Roland®

S-50

Owner's Manual

Version 2.0

The S−50 Version 2.00 software turns the system into a sampling keyboard which can record (sample and record into computer memory) all sorts of sounds, then play these sounds. Please thoroughly read the "Basic Course" of this owner's manual, then go to the necessary section which explaines the relevant mode with the aid of the index provided at the back of the manual.

FEATURES

- The S−50 is 16 voice polyphonic.
- The S−50's digital filter circuits allow you to record all sorts of sounds without affecting the quality of the sounds.
- The S−50's digital editing functions can modify the sampled voice without reducing the sound quality.
- The S−50 can select a sampling frequency of 30 or 15kHz.
- Each of the two Banks can store up to 14.4 seconds of data when the 15kHz sampling frequency is selected.
- The S−50's memory can store up to 32 different Tones (=Wave data + Tone Parameters) and 8 different Patches (=32 Tones assigned to different ranges on the keyboard).
- The Multi Patch Play function allows the S−50 to simultaneously play up to four Patches using four individual receive channels. This function can be effectively used for controlling the S−50 by a sequencer.
- The 16 voices can be assigned to the four Individual Output Jacks in eight different ways (e.g. 8,4,2,2). This enables you to play up to 4 Tones or Patches separately through the four output jacks.
- The S−50 can be set up with a CRT color monitor display featuring an RGB input or a home TV set featuring a video connector, or a black and white display for a computer.
- The sound data in the S−50 can be saved onto 3.5" floppy disk for future use.
- Using the optional Digitizer Tablet DT−100, the waveform or envelope you draw can be programmed in the S−50.

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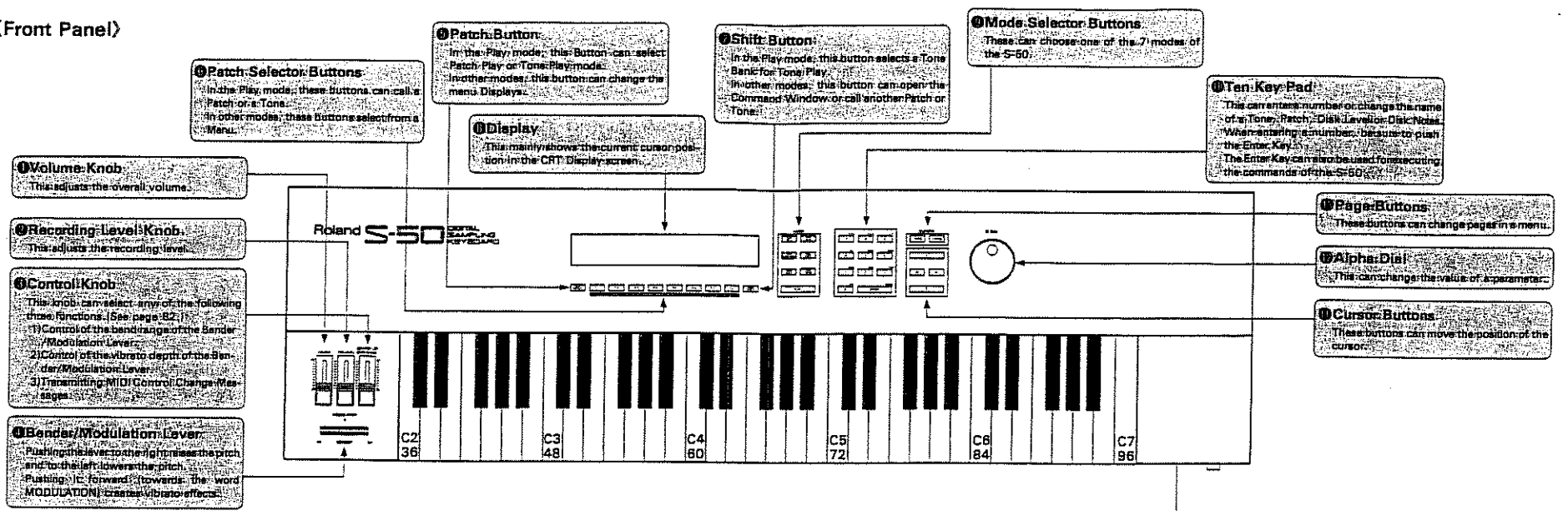
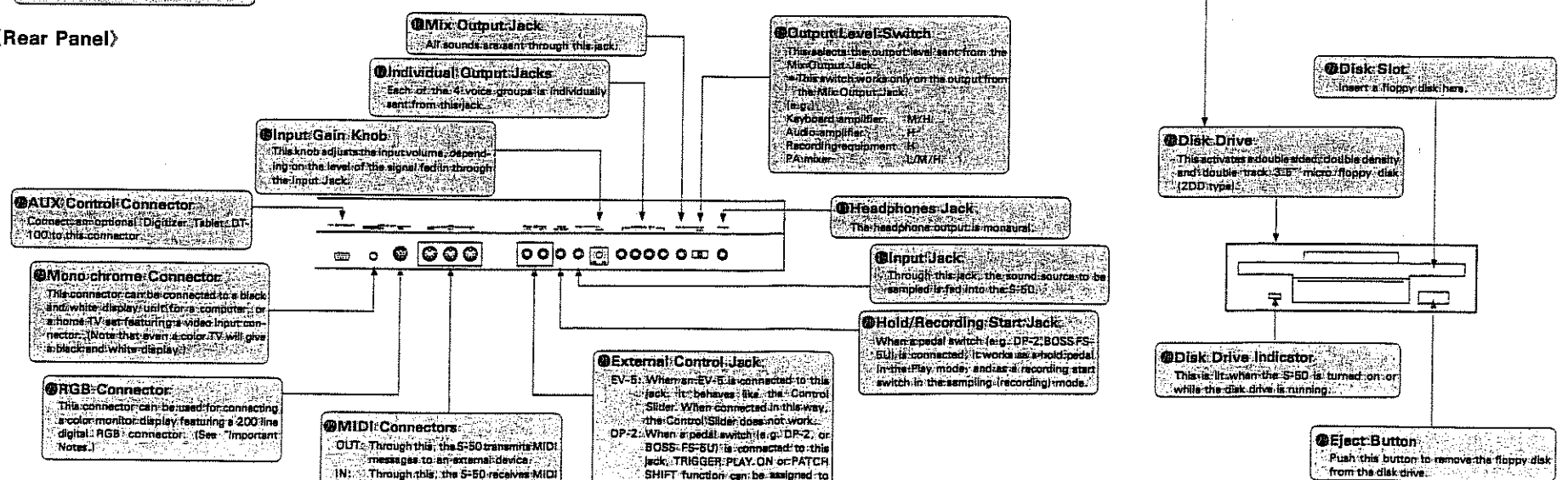
[1] PANEL DESCRIPTIONS

⟨Front Panel⟩



⟨Rear Panel⟩



IMPORTANT NOTES

< S-50 >

- Switching the S-50 off will erase all the data programmed in the S-50. Be sure that the Power switch is not touched accidentally, or the power cord is not disconnected.

- The appropriate power supply for this unit is shown on its name plate. Please make sure that the line voltage in your country meets the requirement.

- Do not use the same socket used for any noise generating device (such as a motor or variable lighting system).

- This unit might not work properly if turned on immediately after being turned off. If this happens, simply turn it off, and turn it on again after waiting a few seconds.

- When turning the S-50 on or off, be sure the disk drive is empty.

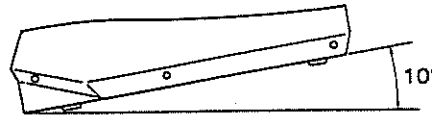
- When disconnecting the power cord from the socket, do not pull the cord. Hold the plug and disengage carefully.

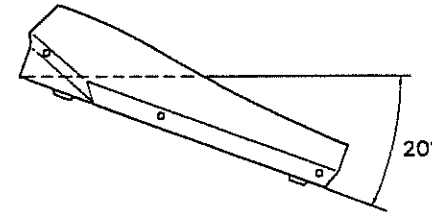
- If this unit is not to be used for a long period of time, be sure to disconnect the power cord from the socket.

- It is normal for this unit to get hot while being operated.

- Avoid using this unit in excessive heat or humidity, or where it may be affected by direct sunlight or dust.

- Place this unit in a steady, horizontal place. If it is inclined upward at more than 10 degrees or downward at more than 20 degrees, the disk drive may not function properly.





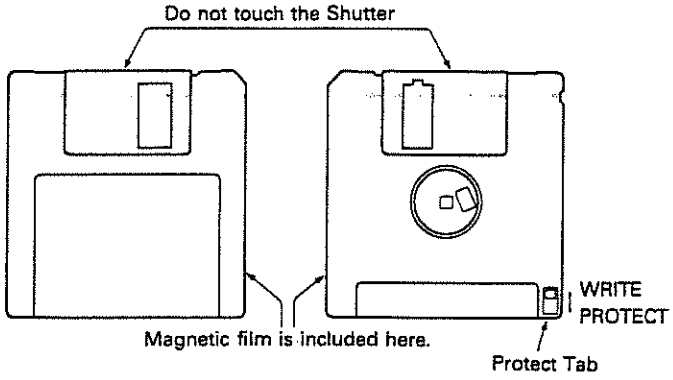
- Use a soft cloth, and clean only with a mild detergent.

- Do not use solvents such as paint thinner.

If this unit happens to fail to function properly, turn it off once, then turn it on again.

< Floppy Disks>

Floppy disks are delicate and can be ruined if not handled properly.



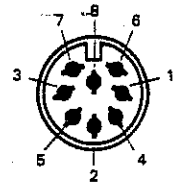
* To prevent accidental loss of data, be sure to set the Protect Tab to the PROTECT position except when writing (recording) data.

- Do not expose the disk to strong magnetic fields such as a TV set or speakers.
- Do not touch the shutter that covers the magnetic film. The magnetic field can be easily damaged, even by slight amounts of grease.
- Keep the disk away from extremely hot or cold temperatures, direct sunlight or dust.
- To prevent accidental loss of data, be sure to set the Protect Tab to the PROTECT position, except when writing (recording) data.
- Never remove the disk, or switch the unit off, while the disk is running (when the disk drive indicator is lit). The disk may be permanently damaged. And while the disk drive is running, do not give a strong shock to the unit, or data may be improperly read from the disk.
- In transit, remove the disk from the disk drive, otherwise the disk and the disk drive may be damaged.

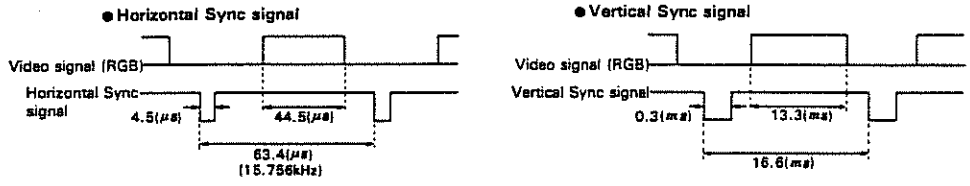
< Color CRT Display>

Before connecting a color display to the S−50, make sure that the monitor's input matches the output of the S−50. If not, do not use the monitor with the S−50.
The output of the S−50's RGB Connector matches the TTL RGB 200 lines.

PIN No	Signal		Spec
1	+5V	+5V power output	
2	GND	Earth	
3		Open	
4	HSYNC	Horizontal Sync signal	TTL level negative
5	VSYNC	Vertical Sync signal	
6	R	Video signal (red)	TTL level positive
7	G	Video signal (green)	
8	B	Video signal (blue)	



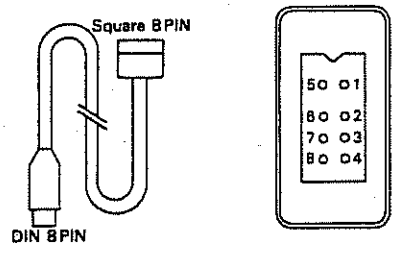
■Timing Chart of RGB Output of the S-50



***Even when all the above specifications are fulfilled, the S−50 may not work properly. This is because the impedance of the connected color monitor differs from that of the S−50.**
(The impedance of the S−50's RGB output is 100 Ω.)

For connecting the S−50 to most 8 pin monitor displays, use the Roland RGB−25N connection cable. Do not use a cable that has different number or different positions of pins.

■RGB-25N (DIN 8PIN Connector−−Square 8PIN Connector)

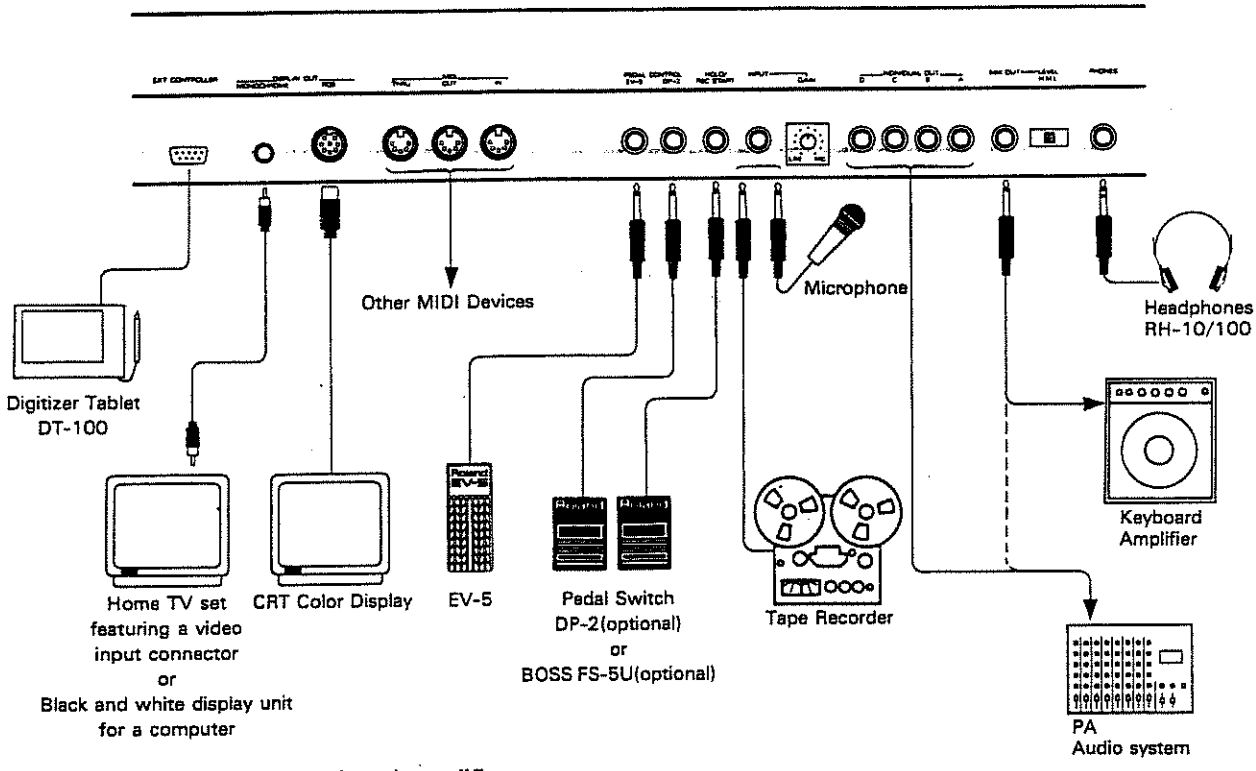


PIN No	Signal	
1	Open	
2	Video signal (red)	TTL level positive
3	Video signal (green)	
4	Video signal (blue)	
5	Earth	
6	Earth	
7	Horizontal Sync signal	TTL level negative
8	Vertical Sync signal	

The Color Display compatible with the S−50 are : IBM Model 5234
Roland DG CC−141, etc.

CONNECTIONS

Make sure all the units are turned off, then make connections as follows.



Setup with a mixer, keyboard amplifier, etc.

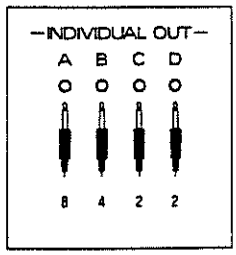
The S−50 does not include speakers, and therefore needs to be set up with a power amplifier, such as a mixer or keyboard amplifier, or headphones.

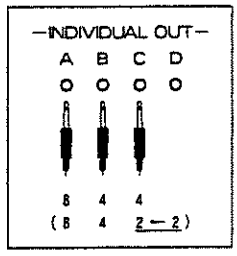
Connect the Mix Output Jack (**MIX OUT**) on the rear panel of the S−50 to the mixer or keyboard amplifier, etc. This sends out all sounds.
When using the headphones, connect them to the Headphones Jack (**PHONES**).

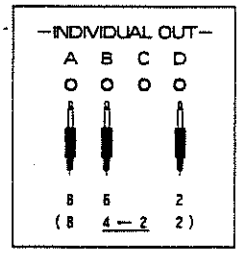
About the Individual Output Jacks

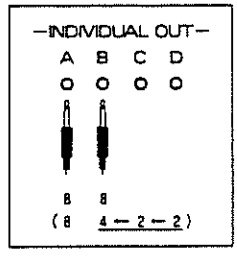
These jacks are used for distributing the sound to the four individual outputs for Multi Patch Play or Multi Tone Play.

The S−50 is 16 voice polyphonic, and the Individual Output Jacks A to D always divide those 16 voices e.g. **8 : 4 : 2 : 2**. However, when a jack (or jacks) is not used, the adjacent jacks will take over as shown on the next page. Do not use the jacks marked with " X" on page 90.









Depending on the Voice Mode set in the **MULTI PATCH**, or **MULTI TONE** in the **Function mode**, the jacks to be used vary, the essential difference being the number of voices assigned to each MIDI channel. (explained in detail on page 89.)

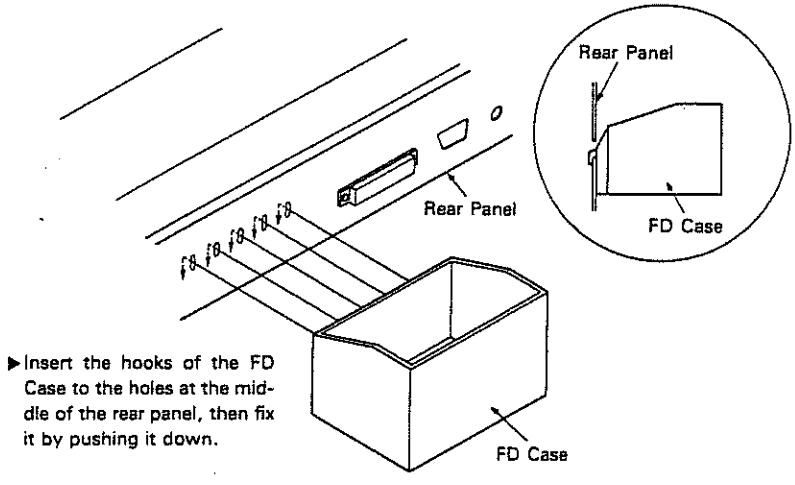
Connecting a CRT Display

The S—50 **Version 2.00** system requires a CRT Display.

To connect a color CRT Display to the S—50, read "**Color CRT Display**" on page 9.

To connect a 200 line black and white display for a computer, or a home TV set featuring a video input jack, use the connector for a Monochrome monitor display (**MONOCHROME**).

***Small screen TV sets, such as a pocket size TV, are no good as S—50 displays, because they are too small to see the letters clearly.**



▶Insert the hooks of the FD Case to the holes at the middle of the rear panel, then fix it by pushing it down.

1 OUTLINE

1. The S−50's Seven Modes

Using the Mode Selector Buttons, any of the following seven modes can be selected.

Please note that the corresponding indicator lights up except when in the Play mode.

● **PLAY Mode**
This mode turns the S−50 to the playing mode.

● **Sampling (REC) Mode**
This mode turns the S−50 to the recording mode.

● **Edit Mode**
In this mode, the sampled voices can be modified and assigned to different keyboard ranges to make a Patch for performance.

● **Function (FUNC) Mode**
This mode can select the basic functions of the S−50, e.g. Master Tune.

● **MIDI Mode**
This mode is for setting the MIDI functions, e.g. MIDI channel.

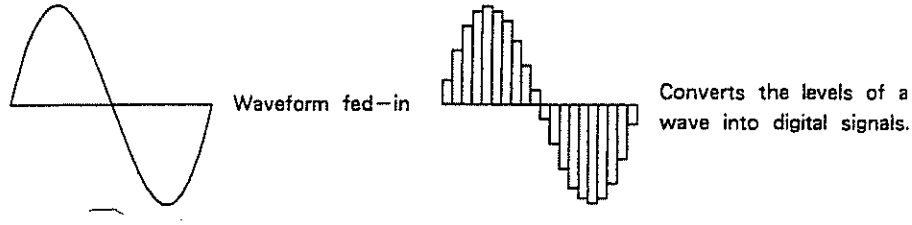
● **DISK Mode**
This mode is for saving the data in the S−50's memory to a 3.5" floppy disk, or loading the data from the disk to the S−50.

● **AUX Mode**
This mode is provided for further procedures.

2. What is the S−50 Sampling Keyboard?

The Roland S−50 Sampling Keyboard is a completely new type of keyboard, which can record (sample and record into computer memory) all sorts of sounds, then play these sounds with the keyboard.

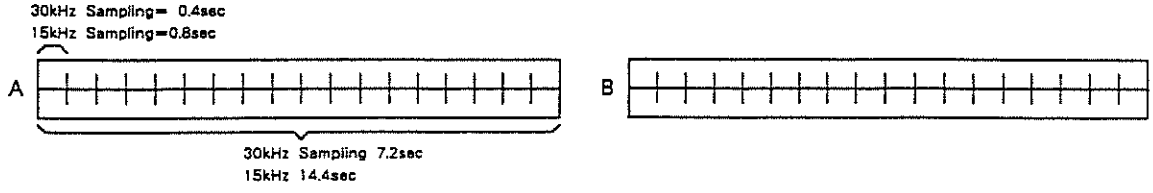
The S−50 is conceptually like a tape recorder in that it records sound. However, the recording process is very different, since the S−50 is recording into computer memory. Computers can accept information only as digital signals, so the S−50 converts audio signals into digital. It does this by examining (sampling) the incoming signal level a great many times a second, and sequentially recording these different levels in computer memory. This digital recording process is called **SAMPLING.**



The **sampling frequencies** are the number of times per second that a sample is made of the input signal. The S−50 can sample either at 30,000 or 15,000 samples per second (30 or 15kHz)

At higher sampling frequencies, the **sampling time** is shorter, but the audio quality of the sample is better. On the other hand, at lower sampling frequencies, longer samples are possible, but the audio quality of the sample is slightly lowered.

The data of the sampled sound is called **Wave data**, and the place where the Waves are stored is a **Wave Bank**. The S−50 contains two **Wave Banks** A and B. Each Wave Bank can sample up to 7.2 seconds at **30kHz** sampling, and 14.4 seconds at **15kHz**. A Wave Bank is divided into **18** sampling units, which are 0.4 seconds long at 30kHz sampling, and 0.8 seconds at 15kHz.

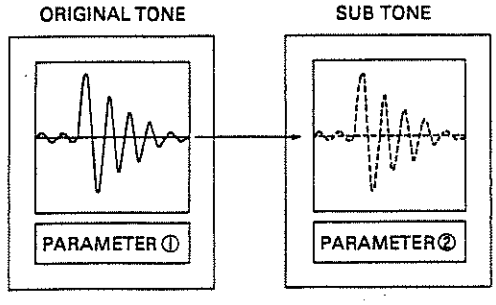


Using an optional Digitizer Tablet, the waveform you draw can be programmed into the S−50.

● Tones

The Wave data written in a Bank can be read and reconstructed with a set of **Tone Parameters**. The combination of a wave and a set of Tone Parameters creates an **Original Tone**. The sampled Wave can be truncated, cutting away unneeded portions of a wave, or two waves can be mixed, etc.(This is called **Wave Data Editing.**) Also, the values of Tone parameters that determine how to read the wave data can be changed. In other words, an Original Tone can be made of an intact sampled wave, or edited wave, plus a set of Tone Parameters set at values you like.

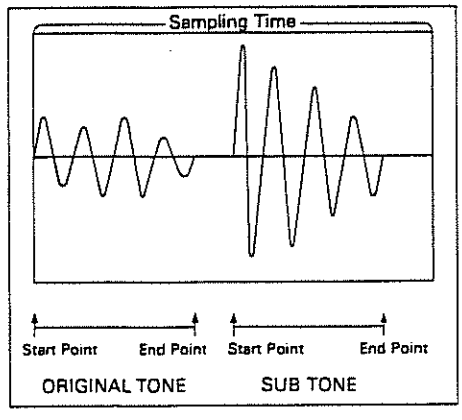
The S−50 allows you to borrow the Wave data from an Original Tone and make a different Tone (= **Sub Tone**) with different values of Tone Parameters.



See page 47 for detailed explanation of creating a Sub Tone.
To view Tone information, refer to page 30 for description of Tone list display.

● Application of Sub Tones (how to use wave banks)

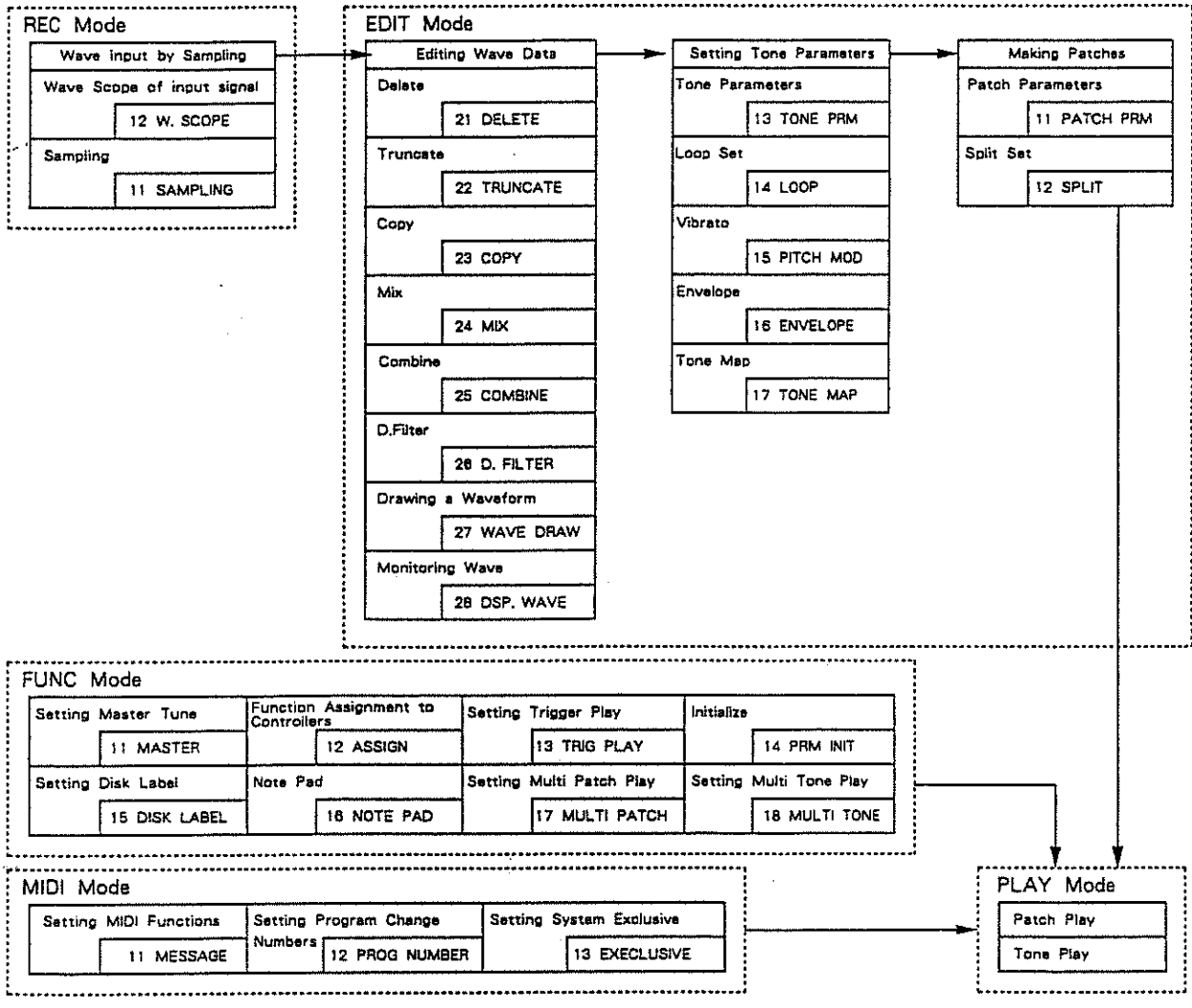
The shortest sampling time of the S−50 is 0.4 seconds. This means that empty space may be left in a wave bank. For instance, when the sampling time is set to 1.2 seconds, sampling a 0.9 second sound will leave 0.3 second space. Here, you can connect a tone shorter than 0.3 seconds to the existing sample by using Trancate (page 66) and Combine (page 74), then set two different Start and End points (page 50). In this way, two different samples (an original tone and a sub tone) can be created. (The system disk contains many tones made in this way.)



Therefore, up to 32 tones (Original Tones and Sub Tones) can be programmed.

● Patches

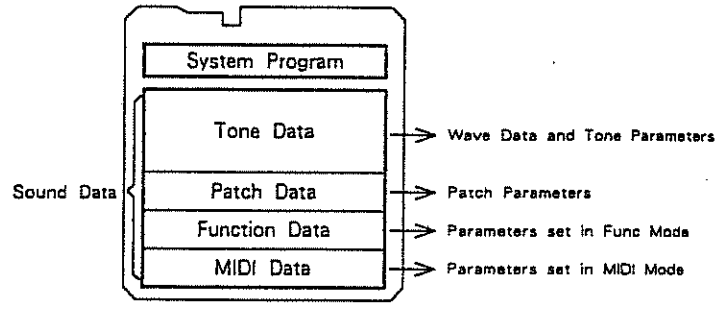
Each of the 32 Tones can be assigned to a different keyboard range. The key assignment of the Tones and the performance controlling functions are combined to make a Patch. Up to 8 Patches can be programmed in the S−50.



2 PROCEDURE I

1. Booting

The S−50 cannot be played immediately after being turned on. The **system program** on the supplied system disk should be transferred to the S−50 to operate it as a sampling keyboard. This procedure is called **Booting**. The system disk to be used is a **Ver. 2.00** disk. After reading the program from the system disk, the S−50 continues to read the Sound Data (**Tone Data, Patch Data, Function Data, MIDI Data,**) stored on the same system disk (=**LOAD ALL**), and is then ready for playing.



Before switching the S−50 on, check if :

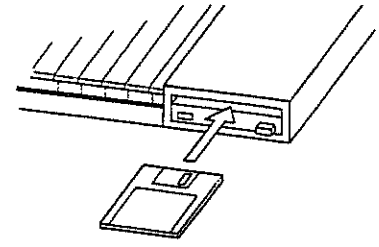
(1) the S−50 is properly set up with the other units and

(2) nothing is inserted in the Disk Drive.

Step 1 **Turn the S−50 on.**

The disk drive indicator lights up.

Step 2 **Make sure the Protect Tab on the disk is set to the PROTECT position, and insert the disk securely until it clicks into position.**



When the system program is properly loaded, **LOAD ALL** (loading all the data) begins. The Display shows **"NOW LOADING"** and a two figure number that counts down. When it counts down to **00**, the data is loaded, and the Display automatically returns to the **Play mode indication.**

***While the disk drive indicator is alight, and the number is counting down, do not remove the floppy disk or turn the unit off. Doing so would damage the disk permanently, or erase the data saved on it.**

<Back-up of a System Disk>

The disks will become erased naturally after a certain length of time. To avoid the loss of important data, make it a rule to make a few back-up disks. The S-50's Backup function allows you to save the entire data on a disk.

