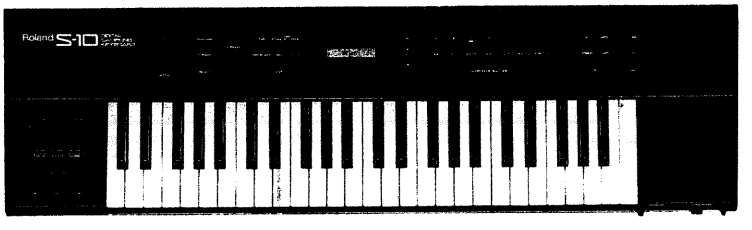
Roland

MIDI DIGITAL SAMPLING KEYBOARD

S-10

Owner's Manual

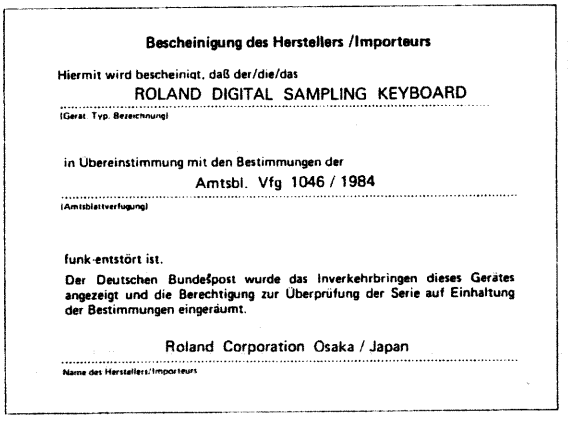


The Roland Sampling Keyboard S-10 is a completely new type keyboard which can record (sample and record into computer memory) all sorts of sounds then play these sounds with the keyboard.

The S-10 is conceptually like a tape recorder in that it records sound. However, the recording process is very different, since the S-10 is recording into computer memory. Computers can accept information only in digital signal, so the S-10 converts audio signal into digitals. It does this by examining (sampling) the incoming signal level great many times a second, and sequentially recording these different levels in computer memory. This digital recording process is called SAMPLING.

FEATURES

- The S-10 has four Banks (A, B, C and D) to record the sounds, therefore any of the four samples can be instantaneously selected.
- The S-10 features the dynamics function.
- The Split function can split the keyboard into the upper and the lower sections.
- The sound you have recorded can be saved onto a 2.8 inch quick disk (QD) for future use.
- The liquid crystal display and the alpha dial serve to make the operation quicker and easier.
- Provided with the MIDI connectors, the S-10 can be setup with a MIDI sequencer and other devices.



Bescheinigung des Herstellers /Importeurs

Hiermit wird bescheinigt, daß der/die/das

ROLAND DIGITAL SAMPLING KEYBOARD

(Gerät Typ Bezeichnung)

in Übereinstimmung mit den Bestimmungen der

Amtsbl. Vfg 1046 / 1984

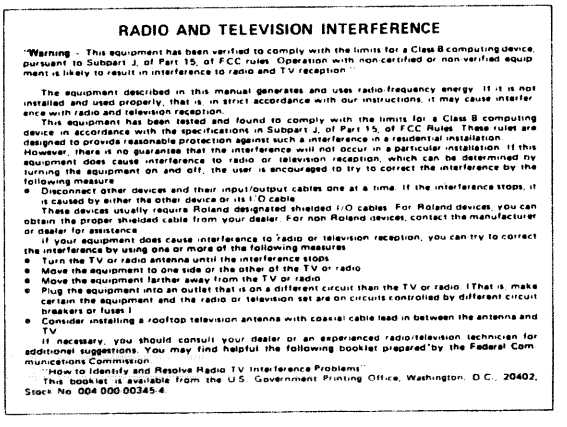
(Amtsblattverfügung)

funk-entstört ist.

Der Deutschen Bundespost wurde das Inverkehrbringen dieses Gerätes angezeigt und die Berechtigung zur Überprüfung der Serie auf Einhaltung der Bestimmungen eingeräumt.

Roland Corporation Osaka / Japan

Name des Herstellers/Importeurs



RADIO AND TELEVISION INTERFERENCE

"Warning – This equipment has been verified to comply with the limits for a Class B computing device, pursuant to Subpart J, of Part 15, of FCC rules. Operation with non-certified or non-verified equipment is likely to result in interference to radio and TV reception."

The equipment described in this manual generates and uses radio-frequency energy. If it is not installed and used properly, that is, in strict accordance with our instructions, it may cause interference with radio and television reception.

This equipment has been tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J, of Part 15, of FCC Rules. These rules are designed to provide reasonable protection against such a interference in a residential installation. However, there is no guarantee that the interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment on and off, the user is encouraged to try to correct the interference by the following measure:

- Disconnect other devices and their input/output cables one at a time. If the interference stops, it is caused by either the other device or its I/O cable.

These devices usually require Roland designated shielded I/O cables. For Roland devices, you can obtain the proper shielded cable from your dealer. For non Roland devices, contact the manufacturer or dealer for assistance.

If your equipment does cause interference to radio or television reception, you can try to correct the interference by using one or more of the following measures:

- Turn the TV or radio antenna until the interference stops.
- Move the equipment to one side or the other of the TV or radio.
- Move the equipment farther away from the TV or radio.
- Plug the equipment into an outlet that is on a different circuit than the TV or radio. (That is, make certain the equipment and the radio or television set are on circuits controlled by different circuit breakers or fuses.)
- Consider installing a rooftop television antenna with coaxial cable lead in between the antenna and TV.

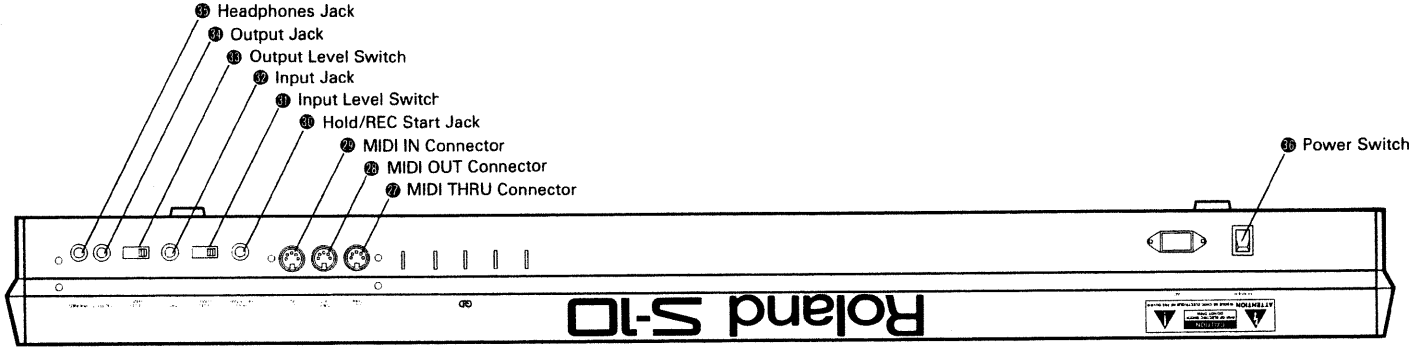
If necessary, you should consult your dealer or an experienced radio/television technician for additional suggestions. You may find helpful the following booklet prepared by the Federal Communications Commission:

"How to Identify and Resolve Radio-TV Interference Problems."

