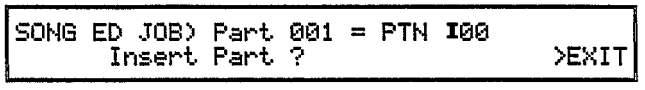
■ **Function**
Jump to a specified part number.

■ **Explanation**
Input the part number you want to jump to, and press the [ ] below " > GO".

Note:
If you specify a part number for which no data has been entered, you will jump to the part after the last entered part.

Insert

Press the [ ] below " > Ins".

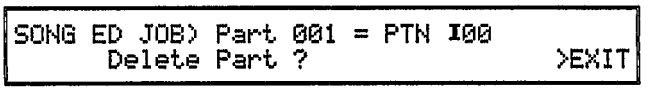


■ **Function**
Insert a part.

■ **Explanation**
This inserts a part in front of a previously entered part. The following parts will be moved back one. When you press [+1], a part will be inserted in front of the currently selected part, and " =PTN***" will begin blinking. Now you can enter a pattern number, or a repeat, volume change, tempo change, etc.

Delete

Press the [ ] below " > Del".

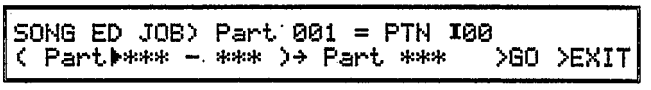


■ **Function**
Delete a part.

■ **Explanation**
This deletes the currently selected part. The following parts will be moved forward one. When you press [+1], the currently displayed part will be deleted.

Copy

Press the [ ] below " > Copy".



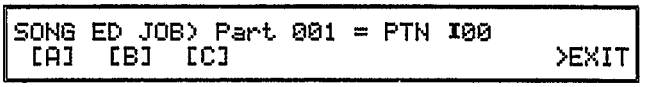
■ **Function**
Copy the specified range of parts to another location.

■ **Explanation**
This copies the parts specified by "(Part *** - ***)" and places them in front of the part specified in "→ Part ***". After specifying the three part numbers, press the [ ] below " > GO". When the display asks "Are you sure?", press [+1], and the parts will be copied.

Note:
If you want to copy only one part, specify the same part number for both locations of "(Part *** - ***)"

Search

Press the [ ] below " > Search".



■ **Function**
Jump to a marked part.

■ **Explanation**

This jumps directly to a part you specified using a mark. Marks will be displayed in the lower line. Press the ▭ below the mark to which you want to jump. The display will immediately show the part that contains the mark.

Note:

If no marks have been entered, you will not be able to use the Search function.

Song name

Press the ▭ below " > Name".

```
SONG ED JOB> Part 001 = PTN I00
     name : NewSong        ←   →    >EXIT
```

■ **Function**

Give a song an 8-character name.

■ **Settings**

Maximum 8 characters.

■ **Explanation**

Enter a name for the song. Page 17 explains how to enter characters.

SONG JOB FUNCTIONS

Songs you create can be edited in many ways. Begin song editing from song play mode as follows.

```
SONG PLAY>▶SONG     >Meas>Part>Tempo>KBD
>toPTN  1 :Moon      001  001  120  RHY
```

If you are not in pattern play mode, press the ▭ below " > toSONG" to enter song play mode. Press JOB to get the following display.

```
SONG JOB SELECT>          Select one !
>Edit>Copy>Clr>Setup>Inst>Asgn>Srch>EXIT
```

Press the ▭ below " > EXIT" to return to the previous display.

Song edit

Press the ▭ below " > Edit".

```
SONG EDIT>   Part 001 = PTN I00
 song1      ←    →     ←    →  >JOB >EXIT
```

This display has been explained in *Creating Rhythm Songs* (page 72) and *Editing a rhythm song* (page 75).

Song copy

Press the ▭ below " > Copy".

```
SONG COPY>
 ▶from SONG 1w   to SONG *      >GO >EXIT
```

■ **Function**

Copy a song to another song.

■ **Settings**

1–8

■ **Explanation**

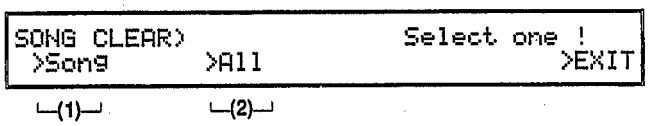
Copy the song specified by the left number to the song specified by the right number. After setting the two song numbers, press the ▭ below " > GO". When "Are you sure?" is displayed, press +1, and the song will be copied.

Note:

The original song data in the copy destination will be erased.

Song clear

Press the ▭ below " > Clr".



(1) Song clear

■ **Function**
Clear the contents of the specified song.

■ **Explanation**
When you press the ▭ below " > Song", the display will allow you to enter the song number. After specifying the song number, press the ▭ below " > GO", and you will be asked "Are you sure?". Press +1 and the song will be cleared.

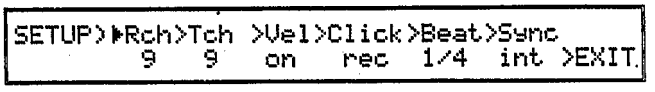
(2) Clear all songs

■ **Function**
Clear all songs 1 - 8.

■ **Explanation**
When press the ▭ below " > All", you will be asked "Are you sure?". Press +1 and all songs will be cleared.

Setup

Press the ▭ below " > Setup".



Settings in this job are shared with the settings in the pattern job "Setup". For details see page 67.

Inst settings

Press the ▭ below " > Inst".

Settings in this job are shared with the settings in the pattern job "Instrument settings". For details see page 68.

Rhythm assign

Press the ▭ below " > Asgn".

Settings in this job are shared with the settings in the pattern job "Rhythm assign". For details see page 69.

Search

Press the ▭ below " > Srch".

■ **Function**
Jump to a marked part, ready to begin song play.

■ **Explanation**
This jumps directly to a marked part. Press the ▭ below the mark you want to jump to, and the display will move to the selected part.

Note:
This cannot be used if no marks have been entered.

CHAPTER 5. USING THE SEQUENCER

This chapter explains how to use the V50 sequencer. You will learn how to record and edit your own original songs.

ABOUT THE SEQUENCER

What is a sequencer?

A sequencer is a device that records a musical performance and plays it back. The data recorded by a sequencer is not sound, but the actual musical performance. This means that is possible to replay the same notes using a different voice than when recording, or to freely change the tempo. It is also possible to edit a certain section of the song, or rearrange the entire song.

Tracks

The V50 sequencer has eight "tracks". A track is a single part (the part played by one instrument) of a song. Since eight tracks are available, a song can have up to eight different parts playing together. For example the eight tracks might be used as follows.

Track 1 (bass)
Track 2 (piano)
Track 3 (sax)
Track 4 (flute)
Track 5 (synthesizer)
Track 6 (guitar)
Track 7 (strings)
Track 8 (sound effect)

— all played together

Each track is recorded separately. For example you might record the bass part on track 1, and then record the piano part on track 2 while listening to the bass part. By repeating this process, you can record as many tracks as you need. To use all eight tracks, you will need to record eight times.

Note:

Since a track can contain program change data to switch voices, a single track can play different sounds at different times. This allows you to use an unlimited number of sounds in a single song. However, no more than eight sounds can be produced at one time.

Realtime recording and step recording

There are two ways to record each track.

(1) Realtime recording
Record the notes with the exact timing that you play them on the keyboard.

(2) Step recording
Use the bar graph in the display to enter notes one by one, specifying the pitch and length for each note.

It is often thought that realtime recording is for good keyboard players, and step recording is for those who cannot play keyboard well. This is not always true. For example, you might use a slow tempo when realtime recording a difftcult phrase, and then play it back at a faster tempo. Or you can use the "quantize" function to correct the timing of notes you recorded in realtime.

Use the two recording methods in the combination that is most efficient for each situation.

Songs

The V50 can remember eight songs, with each song containing eight tracks. However, the total number of notes for all tracks of all songs must not exceed 16,000. This means that depending on the length or complexity of a song, you may not be able to record all eight songs.

Note:

If aftertouch, pitch bend wheel, and modulation wheel data is recorded, the note capacity will be less.

Sequencer data

The eight songs in V50 memory will not remain in memory when the power is turned off.
After recording a song, remember to save it to disk before turning the power off. Data you saved can be recalled using the load function explained on page 105. Page 105 explains how to save, and page 105 explains how to load.

The sequencer and the synthesizer

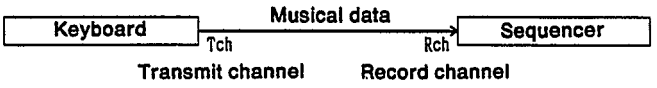
The V50 sequencer and synthesizer are built into the same unit, but are essentially independent. Please remember the following points.

When using the sequencer to record keyboard playing

When you select the recording track in sequencer recording mode, the keyboard transmit channel will automatically be changed to the transmit channel for that sequence track. This eliminates having to set the keyboard transmit channel to match the receive channel of the tone generator (single or performance) so as to be able to hear the sound of the track being recorded.

However, when you move to synthesizer performance mode after recording in the sequencer, remember that the keyboard transmit channel has been changed. This may mean that playing the keyboard will not make the synthesizer sound.

In this case, you can hold the [-] key, and press **TR1**–**TR8** or **RHY** to set the transmit channel of the keyboard to the receive channel of the selected instrument.

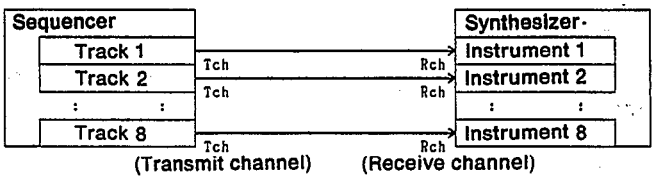


Normally, the receive channel of the sequencer will be set to "Kbd". This allows you to record sequence data from the V50 keyboard. Unless you are using an external keyboard to record sequencer data, leave it at this setting. (Page 88 tells how to set the sequencer receive channel.) When using an external keyboard to record data into the V50 sequencer, set the sequencer receive channel to match the MIDI transmit channel of the external keyboard.

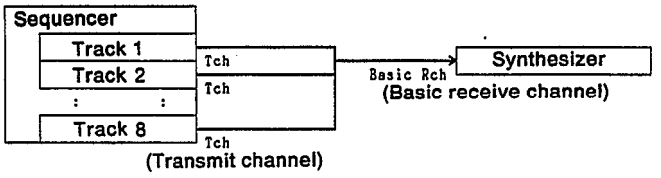
When replaying a sequencer recording using the synthesizer

There are three basic situations.

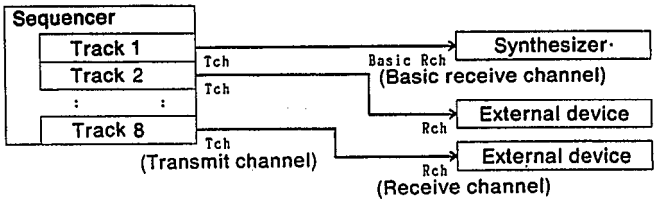
(1) Using performance mode to replay each track with its own voice.
In this case, set the transmit channel of each sequencer track (each recorded track) to match the receive channel of the instrument playing the voice for that track.



(2) Using single play mode to replay all tracks using a single sound.
In this case, set the transmit channels of all tracks (each recorded track) to match the basic receive channel of the synthesizer.



(3) While using single play mode to play one sound, play the remaining tracks using external tone generator modules or synthesizers.
In this case, set the transmit channel of each track (each recorded track) to match the basic receive channel of the synthesizer and the receive channels of the external devices.



Note:

When sending program change messages from the V50 sequencer to external devices, set the MIDI function "Program change" setting to "TransFilter" (see page 101).

As you become more familiar with the sequencer, you will find other ways to use it. To set the sequencer transmit channel, see page 90. To set the performance receive channel, see page 25. To set the basic receive channel, see page 99.

SYNTHESIZER PREPARATIONS

Before starting to record using the sequencer, make the following settings to initialize a performance memory for use with the sequencer.

Note:

If you will be using only one voice with the sequencer, these preparations are unnecessary.

Since you can specify voices when making sequencer recording settings, there is no need to select each voice after initializing.

When using one to four sequencer tracks

Use the performance initialize function to select "SEQ4" as the initialization setting.

(1) Press [PERFORMANCE] to enter performance play mode.
(2) Select a performance number.
(3) Press [OTHERS].
(4) Press the [ ] below " > Init".
(5) Press the [ ] below "SEQ4".
(6) Press [+1] to initialize the performance for four tracks.

When using five or more sequencer tracks.

Use the performance initialize function to select "SEQ8" as the initialization setting.

(1) Press [PERFORMANCE] to enter performance play mode.
(2) Select a performance number.
(3) Press [OTHERS].
(4) Press the [ ] below " >Init".
(5) Press the [ ] below "SEQ8".
(6) Press [+1] to initialize the performance for eight tracks.

When recording and playing back with the sequencer, the rhythm song selected by the rhythm machine will also play back. According to the situation, you will need to use one of the following procedures.

If the sequencer song you are going to record uses a rhythm song which already exists

Select the song in the rhythm song play mode of the rhythm machine mode. The rhythm song will play during sequencer recording and playback.

If you want to create the rhythm song before recording the sequencer song

Before beginning sequencer recording, create the rhythm song in rhythm machine mode. Then select the song in the rhythm play mode of the rhythm machine mode. The rhythm song will play during sequencer recording and playback.

If you will be creating the rhythm song after recording the sequencer song, or if you will not be using rhythm sounds

If the rhythm song contains no data yet, go ahead and record the sequencer song. If the rhythm song contains data, you can either erase it, or select a different rhythm song that contains no data.

During sequencer recording and playback, the rhythm machine will not sound.

Here are some other possibilities.

It is often convenient to keep a simple rhythm pattern playing while you record in the sequencer.

Method 1: **Create a simple rhythm song.**
The song in the following example will repeat rhythm pattern P00 for 200 times.

Part01 = 𝄆
Part02 = PTN P00
Part03 = PTN P00
Part04 = 𝄇 x 99

Method 2: **In rhythm pattern play mode of the rhythm machine, select a rhythm pattern and keep it playing while you record using the sequencer.**
With this method, the pattern will continue repeating even when you are not recording or playing back.

REALTIME RECORDING PROCEDURE

Here we will explain the procedure for realtime recording. The procedure can be illustrated as follows.

Select sequencer operation	*Begin sequencer operations.*
⇩	
Select song to be recorded	*Select the song you want to record.*
⇩	
Select realtime recording	*Select realtime recording.*
⇩	
Set recording conditions	*Select the track to be recorded, the voices and time signature, tempo, etc.*
⇩	
Start and end recording	*Start and end realtime recording.*

Select sequencer operation

From performance play mode, single play mode, or rhythm mode, enter the sequencer mode as follows.

(1) Press **SEQ** to enter sequencer mode and get the following display.

```
PLAY SONG)                Time     >Meas>Tempo
▶1: NewSong                4/4       001  120
```

All sequencer operations are carried out in this mode.

Select a song to record

Select the number of the song to be recorded.

(1) Move the cursor to the far left, and specify a song 1 – 8 to record. If setup data has already been stored for the song, the display may show "withSETUP" or "Song only" when you select the song. (This choice is explained on page 87.)

Select realtime recording

Here we will explain the most basic way to select realtime recording. For details, see page 94.

(1) Press **JOB** to get the following display.

```
SEQUENCER JOB SELECT)     Select one!
>Setup>Tch>Song>Edit>Rec            >EXIT
```

(2) Press the ☐ below " > Rec" to get the following display.

```
RECORD MODE) ▶Mode    >Condition
free = 100% Realtime    Replace     >EXIT
```

(3) Making sure that the cursor is located at " > Mode", select the recording mode. Select from "Realtime", "Step", or "Punch". In this example we will select "Realtime".

(4) Move the cursor to " > Condition", and set the recording condition. Select from "Replace" (replace the previous recording) and "Overdub" (add to the previous recording). In this example we will select "Replace".

(5) Press the ☐ below " > EXIT" twice.

Set recording conditions

This is where you select the song and tracks to be recorded, and set time signature, tempo, rhythm backing, and the voices to be used.

Note:

You cannot change the time signature of a track that has already been recorded. When you want to begin recording from the middle of the song, use [▷▷] and [◁◁] to change the measure, or move the cursor to " > Meas" and directly specify the measure. However if no data exists, you will not be able to advance the measure.

(1) Press [○] to enter recording mode and get the following display.

```
RECORD>  >Mode>Voice>Time     >Meas▶Tempo
 Replace   IND  I00   4/4      001  120
```

(2) Press [TR1]–[TR8] to select the track to be recorded. The LED at the left of [TR1]–[TR8] will indicate the selected track. Normally you will begin recording from track 1. Tracks which already contain data will be indicated by a green LED. Only one track can be recorded at a time. It is not possible to select more than one track for recording at once.

(3) Move the cursor to " > Mode" and select the voice mode. You can hold the key, and press [TR1]–[TR8] or [RHY] to set the transmit channel of the keyboard to the receive channel of the selected instrument.

When "SGL" (single) is selected, single play mode will be used.

When "PFM" (performance) is selected, performance play mode mode will be used.

When "IND" (individual) is selected, the voice of the instrument that matches the transmit channel of the track will be used.

(4) Move the cursor to " >Voice" and select the voice number. You can hold the [–] key, and press [TR1]–[TR8] or [RHY] to set the transmit channel of the keyboard to the receive channel of the selected instrument.

When " > Mode", is set to "SGL", specify the voice number.

When " > Mode" is set to "PFM", specify the performance number.

When " > Mode" is set to "IND", specify the voice number.

(5) Move the cursor to " > Time" and set the time signature. Select from 1/4 - 4/4, 1/8 - 8/8, and 1/16 - 16/16.

(6) Move the cursor to " > Tempo" and set the tempo of the song. Select from a range of 30 - 240 quarter notes per minute.

Start and stop recording

Here is the procedure for actual recording.

(1) Press [▷], and a two-measure countdown will begin. For example, if you have selected a time signature of 4/4, quarter notes will, sound eight times (4 x 2 measures). The display will show the count until recording begins; " - 8, - 7, ...".

(2) When the count reaches "0", recording will begin. Notes and chords you play on the keyboard will be recorded. If you move the cursor to " > voice" and select a different voice, the voice change will be recorded as part of the data.

(3) When you are finished, press [□] to end realtime recording. Page 87 explains how to replay the performance you have just recorded.

If you make a mistake

If you make a mistake in realtime recording, you have the following possibilities.

(1) Record over again from the beginning. Press [○], [▷] and record over from the beginning.

(2) Re-record only the measures where the mistakes in playing were made. Using the punch-in function explained on page 88, you can re-record only these measures.

(3) Correct the mistake using step recording (see page 84).

Selecting single or performance memories while recording

If the transmit channel of the track being recorded matches the basic receive channel of the synthesizer, the performance you specify will be selected. If it does not match, there will be no change.

The voice mode and voice number you specified in the " > Mode" and " > Voice" settings are temporary. If you want to record these voice changes as sequencer data, perform the operations during sequencer recording.

STEP RECORDING PROCEDURE

The procedure for step recording is as follows.

Select sequencer operation	*Begin sequencer operations.*
⇩	
Select song to be recorded	*Select the song you want to record.*
⇩	
Select step recording	*Select step recording.*
⇩	
Set recording conditions	*Select the track to be recorded, the voices and time signature, tempo, etc.*
⇩	
Start and end recording	*Start and end step recording.*

Select the sequencer function

From performance play mode, single play mode, or rhythm mode, enter the sequencer mode as follows.

(1) Press [SEQ] to enter sequencer mode and get the following display.

```
PLAY SONG)                Time     >Meas>Tempo
▶1: NewSong                4/4       001  120
```

All sequencer operations are carried out in this mode.

Select a song to record

Select the number of the song to be recorded.

(1) Move the cursor to the far left, and specify a song 1 - 8 to record. If setup data has already been stored for the song, the display will show "withPFM" or "Song only" when you select the song. (This choice is explained on page 87.)

Select step recording

Here we will explain the most basic way to select step recording. For details, see page 94.

(1) Press [JOB] to get the following display.

```
SEQUENCER JOB SELECT)     Select one!
>Setup>Tch>Song>Edit>Rec              >EXIT
```

(2) Press the [ ] below " > Rec" to get the following display.

```
RECORD MODE) ▶Mode    >Condition
free = 100% Realtime    Replace       >EXIT
```

(3) Making sure that the cursor is located at " > Mode", select the recording mode. Select from "Realtime", "Step", or "Punch". In this example we will select "Step".

(4) Press the [ ] below " > EXIT" twice.

Note:

In step recording, "Overdub" will always be used regardless of the " > Condition" setting.

Set recording conditions

This is where you select the song and tracks to be recorded, and set time signature, tempo, rhythm backing, and the performance or voice to be used. However if no data exists, you will not be able to advance the measure.

Note:

You cannot change the time signature of a track that has already been recorded. When you want to begin recording from the middle of the song, use [▷▷] and [◁◁] to change the measure, or move the cursor to " > Meas" and directly specify the measure.

(1) Press [0] to enter recording mode and get the following display.

```
STEP REC)▶Mode>Voice>Time      >Meas>Tempo
 Overdub    IND  I00   4/4       001   120
```

(2) Press [TR1] – [TR8] to select the track to be recorded. The LED at the left of [TR1] – [TR8] will indicate the selected track. Normally you will begin recording from track 1. Tracks which already contain data will be indicated by a green LED. Only one track can be recorded at a time. It is not possible to select more than one track for recording at once.

(3) Move the cursor to " > Mode" and select the voice mode. You can hold the [–] key, and press [TR1] – [TR8] or [RHY] to set the transmit channel of the keyboard to the receive channel of the selected instrument.

When "SGL" (single) is selected, single play mode will be used.

When "PFM" (performance) is selected, performance play mode mode will be used.

When "IND" (individual) is selected, the voice of the instrument that matches the transmit channel of the track will be used.

(4) Move the cursor to " > Voice" and select the voice number. You can hold the [–] key, and press [TR1] – [TR8] or [RHY] to set the transmit channel of the keyboard to the receive channel of the selected instrument.

When " > Mode" is set to "SGL", specify the voice number.

When " > Mode" is set to "PFM", specify the performance number.

When " > Mode" is set to "IND", specify the voice number.

(5) Move the cursor to "> Time" and set the time signature. Select from l/4 – 4/4, l/8 – 8/8, and l/16 – 16/16.

(6) Move the cursor to " > Tempo" and set the tempo of the song. Select from a range of 30 - 240 quarter notes per minute.

Start and stop recording

Here is the procedure for recording.

(1) Press [▷] to get the following display.

This is known as the "bar graph" display. In step recording, use this bar graph to specify the length and timing of each note. This bar graph shows the data for one measure. The number of the measure currently displayed is shown at the left side. The " + " mark indicates each beat. In the example above, the time signature is 4/4, and "-------+" is the length of one beat. This means that each " – " or " + " indicates the length of a 32nd note.

(2) Use [–1] (◁) or [+1] (▷) to move to the position where you will begin recording. For example, if you want to record a note at the beginning of the second beat, move the cursor (_) to the " – " after the first " + "

(3) Use the numeric keys to specify the note length. Select a note length from "𝅝" to "𝅘𝅥𝅯". The bar graph will display " – " marks to indicate the length of the note.

For example, if you press [3] (𝅗𝅥), the bar graph will show the following.

```
|=========-------+-------+-------|
```

For example, if you press [4] (♪), the bar graph will show the following.

```
|====---+-------+-------+-------|
```

Pressing the same note length twice will result in a note length of double value.

For example if you press [4] (♪) twice, the bar graph will show the following.

```
|=========-------+-------+-------|
```

To enter a dotted note, select the desired note length, and then press the dot key [8] (.).

For example, if you press [4] (♪) and then [8] (.), the bar graph will show the following.

```
|======-+-------+-------+-------|
```

To enter a triplet, select the desired note length, and then press the triplet key [9] (–3–).

For example, to enter ♫ , you would press [4] (♪) and then [9] (–3–).

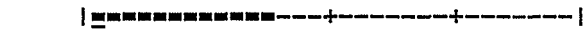
```
|==-----+-------+-------+-------|
```

In the case of triplets, the bar will not show the exact note length.

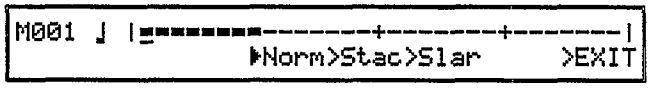
To enter a tie (two added note values), select the first note, then press [7] (TIE), and then select.

the second note. This will add the two selected note values.

For example, to tie ♩ and ♪, press [3] (♩), [7] (TIE), and [4] (♪).



To enter a slur (extended note length) or staccato (shortened note length), press the [ ] below " >GateTime" to get the following display. (The example shows the display when [3] (♩) and then the [ ] below "GateTime" are pressed.)



In this display, press the [ ] below the function you want. When "Stac" is selected, the note will sound for 50% of its length. When "Slur" is selected, the note will sound for 99% of its length. When "Norm" is selected (or when not otherwise specified), the note will sound for 80% of its length.

(4) Specify the note pitch from the keyboard. You may play single notes or chords from the keyboard to specify the pitch of the note. To enter a rest, press [0] (REST). When you specify the note pitch, the " – " in the bar graph will disappear, and a ◆ will indicate the position of the note you just input.

(5) Repeat steps (2), (3), and (4) to input your song.

(6) When finished recording, press [▫]. This completes step recording. Page 87 explains how to play back the song you recorded.

Inputting program changes

You can input program change data to switch voices during a song. Move the cursor to the position in the bar graph at which you want the voice change to occur, and press the [ ] below " > PgmChange". After specifying the voice or performance to change, press the [ ] below "GO". The bar graph will show a "p" to indicate that a program change has been inserted.

When a program change specifies a performance

In this case, the specified performance will be selected only if the transmit channel of that track matches the basic receive channel of the synthesizer. If it does not match, nothing will happen.

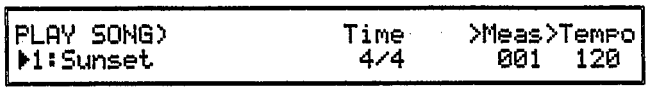
To delete a note you entered

If you input a wrong note, move the cursor to the position of the note and press [–] (ERASE). All notes in the specified 32nd note region will be erased (including program change data).

The voice mode and voice number you specified in the " >Mode" and " >Voice" settings are temporary. If you want to record these voice changes as sequencer data, perform the operations during sequencer recording.

To play back a song, use the following procedure.

(1) Press [SEQ]. (If you are already in sequencer mode, there is no need to do so.) The display will appear as follows.



The LEDs at the left of [TR1] – [TR8] will light green. If desired, it is possible to playback only certain tracks. Page 87 explains this "Track Mute" function.

(2) Select the number (1 – 8) of the song to be played. If you select the number of a song that was stored with setup data, there will be a message allowing you to select "with SETUP" or "Song only".

with SETUP
Select performance number, voice number, and rhythm song number along with the song number.

Song only
Select only the song, and not performance number or rhythm song number.

(3) If necessary, you can set the measure at which to begin playing, and change the tempo.
Specify the measure using [◀◀] and [▶▶], or by moving the cursor to " > Meas" and specifying the measure number.
Tempo can also be modified while playing back.

(4) Specify tempo by moving the cursor to " >Tempo" and entering the tempo. You can also set the tempo by moving the data entry slider while pressing [SEQ].

(5) Press [▶] to begin playback. All tracks that contain data will play back.

(6) To stop playing, press [■]. To resume playing from where you stopped, press [▶]. To resume playing from the beginning of the song, press [■] and [◀◀] together, and then press [▶].

Track mute

Normally when playing back the sequencer, the LEDs at the left of [TR1] – [TR8] will light green, and when you press [▶] all tracks will be played back. The "mute" function allows you to hear only specified tracks.

To mute a track when in sequencer play mode (while stopped, or during playback), press the [TR1] – [TR8] of the track you do not want to hear. The LED of that track will begin to blink green. The blinking tracks will remain silent, and only the unmuted tracks will be played back.

It is also possible to mute tracks before beginning to record.

In the same way, pressing [RHY] will mute, the rhythm machine.

Note:
If you mute all tracks, there will be no sound. When the song number is changed, muting will be defeated.

PUNCH-IN RECORDING

Punch-in recording allows you to re-record only a specified measure or measures using realtime recording, using the following procedure.

(1) Press [JOB] to get the following display.

```
SEQUENCER JOB SELECT)    Select one!
>Setup>Tch>Song>Edit>Rec          >EXIT
```

(2) Press the [ ] below " > Rec" to get the following display.

```
RECORD MODE) ▶Mode   >Condition
free = 100% Realtime  Replace     >EXIT
```

(3) Make sure that the cursor is located at " > Mode", and change the recording mode to "Punch". In punch-in recording, "Replace" will always be used regardless of the " > Condition" setting.

```
RECORD MODE) ▶Mode   >Condition
free =  81%  Punch    Replace     >EXIT
```

(4) Press [0] to get the following display.

```
PUNCH REC)▶Mode>Voice     >Meas >In >Out
          IND  P22         001  001  001
```

(5) Specify the measure from which to start playback (Meas), and the beginning (In) and end (Out) of the measures to be re- recorded. Make sure that "Meas" ≦"In" ≦"Out".

(6) Press [TR1] – [TR8] to select the track to punch-in.

(7) Press [▷] . Playback will begin from the measure you specified in "Meas". When the measure "In" is reached, recording will automatically begin.

Play the keyboard to re-record the specified section.

When the measure "Out" is reached, recording will automatically end. This completes punch-in recording.

SETUP FUNCTIONS

These functions determine the receive channel and various other aspects of the sequencer. In sequencer mode, press [JOB] to get the following display.

```
SEQUENCER JOB SELECT)    Select one!
>Setup>Tch>Song>Edit>Rec          >EXIT
```

Press the [ ] below "> Setup" to get the following display.

```
SETUP)>Rch>A.T >Vel >Click     >Sync
       Kbd off   on   Rec       int >EXIT
```

(1) (2) (3) (4) (5)

If you press the [ ] below " > EXIT" you will return to the previous display.