Use a 2-DD type floppy disk (3.5" double sided, double density, double track micro floppy disk) such as a Roland MF2-DD.

How to backup the System Disk

Boot the S-50 with the Ver. 2.00 system disk, then do the following :

Step 1 Push the DISK button (Mode Selector Button) to turn to the Disk mode.

Step 2 Push the PATCH button, then the P8 button. This selects the Backup function from the DISK menu.

Step 3 Remove the system disk from the disk drive and insert a floppy disk for back-up, with the Protect Tab set to the WRITE position.

Step 4 Push the SHIFT button to open the Command Window.

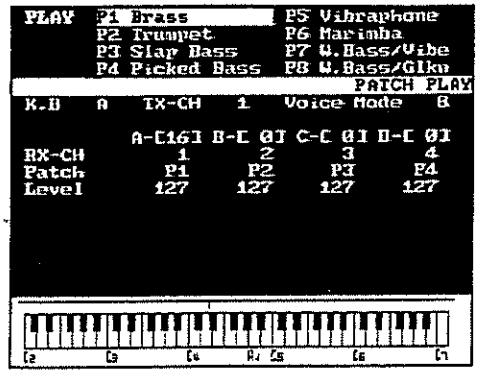
Step 5 Push the ENTER button. The Display will say "FORMATTING", then it counts down to 00, and then "NOW SAVING", another countdown, then "COMPLETE".

Step 6 Push the Eject Button, remove the floppy disk, then return the Protect Tab to the PROTECT position.

It may be a good idea to make a backup of the entire sound library or your own programs.

If the supplied system disk happens to be erased or damaged, consult your local Roland service department.

2. Play Mode

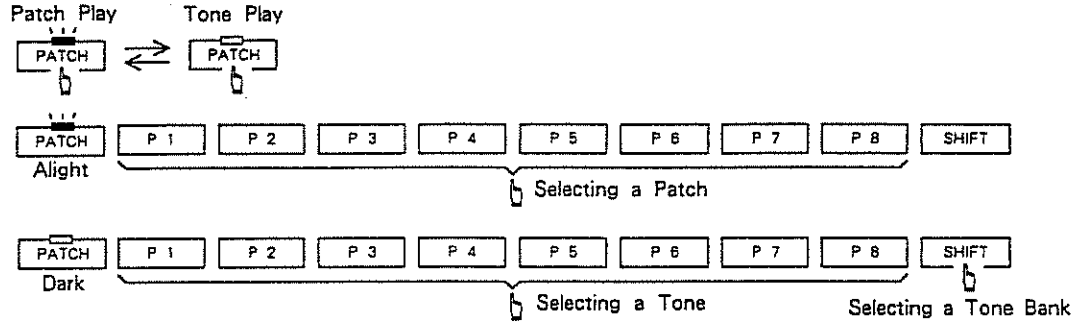


When the S−50 is booted, it will be automatically turned to the Play mode.

"Patch Play" is playing one or more of the eight Patches, which is the basic condition of the Play mode.

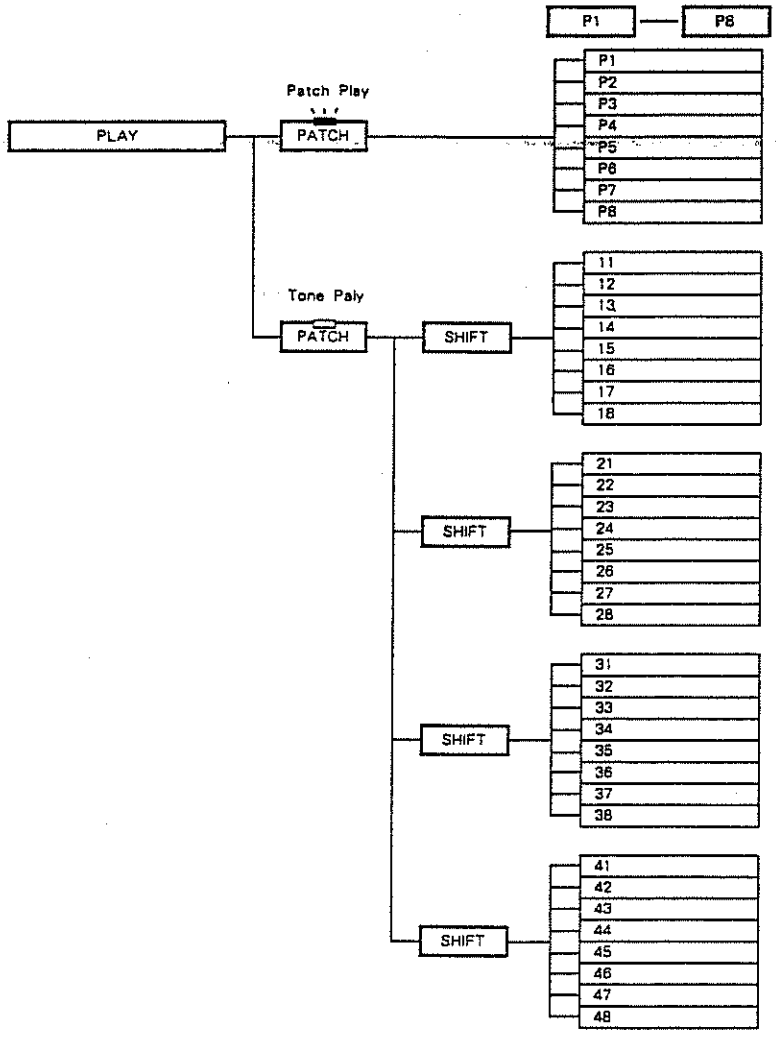
"Tone Play" is playing one or more of the 32 Tones. A Tone is played with the performance controlling functions (e.g. Bend Range parameter) which are set in the Patch previously used, or right after the S−50 has been Booted, with the P1's parameters.

You can select the Patch or Tone Play as shown below.



The indicator of the Patch Button lights up and goes out alternately by pushing it. When it is alight, the S−50 is in the **Patch Play**, and when dark, **Tone Play**. In the **Tone Play**, use the Shift Button to change Tone Banks.

Play Mode Procedure Map



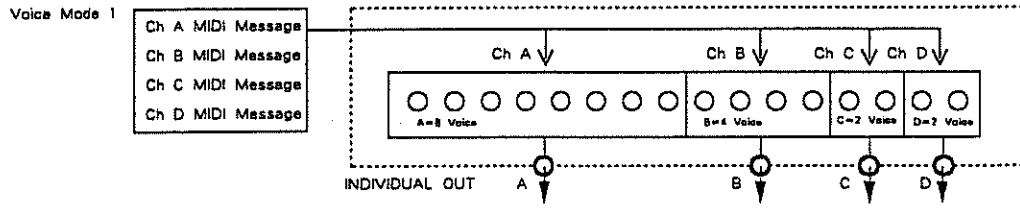
If the S−50 receives MIDI Program Change or Volume messages while in playing in the Play mode, sound delay may occur because it takes a few seconds to change the Display. To resolve this, push +PAGE.

Multi Play Mode

The S−50 can simultaneouly play up to four different Patches or Tones using four different MIDI channels. However, this does not increase the number of available voices (16 voices).

The Multi Play function allows you to divide the 16 voices into up to four **voice groups**, and assign a **receive MIDI** channel, and a **Patch** or **Tone** to each voice group. To play the Patch (or Tone) with a keyboard, select the voice group to be played (or OFF) with "**17 MULTI PATCH**" or "**18 MULTI TONE**" in the **Function Mode**.(See page 89.)

Voice Mode 1



If the Play Mode Display shows as follows, all the 16 voices can be played by the S−50's keyboard.

K. B= A Voice Mode= 8

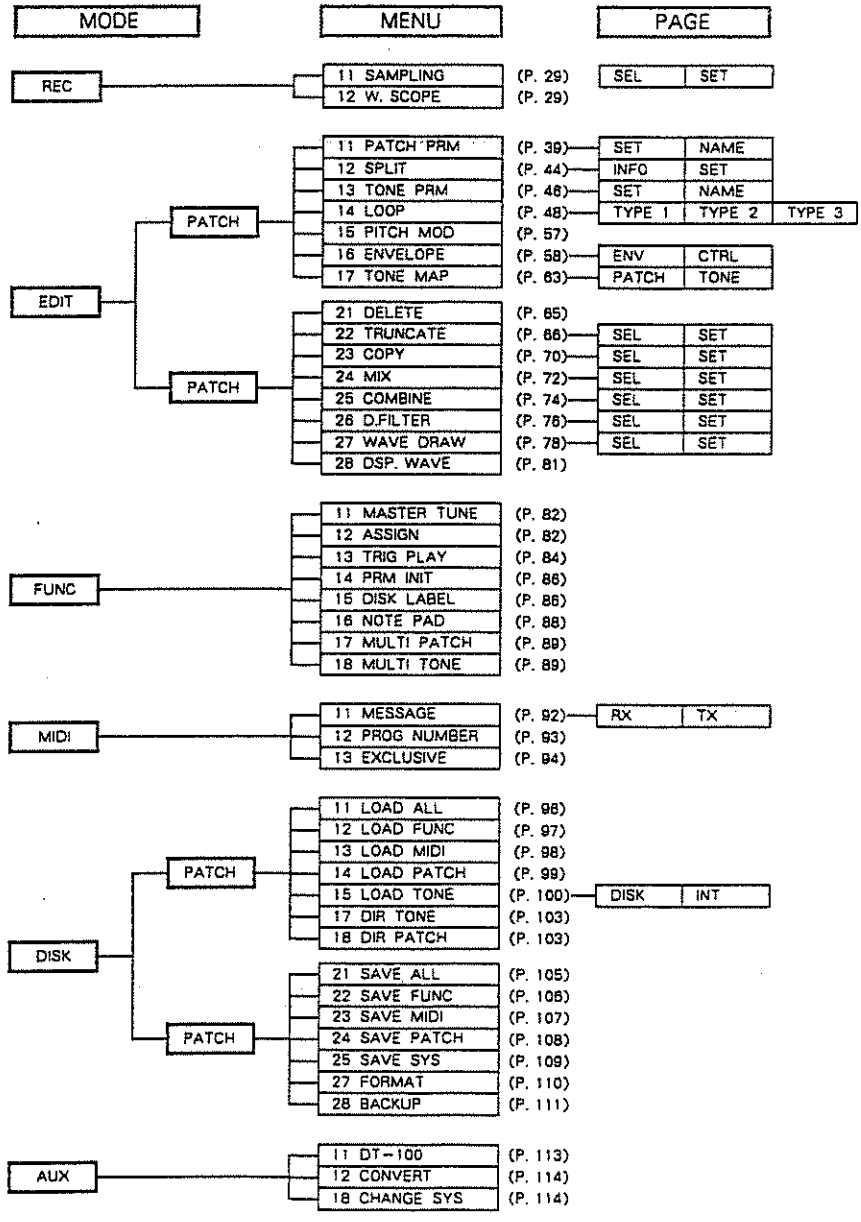
To play the S−50 with its own keyboard, set it as above so that all the 16 voices can be played. First, follow the "Basic Procedure," (see page 22) then change the Display as above with "**17 MULTI PATCH**" in the **Function Mode**.

In the above case, use only the Mix Output, or Individual Output Jack A.

3 PROCEDURE II

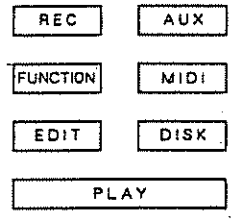
1. BASIC PROCEDURE

Please study the following procedure table before actually taking procedures.



● How to select a Mode

Push the relevant Mode Selector Button, and the indicator lights up.



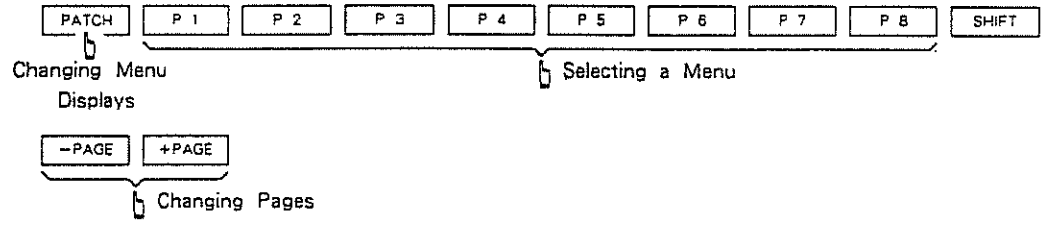
● How to select a menu

Each mode has one or two manus. For editing data, call the relevant menu, and change pages if necessary.

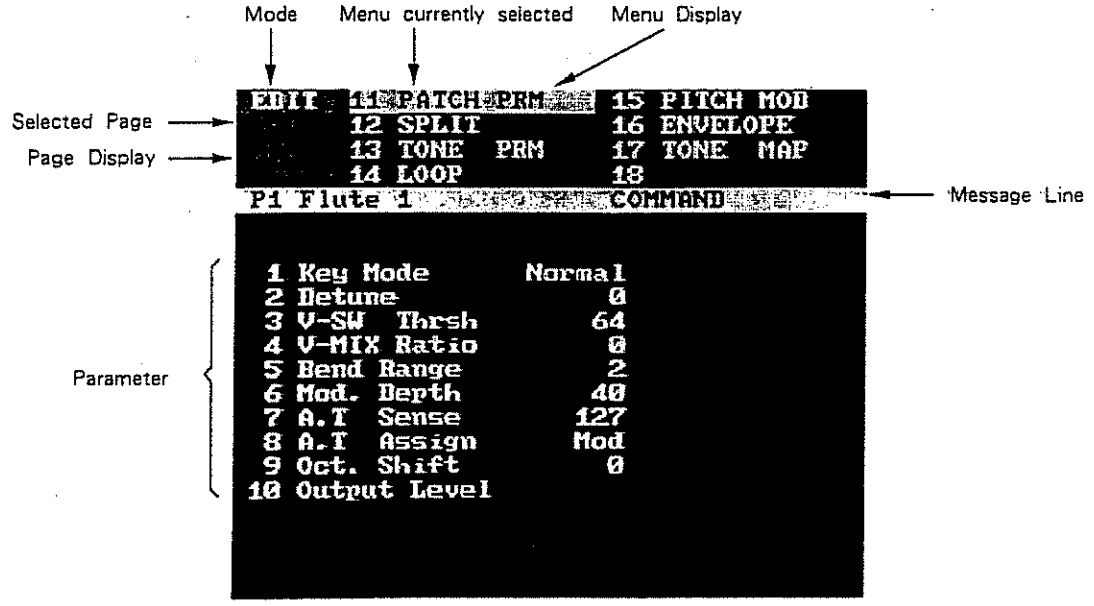
When a MODE is selected with the corresponding Mode Selector Button, the menu currently selected is shown in the upper portion of the CRT Display. Make your choice from the menu with the appropriate button (P1 to P8). To select higher than number 20, push the Patch Button, which changes menu displays alternately.

● How to change pages

When the menu in use has more than one page, you can change pages with the −Page or +Page Button.



● Display Structure



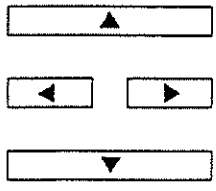
Mode
This shows the current Mode.

Menu Display
The menu choices included in the selected mode are shown. The cursor position displays the current selection.

Page Display
When the menu in use has more than one page, this window shows the names of all the pages. The cursor position displays the page currently selected.

Message Line
The left side shows the selected Patch or Tone, and the right side shows messages for necessary procedures.

Cursor
The cursor can be moved with the Cursor Buttons.



● How to enter a value

Alpha Dial Entry
Rotate the Alpha Dial.

Ten Key Entry
To enter a number, simply push the corresponding number keys. For minus number, push the 0 key twice before the number.

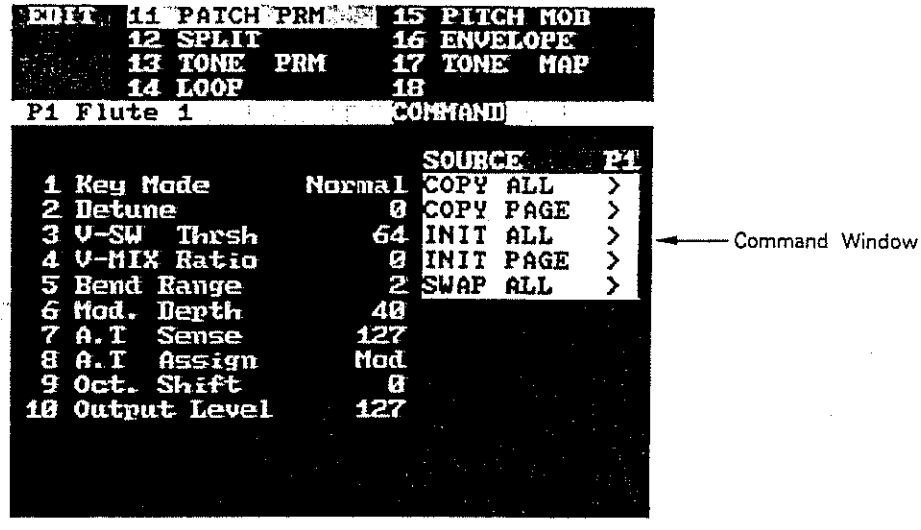
To enter data other than numbers, push the corresponding number key (this is shown at the end of each parameter name in the later part of the manual).

Push the relevant number key (s), and the number is shown at the Message Line. Then push the Enter Key. This will rewrite the value at the cursor position. If you wish to enter the same value at another place, simply move the cursor and push the Enter key. A value that exceeds the variable range will be substituted with the highest or the lowest number.

☞During the Naming procedure (Patch naming, Tone naming, Disk label setting and Disk memo writing), the Ten Key Pad works differently. Read the explanation on each menu.

● Executing a command

When the Display shows "COMMAND" at the message line, you can open a **command window** by pushing the Shift Button. When a Patch or Tone name is shown at the left side of the message line, pushing the Shift key lights up the cursor at the Patch or Tone number. In this case, you need to push the ▶ or ▼ button to open a command window.



Any Command with a ">" mark can be executed by pushing the Enter Key.

Move the cursor to the command to be executed and push the Enter Key. The contents of each command is explained in each menu.

Basically, the name of a command is shown in the command window. However, when the command is a menu, such as the Save or Load menu, the command window shows only **EXECUTE**) instead of the name of the command (menu). In this case, pushing the Enter Key executes the command.

Pushing the Shift button once again will return the Display to a normal condition.

● **Sound during Editing**

The S−50 allows you to actually hear the sound while editing the Patch, except for a few cases. Also, when editing Tone parameters or wave data, you can play the relevant Tone.

The number of voices played while editing is determined by how the Multi Play is set. When the **Play mode** Display shows as below, all the 16 voices can be played from the keyboard at the same time.

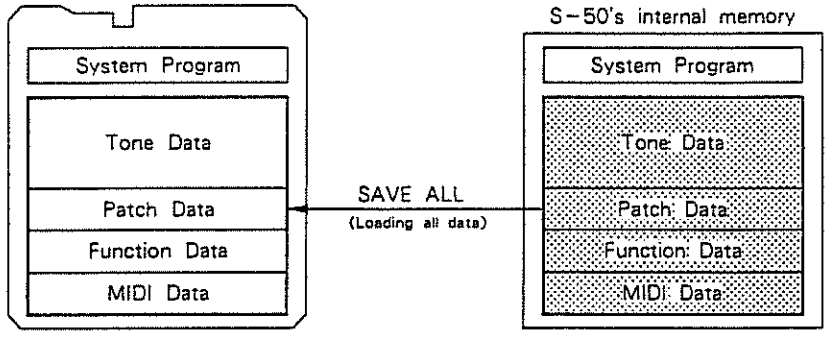
K. B= A Voice Mode= 8

If you wish to continue editing in 16 voice polyphonic mode, change the display by choosing **"17 MULTI PATCH" (in the Function Mode)** before proceeding. In this case, do not use the output jacks other than the Mix Output Jack, or Individual Output Jack A.

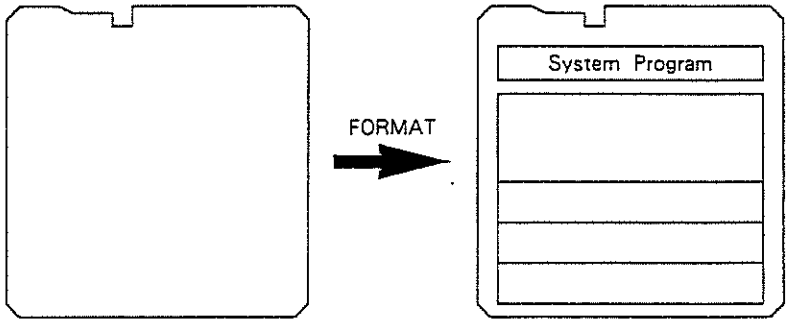
< Data Saving onto a floppy disk >

All Data written in the S−50's internal memory will be erased when the unit is turned off. If you wish to retain the data, save it onto a floppy disk.

To save all THE SOUND DATA in the internal memory, use the "SAVE ALL" command in the Disk Mode.



A brand new disk, or a disk used for a unit other than the S−50 needs formatting (FORMAT in the Disk mode) before saving data onto it. FORMAT turns the disk to S−50's exclusive use and saves the system program.



Makes a space for the S−50 data, and writes the system program on a brand−new disk, or a disk used for something else.

The BACKUP function allows you to execute both the FORMAT and SAVE ALL commands at once.

2. REC (Sampling) Mode

Sampling
11 SAMPLING (P. 29)

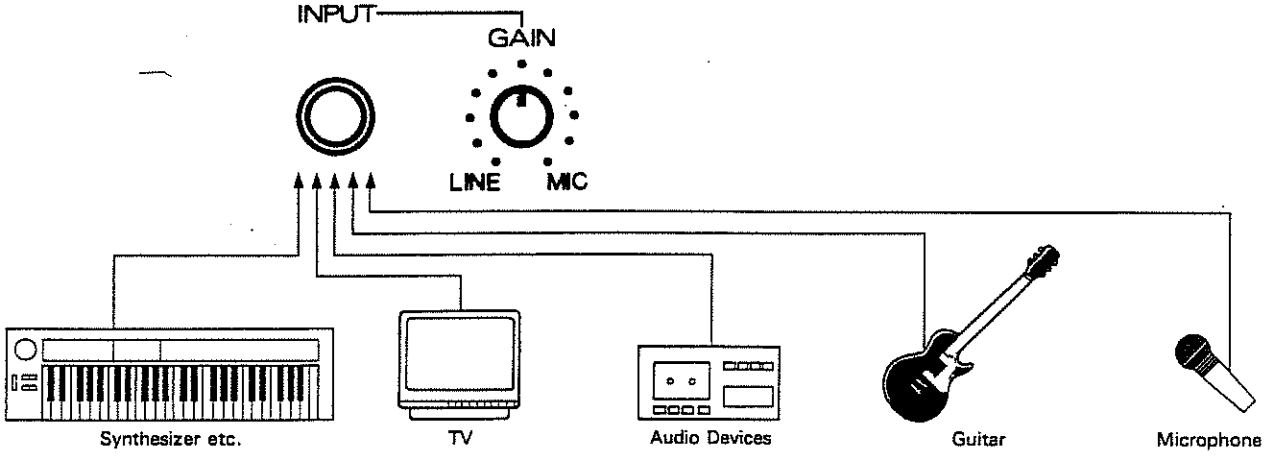
Wave Scope of Input Signal
12. W. SCOPE (P. 29)

[Wave Input by Sampling]

a. Setup for Sampling

Step 1 Connect the output of the microphone, or audio equipment, to the Input Jack of the S−50.

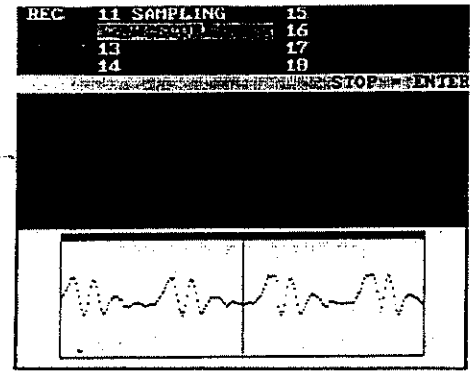
Step 2 To sample a sound from a microphone or guitar, set the Input Gain Knob to the MIC position, and to sample from audio equipment or a TV, set it to the LINE position.



Step 3 Push the Enter Key to start sampling. Or instead, connect a pedal switch (e.g an optional DP−2) to the Rec Start Jack, and push the pedal.

b. Wave Scope of Input Signal

12 W. SCOPE (Wave Scope)



In this case, the input signal can be shown as a waveform.

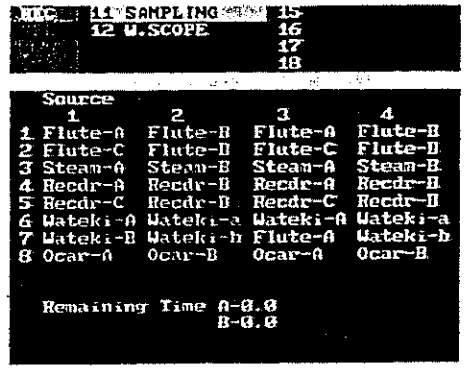
For instance, when a voice signal is fed into the S−50, the Display shows a moving wave. Here, pushing the Enter Key will stop the movement and show a stationary waveform. If you wish to see the moving wave again, push P2.

Be sure that the Recording Level Knob is set to about the center position.

***While a wave is moving, none of the buttons except ENTER work. So, to go to another mode, push ENTER first.**

c. Selecting a Tone Number for Writing

11 SAMPLING : SEL



In this page, you can select a Tone Number where the sample is to be written. Any of the 32 Tone Numbers can be selected.

When an **Original Tone** is selected as a new location, the Wave data that is contained in that Tone is erased (it is erased when SHIFT is pushed before actually sampling), with the new Wave data taking its place. This means that a **Sub Tone** that uses the erased Wave data will be deleted, becoming an unused Tone.

When a **Sub Tone** is selected as a new location, the sampled Wave data replaces the one borrowed from an Original Tone. In other words, the Sub Tone becomes an Original Tone.

● **Tone List Display**

The name of an **Original Tone** is displayed in **yellow**, and a **Sub Tone** in **white**.

Pushing ▼ makes the Display show the contents of the Wave data of Tones. This will help you when you are selecting a destination Tone Number.

A−0. 8	Display of an Original Tone at 30kHz Sampling.
A−0. 8×2	Display of an Original Tone at 15kHz Sampling.

A letter represents a Wave Bank.
A number represents the sampling time (sec).

＊＊ 11 ＊＊	Display of a Sub Tone.
＊＊ −− ＊＊	Display of an empty (unused) Sub Tone.

The number in the Display represents an Original Tone from which the sub Tone borrows Wave data. [−−] represents a deleted Tone or the Sub Tone that does not borrow Wave data from an Original Tone.

Pushing ▲ will return to the normal Display.

● Remaining Time Display

The remaining time of each Wave Bank is shown in seconds at a 30kHz sampling frequency. When sampling in 15kHz, multiply it by 2.

● Maximum Sampling Time

The maximum sampling time to be set varies depending on the destination Tone number selected in this page or the Wave Bank selected in the next page. Please check if there is sufficient space left.

■Maximum sampling time when writing into an Original Tone in the same Wave Bank :

↓

Previous Wave Data + Remaining Time of the Wave Bank

■Maximum sampling time when writing into an Original Tone in a different Bank or writing into a Sub Tone :

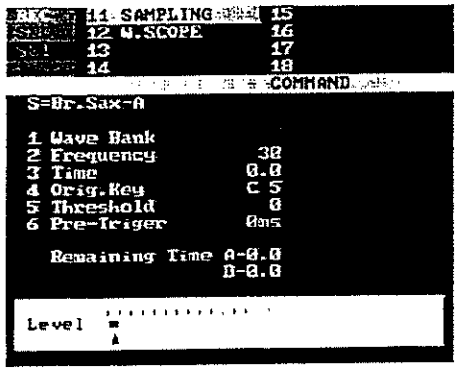
↓

Remaining time of the destination Wave Bank.

If there is not enough space, you should delete some unneeded data to increase the remaining time. You may either delete a Tone with [21 DELETE] in the EDIT mode, or cut off the unneeded portions of a wave with [22 TRUNCATE].(This is erasing data loaded into the internal memory, therefore, the data in the disk is retained intact.)

Using the Alpha Dial or Ten Key Pad, assign the destination Tone Number for the sample at the cursor position, then push + PAGE to go to the SET page.

11 SAMPLING : SET



In this page, you can check the input level, set the values of the parameters, and open a command window to execute sampling. When you have finished sampling, the recorded wave data can be seen.

d. Checking Input Level

As you feed an audio signal, set the level as high as possible without causing the Display to show "OVER," using the Recording Level Knob on the front panel and the Input Gain Knob on the rear panel.
The audio signal fed into the S−50 is sent through the Mix Output Jack, and therefore can be monitored through the connected amplifer.

***When sampling from a microphone, you may hear a howling noise. If so, turn down the volume of the amplifier, or monitor through headphones.**

e. Setting Parameters for Sampling

1 Wave Bank [A/B]

This selects the Wave Bank where the sample is to be written.

2 Frequency (Sampling Frequency)

This selects the sampling frequency.

[30] Ten Key 0
This records a sound with 30kHz sampling frequency.

[15] Ten Key 1
This records a sound with 15kHz sampling frequency.

3 Time (Sampling Time)

This sets the sampling time (0.4 sec steps). You can select up to the maximum sampling time. When 15KHz sampling frequency is selected, multiply the sampling time by 2.

When setting the sampling time with the Ten Key pad, enter the number that represents how many 0.4 sec segments should be used. For instance, for 0.8 sec, enter 2.

If the maximum sampling time is longer than that of the sample, select a longer sampling time so that sampling can be more successful. You can truncate the wave later in **Edit mode** with **[22 TRUNCATE]**.
When the sampling frequency of 15kHz is selected, x2 is shown at the sampling time.

4 Orig. Key (Original Key)

[C0 to C9]

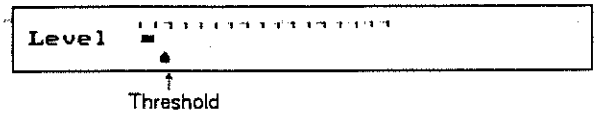
The Original Key represents the key at which the original sample was played.
When sampling from a musical instrument, you may have to set a Key number that matches the pitch of the sampled sound. Middle C is shown as the Key C4, and a semi-tone as #.

A Key number can be entered by assigning the corresponding number with the Ten Key Pad. These numbers are shown on the keyboard of the S-50 illustration on the front page of this manual.

***The highest pitch which can be played on the S-50 is 2 octaves above the sampled sound. Higher pitches cannot be played.**

5 Threshold (Sampling Threshold) [0 to 127]

AUTO sampling starts the moment a signal of a certain level (=threshold level) is fed in. When the threshold level is set to zero, sampling starts the morment ENTER is pushed..



6 Pre-Trigger

Pre-trigger allows you to record the Wave data even before it exceeds the threshold level (before ENTER is pushed, when the threshold level is set to zero.) In other words, this function begins sampling a little earlier, and therfore saves the beginning of the sample from being cut off.

When the sampling frequency 15kHz is selected, the Pre-trigger time is always shown with x2.

[10ms] Ten Key 1
About 0.01 of a second before the Wave data reaches the threshold level, sampling starts.

[50ms] Ten Key 2
About 0.05 of a second before the Wave data reaches the threshold level, sampling starts.

[100ms] Ten Key 3
About 0.1 of a second before the Wave data reaches the threshold level, sampling starts.