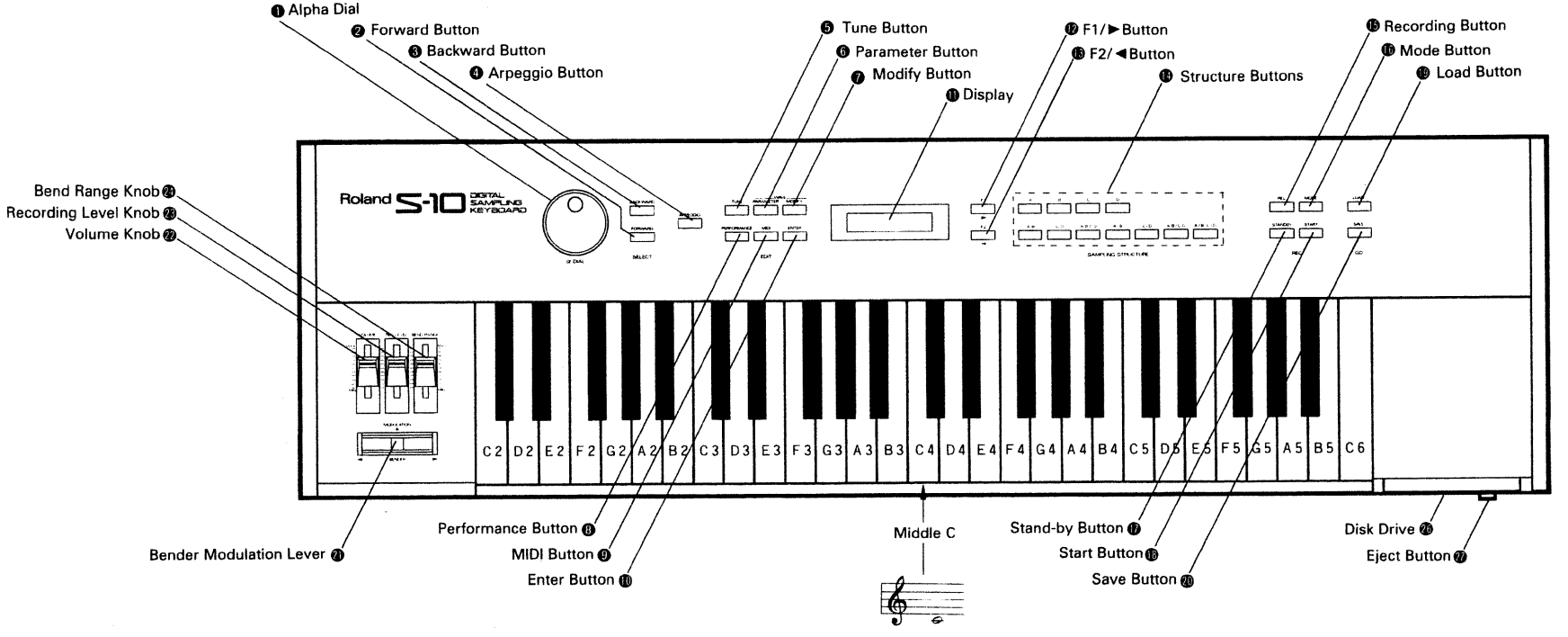
This booklet is available from the U.S. Government Printing Office, Washington, D.C., 20402, Stock No. 004-000-00345-4.

PANEL DESCRIPTION

‹Rear Panel›



‹Front Panel›



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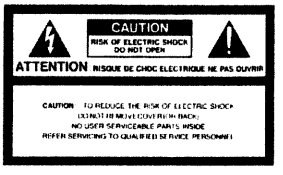
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IMPORTANT NOTES

- 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.
- Please do not use the same socket used for any noise generating device (such as motor, variable lighting system).
- This unit might not work properly if turned on immediately after turned off. If this happens, simply turn it off and turn it on again in a few seconds later.
- Before setting up this unit with other devices, turn this unit and all the other units off.
- This unit might be heated while operating, but there is no need to worry about it.
- Use a soft cloth and clean only with a mild detergent.
- Do not use solvents such as paint thinner.
- Avoid using this unit in excessive heat or humidity or where it may be affected by direct sunlight or dust.
- Operating the unit near a neon, fluorescent lamp, TV or CRT Display may cause noise interference. If so, change the angle or the position of the unit.
- The built-in disk drive of the S-10 is a precision machine. So, please handle it gently.
  Specially while the Disk Drive is running, do not give a strong shock to the unit.





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

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

INSTRUCTIONS PERTAINING TO A RISK OF FIRE, ELECTRIC SHOCK OR INJURY TO PERSONS.

IMPORTANT SAFETY INSTRUCTION

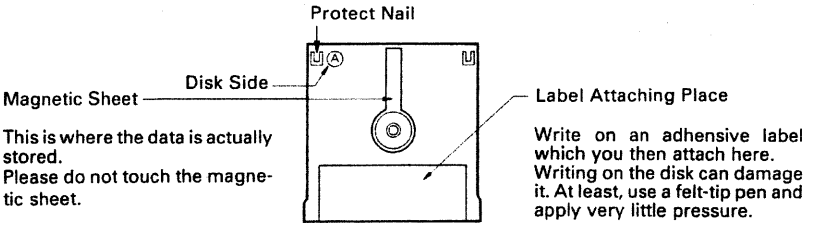
WARNING When using electric products, basic precautions should always be followed, including the following;

1. Read all the instructions before using the product.
2. To reduce the risk of injury, close supervision is necessary when a product is used near children.
3. Do not use this product near water- for example, near a bathtub, washbowl, kitchen sink, in a wet basement, or near a swimming pool, or the like.
4. This product should be used only with a cart or stand that is recommended by the manufacture.
5. This product, either alone or in combination with an amplifier and headphones or speakers, may be capable of producing sound levels that could cause permanent hearing loss.
   Do not operate for a long period of time at a high volume level or at level that is uncomfortable. If you experience any hearing loss or ringing in the ears, you should consult an audiologist.
6. The product should be located so that its location or position does not interfere with its proper ventilation.
7. The product should be located away from heat sources such as radiators, heat registers or other products that produce heat.
8. The product should avoid using in where it may be effected by dust.
9. The product should be connected to a power supply only of the type described in the operating instructions or as marked on the product.
10. The power-supply cord of the product should be unplugged from the outlet when left unused for a long time.
11. Do not tread on the power-supply cord.
12. Do not pull the cord but hold the plug when unplugging.
13. When setting up with any other instruments, the procedure should be followed in accordance with instruction manual.
14. Care should be taken so that objects do not fall and liquids are not spilled into the enclosure through openings.
15. The product should be serviced by qualified service personnel when:
    A: The power-supply cord or the plug has been damaged; or
    B: Objects have fallen, or liquid has been spilled into the product; or
    C: The product has been exposed to rain; or
    D: The product does not appear to operate normally or exhibits a marked change in performance: or
    E: The product has been dropped, or the enclosure damaged.
16. Do not attempt to service the product beyond that described in the user-maintenance instructions. All other servicing should be referred to qualified service personnel.

SAVE THESE INSTRUCTION

How to handle the Quick Disk (QD)

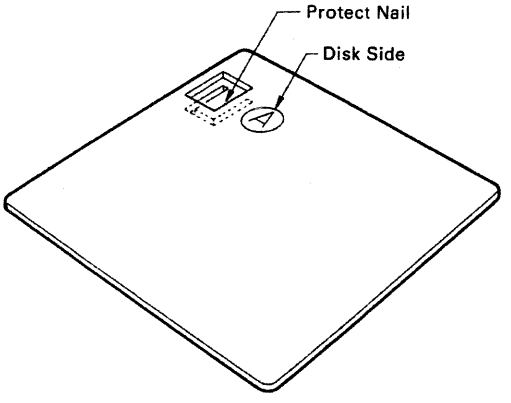
The sampled sound on the S-10 can be saved onto a 2.8 inch double sided quick disk.



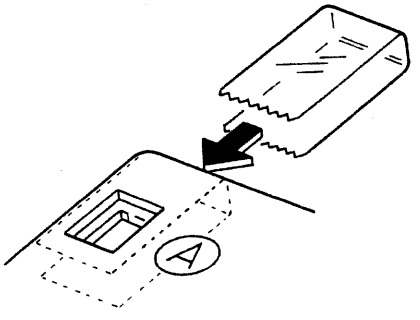
- Please do not touch the magnetic sheet, or the disk may become damaged.
- Do not fold or bend the disk.
- When the disk is not to be used, preserve it vertically in the supplied protective jacket. Do not keep it on a slant or bending shape
- Keep the disk from extremely hot or cold temperatures,dust or direct sunlight.
- Do not expose the disk to strong magnetic field such as headphones or speakers.
- Take out the protection sheet inserted in the disk drive, by pushing the Eject Button ㉕. In transit, reinsert the sheet into the drive.
- Please be sure to put the S-10 on a steady and horisontal place.
- Never remove or insert the disk, switch the S-10 on or off while the indicator of the disk drive is lit, or the disk may be permanently damaged.
- Do not keep running the QD continuously. If it is continuously run without rest, it may not function properly.
- Please be sure that the label is securely attached to the QD, or the label may come off in the disk drive, sticking the QD.