(1) Receive channel

■ **Function**

Set the receive channel of the sequencer.

■ **Settings**

Kbd, 1 – 16, om

■ **Explanation**

This determines the MIDI channel that the sequencer will receive. Select from the following.

Kbd.....Record from the V50 keyboard. MIDI messages from external devices will not be recorded.

1 – 16... Record incoming MIDI messages of the specified channel. When recording MIDI messages from an external device, set this to match the transmit channel of the external device.

omn.....Record incoming MIDI messages of any channel.

Note:

Unless this "receive channel" is set to "kbd", your playing on the V50 keyboard will not be recorded.

(2) Aftertouch

■ Function
Determine aftertouch reception.

■ Settings
off, on

■ Explanation
This determines whether to record the aftertouch of the V50 keyboard or an external device.

off..... Aftertouch messages will neither be received nor recorded.

on..... Aftertouch messages will be received and recorded. If your playing uses aftertouch, it will be played back just as it was recorded.

(3) Velocity

■ Function
Determine key velocity reception.

■ Settings
off, on

■ Explanation
This determines whether to record the velocity of the V50 keyboard or an external device.

off..... Key velocity data will neither be received nor recorded.

on..... Key velocity data will be received and recorded. The key velocity of each note you play will be played back just as it was recorded.

(4) Click

■ Function
Determine when the click will sound.

■ Settings
off, rec, play, always

■ Explanation
This setting determines when the click (the metronome) will sound. Select one of the following.

off..... There will be no click.

Rec..... The click will sound only during realtime and punch-in recording. Normally you will use this setting.

Play/Rec. The click will sound during realtime recording and playback.

Always.... The click will sound at all times while in sequencer mode.

(5) Sync

■ Function
Select the clock (timing source) for the sequencer.

■ Settings
int, MIDI

■ Explanation
This setting selects what will control the tempo. Select one of the following.

int..... Tempo will be controlled by the internal clock. Normally this is the setting you will select.

MIDI..... MIDI clock signals will determine the tempo. Select this setting when you want to control the tempo of the V50 sequencer from an external device.

Note:

When "MIDI" is selected, sequence playback and realtime recording will not be possible unless a clock signal is being received from an external device. (Step recording will be possible.)

The clock selected here applies to both the rhythm machine and the sequencer. If you select "MIDI" here, the rhythm machine will also be set to MIDI clock. This setting can also be made from the rhythm machine mode (see page 68).

SETTING TRANSMIT CHANNELS

Set the MIDI channel on which each sequencer track will transmit data.

In sequencer mode, press JOB to get the following display.

```
SEQUENCER JOB SELECT)    Select one!
>Setup>Tch>Song>Edit>Rec          >EXIT
```

Press the ☐ below " > Tch" to get the following display. (The displays will differ depending on whether the synthesizer mode is Single Play mode or Performance Play mode.

If a synthesizer Voice is selected (single mode).

```
TRANSMIT CHANNEL)  Single Mode   Rch =1
    1✓  2✓  1✓  1✓  3✓  4✓ off✓ off
```

If a synthesizer Performance is selected (multi mode).

```
R   1✓  2✓  3✓  4✓  5✓  6✓  7✓  8
T   1✓  2✓  3✓  4✓  5✓  6✓  7✓  8
```

The lower line of each display shows the channel that each track will transmit. In single mode, the upper right of the display will show the receive channel. In multi mode, the upper line ("R") will show the receive channel for each instrument.

■ **Function**
Set the output channel of each track.

■ **Settings**
off, 1 – 16

■ **Explanation**
This sets the MIDI channel that each track of the sequencer will transmit.

In single mode (single play mode), the V50 will play only the track data that is transmitted on a channel that matches the tone generator "Rch =" setting.

In multi mode (performance play mode), each track will play the instrument that matches its transmit channel (the lower line).

"off" indicates that data is not transmitted.

SONG JOB FUNCTIONS

Here you can name or clear a song.

In sequencer play mode, select the song to name (or clear), and press JOB to get the following display.

```
SEQUENCER JOB SELECT)    Select one!
>Setup>Tch>Song>Edit>Rec          >EXIT
```

Press the ☐ below "> Song" to get the following display.

```
SONG) NAME          Song Clear
1: NewSong  ← →       >GO        >EXIT
```

(1) (2)

Pressing the ☐ below " > EXIT" will return to the previous display.

(1) Song name

■ **Function**
Set a name for the song.

■ **Settings**
Maximum of 8 characters.

■ **Explanation**
Set a name for the song. Page 17 explains how to enter characters.

(2) Song clear

■ **Function**
Erase the song data.

■ **Explanation**
This function erases the song name and the data of all tracks, and will initialize meter and tempo, etc.

Press the ☐ below " > GO". Press +1 in response to the confirming message, and the song will be erased.

Here you can do various editing operations on each track of a song.

In sequencer play mode, select the song to edit, and press [JOB] to get the following display.

```
SEQUENCER JOB SELECT>     Select one!
>Setup>Tch>Song>Edit>Rec          >EXIT
```

Press the [ ] below " > Edit" to get the following display.

```
EDIT TRACK>                Select one!
>Mix >Qntz>Del >Ins >Copy>Eras>Remv>EXIT
```

Pressing the [ ] below " > EXIT" will return to the previous display.

Track mix down

Press the [ ] below " > Mix".

```
TRACK MIX DOWN>
Tr ▶1 and Tr >1  to Tr >1        >GO >EXIT
```

■ **Function**
Mix down (combine) the data of two tracks into one track.

■ **Settings**
1 - 8 (select track)

■ **Explanation**
This will mix the data of two different tracks and put it in a single track. For example, if you had recorded a piano part by playing each hand separately into different tracks, you could use this function to combine the two tracks into a single track.

The first two "Tr" numbers are the source tracks. The third "Tr" is the destination track. After specifying the three tracks, press the [ ] below " > GO". Press [+1] in response to the confirming message, and track mix down will be executed.

Note:
Once you have mixed down two tracks, you will no longer be able to play them with separate voices. Also, the previous data will be erased.

Quantize

Press the [ ] below "Qntz".

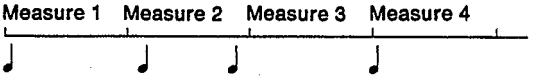
```
QUANTIZE>       ▶Tr  >Size
                  1   1/16        >GO >EXIT
```

■ **Function**
Correct each note to the nearest specified timing.

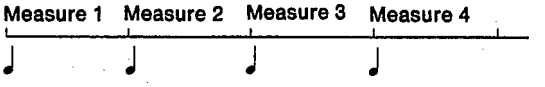
■ **Settings**
l – 8 (select track), 1/48, 1/32, 1/16, l/12, l/8, l/6, l/4 (size)

■ **Explanation**
Quantization will move the start timing of each note to the nearest interval of the specified value.

The following diagram is an example of a track recorded in realtime, and played with inaccurate timing.



The notes on the second and third beat are slightly out of time. Quantize can be used to correct such notes. If we set "Size" to "l/4" and execute this quantize function, the notes will be moved to the nearest beat of "l/4", as follows.



"Size" is the smallest time value that will be allowed to remain after this operation is executed. This means that if you intended your music to contain 16th notes, you should specify 1/16. If you quantized using 1/8, some of the 16th notes might be moved to the nearest 8th note. (The length of the notes will remain unchanged.)

After specifying the track and size, press the [ ] below " > GO". Press [+1] in reply to the confirming message, and quantize will be executed.

Note:
It is not possible to reverse the effects of quantization. If your music contains triplets, use a quantization value such as 1/6, 1/12, or 1/24.

Delete

Press the [ ] below "> Del".

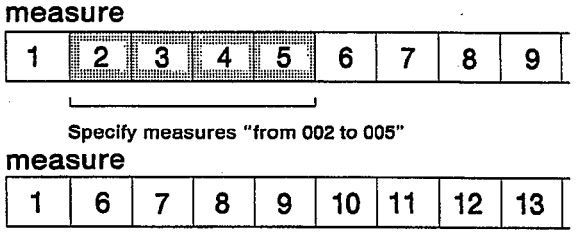
```
DELETE) Delete Measure (All tracks)
from  ▶001  to  >001              >GO >EXIT
```

■ **Function**

Delete the specified range of measures.

■ **Explanation**

The specified range of measures will be deleted from the entire song (all tracks). Measures following this range will be moved forward.



If you specify measures "from 002 to 005" as shown in the upper diagram, the song will change as shown in the lower diagram. (The measures will be renumbered as "1, 2, 3,...")

After specifying the beginning and end measures to be deleted, press the [ ] below " > GO". Press [+1] in reply to the confirming message, and the measures will be deleted.

Insert

Press the [ ] below " > Ins".

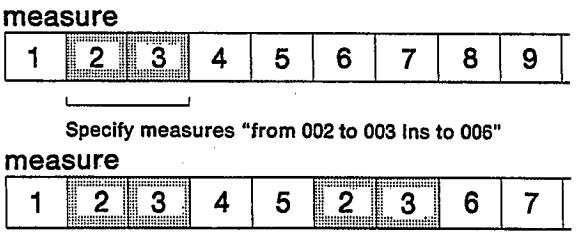
```
INSERT)Insert Measure (All tracks)
from  ▶001  to  >001 Ins  >001 >GO >EXIT
```

■ **Function**

Insert the specified measures into another location.

■ **Explanation**

The specified range of measures (all tracks) will be copied and inserted into another location. Measures at the specified destination will be pushed back.



If you specify measures "from 002 to 003 Ins to 006" as shown in the upper diagram, the song will change as shown in the lower diagram. (The measures will be renumbered as "1, 2, 3,...")

After specifying the beginning and end measures of the source, and the measure of the destination, press the [ ] below " > GO". Press [+1] in reply to the confirming message, and the measures will be inserted.

Note:

Insert affects all tracks. It is not possible to insert measures into just one track.

Copy

Press the [ ] below " > Copy".

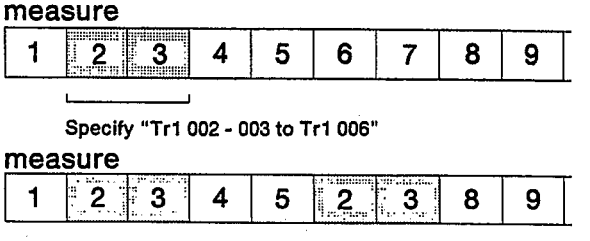
```
COPY) Copy Measure
Tr ▶1 >001→>001  to Tr >1 >001 >GO >EXIT
```

■ **Function**

Copy the specified range of measures to another location.

■ **Explanation**

The specified range of measures from a specified track will be copied to another location. The data previously in that location will be replaced by the newly copied data. This function allows you to copy measures between tracks.



If you specify “Tr1 002 - 003 to Tr1 006” as shown in the upper diagram, the song will change as shown in the lower diagram. (The measures will be renumbered as “1, 2, 3,...”)

After specifying the track, and beginning and end measures of the source, and the track and measure of the destination, press the [ ] below “ > GO”. Press [+1] in reply to the confirming message, and the measures will be copied.

Erase

Press the [ ] below “ > Erase”.

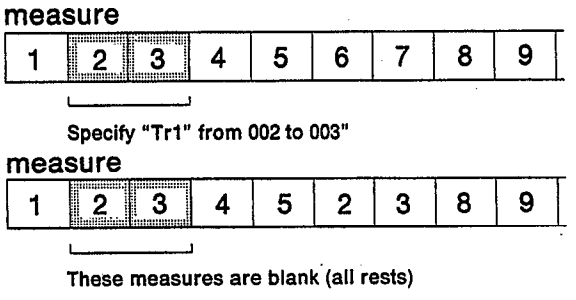
```
ERASE> Erase Measure
  Tr  ▶1   from >001  to  >001 >GO >EXIT
```

■ Function

Erase the data in the specified range of measures.

■ Explanation

The data in the specified range of measures will be erased, and replaced with rests. This allows you to erase part of a single track, or part of all tracks (when “all” is selected instead of a track number).



If you specify “Tr1 from 002 to 003” as shown in the upper diagram, the song will change as shown in the lower diagram.

After specifying the track, and beginning and end measures, press the [ ] below “ > GO”. Press [+1] in reply to the confirming message, and the measures will be erased.

Remove

Press the [ ] below “ > Remov”.

```
REMOVE EVENT>
▶Cnt  >  0=>  0 Tr>1 >001=>001 >GO >EXIT
```

■ Function

Remove the specified data from the specified measures.

■ Explanation

This removes pitch bend wheel data, aftertouch data, or other control change data from the specified range of measures. The note data will remain.

Select one of the types of data to be removed.

Cnt ..... Remove control change data. When this is selected, you will also be able to specify the range of control change numbers 0 – 127 to be removed.

P.B......Remove pitch bend wheel data.

A.T......Remove aftertouch data.

After specifying the track and type of data to be removed (and when “Cnt” is selected, the range of control numbers), the track, and beginning and end measures, press the [ ] below “ > GO”. Press [+1] in reply to the confirming message, and the specified data will be removed.

SETTING RECORDING CONDITIONS

This is where you make various setting related to sequencer recording.

In sequencer mode, press JOB to get the following display.

```
SEQUENCER JOB SELECT)     Select one!
>Setup>Tch>Song>Edit>Rec            >EXIT
```

Press the ☐ below " > Rec" to get the following display.

```
RECORD MODE) ▶Mode    >Condition
free = 100% Realtime    Replace      >EXIT
└──(1)──┘  └─(2)─┘  └──(3)──┘
```

(1) Free

■ **Function**
Displays the remaining sequencer memory.

■ **Explanation**
This indicates the percentage of sequencer memory that is available for recording. 100% indicates that no data is present. 0% indicates that no more data can be recorded.

(2) Recording mode

■ **Function**
Select the recording mode.

■ **Settings**
realtime, step, punch

■ **Explanation**
Select one of the following three recording modes.

Realtime ... Realtime recording (see page 82).

Step..... Step recording (see page 84).

Punch..... Punch-in recording (see page 88).

(3) Recording condition

■ **Function**
Select the realtime recording condition.

■ **Settings**
Replace, Overdub

■ **Explanation**
Select one of the following two realtime recording conditions.

Replace.... The newly recorded data will replace the old data. (The old data will be erased.)

Overdub... The newly recorded data will be combined with the old data.

Note:
When you begin recording using "Replace", all the old data in the measures from where recording began to where recording ended will be erased.

STORING SETUP DATA

The data that is stored for each sequencer song includes the voices, performances, and number of the rhythm song used in that sequencer song. When you load sequencer data from disk and start playback, all this data will be loaded as well, meaning that all necessary data and settings will be made automatically.

Use the following procedure to store setup data.

(1) In sequencer mode, press STORE/COPY to get the following display.

```
STORE) ▶Mode              Are you sure ?
Store SETUP data to song 1 ?
```

(2) Press +1 to store setup data.

Note:
Remember to save the song data itself before you turn the power off. If you fail to do so, the setup data will be lost along with the song data.

- This operations stores only the "number" of the performance and rhythm song. This means that if rhythm song "1" was selected when you-stored, if a different rhythm is in rhythm song "1" when you play the song back, playback will be incorrect.
  In order to play back the correct rhythm for the sequencer song, remember to select "ALL" when saving to disk. (Page 105 tells how to save data.)
- Tempo data is included in a sequencer song, and has no relation with setup data.

CHAPTER 6. UTILITY FUNCTIONS

This chapter explains card and disk operations, settings for MIDI reception and transmission, micro tuning performance effect, and initialization of voices and performances.

CARD OPERATIONS

Types of memory card

The V50 uses two types of card.

ROM card:
Voice and performance data stored on ROM cards can only be read (not written to). You cannot use a ROM card to store your own original voices or performances. Voice or performance cards are of this type.

RAM card (MCD32 or MCD64):
Voice, performance or rhythm machine data can be saved to or loaded from a RAM card. Use a RAM card to store your own original voices, performances, or rhythm machine data.

This type of card has a write protect slider switch. When this switch is "on", data cannot be stored to the card. When you need to store data to a card, set its write protect switch to "off". (Use a pointed non-metallic object such as a toothpick to move the switch.)

Note:

Cards are very fragile. Do not bend or drop them, or subject them to high temperatures, high humidity, or excessive dust.

Do not allow foreign objects to enter the card slot.

Always turn the power off before inserting or removing a card.

Cards contain a backup battery with a lifespan of approximately 5 years. When the backup battery in a card nears the end of its lifespan, the V50 display will show "Change card battery" when you select a card voice or card performance.

When this occurs, copy the contents of the card to another card or to disk, and contact your dealer or authorized Yamaha service center to have the battery replaced. (When the battery is replaced, the memory contents of the card will be lost.)

About card formatting

When you purchase a new RAM card, you must "format" it before using it to save data. Page 95 explains how to format a card.

About card banks

A MCD32 card has 1 bank, and a MCD64 card has 2 banks. (It may help to think of a "bank" as being like a drawer in a file cabinet, A single file cabinet may contain one or more drawers, each with different information.) Saving, loading, and formatting is done separately for each bank.

Card format

Format cards using the following procedure.

Note:

Even if a card is formatted, the old data in the card will not be lost.

(1) Press CARD to get the following display.

```
UT  CARD) ▶BANK Format
             1  unfmtd    >Form>Save>Load
```

(2) Select the bank to format. When using an MCD32, select 1. When using an MCD64, select 1 or 2.

(3) Press the ▭ below " > Form" to get the following display.

```
UT  CARD)  FORMAT   Select one !
                V50SYN     V50RHY     >EXIT
```

You can press the ▭ below " > EXIT" to return to the previous display.

(4) Press a [ ] to specify one of the following two formats.

V50SYN... In this format, the card can be used to store voice data, performance data, or synthesizer setup data.

V50RHY.. In this format, the card can be used to store rhythm part data, song data, or rhythm machine setup data.

The display will ask "Are you sure?"

(5) Press [+1], and the selected bank will be formatted.

Data saved and loaded from card

The following data can be transfered between internal and card memory.

Synthesizer data

Data type	Abbreviation	Contents
All data	SynALL	• Voice data (100 voices) • Performance data (100 performances) • Program change table data • Performance effect data • Micro tuning data ("oct" and "full" only) • System data
Voice & performance data	V&PF	• Voice data (100 voices) • Performance data (100 performances)
Setup All Data	setAL	• Program change table data • Performance effect data • Micro tuning data ("oct" and "full" only)
Program change table data	PCT	• Program change table data
Performance effect data	PEFCT	• Performance effect data
Micro tuning data	MCT	• Micro tuning data ("oct" and "full" only)
System data	SYS	• Master tuning • Basic receive channel • Transmit channel • Program change mode • Control change mode • Aftertouch mode • Pitch bend mode • Note on/off • Device number • Memory protect (INT/CRT) • Combine • Power on message • MIDI on/off • Local on/off • Data entry assign • Controller reset • Fixed velocity • Velocity curve • EG forced damp • Voice dump

Rhythm machine data

Data type	Abbreviation	Contents
Rhythm all data	ALL	• Rhythm pattern data (100 patterns) • Rhythm song data (8 songs) • Rhythm setup data
Rhythm sequence data	R.SEQ	• Rhythm pattern data (100 patterns) • Rhythm song data (8 songs)
Rhythm setup data	SETUP	• Rhythm setup data

Note:
Sequencer data cannot be saved to card.

Save

This is where you save data to a card. This function does not allow you to save individual voices or performances to card. (To store individual voices or performances, use the "store" function explained on page 119.)

Two complete sets of rhythm data (all rhythm patterns, all songs, and rhythm machine setup data) will fit in a single bank of a card. When saving rhythm machine data to card, specify whether to save or load "A" or "B". Synthesizer data occupies an entire bank of a card.

Note:
If the write protect switch on the RAM card is "on", or the memory protect setting (card) is "on", you will get a "Memory Protected" display, and save will not be executed.

Data will be saved into the selected bank, overwriting any data which may have been in that bank. Be careful not to overwrite important data by mistake.

You cannot save to a bank which has not been formatted.

You cannot save to a ROM card.

(1) Press CARD to get the following display.

(2) Specify the bank into which to save data. When using an MCD32, select 1. When using an MCD64, select 1 or 2. The format of the selected bank will be displayed under "Format". When saving synthesizer data, be sure to select a bank that has been formatted to "V50SYN". When saving rhythm machine data, be sure to select a bank that has been formatted to "V50RHY".

(3) Press the ☐ below " > Save" to get the following display.

You can press the ☐ below " > EXIT" to return to the previous display.

(4) Press the ☐ to select the type of data to save.

Synth . . . . . Save synthesizer data.
Rhythm to (A) .. Save rhythm machine data to bank section A
Rhythm to (B).... Save rhythm machine data to bank section B

If you have selected "Synth", the following display will appear.

If you have selected "Rhythm(A)" or "Rhythm(B)", the following display will appear.

(5) Press a ☐ to select the type of data to save. The chart on page 96-97 explains the contents of each type. You will get a message of "Are you sure?"

(6) Press +1, and the specified data will be saved to the selected bank of the card.

Load

Load allows you to load data from the card into V50 memory.

Note:

If the memory protect (internal) is "on", you will get an error message of "Memory Protected", and will not be able to load. (However, R.SEQ is an exception.)

When you execute load, the voice, performance, and setup data etc. will be lost. Be careful not to overwrite any data you wanted to keep.

(1) Press CARD to get the following display.

```
UT  CARD) ▶BANK Format
             1  V50SYN    >Form>Save>Load
```

(2) Select the bank from which to load. When using an MCD32, select 1. When using an MCD64, select 1 or 2.

(3) Press the ☐ below " > Load" to get the following display.

```
UT  CARD)  LOAD     Select one !
Synth   Rhythm(A) Rhythm(B) SEQ(YS)>EXIT
```

(4) Press a ☐ to select one of the following types of data to load.

Synth ..... Load synthesizer data.
Rhythm(A) . . Load rhythm machine data from bank section A.
Rhythm(B)... Load rhythm machine data from bank section B.
SEQ(YS)..... Load sequence data from a YS200/B200 synthesizer.

If you have selected "Synth", the following display will appear.

```
UT  CARD)  LOAD Synth      select one !
SynAL V&PF SetAL PCT PEFCT MCT SYS >EXIT
```

If you have selected "Rhythm(A)" or "Rhythm(B)", the following display will appear.

```
UT  CARD)  LOAD Rhythm(A) select one !
      RhyALL     R.SEQ     SETUP     >EXIT
```

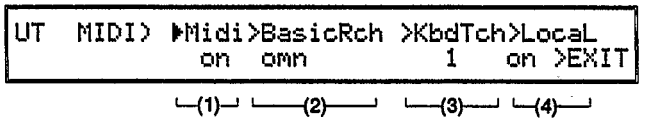
If you have selected "SEQ(YS)", proceed to step (6).

(5) Press a ☐ to select the type of data to load. The chart on page 96-97 explains the contents of each type. You will get a message of "Are you sure?"

(6) Press +1 and the data will be loaded from card to V50 internal memory.

Channel information (MIDI on/off, basic receive channel, transmit channel, local on/off)

Press [MIDI], and then press the [ ] below "ChInfo" to get the following display.



This is where you make overall settings for MIDI transmission. Press the [ ] below " > EXIT" to return the the previous display.

(1) MIDI on/off

■ **Function**
Select whether or not you will receive and transmit MIDI data.

■ **Settings**
off, on

■ **Explanation**
This determines whether or not the V50 will communicate via MIDI with external devices. When you want to use MIDI, set this "on". If not, set it "off. Realtime messages and common messages are not affected by this switch.

(2) Basic receive channel

■ **Function**
Set the MIDI receive channel

■ **Settings**
1- 16, omni

■ **Explanation**
This determines the receive channel for single play mode.

When using the internal sequencer or an external device to play the V50 in single play mode, set this to match the transmit channel of the MIDI device, or select "omni" (omni on).

When "omni" (omni on) is selected, data on any channel 1 – 16 will be received.

When program change is set to "common", this acts as the program change receive channel.

Note:
Set the MIDI receive channel of each instrument in performance play mode using the performance edit setting [TR4] (RECV CH) (see page 25).

(3) Transmit channel

■ **Function**
Set the MIDI transmit channel.

■ **Settings**
1 – 16

■ **Explanation**
This sets the channel on which the V50 will transmit data to external devices.

When using the V50 keyboard to play external synthesizers (such as the DX7II) or tone generator modules (such as the TX802 or TX16W), set the MIDI receive channel of the external devices to match this MIDI transmit channel.

In single play mode, the V50 will sound regardless of this transmit channel setting.

In performance mode, pressing [–] and [TR1] – [TR8] and [RHY] will set the transmit channel to the corresponding instruments.

Note:
In performance play mode, if the channel specified in [TR4] (RECV CH) does not match this transmit channel, playing the keyboard will not produce sound.

(4) Local on/off

■ **Function**
Separate the keyboard and tone generator.

■ **Settings**
off, on

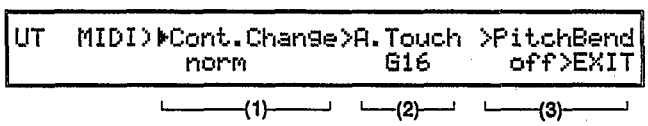
■ **Explanation**
This determines how the V50 keyboard and tone generator are connected. When this is set "on", the keyboard is connected to the tone generator. When this is set "off", the keyboard is disconnected from the tone generator, and playing the keyboard in single play mode will not produce sound.

When this is set "off", the V50 can be used as two separate devices; a MIDI keyboard (without a tone generator) and a tone generator module.

When the power is turned on, this is set "on".

Switch (MIDI control change, MIDI aftertouch, MIDI pitch bend)

Press [MIDI], then press the [ ] below " > Switch" to get the following display.



You can press the [ ] below "EXIT" to return to the previous display.

(1) MIDI control change

■ **Function**
Determine how control change messages are received.

■ **Settings**
off, norm, G1 – G16

■ **Explanation**
This determines how control change messages (controllers except for aftertouch and pitch bend) are received. (Reception of aftertouch and pitch bend are set independently.)

In single play mode, only the control change messages that are received on the basic receive channel will have any effect.

Select from the following.

off ..... Even if control change messages are received from the keyboard or sequencer, they will be ignored.

norm ..... Control change messages from the keyboard or sequencer will have effect only if their channel matches the receive channel.

G1 – G16 .. Control change messages from the keyboard or sequencer will have effect only if their channel matches the receive channel.

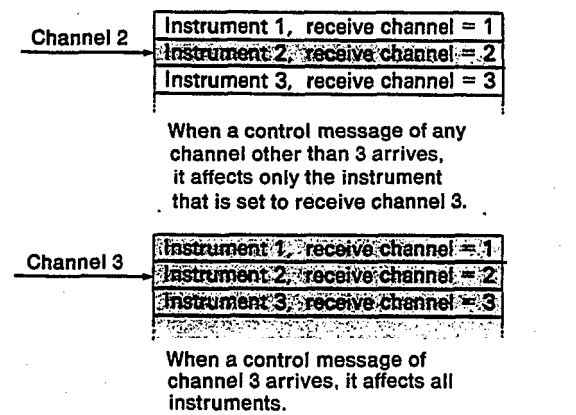
In addition, control change messages of the channel specified here (G1 – G16) will affect instruments of *all* channels (i.e., they will have a global effect).

When this is set to "norm" or "G1 – G16", control change messages will be transmitted, but when set to "off", control change messages will not be transmitted.

About global channel

Global channel is when, in addition to the Normally, different instruments are set to receive a different MIDI channel, and be controlled separately by incoming messages on their own channel.
Global channel is when a certain specified channel is given "global" or "overall" control over *all* instruments regardless of their receive channel setting. When data is received on the specified global channel, it will affect all instruments regardless of their receive channel setting.

The following diagram shows the effect that messages on two different channels will have when a global channel of "G3" has been set.



(2) MIDI aftertouch

■ **Function**
Set reception conditions for aftertouch messages.

■ **Settings**
off, norm, G1 – G16

■ **Explanation**
This determines reception conditions for aftertouch messages. Details of each setting are the same as for MIDI control change explained in the previous section.

(3) MIDI pitch bend

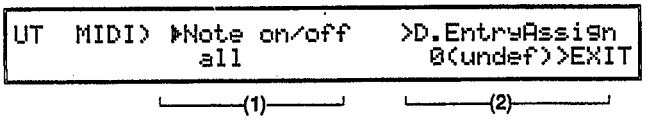
■ **Function**
Set reception conditions for pitch bend messages.

■ **Settings**
off, norm, G1 – G16

■ **Explanation**
This determines reception conditions for pitch bend messages. Details of each setting are the same as for MIDI control change explained in the previous section.

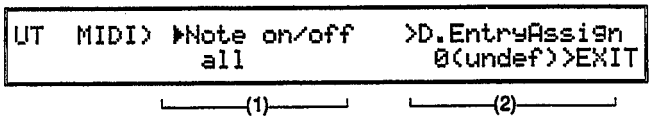
Condition (note on/off, data entry assign)

Press MIDI, then press the ☐ below " > Cond" to get the following display.



You can press the ☐ below " > EXIT" to return to the previous display.

(1) Note on/off



■ **Function**
Specify note reception.

■ **Settings**
all, odd, even

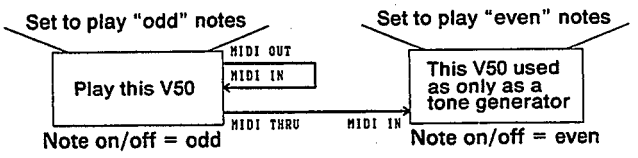
■ **Explanation**
This determines how note on messages (data telling that a note has been played) are received from the sequencer or from MIDI. Select one of the following three.

all ..... The normal condition.

odd ..... When "odd" is selected, the V50 will produce sound only in response to odd-numbered notes. (MIDI note on messages include a note number telling which note was played.)

even ..... When "even" is selected, the V50 will produce sound only in response to even-numbered notes.