[0ms] Ten Key 0
The moment the Wave data reaches the threshold level, sampling starts.

f. Executing Sampling

COMMAND

At this point, check the Display to make sure that you have proceeded correctly so far. Then open a command window by pushing SHIFT.

When an Original Tone is selected as a destination Tone Number, pushing SHIFT will erase the previous Wave data, adding the emptied space to the Remaining time, the Display responding with "WORKING." This, however, does not apply to the sampling which is done without changing the **Wave Bank** or **Time**. This is called "Re-sampling"

When "READY" is shown at the Message Line, sampling can be executed. The moment "READY" appears, the internal memory starts recording the signal being fed, for Pre-trigger or Previous Sampling.

■AUTO Auto Sampling

The Auto sampling can retain the sample (Wave data) from a certain time (Pre-trigger time) before the signal fed into the S-50 actually exceeds the threshold level.

Step 1 **Hit ENTER or push the pedal switch conected to the Rec Start Jack on the rear panel.**

The Display shows "WAITING TRIG" until a signal exceeding the threshold level is fed in.

Step 2 **Feed the sound to be sampled. When the level exceeds the threshold level, the Display changes to "START."**

When the S-50 has sampled as long as the set sampling time, it automatically stops sampling.

To stop sampling in the middle, push ENTER. Cancelling sampling, however, does not shorten the sampling time.

■ MANUAL Manual Sampling

The Manual sampling can retain the sample (Wave data) from a certain time (Pre−trigger time) before you actually push ENTER. The total sampling time is kept unchanged.

Step 1 **Push ENTER or the pedal switch connected to the Rec Start Jack, and feed the signal to be sampled simultaneously. "START" is shown at the Message Line.**

When the S−50 has sampled at the set sampling time, it automatically stops sampling. The threshold level has nothing to do with Manual Sampling, and is therefore ignored.

To stop sampling in the middle, push ENTER. Cancelling sampling, however, does not shorten the sampling time.

■ PREVIOUS Previous Sampling

Previous Sampling can retain Wave data for the set sampling time, that occurs before ENTER is pushed. NOTE : The S−50 continuously examines the incoming data stream, and is always sampling. This is very useful for monitoring what you want to sample, and then sample after the fact. (e.g. monitoring a television show and sampling what you have heard).

Step 1 **When the signal to be sampled is fed into the S−50, push ENTER or the pedal switch connected to the Rec Start Jack on the rear panel.**

After a sound is sampled, the Display shows "WORKING" for a while. The sampled sound cannot be played while "WORKING" is being shown.

g. Monitoring the sampled Waveform

Before making a Tone with the sampled Wave data and the Tone Parameters, you may wish to play it on the keyboard to hear what it sounds like. Also, in the Display, the waveform and the sampling parameters can be seen.

● Waveform Display

All the Wave data sampled in the Wave Bank is shown in the Display. When using a color display, the following three colors are seen :

Blue ·····Wave data previously sampled
Red ·····Wave data you have just sampled.
Green ····Empty space, which has not yet been used.

● Remaining Time Display

This shows the remaining time of each Wave Bank.

***Sampling will initialize all the Tone Parameters except for the Orig Key, and therefore, you need to set these parameters after sampling.(See page 46.)**

A sampled Tone will be automatically named "s" (small letter), except for when resampled.

(The default values of the Tone Parameters are shown on page 87.)

If you wish to re—sample, push P1.

3. EDIT MODE

This mode makes Patches, sets Tone Parameters and edits Wave data.

a. Making a Patch

Each of the 32 Tones can be assigned to a different keyboard range. A combination of the key assignment of Tones, and the performance controlling functions (Patch Parameters) makes a Patch.

Patch Parameters
11 PATCH PRM (P.39)

Split Set
12 SPLIT (P.44)

● Calling a different Patch

In the Patch PRM Display, another Patch can be called and edited.

Step 1 **Push SHIFT, and the cursor will go to the Patch Number at the Message Line. When the cursor is at "COMMAND", push ◀.**

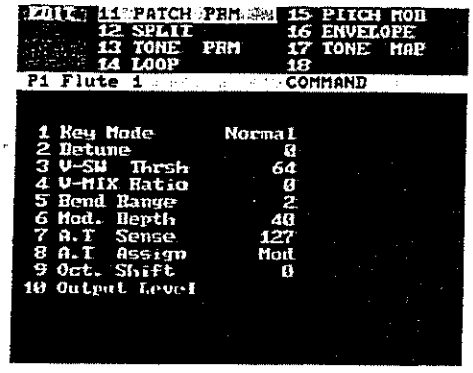
Step 2 **Using the Alpha Dial or the Ten Key pad, select the Patch number to be called.**

The Display changes to the selected Patch.

Step 3 **Push SHIFT, and the Display returns to normal.**

Setting Main Patch Parameters

11 PATCH PRM : SET



In this menu, you can set the controlling performance parameters of a Patch, and open a command window for copying or swapping parameters, or initializing.

1 Key Mode

One of the following five Key Modes can be selected.

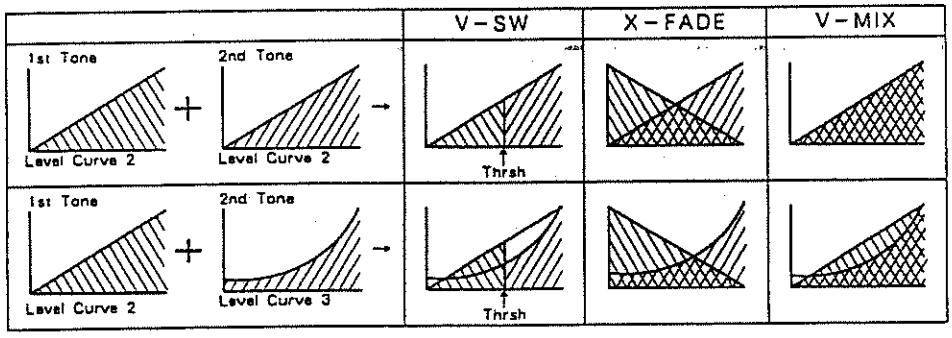
[Normal] Ten Key 0
This turns the S−50 to 16 voice polyphonic, assigning one module and one Tone to a key.

[Unison] Ten Key 4
This mode is 8 voice polyphonic, assigning two modules for the Same Tone to a key. It is possible to detune one of the sounds slightly.

[V−SW] (Velocity Switch) Ten Key 1
This is also 16 voice polyphonic, assigning the 1st or 2nd Tones to a key.
Playing the key harder than a certain level (=Velocity Switch Threshold) will sound the 2nd Tone, weaker will sound the 1st Tone. Each Tone will sound with a set level curve (see page 61) depending on how hard you play the key.

[X−Fade] (Velocity Cross Fade) Ten Key 2
This mode is 8 voice polyphonic, assigning the 1st and 2nd Tones to a key. Depending on how hard you play the key, the volume balance of the 1st and the 2nd Tones differs. The level curve of the 1st Tone is inverted.

[V−MIX] (Velocity Mix) Ten Key 3
This mode is also **8 voice polyphonic**, assigning the 1st and 2nd Tones to a key. The 1st and the 2nd Tones are played simultaneously, each Tone being played with the volume set by the level curve depending on how hard you play the key.



2 Detune (Unison Detune) [−50 to 50]

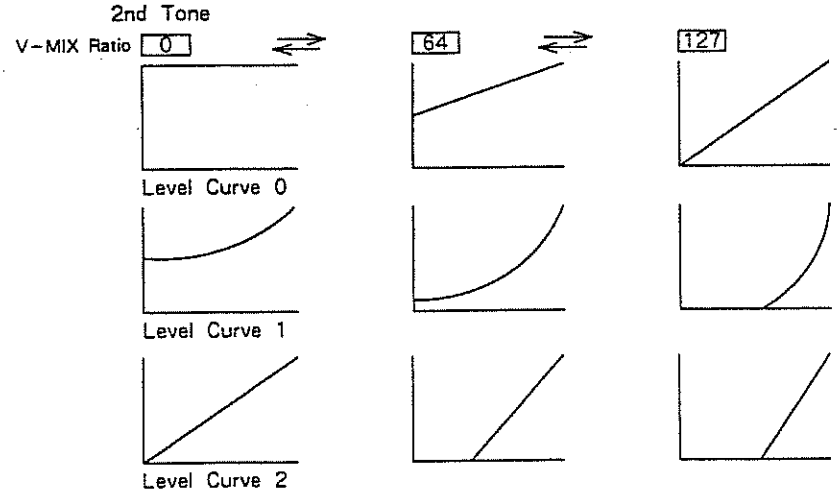
When the **Unison Key Mode** is selected, one of the sounds can be slightly detuned. 50 is roughly half of a semi−tone.

3 V−SW Thrsh (Velocity Switch Threshold) [0 to 127]

When the **V−SW Key Mode** is selected, this determines the threshold level for the two Tones. Higher values require harder playing to sound a different Tone.

4 V−MIX Ratio (Velocity Mix Ratio) [0 to 127]

When the **V−MIX Key Mode** is selected, the level curve of the 2nd Tone can be changed as shown in the picture. At 0, the volume obtained is exactly as in the set level curve.



5 Bend Range [0 to 12]

This sets the maximum pitch alteration caused by moving the **bender/modulation lever** to the right or left extremes. Each number represents a semi-tone; 2 is major 2nd, 3 is minor 3rd, 4 is major 3rd, 7 is perfect 5th and 12 is one octave.

If the "Bend Range" is assigned to the Control Knob with [12 **ASSIGN**] in the **FUNC Mode**, the Bend Range parameter can be edited even while in the playing mode.

Remember that the pitch cannot exceed the original pitch by more than 2 octaves, this applies to the pitch bend lever as well.

6 Mod. Depth (Modulation Depth) [0 to 127]

This sets the depth of the modulation when the **Bender/Modulation Lever** is fully pushed toward the word "**MODULATION**".

When the "Modulation Depth" is assigned to the Control Knob with [**12 ASSIGN**] in the **FUNC Mode**, the Modulation Depth parameter can be edited even while in the playing mode.

7 A.T. Sense (Aftertouch Sensitivity) [0 to 127]

This sets the sensitivity of the aftertouch effect. At 127, the effect is at its maximum.

8 A.T. Assign (Aftertouch Assign)

This can select one of the following four effects caused by Aftertouch.

[**Mod**] (**Modulaltion**) Ten Key 0
Aftertouch controls the vibrato effect.

[**Volume**] Ten Key 1
Aftertouch controls the volume of the sound.

[**Bend +**] (**Bend Up**) Ten Key 2
Aftertouch increases the pitch of the sound.

[**Bend −**] (**Bend Down**) Ten Key 3
Aftertouch lowers the pitch of the sound.

***The pitch bend range of Bend + and Bend − is determined by both A.T. Sens and Bend Range.**

9 Oct Shift (Octave Shift) [−2, −1, 0, 1, 2]

This can shift the pitch of the entire keyboard from −2 to 2 octaves in octave steps.

10 Out Level (Output Level) [0 to 127]

This can set the output level of each Patch separately. At 127, each Tone assigned to the Patch is played at its set level.

COMMAND

Push SHIFT, then move the cursor to COMMAND by using ▶, to open a command window.

■SOURCE [P1 to P8]

This assigns the source Patch for COPY or SWAP.

■COPY ALL This copies all the Patch parameters of the source Patch to the Patch currently selected.

■COPY PAGE Only the Patch parameters of the source Patch which are shown in this page are copied to the Patch currently selected.

■INT ALL This initializes all the Patch parameters of the selected Patch.

■INT PAGE This initializes only the Patch parameters of the selected Patch shown in this Display.

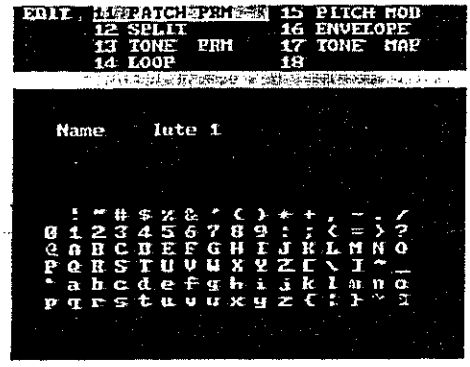
☞The default values of the parameters are shown on page 87.

■SWAP ALL This swaps all the Patch parameters of the selected Patch with those of the source Patch.

[>] Commands can be executed by pushing ENTER.

To return to the normal condition, push SHIFT.

11 PATCH PRM : NAME



This is for naming the Patch currently called, or changing the name. Up to 12 letters can be used for a Patch name.

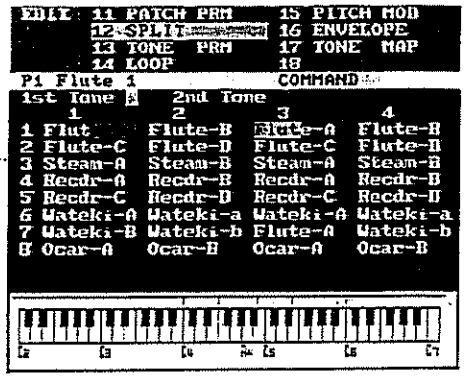
To select a letter, use the Alpha Dial or Ten Key pad. Each time a Ten Key is pushed, a different letter is selected. You do not need to use ENTER.

To move the cursor to the appropriate position, use ◀ and ▶.

1	→A→B→C	7	S→T→U→
2	→D→E→F	8	→V→W→X
3	→G→H→I	9	→Y→Z→/
4	→J→K→L	0	→+→−→x
5	→M→N→O	ENT	Space
6	→P→Q→R		

Split Set

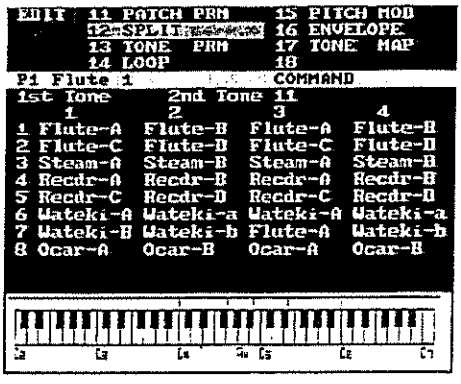
12 SPLIT : INFO



In this page, you can monitor the Tones assigned to a key by playing that key.

Playing one key will move the cursor to the Tone Names which are assigned to the played key. When using a color Display, the cursor is yellow for the 1st Tone, and red for the 2nd Tone. (When the Normal or Unison Key Mode is selected, only the 1st Tone is indicated.

12 SPLIT : SET



In this page, you can assign any of the 32 Tones to a keyboard range.

Step 1 Select the 1st and the 2nd Tones to be assigned from the list.

■ In the Normal or Unison Key Mode
The 1st Tone assigned is played in the Key Mode currently selected. The 2nd Tone is irrelevant for the performance.

■ In the V–SW, X–Fade or V–MIX Key Mode
Both the 1st and the 2nd Tones assigned are played in the current Key Mode.

Step 2 Assign the selected Tone to the keys on the keyboard by pushing the relevant keys.

*When a key is pressed, the Tone is assigned, but the sound created is the previous Tone. Pushing the same key again will sound the new Tone just assigned.

Repeat steps 1 and 2, to continue setting the split points (assigning other Tones to other ranges).

Split Set can also be done with MIDI Key messages. In the same Display, send MIDI Key ON messages, and the Tone shown in the Display will be assigned to that Key number.

In the lower part of the Display (keyboard indication), Split Points are shown as vertical lines. This, however, only applies to the Split Points of the 1st Tones. So, even if the 2nd Tone is assigned to a different key range, it will not show unless the 1st Tone is assigned to the same key range.

COMMAND

Push SHIFT and move the cursor to "COMMAND" with ▶, and a command window opens.

■OCT SHIFT [−2, −1, 0, 1, 2]

The S−50 can be played from C0 to C9.(The highest pitch, however, is two octaves above the Original Key). When the keyboard is in the normal condition (without OCTAVE SHIFT), the pitch range of the keyboad is C2 to C7. Using the Octave Shift function, you can shift the keyboard up to±2 octaves, and therefore can Split−Set in the entire range from C0 to C9. The Display changes according to the Octave Shift you set.

***After completing the Split Set process, return the Oct.Shift [11 PATCH PRM] to the original value.**

■See page 42 for the details of other commands and how to execute them.

To return to the normal Display, push SHIFT.

b. Setting Tone Parameters

Tone Parameters involve how the recorded Wave data is read and reconstructed. Wave data is not transformed by editing Tone Parameters, therefore the Tone Parameters may be edited as many times as you like without affecting the Wave data itself.

Main Tone Parameter Setting
13 TONE PRM (Page 47)

Loop Setting
14 LOOP (Page 48)

Vibrato
15 PITCH MOD (Page 57)

Envelope
16 ENVELOPE (Page 58)

Parameter Setting with Tone Map
17 TONE MAP (Page 63)

● Calling up a different Tone

In the Tone Parameter setting Display (except 18 TONE MAP), different Tones can be called up and edited.

Step 1 Push SHIFT, and the cursor will move to the Tone Number on the Message Line. If the command is in red (color) or highlighted (monochrome), push ◀.

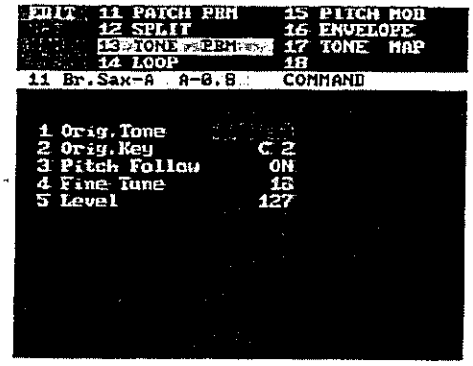
Step 2 Select the Tone Number to be called with the Alpha Dial or Ten Key Pad, and press Enter.

The Display of the selected Tone appears.

Step 3 Push SHIFT to return to the normal Display.

Setting Main Tone Parameters

13 TONE PRM : SET



On the Message Line, the Tone Number, Tone Name, and Wave Data are shown.

1 Orig.Tone (Original Tone)

■ When a Sub Tone is called up.

A Sub Tone does not sound unless Wave data is borrowed from an Original Tone. Here, you can select the Original Tone from which Wave data is borrowed. When an Original Tone is selected, Tone Parameters for looping are copied to the called Sub Tone. And the Wave data is read from that Original Tone by playing the keyboard. If a Sub Tone is selected and "– – –" is shown, no sound is heard.

■ When an Original Tone is called up.

An Original Tone has its own Wave data. When an Original Tone is called up, "* * *" is shown and this cannot be changed.

■ Creating a Sub Tone

First you must locate an empty Tone location. To do this, press Patch to view Tone information (refer to page 30 for description of Tone list display.)

Return to TONE PRM page by pressing Patch.
Press Shift.

Select location you wish to create a Sub Tone with Alpha Dial or 10 Key. (When using 10 Key press Enter after selecting.)

Press Shift to close command window.

Select the original Tone from which you wish to borrow the wave data using the Alpha Dial or 10 Key pad. (When using the 10 Key press Enter). You cannot borrow wave data from an existing Sub Tone. You may now edit the Sub Tone as an original Tone.

2 Orig.Key (Original Key Number) [C0 to C9]

This changes the original key number of a sample. Playing the key selected here will make a sample play in its original pitch. Middle C is represented by C4, and a semi−tone by a #. This is a simple way to transpose a sample into another key.

***The S−50 can play up to two octaves higher than the pitch of the sampled sound. Any pitch that exceeds that cannot be played.**

3 Pitch Follow [ON/OFF]

When Pitch Follow is ON, different pitches are played by different keys. When OFF, the pitch you set with Original Key will sound whichever key is played. (When the Original Key is set to C5, the original pitch of the sampled sound is obtained.)

4 Fine Tune [−50 to 50]

This adjusts the pitch of the Tone subtly.± 50 is about half a semi −tone.

5 Level [0 to 127]

This adjusts the volume of each Tone. At 127, the amplitude of the sample is as it was recorded.

COMMAND

Push SHIFT and move the cursor to "COMMAND" with ▶ to open a command window.

■SOURCE [P1 to P8]

This assigns the source Tone for COPY or SWAP.

■COPY ALL>

This copies all the Tone parameters of the Source Tone to the Tone currently selected.

■COPY PAGE >

This copies the Tone parameters of the Source Tone which are shown in this Display to the Tone currently selected.

■INT ALL >

This initializes all the Tone parameters of the selected Tone to a predetermined default value. (See page 87)

■INT PAGE >

This initializes only the Tone parameters of the selected Tone which are shown on this page to a predetermined default value. (See page 87)

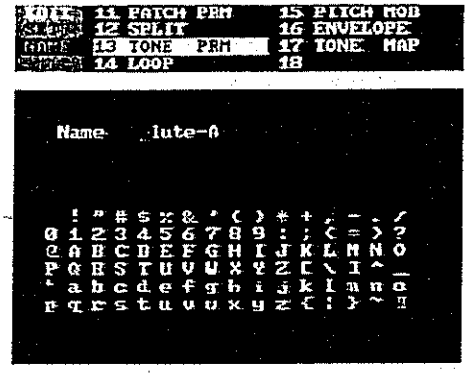
■SWAP ALL >

This swaps all the Tone parameters of the selected Tone with those of the source Tone.

The commands with ">" can be executed by pushing ENTER.

To return to a normal Display, push SHIFT.

13 TONE PRM : NAME



In this Display, the Tone Name of the Tone currently called up can be changed. Up to 8 letters can be used for a Tone Name.

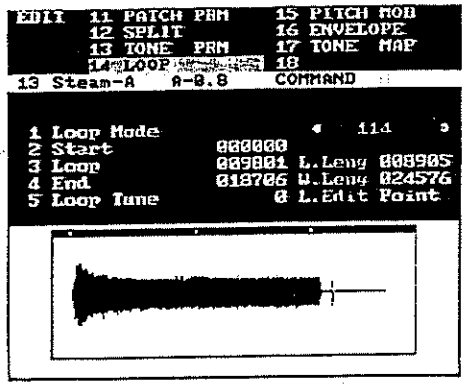
To select a letter, use the Alpha Dial or Ten Key pad. Each time a Ten Key is pushed, a different letter is selected. You do not need to use ENTER.

To move the cursor to the appropriate position, use ◀ and ▶.

1	→A→B→C	7	S→T→U→
2	→D→E→F	8	→V→W→X
3	→G→H→I	9	→Y→Z→/
4	→J→K→L	0	→+→−→×
5	→M→N→O	ENT	Space
6	→P→Q→R		

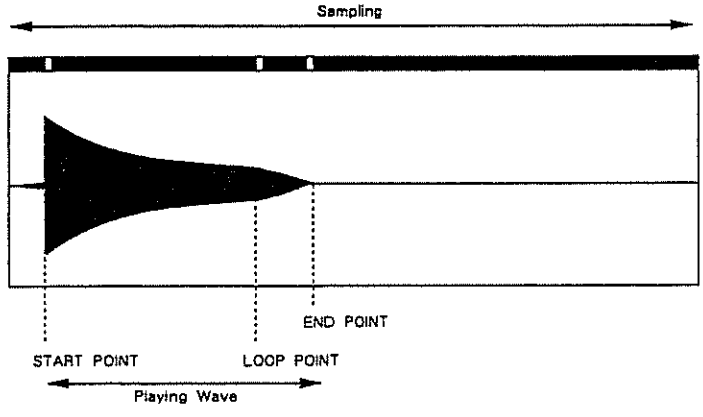
Loop Set

14 LOOP



1Shot (One Shot) is playing a sample only once : the sound disappears once the data is played. Reverse is playing a sample once in the reverse direction. If you wish the sample to be played longer than just once, **Looping** lets the wave data, or a part of the wave data, play as long as you push a key. One Shot may be good for percussive sounds, and **Looping** is ideal for flute or violin.

The sampled wave can have a **Start Point**, **End Point** and **Loop Point**. The Start Point is where the S−50 starts playing the sample, and End Point is where playback ends. When you play a key, the sample normally plays until it reaches the End point, then it goes back to the Loop point, and re−plays through the loop. The Looping process continues for as long as the key is pressed.



In this menu, you can set the Start Point, End Point, Loop Point, and other parameters for looping. After opening a command window, Auto Loop is available enabling the S−50 to detect the Loop Point itself.

1) Setting Loop Mode

1 Loop Mode

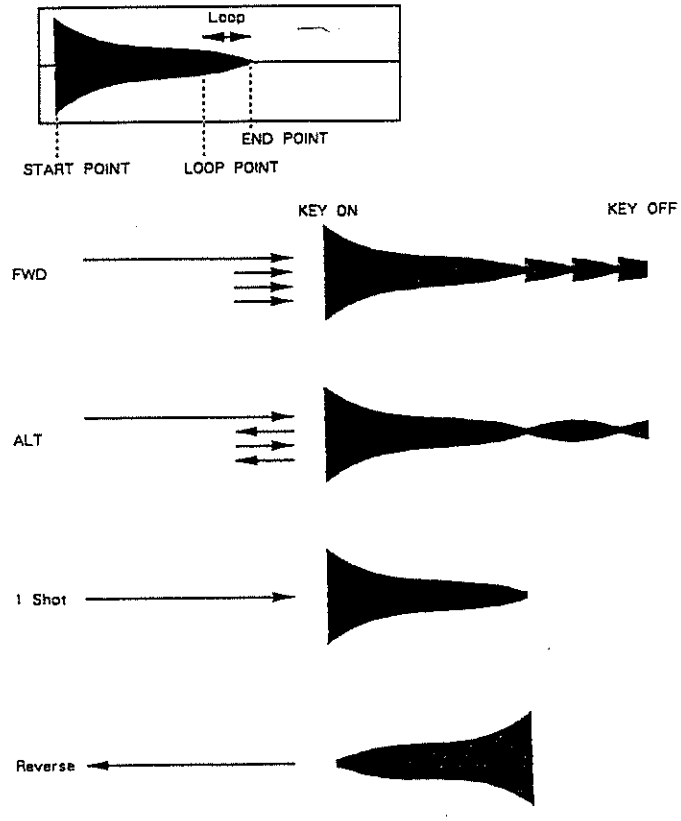
Select one of the four Loop modes : FWD (Forward), ALT (Alternate), 1SHOT (One Shot) and Revers.

[FWD] (Forward) Ten Key 0
When you play a key, the sample plays until it reaches the End point, then repeats playing from the Loop point to the End point.

[ALT] (Alternating) Ten Key 1
The sample plays unitl it reaches the End point, and repeats playing forward and backward between the Loop point and the End point.

[1Shot] (One Shot) Ten Key 2
The sample is played from the Start point to the End point once.

[Reverse] Ten Key 3
The sample plays in a reverse direction (from the End point to the Start point) only once.

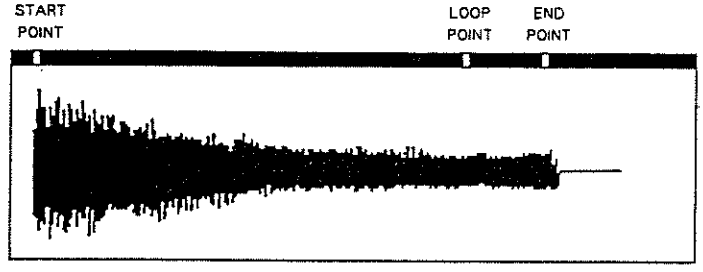


2) Setting Points

Three pages are provided for setting the Start Point, Loop Point and the End Point. As you play the keyboard, set the points using these three pages.

TYPE1

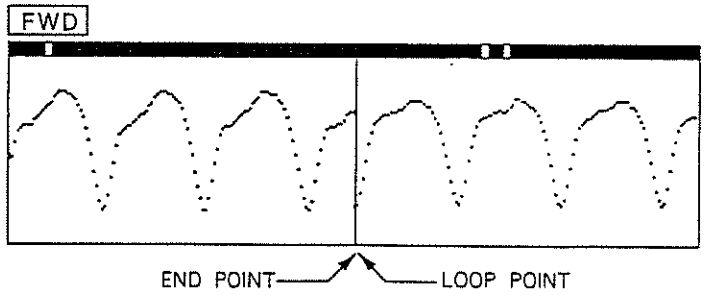
The entire shape of the waveform can be seen in this page. Whether the wave is long or short, the entire wave is shown over the Display. The Start point, Loop point and the End point are shown as small marks on the belt above the wave. Here, you may set the points roughly.



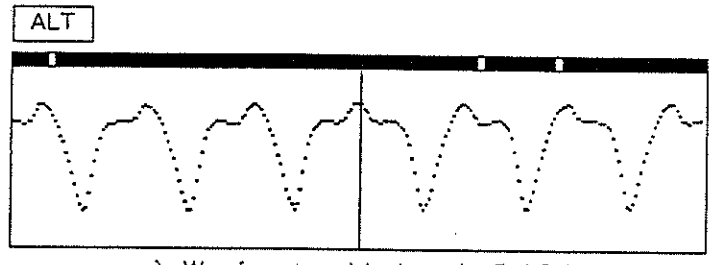
TYPE2

In this page, you can accurately make a loop. You can make a stable sustained loop more successfully if using similar waves.

When the Loop Mode FWD (Forward) is selected, the left side of the center line shows the waveform up to the End point, and the right side shows the waveform from the Loop point. By connecting waves precisely on this line, a natural sustain sound can be obtained.



In the Loop Mode ALT (Alternating), the center line becomes the Loop point when the cursor is put on the Loop position. Therefore, you can see the waveform turned back at the Loop point. When the cursor is on the End position, the wave form is turned back at the End point. In this mode, though, looping is normally quite difficult.

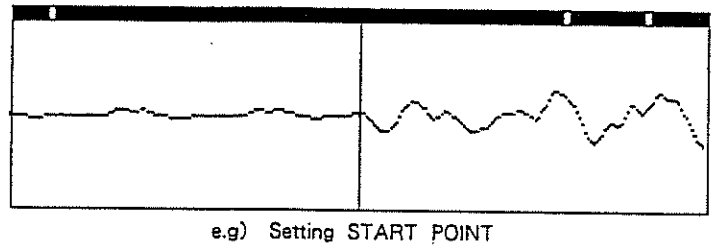


e.g) Wavefrom turned back at the End Point

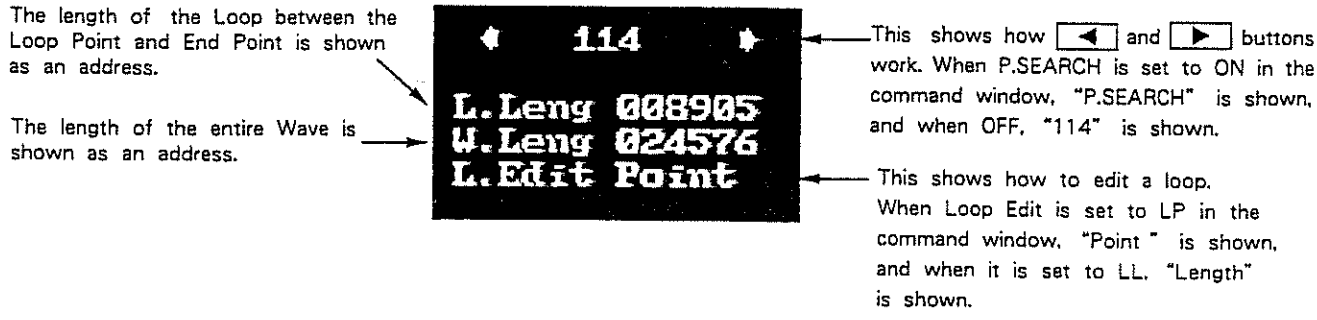
TYPE3

In this page, each point can be finely seen.

When the cursor is positioned at the Start, the center line becomes the Start point. At Loop, the same line is the Loop point : at End, it is the End point.