Protect Nail on the Disk

- To protect the data saved on the disk from an accidental loss or overrecord, snap off the Protect Nail on the disk. This way, the disk can be no longer used for backup, but the data can be read from the disk just the same. The nail is provided for each side A and B.

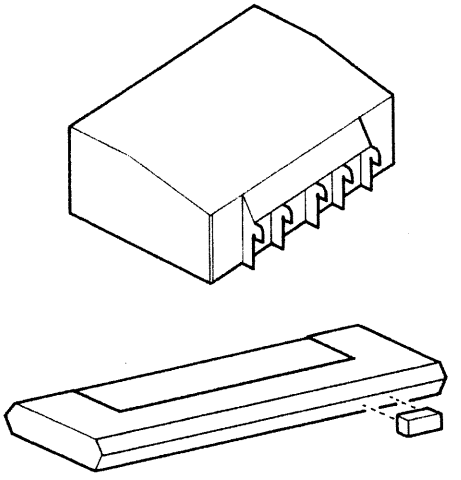


- If you wish to use the disk again for saving other data, stick a selophane adhensive tape as shown below.



How to install the Disk Case

Attach the Disk Case to the rear panel.



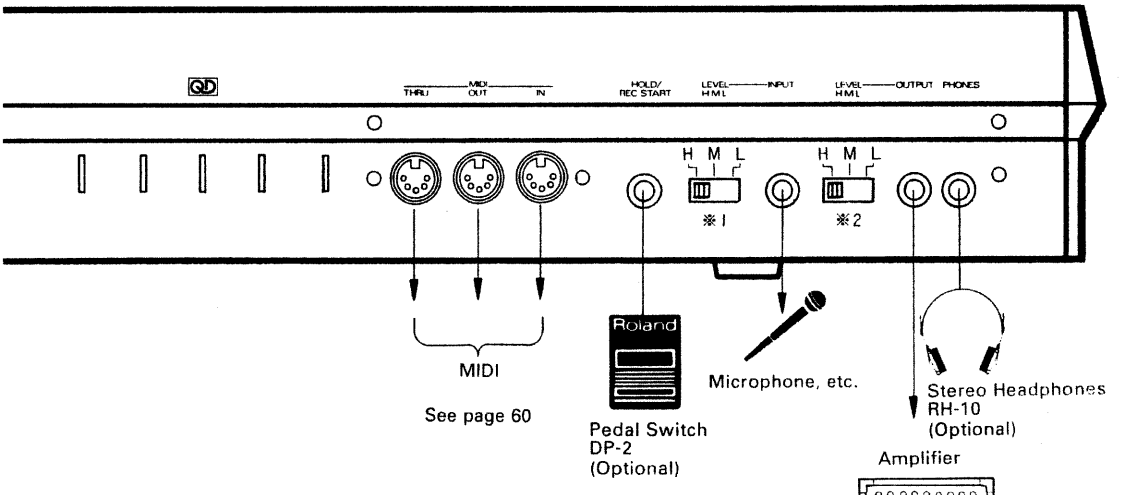
1 Basic Operation

The S-10 can sample all sorts of sounds and record them into the built-in computer memory as digital data. This digital data can be used to play various sounds on the keyboard. In other words, when no digital data is recorded in memory (right after the S-10 is turned on for the first time), there is no sound heard from it.

To play the S-10, you must record sounds or load back the data saved on the quick disk.

Using the QD's sound library, the S-10 can be played as a high quality, preset type keyboard even without recording any sound.

Make sure that the S-10 is turned off, and set it up with the external device.



※ Set the positions of these switches depending on the connected devices.

※1: See page 30.

※2:

Keyboard Amp	M/H
Audio Amp	H
Recording Eqnipment	H
PA,Mixer	L/M/H
Guitar Amp	L/M
etc.	

Turn the S-10 on.

Roland S-10

In a few seconds, the Display will show as below.

Ready

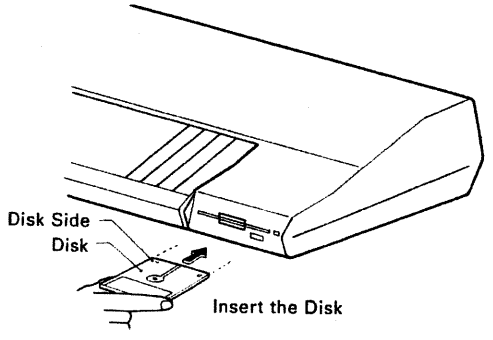
First of all, load the data from the supplied disk to the S-10's internal memory, and play the keyboard.

The side of the disk contains one sound, i.e. two sounds on one disk. The S-10's internal memory can store up to two disk data which is four different sounds.

Both A and B sides of a disk may be used for one sound. (This happens when it takes longer time for sampling the sound.)

1. Loading each of the four different sounds

① Insert the supplied quick disk #001 "Drum Set" into the disk drive with the A side (BD) facing upward.



(Please gently hold the sides of the Disk with your thumb and forefinger, then slowly insert it.)

Inserting the quick disk will automatically start the loading.

* Usually for loading, the Load Button ⑲ should be pushed after inserting the disk. However, if it is inserted while "READY" is still shown in the Display quickly after the S-10 is switched on, pushing the Load Button is not necessary.

During loading, the Display will respond with:

```
Load BASS DRUM
```

While the disk drive is running, the disk drive indicator is lit without fail. This is to warn you not to remove or insert a disk. That would break the disk or erase the data.

After a while, the Display will change as shown below.

```
Load complete
      ⬇
BASS DRUM
```

This shows that the sound saved on the side A(BD) of the disk is loaded to the S-10. Also, the indicator of the Structure Button A is lit. Now, you can hear Bass Drum by playing the keyboard.

② Make sure that the disk drive indicator is dark, push the Eject Button ⑳ remove the QD and reinsert it into the disk drive with the side B(SD) facing upward this time.

③ Push the Load Button ⑲ .

Likewise, load the C(TOM) and the D(HH) sides of the "Drum Set" disk.

Now, four different sounds are loaded into the S-10's internal memory.

By pressing the Structure Buttons A, B, C or D, you can select any of the four sounds. We regard these A, B, C and D as locations where the sounds reside. Each Bank can retain the sound data of one second as longest. To make a sustained sound, you may loop the sampled sounds. (See page 31.)

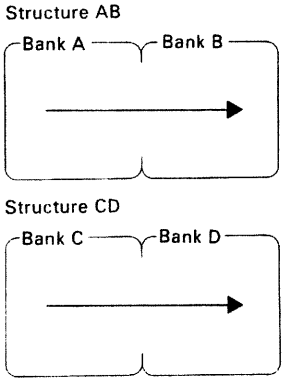
* If the pitch of the sound exceeds the highest note of the S-10's keyboard, it will be substituted with the highest octave.

2. Structure Buttons

The Structure Buttons A, B, C and D are used to select the corresponding sound of the Banks A, B, C and D. These Banks can be recorded or played simultaneously or sequencially by using other Structure Buttons. This is effective for combining two Banks for recording a long tone, etc.

a. Structure AB, CD

The Structure AB can be used for joining the Bank A sound with the B sound. Likewise, the Structure CD button joins the C and D. This is useful for combining two banks for sampling two second sound. You may also combine two different samples and play it.