This function allows you to use two V50s (or a TX81Z, etc.) to increase the total polyphony. The following diagram shows how two V50s can be connected to increase the polyphony to 32 notes. The notes sounded from the keyboard are not affected by this setting.



- Connect the MIDI OUT of the transmitting V50 to its own MIDI IN.
- Connect the MIDI THRU of the transmitting V50 to the MIDI IN of the V50 being used as a tone generator.
- Set one V50 to play even notes, and the other V50 to play odd notes.
- Set the local on/off of the transmitting V50 to "off".

(2) Data entry assign

■ **Function**
Set the control change number transmitted by the data entry slider.

■ **Settings**
0 – 31

■ **Explanation**
This determines which control change number will be transmitted when you move the data entry slider while in performance play mode or single play mode.

As you select a control number, the name of the controller assigned to that number will be shown in parenthesis, as in the following example.

(Example) 1 (Mod.W) . . . . . modulation wheel
2 (BC) . . . . . breath controller
4 (FC) . . . . . foot controller

"(undef)" indicates that the selected control number has not yet been defined as a part of the MIDI standard.

For example, if you set this to "2 (BC)", the data entry slider can act as a breath controller while in performance play mode or single play mode.

Note:
This function only transmits MIDI control change messages. The actual result will depend on the settings of the receiving device.

Program change

Press MIDI, then press the ☐ below " > PgmCng" to get the following display.

You can press the ☐ below " > EXIT" to return to the previous display.

■ **Function**
Specify how program changes from the internal sequencer or from external devices will be received.

■ **Settings**

off, common, individual, direct TransFilter

■ **Explanation**

When program change messages are sent to the V50 from the internal sequencer or from an external device via MIDI, this setting will determine how they are received. Select one of the following.

off

Program change messages will be ignored.

common

In both single play mode and performance play mode, when a program change on the basic receive channel is received, the voice or performance specified by the program change receive table will be selected.

individual

In performance play mode, when a program change message is received on the receive channel of an instrument, the voice specified by the program change receive table will be selected.

direct

In performance play mode, incoming program change messages will directly select the voice for the instrument with the corresponding receive channel. (The program change table is ignored.)

TransFilter

Program changes recorded in the V50 sequencer differ from ordinary program change messages, and actually contain *two* program change signals. (The first signal selects internal, card, or preset memory, and the second signal is the actual voice number.)

This means that when the V50 sequencer is used to select programs of an external device, an extra program change message is transmitted.

If "TransFilter" is selected, the first program change will be filtered out, and only the second will be transmitted. For reception, this is the same as individual.

The program change table is explained in the following section.

When this function is set to "off", the V50 will not transmit program change messages. Also, if the device number is at any setting other than "off', the V50 will transmit system exclusive data whenever a program is changed, and will not transmit a program change message.

If device number is "off" and program change is at any setting other than "off", then a program change message will be sent on the specified transmit channel.

Note:

When "individual" is selected, program changes will refer to the program change table, but if the program change table entry is a performance number, it will be ignored. (Only voices can be selected when "ind" "individual" is selected.)

Program change table initialize

Press MIDI, then press the ☐ below " > PgmCng", and press the ☐ below " > Init" to get the following display.

```
UT  MIDI)  Initialize pgm change table ?
                                    >EXIT
```

You can press the ☐ below " > EXIT" to return to the previous display.

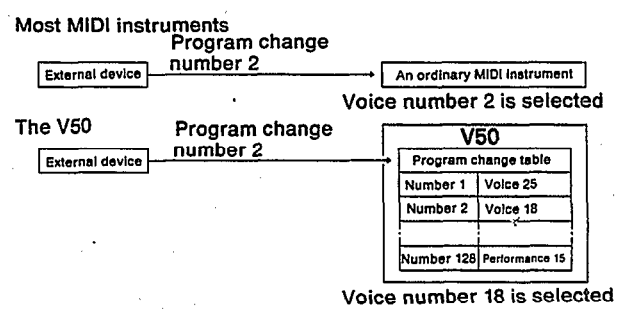
■ **Function**

Initialize the program change table.

■ **Explanation**

When most MIDI instruments receive a program change message, they select the voice of the same number as the program change message. This means that when several such MIDI instruments are connected, their internal memories must be rearranged so that each will select the desired voice in response to a single program change message.

However, the V50 has a "program change table" that allows you to specify which voice (or performance) is selected in response to each incoming program change message. (When "direct" is selected, this program change table is ignored.)



This function allows you to initialize the program change table to the following condition.

Number	Setting
1	I00
2	I01
:	:
100	I99

Number	Setting
101	P00
102	P01
:	:
128	P27

When you press [+1] you will be asked "Are you sure?". Press [+1] again, and the program change table will be initialized.

Program change table edit

Press [MIDI], press the [ ] below " > PgmCng", and press the [ ] below " > Edit" to get the following display.

```
UT  MIDI)  Edit pgm change table
 ↓ pgm ↑ PGM   1=  I00(Strings 1 ) >EXIT
```

You can press the [ ] below " > EXIT" to return to the previous display.

■ **Function**

Edit the program change table.

■ **Explanation**

The program change number is displayed on the left of the " = " , and on the right side, the V50 voice or performance number is displayed.

Press the [ ] below the up/down arrows in the display to select the program change number (displayed at left), and specify the voice number which it will select (displayed at right). Use [INT], [CARD] or [PRESET] to select internal, card, or preset voices. To select performances, press [PERFORMANCE] while pressing [INT], [CARD], or [PRESET].

In this way, set a voice or performance to be selected by each incoming program change.

Pressing "Inc" after memory 99 will advance to the next memory.

Program change transmit

This is not actually a utility function, but we will explain it here. This allows you to transmit a program change message from MIDI OUT without affecting the V50.

When in performance play mode or single play mode, press and hold [PERFORMANCE] or [SINGLE], and the display will show "Sending Pc No.---". Continuing to press the key, use the [0] – [9] keys to enter a three-digit (001 – 128) program change number. The specified program change will be sent on the specified transmit channel at the instant you release [PERFORMANCE] or [SINGLE].

Exclusive message (device number)

Press [MIDI], and press the [ ] below " > Exclusive" to get the following display.

```
UT  MIDI)        ▶Device No.
                      1          >Bulk>EXIT
```

You can press the [ ] below " > EXIT" to return to the previous display.

■ **Function**

Set the MIDI channel on which to receive and transmit system exclusive messages.

■ **Settings**

off, 1 – 16, all

■ **Explanation**

This sets the MIDI channel on which system exclusive messages (data for voices and performances, etc.) will be transmitted and received. Select one of the following.

off..... Exclusive messages will not be transmitted.

1 – 16... Exclusive messages will be transmitted on the channel specified here. (The next section explains the actual transmission.)

all..... Exclusive messages of any channel will be received. Channel 1 will be used for transmission.

Note:

When this "off", exclusive messages will not be transmitted, and when a V50 voice is selected, a program change message will be transmitted.

The device receiving the exclusive message must be set to match the channel specified here.

Exclusive message (bulk dump)

Press [MIDI] press the [ ] below " > Exclusive", and press the [ ] below " > BULK" to get the following display.

```
UT  DUMP) Bulk Dump       Select one !
    VOICE PFM SETUP        SEQ  RHY >EXIT
```

Press the [ ] below " > EXIT" to return to the previous display.

■ **Function**

Transmit exclusive messages.

■ **Settings**

VOICE, PFM, SETUP, SEQ, R.SEQ

■ **Explanation**

The selected type of exclusive message will be transmitted. Select one of the following five.

VOICE.... Transmit voice data. After selecting this, select internal, preset, or card, and specify the range of voices to be transmitted (00 – 24, 25 – 49, 50 – 74, 75 – 99, or ALL to transmit voices 0 – 99).

PFM..... Transmit performance data. After selecting this, select internal, preset, or card, and specify the range of performances to be transmitted (00 – 24, 25 – 49, 50 – 74, 75 – 99, or ALL to transmit performances 0 – 99).

SETUP... Transmit setup data. After selecting this, select the type of setup data to be transmitted. The table on page 96 explains the various types of setup data.

SEQ..... Transmit sequence data. After selecting this, select the type of sequence data to be transmitted (sequence all, sequence data, sequence setup).

R.SEQ..... Transmit rhythm data (pattern data, song data). After selecting this, select the type of rhythm data to be transmitted (rhythm all, rhythm sequence, rhythm setup).

When you have selected the type of data to be transmitted, the display will show "Transmit ready?" When you press [+1] an exclusive message of the specified data will be sent.

About the disk

Unlike a memory card, a single disk can contain many different types of data, and many different sets of each type.

A newly-purchased disk must be formatted before it can be used (see page 108).

Note:

Formatting a disk will erase all the data it contained. Be careful not to format a disk that contains valuable data.

The V50 uses 3.5" 2DD disks. (It cannot use 3.5" 2D or 2HD disks.) Be sure to use the correct type of disk.

Disks have a write protect slider located at the lower left. When this slider is on (the window is open), writing data or formatting is not possible. Leave this slider on when you want to keep valuable data from accidently being erased.

Save

You can save various types of data to disk. The procedure is as follows.

Note:

Disks that have not been formatted cannot be used. If the write protect slider is on, data cannot be saved.

(1) Insert the disk into the disk drive. (Newly-purchased disks must be formatted before they can be used to save data.)

(2) Press DISK to get the following display.

```
UT  DISK)        Select one !
>Save>Load>Del >Rename     >MDR >Dir >Job
```

(3) Press the ☐ below " > Save" to get the following display.

```
UT  DISK) SAVE  Select one !
 ALL  SYN  SEQ  R.SEQ      CARD       >EXIT
```

You can press the ☐ below " > EXIT" to return to the previous display.

(4) Press a ☐ to select one of the following types of data to save.

ALL..... Save synthesizer data (internal voice, internal performance, setup), sequencer data (all songs, setup), and rhythm machine data (pattern, song, setup) to disk.

SYN..... Save only synthesizer data to disk.

SEQ..... Save only sequencer data (a single song) to disk.

R.SEQ.... Save only rhythm machine data for an entire song to disk.

CARD.... Save all data from the specified bank of the currently inserted card to disk.

You will then get the following display. (The "ALL" display will differ according to the data that was selected.)

```
UT  DISK) SAVE  ALL   Set name & push GO
>File 01  ▶NewFile (ALL)    ←    →    >GO
```

(5) With the cursor at ">File", select a file number, and set a file name for the data you are saving. Page 00 explains how to enter characters.

If you want to write over (replace) an already existing file, move the cursor to " > File", and select the file by number.

(6) Press the ☐ below " > GO" and you will get a message "Are you sure?", and if the disk is near the limit of its capacity, you will get a warning message. If so, select "> EXIT".

(7) Press +1 and the specified data will be saved to a file on disk. An indication of the free space on disk (in kilobytes) will be displayed.

Load

Load previously saved data from disk using the following procedure.

Note:

When memory protect (internal) is on, you will get a message of "Memory Protected", and will not be able to load. (SEQ is an exception to this.)

When you execute load, the data in internal memory (of the type that is being loaded) will be erased. Be sure to check before loading.

(1) Insert the disk into the disk drive.

(2) Press DISK to get the following display.

(3) Press the ☐ below " > Load" to get the following display.

You can press the ☐ below " > EXIT" to return to the previous display.

(4) Press a ☐ to select one of the following types of data to load.

ALL..... Load synthesizer, sequencer, and rhythm machine data from disk.

SYN..... Load only synthesizer data from disk.

SEQ..... Load a sequencer song from disk into the currently selected song memory.

R.SEQ .... Load only rhythm machine data (pattern, song) from disk.

CARD .... Load all data from disk into the currently inserted card. Remember that this will erase all the data that was previously in the card.

Be sure to select the same type of data as when you saved. For example, if you saved "ALL" data to a disk file, it is not possible to load only the synthesizer data from that file.

You will then get the following display. (The "ALL" display will differ according to the data that was selected.)

(5) Select the file to load into memory. The name of the selected file will be displayed.

(6) Press the ☐ below " > GO" and you will get a message of "Are you sure?".

(7) Press +1 and the specified data file will be loaded from disk into the V50's memory.

Delete

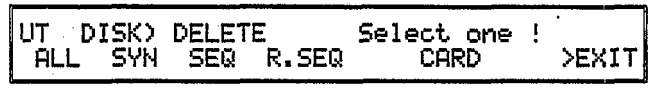
This function deletes a disk file. The procedure is as follows.

Note:
If the disk's memory protect switch is on, it is not possible to delete.

(1) Insert the disk into the disk drive.

(2) Press DISK to get the following display.

(3) Press the ☐ below " > Del" to get the following display.



You can press the ☐ below " > EXIT" to return to the previous display.

(4) Press a ☐ to select the type of data to delete. Be sure to select the same type as when you saved the data. For example if you saved "ALL" data to a disk file, it is not possible to delete only the synthesizer data from that file.

You will then get the following display. (The "ALL" display will differ according to the data that was selected.)

(5) Select the file to be deleted. The name of the selected file will be displayed..

(6) Press the ☐ below " > GO" and you will get a message of "Are you sure?".

(7) Press +1 and the specified file of data will be deleted.

Rename

This changes the name of a disk file. The procedure is as follows.

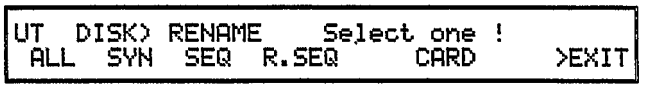
Note:

If the disk's memory protect switch is on, it is not possible to rename.

(1) Insert the disk into the disk drive.

(2) Press DISK to get the following display.

(3) Press the ▭ below " > Rename" to get the following display.



You can press the ▭ below " > EXIT" to return to the previous display.

(4) Press a ▭ to select the type of data in the tile to rename.

You will then get the following display. (The "ALL" display will differ according to the data that was selected.)

(5) Select the file to be renamed, and modify the filename. (Page 17 explains how to enter characters.)

(6) Press the ▭ below " > GO" and you will get a message of "Are you sure?".

(7) Press +1 and the specified file will be renamed.

MDR

The MDR (MIDI data recorder) function allows you to save (In) or load (Out) any type of MIDI bulk data (voice data, sequence data, etc.) as a disk file on the V50 disk.

Press DISK, and then press the below " > MDR" to get the following display.

The first steps of MDR operation are the same as when saving (In) and loading (Out) other V50 data. (However there is no selection of the type of data.) MDR disk files can also be deleted or renamed.

MDR functions use the V50 internal memory, and sequencer data will be cleared. Before beginning MDR operations, save any important sequencer and rhythm data to disk or card.

(1) In (receive MIDI data from an external device and save it to disk).

For the first steps of the MDR procedure, follow the steps explained for saving (see page 105). Specify the file name and press the ▭ below " > GO" to get the "Are you sure?" message. For the remaining steps, use the following procedure.

(1) In response to the "Are you sure?" message, press +1.

(2) The V50 will wait for data to arrive.

(3) Operate the external device to transmit the desired MIDI data.

(4) When transmission is over, press the ▭ below " > GO".

(5) The received data will be saved to disk.

(2) Out (load MIDI data from disk and transmit it to an external device)

The procedure is the same as explained for loading from disk (see page 105).

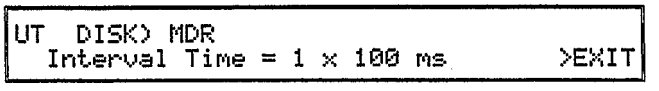
Note:

MDR data will be transmitted on the same channel as it was received, so set the receiving device to the appropriate channel number.

Reception can continue until the internal memory (64K byte) is full.

IntTime (interval time)

The "IntTime" (interval time) setting adjusts the speed at which MDR data is transmitted. Press the ▭ below " > IntTime" to get the following display.



When transmitting MDR data, the time you specify here as "1 x 100ms" will be inserted as a waiting interval between every 1 kB and every block of data transmitted. If the external device has difficulty receiving the data correctly, set a longer interval time, and try again.

Directory

This allows you to see the number and names of files on a disk. The procedure is as follows.

(1) Insert the disk into the disk drive.

(2) Press DISK to get the following display.

```
UT  DISK)        Select one !
>Save>Load>Del >Rename     >MDR >Dir >Job
```

(3) Press the ▭ below " > Dir" to get the following display.

```
UT  DISK) DIRECTORY       Total: 52 Files
▶File 01  :SunShine(ALL)   20K      >EXIT
```

You can press the ▭ below " > EXIT" to return to the previous display.

(4) Select the file number to view the file name and file size. The upper line shows the total number of files on disk. The "ETC" shown in ( ) indicates files that were not saved by the V50.

Format

This function formats a disk. Newly-purchased disks must be formatted before they can be used. You can also use this format function to erase all the files on a disk. The procedure is as follows.

Note:

Formatting will erase all the data on the disk. Formatting is not possible if the disk's write protect slider is on the "on" position.

(1) Insert the disk into the disk drive.

(2) Press DISK to get the following display.

```
UT  DISK)        Select one !
>Save>Load>Del >Rename     >MDR >Dir >Job
```

(3) Press the ▭ below " > Job" to get the following display.

```
UT  DISK)   Insert DISK and select one !
>Format   >Backup   >Status         >EXIT
```

You can press the ▭ below " > EXIT" to return to the previous display.

(4) Press the ▭ below " > Format" to get the message "Are you sure"?

(5) Press +1 and formatting will begin. (Formatting takes approximately 1 minute and 10 seconds.)

Backup

This function copies an entire disk to another disk, making a backup copy.
It is important to make backup copies of your disks to avoid loosing important data.

Note:

Backup works by repeating the following three steps.

(1) Read the original disk (source).
(2) Store the data in V50 internal memory.
(3) Write the data to the duplicate disk (copy).

As you can see from step (2), the backup function uses the V50 sequencer and rhythm pattern internal memory. When you use the backup function, sequence data, and rhythm pattern and rhythm song data will be lost. Before using the backup function, be sure to store important sequence and rhythm data to disk.

The duplicate disk must already be formatted. All the old data in the duplicate disk will be erased.

(1) Press DISK to get the following display.

```
UT  DISK)        Select one !
>Save>Load>Del >Rename     >MDR >Dir >Job
```

(2) Press the ▭ below " > Job" to get the following display.

```
UT  DISK)   Set DISK and select one !
>Format   >Backup   >Status         >EXIT
```

You can press the ▭ below " > EXIT" to return to the previous display.

(3) Press the ▭ below " > BackUp" to get the message "** SEQ/R.SEQ data will be cleared. Sure?".

(4) Press +1 to get the message "** Set original disk & push YES".

(5) Insert the original disk (source) into the disk drive.

(6) Press +1. After a while you will get the message "** Set duplicate disk & push YES".

(7) Insert the duplicate disk (copy) into the disk drive.

(8) Press +1.After a while you will get the message "** Set original disk & push YES".

The upper line of the display will show the percentage of the total disk that has been copied.

Repeat steps (5) - (8) until backup is completed.

When backup is completed, you will get the message "Backup completed !"

Status

This allows you to check the condition of the disk. The number of files, total used bytes, and total remaining bytes will be displayed.

(1) Insert the disk into the disk drive.

(2) Press DISK to get the following display.

```
UT  DISK)        Select one !
>Save>Load>Del >Rename     >MDR >Dir >Job
```

(3) Press the ☐ below " > Job" to get the following display.

```
UT  DISK)   Insert DISK and select one !
>Format   >Backup   >Status          >EXIT
```

You can press the ☐ below " > EXIT" to return to the previous display.

(4) Press the ☐ below " > Status" to get a display like the following.

```
UT  DISK) STATUS
Total=52files, Used= 50K,Free=663K >EXIT
```

The lower line shows the number of files on disk, total used bytes, and total remaining bytes.

MEMORY PROTECT

Memory protect (internal, card)

Press MEMORY PROTECT to get the following display.

```
UT  MEMORY PROTECT)  ▶INT      >CARD
                      off        on
                      └(1)┘      └(2)┘
```

Memory protect keeps internal and card memory from being accidently written over and lost.

(1) Internal

- **Function**
  Protect setting for internal memory.
- **Settings**
  off, on
- **Explanation**
  This turns internal memory protect on/off. When set to "on", voice or performance data cannot be stored to internal memory, nor can card, disk, or MIDI data be loaded into memory. When the power is turned on, this will be set "on".

(2) Card

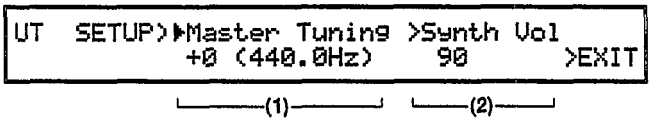
- **Function**
  Protect setting for card memory
- **Settings**
  off, on
- **Explanation**
  This turns card memory protect on/off. When set to "on", voice or performance data cannot be stored to card memory, nor can internal data be saved into card memory. When the power is turned on, this will be set "on".

Note:

The card itself also has a memory protect switch. If the card switch is on, data cannot be saved even if this the card memory protect is turned "off".

Master tuning, synthesizer volume

Press [SETUP], then press the [ ] below " > Tune" to get the following display.



You can press the [ ] below " > EXIT" to return to the previous display.

(1) Master tuning

■ **Function**
Set master tuning.

■ **Settings**
–64 – +64

■ **Explanation**
Master tuning affects the entire V50 in both performance play mode and single play mode. In performance play mode this will adjust the overall tuning of all instruments.

The setting can be adjusted over a range of approximately one half step up or down. At a setting of 0, A3 will be 440.0Hz. A setting of - 64 is - 100 cents (one half step down), and a setting of +64 is 98.4 cents (approximately one half step up).

This function allows you to tune the V50 to instruments that are not tuned to A3 = 440Hz.

(2) Synthesizer volume

■ **Function**
Set the synthesizer volume.

■ **Settings**
0 – 99

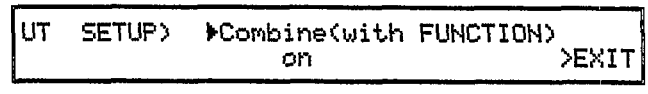
■ **Explanation**
This is used to adjust the volume balance between the synthesizer section and the rhythm machine. 0 is minimum volume, and 99 is maximum volume.

Note:

At a setting of 0, you will not be able to hear the synthesizer.

Combine

Press [SETUP], then press the [ ] below " > Comb" to get the following display.



You can press the [ ] below " > EXIT" to return to the previous display.

■ **Function**
Disconnect function data from a voice.

■ **Settings**
off, on

■ **Explanation**
Each voice data setting is actually divided into two types of data; voice data and function data. The voice data determines the sound of the voice, and the function data determines how the voice is controlled. This combine function disconnects the function data from the rest of the voice data.

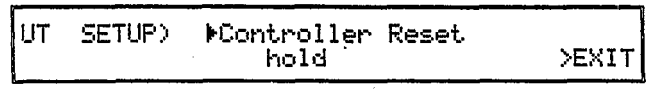
When function data is disconnected, selecting a different voice will change only the voice data, preserving the previous function data. This allows you to change only the voice while preserving the settings (modulation wheel, aftertouch, foot controller, effect etc.) that determine how it is controlled.

"on" is the usual setting, when function data is not disconnected. When set to "off", function data is disconnected.

This setting also applies to performance mode, and the voice function data and effect data will be preserved even when a different performance is selected. If you set combine "off" and select a different voice or performance, the first character of the voice or performance name will be displayed in lower case to indicate that the function settings of the previously selected voice are being used.

Controller reset

Press [SETUP], then press the [ ] below " > Ctrl" to get the following display.



You can press the [ ] below " > EXIT" to return to the previous display.

■ **Function**

Determine controller reset condition.

■ **Settings**

hold, reset

■ **Explanation**

Controller reset determines the condition of the controllers (modulation wheel, pitch bend wheel, breath controller, foot controller, etc.) when a voice or performance is selected.

For example, if you advance the modulation wheel and then select a different voice or performance, this setting determines whether the newly selected voice or performance will be affected by the modulation wheel.

When this is set to "hold", the previous controller data will be apply to the newly selected voice or performance. When this is set to "reset", the controller data will be initialized regardless of the actual controller position whenever a voice or performance is selected, and the newly selected voice will have no modulation wheel effect. However, the instant you move the modulation wheel even slightly, the modulation wheel effect used by the newly selected voice or performance will immediately be applied.

Performance effect (delay)

This sets the delay performance effect. The delay effect adds additional, delayed notes of the same (or different) pitch as the originally played note.

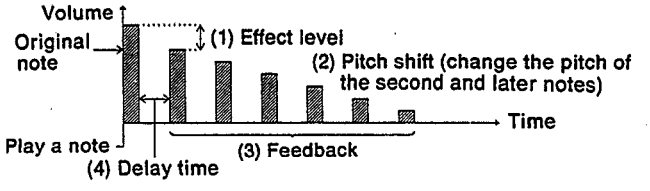
The V50 has memory for four independent settings of the performance delay effect; Delay1, Delay2, Delay3, and Delay4.

This effect can be used in single play mode only while editing the performance delay.

To use this effect in performance play mode, set the performance effect selection in [ ] (OTHERS) to "Delay1" – "Delay4".

Settings can be copied from one performance delay memory to another (see page 120).

Each performance delay memory has the following four settings.



Note:

Only one out of the twelve performance effects (delay 1 - 4, pan 1 - 4, chord 1 - 4) can be used at one time.

The delay effect is effective for up to four notes. If you play four notes, the fourth note will have the correct delay effect. However the instant you play the fifth note, the delay note of the first played note will disappear.

In performance play mode, the delay effect will apply only to the first instrument in the performance. (Usually instrument 1.)

The actual number of feedback repeats will depend on key velocity and the effect level.

If the velocity sensitivity of the carrier operator is 0, the effect level will not equal the original level even if the effect level is set to 99.

Press [SETUP], press the [ ] below " > P.Efct", and press the [ ] below "delay" to get the following display.

```
UT  SETUP>    ▶EDIT DELAY  Select one !
delay1     delay2     delay3     delay4>EXIT
```

You can press the [ ] below " > EXIT" to return to the previous display.

Select the delay you wish to set (delay1 – delay4). For example, if you press the [ ] below "delayl", you will get a display like the following.

```
UT  DELAY1> ▶DelayTime >PitchShift
                1.28sec      +0 >NEXT>EXIT
            └──(1)──┘  └──(2)──┘
```

In addition, if you press the [ ] below " > NEXT" you will get a display like the following.

```
UT  DELAY1> ▶Feedback >EffectLevel
                   6         90 >NEXT>EXIT
            └──(3)──┘  └──(4)──┘
```

If you press the [ ] below " > NEXT" once again, you will return to the previous display.

(1) Delay time

■ **Function**

Set the delay time.

■ **Settings**

0.01 - 1.28

■ **Explanation**

This is the time from when the original note sounds to when the first delay note sounds. Set the delay time over a range of 0.01 - 1.28 seconds.

(2) Pitch shift

■ **Function**

Set the pitch shift.

■ **Settings**

-24 – +24

■ **Explanation**

If this setting is other than 0, the second and later notes will each be higher or lower by the specified amount. With a setting of 0, each delay note will be the same pitch. With a setting of - 1 - -24 the delay notes will descend, and with a setting of + 1 – + 24 the delay notes will ascend.

For example, if this setting is + 2, the delay notes will ascend the whole-tone scale.

(3) Feedback

■ **Function**

Set the feedback.

■ **Settings**

0 - 7

■ **Explanation**

Feedback regulates the number of delay repetitions. Larger settings will cause more repetitions. The actual number of repetitions will depend on the key velocity of the note (the force with which the note is played), and the effect level.

(4) Effect level

■ **Function**

Set the effect level.

■ **Settings**

0-99

■ **Explanation**

Set the delay level in relation to the original sound. With a setting of 0, the delay volume will be 0 (no delay effect), and with a setting of 99, the delay will approximately the same volume as the original sound. (Only if the key velocity sensitivity of the carrier operators is other than zero.)

Performance effect (pan)

This programs another one of the performance effects; pan. When the L and R outputs are connected to a stereo system or to two amps, this pan effect causes the sound to move between the left and right outputs. (You can also hear this effect through headphones.)

The V50 has memory for four independent settings of the performance pan effect; pan1, pan2, pan3, and pan4.

This effect can be used in single play mode only while editing the performance delay.

To use this effect in performance play mode, set the performance effect selection in [ ] (OTHERS) to "Pan1" – "Pan4".

Settings can be copied from one performance pan memory to another (see page 120).

Each performance pan memory has the following three settings.

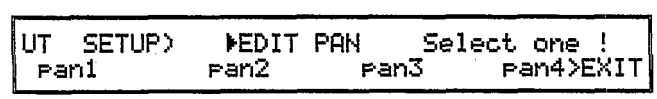
Note:

Only one out of the twelve performance effects (delay 1 - 4, pan 1 - 4, chord 1 - 4) can be used at one time.

When using this in single play mode, the maximum simultaneous notes will be set to eight notes.

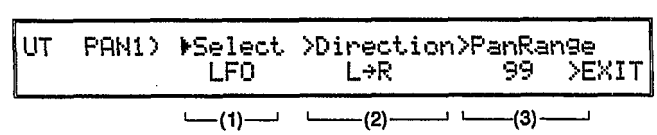
In performance play mode, the pan effect will apply only to instruments whose [TR8] (OUTPUT ASSIGN) setting is either L or R. (The pan effect will not apply to instruments whose output assign setting is "L + R".)

Press [SETUP], press the [ ] below " > P.Efct", and press the [ ] below "pan" to get the following display.



You can press the [ ] below " > EXIT" to return to the previous display.

Select the pan memory you wish to set (pan1 – pan4). For example if you press the [ ] below "pan1", you will get a display like the following.



(1) Select

■ **Function**
Select the type of pan effect.

■ **Settings**
LFO, VEL, NOTE

■ **Explanation**
Select one of the following three types of pan effect.

LFO .... Use a vibrato generator to move the sound left and right.

Vel..... Move the sound left or right depending on the key velocity.

Note .... Move the sound left or right depending on the note pitch.