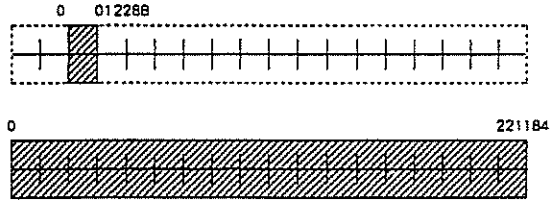


e.g) Setting START POINT



● Address

The points are represented with the positions in memory. This is called Address. The beginning of the wave data is address 0. The last point of a wave with the shortest sampling time (0.4 seconds at 30kHz sampling) is 012288 address. The last point of wave data that uses an entire Wave Bank is 221184 address.



● Entering Address

The address can be set with the Ten Key pad or the Alpha Dial or ▶ and ◀ buttons.

Ten Key Pad····Address can be entered with a number straight away.

Alpha Dial·····This finely increases or decreases the set address.

▶ and ◀ ·····When P.SEARCH is turned to ON with COMMAND, the S−50 searches the peaks of waves, advancing from one peak to another. When OFF, it advances in 114 address steps.

***The S−50 allows you to set the Start point first, then the Loop point, and finally the End point. You cannot set the points in a different order.**

When entering address with the Ten Key pad, be sure that no sound is being played. If a point is set while KEY ON, KEY OFF may not be completed.

COMMAND

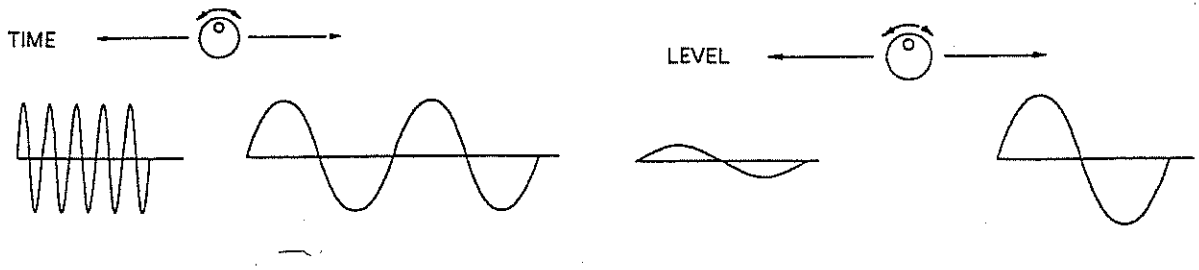
Push SHIFT, then move the cursor to "COMMAND" with ▶ to open a command window.

■ZOOM T

This can enlarge or diminish the wave in [TYPE2] and [TYPE3] pages in the direction of Time.

■ZOOM L

This can enlarge or diminish the wave in [TYPE2] and [TYPE3] pages in the direction of Level.



■LOOP EDIT

This selects one of the two methods of loop setting.

[LP] (Editing with Loop point) Ten Key 0
The Loop point and the End point can be separately set.

[LL] (Editing with Loop length) Ten Key 1
Moving the End point changes the Loop point together, but the Loop length is not affected. This is useful to change the loop in the FWD Loop Mode.

■P.SEARCH (Peak Search)

[ON] Ten Key 1
When setting each point, each time ▶ or ◀ button is pushed, the S−50 searches the peaks of waves, advancing from one peak to another. This is useful for setting the Loop point or End point. point.

[OFF] Ten Key 0
When setting each point, each time ▶ or ◀ button is pushed, the S−50 advances in 114 address steps.

■ A.LOOP L E >
■ A.LOOP L E >

It is possible to make the S−50's internal computer find out the Loop point and the End point of FWD looping. This is called Auto Looping.

The Auto Loop function can find a new Loop point, and the End point between the Loop point and the End point currently set.

[L→E]
This mode searches through the loop from the Loop point to the End point.

[L←E]
This mode searches through the loop from the End point to the Loop point.

The Auto Loop may not be able to find a loop when the range of the loop you set is too short or the waveform is not consistent. Set the loop fairly long and try with different lengths.

Auto Loop is excecuted by pushing ENTER.

Auto Loop only searches FWD loops, and therefore, executing the Auto Loop automatically turns the Loop Mode to FWD.

To return to a normal Display, push SHIFT.

---

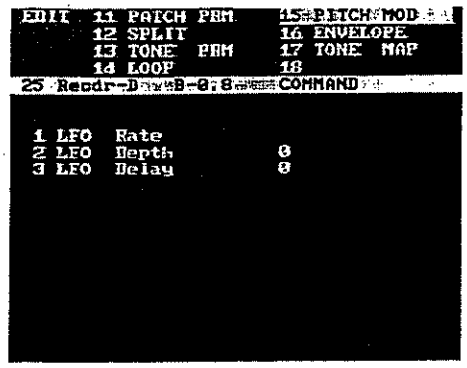
3) Setting Loop Tune

5 Loop Tune [−50 to 50]

Before and after entering a loop, the pitch may differ. If so, adjust the pitch of the loop here.

Vibrato

15 PITCH MOD



When wave data is being read (played back), vibrato effects can be added by using the LFO Modulation.

1 LFO Rate [0 to 127]

This sets the speed of the LFO modulation. Higher values increase the speed.

3 LFO Depth [0 to 127]

This sets the depth of the LFO modulation. Higher values deepen the effect.

4 LFO Delay [0 to 127]

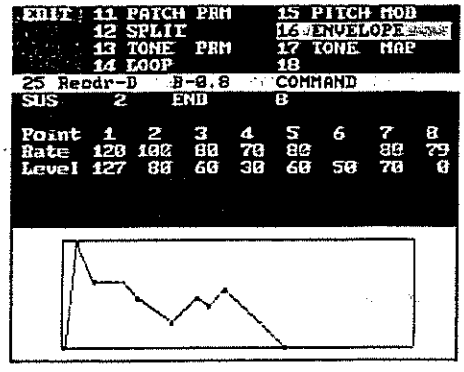
This determines the time spent before the LFO modulation begins. At higher values, the effect appears later.

COMMAND

A Command can be called and executed. The Commands of the S−50 and how to execute them are explained on page 48.

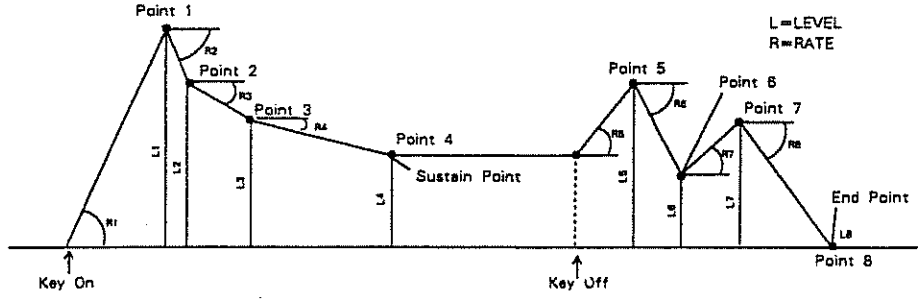
Envelope

16 ENVELOPE : SET



By setting the **Break points** of an envelope curve, wave data can be read (played back) at different volumes. For instance, the attack of the sound can be purposely delayed, or decaying effect can be added to a loop. However, the volume of the original sound is the maximum, therefore it is not possible to make the attack quicker than the sampled waveform, or increase the volume, or sustain a one-shot sound.

In this page, you can open a command window before setting the Break points, for copying or swapping parameters, or for initializing.



Up to eight Break points can be set in an envelope. The position of each Break point is determined by the **Level** and **Rate**.

Rate [1 to 127]

This sets the time interval between two adjacent Break points. Higher values make steeper curves.

Level [0 to 127]

This sets the volume at the Break point.

SUS (Sustain Point) [1 to 7]

This sets the Break point of the level to be sustained until the key is released.

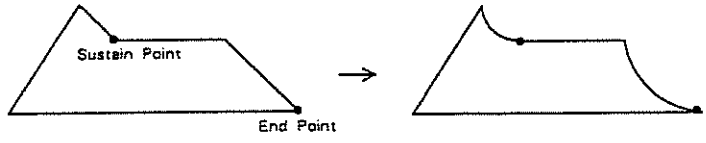
***It is not possible to set the Sustain point after the End point.**

END (End Point) [2 to 8]

This sets the Break point of the decaying sound. The End point is regarded as Level=0, no matter what level is actually set.

***It is not possible to set the End point before the Sustain point.**

The rate before the Sustain point and the End point actually draws an exponential curve.



COMMAND

Push SHIFT and move the cursor to COMMAND to open a command window.

■ZOOM T

The envelope curve shown in the Display can be enlarged or diminished along in the Time coordinate.

■See page 48 for the other commands and how to execute them.

To return to a normal Display, push SHIFT.

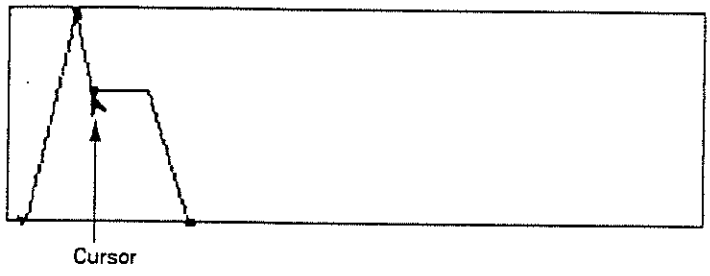
■ Setting Break Points with the Digitizer Tablet DT-100

Using the stylus pen, you can set the Break points directly.

Preparation 1 Set the parameter [DT-100] to ON in the AUX mode.

Preparation 2 Set the Sustain point and End point.

Try drawing with the stylus pen on the pad sheet, and see how the cursor moves.



Step 1 Move the cursor to the Break point which is to be rewritten, and push the switch on the stylus pen.

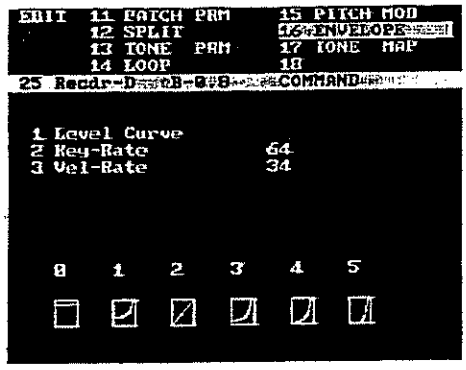
The Break point changes to red.

Step 2 Move the cursor to the new Break point, and push the switch on the stylus pen.

*The new Break point cannot be positioned to the left of an existing break point. If the new Break point is positioned beyond the Break points previously set, they will be moved further to the right.

When you push the switch on the stylus pen to set a new Break point, the set point may be slightly different to the cursor position. This happens because the resolution is 1/128 for Level, and 1/127 for Rate.

16 ENVELOPE : CTRL

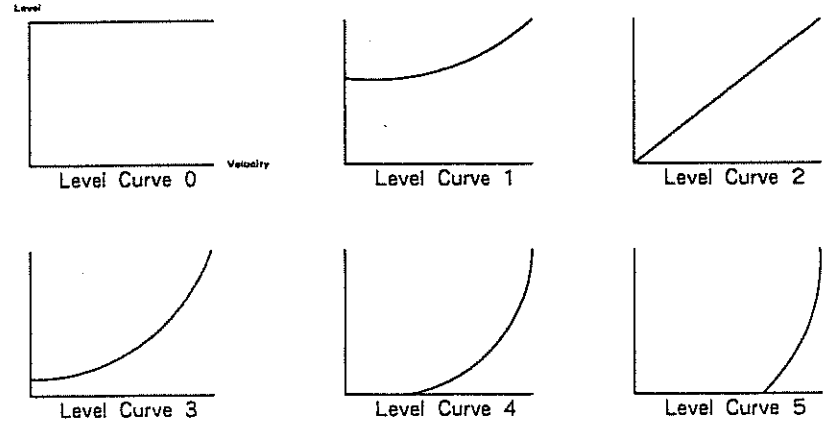


In this page, the parameters for dynamics can be set.

1 Level Curve [0 to 5]

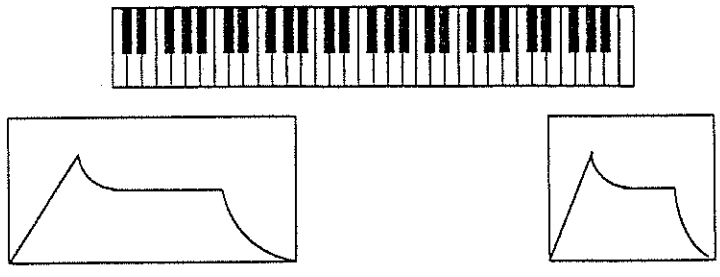
This curve determines the dynamics caused by the style of playing the keyboard.

Level Curve



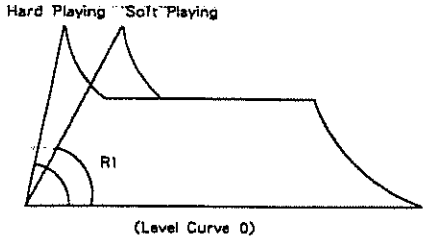
2 Key-Rate [0 to 127]

This can change the curve of the envelope depending on which key is played. Higher values make a mild curve in a lower key.



3 Vel–Rate (Velocity Rate) [0 to 127]

This can change R1 of the envelope curve. At higher value, the curve becomes steeper by playing harder, and milder by playing softer.

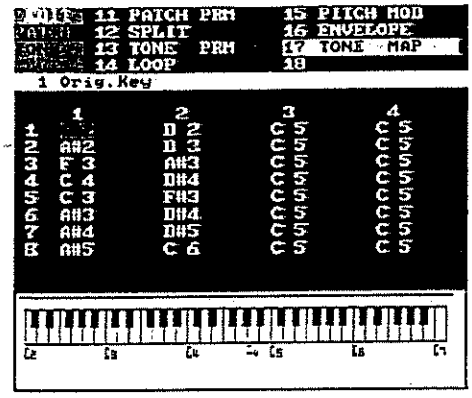


COMMAND

A command can be called and executed. See page 48 for the details of commands, and how to execute them.

Parameter Setting with the Tone Map

17 TONE MAP



In this menu, you can call one of several Tone Parameters, and change the previous values of all the 32 Tones separately. For instance, if you change the value of the "Level" parameter, the Level values for all the 32 Tones will be changed to the values you like.

1	Org. Key
2	Pitch Follow
3	Fine Tune
4	Level
5	LFO Rate
6	LFO Depth
7	LFO Delay
8	Env Sustain
9	Env End
10	Env Rate 1
11	Env Level 1
12	Env Rate 2
13	Env Level 2
14	Env Rate 3
15	Env Level 3
16	Env Rate 4
17	Env Level 4
18	Env Rate 5
19	Env Level 5
20	Env Rate 6
21	Env Level 6
22	Env Rate 7
23	Env Level 7
24	Env Rate 8
25	Env Level 8
26	Level Curve
27	Key-Rate
28	Vel-Rate

In the [PATCH] page, you can actually play the Patch currently called and edit it.

When a key is played, the cursor indicates the Tone (s) assigned to that key. With a color Display, the cursor is yellow for the 1st Tone, and red for the 2nd Tone.(If the Key Mode is Normal or Unison, only the 1st Tone is indicated.)

In the [TONE] page, you can actually play the Tone which is now indicated, and edit it.

The Parameter number and the Parameter name is shown on the Message Line, and the parameter values of all the 32 Tones are shown.

Step 1 Push SHIFT, and the cursor moves to the Parameter number.

Step 2 Select the parameter to be edited by using the Alpha Dial or the Ten Key Pad.

Step 3 Push SHIFT to return to the normal Display, then move the cursor to the Tone to be edited and continue editing.

c. Editing Wave Data

Wave data editing changes the shape of the sample. This process is entirely in the digital domain.

Delete
21 DELETE (Page 65)

Truncate
22 TRUNCATE (Page 66)

Copy
23 COPY (Page 70)

Mix
24 MIX (Page 72)

Combine (Connect)
25 COMBINE (Page 74)

Digital Filter
26 D.FILTER (Page 76)

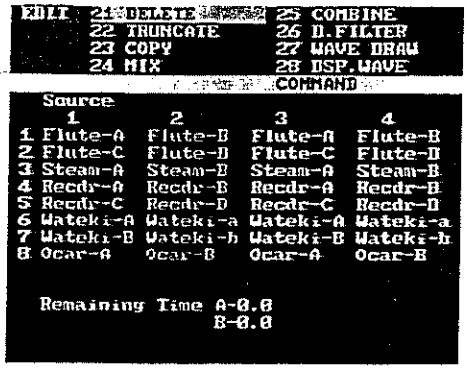
Wave Draw
27 WAVE DRAW (Page 78)

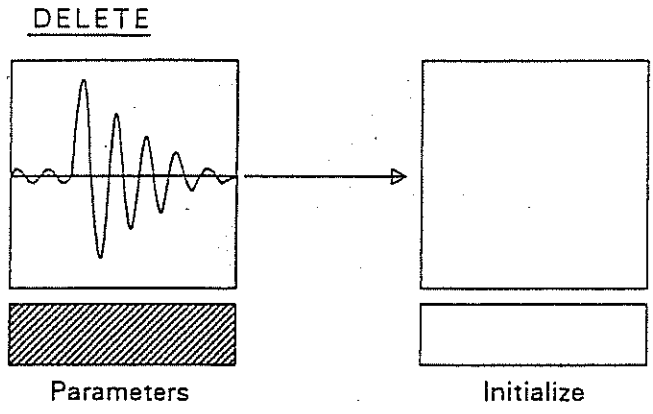
Waveform Monitor
28 DSP.WAVE (Page 81)

Delete

21 DELETE

This menu allows you to delete a Tone that is not needed.





■ Deleting an Original Tone

Deleting an Original Tone naturally erases the Wave data included in that Tone. The space created is added to the Remaining Time. Also, the Tone Parameters are initialized. By deleting an Original Tone, any Sub Tone that borrows Wave data from it will also be deleted. In other words, the space is regarded as being an empty Sub Tone.

■ Deleting a Sub Tone

Deleting a Sub Tone will initialize the Tone Parameters. This, therefore, is regarded as an empty Sub Tone, one that does not have an Original Tone. Deleting a Sub Tone, however, does not erase the Original Tone data used by the Sub Tone.

Select the Tone to be deleted, then open a command window and execute.

COMMAND

Push SHIFT to open a command window.

■ EXECUTE >

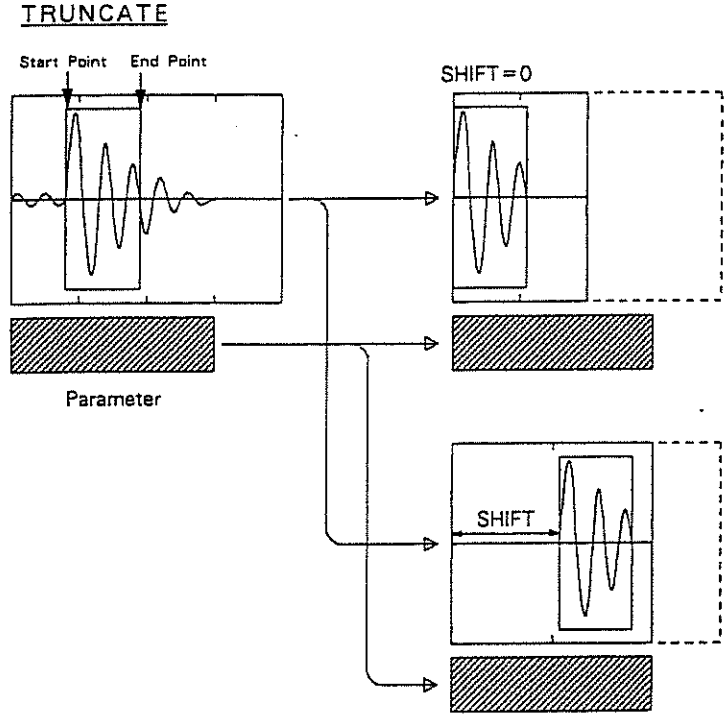
Push ENTER to execute.

Truncate

22 TRUNCATE : SET

This menu allows you to remove the unneeded portions of a Wave, and transfer some portions elsewhere. If a space is made at the end of the Wave data, and it is larger than the minimum sampling time, that space will be erased and added to the remaining time.

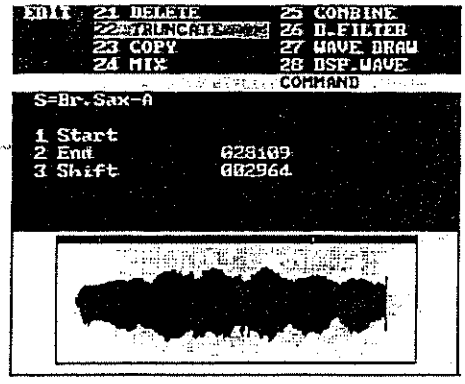
When Truncate is executed, any Sub Tone which used that particular Wave is deleted.



Select the Original Tone to be truncated, and push +PAGE to go to the [SET] page.

22 TRUNCATE : SET

D-19



1) Setting Points

First, set the needed portions of the Wave with the Start and the End points. You can actually listen to the sound while setting two points.

The addresses of the Start and the End points set here are identical to those set-with [14 LOOP]. This means that changing addresses here will automatically change those set in the Loop Set menu.
If you wish to enlarge a particular portion of the Wave, use the three pages of [14 LOOP] to set the addresses.

2) SHIFT

The Wave data between the Start and the End points can be shifted forward or backward. Set the address to which the current Start point is to be shifted. When address 0 is set, the Start point will be shifted to the very begining of the memory area assigned to that data.

COMMAND

Push SHIFT to open the command window.

■ EXECUTE >

Push ENTER to execute.

Making a new Original Tone

Using the following wave editing functions, you can make a completely new Wave.

23 COPY (Page 70)
24 MIX (Page 72)
25 COMBINE (Page 74)
26 D.FILTER (Page 76)

[SEL], for Tone selection, is provided in all these menus.

● Source

This selects the source Tone (Original Tone) which is to be edited. A Sub Tone cannot be selected ("– –" appears).

● Destination

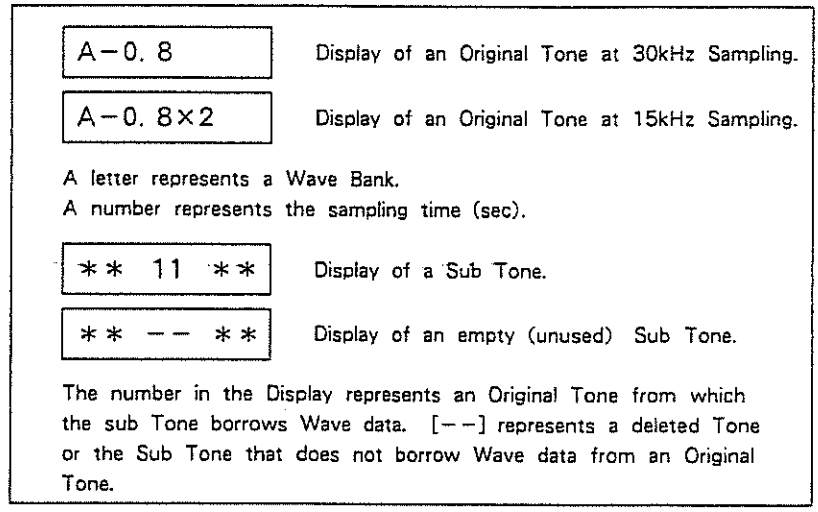
This is the location (the number of an Original Tone) where the edited Wave data is to be written. Any of the 32 Tone numbers, except for the one selected for the source Tone, can be selected. When an Original Tone is selected as a destination Tone, the previous Wave data is replaced by the new Wave data. Also, any Sub Tone that uses the previous Wave is automatically deleted, becoming an empty Sub Tone. If a Sub Tone is selected as a destination, the edited Wave is written into it, and it therefore becomes an Original Tone.

***Note that the Tone selected as a source cannot be used as a destination.**

● Tone List Display

The SEL Display shows Original Tones in yellow, and Sub Tones in white.

Also, pushing ▼ button will display the contents of the Wave data (how much space is used by each Tone).



Pushing ▲ will return to the normal Display.

● **Remaining Time Display**

The remaining time (sec) of each Wave Bank is shown at 30kHz sampling. The remaining time differs depending on the Tone selected in [SEL] page, or the Wave Bank selected in the [SET] page.

■Writing edited Wave data to an Original Tone in the same Wave Bank

The total space the destination Tone can use is ; the space the previous Wave Data occupied + the remaining time of that Wave Bank.

■Writing edited Wave data to an Original Tone in a different Wave Bank

■Writing edited Wave data to a Sub Tone

The total space the destination Tone can use is ; the remaining time of that Wave Bank.

＊When there is not sufficient space, the Wave data will be incomplete.

If you wish to increase the space for writing a new data (edited data), delete a Tone with [21 DELETE], or truncate unnecessary portions of the wave by using [22 TRUNCATE].

COPY

23 COPY : SEL

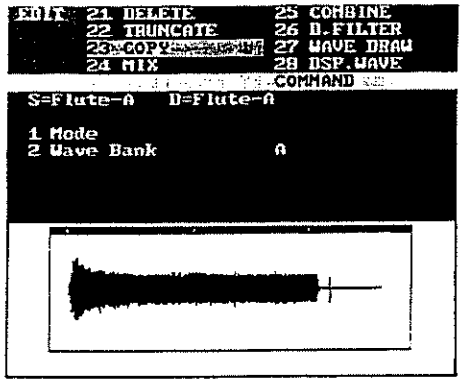
In this menu, you can copy the entire Wave data and the Tone Parameters, at the same time. Also, Reverse Copy makes a reversed copy of the source Wave.

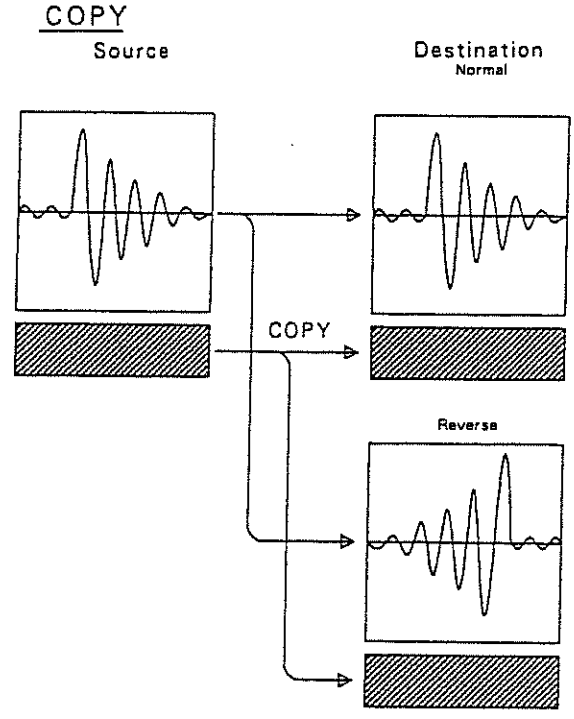
Read "Making a new Original Tone" on page 68, then set the source Tone and the destination Tone.

When you have set the source and the destination Tones, advance to the [SET] page by pushing +PAGE.

23 COPY : SET

This selects Normal or Reverse Copy Mode.





At bottom of the Display, the Wave data of the source Tone is shown.

1. Mode

Normal or Reverse Copy Mode can be selected.

[NORMAL] Ten Key 0
An exact copy of the Wave data can be made.

[REVERSE] Ten Key 1
An reversed copy of the Wave data can be made.

Tone Parameters are copied as they are, so the parameters related to looping should be re-set later with [14 LOOP].

2 Wave Bank

This selects the Wave Bank, A or B ,where the new wave data is to be written.

When you have set all the necessary parameters for copying, open the command window and execute.

COMMAND

Push SHIFT to open the command window.

■ EXECUTE >

Push ENTER to execute.

When copying is completed, the copied Wave data is shown in the Display.

MIX

24 MIX : SEL

This function mixes two Waves to make a new Original Tone.

The mixture of Source 1 and Source 2, is written to the destination Tone. The length of the destination Wave is the same as Source 1, and all the Tone Parameters are initialized. (See page 66)

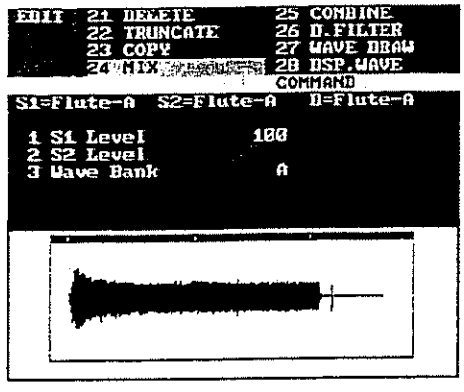
***Select different Tone Numbers or Source 1 and Source 2.**

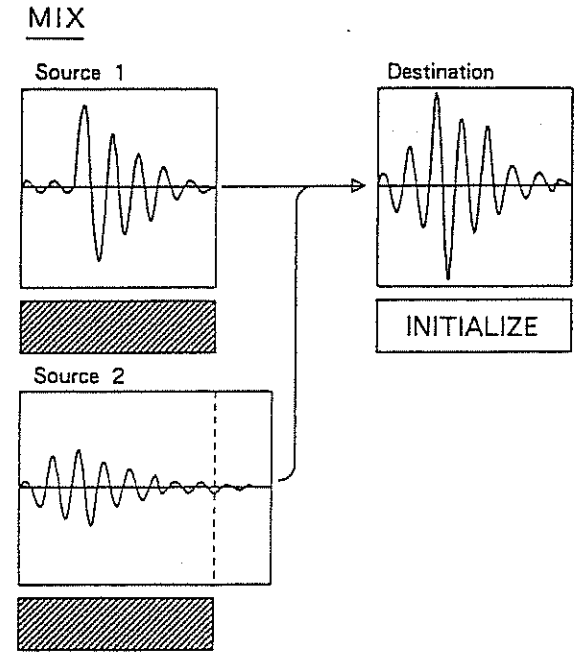
***The two waves are always mixed from address zero, so you may need to truncate the waves to match the wave heads.**

Please read "Making a new Original Tone" on page 68, then select Source 1, Source 2 and the Destination Tone.

When you have selected all the Tones, push +PAGE, to go to the [SET] page.

24 MIX : SET





In this menu, you can set the parameters for mixing Tones.

S1 respresents Source 1, and S2 Source 2. Moving the cursor to S1 causes the bottom of the Display to show the Wave data of Source 1, and the Source 1 Tone will sound by playing the keyboard. Moving the cursor to S2 causes the Display to show the Wave data of Source 2, and the Source 2 Tone can be played from the keyboard.

1 S1 Level [0 to 127]

This sets the level of the Source 1 Tone in MIX. At 127, the waveform is exactly the same as the sample. While changing the level, you cannot hear the change.

2 S2 Level [0 to 127]

This sets the level of the Source 2 Tone in MIX. At 127, the waveform is exactly the same as the sample. While changing the level, you cannot hear the change.

***The sound may be distorted if both levels are set high.**

3 Wave Bank

This selects the Bank, A or B, where the mixed Wave data is to be written. The MIX Command is proceeded with computer calculation, and therefore, the sound change cannot be heard during the value setting. If the created sound is not what you desire, repeat the whole procedure.

When all the necessary settings are done, open the command window and execute.

COMMAND

Push SHIFT to open the command window.

■EXECUTE > Push ENTER to execute.

When MIX has been executed, the mixed Wave data is shown in the Display.

COMBINE

25 COMBINE : SEL

This function allows you to combine two Waves.