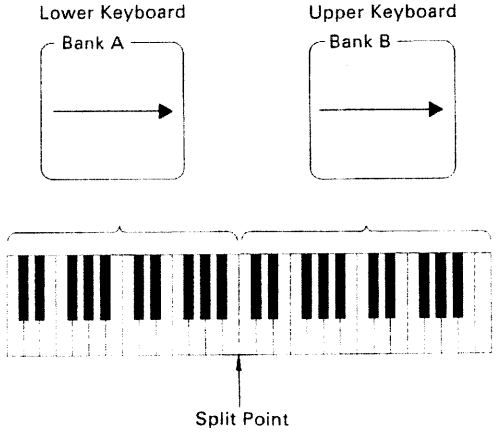
The Structure ABCD plays (or records) the Banks A, B, C, and D sequencially.
If this Structure ABCD is used for playing the "Drum Set", the volume of the later sound will be very low. This is because of the Wave Parameters (explained later).

b. Structure A/B, C/D

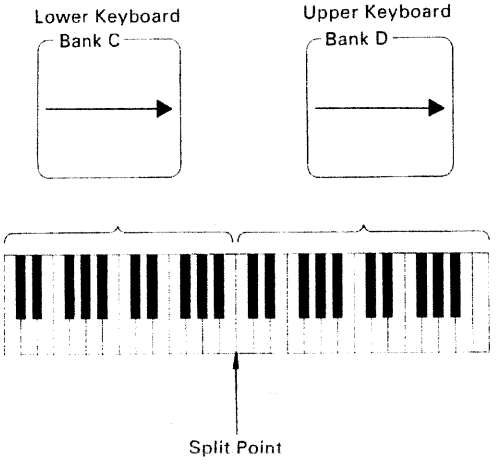
The Structure A/B button plays the Bank A sound in the lower section of the keyboard and the Bank B sound in the upper section. The C/D button works just like that, playing each sound separately in the lower and upper keyboard. The S-10 allows you to change the Split Point where the keyboard is divided into the upper and the lower sections.

* The actual Split Point of the "Drum Set" is different from the following picture.

Structure A/B



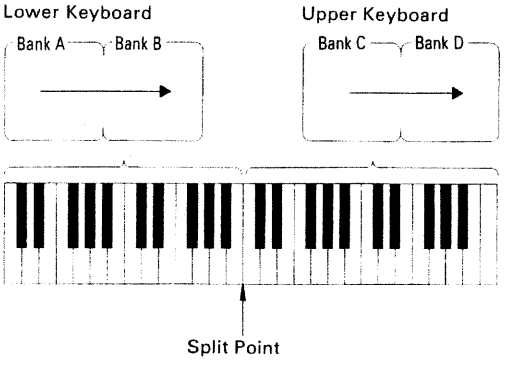
Structure C/D



c. Structure AB/CD

The Structure AB/CD button plays the Bank A sound then the B sound in the lower section, while the D sound is followed by the C in the upper section.

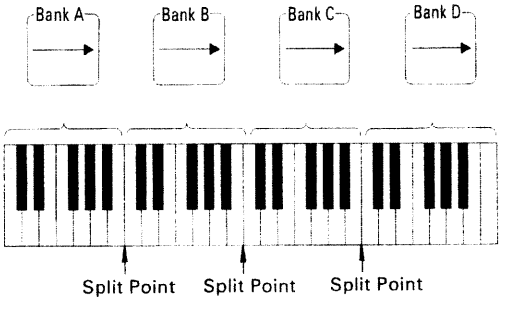
Structure AB/CD



d. Structure A/B/C/D

The Structure A/B/C/D button splits the S-10' keyboard to four sections, and plays each Bank sound A, B, C and D in the four sections separately.

Structure A/B/C/D



These Split Structures are specially useful to create piano sound whose tones subtly vary in higher and lower notes.

e. Note on Sampling Structure

The QD includes the data of the sampling structure. When the loading is completed, the relevant indicators on the panel will light up to tell you which structure is used.

When the Banks of two different sounds are combined, the pitches or volumes of the two sounds may differ. This is related with the Wave Parameter explained later in this manual.

3. Loading both sides of QD

Some data consists of more than one Bank, therefore, saved on both sides of a QD or even on a few sets of QD's. For instance, "STRINGS" of the QD#002 "STRINGS & CHORUS" which is structure A/B, is saved on both sides A and B of the QD. That is, to play this, you should load both sides of the QD.

PROCEDURE

① Make sure that the disk drive indicator is dark, push the Eject Button ㉖ and take out the QD.

② Insert the #002 QD with the A side facing upward, and push the Load Button ⑲ .

Load Strings

When the side A is loaded, the Display will change to:

change QD

The Display tells you that the data on the side B is required.

③ Make sure that the disk drive indicator is dark, push the Eject Button ㉖ and take out the QD.

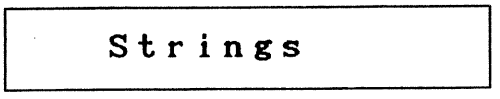
The Display will respond with:

Insert QD

④ Re-insert the QD with the B side facing upward, and loading will automatically start.



When the both sides of the QD are loaded, the S-10 is ready to play (Play Mode) in the relevant structure.



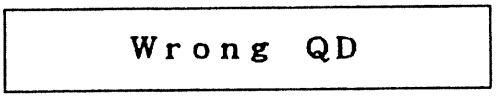
In the Play mode, the Display shows the sound name.

The Banks C and D are still empty. You may, if necessary, load the Banks C and D or structure C/D. Insert the relevant QD and push the Load Button ⓳ .

If you notice that you are using a wrong disk during loading. Wait untill the disk drive indicator goes out, push any of the Structure Buttons ⓲ . This will stop loading and return to the Play mode. Change the disks and repeat the loading procedure.

About Error

When a set of data (both sides of a QD or even two QD's) is supposed to be loaded, but you try to load the data irrelvant to the one loaded before, the Display will respond with:



Take out the disk and insert the appropriate one in a right direction, and the loading will start.

4. Cancelling Structure Setting before Loading

It is possible to load one of the set data (e.g. Bank B of the Structure A/B) to a different Bank (e.g. Bank C).

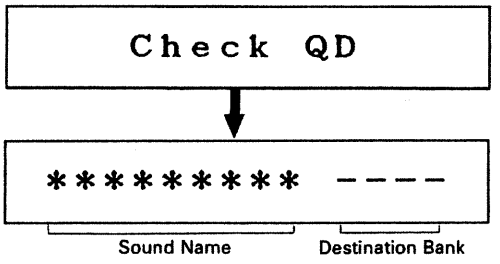
This, however, may cut the sound, because the original Structure is ignored in this way.
Push the Structure Button A, B, C or D where you wish to load the data, and without releasing it, push the Load Button ⓳ .

5. Monitoring the QD Data

You can monitor the contents of the QD; such as Sound Name or Structure setting.

① Insert the relevant QD.

② Push the F1 Button ⑫, then the Load Button ⑲.



The Display shows the Sound Name and the Bank where the sound to be loaded. Also, the Structure setting can be seen on the Structure Indicator ⑬.

While the above indication is shown in the Display, the data is not yet loaded.

To load the data you are now monitoring in the Display, push the Load Button ⑲.

To monitor other disk, make sure that the disk drive indicator is dark and change the disks. Inserting the disk will automatically monitor the data.

If you do not want to load the data you have monitored, push any of the Structure Button ⑪, and the S-10 will return to the Play mode.

2 Performance Controlling Functions

The S-10 features various functions for controlling performance, such as pitch bender, vibrato, pedal hold and auto arpeggio.

The performance controlling functions can be easily engaged by using the buttons on the panel.

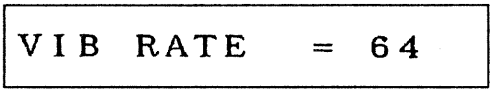
Most of the performance controlling functions consist of Performance Parameters, and the effect of the function can be altered by changing the value of each parameter.

1. Editing Performance Parameters

To change the preprogrammed value of each parameter, take the following procedure.

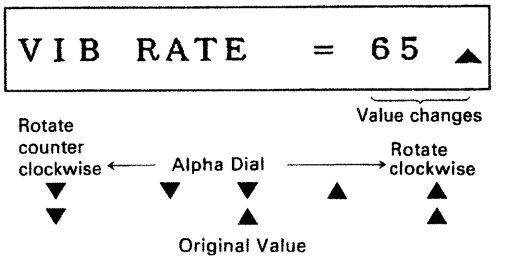
① Push the Performance Button ❽.

② By using the Forward Button ❷ and the Backward Button ❸, call the performance parameter you wish to edit with the aid of the Display window.



③ By rotating the Alpha Dial, change the value of the parameter.

The number shown at the right of the Display will change as below.