(2) Direction

■ **Function**
Select the direction of pan movement.

■ **Settings**
L→ R, L←R

■ **Explanation**
The effects will differ according to the setting made for "select".

When LFO is selected
If the (LFO) of the voice is set to Sync = on, selecting "L→R" will make the sound begin from the left side. Selecting "L← R" will make the sound begin from the right side.

If Sync = off, the "L ← R" or "L→R" setting will not make much difference.

When Vel is selected
When "L→R" is selected, lightly played notes will be toward the left, and strongly played notes will be toward the right. When "L←R" is selected, the opposite will be true.

When Note is selected
When "L→R" is selected, lower notes will be toward the left, and higher notes will be toward the right. When "L←R" is selected, the opposite will be true.

Note:
If you play several keys at once in single play mode, the position of the sound will be determined by the velocity or pitch of the first note.

In performance play mode, the position of the sound will be determined by the velocity or pitch of the first note of the lowest-numbered instrument that is being played.

(3) Pan range

■ **Function**
Set the depth of the pan effect.

■ **Settings**
0-99

■ **Explanation**
This determines the depth of the pan effect. A setting of 0 will be no effect, and 99 is maximum effect.

Performance effect (chord)

This sets the "chord" performance effect. The chord effect allows you to sound up to four notes by playing a single key.

The V50 has memory for four independent settings of the performance chord effect; chord1, chord2, chord3, and chord4.

This effect can be used in single play mode only while editing the performance delay.

To use this effect in performance play mode, set the performance effect selection in [ ] (OTHERS) to "chord1" – "chord4".

Settings can be copied from one performance chord memory to another (see page 120).

Note:
Only one out of the twelve performance effects (delay 1 – 4, pan l – 4, chord l – 4) can be used at one time.

In performance play mode, the chord effect will apply only to the lowest-numbered of the instruments that are sounding.

A chord can be set for each of the twelve keys in the C3 – B3 octave. Each chord can include notes of any octave.

Press [SETUP], press the [ ] below " > P.Efct", and press the [ ] below "chord" to get the following display.

```
UT  SETUP)    ▶EDIT CHORD  Select one !
chord1     chord2     chord3     chord4>EXIT
```

You can press the [ ] below " > EXIT" to return to the previous display.

Now select the chord you want to edit (chord1 – chord4). For example if you press the [ ] below "chord1", you will get a display like the following.

```
UT  CHORD1)    C3 is .....        >KBD
 ← key →    ▶ C3/  E3/  * /  *    in >EXIT
```

The upper line of the display shows the key (C3 in this example) for the chord you are setting. The lower line shows the notes that will be played when you press the specified key. For example, in the next example if you pressed C3, the notes E3 and G3 would sound.

Use the ☐ below "←" and "→" to select the key in the upper line. Use the data entry slider or [−1] [+1] to modify the notes in the lower line. Also, after selecting the key in the upper line, move the cursor to " > KBD", and the chord you play on the keyboard will be set as the chord in the lower line.

Repeat this to set a chord for each of the twelve keys C3 – B3.

Note:

When a preset or card performance is selected, modifying a performance effect parameter will only affect the internal data, so the effect will not change. When you want to change these settings for preset or card performances, temporarily store that performance to internal memory before changing the effect settings.

About microtuning

Microtuning allows you to specify the pitch of each note. Normally, most music of today divides the octave into twelve steps. This is known as equal temperament. There are many other temperaments, and most music of previous centuries was written using one of these other temperaments. Also, 20th century music sometimes divides a half-step into two or even four smaller intervals.

The V50 has 11 preset tunings including equal temperament. In addition, two user memories are provided for you to create your own temperaments.

The 11 preset tunings are shown on page 29.

To use a micro tuning in single play mode, enter the micro tuning edit function we will be explaining in this section.

To use a micro tuning in performance play mode, set the ☐ (OTHERS) micro tuning select to the temperament you want to use.

The following two user micro tunings are provided.

(1) Octave
Set the pitch for the twelve notes C3 - B3. Other octaves will automatically be adjusted to the same relative pitch steps.

(2) Full keyboard
Set the pitch for each note C-2 – G8 in the MIDI note range. (This is a broader range than the V50 61- note keyboard covers.)

Note:

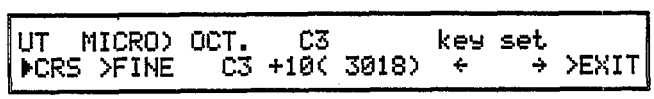
The micro tuning you set will be remembered even when the power is turned off. However only two memories are provided for your own original micro tunings (one "octave", one "full"). If you want to create more tunings than this, you will have to save the data for each to a card (see page 97).

Microtuning (octave edit)

This is where you set the pitch for each of the twelve notes C3 – B3. Other octaves will be automatically adjusted to the same relative pitch steps.

If desired, you can use the initialization function explained next to initialize the user octave microtuning to one of the 11 presets, and then use this octave edit function to adjust the data as needed.

Press [STEP], press the ☐ below " > Micro", then press the ☐ below "OCT. Edit" to get the following display.



The note in the center of the upper row is the note whose pitch you are specifying. The center of the lower row shows the actual pitch that is produced when you play that note. For example, in the above display, the pitch produced when the note "C3" is played will be + 10 steps above the "C3" of equal temperament. One step is 1/64th of a note (1.5625 cents). The parentheses show the pitch of the note in steps starting from C#-1.

When the cursor is at "CRS", modify the note name in the lower line. When the cursor is at "FINE", increase or decrease the step units in the lower line.

To change the note displayed in the upper line, press a key C3 – B3 on the keyboard, or press the ☐ below "←" or "→" .

Microtuning (octave initialize)

To simplify creating your own octave micro tuning, this function allows you to copy a preset micro tuning into the user octave micro tuning memory. You can then modify it as desired.

Press SETUP, press the ▭ below " > Micro", then press the ▭ below "OCT. Init" to get the following display.

```
UT  MICRO) INIT     ▶Table       >key
>GO                2:Pure(major)   C  >EXIT
```

Select the micro tuning to initialize to. (If necessary, specify the tonic.) Then press the ▭ below "yes". Press +1, and the user octave tuning will be intialized.

Microtuning (full keyboard edit)

This is where you set the pitch for each of the note in the MIDI note range C-2 – G8.

If desired, you can use the initialization function explained next to initialize the user full keyboard microtuning to one of the 11 presets, and then use this full keyboard edit function to adjust the pitch for each note as needed.

Press STEP, press the ▭ below " > Micro", then press thebelow "FULL Edit" to get the following display.

```
UT  MICRO) FULL.  C-2        key set
▶CRS >FINE  C#-1 +10(   10)  ←    → >EXIT
```

The note in the center of the upper row (C-2 in the above example) is the key whose pitch you are specifying. The center of the lower row shows the actual pitch that is produced when you play that key. For example in the above display, the pitch produced when the key "C-2" is played will be + 10 steps above the "C#-1" of equal temperament. One step is 1/64th of a note (1.5625 cents). The parentheses show the pitch of the note in steps starting from C#-1.

When the cursor is at "CRS", modify the note name in the lower line. When the cursor is at "FINE", increase or decrease the step-units in the lower line.

To change the note displayed in the upper line, press a key on the keyboard, or press the ▭ below **"←"** or **"→"**.

Microtuning (full keyboard initialize)

To simplify creating your own full keyboard micro tuning, this function allows you to copy a preset micro tuning into the user full keyboard micro tuning memory. You can then modify it as desired.

Press SETUP, press the ▭ below " > Micro", then press the ▭ below "FULL Init" to get the following display.

```
UT  MICRO) INIT     ▶Table       >key
>GO                2:Pure(major)   C  >EXIT
```

Select the micro tuning to initialize to. (If necessary, specify the tonic.) Then press the ▭ below "yes". Press +1, and the user octave tuning will be intialized.

Velocity (fixed velocity, velocity curve)

Press SETUP, and press the ▭ below " > Vel" to get the following display.

```
UT  SETUP)▶FixedVelocity >VelCurve
                 127       0(norm)  >EXIT
                 └──(1)──┘  └─(2)─┘
```

You can press the ▭ below " > EXIT" to return to the previous function.

(1) Fixed velocity

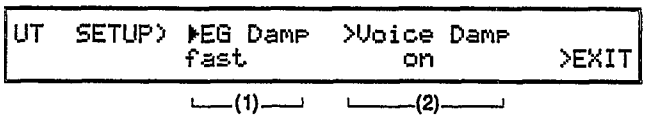
- **Function**
  Set a fixed velocity for every note.
- **Settings**
  off, 1 – 127
- **Explanation**
  This sets the velocity produced when a key is pressed. Normally, it will be set to "off", and the velocity of a note will be determined by how strongly it is played.
  However, setting this to a value of 1 – 127 will make each note produce velocity specified here, regardless of how strongly the key was actually played.

(2) Velocity, curve

- **Function**
  Set a curve for velocity response.
- **Settings**
  0 – 7
- **Explanation**
  This setting determines how velocity values will change in response to stronger or softer playing. Higher settings in the range of 0 – 5 will produce higher velocity even in response to softer playing. (I.e., a setting of 5 would be the most "sensitive".) A setting of 6 is a nearly flat curve, but the maximum velocity will be 80. A setting of 7 is reverse velocity (the stronger you play, the lower the velocity becomes). When power is turned on, 0 (norm) is selected.

Damp (EG forced damp, voice damp)

Press **SETUP**, then press the ☐ below " > Damp" to get the following display.



You can press the ☐ below " > EXIT" to return to the previous display.

(1) EG forced damp

■ **Function**

This determines how notes beyond the maximum polyphony will be handled.

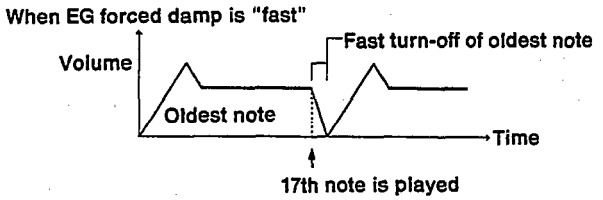
■ **Setting**

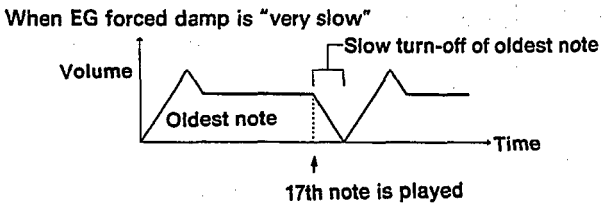
veryslow, slow, medium, fast

■ **Explanation**

When an instrument in performance play mode receives more notes than allowed by its maximum notes setting, or when more than 16 notes are received in single play mode, this setting determines how the overflowing notes will be handled.

For example, in single play mode when the 17th note is received, the oldest note will be turned off. This EG forced damp determines how quickly the oldest note will be turned off.





A setting of "fast" takes the shortest time to turn off the oldest note, and a setting of "veryslow" takes the longest time.

As you can see from the diagram, EG forced damp reduces the click noise produced when a note is turned off instantly. The longer the setting, the less noise there will be. However sounds with a quick attack (piano, organ, etc.) will sound rather unnatural with a long forced damp setting, since the notes will begin perceptably later than they should. In such cases, set EG forced damp to "fast".

(2) Voice damp

■ **Function**

Determine if notes will continue to sound through a voice change when in single mode.

■ **Settings**

off, on

■ **Explanation**

When "on" is selected, notes sounding when a voice is selected will be turned off. When "off' is selected, notes will continue to sound, and the newly selected voice will be used for the next note. However, LFO data will change at the instant the voice is selected.

Voice initialize

From single play mode or voice edit mode, press OTHERS to get the following display.

■ **Function**
Initialize a voice.

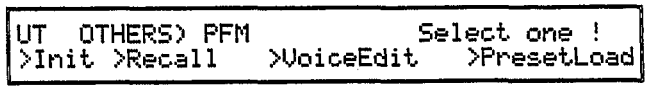
■ **Explanation**
This function sets a voice to an initial state, with settings at maximum or minimum, producing the simplest possible sound.

Press the ☐ below " > Init" to get the message "Are you sure?". Press +1 and the voice will be initialized.

Note:
The voice function data will be initialized even if the combine setting is "off".

Performance initialize

From performance play mode or performance edit mode, press OTHERS to get the following display.



Press the ☐ below " > Init" to get the following display.

You can press the ☐ below " > EXIT" to return to the previous display.

■ **Function**
Initialize a performance.

■ **Explanation**
You can initialize to one of the following six types.

SNGL..... Just a single instrument

DUAL..... Two instruments sounding together

SPLT..... Two instruments split at B2/C3

4LYR..... Four instruments sounding together

8LYR..... Eight instruments sounding together

SEQ4..... Setting for playing four instruments from the sequencer

SEQ8..... Setting for playing eight instruments from the sequencer

Page 125 shows the initial settings for each of these. Press a ☐ below the desired initialization setting, and you will be asked "Are you sure?". Press +1 and the performance will be intialized.

Voice recall

From single play mode or voice edit, press OTHERS to get the following display.

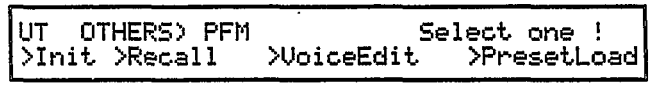
■ **Function**
Recall a voice.

■ **Explanation**
This function recalls the voice you were most recently editing. This is especially useful when, while editing a voice, you select another voice by mistake before saving your edited voice.

Press the ☐ below " > Recall" to get the message "Are you sure?". Press +1 and the previously edited voice will be recalled.

Performance recall

From performance play mode or performance edit, press OTHERS to get the following display.



■ **Function**
Recall a performance.

■ **Explanation**
This function recalls the performance you were most recently editing. This is especially useful when, while editing a performance, you select another performance by mistake before saving your edited performance.

Press the ☐ below " > Recall" to get the message "Are you sure?". Press and the previously edited performance will be recalled.

Preset load

From single play mode, performance play mode, or voice or performance edit, press [OTHERS]. The following example shows the voice display.)

Press the [ ] below " > PresetLoad" to get the following display.

You can press the [ ] below " > EXIT" to return to the previous display.

■ Function

Load the preset performance effects and/or micro tunings.

■ Explanation

This loads the preset performance effects settings, and/or the preset micro tuning settings into internal user memory.

Select one of the following presets to load.

ALL..... Load performance effects and micro tunings.

PEFCT.... Load only performance effects.

MCT..... Load only micro tunings.

When you press a [ ] to select the preset, you will get a message "Are you sure?". Press [+1] and the preset will be loaded.

Note:

This function will erase all performance effect and micro tuning settings in internal user memory.

If internal user memory contains performance effect and micro tuning settings that you want to keep, save them to card or disk before using this function.

Voice edit

From performance play mode or performance edit, press [OTHERS] to get the following display.

■ Function

From editing a performance, jump to editing a voice.

■ Explanation

From performance editing, this allows you to instantly jump to edit one of the voices in the performance.

Press the [ ] below " > Voice Edit" to get the following display.

Press a [ ] to select the voice you want to edit, and you will jump to voice editing mode. (However the upper left of the display will show "M1111" instead of the usual "E1111".)

You can repeat this to edit several voices of a performance at once.

Note:

If you edit a voice using this function and press [SINGLE] before storing the voice, you will get a message "** go to SGL mode Sure?". If you now press [+1], the voice being edited will return to the original data.

If you have edited voice data from this function, you will be able to individually store the modified voices (see page 00).

This mode is unlike normal single mode in the following ways.

(1) EFCT edit and copy
(2) compare mode
(3) operator on/off

If you press a button other than an edit button, you will return to the above menu.

Note:

If you turn an instrument's MAX NOTES = 0 while in multi-voice edit, the sound you are editing will disappear.

Voice store

From single play mode, press STORE/COPY to get the following display.

```
SINGLE MODE)
     Mem Store I23 -> I   ?
```

■ **Function**

Store a voice to internal or card memory.

■ **Explanation**

Store the currently selected voice as an internal voice or card voice.

While continuing to press STORE/COPY, specify the voice number to store.

Press INT or CARD to select internal or card memory. When you have input the store destination, release STORE/COPY. You will be asked "OK?", and when you press +1 the voice will be stored.

Note:

When internal memory protect is on, the right edge of the display will show "Prot?" (protect), and by pressing the ▭ below it, you can temporarily defeat protect.

When card memory protect is on, or when the card memory protect slider is on, voices cannot be saved to card memory.

Voices cannot be stored in a card that has not been formatted.

Performance store

From performance play mode, press STORE/COPY to get the following display.

```
PERFORMANCE MODE)
       PFM  Store I04 -> I   ?
```

■ **Function**

Store a performance to internal or card memory.

■ **Explanation**

Store the currently selected performance as an internal performance or card performance.

While continuing to press STORE/COPY, specify the performance number to store. Press INT or CARD to select internal or card memory. When you have input the store destination, release STORE/COPY. You will be asked "OK?", and when you press +1 the performance will be stored.

Note:

When internal memory protect is on, the right edge of the display will show "Prot?" (protect), and by pressing the ▭ below it, you can temporarily defeat protect.

When card memory protect is on, or when the card memory protect slider is on, performances cannot be saved to card memory.

Performances cannot be stored in a card that has not been formatted.

Voice store when using voice edit

When you have finished editing, press OTHERS and then STORE/COPY to get the following display.

```
UT  OTHERS) STORE VOICE   which voice ?
  i01/ i03/ I13/   */   */   */   */  *
```

■ **Function**

Store after using the voice edit function.

■ **Explanation**

You will get a blinking message "which voice?". While continuing to press STORE/COPY, press the ▭ below the voice you want to store. Specify the voice number destination, and release STORE/COPY. You will be asked "OK?", so press +1.

If you want to store other voices, repeat this proceedure.

Note:

When the card memory protect slider is on, voices cannot be saved to card memory.

Voices cannot be stored in a card that has not been formatted.

If you have entered this function from internal performance, voices can be stored only in internal memory. If from card, only in card memory.

Storing using the voice edit function is possible only in the voice edit display.

Effect copy

While setting voice or performance [ ] (EFFECT) data, press [STORE/COPY] to get the following display.

```
EFFECT COPY>    EFCT=1:Reverb Hall
       current effect data -> I  ?
```

■ **Function**
Copy effect settings between voices or performances.

■ **Explanation**
This function copies the effect settings of the currently selected voice or performance to another voice or performance.

While continuing to press [STORE/COPY], specify the voice number or performance number copy destination. When you have input the store destination, release [STORE/COPY]. You will be asked "OK?", and when you press [+1] the effect settings will be stored to the specified voice or performance.

Note:
When internal memory protect is on, effects cannot be copied to internal memory.

When card memory protect is on, or when the card memory protect slider is on, effects cannot be copied to card memory.

Effects cannot be copied to a card that has not been formatted.

Performance effect copy

While setting [SETUP] performance effects, press [STORE/COPY] to get the following display.

```
PFM EFFECT COPY>
       delay 1 -->  delay ?
```

■ **Function**
Copy settings between each type of performance effect 1–4.

■ **Explanation**
This function copies the settings of the currently selected performance effect to another performance effect of the same type.

While continuing to press [STORE/COPY], specify the copy destination, and then release [STORE/COPY]. You will be asked "OK?", and when you press [+1] the performance effect settings will be copied to the specified performance effect.

Note:
A performance effect can be copied only to another performance effect of the same type.

Envelope generator copy

While setting a voice's envelope generator, press [STORE/COPY] to get the following display.

```
EG COPY>  set source & destination OP !
          >OP?  -->  >OP?
```

■ **Function**
Copy envelope generator settings between operators.

■ **Explanation**
This function copies the following settings (envelope generator and keyboard scaling) from one operator to another operator.

Envelope generator data . . . . AR, D1R, D2R, RR
(SHIFT is not included)

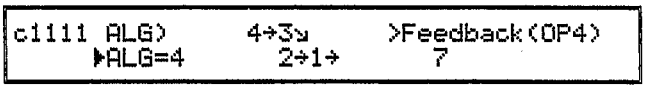
Keyboard scaling data . . . . . LS, RS

While continuing to press [STORE/COPY], specify the copy source and destination, and then release [STORE/COPY]. When you specify the destination, the envelope generator settings will be copied between the specified operators.

COMPARE FUNCTIONS

Voice compare

While editing a voice, press COMPARE.



■ Function

Compare the edited and original versions of a voice.

■ Explanation

While editing a voice, or in single play mode, press COMPARE. The "e" in the upper left of the display will change to a "c", and you will be able to hear the voice as it was before you began editing.

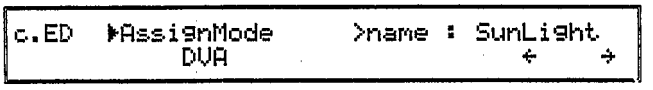
Press COMPARE once again to return to the edited voice.

Note:

While compare is selected, editing is not possible. During compare, the LED at the left of SINGLE will light to indicate compare mode.

Performance compare

While editing a voice, press COMPARE.



■ Function

Compare the edited and original versions of a performance.

■ Explanation

While editing a performance, or in performance play mode, press COMPARE. The "e" in the upper left of the display will change to a "c", and you will be able to hear the performance as it was before you began editing.

Press COMPARE once again to return to the edited performance.

Note:

While compare is selected, editing is not possible. During compare, the LED at the left of PERFORMANCE will light to indicate compare mode.

APPENDIX

TROUBLESHOOTING

The V50 has a very large number of functions. Each one is closely related to the others, and one function can sometimes have an unexpected effect on another function. Another possibility is that the amp or mixer system is not operating correctly. This chapter will explain some difficulties you may encounter, and give possible reasons for them.

The following points will help you determine whether the problem is with the V50 itself, with the amp/speaker system, or with the audio and MIDI cables connecting the system.

- Plug a set of headphones into the V50 and listen for audio output.

  If so, the problem is in the amp or mixer system, or in the cables used for connection.

- Check whether the problem occurs with other performances or voices.

  If the problem occurs only with a specific performance or voice, the problem is in the performance or voice setting. If the problem occurs with all performances or voices, check the other settings (utility mode, etc.).

When you have a general idea of where the problem is, consult the following tables.

Problems in the amp, mixer, or audio cable

Problem	Possible reason	Page reference
No sound	Is the amp turned on?	—
	Is the amp (or mixer) volume up?	—
	Are the V50 outputs correctly connected to the amp inputs?	10
	Is the audio cable faulty?	—
Distorted sound	Is the V50 connected to the mic inputs?	10

Problems in the performance

Problem	Possible reason	Page reference
No sound	Are the maximum note settings correct?	24
	Do the MIDI receive and transmit channels match?	25,99
	Is volume turned up for each instrument?	27
	Is the output assign for each instrument turned off?	27
	Are the high/low note limits for each instrument correct?	25
	Are the instruments turned off?	25

Problem	Possible reason	Page reference
Keys play the wrong pitch	Is note shift set to a non-zero value?	27
	Is detune set to a non-zero value?	26
	Are micro tuning settings correct?	28
Unsteady pitch	Are you using detuned instruments in alternate assign?	26
Can't play chords	Are the maximum note settings correct?	24
	Are you using a voice that is set to mono mode?	49

Problems in the voice

Problem	Possible reason	Page reference
No sound	Is the output level of the carrier operators turned up?	48
	Is a setting of the pitch envelope generator level PL1 – PL3 too low to hear?	47
	Is a foot controller controlling the volume (or volume pedal) at minimum position?	50
	Are breath controller and aftertouch EG bias set to high values?	52, 53
Keys play the wrong pitch	Is transpose set to a value other than midC=C3?	49
	Are the oscillator frequencies correctly set?	44
	Are the oscillators detuned?	44
Unsteady pitch	If LFO P Mode Sens. and P Mod Depth are set to high values, the resulting heavy vibrato will cause unsteady pitch.	43
	Is FC Pitch turned up although a foot controller is not connected?	50
	The normal pitch will sound if the pitch envelope generator PL1 – PL3 are all set to 50.	47
	Is the breath controller or aftertouch P.Bias set to a high value?	52, 53
	Is the portamento time set at maximum?	50
Can't play chords	Is mono mode selected?	49

Problems in other areas

Problem	Possible reason	Page reference
No sound	Is the fixed velocity set too low?	115
	Is the synthesizer volume at 0?	110
Some keys do not produce sound	Is note on/off set to odd or even?	101
Keys play the wrong pitch	Is the master tuning set at other than 0?	110
Can't use card performances or voices	Are the contents of the card bank correct?	95
	Is the correct bank selected?	95

Problems with the sequencer

Problem	Possible reason	Page reference
Sequencer does not make sound	Is the synthesizer volume raised?	110
	Are the TR1 – TR8 LEDs lit?	87
	Do the transmit channels of each track match the receive channels of the synthesizer?	25,90

Problems with the rhythm machine

Problem	Possible reason	Page reference
Rhythm machine does not make sound	Is the rhythm machine volume raised?	77

Preset voices

The V50's preset memory contains the following voices.

00	Stirings 1	25	MellowBrs	50	FolkGtr 1	75	IceBell
01	PowerBrass	26	FloatBrass	51	FolkGtr 2	76	SpaceBell
02	MetalSpace	27	Trumpet	52	E.Guitar 1	77	Sunbeam
03	Piano	28	Trombone	53	E.Guitar 2	78	BreathHit
04	E.Piano	29	Sax	54	Guitar	79	Suspense
05	ClinkDecay	30	Strings 2	55	FingerBs	80	Wire 1
06	SoftCloud	31	Strings 3	56	SynBass 2	81	Whasp
07	Metalimba	32	BrightStrg	57	SynBass 3	82	Sandarimba
08	PanFlute	33	WideString	58	FretlessB.	83	Cosmic
09	SynBass 1	34	SoftStrinG	59	UpriteBass	84	Elegant
10	E.Piano 2A	35	Strings 4	60	Flute	85	HuskeyOrg.
11	E.Piano 2B	36	ClassicStr	61	Oboe	86	Wire 2
12	PianoAtck	37	Strg+Chime	62	Clarinet	87	Wire 3
13	E.Organ 1	38	CelloEns.	63	Violin	88	Wire 4
14	E.Organ 2	39	Pizzicato	64	Cello	89	Bells
15	Vibe	40	Ensemble 1	65	Whistle	90	SteelDrum
16	Marimba	41	DayBreak	66	Recorder	91	ShrineBell
17	Celeste	42	FluteVoice	67	Harmonical	92	SofTimpani
18	Clavi	43	AngelChoir	68	Harmonica2	93	OilDrum
19	LargePipes	44	Ensemble 2	69	Harp	94	HandBells
20	SolidBrs	45	PEGvoice	70	AnalogLead	95	Strike 1
21	LowCutBrs	46	Ensemble 3	71	Dist.Lead	96	Strike 2
22	HiPeakBrs	47	WoodEns.	72	MetalAtck	97	Space
23	AttackBrs	48	Universe	73	WoodThump	98	Woosh
24	SoftLead	49	Forest	74	PuffPanFlt	99	Thunder

Preset performances

The V50's preset memory contains the following performances.