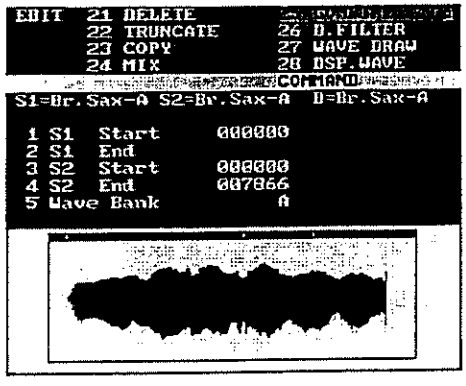
COMBINE is the joining of two waves, with the unnecessary portions discarded. The End point of Source 1 is directly joined to the Start point of Source 2. Here, the Tone Parameters are initialized.

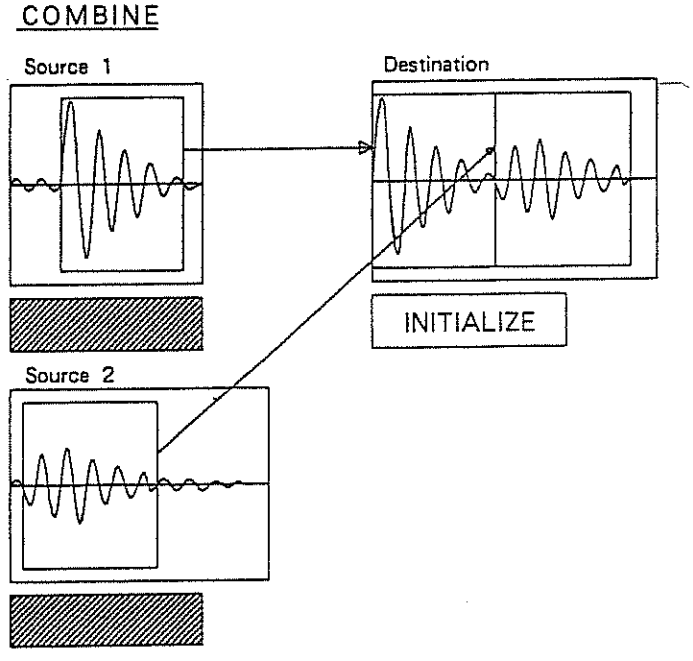
***Select different Tone Numbers for Source 1 and Source 2.**

Read "Making a new Original Tone" on page 68, and select the Source 1, Source 2 and the Destination Tone.

When you have selected the Tones, go to the [SET] page by pushing +PAGE.

25 COMBINE : SET





1) Setting the Start and End Points

S1 respresents Source 1, and S2 Source 2. Moving the cursor to S1 causes the bottom of the Diplay to show the Wave data of the Source 1, and the Source 1 Tone will sound by playing the keyboard. Moving the cursor to S2 causes the Display to show the Wave data of Source 2, and the source 2 Tone can be played by the keyboard.

The addresses of the Start and End points set here are identical to those set with [14 LOOP]. This means that changing addresses here will automatically change those set in Loop Set. If you wish to enlarge a particular portion of the wave, use the three pages of [14 LOOP] and set the addresses.

2) Selecting a Wave Bank

5 Wave Bank

This selects the Wave Bank, A or B, where the combined data is to be written.

COMMAND

Push SHIFT to open the command window.

■ EXECUTE >

Push ENTER to execute.

When COMBINE has been executed, the combined Wave data is shown in the Display.

DIGITAL FILTER

26 D.FILTER : SEL

With this function, the Wave data is processed by the Digital Filter.

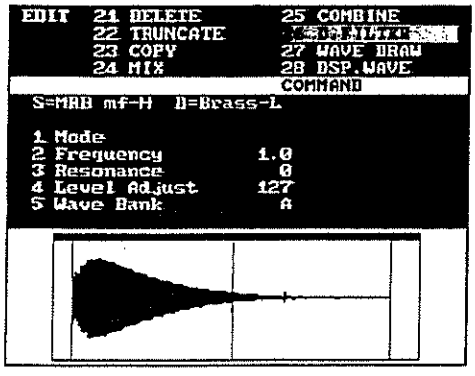
***Tone Parameters will be copied from the Source Tone to Destination.**

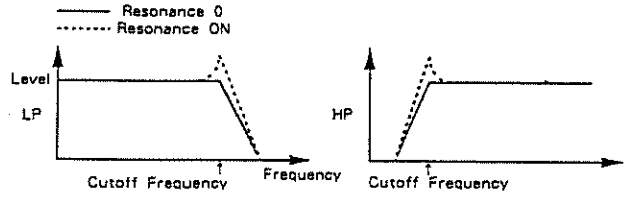
Please read "Making a new Original Tone" on page 68, then select the Source and Destination Tones.

When you have selected the Tones, push +PAGE, to go to the [SET] page.

26 D.FILTER : SET

In this menu, you can set the parameters for the DIGITAL FILTER.





1 Mode

You can select one of the two filters: −12dB/Octave Lowpass Filter or Highpass Filter, where cutoff frequency and resonance can be set. By executing D.Filter twice, −24dB/Octave, and three times, −36dBm/Octave, filtering effects can be obtained.

[LPF] (Low−pass Filter) Ten Key 0
This filter passes lower frequencies and cuts higher frequencies.

[HPF] (High−pass Filter) Ten Key 1
This filter passes higher frequencies and cuts lower frequencies.

2 Frequency (Cutoff Frequency) [0.1 to 10.0]

This sets the cutoff frequency from 0.1kHz to 10.0kHz. Ten Key 1 =0.1kHz, Ten Key 10=1.0kHz and 100=10.0kHz.

3 Resonance [0 to 127]

At higher values, the harmonic content at the set cutoff frequency is emphasized.

4 Level Adjust [0 to 127]

At 127, the level of the original Wave data is sent to the filter. If the sound is distorted with a high Resonance setting, adjust the level here.

5 Wave Bank

This selects the Wave Bank, A or B, where the filtered Wave data is to be written.

***Digital filtering is processing the wave by computer, and therefore, the filtered wave data cannot be heard before executed. So, you may have to repeat the filtering process to obtain the optimum result.**

When all the necessary settings for filtering are made, open the command window and execute.

COMMAND

Push SHIFT to open the command window.

■ EXECUTE > Push ENTER to execute.

When a DIGITAL FILTER has been executed, the filtered wave data is shown in the Display.

***When the Level Adjust is set to around 127, the sound may be distorted. If so, lower the level, and repeat.**

Drawing Waveform

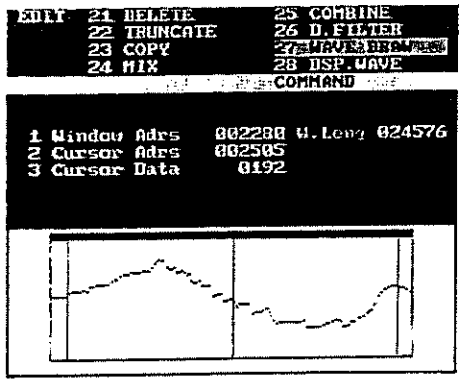
27 WAVE DRAW : SEL

With this function, you can draw a waveform using the optional Digitizer Tablet DT−100.

First of all, set the [DT−100] parameter to ON in the AUX mode. This page allows you to select the Original Tone to be edited. You cannot select a Sub Tone ("−−" appears in the Display).

When you have selected the Tone, push +PAGE to go to the [SET] page.

27 WAVE DRAW : SET



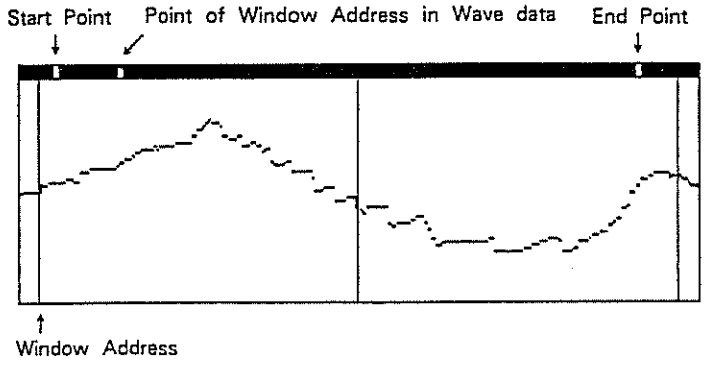
Now, you can enter Wave data by actually drawing a waveform using the DT−100.

Each half of the wave, the left and the right, uses 114 addresses. The entire waveform shown uses 228 addresses.

Draw a waveform on the pad sheet, using the stylus pen, and see how the cursor moves in the Display.

1) Selecting the place (address) of the Wave data to be edited

Normally, you want to edit a part of the Wave data. The position you want can be assigned with the digitizer tablet or by using the panel switches and the Alpha Dial on the S−50. The blue belt shown above the wave indication represents the whole length of the Wave data. The small white square on the blue belt represents the position (=Window Address) of the Wave data which you can edit. The wave data at the Window Address is shown under the blue belt using as much as 228 addresses.



■ Assigning a Window Address using the Digitizer Tablet

Step 1 — Move the cursor (red triangle) onto the blue belt, and the cursor becomes a white square.

Step 2 — Move the white square cursor to the position (Window Address) you want, and push the switch on the stylus pen.

Now, the wave data at the assigned position (=Window Address) is shown.

Step 3 — Move the cursor from the blue belt down to the wave section.

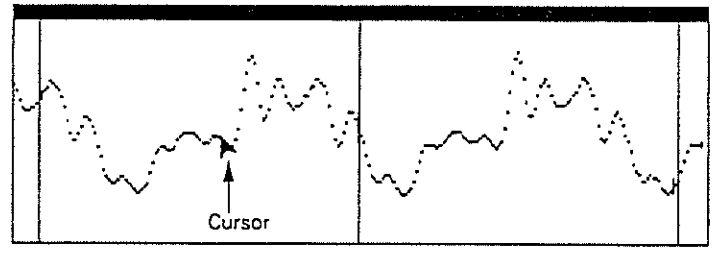
Step 4 — Move the cursor (now a red triangle) outside the right or left end of the wave indication, and the cursor becomes an arrow which will scroll the wave 114 steps to the right or left just by pushing the switch.

■ Assigning a Window Address on the S−50's panel

Step 1 — Move the cursor to the Window Address parameter in the Display, using the Cursor Buttons.

Step 2 — Push ▶ and ◀, and the wave data will be scrolled right or left in 114 address steps. The Alpha Dial, or the Ten Keys, can scroll the wave in one address step.

2) Drawing a Waveform



Step 1 — Move the cursor to where you wish to draw the waveform, and push the switch on the stylus pen.

Step 2 — While holding the switch down, draw a wave.

The wave you have drawn is shown in red.

Step 3 — Release the switch, then take the stylus pen away from the pad sheet.

COMMAND

Push SHIFT to open the command window.

■WINDOW LOOP [ON, OFF]

The 228 addresses (accessible by Window Address) are actually such short sounds that they cannot be monitored, but by looping them they can then be monitored.

W.LOOP ON always sets Start point = address 0, Loop Point = Window address (the vertical line at the left end) and End point = Window address plus 228 (the vertical line at the right end). With KEY ON message, the wave data is read from address 0, and the loop from the Window address to that plus 288 is repeated.

When ON, it is possible to draw a waveform while listening to a sound :

Step 1 **Place the head of the stylus pen on the pad sheet, and play the key before pushing the switch on the stylus pen.**

Step 2 **Switch it on while holding the key down, this will hold the sound.**

Step 3 **Draw a waveform while holding the switch down, and the sound will change.**

Step 4 **Switch it off, and the sound will stop.**

When OFF, the original Start point, Loop point and End point are retrieved.
If you move to another menu with W.LOOP ON, the original points will be automatically rewritten.

When changed from a different menu to this menu, W.LOOP is automatically set to OFF.

■COPY >

This can copy the 228 addresses of wave data shown in the Display to the succeeding data (up to the Wave End).

■CLR WINDOW >

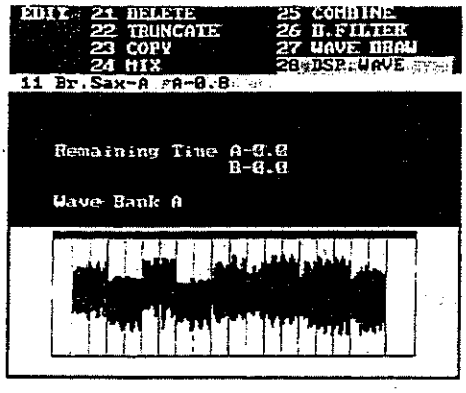
This erases the 228 addresses of wave data shown in the Display.

■CLR ALL >

The entire Wave data from the Wave Top to the Wave End can be erased.

Monitoring Wave

28 DSP.WAVE



In this menu, the entire Wave Bank to which the Tone currently in use belongs, is shown. The Tone is shown in red, and the other Tones are shown in blue. The Wave Bank is divided into 18 segments of the smallest sampling time (0.4 sec). The Display also shows the name of the Wave Bank.

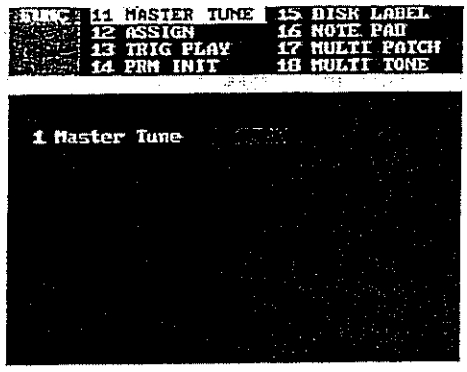
When a Sub Tone is in use, the wave data of the Original Tone that is used in the Sub Tone is shown in red.

4. FUNC (Function) Mode

The Function menu includes the following eight choices.

MASTER TUNE

11 MASTER TUNE

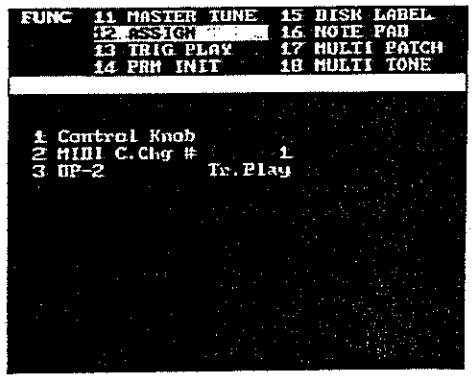


1 Master Tune [−50 to 0 to 50]

This performs an overall tuning of the S−50. At zero, the pitch of the sound is exactly the same as when set with the relevant Tone Parameters.

Assigning a function to each Controller

12 ASSIGN

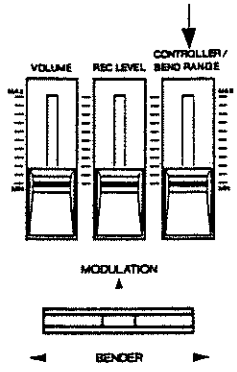


This menu assigns a function to each Controller (Control Knob or DP−2).

1 Control Knob

One of the following three functions can be assigned to the Control Knob .

*The Expression Pedal EV−5 works exactly the same as the Control Knob. Connect it to the External Control Jack (EV−5) on the rear panel. When the EV−5 is being used, the Control Knob on the front panel does not work.



[B.Range] (Bend Range) Ten Key 0
This function changes the maximum effect of the bender effect caused by moving the Bender/Modulation Lever. The [Bend Range] parameter of the Patch currently called is edited.

[M.Depth] (Modulation Depth) Ten Key 1
This function controls the depth of the modulation caused by moving the Bender/Modulation Lever. The [Mod.Depth] parameter of the Patch currently called up is edited.

[C.Chg] (MIDI Control Change Messages Transmit) Ten Key 2
This function transmits MIDI Control Change messages. The Control Change number to be transmitted can be selected with the following parameter : MIDI C.Chg #.

2 MIDI C.Chg # (MIDI Control Change Number) [0 to 95]

When a C.Chg is assigned to the Control Knob, the Control Change number set here is transmitted.

3 DP-2

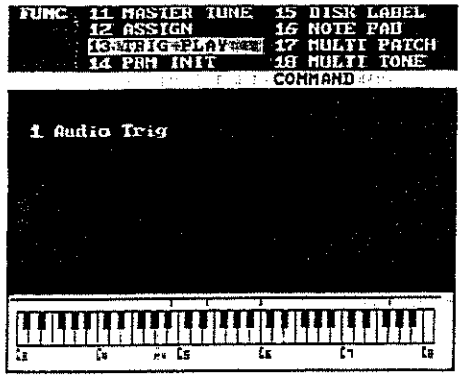
Either of the following two functions can be assigned to the connected pedal switch, such as a DP-2.

[Tr.Play] (Trigger Play) Ten Key 0
Each time the pedal is pressed, a trigger signal is sent. The [13 TRIG PLAY] menu allows you to set the parameters for Trigger Play.

[P.SHIFT] (Patch Shift) Ten Key 1
Pushing the pedal advances one Patch.

Setting Trigger Play

13 TRIG PLAY



Up to eight keys you have assigned can be played by pressing the pedal switch, or by feeding an audio signal. This is called Trigger Play. Trigger play allows you to play more than one key at the same time with the pedal switch, instead of playing the keyboard, and therefore, may be effectively used for adding effect sounds while you are playing the keyboard.

● Assigning the keys to be triggered

Up to eight keys can be triggered. Even when eight keys are assigned, the number of the voices actually triggered differs, depending on the Key mode of the Patch in use, the Voice assignment in Multi Play, the number of keys being played on the keyboard, etc.

Assign the keys to be triggered by playing the relevant keys on the keyboard. Any key exceeding the 8th key (e.g.9th, 10th key) will be ignored.

To cancel the keys previously assigned, execute the [CLEAR] command.

*The keys to be triggered cannot be assigned using MIDI Key messages.

● How to use trigger-play

■ Trigger-play using the pedal switch (e.g. DP-2)

Assign Tr.Play to the DP-2 with the [12 ASSIGN], and the assigned keys are triggered by using the pedal.

■ Trigger-play using an audio signal

Refer to [1 Audio Trig] on the next page.

1 Audio Trig (Audio Trigger) [ON/OFF]

To use trigger–play with an audio signal fed into the Input Jack of the S–50, set the Audio Trig to ON. In any mode other than the REC mode, the assigned keys are triggered by the audio signal fed in.

COMMAND

Push SHIFT to open the command window.

■OCT SHIFT [–2, –1, 0, 1, 2]

The S–50 can be played from C0 to C9.(The highest pitch, however, is two octaves above the Original Key). When the keyboard is in the normal condition (without OCTAVE SHIFT), the pitch range of the keyboad is C2 to C7. Using the Octave Shift function, you can shift the keyboard ±2 octaves, therefore you can Split Set the entire range from C0 to C9. The Display changes according to the Octave Shift you set.

***After assigning the keys, return the Oct.Shift in [11 PATCH PRM] to the original value.**

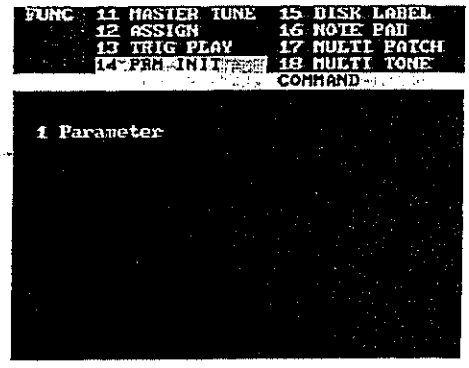
■CLEAR >

This cancels the keys previously assigned for trigger–play.

Simply push ENTER.

Initialize

14 PRM INT



This resets the parameters to the default values.

The default values of the parameters are shown in the table on the next page.

1 Parameter

This selects which parameters are to be initialized.

[ALL] Ten Key 0
This initializes all the parameters.

[Patch] Ten Key 1
This initializes all the Patch Parameters of all the Patches.

[Tone] Ten Key 2
This initializes all the Tone Parameters of all the Tones.

[FUNC] Ten Key 3
This initializes all the parameters set in the Function mode.

[MIDI] Ten Key 4
This initializes all the parameters set in the MIDI mode.

When you have selected the parameters to be initialized, open the command window and execute.

COMMAND

Push SHIFT to open the command window.

■EXECUTE > Push ENTER to execute.

When completed, "COMPLETE" is shown on the Message Line.

Default Setting of each Parameter

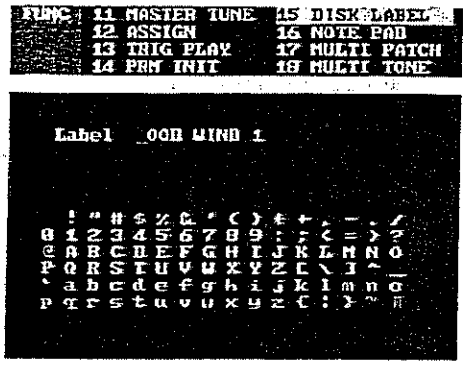
● Tone Parameters	
Org. Key	C5
Pitch Follow	ON
Fine Tune	0
Level	127
Tone Name	i
Loop Mode	1 Shot
Start	000000
Loop	000000
End	Address at the End Point (000000 when deleted)
Loop Tune	0
LFO Rate	88
LFO Depth	0
LFO Delay	0
Env Sustain	2
Env End	3
Env Rate 1	127
Env Level 1	127
Env Rate 2	127
Env Level 2	127
Env Rate 3	127
Env Level 3	0
Env Rate 4	127
Env Level 4	0
Env Rate 5	127
Env Level 5	0
Env Rate 6	127
Env Level 6	0
Env Rate 7	127
Env Level 7	0
Env Rate 8	127
Env Level 8	0
Level Curve	2
Key−Rate	0
Vel−Rate	0

● Patch Parameters	
Key Mode	Normal
Detune	0
V−SW Thrsh	64
V−MIX Ratio	0
Bend Range	2
Mod. Depth	64
A.T Sense	0
A.T Assign	Mod.
Oct Shift	0
Out Level	127
Name	No Name
Split (Commom for the entire keyborard) 1st Tone 2nd Tone	 11 11

● Prameters set in Function Mode	
Master Tune	0
Control Knob	M.Depth
MIDI C.Cng #	1
DP−2	Tr. Play
Audio Trig	OFF
Assigned Keys	Clear
Label	No Name
Note	No Name
K.B	A
Voice Mode	8
RX−CH	1~4
Patch	P1~P4
Tone	11~14
Level	127
● Parameters set in MIDI Mode	
RX−CH	1~4
TX−CH	1
P. Chg	ON
B. Range	OFF
Mod.	ON
Hold	ON
A.T	OFF
Vol.	OFF
RX P.Chg#	1~8
TX P.Chg#	1~8
Exclusive	OFF
Device ID	1

Setting a Disk Label

15 DISK LABEL



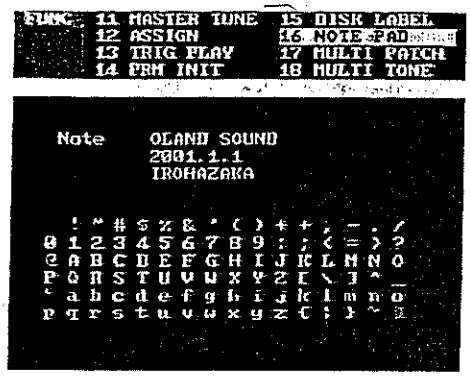
This sets the name of a disk, or changes the name. Up to 12 letters can be used for a name.

Each letter of the name can be entered using the Alpha Dial or the Ten Key Pad. Available letters are silkscreened on the Ten Key Pad. You do not have to push ENTER.

Move the cursor with ▶ and ◀.

Note Pad

16 NOTE PAD



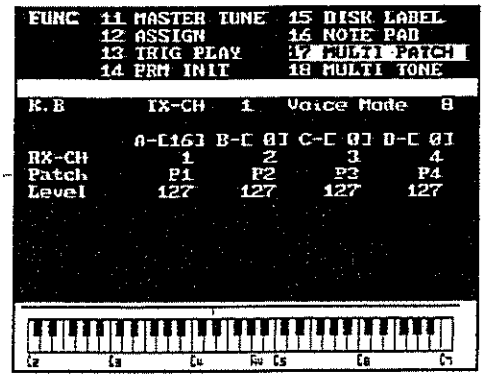
This allows you to write a memo in each disk. Up to 48 letters can be used. Use the Alpha Dial or Ten Key Pad for writing the memo. You do not need to push ENTER.

Move the cursor using ▶, ◀, ▲ and ▼.

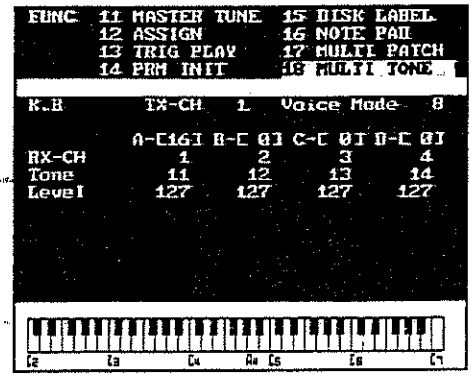
1	→A→B→C	7	S→T→U→
2	→D→E→F	8	→V→W→X
3	→G→H→I	9	→Y→Z→/
4	→J→K→L	0	→+→−→×
5	→M→N→O	ENT	Space
6	→P→Q→R		

Setting Multi Play

17 MULTI PATCH



18 MULTI TONE



Multi Play allows you to play up to four different Patches, or Tones simultaneously, using MIDI messages sent on different MIDI channels. The number of voices which the S−50 can play at the same time is 16. So, the four different sounds may be played using specific combinations of voices, e.g., 8,4,2 and 2.

The parameters set in [17 MULTI PATCH] (Multi Patch Play) and [18 MULTI TONE] (Multi Tone Play) are common for both menus. Changing the values of the parameter of one menu automatically changes that of the other.

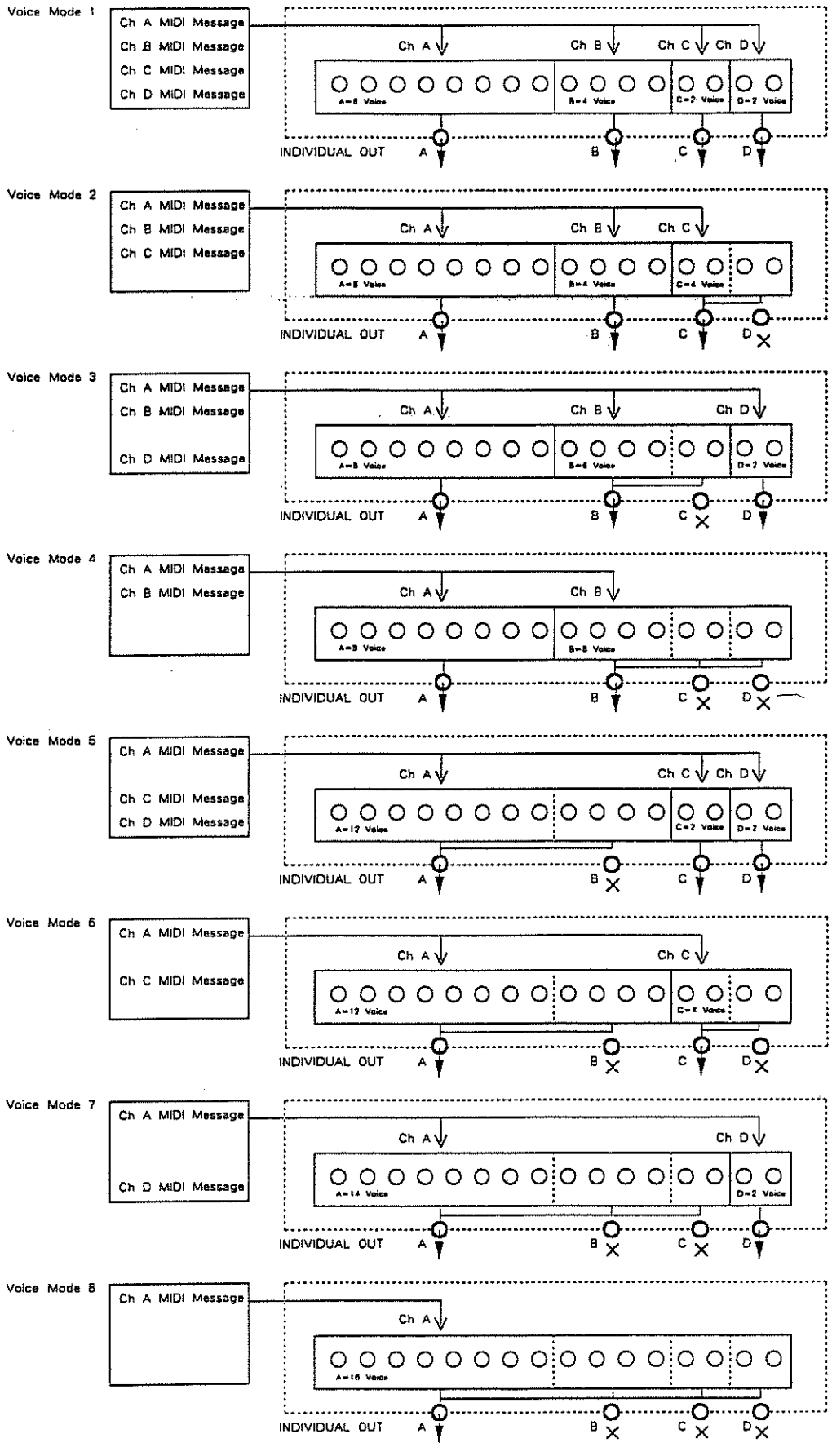
The S−50 is 16 voice polyphonic. Multi Play divides these 16 voices into some voice groups. How the voices are divided is determined by the Voice Mode. Each voice group can be played using MIDI messages sent on each MIDI channel. And one of the voice groups can be played with the S−50's keyboard.

Voice Mode

This selects how the 16 voices are divided.

The following picture shows how the MIDI messages work on the voices (modules) in each Voice Mode.

	A	B	C	D
Voice Mode 1	8	4	2	2
Voice Mode 2	8	4	4	0
Voice Mode 3	8	6	0	2
Voice Mode 4	8	8	0	0
Voice Mode 5	12	0	2	2
Voice Mode 6	12	0	4	0
Voice Mode 7	14	0	0	2
Voice Mode 8	16	0	0	0


Voice Mode 1
Ch A MIDI Message
Ch B MIDI Message
Ch C MIDI Message
Ch D MIDI Message
Ch A
Ch B
Ch C
Ch D
A=8 Voice
B=4 Voice
C=2 Voice
D=2 Voice
INDIVIDUAL OUT
A
B
C
D
Voice Mode 2
Ch A MIDI Message
Ch B MIDI Message
Ch C MIDI Message
Ch A
Ch B
Ch C
A=8 Voice
B=4 Voice
C=4 Voice
INDIVIDUAL OUT
A
B
C
D
Voice Mode 3
Ch A MIDI Message
Ch B MIDI Message
Ch D MIDI Message
Ch A
Ch B
Ch D
A=8 Voice
B=6 Voice
D=2 Voice
INDIVIDUAL OUT
A
B
C
D
Voice Mode 4
Ch A MIDI Message
Ch B MIDI Message
Ch A
Ch B
A=8 Voice
B=8 Voice
INDIVIDUAL OUT
A
B
C
D
Voice Mode 5
Ch A MIDI Message
Ch C MIDI Message
Ch D MIDI Message
Ch A
Ch C
Ch D
A=12 Voice
C=2 Voice
D=2 Voice
INDIVIDUAL OUT
A
B
C
D
Voice Mode 6
Ch A MIDI Message
Ch C MIDI Message
Ch A
Ch C
A=12 Voice
C=4 Voice
INDIVIDUAL OUT
A
B
C
D
Voice Mode 7
Ch A MIDI Message
Ch D MIDI Message
Ch A
Ch D
A=14 Voice
D=2 Voice
INDIVIDUAL OUT
A
B
C
D
Voice Mode 8
Ch A MIDI Message
Ch A
A=16 Voice
INDIVIDUAL OUT
A
B
C
D

Each voice group can be sent out separately through the Individual Output Jacks. Each of the output jacks, A to D, sends out the corresponding voice group. However, do not connect a plug to an output jack to which no choice is assigned (the jacks marked with an X). When all the four jacks are used, the voices are assigned as A=8 voices, B=4 voices, C=2 voices and D=2 voice. (See page 10.)