If you wish to edit other parameters, repeat the steps ② and ③.

④ Push the Enter Button ❿.

The performance parameters will be always called in the sequence as shown below.

Performance Controlling Function	Display	Performance Parameter
Vibrato	VIB RATE	Vibrato Rate
	M-VIB DPTH	Manual Vibrato Depth
	D-VIB DPTH	Delay Vibrato Depth
	D-VIB DLAY	Delay Vibrato Delay Time
Bender	BEND MODE	Bend Mode
Arpeggio	ARP SYNC	Arpeggio Sync Mode
	ARP RATE	Arpeggio Rate
	ARP MODE	Arpeggio Mode
	ARP RANGE	Arpeggio Range
	ARP REPEAT	Arpeggio Repeat
	ARP DECAY	Arpeggio Decay
Velocity Mix	V-MX THRSH	Velocity Mix Threshold
Velocity Switch	V-SW THRSH	Velocity Switch Threshold
Detune	DTUN MODE	Detune Mode
	DTUN RANGE	Detune Range
	ABEND DEST	Auto Bend Destination
	BEND DEST	Pitch Bend Destination
Delay	DELAY TIME	Delay Time
	DELAY LEVL	Delay Level
	KEY OFFSET	Key Offset
Trigger Play	TRG G-TIME	Gate Time
	Ext Gate Play	Trigger Play

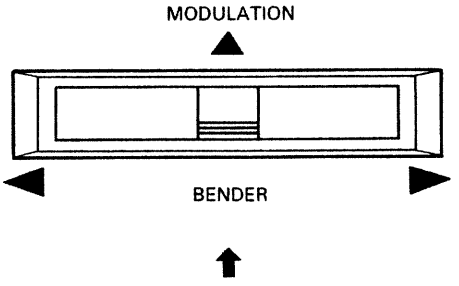
You can edit the parameters while playing the keyboard, but the change cannot be heard until you release the key and play it again.

2. Performance Controlling Functions determined by Performance Parameters

a. Vibrato

Pushing the Bender Lever ㉑ backward will create vibrato effect. This is called "Manual Vibrato". "Delay Vibrato" is the vibrato that does not come on immediately after the key is played, but comes on after a certain time has elapsed.

To control these vibrato effects, the following performance parameters are involved.



Pushing the lever forward will engage the Vibrato effect.

- **Vibrato Rate**

```
VIB RATE   = 64
```

This sets the rate of the vibrato from 0 to 127.

- **Manual Vibrato Depth**

```
M-VIB DPTH= 32
```

This sets the depth of the manual vibrato from 0 to 127.

- **Delay Vibrato Depth**

```
D-VIB DPTH=  0
```

This sets the depth of the delay vibrato from 0 to 127.

- **Delay Time of the Delay Vibrato**

```
D-VIB DLAY= 64
```

This sets the time needed for the delayed vibrato to come on after a key is played from 0 to 127.

If the vibrato in the Wave Parameter (explained on page 43) is set to OFF, the sound would not take on vibrato at all.

b. Pitch Bender

Raise the Bend Range Knob ㉓, and bending the Bender Lever ㉑ will create pitch bend effect. The depth of the pitch bend effect can be set with the Range Knob ㉓ in semi-tone steps from 0 to 12 (one octave). While the Bend Range Knob is being moved, the Dispaly shows the value of the bend range depth.

```
BEND RNG=12 [ 9]
```

The S-10 cannot play the pitch higher than the sample by 1 octave and 6th (21 semi-tones). The exceeded pitch will be substituted with the pitch of the lower octave.
The number shown at the right of the Display represents how many notes higher than the pitch of the sampled sound can be output from the S-10. As you raise the Bend Range Knob ㉓, the number becomes smaller.

If the pitch bender in the Wave Parameter (explained on page 43) is set to OFF, the sound would not take on the pitch bend effect.

How the Pitch Bend changes can be selected with the Performance Parameter "Pitch Bend Mode".

- **Pitch Bend Mode**

```
BEND MODE =CONT
```

The Bender Lever can function in various ways as shown in the table below.

Mode	Display	Description
Normal (Continue)	CONT	Usual smooth pitch bend.
Chromatic	CHRM	Chromatic pitch bend.

c. Arpeggio

Pushing the Arpeggio Button ❹ will light on the indicator and turn the Arpeggio function on. Playing a chord will create arpeggio. The following six performance parameters are involved with arpeggio.

- **Arpeggio Rate**

Pushing the Parameter Button ❻ during arpeggio performance will cause the Display to show Arpeggio Rate.

```
ARP RATE = 64
```

Set the rate of the arpeggio.

- **Arpeggio Mode**

```
ARP MODE = UP
```

Set the shape of the arpeggio.

Mode	Display	Description
Upward	UP	
Downward	DOWN	
Up and Down	U/D	
Random	RND	Plays the pressed keys at random.

- **Arpeggio Range**

```
ARP RANGE =1oct
```

This sets how many octaves should be used for the arpeggio performance from 1 to 3 octaves.

- **Arpeggio Repeat**

```
ARP REPEAT= 1
```

This sets how many times the same chord should be arpeggiated from 1 to 16 times.

- **Decay**

```
ARP DECAY =10
```

At 1, the arpeggio decays fastest and at 10, it is sustained in a set volume.
When the Dynamics Sens of the Wave Parameters (see page 43) is set other than 127, the decay effect cannot be completed.

- **Arpeggio Sync Mode**

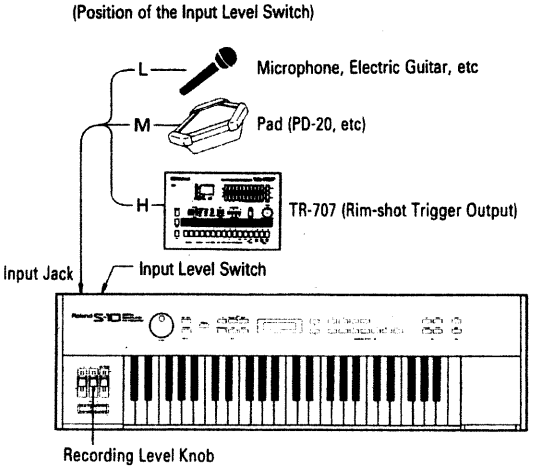
```
ARP SYNC =INT
```

This selects whether the arpeggio should play on its own or sync to the external device.

Mode	Display	Description
Internal Clock	INT	Internal clock controls arpeggio performance.
External Trigger	EXT	Every external trigger plays one step of Arpeggio.

External Trigger Mode

In this mode, the external trigger signal (audio or pulse) fed into the Input Jack ㉜ will play each note of the chord. Every trigger signal plays one of the keys you are pushing on the keyboard in the sequence of as the Arpeggio Mode is set.



Set the Input Sensitivity Selector Switch ㉛ and the Recording Level Knob to the positions which allow the most stable action.

d. Trigger Play

By feeding external signal (audio or pulse) to the Input Jack ㉜, the note selected with the performance parameter will be played.

* See the picture on page 20.

Set the Input Sensitivity Selector Switch ㉛ and the Recording Level Knob to the positions which allow the most stable action.

The Trigger Play function is available even during usual performance. However, when the Arpeggio Button is turned on, it will function differently as shown below.

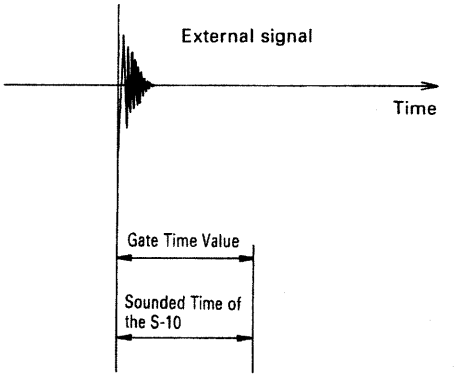
Arpeggio Sync Mode	What is done by External Trigger
INT	The Arpeggio is performed in the set keys.
EXT	The Arpeggio played on the Keyboard will sync to the external trigger

- **Gate Time**

```
TRG  G-TIME=    0
```

When the external signal is very short (e.g. signal from a drum pad), the actual sounding time of the sound can be set with the Gate Time. Higher number is longer gate time.