00	"V"Lead 1	25	Sequence	50	Scatter 2	75	Bs/E.Piano
01	"V"Brass 1	26	VibeEp	51	W-limba	76	Bs/Wire
02	Metal 1	27	PopsBrass2	52	TakeOff	77	Bs/MuteTp.
03	BalladEp	28	SaxSection	53	GrowVoice	78	Explosion
04	Piano	29	Waahz	54	Harp	79	Ac.Guitar
05	Ensemble 1	30	Mystery	55	Ep+Strings	80	Valley
06	"V"String1	31	Fanfare	56	"V"Brass 3	81	Metal 3
07	12stGuitar	32	DeepBell	57	"V"Brass 4	82	HolloWood
08	PopsBrass1	33	E.Organ 1	58	PanFlute	83	Fugue
09	Universe	34	Clinkimba	59	Huskey	84	DistLead
10	Pizzicato	35	Meteor	60	E.Guitar	85	E.Organ 2
11	SaxLead	36	Strings 1	61	VIbePiano	86	Tinqule
12	WarmStrgs	37	"V"Bass 2	62	"V"Bass 3	87	Tropical
13	"V"String2	38	"DX"Ep	63	Strings 2	88	Elegant
14	"V"Bass 1	39	FloatChime	64	Resonance	89	SteelPiano
15	PuffBrass	40	Ensemble 2	65	SoftBrass	90	Ensemble 4
16	Cotton	41	PanBells	66	Ensemble 3	91	Metal 4
17	Sunbeam	42	BigBand	67	"V"Bass 4	92	OilDrum
18	Metal 2	43	AttackBass	68	TaikoBells	93	DragonHit
19	SpaceBells	44	"V"Lead 3	69	WirePiano	94	*Pops
20	HeavyMetal	45	"V"Lead 4	70	Clavi	95	*Funk
21	Chorus	46	SeqMarimba	71	Stakkato	96	*Rock
22	"V"Lead 2	47	Bells 1	72	Harmonica	97	*Jazz
23	MildBrass	48	Bells 2	73	PuffLead	98	*Latin
24	"V"Brass 2	49	Scatter 1	74	Bs/Brass	99	*V50 Demo

Initialized performance settings

SNGL

NAME	SINGLE							
INST NUMBER	1	2	3	4	5	6	7	8
ASSIGN MODE	DVA							
NOTES	0	off	off	off	off	off	off	off
VOICE NUMBER	100	*	*	*	*	*	*	*
MIDI RECEIVE CH	1	*	*	*	*	*	*	*
LIMIT / LOW	C-2	*	*	*	*	*	*	*
LIMIT / HIGH	G8	*	*	*	*	*	*	*
INST DETUNE	+0	*	*	*	*	*	*	*
NOTE SHIFT	+0	*	*	*	*	*	*	*
VOLUME	99	*	*	*	*	*	*	*
OUTPUT ASSIGN	L+R	*	*	*	*	*	*	*
LFO SELECT	1	*	*	*	*	*	*	*
MICRO TUNING	Equal							
	off	*	*	*	*	*	*	*
P. EFFECT	off	*	*	*	*	*	*	*
EFFECT	off	*	*	*	*	*	*	*

4LYR

NAME	4 LAYER							
INST NUMBER	1	2	3	4	5	6	7	8
ASSIGN MODE	DVA							
NOTES	0	0	0	0	off	off	off	off
VOICE NUMBER	100	100	100	100	*	*	*	*
MIDI RECEIVE CH	1	1	1	1	*	*	*	*
LIMIT / LOW	C-2	C-2	C-2	C-2	*	*	*	*
LIMIT / HIGH	G8	G8	G8	G8	*	*	*	*
INST DETUNE	-2	-1	+1	+2	*	*	*	*
NOTE SHIFT	+0	+0	+0	+0	*	*	*	*
VOLUME	95	95	95	95	*	*	*	*
OUTPUT ASSIGN	L+R	L+R	L+R	L+R	*	*	*	*
LFO SELECT	1	2	vib	vib	*	*	*	*
MICRO TUNING	Equal							
	off	off	off	off	*	*	*	*
P. EFFECT	off	off	off	off	*	*	*	*
EFFECT	off	off	off	off	*	*	*	*

DUAL

NAME	DUAL							
INST NUMBER	1	2	3	4	5	6	7	8
ASSIGN MODE	DVA							
NOTES	0	0	off	off	off	off	off	off
VOICE NUMBER	100	100	*	*	*	*	*	*
MIDI RECEIVE CH	1	1	*	*	*	*	*	*
LIMIT / LOW	C-2	C-2	*	*	*	*	*	*
LIMIT / HIGH	G8	G8	*	*	*	*	*	*
INST DETUNE	+0	+2	*	*	*	*	*	*
NOTE SHIFT	+0	+0	*	*	*	*	*	*
VOLUME	99	99	*	*	*	*	*	*
OUTPUT ASSIGN	L+R	L+R	*	*	*	*	*	*
LFO SELECT	1	2	*	*	*	*	*	*
MICRO TUNING	Equal							
	off	off	*	*	*	*	*	*
P. EFFECT	off	off	*	*	*	*	*	*
EFFECT	off	off	*	*	*	*	*	*

8LYR

NAME	8 LAYER							
INST NUMBER	1	2	3	4	5	6	7	8
ASSIGN MODE	DVA							
NOTES	0	0	0	0	0	0	0	0
VOICE NUMBER	100	100	100	100	100	100	100	100
MIDI RECEIVE CH	1	1	1	1	1	1	1	1
LIMIT / LOW	C-2	C-2	C-2	C-2	C-2	C-2	C-2	C-2
LIMIT / HIGH	G8	G8	G8	G8	G8	G8	G8	G8
INST DETUNE	+0	+0	-1	+1	-2	+2	-4	+4
NOTE SHIFT	+0	+0	+0	+0	+0	+0	+0	+0
VOLUME	92	92	92	92	92	92	92	92
OUTPUT ASSIGN	L+R	L+R	L+R	L+R	L+R	L+R	L+R	L+R
LFO SELECT	1	2	vib	vib	vib	vib	vib	vib
MICRO TUNING	Equal							
	off	off	off	off	off	off	off	off
P. EFFECT	off	off	off	off	off	off	off	off
EFFECT	off	off	off	off	off	off	off	off

SPLT

NAME	SPLIT							
INST NUMBER	1	2	3	4	5	6	7	8
ASSIGN MODE	DVA							
NOTES	0	0	off	off	off	off	off	off
VOICE NUMBER	I00	I00	*	*	*	*	*	*
MIDI RECEIVE CH	1	1	*	*	*	*	*	*
LIMIT / LOW	C-2	C3	*	*	*	*	*	*
LIMIT / HIGH	B2	G8	*	*	*	*	*	*
INST DETUNE	+0	+0	*	*	*	*	*	*
NOTE SHIFT	+0	+0	*	*	*	*	*	*
VOLUME	99	99	*	*	*	*	*	*
OUTPUT ASSIGN	L+R	L+R	*	*	*	*	*	*
LFO SELECT	1	2	*	*	*	*	*	*
MICRO TUNING	Equal							
	off	off	*	*	*	*	*	*
P. EFFECT	off	off	*	*	*	*	*	*
EFFECT	off	off	*	*	*	*	*	*

SEQ8

NAME	SEQENCER8							
INST NUMBER	1	2	3	4	5	6	7	8
ASSIGN MODE	DVA							
NOTES	0	0	0	0	0	0	0	0
VOICE NUMBER	I00	I01	I02	I03	I04	I05	I06	I07
MIDI RECEIVE CH	1	2	3	4	5	6	7	8
LIMIT / LOW	C-2	C-2	C-2	C-2	C-2	C-2	C-2	C-2
LIMIT / HIGH	G8	G8	G8	G8	G8	G8	G8	G8
INST DETUNE	+0	+0	+0	+0	+0	+0	+0	+0
NOTE SHIFT	+0	+0	+0	+0	+0	+0	+0	+0
VOLUME	99	99	99	99	99	99	99	99
OUTPUT ASSIGN	L+R	L+R	L+R	L+R	L+R	L+R	L+R	L+R
LFO SELECT	1	2	vib	vib	vib	vib	vib	vib
MICRO TUNING	Equal							
	off	off	off	off	off	off	off	off
P. EFFECT	off	off	off	off	off	off	off	off
EFFECT	off	off	off	off	off	off	off	off

SEQ4

NAME	SEQUENCER4							
INST NUMBER	1	2	3	4	5	6	7	8
ASSIGN MODE	DVA							
NOTES	0	0	0	0	off	off	off	off
VOICE NUMBER	I00	I01	I02	I03	*	*	*	*
MIDI RECEIVE CH	1	2	3	4	*	*	*	*
LIMIT / LOW	C-2	C-2	C-2	C-2	*	*	*	*
LIMIT / HIGH	G8	G8	G8	G8	*	*	*	*
INST DETUNE	+0	+0	+0	+0	*	*	*	*
NOTE SHIFT	+0	+0	+0	+0	*	*	*	*
VOLUME	99	99	99	99	*	*	*	*
OUTPUT ASSIGN	L+R	L+R	L+R	L+R	*	*	*	*
LFO SELECT	1	2	vib	vib	*	*	*	*
MICRO TUNING	Equal							
	off	off	off	off	*	*	*	*
P. EFFECT	off	off	off	off	*	*	*	*
EFFECT	off	off	off	off	*	*	*	*

Initialized voice settings

						VOICE NAME	INIT VOICE	
OPERATOR		1	2	3	4	POLY / MONO MODE		Poly
ALGORITHM		1				PITCH BEND RANGE		4
FEEDBACK LEVEL		0				FOOT SW		Sus
LFO	WAVE	triangl				PORTAMENTO	MODE	Full
	SPEED	35					TIME	0
	DELAY	0				FOOT CONTROL	VOLUME	40
	SYNC	off					PITCH	0
	PMD	0					AMPLITUDE	0
	AMD	0				MODULATION WHEEL	PITCH	50
SENSITIVITY	PMS	6					AMPLITUDE	0
	AMS	0				BREATH CONTROL	PITCH	0
	AME	off	off	off	off		AMPLITUDE	0
	EBS	0	0	0	0		PITCH BIAS	+0
	KVS	+0	+0	+0	+0		EG BIAS	0
OSCILLATOR	MODE	r	r	r	r	AFTER TOUCH	PITCH	0
	FIX SHIFT	*	*	*	*		AMPLITUDE	0
	FIX RANGE	*	*	*	*		PITCH BIAS	+0
	FREQUENCY	1.00	1.00	1.00	1.00		EG BIAS	0
	WAVE	W1	W1	W1	W1	REVERB	RATE	off
	DETUNE	0	0	0	0	EFFECT		
ENVELOPE GENERATOR	AR	31	31	31	31		SELECT	off
	D1R	31	31	31	31		BALANCE	*
	D1L	15	15	15	15		OUT LEVEL	*
	D2R	0	0	0	0		STEREO MIX	*
	RR	15	15	15	15		PARAM 1	*
	SHIFT	off	off	off	off		PARAM 2	*
PITCH ENVELOPE GENERATOR	PR1	99					PARAM 3	*
	PL1	50						
	PR2	99						
	PL2	50						
	PR3	99						
	PL3	50						
OUTPUT LEVEL		90	0	0	0			
KEYBOARD SCALING	RATE	0	0	0	0			
	LEVEL	+0	+0	+0	+0			
TRANSPOSE		C3						

SPECIFICATIONS

● Synthesizer section

Keyboard:	61-note (C1 - C6), velocity and pressure sensitive
Tone generators:	4-operator 8-algorithm FM, 8 selectable waveforms
Polyphony:	16 notes maximum simultaneous, last note priority, 8-voice multi-timbral
Internal memory:	100 internal voices 100 preset voices 100 internal performances 100 preset performances 12 (3 types x 4 each) performance effects (delay, pan, chord) 2 micro tuning (octave, full) program change table system setup

● Sequencer section

Tracks:	8 (maximum 16 note polyphony/track, maximum 32 note total polyphony for all tracks)
Songs:	8
Resolution:	192th note (internal clock) 96th note (MIDI clock) 32nd note (step record)
Internal memory:	64Kbyte (approximately 16,000 notes)

● Rhythm section

Tone generation:	PCM
Polyphony:	8 notes
Internal memory:	100 preset patterns 100 internal patterns

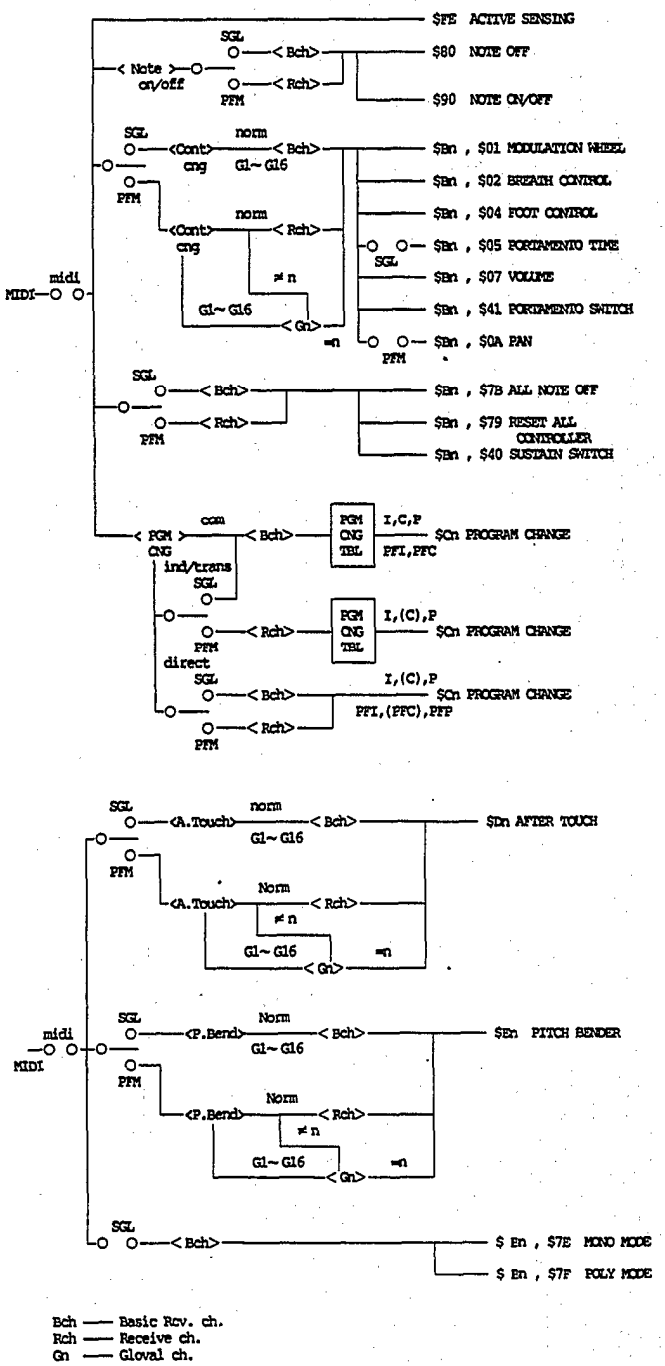
● Other

Digital effecfs:	32 types (parameters programmable for each voice and performance)
Terminals:	OUTPUT L/MONO, OUTPUT R, VOLUME, FC, FS, START/STOP, MIDI IN, OUT, THRU, BREATH CONTROL, PHONES
Display:	40 character 2 line, backlit
Power consumption:	25 W
Power requirements:	USA and Canadian model; 120 V 60Hz General model; 220 – 240 V 50 Hz
Dimensions (W x D x H):	1002 mm x 326 mm x 98 mm (3' 3 1/2" x 1' 7/8" x 3' 7/8")
Weight:	11.2 Kg (24 lbs 11 oz)

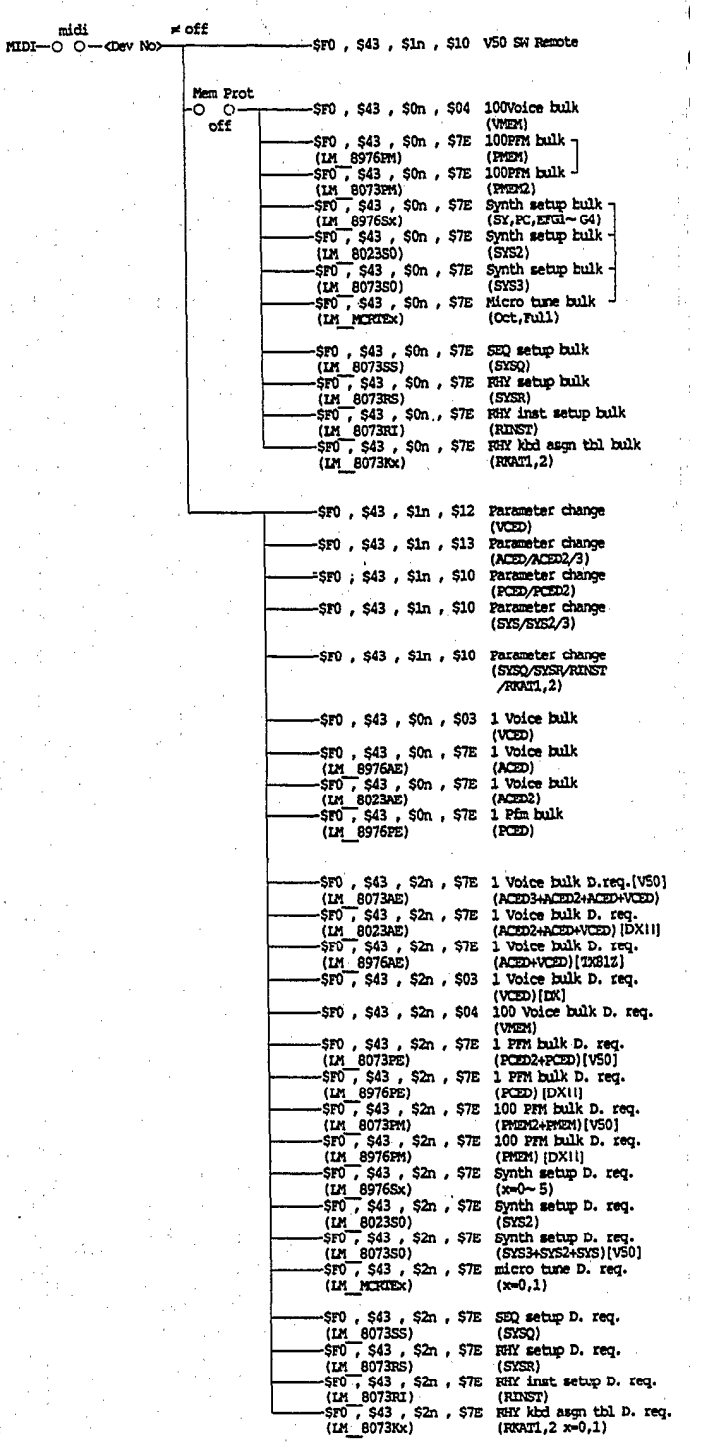
SYNTHESIZER SECTION

MIDI reception/ transmission block diagram

1. MIDI reception conditions



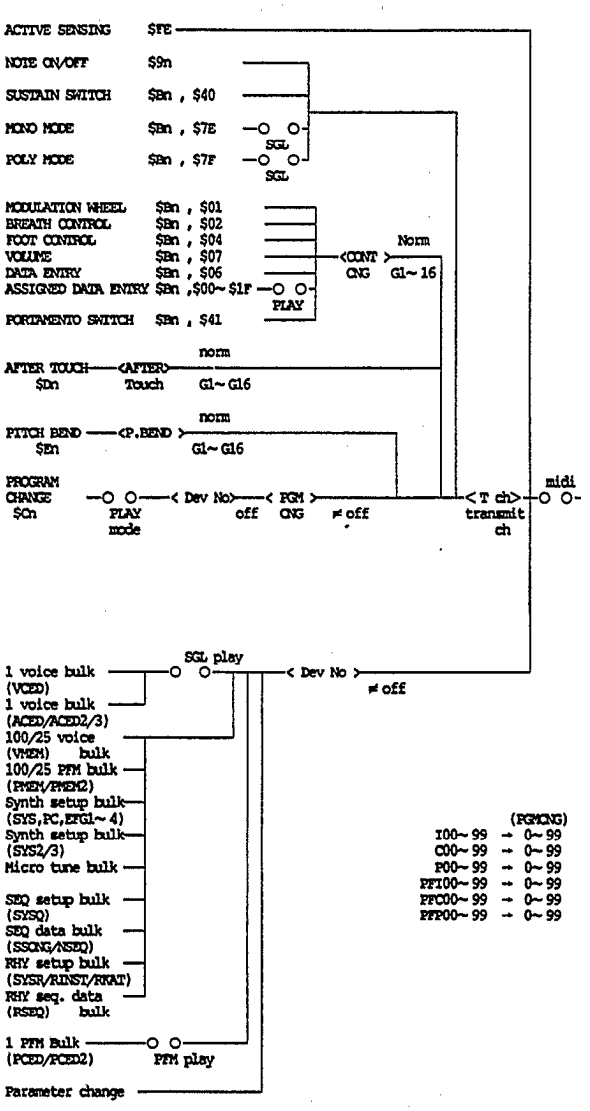
Bch —— Basic Rcv. ch.
Rch —— Receive ch.
Gn —— Gloval ch.



Dev No = Device Number

VCED = Voice edit buffer
ACED = Additional voice edit buffer (for TX81Z)
ACED2/3 = Additional voice edit buffer 2/3 (forDX11/V50)
PCED = Performance edit buffer
PCED2 = Performance edit buffer 2
VMEM = Voice memory
PMEM = Performance memory
PMEM2 = Performance memory 2

2. MIDI transmission condition



3. Channel message

3.1 Transmission

3.1.1 Note on/off

Transmitted note range = C1 (36) – C6 (96)
Velocity range = 0 – 127 (0: note off)

3.1.2 Control change

When the following controllers are moved, MIDI is transmitted.

ctl#	parameter	data rng	
1	Modulation wheel	0...127	
2	Breath control	0...127	
4	Foot control	0...127	
6	Data entry slider at not play mode	0...127	
7	Volume pedal	0...127	
64	Sustain switch	0 , 127	*1
65	Portamento switch	0 , 127	
0~31	Assinged Data entry slider at Play mode	0...127	

*1 The control change switch cannot turn transmission on/off.

♦ In system setup mode, the transmission mode can be selected.
off : No control changes are transmitted.
norm/G1–G16 : Transmitted on the channel specified by Trns.ch

3.1.3 Program change

When a voice is selected in single mode, or when a performance is selected in performance mode, a program change is transmitted. Regardless of the mode, the program change number is assigned as follows.

I, P, C, PFI, PFC, PFP 00–99 → Program change no. 00–99

Transmission can be turned on/off by mode.

1) off:
program changes are not transmitted

2) common/individual/direct:
Transmitted when voice/performance is selected in SYNTH mode. However, program changes transmitted from the internal sequencer for data created on the V50 consist of bytes, and are transmitted as follows.

pgm change	mode & memory		
#119	IND	INT	(I)or(C)
#120	not used		
#121	IND	PRESET	(P)
#122	SGL	INT	(I)
#123	SGL	CARD	(C)
#124	SGL	PRESET	(P)
#125	PFM	INT	(PFI)
#126	PFM	CARD	(PFC)
#127	PFM	PRESET	(PFP)

See the reception section for the meaning of mode (IND/SGL/PFM).

3) Transfilter:
Transmit on the channel specified by Trans ch. However program changes from the internal sequencer will be transmitted as a single byte without program changes above 119 (for SEQ mode). (For tone generators other than the V50.)

3.1.4 Pitch bend

Pitch bend is transmitted with 7 bit resolution.

♦ Transmission on/off is possible in system setup (off, norm, G1 – G16). The contents are, the same as for control change.)

3.1.5 Aftertouch

♦ Transmission on/off is possible in system setup (off, norm, G1 – G16). The contents are the same as for control change.)

3.1.6 Channel mode messages

The following messages are transmitted when the mono/poly mode of a voice is changed.

★ MONO mode ($Bn, $7E, $01) only in single mode
★ POLY mode ($Bn, $7F, $00) only in single mode

3.2 Reception

3.2.1 Note on/off

Note reception range = C-2 – G8
Velocity range = 0 – 127 (only note on)

♦ In system setup, the following settings are possible.

normal = all note numbers are received
odd = only odd note numbers are received
even = only even note numbers are received

3.2.2 Control change

The following parameters can be controlled via MIDI.

ctl#	parameter	data rng	
1	Modulation wheel	0...127	
2	Breath control	0...127	
4	Foot control	0...127	
5	Portament time	0...127	*1
7	Volume	0...127	
10	PAN	0...127	*2
64	Sustain switch	0...127	*3
65	Portamento switch	0...127	

*1 Only in single mode
*2 Only in performance mode, 0 – 42 (L), 43 – 85 (L + R), 86 – 127 (R).
*3 Reception cannot be turned on/off by the control change switch.

♦ Reception mode is set in system setup.

Off : No control changes are received.
norm : Control changes are received by each channel (normal setting).
G1 – G16 : A global channel can be set, indicated by the number following the "G". Control changes received on this channel will apply to all channels (apply to all instruments). Each instrument will receive data both from this global channel and from the channel specified for the instrument, with last-data priority.

3.2.3 Program change

When a program change is received, the unit responds as follows. Five types of reception mode can be selected in system setup.

1) off:
Program changes are not received.

2) common:
Program changes are received and converted to the number assigned by the program change table. If the selected table entry contains a PFM number (PF00-99), it will cause the V50 to move from single to performance mode.

3) individual:
Select this setting when you want to select voices for each instrument in performance mode. The program change table is still consulted, but if the selected table entry assigns a performance, it is ignored. In single mode, selecting "individual" has the same effect as selecting "com".

The selected voice will depend on whether an INT or CRT performance is currently selected.

Program change table data	Currently selected performance	
	INT	CARD
I00 — I99	I00 — 99	C00 — 99
C00 — C99	I00 — 99	C00 — 99
P00 — P99	←	←
PFI00— PFI99	Ignored	←
PFC00— PFC99	Ignored	←
PFP00— PFP99	Ignored	←

4) direct (V50 mode):
In this case, the program change table is not consulted, and response is fixed as follows. Also, program changes of #119 and above are used as follows to change the mode, and following program changes will select voices in that mode. If a program change #00 – 99 is received without having received a mode select program change, it will be processed as "IND INT"

pgm change	mode & memory		
#00-99	00-99 in that mode		
#119	IND	INT	(I)or(C)
#120	not used		
#121	IND	PRESET	(P)
#122	SGL	INT	(I)
#123	SGL	CARD	(C)
#124	SGL	PRESET	(P)
#125	PFM	INT	(PFI)
#126	PFM	CARD	(PFC)
#127	PFM	PRESET	(PFP)

Meaning of each mode

IND (individual):
Select the voice for each instrument in pfm mode.

SGL (single):
Change to single mode, and select the specified single mode voice.

PFM (performance):
Change to performance mode, and select the specified voice of performance mode.

5) TransFilter:
For reception, this is identical to "individual".

3.2.4 Pitch bend

Pitch bend reception uses only the MSB.

♦ The reception mode can be selected in system setup (off, norm, G1 – G16).
Contents are the same as for control changes.

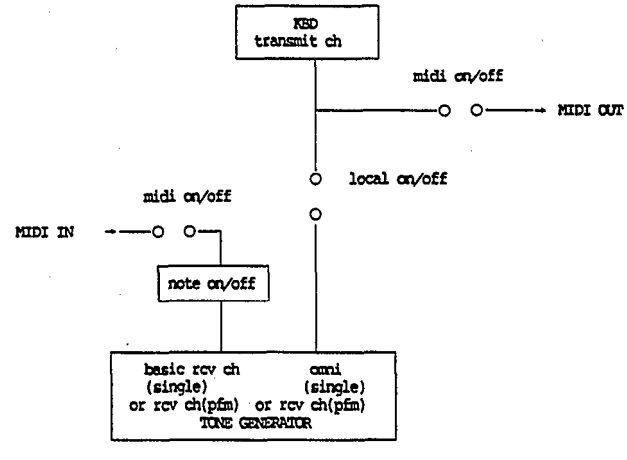
3.2.5 Aftertouch

♦ The reception mode can be selected in system setup (off, norm, G1 – G16).
Contents are the same as for control changes.

3.2.6 Channel mode messages

★ALL NOTE off ($Bn, $7B, $00)
★MONO mode ($Bn, $7E, $01) only in single mode
★POLY mode ($Bn, $7F, $00) only in single mode

3.3 Functional diagram of keyboard and tone generator



Note 1: In single mode, sound will be produced even if the basic receive channel and the transmit channel do not match.

Note 2: A distinction is made between note on messages from the keyboard and note on messages from MIDI. However no distinction is made between controller data from the keyboard and controller data from MIDI (sustain switch. control change, aftertouch, pitch bend).

4. System exclusive messages

4.1 Parameter changes

This unit transmits and receives the following 13 types of parameter change. (However, 13.Remote Switch is only received.) For 13.Remote Switch, the screen will be the same as when the switch is pressed.

```
      1). VCED parameter change
##    2). ACED / ACED2 / ACED3 parameter change
##    3). PCED parameter change
##    4). PCED2 parameter change
##    5). System parameter change(SYS,SYS2,SYS3)  ┐
      6). Effect parameter change(EFG1~ 4)        │ SYN
      7). Micro tuning parameter change(OCT,FULL) │ setup
      8). Program change Table para. change       ┘
##    9). SEQ system parameter change(SYSQ).....SEQ setup
##   10). rhythm system parameter change(SYSR)    ┐
##   11). rhythm inst setup parameter change(RINST1,2) │ RHYTHM
##   12). rhythm keyboard assign table           │ setup
              system parameter change (RMAT1,2)  ┘
##   13). Remote switch parameter change
```

Parameter change format is as follows.

★ Format for 1) — 3)

```
11110000    f0
01000011    43
0001nnnn    nnnn    = Device No
0ggggghh    ggggg   = group number , hh = sub group number
0ppppppp    ppppppp = parameter number
0ddddddd    ddddddd = data
11110111    f7
```

For details of ggggg, hh, ppppppp, ddddddd, see the following items.

★ For the format of 4)... see 4.1.4.
★ For the format of 5)... see 4.1.5.
★ For the format of 6)... see 4.1.6.
★ For the format of 7)... see 4.1.7.
★ For the format of 8)... see 4.1.8.
★ For the format of 9)-12)... see 4.1.9.
★ For the format of 13)... see 4.1.10.

4.1.1 VCED parameter change

```
ggggg = 00100   (4)
hh    = 10      (2)
```

VCED (Voice edit buffer) messages change data one parameter at a time. For ppppppp (parameter number) and ddddddd (data), see table 1.
Single mode is automatically entered when this message is received.

4.1.2 ACED / ACED2 / ACED3 parameter change

```
ggggg = 00100   (4)
hh    = 11      (3)
```

ACED/ACED2 (Additional voice edit buffer) messages change data one parameter at a time. For ppppppp (parameter number) and ddddddd (data), see table 1.
Single mode is automatically entered when this message is received.

4.1.3 PCED parameter change

```
ggggg   = 00100 (4)
hh      = 00    (0)
ppppppp =       (0-109)
```

PCED (Performance edit buffer) messages change data one parameter at a time. For ppppppp (parameter number) and ddddddd (data), see table 1.
Performance mode is automatically entered when this message is received.

4.1.4 PCED2 parameter change

★ Format

```
11110000    f0
01000011    43
0001nnnn    nnnn    = Device No
0ggggghh    ggggg   = 00100 (4) , hh = 00 (0)
0ppppppp    ppppppp = 1101110 (110)
0kkkkkkk    kkkkkkk = Parameter number
0ddddddd    ddddddd = data
11110111    f7
```

PCED2 messages change data one parameter at a time. For kkkkkkk (parameter number) and ddddddd (data), see table 1.
Performance mode is automatically entered when this message is received.

4.1.5 System parameter change (SYS, SYS2, SYS3)

★ Format

```
11110000    f0
01000011    43
0001nnnn    nnnn    = Device No
0ggggghh    ggggg   = 00100 (4) , hh = 00 (0)
0ppppppp    ppppppp = 1111011 (123)
0kkkkkkk    kkkkkkk = Parameter number
0ddddddd    ddddddd = data
11110111    f7
```

These messages change system data one parameter at a time.
For kkkkkkk (parameter number) and ddddddd (data), see table 3.

4.1.6 Effect parameter change

★ Format

```
11110000    f0
01000011    43
0001nnnn    nnnn    = Device No
0ggggghh    ggggg   = 00100 (4) , hh = 00 (0)
0ppppppp    ppppppp = 1111100 (124:EFG1),1111000(120:EFG2)
0kkkkkkk    kkkkkkk = Parameter number  ,1111001(121:EFG3)
0ddddddd    ddddddd = data              ,1111010(122:EFG4)
11110111    f7
```

These messages change PFM Effect (delay, pan, chord) data one parameter at a time. The value of ppppppp sets the group number.

```
EFG1 : delay1,pan1,chord1
EFG2 : delay2,pan2,chord2
EFG3 : delay3,pan3,chord3
EFG4 : delay4,pan4,chord4
```

For kkkkkkk (parameter number) and ddddddd (data), see table 3.