*The level of the sound from each jack may be different. If so, adjust the volume with a mixer, or the LEVEL parameter of each voice group.
*If the MIDI Key ON messages (and the keys played on the S−50 keyboard) exceeds the number of voices assigned to each voice group, the extra "KEY ON will be ignored.
*In Patch Play mode, playing one key uses two voices if the Patch is set to X−Fade, V−Mix or Unison Key mode. Therefore, the maximum number of voices is 8.
*The voice group to which no voice is assigned ignores all MIDI messages.

1 RX−CH (Receive Channel) [1 to 16]

This sets the receive MIDI channel of each voice group.

2 PATCH [P1 to P8]
2 TONE [11 to 48]

In the [17 MULTI PATCH] menu, you can select the Patch to be assigned to each voice group. During live performance, you can change the Patches with MIDI Program Change messages (from an external device.)

In [18 MULTI TONE] menu, you can select the Tone to be assigned to each voice group. During live performance, you can change Tones with MIDI Program Change messages (from an external device.)

3 LEVEL [0 to 127]

This sets the level of each voice group.

4 K.B.(keyboard) [A to D, OFF]

This selects the voice group to be played with the S−50 keyobard. When OFF, no sound is produced by playing the keyboard. The control knobs or swtiches on the front panel of the S−50 control only the sound of the voice group (Patch or Tones) assigned to the S−50's keyboard.

*No sound is produced when a voice group which has no voice is assigned to the keyboard, or when K.B. is set to OFF, but the MIDI messages are transmitted.

5 TX−CH

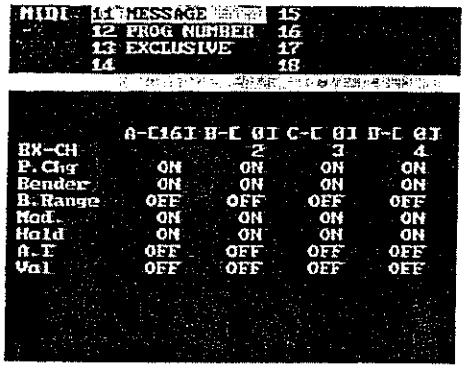
You can change the Transmit channels.

5. MIDI Mode

This mode allows you to set the MIDI parameters.

Setting MIDI Functions

11 MESSAGE : RX



In this page, you can set how the MIDI messages are received by the S-50.

CH (Channel) [1 to 16] This sets the receive channel.

P.Chg (Program Change) This selects whether to receive the Program Change messages or not.

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

Program Change message selects a Patch during Patch Play mode, and selects a Tone in Tone Play mode.

In [12 PROG.NUMBER], you can set how each Program Change number corresponds to a Patch number.

The Program Change numbers correspond to the Tone numbers as shown left.

Bender This selects whether to receive the Bender message or not.

Bend Range This selects whether to receive the Bend Range (Control Change RPC No.0) messages or not.

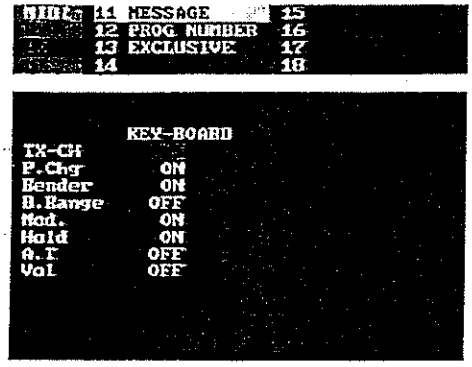
Mod.(Modulation) This selects whether to receive the Modulation (Control Change No. 1) message or not.

Hold This selects whether to receive the Hold (Control Change No.64) message or not.

A.Touch (Aftertouch) This selects whether to receive the Aftertouch message or not.

Volume This selects whether to receive the Volume (Control Change No.7) message or not.

11 MESSAGE : TX



This determines the MIDI messages to be transmitted.

CH (Transmit Channel) [1 to 16]

This sets the transmit channel.

P.Chg (Program Change)

This selects whether to transmit the Program Change Messages or not.

Tone Bank / Number

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

Selecting a Patch or a Tone on the S−50 will transmit the corresponding Program Change number.

In [12 PROG.NUMBER], you can set how each Program Change number corresponds to a Patch number.

The Program Change numbers correspond to the Tone numbers as shown left.

Bender

This selects whether to transmit the Bender message or not.

Bend Range

This selects whether or not to send the Bend Range (Control Change RPC No.0) messages.

Mod.(Modulation)

This selects whether or not to send the Modulation (Control Change No. 1) message.

Hold

This selects whether or not to transmit the Hold (Control Change No.64) message.

A.Touch (Aftertouch)

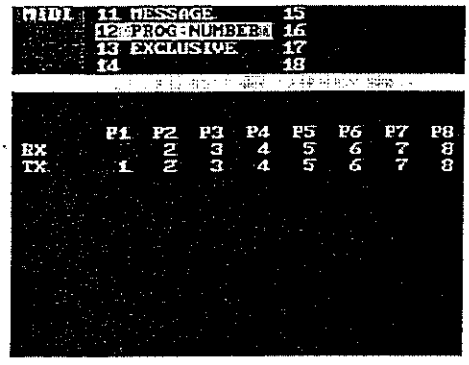
This selects whether or not to send the Aftertouch message.

Volume

This selects whether or not to transmit the Volume (Control Change No.7) message.

Setting Program Change Numbers

12 PROG.NUMBER



This sets how each Program Change number corresponds to a Patch number.

RX (Receive) [1 to 127] This sets how the Program Change numbers sent from an external device change the Patch numbers on the S−50.

TX (Transmit) [1 to 127] This sets what Program Change number is transmitted by changing the Patches on the S−50.

SYSTEM EXCLUSIVE

13 EXCLUSIVE

Using the Roland MIDI System Exclusive, the data in the S−50's internal memory can be transferred.

For details, refer to the "MIDI Implementation Chart" at the back of the manual.

6. DISK MODE

This mode allows you to load the data saved on a disk into the S−50, or to save the data from the S−50 to the disk.

LOADING

The data saved on a disk can be loaded into the internal memory of the S−50.

Loading the entire data
11 LOAD ALL (Page 96)

Loading Function Parameters
12 LOAD FUNC (Page 97)

Loading MIDI Parameters
13 LOAD MIDI (Page 98)

Loading a Patch
14 LOAD Patch (Page 99)

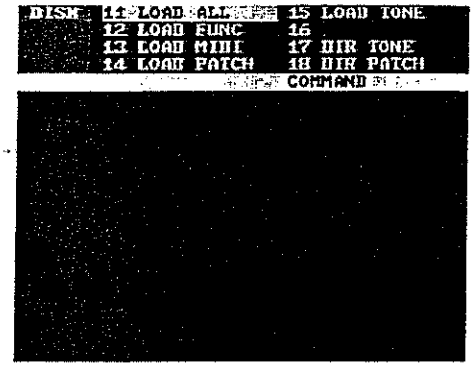
Loading a Tone
15 LOAD TONE (Page 100)

Directory of Tone Names on a disk
17 DIR TONE (Page 103)

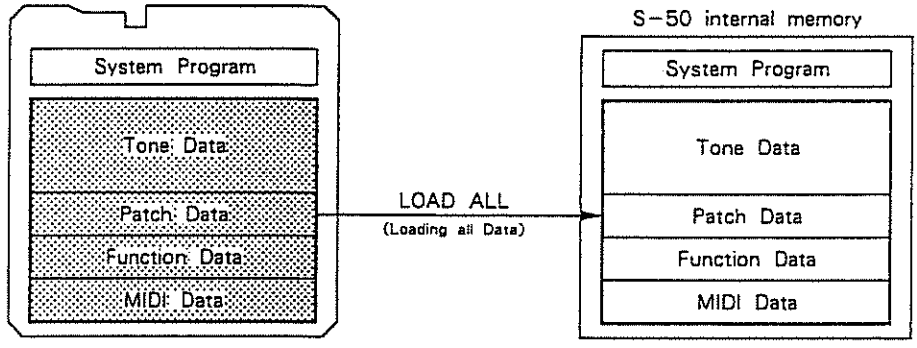
Directory of Patch Names on a disk
18 DIR PATCH (Page 103)

Loading the entire data

11 LOAD ALL



The entire sound data on the disk can be loaded into the S−50.



Insert a disk that contains the data to be loaded.

COMMAND

Push SHIFT to open the command window.

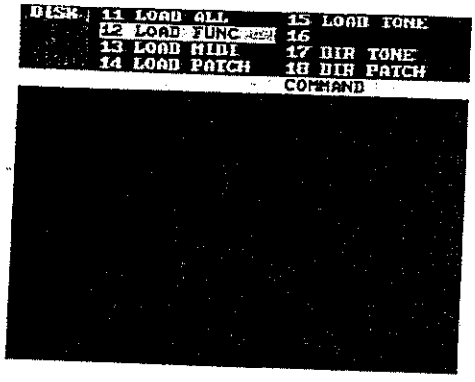
■ EXECUTE >

Push ENTER, and "NOW LOADING" is shown on the Message Line, and the disk label of the disk which is currently being loaded is shown in the command window.

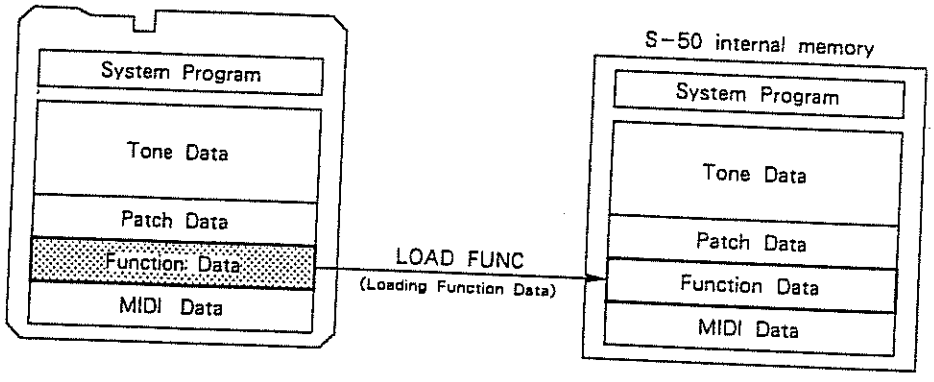
When LOAD ALL is executed, "COMPLETE" is shown on the Message Line.

Loading Func Parameters

12 LOAD FUNC



Only the Function data (the parameters which can be set in Function mode) is loaded into the S−50.



Insert the disk that contains the data to be loaded.

COMMAND

■ EXECUTE >

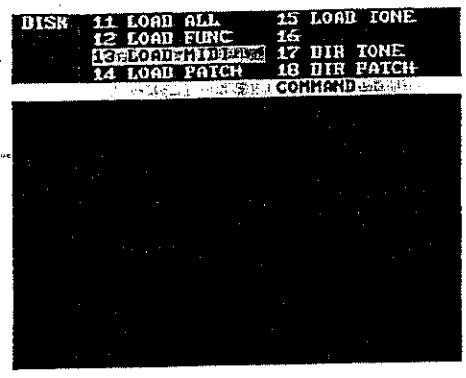
Push SHIFT to open the command window.

Push ENTER, and "NOW LOADING" is shown on the Message Line.

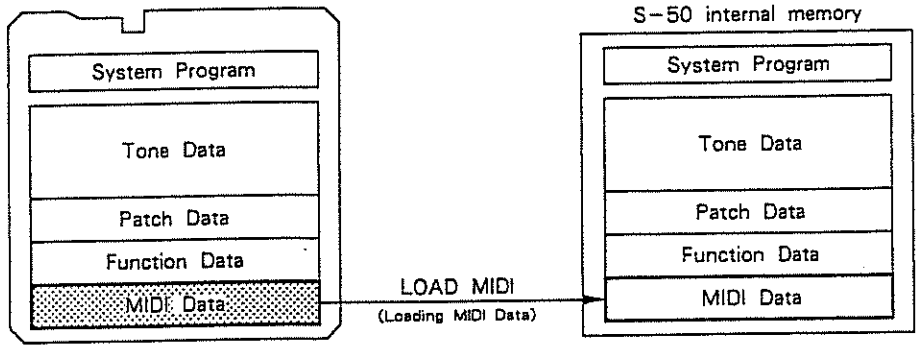
When LOAD FUNC is executed, "COMPLETE" is shown on the message line.

Loading MIDI Parameters

13 LOAD MIDI



Only the MIDI data (the parameters which can be set in the MIDI mode) is loaded into the S−50.



Insert a disk that contains the data to be loaded.

COMMAND

Push SHIFT to open the command window.

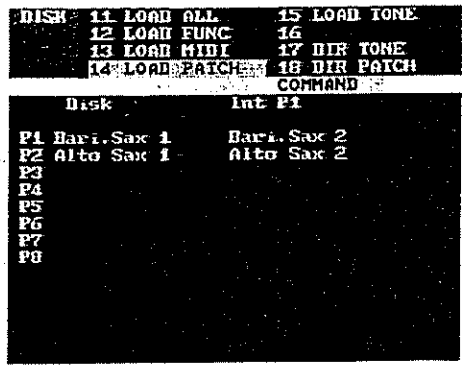
■EXECUTE >

Push ENTER, and "NOW LOADING" is shown on the Message Line.

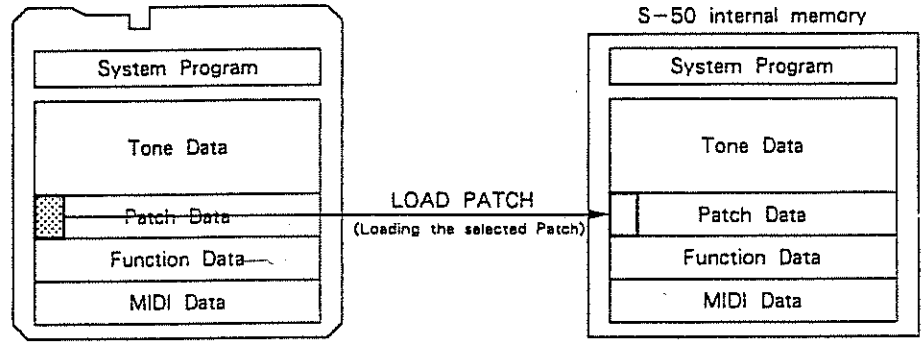
When finished, "COMPLETE" is shown on the message line.

Loading a Patch

14 LOAD PATCH



Patch Parameters of a Patch saved on a disk can be loaded into the S−50.



Step 1 — Insert the disk that contains the Patch data to be loaded, and push P4.(This menu can load only the Patch names of the data saved on the disk.)
The left half of the Display shows the list of the Patches saved on the disk connected to the disk drive, and the right half shows the list of the Patches written in the internal memory of the S−50.

Step 2 — Where it says "DISK", enter the Patch number to be loaded (=source Patch), and at INT, the Patch number where the source Patch is to be loaded to (=destination Patch number).

COMMAND

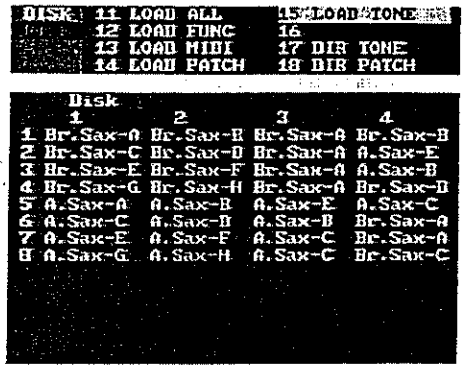
Push SHIFT to open the command window.

■EXECUTE > — Push ENTER, and "NOW LOADING" is shown on the Message Line.

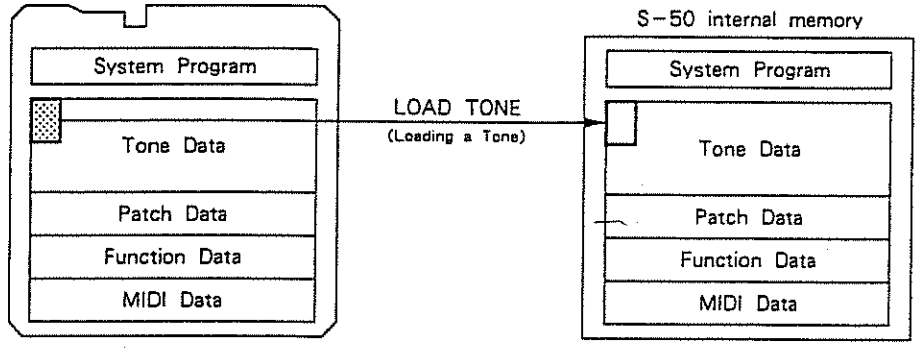
When finished, "COMPLETE" is shown on the message line.

Loading a Tone

15 LOAD TONE : DISK



You can select any one of the Original Tones saved on a disk, and load the Wave data and the Tone Parameters of that Tone into the S-50.



Step 1 Insert the disk that contains the Tone data to be loaded, and push P5.(In this menu, only the Tone names saved on the disk can be loaded.)

Step 2 Where it says "DISK," enter the number of the Original Tone to be loaded.

*A Sub Tone cannot be loaded as it does not contain Wave data.("--" is indicated.)

● Tone List Display

Original Tones are displayed in yellow, and the Sub Tones in white.

Pushing ▼ will change the Display as follows.

A−0. 8	Display of an Original Tone at 30kHz Sampling.
A−0. 8×2	Display of an Original Tone at 15kHz Sampling.

A letter represents a Wave Bank.
A number represents the sampling time (sec).

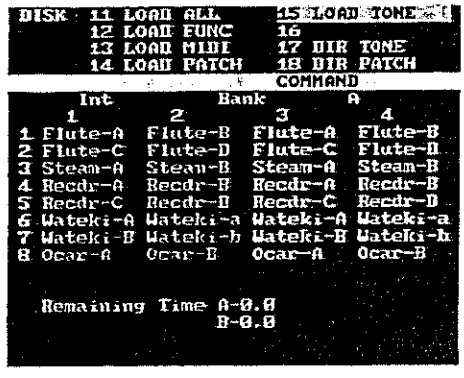
＊＊ 11 ＊＊	Display of a Sub Tone.
＊＊ −− ＊＊	Display of an empty (unused) Sub Tone.

The number in the Display represents an Original Tone from which the sub Tone borrows Wave data. [−−] represents a deleted Tone or the Sub Tone that does not borrow Wave data from an Original Tone.

Pushing ▲ will return to the normal Display.

Step 3 **When you have selected the Tone, push +PAGE to go to the next page.**

15 LOAD TONE : INT



The list of Tones written in the S−50's internal memory is displayed.

Step 4 **Where it says "INT," enter the destination Tone number where the source Tone is to be written.**

Any of the 32 Tone numbers can be selected as a destination Tone. However, when an Original Tone is a destination Tone, the Wave data will be replaced with the Wave data of the source Tone, and any Sub Tone that uses that Wave data will be deleted, becoming an empty Tone.

● Tone List Display

In exactly the same way as in the [DISK] page, the Display can be changed to Tone List.

● Remaining Time Display

The remaining time (sec) of each Wave Bank is shown for 30kHz sampling time.

The space required for loading the Wave data on a disk into the internal memory varies as shown below, depending on the destination Tone.

■Required space when loading to an Original Tone within the same Wave Bank :

The source data must be less than the previous Wave data + Remaining Time of the Wave Bank

■Required space when loading to an Original Tone in a different Wave Bank

■Required space when loading to a Sub Tone :

The source data must be less than the remaining time of the destination Wave Bank

***If there is not enough space, the excess data will be ignored.**

To increase the space, you should delete some unneeded data. You may either delete a Tone with [21 DELETE] in Edit mode, or cut off unneeded portions of a wave with [22 TRUNCATE].

Step 5 **Open the command window and execute the LOAD TONE command.**

COMMAND

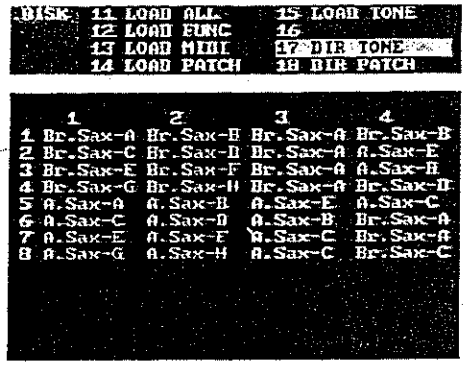
Push SHIFT to open the command window.

■EXECUTE > Push ENTER, and "NOW LOADING" is shown on the Message Line.

When finished, "COMPLETE" is shown on the message line.

Directory of Tone Names on a disk

17 DIR TONE

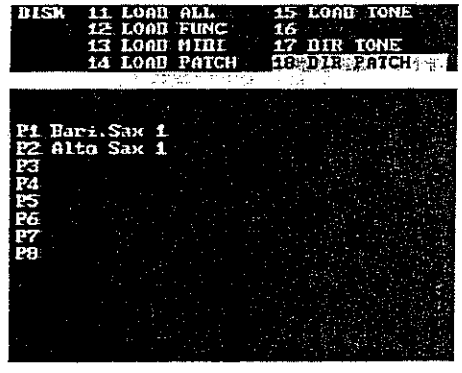


You can see the list of the Tone names saved on a disk.

To see the Tone directory on more than one disk, exchange the disks and push P7.

Directory of Patch Names on a disk

18 DIR PATCH



You can see the list of the Patch names saved on a disk.

To see the Patch directory on more than one disk, exchange the disks and push P8.

SAVING

The data written in the internal memory of the S−50 can be saved onto a disk.

Saving the entire data
21 SAVE ALL (Page 105)

Saving Function Parameters
22 SAVE FUNC (Page 106)

Saving MIDI Parameters
23 SAVE MIDI (Page 107)

Saving a Patch
24 SAVE PATCH (Page 108)

Saving the System only
25 SAVE SYS (Page 109)

Formatting a Disk
27 FORMAT (Page 110)

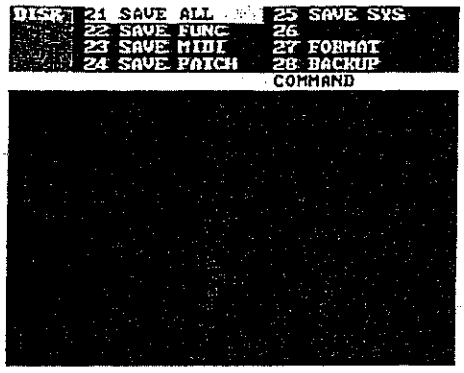
Backup
28 BACKUP (Page 111)

The Protect Tab on a disk serves to protect the data from accidental erasure. To save data onto a disk, be sure to set the tab to the WRITE position first. Then insert it into the disk drive. When the Protect Tab is set to the PROTECT position, the data cannot be saved. After saving is completed, be sure to return the tab to the PROTECT position.

A brand new floppy disk, or a disk being used for any device other than the S−50, should first be formatted as explained on page 110. Then it is possible to save the data. Without properly formatting a disk, the data cannot be saved.

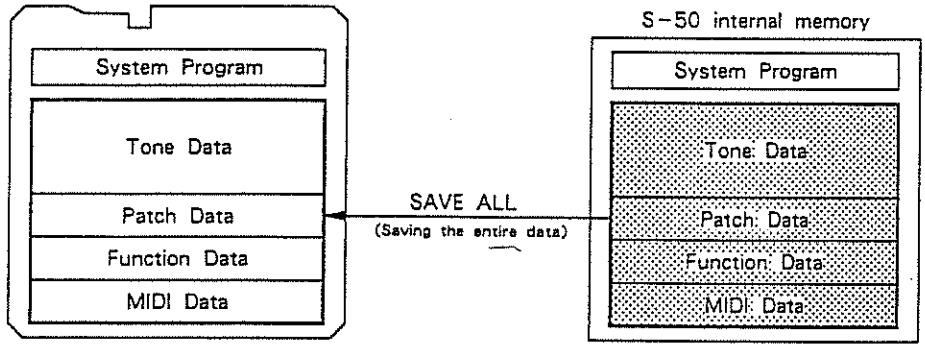
Saving the entire data

11 SAVE ALL



The entire sound data in the internal memory of the S−50 can be saved onto a disk.

Set the Protect Tab of the disk to the WRITE position, and insert the disk into the disk drive.



Set the Protect Tab of the disk to the WRITE position, and insert the disk into the disk drive.

COMMAND .....

Push SHIFT to open the command window.

■EXECUTE > Push ENTER, and "NOW SAVING" is shown on the Message Line.

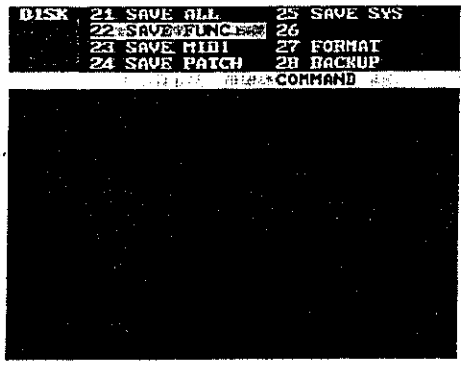
When it counts down up to "00" and "COMPLETE" is shown on the Message Line, SAVE ALL is completed.

.....

Remove the disk from the disk drive, and return the Protect Tab to the PROTECT position.

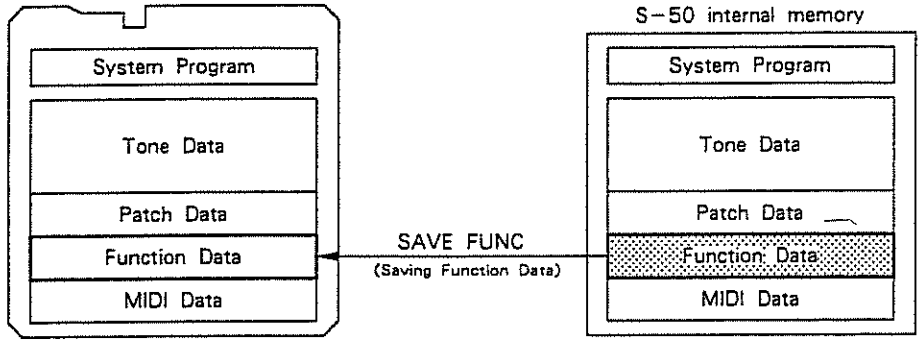
Saving Func Parameters

22 SAVE FUNC



Only the Function data (the parameters which can be set in the Function mode) is saved onto a disk.

Set the Protect Tab on the disk to the WRITE position, and insert it into the disk drive.



Set the Protect Tab of the disk to the WRITE position, and insert the disk into the disk drive.

COMMAND

Push SHIFT to open the command window.

■ EXECUTE >

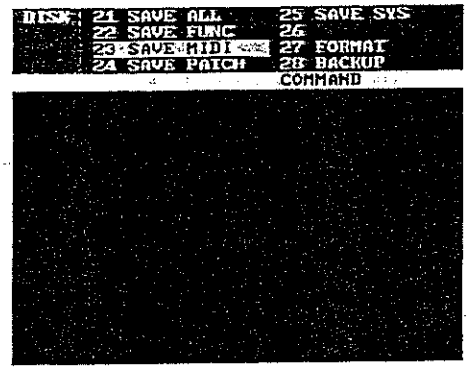
Push ENTER, and "NOW SAVING" is shown on the Message Line.

When finished, "COMPLETE" is shown on the message line.

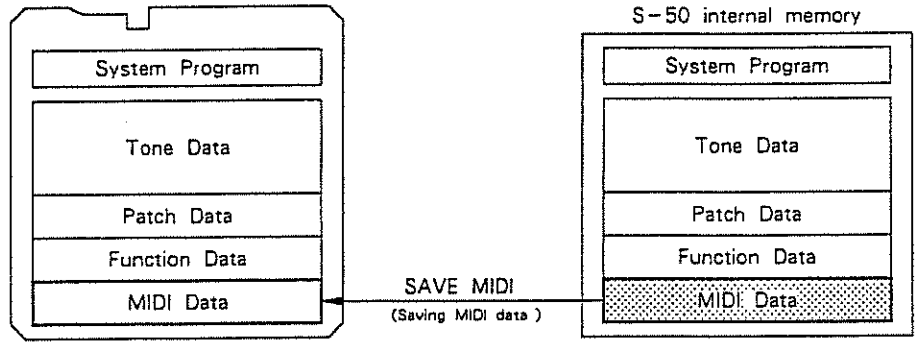
Remove the disk from the disk drive and return the Protect Tab to the PROTECT position.

Saving MIDI Prameters

23 SAVE MIDI



Only the MIDI data (the parameters which can be set in the MIDI mode) is saved onto a disk.



Set the Protect Tab of the disk to the WRITE position, and insert the disk into the disk drive.

COMMAND

Push SHIFT to open the command window.

■ EXECUTE >

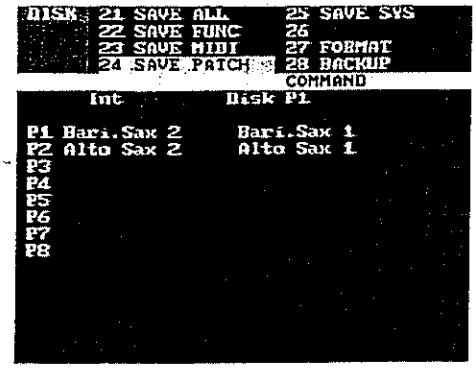
Push ENTER, and "NOW SAVING" is shown on the Message Line.

When finished, "COMPLETE" is shown on the message line.

Remove the disk from the disk drive and return the Protect Tab to the PROTECT position.

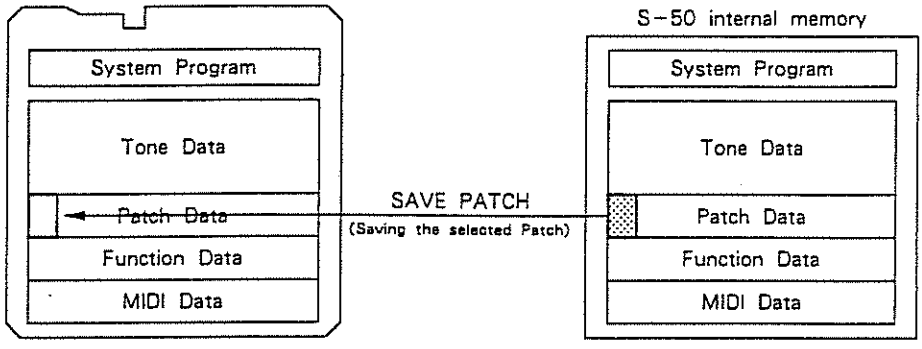
Saving a Patch

24 SAVE PATCH



Patch parameters of a Patch written in the S−50 can be saved onto a disk.

The left half of the Display shows the list of the Patches written in the internal memory of the S−50, and the right half shows the list of the Patches saved on the disk.



Step 1 Set the Protect Tab on the disk to the WRITE position, and insert the disk to the disk drive.

Step 2 Push P4.(This menu lets you see only the Patch names of the data saved on the disk.)

Step 3 Where it says"INT," enter the Patch number to be saved (=source Patch), and at DISK, the Patch number where the source Patch is to be saved (=destination Patch number).

COMMAND

Push SHIFT to open the command window.