When the external signal is very short (=the set gate time is short)



- **Trigger Play**

```
Ext Gate Play
```

Up to four notes to be trigger-played can be assigned. There are two ways for key registeration.

Method 1 (Key registeration with the Alpha Dial)

① Push the button ▶ ⑫.

```
 —   —   —   —
```

The Display will respond with:

It shows that up to four keys can be registered. "—" in the Display, shows that no key is registered. When a key is registered, the key number will be shown in the Display.

② Rotate the Alpha Dial ❶ until the desired key number is shown in the Display.

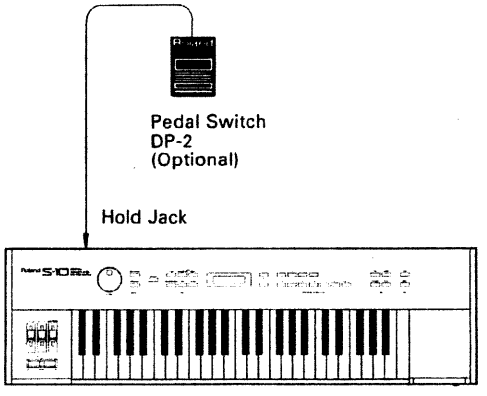
C3 – – –

To register the next key, push the ▶ button ⓬ to flash the next position, and select a key number by rotating the Alpha Dial. Likewise, the third and the forth keys can be registered.

① When registeration is completed, push the Enter Button ⓫.

Method 2 (Registeration from the keyboard)

Connect the optional pedal switch DP-2 to the Hold Jack ㉚.



① Rotate the Alpha Dial until "Trigger Play" is shown in the Display.

Ext Gate Play

② Press the pedal switch.

– – – –

③ While still pressing the pedal, push the keys (up to four keys) which you wish to register.

C2 C3 C4 C5

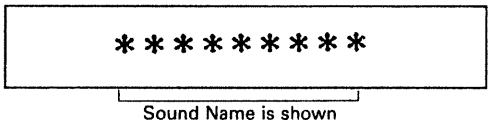
④ Release the pedal switch.

Ext Gate Play

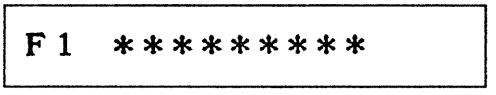
e. Detune

By playing one key, you can actually generate two sounds in slightly different pitches.

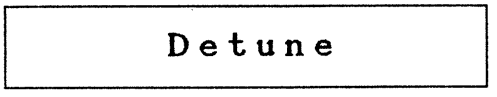
① Push the Structure Button ⓭ which contains the Bank you wish to use.



② Push the F1 button ⓬.



③ Push the same Structure Button ⓭ you pushed in the step ②



When using the Detune function, the S-10 is four voice polyphonic.

To turn the Detune function off, simply push any of the Structure Buttons ⓭.

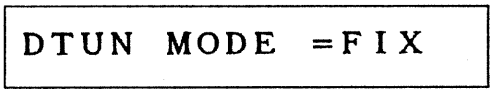
- **Detune Range**

In the Detune mode, the Detune Range value appears first by pushing the Performance Button ⓼.



The pitch difference between the two sounds can be determined by the value of the Detune Range. Higher value increases the pitch difference.

- **Detune Mode**



The pitch difference between the two sounds can be controlled by how you play the keyboard.

Mode	Display	Description
Fixed	FIX	The pitch difference of two sounds is not affected by how you play the keyboard
Touch Sensitivity	VELO	The harder playing manner will increase the pitch difference of two sounds

- **Auto Bend Destination**



When the auto bend effect is applied to a sound with Wave Parameters (explained on page 43), one of the detuned sounds can take on the auto bend effect.

Mode	Display	Description
Both	BOTH	Both voices take on Auto Bend.
Half	HALF	Either of voices takes on Auto Bend

- **Pitch Bend Destinaition**

```
BEND DEST =BOTH
```

One of the detuned sounds can take on the pitch bend effect.

Mode	Display	Description
Both	BOTH	Both voices take on Pitch Bend
Half	HALF	Either of voices takes on Pitch Bend

When the Pitch Bend of the Wave Parameter (explained on page 43) is OFF, sound would not take on the pitch bend effect.

f. Delay

When a key is played, the direct sound then delayed sound will be heard.

① Push the Structure Button ⓮ that contains the sound to take on the Delay effect.

```
*********
```

② Push the F2 button ⓭.

```
F2 *********
```

③ Push the same Structure Button that you pushed in the step ①.

```
Delay
```

When the Delay function is in use, the S-10 is four voice polyphonic.

To turn the Delay function off, simply push any of the Structure Buttons ⓮.

- **Delay Time**

Delay time is the time spent between the direct and the delay sounds. In the Delay mode, the Delay time value will be first shown in the Display by pushing the Performance Button ❽.

```
DELAY TIME=127
```

- **Delay Sound Level**

```
DELAY  LEVL=127
```

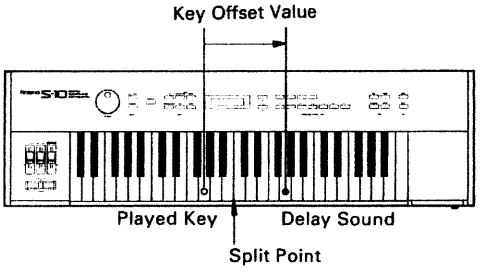
The level of the delay sound can be set from 0 to 127.

- **Key Offset**

```
KEY  OFFSET=   0
```

You can set the pitch of the delay sound higher or lower than the direct sound, in semi-tone steps from -12 (one octave lower) to +12 (one octave higher).

When the Split mode is selected with the Structure Button, the pitch of the delay sound may exceed that of the split point. In such a case, the key of the split point will substitute it.



g. Dual Function

By playing only one key, the sounds in the two different Structures can be generated. Also, you can mute or generate a sound by playing the keyboard softer or harder.

1) Dual Tone

In the Dual Tone mode, the sounds of two different Structures can be simultaneously generated by playing only one key.

Push two Structure Buttons ⓭ at the same time.

```
Dual Tone
```

However, note that you cannot select the Structures which contain the same Banks, e.g., the Structures A and A/B, or A and AB/CD.

When the Dual Tone function is in use, the S-10 is four voice polyphonic.

To turn the Dual Tone function off, simply push any of the Structure Button ⓭.

2) Velocity Mix

When two Structures are selected with Dual Tone function, one of the Structures (=Velocity Structure) can be muted under a set threshold level (minimum volume), while the other.Structure (=Normal Structure) will always be heard no matter how softly you play the keyboard. That is, one of the sounds can be generated only if you play the keyboard stronger than the set threshold level, but it is muted if the volume is lower than the threshold level.

① Push the Structure Button ⓭ to select the Normal Structure.

```
********
```

② Push the F1 button ⑫ .

F 1 ＊＊＊＊＊＊＊＊＊

③ Push the Structure Button of the Velocity Structure.

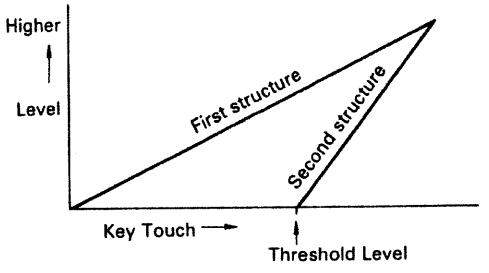
Velo-Mix

The indicator of the Normal Structure is lit, and that of the Velocity Structure flashes.

However, note that you cannot select the Structures which contain the same Banks, e.g., the Structures A and A/B, or A and AB/CD.

When the Velocity Mix function is in use, the S-10 is four voice polyphonic.

To turn the Velocity Mix function off, simply push any of the Structure Buttons ⑬ .



- **Velocity Mix Threshold**

This can set the threshold level (minimum volume) at which the Velocity Structure can sound.

V-MX THRSH= 64

The value shown here represents the minimum strength of your key touch required for the Velocity Structure to sound. That is, when the value is higher, stronger playing manner is required, therefore, only by a very strong playing manner, you can hear both Structures.