4.1.7 Micro tuning parameter change

★ Format

```
11110000    f0
01000011    43
0001nnnn    nnnn    = Device No
0ggggghh    ggggg   = 00100 (4) , hh = 00 (0)
0ppppppp    ppppppp = 1111101 (125:OCT),1111110(126:FULL)
0kkkkkkk    kkkkkkk = key number
0hhhhhhh    hhhhhhh = data (high)
01111111    1111111 = data (low)
11110111    f7
```

These messages change micro tuning data one key at a time.
For kkkkkkk (key number) and ddddddd (data), see table 3.

4.1.8 Program change parameter change

★ Format

```
11110000    f0
01000011    43
0001nnnn    nnnn    = Device No
0ggggghh    ggggg   = 00100 (4) , hh = 00 (0)
0ppppppp    ppppppp = 1111111 (127)
0kkkkkkk    kkkkkkk = PGM change No
0hhhhhhh    hhhhhhh = data (high)
01111111    1111111 = data (low)
11110111    f7
```

These messages change the PGM Change Table data. Data has the following meaning.

```
##   high data    low data
      0            0 - 99      I00 - I99
      1            0 - 99      C00 - C99
      2            0 - 99      P00 - P99
      3            0 - 99      PFI00 - PFI99
      4            0 - 99      PFC00 - PFC99
      5            0 - 99      PFP00 - PFP99
```

For kkkkkkk (PGM change number), see table 3.

4.1.9 SYSQ, SYSR, RINST, RKAT parameter change

★Format

```
11110000    f0
01000011    43
0001nnnn    nnnn    = Device No
0ggggghh    ggggg   = 00100 (4) , hh = 00 (0)
0ppppppp    ppppppp = 111 - 116
0kkkkkkk    kkkkkkk = Parameter number
0ddddddd    ddddddd = data
11110111    f7

   p=111   : SYSQ ( SEQ system )
   p=112   : SYSR ( RHYTHM system )
   p=113   : RINST1 ( RHYTHM inst setup (VOL,PAN))
   p=114   : RINST2 ( RHYTHM inst setup (NOTE))
   p=115   : RKAT1 ( RHYTHM kbd assign table 1 )
   p=116   : RKAT2 ( RHYTHM kbd assign table 2 )
```

These messages change the setup data for rhythm and sequencer, one parameter at a time. Some of these parameters are not received while playing.
For kkkkkkk (parameter number) and ddddddd (data), see table 3.

4.1.10 Remote switch parameter change

★ Format

```
11110000    f0
01000011    43
0001nnnn    nnnn    = Device No
0ggggghh    ggggg   = 00100 (4) , hh = 00 (0)
0ppppppp    ppppppp = 1110110 (118)
0kkkkkkk    kkkkkkk = switch number
0ddddddd    ddddddd = data
11110111    f7

   ddddddd = 1111111 ($7F)    ON
           = 0000000          OFF
```

These parameters are for reception only, and allow all panel switches to be remotely controlled. They cause the same effect as when that switch is pressed. Reception for this data cannot be turned off by the various MIDI switches.
For kkkkkkk (switch number), see table 1.

4.2 Voice data bulk dump

There are two types of voice data bulk dump, as follows.

1) Voice edit buffer bulk dump
2) Voice memory bulk dump

♦ For the format details of each type of bulk data dump, see tables 1, 2, and 3.

4.2.1 Voice edit buffer bulk dump

The voice data in the voice edit buffer is transmitted when a voice is selected in PLAY mode of single mode, or when Init Voice or Recall Edit is executed. When this is received, it will be loaded into the voice edit buffer. ACED2 is parameter data added to the TX81Z parameters for the DX11. ACED3 is parameter data added to the DX11 parameters for the V50.

a) Transmission
Data is transmitted in the following order. There is a time interval of approximately 100ms between each bulk data.

1) ACED3 (Additional voice edit buffer3) bulk data
2) ACED2 (Additional voice edit buffer2) bulk data
3) ACED (Additional voice edit buffer) bulk data
4) VCED (voice edit buffer) bulk data

b) Reception
When data is received, operation is as follows. – indicates that the data does not change.

Received data \ Buffer	VCED	ACED	ACED2	ACED3
VCED only	set	cleared	cleared	cleared
ACED only	—	set	cleared	cleared
ACED+VCED	set	set	cleared	cleared
ACED2 only	—	—	set	cleared
ACED2+ACED	—	set	set	cleared
ACED2+ACED+VCED	set	set	set	cleared
ACED3 only	—	—	—	set
ACED3+ACED2	—	—	set	set
ACED3+ACED2+ACED	—	set	set	set
ACED3+ACED2+ACED +VCED	set	set	set	Set

4.2.2 Voice memory bulk dump

This transmits/receives data for the 100 voices in internal memory, or preset/card voice data (100 voices) all together or 25 voices at a time.

VMEM (voice memory) bulk data is the combination of VCED, ACED, ACED2, and ACED3.
(twenty-five V50 voices) + (eight INIT VOICE voices) = 32 voices

a) Transmission
Data is transmitted in the following order.

a-1) When transmitting ALL.
header (block1)
VMEM (00-24)
header (block2)
VMEM (25-49)
header (block3)
VMEM (50-74)
header (block4)
VMEM (75-99)

a-2) When transmitting one block at a time.
header (specified block)
VMEM

b) Reception
When VMEM is received, "Midi Received" and the name of the received block will be displayed. VMEM 32 voice bulk data without a header is loaded directly into I00 – I31.

4.3 Performance data bulk dump

There are two types of performance data bulk dump, as follows.

1) Performance edit buffer bulk dump
2) Performance memory bulk dump

4.3.1 Performance edit buffer bulk dump

When a performance is selected in PLEY mode of performance mode, or when Init Performance or Recall Performance has been executed, the performance data in the performance edit buffer will be transmitted. When this data is received, the performance data will be loaded into the performance edit buffer.

♦For the details of the bulk dump data format, see tables 1, 2, and 3.

a) Transmission
Data is transmitted in the following order. There is an interval of approximately 100ms between each bulk dam.

1) PCED2 (performance edit buffer 2) bulk data
2) PCED (performance edit buffer) bulk data

4.3.2 Performance memory bulk dump

This transmits/receives data for the 100 performances in internal, preset or card memory, either all together or 25 performances at a time.

♦ For the details of the bulk dump data format, see tables 1, 2, and 3.

a) Transmission
Data is transmitted in the following order. There is an interval of approximately 100ms between each bulk data.

1) PMEM2 (performance memory 2) bulk data
2) PMEM (performance memory) bulk data

Data is transmitted in the following order.

a-1) When transmitting ALL.
header (block1)
PMEM2 (00-24)
PMEM (00-24)
header (block2)
PMEM2 (25-49)
PMEM (25-49)
header (block3)
PMEM2 (50-74)
PMEM (50-74)
header (block4)
PMEM2 (75-99)
PMEM (75-99)

a-2) When transmitting one block at a time.
header (specified block)
PMEM2
PMEM

b) Reception
When PMEM is received, "Midi Received" and the name of the received block will be displayed. PMEM 32 performance bulk data without a header is loaded directly into PFI00 – PFI31.

When data is received, operation is as follows. – indicates that the data does not change.

Received data \ Buffer	PCED	PCED2	PMEM	PMEM2
PCED only	set	default	–	–
PCED2 only	–	set	–	–
PCED2 + PCED	set	set	–	–
PMEM only	–	–	set	default
PMEM2 only	–	–	–	set
PMEM2 + PMEM	–	–	set	set

4.4 SYNTH system setup data bulk dump

This transmits and receives the system setup data of the V50. For transmission, this is divided into four types of bulk data. (EF is divided into EFG1 – EFG4.) SYS2 data contains parameters added to TX81Z parameters for the DX11. SYS3 data contains parameters added to DX11 parameters for the V50.

SYS..... System (SYS3→ SYS2 → SYS)
PCT.....Program Change table
P.EFCT.....Effect data (EFG1, 2, 3, 4)
MCT .....Micro tuning data (OCT, FULL)

When "SetALL" is selected and transmission executed to transmit all of the above data (except for System data), the data will be transmitted in the following order.

1. PCT
2. P.EFCT (EFGl →2→3 →4)
3. MCT Transmits/receives the data currently in the OCT, FULL micro tuning buffers.

♦ For details of each bulk dump data format, see tables 2 and 3.
♦ EFG n (n = 1 – 4) indicates the set of delay n, pan n, and chord n.

4.5 SEQ data bulk dump

This transmits and receives system setup data and sequence data for the currently selected song of the V50 internal sequencer. When receiving sequence data, it will be loaded into the current song only if the current song is empty. (Data is not received while playing.) For transmission, the data is divided into three types of bulk data.

SETUP.....System (SYSQ)
SSONG.....current sequence song data
NSEQ..... .current sequence data

If "SeqALL" is selected and transmission executed, the above three types of data will be sucessively transmitted in the following order.

1. SSONG
2. NSEQ
3. SETUP

♦ For details of each bulk dump data format, see table 2 for SETUP, and see the format table of the sequencer section for NSEQ and SSONG.

4.6 RHYTHM data bulk dump

This transmits and receives system setup data and sequence data for the V50 rhythm machine. (Data is not received while playing.) For transmission, the data is divided into four types of bulk data.

SETUP..... System (SYSR)
.....inst setup (RINST)
.....keyboard assign table (RKAT1,2)
RSEQ.....rhythm sequence data

If "RhyqALL" is selected and transmission executed, data will be transmitted in the following order.

1) SYSR
2) RINST
3) RKAT1
4) RKAT2
5) RSEQ

♦ For details of each bulk dump data format, see table 4.

4.7 Dump request

Dump request is possible for all types of bulk data.

♦ For details of each message, see table 5.

5. System common messages (for SEQ/RHYTHM)

5.1 Status F2 (song position pointer)

Received only. (except in REC mode of SEQ/R)

5.2 Status F1, F3 . . . F7

Aside from internally registering as status bytes, these have no effect.

6. System realtime messages (for SEQ/RHYTHM)

6.1 Status F8, FA, FB, FC

Received.

6.2 Status F9, FD, FF

After decoding, these have no effect.

6.3 Status FE (active sensing)

a) Transmission
FE is transmitted at intervals of approximately 170msec.

b) Reception
Once FE is received, if no MIDI data appears for longer than approximately 300msec, the MIDI reception buffer is cleared, and if there are remaining Key Ons, they are turned Off.

< Table 1>

Parameters in the table surrounded by "%%%" are parameters which have been added to or modified from TX81Z parameters.

Parameters in the table surrounded by "###" are parameters which have been added to or modified from DX11 parameters.

Parameter list of parameter change and bulk

*** VCED *** 93 byte voice edit parameter (1 bulk edit format)
para. cng g=4, h=2

	VCED adress (para.cng)	b7 b6 b5 b4 b3 b2 b1 b0		
edit	0	0 0 0 —— AR ——	0-31	
	1	0 0 0 —— D1R ——	0-31	
	2	0 0 0 —— D2R ——	0-31	
	3	0 0 0 0 —— RR ——	1-15	
	4	0 0 0 0 —— D1L ——	0-15	
	5##	0 ——— LS ———	0-99	with LS2(sign)
	6	0 0 0 0 0 0 -RS—	0-3	OP.4
	7	0 0 0 0 0 —EBS—	0-7	
	8	0 0 0 0 0 0 0 AME	0-1	
	9##	0 0 0 0 —— KVS ——	0-14	0-7(0 - +7) 8-14(-7 - -1)
	10	0 ——— OUT ———	0-99	
	11	0 0 —— CRS ——	0-63	(RATIO)
		0 0 — CRS —— x x	0-63	(FIX)
	12	0 0 0 0 0 0 —DET —	0-6	(center=3)
	13			
	.			OP.2
	.			
	26			
	.			OP.3
	.			
	39			
	.			OP.1
	.			
	52	0 0 0 0 0 —ALG—	0-7	
	53	0 0 0 0 0 —FBL—	0-7	
	54	0 —— LFS ———	0-99	
	55	0 —— LFD ———	0-99	
	56	0 —— PMD ———	0-99	
	57	0 —— AMD ———	0-99	
	58	0 0 0 0 0 0 0 0 SY	0-1	LFO SYNC
	59	0 0 0 0 0 0 0 -LFW-	0-3	
	60	0 0 0 0 0 0 —PMS—	0-7	
	61	0 0 0 0 0 0 0 -AMS-	0-3	
	62	0 0 —— TRPS ——	0-48	(center=24)
function	63	0 0 0 0 0 0 0 0 MD	: MONO	
	64	0 0 0 0 —— PBR ——	0-12	
	65	0 0 0 0 0 0 0 0 PM	: PCRMOD	
	66	0 ——— PORT ———	0-99	
	67	0 ——— FC VOL ———	0-99	
###	68	0 0 0 0 0 0 0 0 SU	0-1	sus.(F.SW)
	69	———reserved———		por.
	70	0 0 0 0 0 0 0 0 CH	0-1	chorus set 0
	71	0 —— MW PITCH ———	0-99	
	72	0 —— MW AMPLI ———	0-99	
	73	0 —— BC PITCH ———	0-99	
	74	0 —— BC AMPLI ———	0-99	
	75	0 —— BC P BIAS ———	0-100	(center0=50)
	76	0 —— BC E BIAS ———	0-99	
	77	0 — VOICE NAME 1 —	32-127	
	78	0 — VOICE NAME 2 —		
	79	0 — VOICE NAME 3 —		
	80	0 — VOICE NAME 4 —		
	81	0 — VOICE NAME 5 —		
	82	0 — VOICE NAME 6 —		
	83	0 — VOICE NAME 7 —		
	84	0 — VOICE NAME 8 —		
	85	0 — VOICE NAME 9 —		
	86	0 — VOICE NAME 10 —		
%%%	87	0 ——— PR1 ———	0-99	PEG
%%%	88	0 ——— PR2 ———	0-99	
%%%	89	0 ——— PR3 ———	0-99	
%%%	90	0 ——— PL1 ———	0-99	(center=50)
%%%	91	0 ——— PL2 ———	0-99	
%%%	92	0 ——— PL3 ———	0-99	

*** parameter change only ***

nn (para.no)	b7 b6 b5 b4 b3 b2 b1 b0	dd (value)	comment
93	0 0 0 0 OP1 OP2 OP3 OP4	0-1	op. on(1)/off(0)

note) 5 LS
LCD -99,,,-1,0,+1,,,+99
INT data/VCEDbulk LS2 1———1,0,0———0
(para. change) LS 99,,,,1,0,1,,,,,99

VMEMbulk LS2 1———1,0,0———0
LS 99,,,,1,0,1,,,,,99

9 KVS
INT data 0,,,,6,7,8,,,,14
LCD -7,,-1,0,+1,,,+7
MIDI 8,,,14,0,1,,,,7

4	0	0	0	0	0	0	—EGSFT—	0-3	0(off)-3(12dB)
5 . .									OP.2
10 . .									OP.3
15 . 19									OP.1 0(off)
20	0	0	0	0	0		—REV—	0-7	0(off),7(first)function
21	0	——— FC PITCH ———						0-99	function
22	0	——— FC AMPLI ———						0-99	

*** ACED2 *** 10 byte additional parameter 2 for DX11/V50
para. cng g=4, h=3

NO.	para.	No	b7	b6	b5	b4	b3	b2	b1	b0	Data	note
0	23	0	——— AT PITCH ———								0-99	function
1	24	0	——— AT AMPLI ———								0-99	
2	25	0	——— AT P.BIAS ———								0-100	center 0 = 50
3	26	0	——— AT EG BIAS ———								0-99	
4##	27	0	——— FIX RANGE MODE(OP4) ———								0-1	0(HI),1(LO)
5##	28	0	——— FIX RANGE MODE(OP2) ———								0-1	
6##	29	0	——— FIX RANGE MODE(OP3) ———								0-1	
7##	30	0	——— FIX RANGE MODE(OP1) ———								0-1	
8##	31	0	0	0	0	—— LS SIGN ———					0-15	OP1,2,3,4
9	32	0	——— reserved ———									

note) 2 AT P.BIAS
INT data 0,,,,,,49,50,51,,,,,,100
LCD -50,,,,-1, 0,+1,,,,,,+50
MIDI 51,,,,,100,0,+1,,,,,,+50

4-7 FIX RANGE MODE
INT data 0 , 1 Hi:255-32KHz
LCD Hi , Lo Lo:1-100Hz
MIDI 0 , 1

8 LS SIGN
b3 b2 b1 b0
op1 op2 op3 op4 0: +
1: -

*** ACED3 *** 20 byte additional parameter 3 for WT11/V50
para. cng g=4, h=3

NO.	para.	No	b7	b6	b5	b4	b3	b2	b1	b0	Data	note
0	33	0	0	0	0	—— EFCT SEL ——					0-32	0:off,1-32:EFCT(DSP)
1	34	0	——— BALANCE ———								0-100	
2	35	0	——— OUT LEVEL ———								0-100	
3	36	0	——— STEREO MIX ———								0-1	
4	37	0	——— EFCT param1 ———								0-75	
5	38	0	——— EFCT param2 ———								0-99	
6	39	0	——— EFCT param3 ———								0-99	function
7	40	0	——— reserved ———									
8	41	0	——— reserved ———									
. . 19	52	0	——— reserved ———									

note) COMBINE
at COMBINE=off,
Function (function at VCED + func at ACED(REV,FCPM/AM)
+ func at ACED2(ATPM/AM/PB/EB) + EFCT at ACED3) are not changed
when voice/pfm is selected. (except voice name)

*** ACED *** 23 byte additional parameters (1 bulk edit format)
para. cng g=4, h=3

NO.(para)	b7	b6	b5	b4	b3	b2	b1	b0	Data	note
0	0	0	0	0	0	0	0	FIX	0-1	OP.4
1	0	0	0	0	0	— FIXRG —			0-7	0(255Hz)-7(32KHz)
2	0	0	0	0	— FINE —				0-15	(7:F=0-3)
3	0	0	0	0	0	— OSW —			0-7	
4	0	0	0	0	0	0	—EGSFT—		0-3	0(off)-3(12dB)
5										OP.2
.										
.										
10										OP.3
.										
.										
15										OP.1
.										
19									0(off)	
20	0	0	0	0	0	—REV—			0-7	0(off),7(first)function
21	0	— FC PITCH —							0-99	function
22	0	— FC AMPLI —							0-99	

*** ACED2 *** 10 byte additional parameter 2 for DX11/V50
para. cng g=4, h=3

NO.	para.	Nob	b7	b6	b5	b4	b3	b2	b1	b0	Data	note
0	23	0	— AT PITCH —								0-99	function
1	24	0	— AT AMPLI —								0-99	
2	25	0	— AT P.BIAS —								0-100	center 0 = 50
3	26	0	— AT EG BIAS —								0-99	
4##	27	0	— FIX RANGE MODE(OP4) —								0-1	0(HI),1(LO)
5##	28	0	— FIX RANGE MODE(OP2) —								0-1	
6##	29	0	— FIX RANGE MODE(OP3) —								0-1	
7##	30	0	— FIX RANGE MODE(OP1) —								0-1	
8##	31	0	0	0	0	— LS SIGN —					0-15	OP1,2,3,4
9	32	0	— reserved —									

note) 2 AT P.BIAS INT data 0,,,,,,49,50,51,,,,,,100
LCD -50,,,,-1, 0,+1,,,,,,+50
MIDI 51,,,,,100,0,+1,,,,,,+50

4-7 FIX RANGE MODE
INT data 0 , 1 Hi:255-32KHz
LCD Hi , Lo Lo:1-100Hz
MIDI 0 , 1

8 LS SIGN

b3	b2	b1	b0	
op1	op2	op3	op4	0: +
				1: -

*** ACED3 *** 20 byte additional parameter 3 for WT11/V50
para. cng g=4, h=3

NO.	para.	Nob	b7	b6	b5	b4	b3	b2	b1	b0	Data	note
0	33	0	0	0	0	— EFCT SEL —					0-32	0:off,1-32:EFCT(DSP)
1	34	0	— BALANCE —								0-100	
2	35	0	— OUT LEVEL —								0-100	
3	36	0	— STEREO MIX —								0-1	
4	37	0	— EFCT param1 —								0-75	
5	38	0	— EFCT param2 —								0-99	
6	39	0	— EFCT param3 —								0-99	function
7	40	0	— reserved —									
8	41	0	— reserved —									
.												
.												
19	52	0	— reserved —									

note) COMBINE
at COMBINE=off,
Function (function at VCED + func at ACED(REV,FCPM/AM)
+ func at ACED2(ATPM/AM/PB/EB) + EFCT at ACED3) are not changed
when voice/pfm is selected. (except voice name)

*** PCED *** 110 byte Performance data (edit format)
para. cng g=4, h=0

No.prm#	b7	b6	b5	b4	b3	b2	b1	b0	Data	note
0	0	0	0	— MAX NOTES —					0-16	INST1
1 ##	0	0	0	0	0	0	0	VTYPE	0-1	voice type 0:int/card 1:preset
2 ##	0	— Voice Number —							0-99	
3	0	0	0	— Recv. ch —					0-16	16(omni)
4	0	— LIMIT/L —							0-127	0(C-2)-127(G8)
5	0	— LIMIT/H —							0-127	
6	0	0	0	0	— DETUNE —				0-14	7(center)
7	0	0	— NOTE SHIFT —						0-48	24 (center)
8	0	— VOLUME —							0-99	
9	0	0	0	0	0	0	OUT_ASGN		0-3	0(off),1(L),2(R) 3(L+R)
10	0	0	0	0	0	0	—LFOS—		0-3	0(off),1(1st Inst) 2(2nd Inst),3(vib)
11	0	0	0	0	0	0	0	MIE	0-1	
12										INST2
.										
24										INST3
.										
36										INST4
.										
48										INST5
.										
60										INST6
.										
72										INST7
.										
84										INST8
.										
96	0	0	0	0	—MTIBL—				0-12	0(oct),1(full)
97 ##	0	0	0	0	0	0	—ASMODE—		0-2	0(norm),1(alter) 2(DVA)
98 %%%	0	0	0	0	—EFSEL—				0-12	
99	0	0	0	0	—KEY—				0-11	0(C)-11(B)
100	0	— PFM NAME 1 —							32-127	ASCII
101	0	— 2 —								
.		.								
.		.								
109	0	— PFM NAME 10 —								

note) 98 EFSEL=0(off),1(delay1),2(pan1),3(chord1),4(delay2),5(pan2),.....
.....,11(pan4),12(chord4)

*** PCED2 *** 33 byte Performance data 2 (edit format) for V50/WT11
para. cng g=4, h=0, p=110

No.prm#	b7	b6	b5	b4	b3	b2	b1	b0	Data	note
0	0	0	0	— RESERVE NOTES —					0-17	0(off),1-17(0-16)INST1
1	0	0	0	0	0	0	0	EFCTE	0-1	EFCT(DSP) on/off
2										INST2
3										
4										INST3
5										
6										INST4
7										
8										INST5
9										
10										INST6
11										
12										INST7
13										
14										INST8
15										
16	0	0	0	— EFCT SEL —					0-32	0:off,1-32:EFCT(DSP)
17	0	— BALANCE —							0-100	
18	0	— OUT LEVEL —							0-100	
19	0	— STEREO MIX —							0-1	
20	0	— EFCT param1 —							0-75	
21	0	— EFCT param2 —							0-99	
22	0	— EFCT param3 —							0-99	
23	0	— reserved —							0-2	LFO CONTROL for WT11
24	0	— reserved —								
.										
.										
32	0	— reserved —								

*** remote switch ***
para. cng g=4, h=0, p=118

g	h	p	k	switch	k	switch
4	0	118	0	performance	31	tenkey minus
			1	single	32	increment
			2	internal	33	decrement
			3	card	34	tr1
			4	preset	35	tr2
			5	sequencer	36	tr3
			6	rhythm	37	tr4
			7	record	38	limit/lo
			8	bwd	39	limit/hi
			9	stop	40	tr5
			10	play	41	tr6
			11	fwd	42	tr7
			12	seq/rhy job	43	tr8
			13	pf1	44	others
			14	pf2	45	efct
			15	pf3	46	ut-card
			16	pf4	47	ut-midi
			17	pf5	48	ut-disk
			18	pf6	49	ut-prot
			19	pf7	50	ut-setup
			20	pf8	51	ut-others
			21	tenkey 0	52	store
			22	tenkey 1	53	compare
			23	tenkey 2	54	efct bypass
			24	tenkey 3	55	demo
			25	tenkey 4	56	POWER ON(restart)
			26	tenkey 5		
			27	tenkey 6		
			28	tenkey 7		
			29	tenkey 8		
			30	tenkey 9		

< Table 2 >

Detail of Bulk Dump Format

★ VCED
f = 3
data size = 93 ($005D)
data format = 7bit binary
total bulk size = 93+8 = 101

f0,43,0n,03,00,5D,<VCED data>,sum,f7

★ VMEM
block header
f0,43,1n,44,07,<block No 1-4>,f7

f = 4
data size = 128x32 = 4096 ($1000)
data format = 7bit binary
total bulk size = 4096+8 = 4104

f0,43,0n,04,20,00,<VMEM data>,sum,f7

★ ACED
f = 126 LM_8976AE
data size = 23+10 = 33 ($0021)
data format = 7bit binary
total bulk size = 33+8 = 41

f0,43,0n,7e,00,21,LM_8976AE,<ACED data>,sum,f7

%%% ★ ACED2
f = 126 LM_8023AE
data size = 10+10 = 20 ($0014)
data format = 7bit binary
total bulk size = 20+8 = 28

f0,43,0n,7e,00,14,LM_8023AE,<ACED2 data>,sum,f7

★ ACED3
f = 126 LM_8073AE
data size = 20+10 = 30 ($001e)
data format = 7bit binary
total bulk size = 30+8 = 38

f0,43,0n,7e,00,1e,LM_8073AE,<ACED3 data>,sum,f7

★ PCED
f = 126 LM_8976PE
data size = 110+10 = 120 ($0078)
data format = 7bit binaly
total bulk size = 120+8 = 128

f0,43,0n,7e,00,78,LM_8976PE,<PCED data>,sum,f7

★ PCED2
f = 126 LM_8073PE
data size = 10+33 = 43 ($002B)
data format = 7bit binaly
total bulk size = 43+8 = 51

f0,43,0n,7e,00,2b,LM_8073PE,<PCED2 data>,sum,f7

★ PMEM
block header
f0,43,1n,10,75,01,<block No 0-3>,f7

f = 126 LM_8976PM
data size = 10+76x32 = 2442 ($098A)
data format = 7bit binary
total bulk size = 2442+8 = 2450

f0,43,0n,7e,13,0a,LM_8976PM,<PMEM data >,sum,f7

★ PMEM2
f = 126 LM_8073PM
data size = 10+25x32 = 810 ($032A)
data format = 7bit binary
total bulk size = 810+8 = 818

f0,43,0n,7e,06,2a,LM_8073PM,<PMEM2 data >,sum,f7

★ system setup
f = 126 LM_8976Sx (x=0,1,2)

X = 0(SYS) data size = 10+27 = 37 ($0025)
data format = 7bit binary
total data size = 37+8 = 45

f0,43,0n,7e,00,25,LM_8976S0,<system data>,sum,f7

X = 1(PC) data size = 10+128x2 = 266 ($010A)
data format = 7bit binary
total data size = 266+8 = 274

f0,43,0n,7e,02,0A,LM_8976S1,<P.CNGIBL data>,sum,f7

X = 2(EFG1) delay1,pan1,chord1
data size = 10+55 = 65 ($0041)
data format = 7bit binary
total data size = 65+8 = 73

f0,43,0n,7e,00,41,LM_8976S2,<effect group1 data>,sum,f7

%%% X = 3(EFG2) delay2,pan2,chord2

f0,43,0n,7e,00,41,LM_8976S3,<effect group2 data>,sum,f7

%%% X = 4(EFG3) delay3,pan3,chord3

f0,43,0n,7e,00,41,LM_8976S4,<effect group3 data>,sum,f7

%%% X = 5(EFG4) delay4,pan4,chord4

f0,43,0n,7e,00,41,LM_8976S5,<effect group4 data>,sum,f7

★ micro tuning buffer
f = 126 LM_MCRTEx (x=0,1)
X = 0 (OCT) data size = 24+10 = 34 ($0022)
data format = 7bit binary
total bulk size = 34+8 = 42

f0,43,0n,7e,00,22,LM_MCRTEx,<MCR OCT data>,sum,f7

X = 1 (Full) data size = 10+256 = 266 ($010a)
data format = 7bit binary
total bulk size = 274

f0,43,0n,7e,02,0a,LM_MCRTEx,<MCR Full data>,sum,f7

%%% ★ system setup 2 for V2
f = 126 LM_8023Sx (x=0)
X = 0(SYS2) data size = 16+10 = 26 ($001A)
data format = 7bit binary
total data size = 26+8 = 34

f0,43,0n,7e,00,1A,LM_8023S0,<system data>,sum,f7

★ system setup 3 for V50
f = 126 LM_8073S0
data size = 32+10 = 42 ($002A)
data format = 7bit binary
total data size = 42+8 = 50

f0,43,0n,7e,00,2a,LM_8073S0,<system data3>,sum,f7

```
##      ★ SEQ system setup (SYSQ) for V50
                  f = 126  LM_8073SS
                  data size = 33+10 = 43 ( $002B)
                  data format = 7bit binary
                  total data size = 43+8 = 51

            f0,43,0n,7e,00,2b,LM_8073SS,<SEQ system data>,sum,f7


##      ★ RHYTHM system setup (SYSR) for V50
                  f = 126  LM_8073RS
                  data size = 16+10 = 26 ( $001a)
                  data format = 7bit binary
                  total data size = 26+8 = 34

            f0,43,0n,7e,00,1a,LM_8073RS,<RHYTHM system data>,sum,f7

##      ★ RHYTHM inst setup (RINST) for V50
                  f = 126  LM_8073RI
                  data size = 183+10 = 193 ( $0141)
                  data format = 7bit binary
                  total data size = 193+8 = 201

            f0,43,0n,7e,01,41,LM_8073RI,<RINST data>,sum,f7

##      ★ RHYTHM kbd assign table (RKAT1,2) for V50
                  f = 126  LM_8073Kx    (x=0:user1,1:user2)
                  data size = 61+10 = 71 ( $0047)
                  data format = 7bit binary
                  total data size = 71+8 = 79

            f0,43,0n,7e,00,47,LM_8073K0,<RKAT1 data>,sum,f7
            f0,43,0n,7e,00,47,LM_8073K1,<RKAT2 data>,sum,f7
```