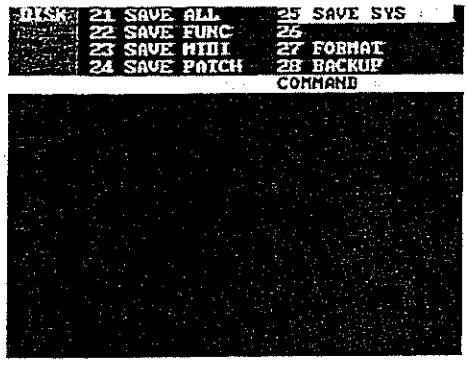
■ EXECUTE > Push ENTER, and "NOW SAVING" is shown on the Message Line.

When finished, "COMPLETE" is shown on the message line.

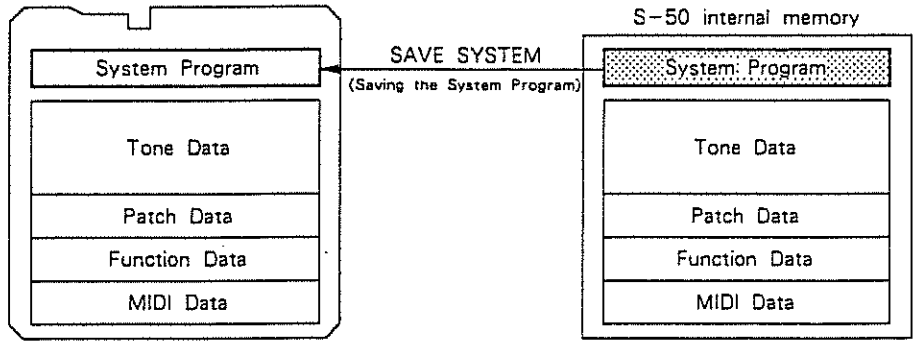
Remove the disk from the disk drive, and return the Protect Tab to the PROTECT position.

Saving the System

25 SAVE SYS



The system program loaded in the internal memory can be saved onto the disk.



Set the Protect Tab on the disk to the WRITE position, and insert the disk.

COMMAND

Push SHIFT to open the command window.

■EXECUTE >

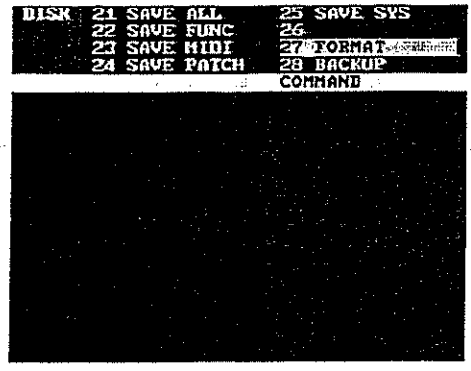
Push ENTER, and "S-50 VER.2.00" is shown on the message line.

When finished, "COMPLETE" is shown on the message line.

Remove the disk from the disk drive, and return the Protect Tab to the PROTECT position.

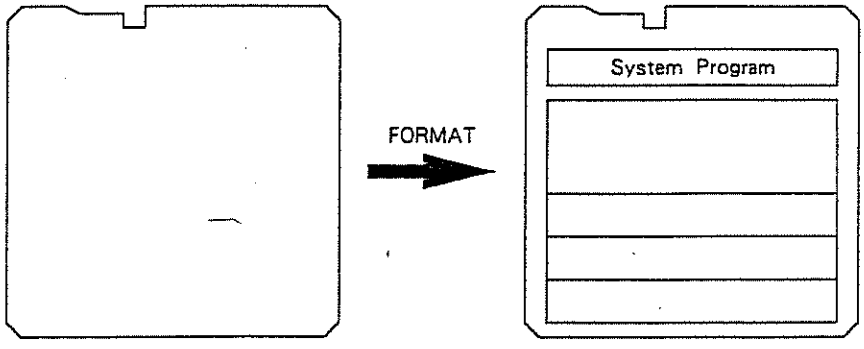
Format

27 FORMAT



This formats the disk for the S−50, and saves the system program loaded in the internal memory of the S−50.

The data in the S−50 cannot be saved onto a brand new disk, or a disk which has been used for a device other than the S−50, unless it is formatted.



Make a space for the S−50 and write the system program on a brand−new disk or the disk used for something else.

Set the Protect Tab on the disk to the WRITE position, and insert the disk.

COMMAND

Push SHIFT to open the command window.

■ EXECUTE

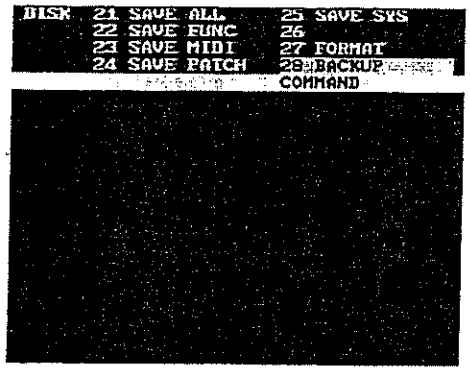
Push ENTER, and "NOW FORMATTING" is shown on the message line.

When it counts down to 00, and "COMPLETE" is shown, FORMAT is completed.

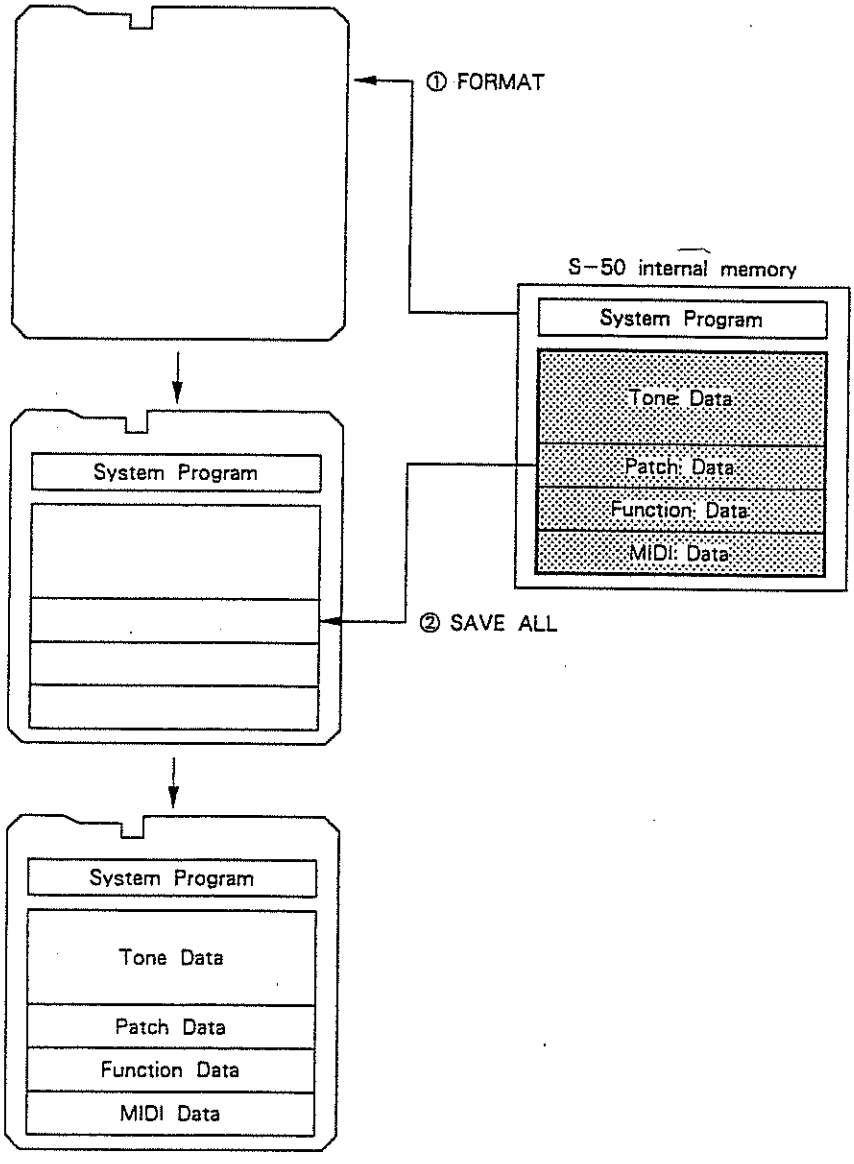
Remove the disk from the disk drive and set the Protect Tab to the PROTECT position.

Backup

27 BACKUP



The entire data in the internal memory of the S−50 can be saved onto a disk.



BACKUP includes both the [FORMAT] and [SAVE ALL] functions.

Set the Protect Tab on the disk to the WRITE position, and insert it into the disk drive.

COMMAND

Push SHIFT to open the command window.

■ EXECUTE >

Push ENTER.

"FORMATTING" is shown on the message line first, then it counts down to 00, and "NOW SAVING" appears.

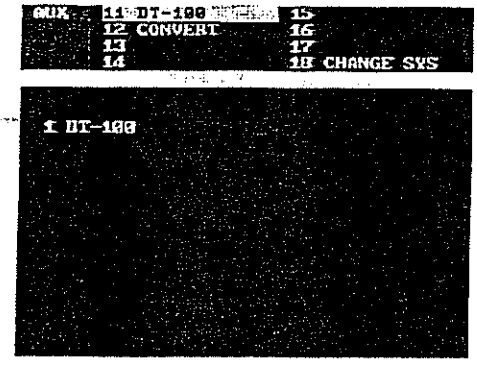
When it counts down to 00 again, and "COMPLETE" is shown, BACKUP is completed.

Remove the disk from the disk drive, return the Protect Tab to the PROTECT position.

7. AUX Mode

DT-100's Switch

11 DT-100

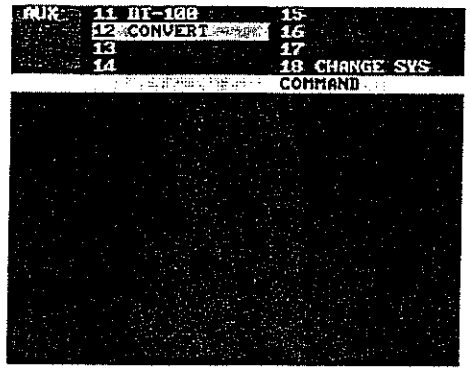


Turn this to ON when using the DT-100.

*This parameter data is saved on a disk together with the Function data (the parameters set in the Function mode.)

Convert

12 CONVERT



CONVERT updates a Ver.1.00 disk to Ver.2.00. The system program of the Ver. 1.00 disk is converted into Ver.2.00 leaving the sound data intact.

Insert the Ver.1.00 disk to be converted into the disk drive with the Protect Tab set to the WRITE position.

COMMAND .....

Push SHIFT to open a command window.

■EXECUTE > Push ENTER, and "WORKING" is shown on the message line.

When finished, "COMPLETE" is shown on the message line.

.....

Remove the disk from the disk drive and return the Protect Tab to the PROTECT position.

Change System

18 CHANGE SYS

The Change System function is provided to exchange the System Program of the Ver.2.00 disk for further software, e.g. sequencer which will be released in the future.

***Do not use this function to convert a Ver.1.00 disk into Ver.2.00<, but use the CONVERT function.**

ERROR MESSAGE TABLE

DISK LOAD ERROR＊＊ **(No matter what number is shown at ＊＊, the necessary procedure to be taken is the same.)**

There is something wrong with the system disk. Replance it with a proper one.

DISK ERROR＊＊ **(No matter what number is shown at ＊＊, the necessary procedure to be taken is the same.)**

There is something wrong with a floppy disk. Replance it with a proper one.

DISK PROTECTED The Protect Tab on the floppy disk is set to the PROTECT position. Set the tab to the WRITE position and repeat writing.

INSERT DISK A floppy disk is not connected to the S−50 or the connected disk is not formatted for the S−50. Insert a disk formatted for the S−50.

DISK Ver. ERROR This error message appears when you have tried to read data from the Ver. 1.0 disk on the S−50 booted with the Ver. 2.0 system, or when you have tried to convert the disk already converted from Ver. 1.0 to 2.0.

NOT EXECUTE This is shown when you have tried to execute what is impossible on the S−50, such as the value you have set is not appropriate.

SPECIFICATIONS

61 key, 16 voice, polyphonic sampling keyboard with velocity sensitivity and aftertouch.

■ **Memory**
Wave Data 512k words
32 Tone/Tone Parameters
8 Patch/Patch Parameters
Function Parameters
MIDI Function Parameters

■ **Front Panel**
Volume Knob
Recording Level Knob
Bender Modulation Lever
Patch Button
Patch Selector Buttons
Shift Button
Display
Mode Selector Buttons
Ten Key Pad (0 to 9, ENTER)
Cursor Buttons
Alpha Dial
Page Buttons

■ **Rear Panel**
Headphone Jack
Output Level Switch
Mix Output Jack
Individual Output Jacks x 4
Input Gain Knob
Input Jack
Hold/Rec Start Jack
External Control Jack x 2
MIDI Connector x 3
RGB Connector for a Color Monitor Display

Composite Connector for a Black and White Monitor Display
AUX Connector
Power Switch

■ **Disk Drive**
3.5" Micro Floppy Disk Drive : Double density, Double Track (2DD)

■ **Dimensions**
1105.5 (W) X 328 (D) X 93 (H) mm /43-1/2" X 12-15/16" X 3-11/16"

■ **Weight**
13kg/28 lb 11 oz

■ **Consumption**
36W

■ **Accessories**
Connection Cord x 1
System Disk x 1
Sound Library Disk x 4
Floppy Disk Case
Owner's manual
Guide Book for MIDI
Power Supply Cord x 1

■ **Options**
Pedal Switch DP-2, FS-5U
Expression Pedal EV-5
Digitizer Tablet
RGB Cable RGB-25N
3.5" Micro Floppy Disk MF2DD
Sound Library Disks RSB-501 to 505

*** Specifications are subject to change without notice.**

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16-VOICE DIGITAL SAMPLING KEYBOARD
MODEL S-50

MIDI Implementation Chart

Date : Mar. 30. 1987
Version : 2.00

Function...		Transmitted	Recognized	Remarks
Basic	Default	1-16	1-16 *4	*2
Channel	Changed	1-16	1-16 *4	
Mode	Default	Mode 3	Mode 3	*2
	Messages	Mode 3	X	
	Altered	*********	X	
Note Number		39-96	0-127	
	True Voice	*********	0-127	
Velocity	Note ON	O	*1	v=1-127
	Note OFF	X (9n, v=0)	X	
After Touch	Key's	X	X	
	Ch's	*1	*1	
Pitch Bender		*1	*1 (0-12 semi)	9 bit resolution
Control Change	1	*1	*1	Modulation
	7	*1	*1	Volume
	64	*1	*1	Hold
	100, 101			RPC LSB, MSB
	6, 38			Data Entry LSB, MSB
				Number-0 Pitch Bend Sensitivity
Prog Change		*1 (0-127)	*1 (0-127)	*3
	True #	*********	0-127	
System Exclusive		*1	*1	
System Common	Song Pos	X	X	
	Song sel	X	X	
	Tune	X	X	
System Real Time	Clock	X	X	
	Commands	X	X	
Aux Message	Local ON/OFF	X	X	
	All Notes OFF	O (123)	O (123-127)	
	Active Sense	X	X	
	Reset	X	X	
Notes		*1 Can be set to O or X manually, and memorized by disk. *2 Memorized by disk. *3 Program change numbers for each Patch can be set freely. *4 MIDI Channel of each voice group can be set in Multi Channel Mode.		

Mode 1 : OMNI ON, POLY
Mode 2 : OMNI ON, MONO
Mode 3 : OMNI OFF, POLY
Mode 4 : OMNI OFF, MONO

O : Yes
X : No

Roland

S-50

Ver. 2.00

MIDI Implementation

1. Data Format for Exclusive Messages

Roland's MIDI implementation uses the following data format for all exclusive messages (type IV) :

Byte	Description
F0H	Exclusive status
41H	Manufactures ID (Roland)
DEV	Device ID
MDL	Model ID
CMD	Command ID
[BODY]	Maindata
F7H	End of exclusive

MIDI status : F0H, F7H

An exclusive message must be flanked by a pair of status codes, starting with a Manufactures-ID immediately after F0H (MIDI version1.0).

Manufactures- ID : 41H

The Manufactures-ID identifies the manufacturer of a MIDI instrument that triggeres an exclusive message. Value 41H represents Roland's Manufactures-ID.

Device- ID : DEV

The Device-ID contains a unique value that identifies the individual device in the multiple implementation of MIDI instruments. It is usually set to 00H - 0FH, a value smaller by one than that of a basic channel, but value 00H - 1FH may be used for a device with multiple basic channels.

Model- ID : MDL

The Model-ID contains a value that uniquely identifies one model from another. Different models, however, may share an identical Model-ID if they handle similar data.

The Model-ID format may contain 00H in one or more places to provide an extended data field. The following are examples of valid Model-IDs, each representing a unique model :

01H
02H
03H
00H, 01H
00H, 02H
00H, 00H, 01H

Command- ID : CMD

The Command-ID indicates the function of an exclusive message. The Command-ID format may contain 00H in one or more places to provide an extended data field. The following are examples of valid Command-IDs, each representing a unique function :

01H
02H
03H
00H, 01H
00H, 02H
00H, 00H, 01H

Main data : BODY

This field contains a message to be exchanged across an interface. The exact data size and contents will vary with the Model-ID and Command-ID.

2. Address- mapped Data Transfer

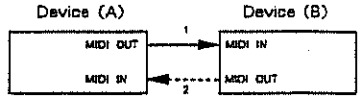
Address mapping is a technique for transferring messages conforming to the data format given in Section 1. It assigns a series of memory-resident records--waveform and tone data, switch status, and parameters, for example--to specific locations in a machine-dependent address space, thereby allowing access to data residing at the address a message specifies.

Address-mapped data transfer is therefore independent of models and data categories. This technique allows use of two different transfer procedures : one-way transfer and handshake transfer.

One- way transfer procedure (See Section3 for details.)

This procedure is suited for the transfer of a small amount of data. It sends out an exclusive message completely independent of a receiving device status.

Connection Diagram

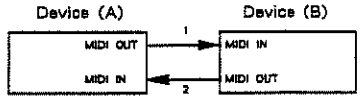


Connectionat point2 is essential for "Request data" procedures. (See Section3.)

Handshake- transfer procedure (See Section4 for details.)

This procedure initiates a predetermined transfer sequence (handshaking) across the interface before data transfer takes place. Handshaking ensures that reliability and transfer speed are high enough to handle a large amount of data.

Connection Diagram



Connectionat points1 and 2 is essential.

Notes on the above two procedures

*There are separate Command-IDs for different transfer procedures.
*DevicesA and B cannot exchange data unless they use the same transfer procedure, share identical Device-ID and Model ID, and are ready for communication.

3. One- way Transfer Procedure

This procedure sends out data all the way until it stops when the messages are so short that answerbacks need not be checked.
For long messages, however, the receiving device must acquire each message in time with the transfer sequence, which inserts intervals of at least 20milliseconds in between.

Types of Messages

Message	Command ID
Request data 1	RQ1 (11H)
Data set 1	DT1 (12H)

Request data # 1 : RQ1 (11H)

This message is sent out when there is a need to acquire data from a device at the other end of the interface. It contains data for the address and size that specify designation and length, respectively, of data required.
On receiving an RQ1 message, the remote device checks its memory for the data address and size that satisfy the request.

If it finds them and is ready for communication, the device will transmit a "Data set 1 (DT1)" message, which contains the requested data. Otherwise, the device will send out nothing.

Byte	Description
F0H	Exclusive status
41H	Manufactures ID (Roland)
DEV	Device ID
MDL	Model ID
11H	Command ID
aaH	Address MSB
⋮	⋮
	LSB
ssH	Size MSB
⋮	⋮
	LSB
sum	Check sum
F7H	End of exclusive

*The size of the requested data does not indicate the number of bytes that will make up a DT1 message, but represents the address fields where the requested data resides.
*Some models are subject to limitations in data format used for a single transaction. Requested data, for example, may have a limit in length or must be divided into predetermined address fields before it is exchanged across the interface.
*The same number of bytes comprises address and size data, which, however, vary with the Model-ID.
*The error checking process uses a checksum that provides a bit pattern where the least significant 7 bits are zero when values for an address, size, and that checksum are summed.

Data set 1 : DT1 (12H)

This message corresponds to the actual data transfer process. Because every byte in the data is assigned a unique address, a DT1 message can convey the starting address of one or more data as well as a series of data formatted in an address - dependent order.

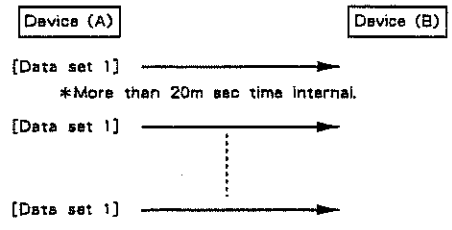
The MIDI standards inhibit non-real time messages from interrupting an exclusive one. This fact is inconvenient for the devices that support a "soft-through" mechanism. To maintain compatibility with such devices, Roland has limited the DT1 to 256 bytes so that an excessively long message is sent out in separate segments.

Byte	Description
F0H	Exclusive
41H	Manufactures ID (Roland)
DEV	Device ID
MDL	Model ID
12H	Command ID
aaH	Address MSB
	LSB
ddH	Data
sum	Check sum
F7H	End of exclusive

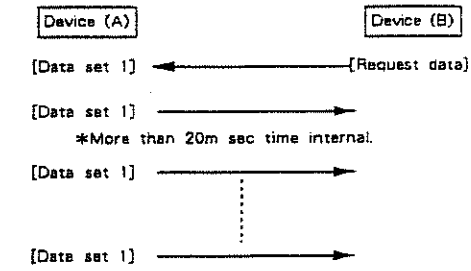
*A DT1 message is capable of providing only the valid data among those specified by an RQ1 message.
*Some models are subject to limitations in data format used for a single transaction. Requested data, for example, may have a limit in length or must be divided into predetermined address fields before it is exchanged across the interface.
*The number of bytes comprising address data varies from one Model-ID to another.
*The error checking process uses a checksum that provides a bit pattern where the least significant 7 bits are zero when values for an address, size, and that checksum are summed.

Example of Message Transactions

● Device A sending data to Device B
Transfer of a DT1 message is all that takes place.



● Device B requesting data from Device A
Device B sends an RQ1 message to Device A. Checking the message, Device A sends a DT1 message back to Device B.



4. Handshake- Transfer Procedure

Handshaking is an interactive process where two devic exchange error checking signals before a message transacti takes place, thereby increasing data reliability. Unlike one-w transfer that inserts a pause between message transactior handshake transfer allows much speedier transactions becau data transfer starts once the receiving device returns a rua signal.

When it comes to handling large amounts of data--sampl waveforms and synthesizer tones over the entire range, fo example--across a MIDI interface, handshaking transfer more efficient than one-way transfer.

Types of Messages

Message	Command ID
Want to send data	WSD (40H)
Request data	RQD (41H)
Data set	DAT (42H)
Acknowledge	ACK (43H)
End of data	EOD (45H)
Communication error	ERR (4EH)
Rejection	RJC (4FH)

Want to send data : WSD (40H)

This message is sent out when data must be sent to a devi at the other end of the interface. It contains data for tl address and size that specify designation and length respectively, of the data to be sent.

On receiving a WSD message, the remote device checks i memory for the specified data address and size which w satisfy the request. If it finds them and is ready f communication, the device will return an "Acknowled (ACK)" message.
Otherwise, it will return a "Rejection (RJC)" message.

Byte	Description
F0H	Exclusive status
41H	Manufactures ID (Roland)
DEV	Device ID
MDL	Model ID
40H	Command ID
aaH	Address MSB
	LSB
ssH	Size MSB
	LSB
sum	Check sum
F7H	End of exclusive

*The size of the data to be sent does not indicate the numb of bytes that make up a "Data set (DAT)" message, b represents the address fields where the data should resid
*Some models are subject to limitations in data format us for a single transaction. Requested data, for example, m have a limit in length or must be divided into predetermin address fields before it is exchanged across the interface.
*The same number of bytes comprises address and size da which, however, vary with the Model-ID.
*The error checking process uses a checksum that provid a bit pattern where the least significant 7 bits are zero wh values for an address, size, and that checksum are summe

Request data : RQD (41H)

This message is sent out when there is a need to acquire data from a device at the other end of the interface. It contains data for the address and size that specify designation and length, respectively, of data required.

On receiving an RQD message, the remote device checks its memory for the data address and size which satisfy the request. If it finds them and is ready for communication, the device will transmit a "Data set (DAT)" message, which contains the requested data. Otherwise, it will return a "Rejection (RJC)" message.

Byte	Description
F0H	Exclusive status
41H	Manufactures ID (Roland)
DEV	Device ID
MDL	Model ID
41H	Command ID
aaH	Address MSB
⋮	⋮
	LSB
ssH	Size MSB
⋮	⋮
	LSB
sum	Check sum
F7H	End of exclusive

*The size of the requested data does not indicate the number of bytes, that make up a "Data set (DAT)" message, but represents the address fields where the requested data resides.
*Some models are subject to limitations in data format used for a single transaction: Requested data, for example, may have a limit in length or must be divided into predetermined address fields before it is exchanged across the interface.
*The same number of bytes comprises address and size data, which, however, vary with the Model-ID.
*The error checking process uses a checksum that provides a bit pattern where the least significant 7 bits are zero when values for an address, size, and that checksum are summed.

Data set : DAT (42H)

This message corresponds to the actual data transfer process. Because every byte in the data is assigned a unique address, the message can convey the starting address of one or more data as well as a series of data formatted in an address-dependent order.

Although the MIDI standards inhibit non-real time messages from interrupting an exclusive one, some devices support a "soft-through" mechanism for such interrupts. To maintaincompatibility with such devices, Roland has limited the DAT to 256bytes so that an excessively long message is sent out in separate segments.

Byte	Description
F0H	Exclusive status
41H	Manufactures ID (Roland)
DEV	Device ID
MDL	Model ID
42H	Command ID
aaH	Address MSB
⋮	⋮
	LSB
ddH	Data
⋮	⋮
sum	Check sum
F7H	End of exclusive

*A DAT message is capable of providing only the valid data among those specified by an RQD or WSD message.
*Some models are subject to limitations in data format used for a single transaction. Requested data, for example, may have a limit in length or must be divided into predetermined address fields before it is exchanged across the interface.
*The number of bytes comprising address data varies from one model ID to another.
*The error checking process uses a checksum that provides a bit pattern where the least significant 7 bits are zero when values for an address, size, and that checksum are summed.

Acknowledge : ACK (43H)

This message is sent out when no error was detected on reception of a WSD, DAT, "End of data (EOD)", or some other message and a requested setup or action is complete. Unless it receives an ACK message, the device at the other end will not proceed to the next operation.

Byte	Description
F0H	Exclusive status
41H	Manufactures ID (Roland)
DEV	Device ID
MDL	Model ID
43H	Command ID
F7H	End of exclusive

End of data : EOD (45H)

This message is sent out to inform a remote device of the end of a message. Communication, however, will not come to an end unless the remote device returns an ACK message even though an EOD message was transmitted.

Byte	Description
F0H	Exclusive status
41H	Manufactures ID (Roland)
DEV	Device ID
MDL	Model ID
45H	Command ID
F7H	End of exclusive

Communications error : ERR (4EH)

This message warns the remote device of a communications fault encountered during message transmission due, for example, to a checksum error. An ERR message may be replaced with a "Rejection (RJC)" one, which terminates the current message transaction in midstream.

When it receives an ERR message, the sending device may either attempt to send out the last message a second time or terminate communication by sending out an RJC message.

Byte	Description
F0H	Exclusive status
41H	Manufactures ID (Roland)
DEV	Device ID
MDL	Model ID
4EH	Command ID
F7H	End of exclusive

Rejection : RJC (4FH)

This message is sent out when there is a need to terminate communication by overriding the current message. An RJC message will be triggered when :

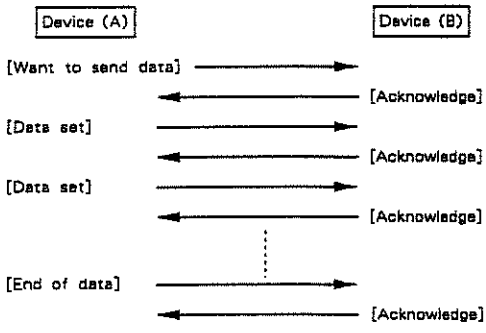
- a WSD or RQD message has specified an illegal data address or size,
- the device is not ready for communication.
- an illegal number of addresses or data has been detected.
- data transfer has been terminated by an operator.
- a communications error has occurred.

An ERR message may be sent out by a device on either side of the interface. Communication must be terminated immediately when either side triggers an ERR message.

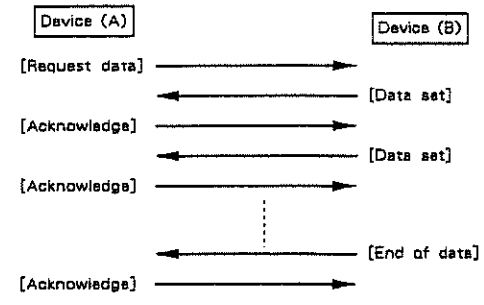
Byte	Description
F0H	Exclusive status
41H	Manufactures ID (Roland)
DEV	Device ID
MDL	Model ID
4FH	Command ID
F7H	End of exclusive

Example of Message Transactions

● Data transfer from device (A) to device (B).

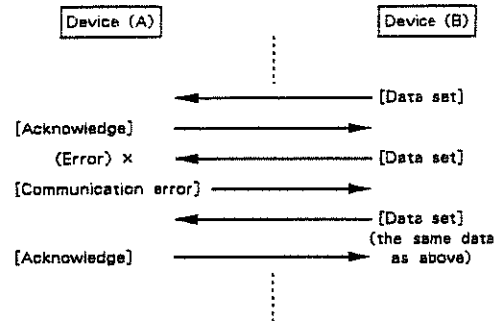


● Device (A) requests and receives data from device (B).

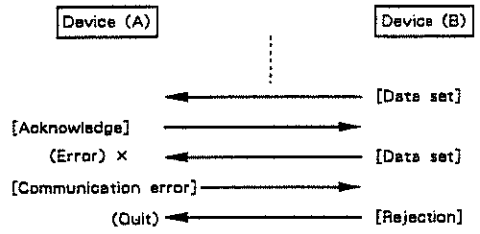


● Error occurs while device (A) is receiving data from device (B).

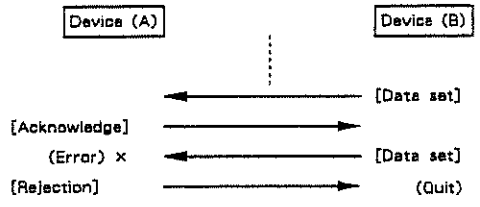
1) Data transfer from device (A) to device (B).



2) Device (B) rejects the data re-tranamitied, and quits data transfer.



3) Device (A) immediately quits data transfer.