3) Velocity Switch

This functions can select one of the two sounds to be generated depending on how you play the keyboard (Velocity). That is, you can hear one sound (=Weak Structure) when playing the keyboard softer than a set velocity, and the other sound (=Strong Structure) when playing harder than that.

① Push the Structure Button ⑬ to select the Weak Structure.

＊＊＊＊＊＊＊＊＊

② Push the F2 button ⑱ .

F 2 ＊＊＊＊＊＊＊＊＊

③ Push the Structure Button to select the Strong Structure.

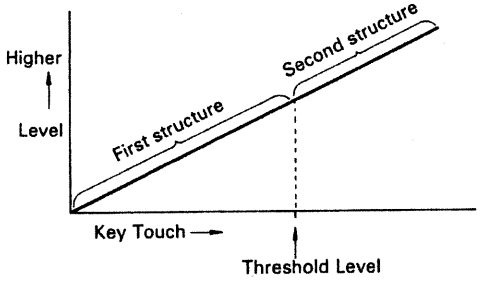
Velo-Switch

The indicator of the Weak Structure is lit, and that of the Strong Structure flashes.

However, when the above function is in use, you cannot select the Structures which contain the same Banks, such as A and A/B, or A and AB/CD, etc.

* In this mode, the S-10 is eight voice polyphonic.

To turn the Velocity Switch function off, simply push any of the Structure Button ⑬.



- **Velocity Switching Threshold**

  This determines the threshold level (velocity) under which the Weak Structure is selected, and over which the Strong Structure is selected.

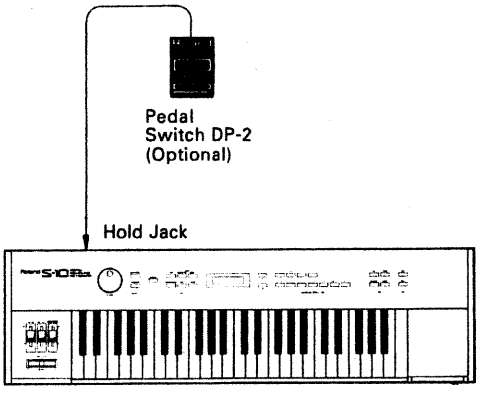
V-SW THRSH= 64

By setting a high value (velocity), you can hear the Strong Structure only when playing the keyboard hard.

3. Performance Controlling Functions which are unrelated with Performance Parameters

a. Pedal Hold

The pedal hold function can be turned on or off by operating the optional pedal switch DP-2 connected to the Hold Jack ⑳ on the rear panel. Pedal Hold is the function that retains the sound even after the key is released.



The sound which is not looped (explained on page 31) cannot take on the Hold effect.

b. Tuning

The S-10 can be tuned to other musical instrument within the range of semi-tone upper and lower.

① Push the Tune Button ❺ .

```
MST TUNE =   0
```

② Rotate the Alpha Dial until the S-10 is tuned to the other musical instrument.

```
MST TUNE =+  7 ▲
```

The value shown in the Display represents how many cents are raised or lowerd. (100 cents make a semi-tone)

③ Push the Enter Button ❿ .

```
********
```

To return to ±0 cent, simply push the Enter Button ❿ while holding the Tune Button ❺ down.

c. Changing Split Point

When the Split Structure is currently in use, the split point can be changed. Also, in the Dual mode, the split point can be changed.

① See whether the indicator of the Structure is lit or flashing.

When lit:

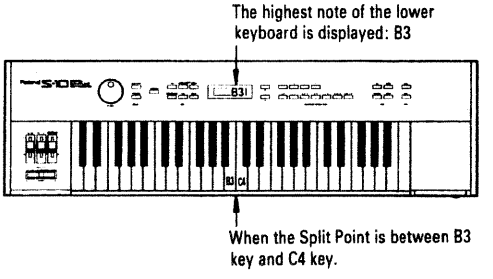
Push the F1 button ⓬ , and the Parameter Button.

When flashing:

Push the F2 button ⓭ , then the Parameter Button.

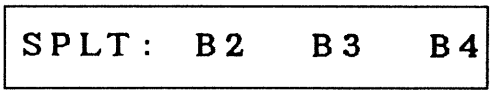
```
SPLT:   B3
```

The key number of the highest note in each Bank is shown in the Display.



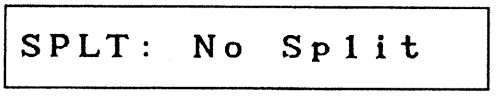
② Change the flashing key number using the Alpha Dial ❶.

When the Structure A/B/C/D is in use, three split points will be shown. In this case, move the flashing positions using the and buttons ▶ ⓬ and ◀ ⓭, then change the split points by rotating the Alpha Dial.



③ When you have finished to change the split points, push the Enter Button ⓮.

When the Structure which is not splited is selected, but you have tried to change the split point, the Display will respond with as follows showing that it is not possible.



4. Performance Parameters

Each side of a QD contains one Bank data with the information of performance parameters and split point. When the data is loaded from the QD to the S-10, the performance parameters of the data finally loaded will be kept in the S-10's memory. This means that you should be careful when loading data into the S-10 from different QD's. If you wish to use only the voice and the split point information, you can leave out the performance parameter information as follows.

- **Loading the data into the S-10 without Performance Parameters**

Push the F2 Button ⓭, then the Load Button ⓳, and the data will be loaded leaving the performance parameter information.

When extracting a Bank or Banks of a Structure (page 14), the performance parameters are not loaded.

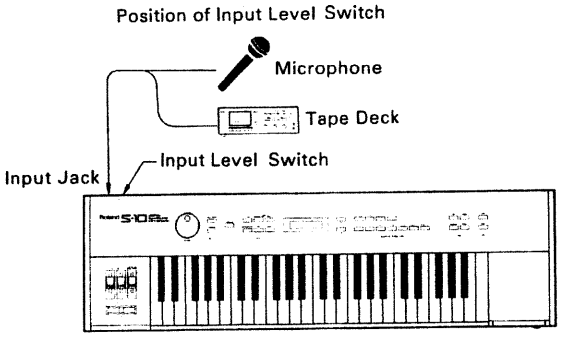
3 SAMPLING

Without using the performance disk, you can sample the voice from a microphone or audio equipment, and play it from the keyboard.

1. Basic Sampling

Plug a microphone or an instrument into the Input Jack ㉜ .

Move the Input Level Switch ㉛ depending on the output level of the mic or instrument connected.

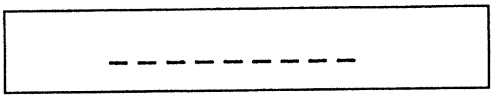


Example Settings of the Input Level Selector Switch

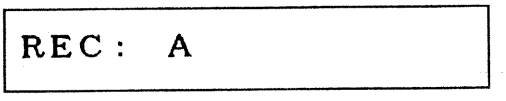
L (−50dB)	Microphone
M (−20dB)	Electric Guitar
H (0dB)	Cassette Deck, CD player (Line Level)

When a mic is connected, turn the Master Volume down, or it will cause howling.

① Select the Bank (A, B, C, or D) to be sampled.

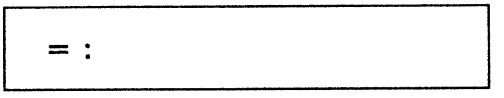


② Push the Recording Button ⑮ .



The selected Bank will be shown in the Display. Here, you can monitor the sampling sound with the amplifier, speakers or headphones. If sampling from a mic, please do not use speakers.

③ Push the Stand-by Button ⑰ .



The Display now serves as a level meter. Ensuring that the sound is securely being fed into the sampler, adjust the Recording Level Knob at the far left of the keyboard. Just like the volume adjustment in tape recording, set the level as high as possible without " : " mark exceeding the right margin in the Display.

④ Set the level of the Auto Trigger by rotating the Alpha Dial ❶ until the " : " mark in the Display reaches the desired position.

Auto Trigger is the function that starts the sampling automatically when the signal exceeding the set level is fed into the sampler.

When the signal that exceeds the trigger level (represented with " : " mark) is fed into the sampler, the far right of the Display shows " * " mark. Make sure that " * " does not appear in the Display because of noise.