< Table 3 >

*** VMEM *** 128 byte (88 byte is used) voice data (memory format)

	adress	b7	b6	b5	b4	b3	b2	b1	b0	dd (value)	comment	
	0	0	0	0	———	AR	———			0-31		
	1	0	0	0	———	D1R	———			0-31		
	2	0	0	0	———	D2R	———			0-31		
	3	0	0	0	0	———	RR	———		1-15		
	4	0	0	0	0	———	D1L	———		0-15		OP.4
	5	0	———	———	———	LS	———	———		0-99		
	6	0	AME	——	EBS	—	——	KVS	—	0-1,0-7,0-7		
	7	0	———	———	———	OUT	———	———		0-99		
	8	0	0	———	———	CRS	———	———		0-63 (RATIO)		
		0	0	——	CRS	———	x	x		0-63 (FIX)		
##	9	0	LS2	KVS2	—RS—	——	DET	——		0-1,0-1,0-3,0-6 LS2,KVS2 (sign)		
	10											
	.											OP.2
	.											
	20											
	.											OP.3
	.											
	30											
	.											OP.1
	.											
	40	0	SY	——	FBL	—	—	ALG	——	0-1,0-7,0-7		
	41	0	———	———	———	LFS	———	———		0-99		
	42	0	———	———	———	LFD	———	———		0-99		
	43	0	———	———	———	PMD	———	———		0-99		
	44	0	———	———	———	AMD	———	———		0-99		
	45	0	——	PMS	—	-AMS—		-LFW—		0-7,0-3,0-3		
	46	0	0	———	———	TRPS	———	———		0-48		
	47	0	0	0	0	———	PBR	——		0-12		
	48	0	x	x	CH	MO	SU	PO	PM	0-1,0-1,0-1,0-1,0-1		
	49	0	———	———	———	PORT	———	———		0-99		
	50	0	———	———	———	FC VOL	———	———		0-99		
	51	0	———	———	———	MW PITCH	———	———		0-99		
	52	0	———	———	———	MW AMPLI	———	———		0-99		
	53	0	———	———	———	BC PITCH	———	———		0-99		
	54	0	———	———	———	BC AMPLI	———	———		0-99		
	55	0	———	———	———	BC P BIAS	———	———		0-100		
	56	0	———	———	———	BC E BIAS	———	———		0-99		
	57	0	——	VOICE	NAME	1	——			32-127		
	58	0	——	VOICE	NAME	2	——					
	59	0	——	VOICE	NAME	3	——					
	60	0	——	VOICE	NAME	4	——					
	61	0	——	VOICE	NAME	5	——					
	62	0	——	VOICE	NAME	6	——					
	63	0	——	VOICE	NAME	7	——					
	64	0	——	VOICE	NAME	8	——					
	65	0	——	VOICE	NAME	9	——					
	66	0	——	VOICE	NAME	10	——					
$$$	67	0	———	———	———	PR1	———	———		0-99		
$$$	68	0	———	———	———	PR2	———	———		0-99		
$$$	69	0	———	———	———	PR3	———	———		0-99		
$$$	70	0	———	———	———	PL1	———	———		0-99		
$$$	71	0	———	———	———	PL2	———	———		0-99		
$$$	72	0	———	———	———	PL3	———	———		0-99		

note) KVS,KVS2

at VCED KVS	at VMEM KVS2	KVS	—LCD—
0	0	0	0
1	^	1	+1
.	^	.	.
.	^	.	.
7	0	7	+7
8	1	7	-7
.	^	.	.
.	^	.	.
14	1	1	-1

5	LS	LCD		-99,,,-1,0,+1,,,+99
		VMEMbulk	LS2	1———1,0,0———0
			LS	99,,,,1,0,1,,,,,99

*** VMEM ***

No.	b7	b6	b5	b4	b3	b2	b1	b0	Data	note
0										
.				same as DX21 VMEM						
.										
67				PEG PR1						
.										
72				PEG PL3						
73 ##	0	FIXRM	-EGSFT-		FIX	——	FIXRG	—		OP.4
74	0	——	OSW	——	———	FINE	———			
75										OP.2
.										
77										OP.3
.										
79										OP.1
.										
81	0	0	0	0	0	———REV———				FUNCTION
82	0	———	———	———	FC PITCH	———	———			
83	0	———	———	———	FC AMPLI	———	———			

*** VMEM for DX11/V50 ***

No.	b7	b6	b5	b4	b3	b2	b1	b0	Data	note
84	0	———	———	———	AT PITCH	———	———			
85	0	———	———	———	AT AMPLI	———	———			
86	0	———	———	———	AT P.BIAS	———	———			center=0
87	0	———	———	———	AT EG BIAS	———	———			
88	0	———	———	———	reserved	———	———			not used
89	0	———	———	———	reserved	———	———			not used
90	0	———	———	———	reserved	———	———			DS55 delay
91	0	0	0	0	-EFFECT PRESET NO—				0-10	(0:off)YS effect
92	0	0	———	EFFECT TIME	———				0-40	
93	0	———	———	EFFECT BALANCE	———				0-99	
94 ##	0	0	0	———	———	EFCT SEL	——		0-32	0:off,1-32:EFCT(DSP)
95 ##	0	———	———	———	BALANCE	———	———		0-100	
96 ##	0	———	———	———	OUT LEVEL	———	———		0-100	
97 ##	0	———	———	———	STEREO MIX	———	———		0-1	
98 ##	0	———	———	———	EFCT param1	———	———		0-75	
99 ##	0	———	———	———	EFCT param2	———	———		0-99	
100 ##	0	———	———	———	EFCT param3	———	———		0-99	
101-127	0	0	0	0	0	0	0	0		

note)	AT P.BIAS	INT data	0,,,,,,49,50,51,,,,,,100
		LCD	-50,,,,-1, 0,+1,,,,,,+50
		MIDI	51,,,,,100,0,+1,,,,,,+50
	FIX RANGE MODE	INT data	0 , 1
		LCD	Hi , Lo
		MIDI	0 , 1

VMEM receive block (parameter change) g=9,h=0 same as EOS

paramNo.	b7	b6	b5	b4	b3	b2	b1	b0	Data	note
7	0	0	0	0	0	——BLOCK——			0-4	0:32voice 1-4:block

*** PMEM *** 76 byte Performance data (memory format)

No.		b7	b6	b5	b4	b3	b2	b1	b0	Data	note
0	##	0	OUT_ASGN		VTYPE		-MAX NOTES(MAX1)-				INST1
1	##	0	———		VOICE NO		———				
2		0	—LFOS—				RCV CH				
3		0	———		LIMIT/L		———				
4		0	———		LIMIT/H		———				
5		0	0	0	0	—	DETUNE				
6		0	MTE	———		NOTE SHIFT		———			
7		0	———		VOLUME		———				
8											INST2
.											
16											INST3
.											
24											INST4
.											
32											INST5
.											
40											INST6
.											
48											INST7
.											
56											INST8
.											
64	#####	0	EFSEL3	-EFSEL2—		———	MITBL	———			
65		0	———	KEY	———		—EFSEL1-	ASMOD1			
66		0	———		PFM NAME 1		———				
67		0	———		PFM NAME 2		———				
.											
.											
75		0	———		PFM NAME 10		———				

note1) effect select

PCED	EFSEL PMEM	EFSEL2	EFSEL1	
0	off	%00	%00	
1	delay1		%01	
2	pan1		%10	
3	chord1		%11	
4	d2	%01	%01	
5	p2		%10	
6	c2		%11	
7	d3	%10	%01	
8	p3		%10	
9	c3		%11	
10	d4	%11	%01	
11	p4		%10	
12	c4		%11	
		%01	%00	—>off(%00 %00)
		%10	%00	—>off(%00 %00)
		%11	%00	—>off(%00 %00)

EFSEL(PCED)= EFSEL2 x 3 + EFSEL1

note2) Effect select Compatibility (DX11 —> TX81Z)

	DX11	TX81Z
PMEM bulk	delay1,delay2,delay3,delay4	—> delay
	pan1,pan2,pan3,pan4	—> pan
	chord1,chord2,chord3,chord4	—> chord
PCED bulk	delay1	—> delay
	pan1	—> pan
	chord1	—> chord
	delay2 - chord4	—> chord

*** PMEM2 *** 25 byte Performance data 2(memory format) for V50/WT11

No.		b7	b6	b5	b4	b3	b2	b1	b0	Data	note
0	##	0	EFCTE	0	——	RESERVE	NOTES	——		0-1,0-17	INST1
1	##	0	EFCTE	0	——	RESERVE	NOTES	——		0-1,0-17	INST2
2	##	0	EFCTE	0	——	RESERVE	NOTES	——		0-1,0-17	INST3
3	##	0	EFCTE	0	——	RESERVE	NOTES	——		0-1,0-17	INST4
4	##	0	EFCTE	0	——	RESERVE	NOTES	——		0-1,0-17	INST5
5	##	0	EFCTE	0	——	RESERVE	NOTES	——		0-1,0-17	INST6
6	##	0	EFCTE	0	——	RESERVE	NOTES	——		0-1,0-17	INST7
7	##	0	EFCTE	0	——	RESERVE	NOTES	——		0-1,0-17	INST8
8	##	0	0	0	———		EFCT SEL		———	0-32	0:off,1-32:EFCT(DSP)
9	##	0	———		BALANCE		———			0-100	
10	##	0	———		OUT LEVEL		———			0-100	
11	##	0	———		STEREO MIX		———			0-1	
12	##	0	———		EFCT param1		———			0-75	
13	##	0	———		EFCT param2		———			0-99	
14	##	0	———		EFCT param3		———			0-99	
15		0	———		reserved		———				LFO CONTROL for WT11
16	##	0	x	x	x	x	x	-ASMOD2-		0-1	(DVA flag)
17	##	0	x	x	x	—MAX2—		—MAX2—		0-1,0-1	INST1,INST2
18	##	0	x	x	x	—MAX2—		—MAX2—		0-1,0-1	INST3,INST4
19	##	0	x	x	x	—MAX2—		—MAX2—		0-1,0-1	INST5,INST6
20	##	0	x	x	x	—MAX2—		—MAX2—		0-1,0-1	INST7,INST8
21		0	———		reserved		———				
22		0	———		reserved		———				
23		0	———		reserved		———				
24		0	———		reserved		———				

note) MAX NOTES= 8 x MAX2 + MAX1 (<=16)

MAX NOTES Compatibility (V50 —> DX11) MAX1 only

ASMOD=2 x ASMOD2 + ASMOD1

PMEM receive block (parameter change) g=4,h=0,p=117,

paramNo.	b7	b6	b5	b4	b3	b2	b1	b0	Data	note
1	0	0	0	0	0	0	—BLOCK—		0-3	0-3:block

****

* SYSTEM SETUP bulk dump *

****

*** SYS *** 27 byte sytem set up for TX81Z

para. cng g=4, h=0, p=123

No.	para	b7	b6	b5	b4	b3	b2	b1	b0	Data	note
0	0	0	———			TUNE			———	0-127	master tune center=64
1	1	0	0	0	———	MIDBCH			———	0-16	basic rcv ch 16:omni
2	2	0	0	0	0	———	MIDTCH		———	0-15	trans ch
3	##3	0	0	0	0	0	———	PGMSW	———	0-4	pgm cng sw
4	4	0	0	0	———		CONTSW		———	0-17	cont.cng sw 1:norm 2-17(G1-G16)
5	5	0	0	0	———		PBSW		———	0-17	p.bend sw 1:norm 2-17(G1-G16)
6	6	0	0	0	0	0	0	-NOTESW-		0-2	note on/off 0:all,1:odd 2:even
7	##7	0	0	0	———		DEVICE NO		———	0-17	device number 0:off,17:all (V2 exclusive on/off)
8	8	0	0	0	0	0	0	0	MLOCK	0-1	mem. protect
9	9	0	0	0	0	0	0	0	CMBIN	0-1	combine
10	10	0	0	0	0	0	0	0	ATBCSW	0-1	AT to BC sw on/off(not used)
11	11	0	———			ID1			———	32-127	ID (ascii)
12	12	0	———			ID2			———		
13	13	0	———			ID3			———		
.	.										
.	.										
.	.										
26	26	0	———			ID16			———		

note) 3 PGMSW

0:off, 1:common, 2:individual, 3:direct, 4:TrnsFilter

*** SYS2 for DX11 *** 16 bytes sytem set up 2

para. cng g=4, h=0, p=123

No.	para	b7	b6	b5	b4	b3	b2	b1	b0	Data	note
0	27	0	0	0	0	0	0	0	MIDIE	0-1	midi on/off
1	28	0	0	0	0	0	0	0	LOCALF	0-1	local on/off
2	29	0	0	0	———		ATSW		———	0-17	After T.SW 1=norm 2-17(G1-G16)
3	30	0	0	0	———		DEASGN		———	0-31	D.E. asgn
4##	31	0	———			CRDBNK			———	0-124	card bank(1-32) x4
5	32	0	0	0	0	0	0	0	CNTRST	0-1	controller reset
6	33	0	0	0	0	0	0	0	CRDLCK	0-1	card prot
7	34	0	———			FIXTCH			———	0-127	fixed velocity
8	35	0	0	0	0	0	0	-EGFDMP-		0-3	EG forced damp
9	36	0	———			reserved			———		
10	37	0	———			reserved			———		
11	38	0	———			reserved			———		
12	39	0	———			reserved			———		
13	40	0	———			reserved			———		
14	41	0	———			reserved			———		
15	42	0	———			reserved			———		

*** parameter change only (receive only) ***

43	0	QEDATK	0-99
44	0	QEDREL	0-99
45	0	QEDVOL	0-99
46	0	QEDERI	0-99

*** SYS3 for V50 *** 32 byte syten setup 3
para. cng g=4, h=0, p=118

No.	para	b7	b6	b5	b4	b3	b2	b1	b0	Data	note
0	47	0	ID17							32-127	ID2 (ascii)
1	48	0	ID18								
2	49	0	ID19								
.	.										
.	.										
.	.										
23	70	0	ID40								
24	71	0	SYN VOL							0-99	synth volume
25	72	0	INTERVAL							0-10	MDR interval time
26	73	0	VEL CURVE							0-7	
27	74	0	VOICE DAMP							0-1	
28	75	0	reserved								
29	76	0	reserved								
30	77	0	reserved								
31	78	0	reserved								

** parameter change only **

para	b7	b6	b5	b4	b3	b2	b1	b0	Data	note
79	0	0	0	0	0	0	0	BYPASS	0-1	effect bypass

*** P.EFFECT *** 55 byte performance effect data
para. cng g=4, h=0, p=124,120,121,122

No.	para	b7	b6	b5	b4	b3	b2	b1	b0	Data	note
0	0	0	EF1T							0-127	effect 1 time 0.01s-1.28s
1	1	0	0	EF1P						0-48	effect 1 pitch center=24
2	2	0	0	0	0	0	EF1F			0-7	effect 1 feed back
3	3	0	EF1L							0-99	effect 1 out level
4	5 *1	0	0	0	0	0	0	EF2S		0-2	effect 2 select 0(LFO),1(velocity) 2(note)
5	4 *2	0	0	0	0	0	0	0	EF2D	0-1	effect 2 direction 0(L->R),1(L<-R)
6	6	0	EF2R							0-99	effect 2 range
7	7	0	0	CHORD						0-49	effect 3 chord note center=24 no use=49
8	8										
9	9										
10	10										KEY C3
11	11										
12	12										
13	13										
14	14										KEY C#3
.	.										
.	.										
51	51										
52	52										
53	53										
54	54										KEY B3

note) *1,*2
parameter change No.(4,5) is not same as bulk No.
*1 (EF2S) para. change No=5
*2 (EF2D) para. change No=4

*** PGMCNG *** 256 byte program change table (extend to 2 byte per 1 number)
para. cng g=4, h=0, p=127

No.	para	b7	b6	b5	b4	b3	b2	b1	b0	Data	note
0	0	0	0	0	0	0	TYPE			0-5	voice type
		0	NUMBER							0-99	No PGM1
1	1										PGM2
.	.										.
.	.										.
127	127										PGM128

(note)

##	type	number	display
	0	0 - 99	I00 - I99
	1	0 - 99	C00 - C99
	2	0 - 99	P00 - P99
	3	0 - 99	PFI00 - PFI99
	4	0 - 99	PFC00 - PFC99
	5	0 - 99	PFP00 - PFP99

****
* micro tuning bulk dump *
****

*** OCTAVE *** 24 byte micro tuning data (octave)
para. cng g=4, h=0, p=125

No.	para	b7	b6	b5	b4	b3	b2	b1	b0	Data	note
0	0	0	MS BYTE of MCT							13-107	(C#-1-B6)
		0	LS BYTE of MCT							0- 63	C
1	1										C#
2	2										
.											
.											
.											
11	11										B

*** FULL KBD *** 256 byte micro tuning data (full keyboard)
para. cng g=4, h=0, p=126

No.	para	b7	b6	b5	b4	b3	b2	b1	b0	Data	note
0	0	0	MS BYTE of MCT							13-107	
		0	LS BYTE of MCT							0- 63	C-2 (0)
1	1										C#-2 (1)
2	2										
.	.										
.	.										
.	.										
127	127										G8 (127)

****
* SEQUENCER bulk dump *
****

*** SYSQ *** 33 byte sequencer system setup
para. cng g=4, h=0, p=111

No.	para	b7	b6	b5	b4	b3	b2	b1	b0	Data	note
0&$	0	0	0	0	0	0	0	0	TEMPO1	0-1	tempo data 30-240 (7bit)
1&$	1	0	TEMPO2							0-127	
2	2	0	0	0	0	0	0	METRO		0-3	metronome 0:off,1:rec,2:rec/play 3:always
3	3	0	0	0	0	0	0	0	SYNC	0-1	sync 0:int,1:midi SEQ/R common
4	4	0	0	0	SEQ$RCH					0-16	receive ch in rec mode 0-15:1-16ch,16:omni 17:kbd
5	5	0	0	0	0	0	0	0	SEQ$ATSW	0-1	after touch record sw
6	6	0	0	0	0	0	0	0	SEQ$VELSW	0-1	velocity record switch
7	7	0	0	0	0	SEQ$SCNG_NO				0-7	sequence song number
8&$	8	0	SEQ$TSIG1							0-15	time signature TSIG1/TSIG2 TSIG=0:1...15:16 TSIG2=2: 1/4 3: 1/8 4: 1/16
9&$	9	0	SEQ$TSIG2							2-4	
10&$	10	0	SEQ$SCNG_NAME1							32-127	song name (ASCII)
11&$	11	0	SEQ$SCNG_NAME2								
.	.	.									
17&$	17	0	SEQ$SCNG_NAME8								
18&$	18	0	0	0	SEQ$TCH(TRACK1)					0-16	transmit channel 16:off
19&$	19	0	0	0	SEQ$TCH(TRACK2)						
.	.	.									
25&$	25	0	0	0	SEQ$TCH(TRACK8)						
26	26	0	0	0	0	0	0	REC_TYPE		0-2	recording mode 0:real,1:step,2:punch
27	27	0	0	0	0	0	0	0	REPLACE	0-1	flag of replace 0:over dub,1:replace
28	28	0	reserved								
29	29	0	reserved								
30	30	0	reserved								
31	31	0	reserved								
32	32	0	reserved								

note) 1. &..current edit parameter
2. all parameter change is not received under playing
3. $..ignored when bulk is received

****
* RHYTHM SYSTEM SETUP bulk dump *
****

*** SYSR *** 16 byte rhythm system setup
para. cng g=4, h=0, k=112

No.	para	b7	b6	b5	b4	b3	b2	b1	b0	Data	note
0	0	0	———	———	RY$VOLUME	———	———			0-99	rhythm master volume
1	1	0	0	0	0	0	0	-RY$DSP-		0-2	dsp sw 0:off,1:on,2:mix
2	2	0	0	0	0	0	0	0	ASGN	0-1	kbd asgn sw 0:rhy,1:syn
3	3	0	0	0	0	0	-RY$QUANTIZE-			0-7	quantize 1/4 - off
4	4	0	0	0	———	RY$RCH	———			0-17	receive ch 1-16,omni
5	5	0	0	0	———	RY$TCH	———			0-16	transmit ch 1-16,off
6	6	0	0	0	0	0	0	0	VEL	0-1	velocity sw 0:off,1:on
7	7	0	0	0	0	0	0	0	CLICK	0-1	click sw 0:rec,1:play
8	8	0	0	0	0	0	—RY$CLICK—			0-6	click value 1/4 - 1/32
9	9	0	0	0	0	0	—RY$ASGN—			0-4	assign table number preset1-3,user1-2
10	10	0	0	0	0	0	0	0	PTYPE	0-1	pattern type 0:int,1:preset
11	11	0	———	———	RY$PTN NUM	———	———			0-99	pattern number 0-99
12	12	0	0	0	0	0	-RY$SONG NUM-			0-7	song number
13	13	0	0	0	0	0	0	0	REC	0-1	record type 0:realtime 1:step
14	14	0	0	0	0	0	0	0	SONG	0-1	R mode 0:ptn 1:song
15	15	———	———	reserved	———	———	———				

note) 1. parameter change(No=12-14) is not received under playing
2. parameter change(No=10-11) is received at PTN mode only
3. parameter change(No=12) is received at SONG mode only

*** RINST *** 183 byte rhythm instrument set up
para. cng g=4, h=0, p=113(RINST1) VOL,PAN
p=114(RINST2) NOTE

No.	para	b7	b6	b5	b4	b3	b2	b1	b0	Data	note
—	p:113	—									
0	0	0	0	0	0	——	VOLUME	——		0-15	inst volume of BD1
1	1	0	0	0	0	——	VOLUME	——		0-15	inst volume of BD2
.	.										
.	.										
60	60	0	0	0	0	——	VOLUME	——		0-15	inst volume of VBRSLP
61	61	0	0	0	0	0	— PAN	——		0-6	inst pan of BD1
62	62	0	0	0	0	0	— PAN	——		0-6	inst pan of BD2
.	.										
.	.										
121	121	0	0	0	0	0	— PAN	——		0-6	inst pan of VBRSLP
—	p:114	—									
122	0	0	———	———	NOTE	———	———			0-127	inst note of BD1
123	1	0	———	———	NOTE	———	———			0-127	inst note of BD2
.	.										
.	.										
182	60	0	———	———	NOTE	———	———			0-127	inst note of VBRSLP

order of instruments is as follow.

	x0	x1	x2	x3	x4	x5	x6	x7	x8	x9
0x	BD 1	BD 2	BD 3	H.BD	GateBD	E.BD	SD 1	SD 2	PiclSD	H.SD 1
1x	H.SD 2	GateSD	E.SD	Rim 1	Rim 2	Tom 1	Tom 2	Tom 3	Tom 4	F.Tom1
2x	F.Tom2	F.Tom3	F.Tom4	E.Tom1	E.Tom2	E.Tom3	E.Tom4	HHclos	HHopen	HH/4o
3x	HHpdl	Ride	Edge	Crash	FMprc1	FMprc2	FMprc3	GlsCsh	BellTr	TimpnH
4x	TimpnL	Claps	Shaker	Cowbel	TimblH	TimblL	MistlS	MistlL	CgaMT	CgaHOP
5x	Cga LO	Bgo HI	Bgo LO	CuicaH	CuicaL	Ago HI	Ago LO	Tambrn	Claves	Cstnt
6x	VbrSlp									

*** RKAT *** 122 byte rhythm keyboard assign data
para. cng g=4, h=0, p=115 (user assign 1)
p=116 (user assign 2)

No.	para	b7	b6	b5	b4	b3	b2	b1	b0	Data	note
0	0	0	———	———	INST NUMBER	———	———			0-61	inst of C1 0-60:inst number,61:off
1	1	0	———	———	INST NUMBER	———	———			0-61	inst of C#1
2	2	0	———	———	INST NUMBER	———	———			0-61	inst of D1
.	.	.									
.	.										
.	.										
60	60	0	———	———	INST NUMBER	———	———			0-61	inst of C6

< Table 4 >

Dump Request Messages

	★	VCED	f0,43,2n,03,f7
##	★	VMEM (VS0 100 voice bulk)	f0,43,2n,04,f7
	★	ACED + VCED [TX81Z]	f0,43,2n,7e,LM__8976AE,f7
%%%	★	ACED2 + ACED + VCED [V2]	f0,43,2n,7e,LM__8023AE,f7
##	★	ACED3 + ACED2 + ACED + VCED (VS0 1voice bulk)	f0,43,2n,7e,LM__8073AE,f7
	★	PCED [V2]	f0,43,2n,7e,LM__8976PE,f7
##	★	PCED2 + PCED (VS0 1 pfm bulk)	f0,43,2n,7e,LM__8073PE,f7
	★	PMEM	f0,43,2n,7e,LM__8976PM,f7
##	★	PMEM2 + PMEM (VS0 100 pfm bulk)	f0,43,2n,7e,LM__8073PM,f7
	★	system setup	f0,43,2n,7e,LM__8976Sx,f7 (x = 0,1,2) SY PC EFG1
%%%	★	setup(effect grp2-4)	f0,43,2n,7e,LM__8976Sx,f7 (x = 3,4,5) EFG2-EFG4
%%%	★	system setup 2	f0,43,2n,7e,LM__8023S0,f7
##	★	system setup 3 + 2 + 1	f0,43,2n,7e,LM__8073S0,f7
	★	micro tuning buffer	f0,43,2n,7e,LM__MCRTEx,f7 (x = 0 , 1)
##	★	SEQ system (SYSQ)	f0,43,2n,7e,LM__8073SS,f7
##	★	SEQ sequence data(NSEQ)	f0,43,2n,0A,LM__NSEQ__,f7
##	★	SEQ song data(SSONG)	f0,43,2n,7e,LM__8073SQ,f7
##	★	RHYTHM system (SYSR)	f0,43,2n,7e,LM__8073RS,f7
##	★	RHYTHM inst setup (RINST)	f0,43,2n,7e,LM__8073RI,f7
##	★	R kbd assign table (RKAT1) (user1)	f0,43,2n,7e,LM__8073K0,f7
##	★	R kbd assign table (RKAT2) (user2)	f0,43,2n,7e,LM__8073K1,f7
##	★	R seq data(RSEQ)	f0,43,2n,7e,LM__8073RY,f7

note)	Ascii number	HEX
	★ LM__8976AE	4c,4d,20,20,38,39,37,36,41,45
	★ LM__8023AE	4c,4d,20,20,38,30,32,33,41,45
	★ LM__8976PE	4c,4d,20,20,38,39,37,36,50,45
	★ LM__8976PM	4c,4d,20,20,38,39,37,36,50,4d
	★ LM__8976S0	4c,4d,20,20,38,39,37,36,53,30
	LM__8976S1	4c,4d,20,20,38,39,37,36,53,31
	LM__8976S2	4c,4d,20,20,38,39,37,36,53,32
	LM__8976S3	4c,4d,20,20,38,39,37,36,53,33
	LM__8976S4	4c,4d,20,20,38,39,37,36,53,34
	LM__8976S5	4c,4d,20,20,38,39,37,36,53,35
	★ LM__8023S0	4c,4d,20,20,38,30,32,33,53,30
	★ LM__MCRTE0	4c,4d,20,20,4d,43,52,54,45,30
	LM__MCRTE1	4c,4d,20,20,4d,43,52,54,45,31
	★ LM__8073AE	4c,4d,20,20,38,30,37,33,41,45
	LM__8073PE	4c,4d,20,20,38,30,37,33,50,45
	LM__8073PM	4c,4d,20,20,38,30,37,33,50,4d
	LM__8073S0	4c,4d,20,20,38,30,37,33,53,30
	★ LM__8073SS	4c,4d,20,20,38,30,37,33,53,53
	LM__NSEQ__	4c,4d,20,20,4e,53,45,51,20,20
	LM__8073SQ	4c,4d,20,20,38,30,37,33,53,51
	★ LM__8073RS	4c,4d,20,20,38,30,37,33,52,53
	LM__8073RI	4c,4d,20,20,38,30,37,33,52,49
	LM__8073K0	4c,4d,20,20,38,30,37,33,4b,30
	LM__8073K1	4c,4d,20,20,38,30,37,33,4b,31
	LM__8073RY	4c,4d,20,20,38,30,37,33,52,59

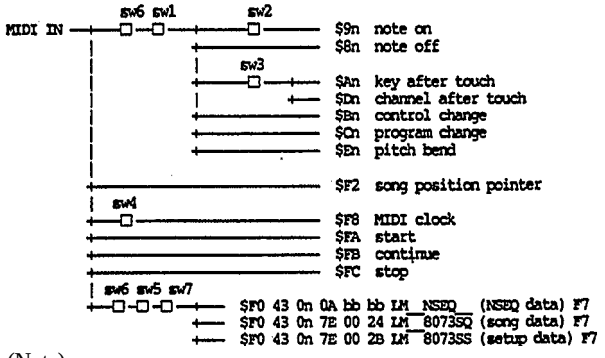
< **Table 5** >

<<< $F0,$43,$1n,... >>>

	VCED	$12(g=4,h=2),p=0-92,93	
	VCED(DX21)	$12(g=4,h=2),p=94-127	
	ACED	$13(g=4,h=3),p=0-22	
%%%	ACED2(DX11)	$13(g=4,h=3),p=23-32	
##	ACED3(V50)	$13(g=4,h=3),p=33-52	
	SYS(81Z remote)	$13(g=4,h=3),p=64-75	
%%%	SYS(DX11remote)	$13(g=4,h=3),p=76-124	
	PCED	$10(g=4,h=0),p=0-109	
##	PCED2	$10(g=4,h=0),p=110	k=0-32
##	SYSQ(seq system)	$10(g=4,h=0),p=111	k=0-32
##	SYSR(r system)	$10(g=4,h=0),p=112	k=0-15
##	RINST1(vol/pan)	$10(g=4,h=0),p=113	k=0-121
##	RINST2(note)	$10(g=4,h=0),p=114	k=0-60
##	RKAT1(user1)	$10(g=4,h=0),p=115	k=0-60
##	RKAT2(user2)	$10(g=4,h=0),p=116	k=0-60
	VMEM bulk header	$44(g=9,h=0),p=7,	(d=1-4)
	PMEM bulk header	$10(g=4,h=0),p=117,	k=1 (d=0-3)
##	V50RM(V50remote)	$10(g=4,h=0),p=118	K=0-56
	WT11SYS(system)	$10(g=4,h=0),p=119,	k=0-15
	WT11SYS(remote)	$10(g=4,h=0),p=119	K=64-74
%%%	SYS(effect gp2)	$10(g=4,h=0),p=120,	k=0-54
%%%	SYS(effect gp3)	$10(g=4,h=0),p=121,	k=0-54
%%%	SYS(effect gp4)	$10(g=4,h=0),p=122,	k=0-54
	SYS(system)	$10(g=4,h=0),p=123,	k=0-26
%%%	SYS2(DX11system)	$10(g=4,h=0),p=123,	k=27-46
##	SYS3(V50system)	$10(g=4,h=0),p=123,	k=47-79
	SYS(effect gp1)	$10(g=4,h=0),p=124,	k=0-54
	MCT(oct)	$10(g=4,h=0),p=125,	k=0-11
	MCT(full)	$10(g=4,h=0),p=126,	k=0-127
	SYS(pgmcng)	$10(g=4,h=0),p=127,	k=0-127

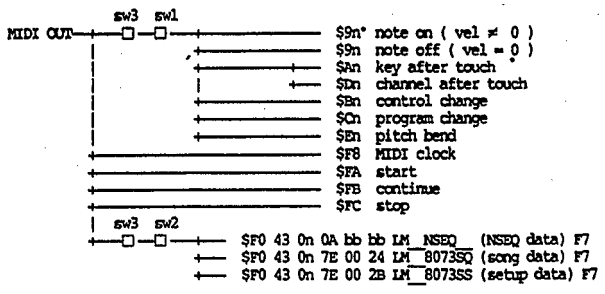
SEQUENCER SECTION

Reception flow diagram



(Note)
sw1: When in RECORD, the SETUP reception channel
sw2: When in RECORD, the SETUP velocity on/off
sw3: When in RECORD, the SETUP aftertouch on/off
sw4: When in PLAY, this is on when SETUP sync is set to "MIDI"
sw5: Set by the UTILITY (setup) device number
sw6: Received only when UTILITY (setup) midi sw = on
sw7: Received only when UTILITY int memory protect = off

Transmission flow diagram



(Note)
sw1: Set for each track in MIDI TRANSMIT CHANNEL
sw2: Set in Device No. of utility (setup)
sw3: Transmitted only when UTILITY (setup) midi sw=on

Channel messages:
Received only during RECORD. Transmitted only during PLAY and during overdub. For transmission/reception conditions, see the reception flow diagram and the transmission flow diagram.