MODEL S-50 MIDI Implementation

Date:Apr.13.1987
Version:2.00

1. TRANSMITTED DATA

Status	Second	Third	Description	
1001 nnnn	0kkkkkkk	00000000	Note OFF kkkkkkk = 36 - 96	
1001 nnnn	0kkkkkkk	0vvvvvvv	Note ON. kkkkkkk = 36 - 96 vvvvvvv = 1 - 127	
1011 nnnn	00000001	0vvvvvvv	Modulation vvvvvvv = 0 - 127	*1-1
1011 nnnn	00000111	0vvvvvvv	Volume vvvvvvv = 0 - 127	*1-1
1011 nnnn	00000110	0vvvvvvv	DATA ENTRY MSB	*1-1,*1-5
1011 nnnn	00100110	0vvvvvvv	DATA ENTRY LSB	*1-1,*1-5
1011 nnnn	01000000	0vvvvvvv	Hold 1 vvvvvvv = 0 (OFF) vvvvvvv = 127 (ON)	*1-1
1011 nnnn	01100100	0vvvvvvv	RPC LSB	*1-1,*1-5
1011 nnnn	01100101	0vvvvvvv	RPC MSB RPC # = 0	*1-1,*1-5
1011 nnnn	01000000	0vvvvvvv	Hold 1 vvvvvvv = 0 (OFF) vvvvvvv = 127 (ON)	*1-1
1011 nnnn	0mmmmmmm	01111111	Control change mmmmmmm = 0 - 95 1111111 = 0 - 127	*1-6
1100 nnnn	0ppppppp		Program Change ppppppp = 0 - 127	*1-1,*1-2
1101 nnnn	0vvvvvvv		Channel After Touch vvvvvvv = 0 - 127	*1-1
1110 nnnn	0vvvvvvv	0vvvvvvv	Pitch Bend Change	*1-1
1011 nnnn	01111011	00000000	All NOTES OFF	*1-3
1011 nnnn	01111100	00000000	OMNI OFF	*1-4
1011 nnnn	01111111	00000000	POLY ON	*1-4
1111 0000	....	11110111	System exclusive	*1-1

Notes:

*1-1 Transmitted if the corresponding function switch is ON.

*1-2 Sent whenever 'Patch Number' is changed.
The program number (ppppppp) can be one of the numbers between 0 and 127.

*1-3 Sent whenever 'Patch Number' is changed.

*1-4 When power is first applied, these messages are transmitted.

*1-5 When BEND RANGE is changed,RPC (Registerd parameter control number)

BnH,64H,pp,65H,qq,06H,mm,26H,ll
pp,qq = RPC number LSB,MSB
mm,ll = parameter value MSB,LSB

RPC #	value MSB	value LSB	Description
0	0vvv vvvv	0000 0000	BEND RANGE (0-12 semitone, 1 semitone step)

*1-6 Transmitted if it assigns Control Knob as Control Change.

2. RECOGNIZED DATA *2-1

Status	Second	Third	Description	
1000 nnnn	0kkkkkkk	0vvvvvvv	Note OFF,velocity ignored	
1001 nnnn	0kkkkkkk	00000000	Note OFF kkkkkkk = 0 - 127	
1001 nnnn	0kkkkkkk	0vvvvvvv	Note ON. kkkkkkk = 0 - 127 vvvvvvv = 1 - 127	
1011 nnnn	00000001	0vvvvvvv	Modulation vvvvvvv = 0 - 127	*2-2
1011 nnnn	00000111	0vvvvvvv	Volume vvvvvvv = 0 - 127	*2-2
1011 nnnn	00000110	0vvvvvvv	DATA ENTRY MSB	*2-2,*2-5
1011 nnnn	00100110	0vvvvvvv	DATA ENTRY LSB	*2-2,*2-5
1011 nnnn	01000000	01xxxxxx	Hold 1 ON	*2-2
1011 nnnn	01000000	00xxxxxx	Hold 1 OFF	*2-2
1011 nnnn	01100100	0vvvvvvv	RPC LSB	*2-2,*2-5
1011 nnnn	01100101	0vvvvvvv	RPC MSB	*2-2,*2-5
1100 nnnn	0ppppppp		Program Change ppppppp = 0 - 127	*2-3
1101 nnnn	0vvvvvvv		Channel After Touch vvvvvvv = 0 - 127	*2-2
1110 nnnn	0vvvvvvv	0vvvvvvv	Pitch Bend Change	*2-2
1011 nnnn	01111011	00000000	All NOTES OFF	*2-2
1011 nnnn	01111100	00000000	OMNI OFF	*2-4
1011 nnnn	01111111	00000000	POLY ON	*2-4
1111 0000	....	11110111	System exclusive	*2-2

Notes:

*2-1 The number nnnn should match one of the channel numbers set on the S-50 in the multi-channel mode.

*2-2 Received if the corresponding function switch is ON.

*2-3 Recognized only when the program number is one of the patch numbers.

*2-4 Mode Messages (123 - 127) are also recognized as ALL NOTES OF

*2-5 RPC and value (DATA ENTRY) are recognized as follows.

RPC #	value MSB	value LSB	Description
0	0vvv vvvv	0xxx xxxx	BEND RANGE (0-12 semitone, 1 semitone step) xxxxxxx is ignored.

3. EXCLUSIVE COMMUNICATIONS

The S-50 can send or receive Exclusive Message only when Exclusive switch is set at on on the panel.

The Model - ID number of the S-50 is [41H].

Device - ID can be changed from the panel in MIDI Mode. The 1 - 16 on the display correspond to Device - ID codes 0 - 15, respectively.

Address and Size should 3 bytes of data, respectively.

3.1 One way communication

3.1.1 Request RQ1 11H

Only when the address and size in RQ1 match those set on the S it transmits the corresponding data.
Requests having illegal address or size are ignored.

The S-50 won't send RQ1.

Byte	Description	
F0H	Exclusive status	
41H	Roland - ID	
DEV	Device - ID	
18H	Model - ID (S-50)	
11H	Command - ID (RQ1)	
aaH	Address MSB	*3-
aaH	Address	
aaH	Address LSB	
ssH	Size MSB	*3-
ssH	Size	
ssH	Size LSB	
sum	Checksum	
F7H	EOX (End of Exclusive)	

3.1.2 Data set DT1 12H

When a Data set message contains an appropriate address, the S-50 stores the associated data into that address. Any Data set having illegal address is ignored.

The S-50 sends a Data set message when Tone Parameter is edited on the pannel or when it receives RQ1.

Byte	Description	
F0H	Exclusive status	
41H	Roland - ID	
DEV	Device - ID	
18H	Model - ID (S-50)	
12H	Command - ID (DT1)	
aaH	Address MSB	*3-1
aaH	Address	
aaH	Address LSB	
ddH	Data	*3-2
:		
sum	Checksum	
F7H	EOX (End of Exclusive)	

3.2 Handshaking communication

3.2.1 Want to send data WSD 40H

When received WSD message has correct address and size data, the S-50 sends ACK and waits the associated data.
If not correct, it will send RJC.

The S-50 won't transmit WSD.

Byte	Description	
F0H	Exclusive status	
41H	Roland - ID	
DEV	Device - ID	
18H	Model - ID (S-50)	
40H	Command - ID (WSD)	
aaH	Address MSB	*3-1
aaH	Address	
aaH	Address LSB	
ssH	Size MSB	*3-1
ssH	Size	
ssH	Size LSB	
sum	Checksum	
F7H	EOX (End of Exclusive)	

3.2.2 Request data RQD 41H

Upon receipt of RQD containing correct address and size data, the S-50 sends the corresponding data.
Instead, it will send RJC if the address and size are incorrect.

The S-50 won't send RQD.

Byte	Description	
F0H	Exclusive status	
41H	Roland - ID	
DEV	Device - ID	
18H	Model - ID (S-50)	
41H	Command - ID (RQD)	
aaH	Address MSB	*3-1
abH	Address	
acH	Address LSB	
szH	Size MSB	*3-1
sbH	Size	
scH	Size LSB	
sum	Checksum	
F7H	EOX (End of Exclusive)	

3.2.3 Data set DAT 42H

Byte	Description	
F0H	Exclusive status	
41H	Roland - ID	
DEV	Device - ID	
18H	Model - ID (S-50)	
42H	Command - ID (DAT)	
aaH	Address MSB	*3-1
abH	Address	
acH	Address LSB	
ddH	Data	*3-2
:		
sum	Checksum	
F7H	EOX (End of Exclusive)	

3.2.4 Acknowledge ACK 43H

Byte	Description
F0H	Exclusive status
41H	Roland - ID
DEV	Device - ID
18H	Model - ID (S-50)
43H	Command - ID (ACK)
F7H	EOX (End of Exclusive)

3.2.5 End of data EOD 45H

Byte	Description
F0H	Exclusive status
41H	Roland - ID
DEV	Device - ID
18H	Model - ID (S-50)
45H	Command - ID (EOD)
F7H	EOX (End of Exclusive)

3.2.6 Communication error ERR 4EH

The S-50 sends ERR if a checksum error occurs.

Upon receipt of ERR, the S-50 sends RJC and ceases the current communication.

Byte	Description
F0H	Exclusive status
41H	Roland - ID
DEV	Device - ID
18H	Model - ID (S-50)
4EH	Command - ID (ERR)
F7H	EOX (End of Exclusive)

3.2.7 Rejection RJC 4FH

The S-50 sends RJC and ceases communication if it detects one of the following :
a) ERR is received.
b) address in the data set it is sending are not continuous one and
c) ENTER is activated on the panel.

Byte	Description
F0H	Exclusive status
41H	Roland - ID
DEV	Device - ID
18H	Model - ID (S-50)
4FH	Command - ID (RJC)
F7H	EOX (End of Exclusive)

Notes :

*3-1 Address and size should specify a memory space in which data exist. The lowest bit of LSB byte in address and size should be 0.

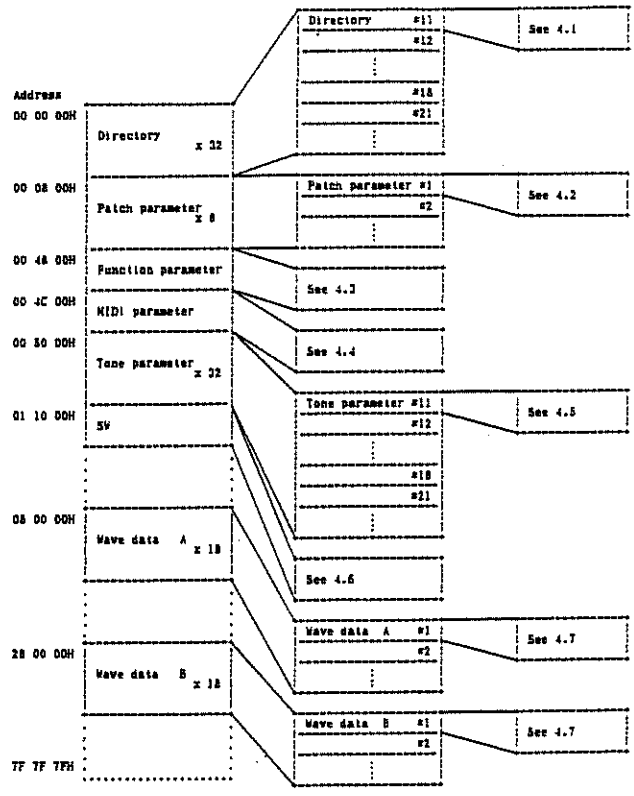
*3-2 The number of data bytes should be even number.

4. Address mapping of parameters

The address is described in 7-bit bytes as follows.

Address	MSB		LSB
binary	0aaa aaaa	0bbb bbbb	0ccc cccc
7 bit Hex	AA	BB	CC

The address used in communication is a top address of each block plus a offset address.



4.1 Directory

Offset address	Description		
00H 01H : : 0EH 0FH	0000 aaaa 0000 bbbb 0000 aaaa 0000 bbbb	TONE NAME 1 aaaa bbbb TONE NAME 8 aaaa bbbb	32 - 127 (ASCII) 32 - 127 (ASCII)
10H 11H	0xxx xxxx 0xxx xxxx	dummy	
12H 13H	0000 aaaa 0000 bbbb	SOURCE TONE aaaa bbbb	0 - 31
14H 15H	0000 aaaa 0000 bbbb	ORIG/SUB TONE aaaa bbbb	0: ORG 1: SUB
16H 17H	0000 aaaa 0000 bbbb	SAMPLING FREQUENCY aaaa bbbb	0:30KHz 1:15KHz
18H 19H	0000 aaaa 0000 bbbb	ORIG KEY NUMBER aaaa bbbb	11 - 120 (MIDI FORMAT)
1AH 1BH	0000 aaaa 0000 bbbb	WAVE BANK aaaa bbbb	0: A 1: B
1CH 1DH	0000 aaaa 0000 bbbb	WAVE SEGMENT TOP aaaa bbbb	0 - 17
1EH 1FH	0000 aaaa 0000 bbbb	WAVE SEGMENT LENGTH aaaa bbbb	0 - 18
Total size		00 00 20H	

4.2 Patch parameter

Offset address		Description	
00 00H 00 01H : : 00 16H 00 17H	0000 aaaa 0000 bbbb 0000 aaaa 0000 bbbb	PATCH NAME 1 aaaa bbbb PATCH NAME 12 aaaa bbbb	32 - 127 (ASCII) 32 - 127 (ASCII)
00 18H 00 19H	0000 aaaa 0000 bbbb	BEND RANGE aaaa bbbb	0 - 11
00 1AH 00 1BH	0xxx xxxx 0xxx xxxx	dummy	
00 1CH 00 1DH	0000 aaaa 0000 bbbb	AFTER TOUCH SENSE aaaa bbbb	0 - 127
00 1EH : 00 25H	0xxx xxxx 0xxx xxxx	dummy	
00 26H 00 27H	0000 aaaa 0000 bbbb	KEY MODE aaaa bbbb	0: Normal 1: V-Sw 2: X-Fade 3: V-Mix 4: Unison
00 28H 00 29H	0000 aaaa 0000 bbbb	VELOCITY SW THRESHOLD aaaa bbbb	0 - 127
00 2AH : 00 4FH	0xxx xxxx 0xxx xxxx	dummy	
00 50H 00 51H : 01 4EH 01 4FH	0000 aaaa 0000 bbbb 0000 aaaa 0000 bbbb	TONE TO KEY #1-1 aaaa bbbb TONE TO KEY #1-128 aaaa bbbb	0 - 31 0 - 31
01 50H 01 51H : 02 4EH 02 4FH	0000 aaaa 0000 bbbb 0000 aaaa 0000 bbbb	TONE TO KEY #2-1 aaaa bbbb TONE TO KEY #2-128 aaaa bbbb	0 - 31 0 - 31
02 50H 02 51H	0000 aaaa 0000 bbbb	COPY SOURCE aaaa bbbb	0 - 7
02 52H 02 53H	0000 aaaa 0000 bbbb	OCTAVE SHIFT aaaa bbbb	-2 - 2
02 54H 02 55H	0000 aaaa 0000 bbbb	OUTPUT LEVEL aaaa bbbb	0 - 127
02 56H 02 57H	0000 aaaa 0000 bbbb	MODULATION DEPTH aaaa bbbb	0 - 127
02 58H 02 59H	0000 aaaa 0000 bbbb	DETUNE aaaa bbbb	-64 - 63
02 5AH 02 5BH	0000 aaaa 0000 bbbb	VELOCITY MIX RATIO aaaa bbbb	0 - 127
02 5CH 02 5DH	0000 aaaa 0000 bbbb	AFTER TOUCH ASSIGN aaaa bbbb	0: Modulation 1: Volume 2: Bend + 3: Bend -
02 5EH : 07 7FH	0xxx xxxx 0xxx xxxx	dummy	
Total size		00 08 00H	

4.3 Function parameter

Offset address		Description	
00 00H 00 01H	0000 aaaa 0000 bbbb	MASTER TUNE aaaa bbbb	-64 - 63
00 02H : 00 07H	0xxx xxxx 0xxx xxxx	dummy	
00 08H 00 09H	0000 aaaa 0000 bbbb	CONTROLLER ASSIGN aaaa bbbb	0: Mod Depth 1: Bend Range 2: Cntrl Change
00 0AH 00 0BH	0000 aaaa 0000 bbbb	DP-2 ASSIGN aaaa bbbb	0: Trig Play 1: Patch Shift
00 0CH : 00 1BH	0xxx xxxx 0xxx xxxx	dummy	
00 1CH 00 1DH	0000 aaaa 0000 bbbb	AUDIO TRIG aaaa bbbb	0: OFF 1: ON
00 1EH 00 1FH	0000 aaaa 0000 bbbb	SYSTEM MODE aaaa bbbb	0: Patch 1: Tone
00 20H 00 21H	0000 aaaa 0000 bbbb	VOICE MODE aaaa bbbb	0 - 7
00 22H 00 23H : 00 30H 00 31H	0000 aaaa 0000 bbbb 0000 aaaa 0000 bbbb	MULTI MIDI RX-CH 1 aaaa bbbb MULTI MIDI RX-CH 8 aaaa bbbb	0 - 15 0 - 15
00 32H 00 33H : 00 40H 00 41H	0000 aaaa 0000 bbbb 0000 aaaa 0000 bbbb	MULTI PATCH NUMBER 1 aaaa bbbb MULTI PATCH NUMBER 8 aaaa bbbb	0 - 7 0 - 7
00 42H 00 43H : 00 50H 00 51H	0000 aaaa 0000 bbbb 0000 aaaa 0000 bbbb	MULTI TONE NUMBER 1 aaaa bbbb MULTI TONE NUMBER 8 aaaa bbbb	0 - 31 0 - 31
00 52H 00 53H	0xxx xxxx 0xxx xxxx	dummy	
00 54H 00 55H	0000 aaaa 0000 bbbb	KEYBOARD ASSIGN aaaa bbbb	0: A 1: B 2: C 3: D 4: OFF
00 56H 00 57H : 00 64H 00 65H	0000 aaaa 0000 bbbb 0000 aaaa 0000 bbbb	MULTI LEVEL 1 aaaa bbbb MULTI LEVEL 8 aaaa bbbb	0 - 127 0 - 127
00 66H 00 67H : : 00 7CH 00 7DH	0000 aaaa 0000 bbbb 0000 aaaa 0000 bbbb	DISK LABEL 1 aaaa bbbb DISK LABEL 12 aaaa bbbb	32 - 127 (ASCII) 32 - 127 (ASCII)
00 7EH 00 7FH : : 01 5CH 01 5DH	0000 aaaa 0000 bbbb 0000 aaaa 0000 bbbb	NOTE 1 aaaa bbbb NOTE 48 aaaa bbbb	32 - 127 (ASCII) 32 - 127 (ASCII)
01 5EH 01 5FH	0000 aaaa 0000 bbbb	MIDI CONTROL CHANGE NUMBER aaaa bbbb	0 - 95
01 60H 01 61H	0000 aaaa 0000 bbbb	PARAMETER INITIALIZE aaaa bbbb	0: All 1: Patch 2: Tone 3: Func 4: MIDI
01 62H 01 63H	0000 aaaa 0000 bbbb	DT-100 aaaa bbbb	0: OFF 1: ON
01 64H : 03 7FH	0xxx xxxx 0xxx xxxx	dummy	
Total size		00 04 00H	

Offset address	Description		
00 00H : 00 0FH	0xxx xxxx 0xxx xxxx	dummy	
00 10H 00 11H	0000 aaaa 0000 bbbb	TX CHANNEL aaaa bbbb	0 - 15
00 12H 00 13H	0000 aaaa 0000 bbbb	TX PROGRAM CHANGE aaaa bbbb	0: OFF 1: ON
00 14H 00 15H	0000 aaaa 0000 bbbb	TX BENDER aaaa bbbb	0: OFF 1: ON
00 16H 00 17H	0000 aaaa 0000 bbbb	TX MODULATION aaaa bbbb	0: OFF 1: ON
00 18H 00 19H	0000 aaaa 0000 bbbb	TX HOLD aaaa bbbb	0: OFF 1: ON
00 1AH 00 1BH	0000 aaaa 0000 bbbb	TX AFTER TOUCH aaaa bbbb	0: OFF 1: ON
00 1CH 00 1DH	0000 aaaa 0000 bbbb	TX VOLUME aaaa bbbb	0: OFF 1: ON
00 1EH 00 1FH	0xxx xxxx 0xxx xxxx	dummy	
00 20H 00 21H : 00 2EH 00 2FH	0000 aaaa 0000 bbbb 0000 aaaa 0000 bbbb	RX PROGRAM NUMBER 1 aaaa bbbb RX PROGRAM NUMBER 8 aaaa bbbb	0 - 127 0 - 127
00 30H 00 31H : 00 3EH 00 3FH	0000 aaaa 0000 bbbb 0000 aaaa 0000 bbbb	TX PROGRAM NUMBER 1 aaaa bbbb TX PROGRAM NUMBER 8 aaaa bbbb	0 - 127 0 - 127
00 40H 00 41H : 00 4EH 00 4FH	0000 aaaa 0000 bbbb 0000 aaaa 0000 bbbb	RX CHANNEL 1 aaaa bbbb RX CHANNEL 8 aaaa bbbb	0 - 15 0 - 15
00 50H 00 51H : : 00 5EH 00 5FH	0000 aaaa 0000 bbbb 0000 aaaa 0000 bbbb	RX PROGRAM CHANGE 1 aaaa bbbb RX PROGRAM CHANGE 8 aaaa bbbb	0: OFF 1: ON 0: OFF 1: ON
00 60H 00 61H : : 00 6EH 00 6FH	0000 aaaa 0000 bbbb 0000 aaaa 0000 bbbb	RX BENDER 1 aaaa bbbb RX BENDER 8 aaaa bbbb	0: OFF 1: ON 0: OFF 1: ON
00 70H 00 71H : : 00 7EH 00 7FH	0000 aaaa 0000 bbbb 0000 aaaa 0000 bbbb	RX MODULATION 1 aaaa bbbb RX MODULATION 8 aaaa bbbb	0: OFF 1: ON 0: OFF 1: ON
01 00H 01 01H : : 01 0EH 01 0FH	0000 aaaa 0000 bbbb 0000 aaaa 0000 bbbb	RX HOLD 1 aaaa bbbb RX HOLD 8 aaaa bbbb	0: OFF 1: ON 0: OFF 1: ON
01 10H 01 11H : : 01 1EH 01 1FH	0000 aaaa 0000 bbbb 0000 aaaa 0000 bbbb	RX AFTER TOUCH 1 aaaa bbbb RX AFTER TOUCH 8 aaaa bbbb	0: OFF 1: ON 0: OFF 1: ON
01 20H 01 21H : : 01 2EH 01 2FH	0000 aaaa 0000 bbbb 0000 aaaa 0000 bbbb	RX VOLUME 1 aaaa bbbb RX VOLUME 8 aaaa bbbb	0: OFF 1: ON 0: OFF 1: ON
01 30H 01 31H : : 01 3EH 01 3FH	0000 aaaa 0000 bbbb 0000 aaaa 0000 bbbb	RX BEND RANGE 1 aaaa bbbb RX BEND RANGE 8 aaaa bbbb	0: OFF 1: ON 0: OFF 1: ON
01 40H 01 41H	0000 aaaa 0000 bbbb	TX BEND RANGE aaaa bbbb	0: OFF 1: ON
01 42H 01 43H	0000 aaaa 0000 bbbb	SYSTEM EXCLUSIVE aaaa bbbb	0: OFF 1: ON
01 44H 01 45H	0000 aaaa 0000 bbbb	DEVICE ID aaaa bbbb	0 - 15
01 46H : 03 7FH	0xxx xxxx 0xxx xxxx	dummy	
Total size		00 04 00H	

Offset address	Description		
00 00H 00 01H : 00 0EH 00 0FH	0000 aaaa 0000 bbbb 0000 aaaa 0000 bbbb	TONE NAME 1 aaaa bbbb TONE NAME 8 aaaa bbbb	32 - 127 (ASCII) 32 - 127 (ASCII)
00 10H 00 11H	0xxx xxxx 0xxx xxxx	dummy	
00 12H 00 13H	0000 aaaa 0000 bbbb	SOURCE TONE aaaa bbbb	0 - 31
00 14H 00 15H	0000 aaaa 0000 bbbb	ORIG/SUB TONE aaaa bbbb	0: ORG 1: SUB
00 16H 00 17H	0000 aaaa 0000 bbbb	SAMPLING FREQUENCY aaaa bbbb	0:30KHz 1:15KHz
00 18H 00 19H	0000 aaaa 0000 bbbb	ORIG KEY NUMBER aaaa bbbb	11 - 120 (MIDI FORMAT)
00 1AH 00 1BH	0000 aaaa 0000 bbbb	WAVE BANK aaaa bbbb	0: A 1: B
00 1CH 00 1DH	0000 aaaa 0000 bbbb	WAVE SEGMENT TOP aaaa bbbb	0 - 17
00 1EH 00 1FH	0000 aaaa 0000 bbbb	WAVE SEGMENT LENGTH aaaa bbbb	0 - 18
00 20H 00 21H 00 22H 00 23H 00 24H 00 25H	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd 0000 eeee 0000 ffff	START POINT aaaa bbbb cccc dddd eeee ffff	000000 - 221180
00 26H 00 27H 00 28H 00 29H 00 2AH 00 2BH	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd 0000 eeee 0000 ffff	END POINT aaaa bbbb cccc dddd eeee ffff	000004 - 221184
00 2CH 00 2DH 00 2EH 00 2FH 00 30H 00 31H	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd 0000 eeee 0000 ffff	LOOP POINT aaaa bbbb cccc dddd eeee ffff	000000 - 221184
00 32H 00 33H	0000 aaaa 0000 bbbb	LOOP MODE aaaa bbbb	0:Fwd 1: Alt 2: 1Shot 3:Reverse
00 34H : 00 37H	0xxx xxxx 0xxx xxxx	dummy	
00 38H 00 39H	0000 aaaa 0000 bbbb	LFO RATE aaaa bbbb	0 - 127
00 3AH 00 3BH	0xxx xxxx 0xxx xxxx	dummy	
00 3CH 00 3DH	0000 aaaa 0000 bbbb	LFO DELAY aaaa bbbb	0 - 127
00 3EH : 00 41H	0xxx xxxx 0xxx xxxx	dummy	
00 42H 00 43H	0000 aaaa 0000 bbbb	LFO DEPTH aaaa bbbb	0 - 127
00 44H : 00 49H	0xxx xxxx 0xxx xxxx	dummy	
00 4AH 00 4BH	0000 aaaa 0000 bbbb	FINE TUNE aaaa bbbb	-64 - 63
00 4CH : 00 65H	0xxx xxxx 0xxx xxxx	dummy	
00 66H 00 67H	0000 aaaa 0000 bbbb	ENV SUSTAIN POINT aaaa bbbb	0 - 7
00 68H 00 69H	0000 aaaa 0000 bbbb	ENV END POINT aaaa bbbb	1 - 7
00 6AH 00 6BH	0000 aaaa 0000 bbbb	ENV LEVEL 1 aaaa bbbb	0 - 127

00 6CH 00 6DH	0000 aaaa 0000 bbbb	ENV RATE 1 aaaa bbbb	1 - 127
00 6EH 00 6FH	0000 aaaa 0000 bbbb	ENV LEVEL 2 aaaa bbbb	0 - 127
00 70H 00 71H	0000 aaaa 0000 bbbb	ENV RATE 2 aaaa bbbb	1 - 127
00 72H 00 73H	0000 aaaa 0000 bbbb	ENV LEVEL 3 aaaa bbbb	0 - 127
00 74H 00 75H	0000 aaaa 0000 bbbb	ENV RATE 3 aaaa bbbb	1 - 127
00 76H 00 77H	0000 aaaa 0000 bbbb	ENV LEVEL 4 aaaa bbbb	0 - 127
00 78H 00 79H	0000 aaaa 0000 bbbb	ENV RATE 4 aaaa bbbb	1 - 127
00 7AH 00 7BH	0000 aaaa 0000 bbbb	ENV LEVEL 5 aaaa bbbb	0 - 127
00 7CH 00 7DH	0000 aaaa 0000 bbbb	ENV RATE 5 aaaa bbbb	1 - 127
00 7EH 00 7FH	0000 aaaa 0000 bbbb	ENV LEVEL 6 aaaa bbbb	0 - 127
01 00H 01 01H	0000 aaaa 0000 bbbb	ENV RATE 6 aaaa bbbb	1 - 127
01 02H 01 03H	0000 aaaa 0000 bbbb	ENV LEVEL 7 aaaa bbbb	0 - 127
01 04H 01 05H	0000 aaaa 0000 bbbb	ENV RATE 7 aaaa bbbb	1 - 127
01 06H 01 07H	0000 aaaa 0000 bbbb	ENV LEVEL 8 aaaa bbbb	0 - 127
01 08H 01 09H	0000 aaaa 0000 bbbb	ENV RATE 8 aaaa bbbb	1 - 127
01 0AH 01 0BH	0xxx xxxx 0xxx xxxx	dummy	
01 0CH 01 0DH	0000 aaaa 0000 bbbb	ENV KEY-RATE aaaa bbbb	0 - 127
01 0EH 01 0FH	0000 aaaa 0000 bbbb	LEVEL aaaa bbbb	0 - 127
01 10H 01 11H	0000 aaaa 0000 bbbb	ENV VEL-RATE aaaa bbbb	0 - 127

01 12H 01 13H	0000 aaaa 0000 bbbb	REC THRESHOLD aaaa bbbb	0 - 127
01 14H 01 15H	0000 aaaa 0000 bbbb	REC PRE-TRIGER aaaa bbbb	0: 0ms 1: 10ms 2: 50ms 3: 100ms
01 16H 01 17H	0000 aaaa 0000 bbbb	REC SAMPLING FREQUENCY aaaa bbbb	0: 30KHz 1: 15KHz
01 18H 01 19H 01 1AH 01 1BH 01 1CH 01 1DH	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd 0000 eeee 0000 ffff	REC START POINT aaaa bbbb cccc dddd eeee ffff	000000 - 221180
01 1EH 01 1FH 01 20H 01 21H 01 22H 01 23H	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd 0000 eeee 0000 ffff	REC END POINT aaaa bbbb cccc dddd eeee ffff	000004 - 221184
01 24H 01 25H 01 26H 01 27H 01 28H 01 29H	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd 0000 eeee 0000 ffff	REC LOOP POINT aaaa bbbb cccc dddd eeee ffff	000000 - 221184
01 2AH 01 2BH	0000 aaaa 0000 bbbb	ZOOM T aaaa bbbb	0 - 5
01 2CH 01 2DH	0000 aaaa 0000 bbbb	ZOOM L aaaa bbbb	0 - 5
01 2EH 01 2FH	0000 aaaa 0000 bbbb	COPY SOURCE aaaa bbbb	0 - 31
01 30H 01 31H	0000 aaaa 0000 bbbb	LOOP TUNE aaaa bbbb	-64 - 63
01 32H 01 33H	0000 aaaa 0000 bbbb	LEVEL CURVE aaaa bbbb	0 - 5
01 34H : 01 4BH	0xxx xxxx : 0xxx xxxx	dummy	

01 4CH 01 4DH 01 4EH 01 4FH 01 50H 01 51H	0000 aaaa 0000 bbbb 0000 cccc 0000 dddd 0000 eeee 0000 ffff	LOOP LENGTH aaaa bbbb cccc dddd eeee ffff	000004 - 221184
01 52H 01 53H	0000 aaaa 0000 bbbb	PITCH FOLLOW aaaa bbbb	0: OFF 1: ON
01 54H 01 55H	0000 aaaa 0000 bbbb	ENV ZOOM aaaa bbbb	0 - 5
01 56H : 01 7FH	0xxx xxxx : 0xxx xxxx	dummy	
Total size		00 02 00H	

4.6 SW

Offset address	Description		
00H 01H	0000 aaaa 0000 bbbb	SW 1 (all) aaaa bbbb	
02H 03H	0000 aaaa 0000 bbbb	SW 2 (character) aaaa bbbb	
04H 05H	0000 aaaa 0000 bbbb	SW 3 (patch) aaaa bbbb	
06H 07H	0000 aaaa 0000 bbbb	ALPHA DIAL aaaa bbbb	-127 - 127
Total size		00 00 08H	

4.7 Wave data

Offset address	Description		
00 00 00H 00 00 01H	0aaa aaaa 0bbb bb00	aaaa aaab bbbb 12 bit 2's complemet data	
: :			
01 3F 7EH 01 3F 7FH			
Total size		01 40 00H	

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