Mode messages:
Neither received nor transmitted.

System common messages:
Only $F2 (song position pointer) is received. (However not in recording mode, nor during playback.) Other than this, neither received nor transmitted.

BULK DUMP:
Three types of bulk data are transmitted and received. The transmission/reception channel can be set in synthesizer mode.

1) $F0 43 on 7E 00 2B LM_8073SS (setup data) F7
2) $F0 43 on 7E 00 24 LM_8073SQ (song data) F7
3) $F0 43 on 0A bb bb LM_NSEQ_(NSEQ data) F7

Reception is possible only when not playing back or recording. When 2.song data and 1.NSEQ data (sequence data) is received, it will be loaded into song memory only if the current song is empty.

Transmission occurs when MIDI exclusive "bulk dump" is executed, or when a dump request is received.

The data format for NSEQ data and seq song data is explained below. For the seq (SYSQ) data format, see the data format table for the synthesizer section (table 4).
Bulk data with a header of "LM—NSEQ1—" can also be received. (However, macros, time signature changes, exclusive, etc. in the data will be ignored.)

○NSEQ DATA FORMAT

NSEQ data for a one song consists of multiple tracks beginning with F0 0n (n= track number) and ending with F2. Empty tracks are not included.

The time/event/control data explained in the supplement are between the F0 0n and the F2.

hex	description
F0	top of track #1
00	
—	
—	time/event/control data
—	
F2	end of record
—	
—	track #2 ~ #7 data
—	
F0	top of track #8
07	
—	
—	time/event/control data
—	
F2	end of record

Supplement: NSEQ time/event/control data format (expressed in binary)

short time	0ttttttt	(384th note length / bit)
long time	0ttttttt 0ttttttt	(in the order of MS byte - LS byte)
short note	10ddddd 0kkkkkkk 0vvvvvvv	
long note	110ddddd 0ddddddd 0kkkkkkk 0vvvvvvv	
short note	10ddddd 1kkkkkkk	(when velocity = $40)
long note	110ddddd 0ddddddd 1kkkkkkk	(when velocity = $40)
	ddd = duration	(96th note length / bit)
	kkk = MIDI note number	
	vvv = MIDI velocity	
measure mark	11110101	(measure mark)
no operation	11111000	(does nothing)

(The following are the same as MIDI format except for the MS byte.)

poly a.touch	11111010 0kkkkkkk 0vvvvvvv
control change	11111011 0ccccccc 0vvvvvvv
program change	11111100 0ppppppp
channel a.touch	11111101 0vvvvvvv
pitch bend	11111110 0vvvvvvv 0vvvvvvv

OSEQ SONG DATA FORMAT

Song data consists of tempo, beat (time signature), and song name. It has the following format.

*** SSONG *** 26 byte sequencer song data

No	b7	b6	b5	b4	b3	b2	b1	b0	Data	note
0	0	0	0	0	0	0	0	SETUP	0-1	setup store flag
1	0	0	0	——TIME_SIG——					0-31	packed time signature
2	0	0	0	0	0	0	0	TEMPO1	0-1	tempo 30-240 (7bit)
3	0	——TEMPO2——							0-127	
4	0	——SONG_NAME1——							32-127	song name (ASCII)
5	0	——SONG_NAME2——								
.	.									
11	0	——SONG_NAME8——								
12	0	0	0	——SEQ_TCH(TRACK1)——					0-16	transmit channel 16:off
13	0	0	0	——SEQ_TCH(TRACK2)——					0-16	transmit channel 16:off
.	.									
19	0	0	0	——SEQ_TCH(TRACK8)——					0-16	transmit channel 16:off
20	0	0	0	0	0	0	0	SMODE	0-1	synth mode 0:SGL,1:PFM mode
21	0	0	0	0	0	0	—VTYPE—		0-2	synth voice type 0:internal 1:card, 2:preset
22	0	——VOICE/PFM_NO——							0-99	synth voice/pfm No
23	0	0	0	0	0	0	0	RMODE	0-1	Rhythm mode 0:PTN 1:SONG
24	0	0	0	0	0	0	0	R_NO1	0-1	Rhythm song/ptn No
25	0	——R SONG/PTN_NO2——							0-127	0 - 99:I00-I99 100-199:P00-P99

note) 1 TIME_SIG

0 - 3 : 1/4 - 4/4
4 -11 : 1/8 - 8/8
12-27 : 1/16 - 16/16

(Table 1) 1. Transmission data

1-1 Channel information

(1) Channel voice information

(1.1)KEY ON/OFF

STATUS	1001nnnn	(9n)	n=channel number
NOTE No.	0kkkkkkk		k=0(C-2)~ 111(D#7)
VELOCITY	0vvvvvvv	(v≠ 0)	KEY ON
	00000000	(v= 0)	KEY OFF

(1.2)POLYPHONIC AFTER TOUCH

STATUS	1010nnnn	(An)	n=channel number
NOTE No.	0kkkkkkk		k=0(C-2)~ 127(G8)
Value	0vvvvvvv		v=0~ 127

(1.3)CONTROL CHANGE

STATUS	1011nnnn	(Bn)	n=channel number
CONTROL No.	0ccccccc		c=0~ 121
CONTROL Value	0vvvvvvv		

(1.4)PROGRAM CHANGE

STATUS	1100nnnn	(Cn)	n=channel number
PROGRAM No.	0ppppppp		p=0~ 99
	mode(if pgm cng sw is not TransFilter)		p=119:IND int(at PFI) card(at PFC)
			p=121:IND preset
			p=122:SGL int
			p=123:SGL card
			p=124:SGL preset
			p=125:PFM int
			p=126:PFM card
			p=127:PFM preset

(1.5)AFTER TOUCH

STATUS	1101nnnn	(Dn)	n=channel number
Value	0vvvvvvv		v=0~ 127

(1.6)PITCH BENDER

STATUS	1110nnnn	(En)	n=channel number
Value	0uuuuuuu		
Value	0vvvvvvv		

1-2 System information

(1) System realtime messages

(1.1)TIMING CLOCK

STATUS	11111000	(F8)

(1.2)START

STATUS	11111010	(FA)

(1.3)CONTINUE

STATUS	11111011	(FB)

(1.4)STOP

STATUS	11111100	(FC)

(2) System exclusive messages

(2.1) SEQUENCE DUMP

STATUS	11110000	(F0)	
ID No.	01000011	(43)	
SUB STATUS	0000ssss	(0s)	s=device number
GROUP NUMBER	00001010	(0A)	
BYTE COUNT(MSB)	0bbbbbbb		
BYTE COUNT(LSB)	0bbbbbbb		
CLASIFICATION-	01001100	ASCII'L	
NAME	01001101	ASCII'M	
	00100000	ASCII'_	
	00100000	ASCII'_	
DATA FORMAT-	01001110	ASCII'N	
NAME	01010011	ASCII'S	
	01000101	ASCII'E	
	01010001	ASCII'Q	
	00100000	ASCII'_	
	00100000	ASCII'_	
DATA	0ddddddd	]	
	0ddddddd	]	
CHECK SUM	0eeeeeee		
EOX	11110111	(F7)	

(2.2) UNIVERSAL BULK DUMP (Seq song data)

STATUS	11110000	(F0)	
ID No.	01000011	(43)	
SUB STATUS	0000ssss	(0s)	s=device number
GROUP NUMBER	01111110	(7E)	
BYTE COUNT(MSB)	00000000	(00)	
BYTE COUNT(LSB)	00100100	(24)	
CLASIFICATION-	01001100	ASCII'L	
NAME	01001101	ASCII'M	
	00100000	ASCII'_	
	00100000	ASCII'_	
DATA FORMAT-	00111000	ASCII'8	
NAME	00110000	ASCII'0	
	00110111	ASCII'7	
	00110011	ASCII'3	
	01010011	ASCII'S	
	01010001	ASCII'Q	
DATA	0ddddddd		
	0ddddddd		26 bytes
CHECK SUM	0eeeeeee		
EOX	11110111	(F7)	

(Table 2) 2. Reception data

2-1 Channel information

Same as transmission

2-2 System information

(1) System common messages

(1.1) SONG POSITION POINTER STATUS 11110010 (F2)

(2) System realtime message

Same as transmission

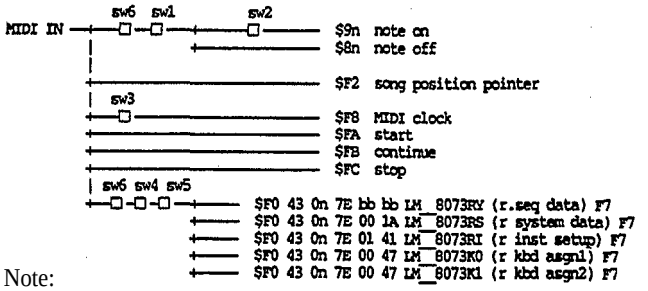
(3) System exclusive message

(3.1) SEQUENCE DUMP
Same as transmission

(3.2) UNIVERSAL BULK DUMP (Seq setup data)
Same as transmission

RHYTHM SECTION

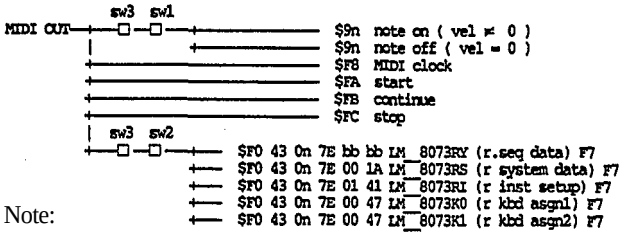
Reception flow diagram



Note:

sw1: Reception channel in SETUP
sw2: When in RECORD, the SETUP velocity on/off
sw3: When in PLAY, this is "on" when the SETUP sync is set to "MIDI"
sw4: The device number selected in utility (setup)
sw5: Received only when the utility setting memory protect is "off".
sw6: Received only when UTILITY (setup) midi sw = on

Transmission flow diagram



Note:

sw1: The transmit channel in SETUP.
sw2: The device number in utility (setup)
sw3: Transmitted only when UTILITY (setup) midi = on

Channel messages:
Transmitted only during PLAY and while recording. For the reception and transmission conditions, see the reception flow diagram and the transmission flow diagram.

Mode messages:
Neither received nor transmitted.

System common messages:
Only $F2 (song position pointer) is received (however not when in recording mode nor during playback). Other messages are neither received nor transmitted.

System Realtime Messages:
$F8. $FA, $FB, and $FC are transmitted and received. (However when in recording mode, $FA, $FB, and $FC are not received.)

BULK DUMP:
Five types of bulk data are transmitted and received. The transmission/reception channel can be set in synthesizer mode.

1. $F0 43 0n 7E bb bb LM_8073RY (r.seq data) F7
2. $F0 43 0n 7E 00 1A LM_8073RS (r system data) F7
3. $F0 43 0n 7E 01 41 LM_8073RI (r inst data) F7
4. $F0 43 0n 7E 00 47 LM_8073K0 (r kbd asgn1) F7
5. $F0 43 0n 7E 00 47 LM_8073K1 (r kbd asgn2) F7

Reception is possible at any time except while playing or recording. Transmission occurs when MIDI exclusive "bulk dump" has been executed, or when a dump request has been received.

For the data formats of system (SYSR), inst setup (RINST), and kbd assign table (RKAT), see the data format table of the synthesizer section (table 4).

(Table 1) 1. Transmission data

1-1 Channel information

(1) Channel voice messages

(1.1)KEY ON/OFF			
STATUS	1001nnnn	(9n)	n=channel number
NOTE No.	0kkkkkkk		k=0(C-2)~127(G8)
VELOCITY	0vvvvvvv	(v≠0)	KEY ON
	00000000	(v=0)	KEY OFF

1-2 System information

(1) System realtime messages

(1.1)TIMING CLOCK		
STATUS	11111000	(F8)
(1.2)START		
STATUS	11111010	(FA)
(1.3)CONTINUE		
STATUS	11111011	(FB)
(1.4)STOP		
STATUS	11111100	(FC)

(2) System exclusive messages

(2.1) RHYTHM SEQUENCE DUMP			
STATUS	11110000	(F0)	
ID No.	01000011	(43)	
SUB STATUS	0000ssss	(0s)	s=device number
GROUP NUMBER	01111110	(7E)	
BYTE COUNT(MSB)	0bbbbbbb		
BYTE COUNT(LSB)	0bbbbbbb		
CLASIFICATION-	01001100	ASCII'L	
NAME	01001101	ASCII'M	
	00100000	ASCII'	
	00100000	ASCII'_	
DATA FORMAT-	00111000	ASCII'8	
NAME	00110000	ASCII'0	
	00110111	ASCII'7	
	00110011	ASCII'3	
	01010010	ASCII'R	
	01011001	ASCII'Y	
DATA	0ddddddd	] Note 1)	
	0ddddddd	] Note 1)	
CHECK SUM	0eeeeeee		
EOX	11110111	(F7)	

Note 1) data format

count	size(byte)	data
0 - 217	218	pattern/song directory
218 - 317	100	time signature of 100 pattern
318 - 417	100	bar of 100 pattern
418 - 481	64 (8x8song)	song name
482 - 10239(max)	9758 (max)	pattern/song data

The above data is divided into MSB4 bits and LSB 4 bits, and each converted into an ASCII code. If the data count exceeds 4K bytes, the data from "BYTE COUNT" to "CHECK SUM" is repeated for every 4K bytes.

(Table 2) 2. Reception data

2-1 Channel information
Same as for reception

2-2 System information

(1) System common messages

(1.1) SONG POSITION POINTER
STATUS 11110010 (F2)

(2) System realtime messages
Same as for reception

(3) System exclusive messages

(3.1) RHYTHM SEQUENCE DUMP
Same as for transmission

YAMAHA [Digital Synthesizer——synthesizer part] Date :12/28, 1988
Model V50 MIDI Implementation Chart Version : 1.0

Function . . .		Transmitted	Recognized	Remarks
Basic	Default	1 - 16	1 - 16	memorized
Channel	Changed	1 - 16	1 - 16	
Mode	Default	3	1, 2, 3, 4	memorized
	Messages	POLY, MONO(M=1)	POLY, MONO(M=1)	sgl mode only
	Altered	**********	x	
Note Number		36 - 96	0 - 127	
	True voice	**********	12 - 107	
Velocity	Note ON	o 9nH,v=1-127	o v=1-127	
	Note OFF	x 9nH,v=0	x	
After Touch	Key's	x	x	
	Ch's	o *3	o *3	
Pitch Bender		o *2	o 0-12 semi *2	7 bit resolution
Control Change	1	o *1	o *1	Modulation wheel
	2	o *1	o *1	Breath control
	4	o *1	o *1	Foot control
	5	x	o (sgl only) *1	Portamento time
	6	o *1	x	Data entry knob
	7	o *1	o *1	Volume
	10	x	o (pfm only) *1	Pan(L,L+R,R)
	64	o	o	Sustain
	65	o *1	o *1	Portamento
	96	o *1	x	Data entry +1
	97	o *1	x	Data entry -1
	0 - 31	o *1		D. entry (play)
	121	x	o	Reset All Cntrller
Prog Change		o 0 - 127 *4	o 0 - 127	if pgm cng sw is
	True #	**********	0 - 599	on.(assignable)
System Exclusive		o *5	o *5	Voice parameters
System Common	Song Pos	x	o	
	Song Sel	x	x	
	Tune	x	x	
System Real Time	Clock	o	o	
	Commands	o	o	
Aux Mes-sages	Local ON/OFF	x	x	
	All Notes OFF	x	o (123,126,127)	126,127 sgl only
	Active Sense	o	o	
	Reset	x	x	

Notes: *1 = transmit/receive if control change sw is on.
*2 = transmit/receive if pitch bend sw is on.
*3 = transmit/receive if after touch sw is on.
*4 = transmit if pgm change sw is on and exclusive sw is off.
*5 = transmit/receive if device No is not off.

Mode 1 : OMNI ON, POLY Mode 2 : OMNI ON, MONO o : Yes
Mode 3 : OMNI OFF, POLY Mode 4 : OMNI OFF, MONO x : No

YAMAHA [Digital synthesizer---sequencer part] Date :12/28, 1988
Model V50 MIDI Implementation Chart Version : 1.0

Function . . .	Transmitted	Recognized	Remarks
Basic Default	1-16	1 - 1 6	memorized
Channel Changed	1-16	1 - 1 6	
Default	x	x	
Mode Messages	x	x	
Altered	**********	x	
Note Number : True voice	0 - 111 **********	0 - 111	
Velocity Note ON	o 9nH,v=1-127	o v=1-127 *1	
Note OFF	x 9nH,v=0	x	
After Key's	o	o *2	
Touch Ch's	o	o *2	
Pitch Bender	o	o	
0 - 120	o	o	
Control Change			
Prog Change : True #	o 0 - 127 **********	o 0 - 127	
System Exclusive	o	o *3	Song data
System : Song Pos	x	o *4	
: Song Sel	x	x	
Common : Tune	x	x	
System :Clock	o	o *5	
Real Time :Commands	o	o	
Aux :Local ON/OFF	x	x	
:All Notes OFF	x	x	
Mes- :Active Sense	o	x	
sages:Reset	x	x	

Notes: *1 = receive if velocity switch is on.
*2 = receive if after touch switch is on.
*3 = receive if current song has no data.
*4 = not receive at recording mode.
*5 = receive in MIDI sync mode.

Mode 1 : OMNI ON, POLY Mode 2 : OMNI ON, MONO o : Yes
Mode 3 : OMNI OFF, POLY Mode 4 : OMNI OFF, MONO x : No

YAMAHA [Digital Synthesizer---rhythm part] Date :12/28, 1988
Model V50 MIDI Implementation Chart Version : 1 . 0

Function . . .	Transmitted	Recognized	Remarks
Basic Default	1 - 1 6 *1	1 - 1 6	memorized
Channel Changed	1 - 1 6	1 - 1 6	
Mode Default	x	x	
Messages	x	x	
Altered	**********	x	
Note Number : 0 - 127	0 - 127	0 - 127	
True voice	**********		
Velocity Note ON	o 9nH,v=1-127	o v=1-127 *2	
Note OFF	x 9nH,v=0	x	
After Key's	x	x	
Touch Ch's	x	x	
Pitch Bender	x	x	
Control Change	x	x	
Prog Change : True #	x **********	x	
SystemExclusive	o *3	o *3	Song data etc.
System : Song Pos	x	o *4	
: Song Sel	x	x	
Common : Tune	x	x	
System : Clock	o	o *5	
Real Time : Commands	o	o	
Aux : Local ON/OFF	x	x	
: All Notes OFF	x	x	
Mes- : Active Sense	o	x	
sages: Reset	x	x	

Notes: *1 = transmit under playing.
*2 = receive if velocity switch is on.
*3 = transmit/receive if device No is not off.
*4 = not receive at recording mode.
*5 = receive in MIDI sync mode.

Mode 1 : OMNI ON, POLY Mode 2 : OMNI ON, MONO o : Yes
Mode 3 : OMNI OFF, POLY Mode 4 : OMNI OFF, MONO x : No

Performance data blank chart

You may copy the following chart as a memo sheet for your performance settings.

Vous pouvez copier le tableau suivant et y portez vos réglages de performance afin de vous en souvenir.

Kopieren Sie diese Übersicht und notieren Sie jeweils Ihre neu programmierten Performance-Werte.

YAMAHA V50 PERFORMANCE DATA						DATE / /			
NAME									
INST NUMBER	1	2	3	4	5	6	7	8	
ASSIGN MODE									
NOTES									
VOICE NUMBER									
MIDI RECEIVE CH									
LIMIT / LOW									
LIMIT / HIGH									
INST DETUNE									
NOTE SHIFT									
VOLUME									
OUTPUT ASSIGN									
LFO SELECT									
MICRO TUNING									
SELECT									
KEY									
P. EFFECT									
EFFECT									
SELECT									
BALANCE									
OUT LEVEL									
STEREO MIX									
PARAM 1									
PARAM 2									
PARAM 3									

Voice data blank chart

You may copy the following chart as a memo sheet for your voice settings.

Vous pouvez copier le tableau suivant et y portez vos réglages de voix afin de vous en souvenir.

Kopieren Sie diese Übersicht und notieren Sie jeweils Ihre neu programmierten Voice-Werte.

YAMAHA V50 VOICE DATA		DATE / /				VOICE NAME		
OPERATOR		1	2	3	4	POLY / MONO MODE		
ALGORITHM						PITCH BEND RANGE		
FEEDBACK LEVEL						FOOT SW		
LFO	WAVE					PORTAMENTO	MODE	
	SPEED						TIME	
	DELAY					FOOT CONTROL	VOLUME	
	SYNC						PITCH	
	PMD						AMPLITUDE	
	AMD					MODULATION WHEEL	PITCH	
SENSITIVITY	PMS						AMPLITUDE	
	AMS					BREATH CONTROL	PITCH	
	AME						AMPLITUDE	
	EBS						PITCH BIAS	
	KVS						EG BIAS	
OSCILLATOR	MODE					AFTER TOUCH	PITCH	
	FIX SHIFT						AMPLITUDE	
	FIX RANGE						PITCH BIAS	
	FREQUENCY						EG BIAS	
	WAVE					REVERB	RATE	
	DETUNE					EFFECT		
ENVELOPE GENERATOR	AR						SELECT	
	D1R						BALANCE	
	D1L						OUT LEVEL	
	D2R						STEREO MIX	
	RR						PARAM 1	
	SHIFT						PARAM 2	
PITCH ENVELOPE GENERATOR	PR1						PARAM 3	
	PL1							
	PR2							
	PL2							
	PR3							
	PL3							
OUTPUT LEVEL								
KEYBOARD SCALING	RATE							
	LEVEL							
TRANSPOSE								

IMPORTANT
SAFETY AND INSTALLATION INSTRUCTIONS

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

WARNING — When using electronic products, basic precautions should always be followed, including the following:

1. Read all Safety and Installation Instructions, Supplemental Marking and Special Message Section data, and any applicable assembly instructions BEFORE using this product.
2. Check unit weight specifications BEFORE you attempt to move this product.
3. Main power supply verification. Yamaha Digital Musical Instrument products are manufactured specifically for use with the main supply voltage used in the area where they are to be sold. The main supply voltage required by those products is printed on the name plate. If any doubt exists please contact the nearest Yamaha Digital Musical Instrument retailer.
4. Some Yamaha Digital Musical Instrument products utilize external power supplies or adapters. Do NOT connect products of this type to any power supply or adapter other than the type described in the owners manual or as marked on the unit.
5. This product may be equipped with a plug having three prongs or a polarized line plug (one blade wider than the other). If you are unable to insert the plug into the outlet, contact an electrician to have the obsolete outlet replaced. Do NOT defeat the safety purpose of the plug. Yamaha products not having three prong or polarized line plugs incorporate construction methods and designs that do not require line plug polarization.
6. **WARNING** — Do NOT place objects on the power cord or place the unit in a position where anyone could walk on, trip over, or roll anything over cords of any kind, An improper installation of this type can create the possibility of a fire hazard and/or personal injury.
7. Environment: Your Yamaha Digital Musical Instrument should be installed away from heat sources such as heat registers and/or other products that produce heat.
8. Ventilation: This product should be installed or positioned in a way that its placement or location does not interfere with proper ventilation.
9. Yamaha Digital Musical Instrument products are frequently incorporated into "Systems" which are assembled on carts, stands or in racks. Utilize only those carts, stands, or racks that have been designed for this purpose and observe all safety precautions supplied with the products. Pay special attention to cautions that relate to proper assembly, heavier units being mounted at the lower levels, load limits, moving instructions, maximum usable height and ventilation.
10. Yamaha Digital Musical Instrument products, either alone or in combination with amplification, headphones, or speakers, may be capable of producing sound levels that could cause permanent hearing loss. Do NOT operate at high volume levels or at a level that is uncomfortable. If you experience any discomfort, ringing in the ears, or suspect any hearing loss, you should consult an audiologist.
11. Do NOT use this product near water or in wet environments. For example, near a swimming pool, spa, in the rain, or in a wet basement.
12. Care should be taken so that objects do not fall, and liquids are not spilled into the enclosure.
13. Yamaha Digital Musical Instrument products should be serviced by a qualified service person when:
    a. The power supply/power adapter cord or plug has been damaged; or
    b. Objects have fallen, or liquid has been spilled into the products; or
    c. The unit has been exposed to rain; or
    d. The product does not operate, exhibits a marked change in performance; or
    e. The product has been dropped, or the enclosure of the product has been damaged.
14. When not in use, always turn your Yamaha Digital Musical Instrument equipment "OFF". The power supply cord should be unplugged from the outlet when the equipment is to be left unused for a long period of time. NOTE: In this case, some units may lose some user programmed data. Factory programmed memories will not be affected.
15. Electromagnetic Interference (RFI). Yamaha Digital Musical Instruments utilize digital (high frequency pulse) technology that may adversely affect Radio/TV reception. Please read FCC Information (inside cover) for additional information.
16. Do NOT attempt to service this product beyond that described in the user maintenance section of the owners manual. All other servicing should be referred to qualified service personnel.

PLEASE KEEP THIS MANUAL
FOR FUTURE REFERENCE!

This Information on safety Is provided to comply with U.S.A. laws, but should be observed by users In all countries.

SPECIAL MESSAGE SECTION

ELECTROMAGNETIC INTERFERENCE (RFI): Your Yamaha Digital Musical Instrument Product has been type tested and found to comply with all applicable regulations. However, if it is installed in the immediate proximity of other electronic devices, some form of interference may occur. For additional RFI information see the FCC information section located in this manual.

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

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

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

STATIC ELECTRICITY CAUTION: Some Yamaha Digital Musical Instrument products have modules that plug into the unit to perform various functions. The contents of a plug-in module can be altered/damaged by static electricity discharges. Static electricity build-ups are more likely to occur during cold winter months (or in areas with very dry climates) when the natural humidity is low. To avoid possible damage to the plug-in module, touch any metal object (a metal desk lamp, a door knob, etc.) before handling the module. If static electricity is a problem in your area, you may want to have your carpet treated with a substance that reduces static electricity build-up. See your local carpet retailer for professional advice that relates to your specific situation.

Model _____

Serial No. _____

Purchase Date _____

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