Here, the S-10 is still in the stand-by mode.

⑤ Push the Start Button ⓭.

```
* REC KEY    C4 *
```

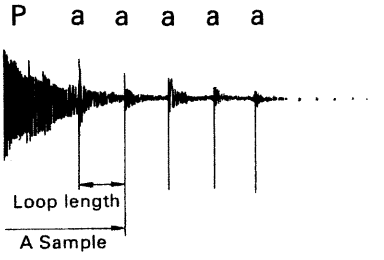
Now, the Display shows the pitch of the sound to be sampled. When sampling a sound from a musical instrument, try to feed the correct pitch. (Even if a different pitch is used, it can be corrected later, though)

When the sound that exceeds the set Auto Trigger level is fed in, the sampling is done only for a second and goes back to the Play mode.

The performance parameters set before the sampling are retained in the S-10, therefore, it may not be necessarily played with the sampled sound. Reset all the performance parameters to the default settings by pushing the Enter Button ⓾ while holding the Performance Button ❽ down.

You can now hear the sampled sound by playing keyboard. The sampled sound longer than 0.8 sec will be automatically looped (Autolooping). Looping function repeats playing a part of the sampled sound. This way, sustain sound can be performed. For instance, you can produce "Paaaaaa . . . . ." sound by a sample "Pa".

Looping a sample can produce an annoying tricking or popping noise, but this can be removed later by correcting Wave Parameter (explained on page 37).



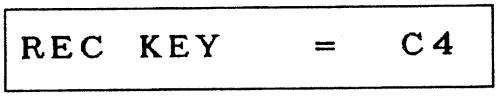
If the S-10's built-in computer cannot find the start point of the loop, the looping is not performed and the unit goes back to the Play mode.

If the Autoloop function of the Wave Modify parameters is set to Mode 3 or Mode 4, looping will be more difficult.

2. Changing Sampling Conditions

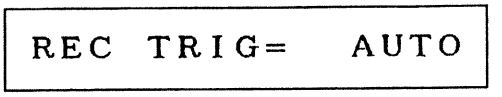
You can change the following sampling conditions: Key Numbers, Trigger Modes and Sampling Clock. Push the Recording Button ⓯ then the Mode Button ⓰ , and select the condition you wish to change by using the Forward Button ❷ and Back Button ❸ . Then make a necessary alteration, and push the Stand-by Button ⓱ , and you can move to the sampling operation.

- **Changing Key Numbers in Sampling**



When you are sampling a specific pitch, you may set an appropriate key number. It is important to remember that the pitch exceeding the highest note of the keyboard cannot sound.

- **Changing Trigger Modes**

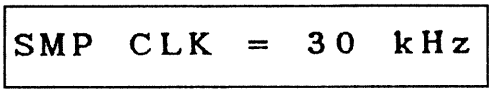


Usually, set this to Auto Trigger mode. However, when sampling a long tone that is difficult to start sampling, select Manual mode. The moment you push the Start Button 18 and the pedal switch (or push the Start Button twice), the sampling begins.

When the Manual mode is selected, the " : " mark in the Display goes out.

The selected mode will remain even after the S-10 is turned off.

- **Sampling Clock**



Usually, one second sample can be recorded in a Bank at the 30kHz frequency. However, it can be extended to two seconds, by selecting the 15Hz frequency. This, however, decreases higher frequencies, making the sound muffled.

3. Sampling a Long Tone or Split

To sample a long tone, you need the Structure AB (two seconds), CD (two seconds), or ABCD (four seconds). Also, when the tone delicately differs depending on the pitch, or two different sounds are required in the upper and lower sections of the splited keyboard, you need the Structure A/B, C/D, AB/CD or A/B/C/D.

a. Sampling a Long Tone

The necessary procedure is almost the same as the basic sampling.
After selecting a Structure, the Display shows the relevant Banks. Using the Sampling Clock function (on page 31) together with this effect of combining more than one Bank, the time can be even more extended twice as long.

In a single Bank sampling, the auto-looping is performed on the sample exceeding 0.8sec. But in a stracture of combined Banks, auto-looping works when the last Bank exceeds 0.8sec For instance, in the structure AB, the sample longer than 1.8 sec will be looped.

b. Sampling of Split Stuctures

When Split Structures such as A/B, C/D, AB/CD or A/B/C/D is selected, the group of the relevant Banks are shown in the Display. Select the desired group of the Banks by rotating the Alpha Dial ❶.

The necessary procedure is basically the same as the usual sampling. In this mode, however, next Bank to be sampled is displayed after you have sampled one Bank. When all Banks are sampled, the S-10 will automatically return to the Play mode.

If you wish to go back to the Play mode for verifying what you have sampled so far, push any of the Structure Buttons ⓭. When you resume sampling other Bank which has not been sampled yet, be sure to assign the correct Bank.

4. De-activating Looping

To sample a long tone, you use more than one Bank combined, and Looping is not necessary. However, the S-10's Auto Looping function will be automatically activated whenever a sound longer than 0.8sec is fed in. The Looping function can be removed later or even now before any sampling is performed. To cancel the Looping function now, simply push any of the Structure Buttons while the Display is showing the following indication.

```
Seek loop point
```

4 Correcting the Sampled Data

The sampled sound is stored in the S-10's memory, and later when the keyboard is played, read from the memory and reconstucted. Wave Parameters are involved with the Reading and Reconstructing.

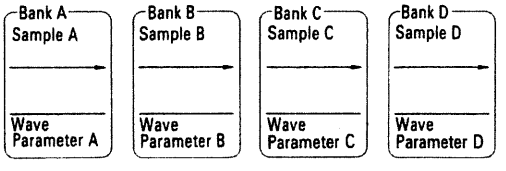
Even the useless samples will come to serve to your purpose if modified by the wave parameters to be played in a different way. For instance, the pitch of a sample can be modified during reading. Also, by using the wave parameters and changing the way of playing samples in more active ways, you can perform various things, e.g. changing looping, adding envelope curve, etc. In other words, wave parameters are not involved with transforming the sample itself, but only with changing how it is read from memory.

Each sampled sound has a set of wave parameters.

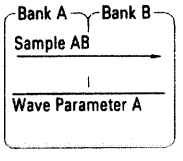
When more than one Bank is used for sampling a sound, the group of the Banks (one Structure) has a set of wave parameters.

The data loaded from a QD can also be modified with the wave parameters.

Single Bank Structure



Structure AB

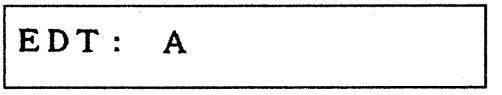


This concept applies to the Split Structure as well.

1. Editing Wave Parameters

Any of the wave parameters can be edited in the following method.

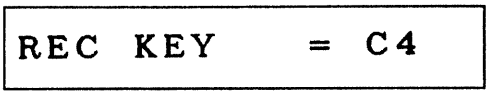
① Push the Parameter Button ❻.



The Display shows the Bank(s) which is to be edited by the wave parameters.

When a Split Structure is in use, select the Bank to be edited by using the ► button ⓬ and the ◄ button ⓭.

② Select the wave parameter to be changed with the Forward Button ❷ or Backward Button ❸.



③ By rotating the Alpha Dial ❶, change the value of the parameter.

Repeat the steps ② and ③ as many times as necessary.

④ Push the Enter Button ⓫.

Display	Wave Parameter
REC KEY	Recording Key Number
BANK TUNE	Bank Tune
LOOP TUNE	Loop Tune
SCAN MODE	Scanning Mode
LOOP TYPE	Loop Type
ST	Start Point
END	End Point (Manual)
LP	Loop Length (Manual)
AEN	End Point (Auto)
ALP	Loop Length (Auto)
KEY FOLLOW	Key Follow
PITCH BEND	Pitch Bend On/Off
VIBRATO	Vibrato On/Off
ENV V-SENS	Envelope Velocity Sensitivity
ENV RATE 1	Envelope Rate 1
ENV LEVEL 1	Envelope Level 1
ENV RATE 2	Envelope Rate 2
ENV LEVEL 2	Envelope Level 2
ENV RATE 3	Envelope Rate 3
ENV LEVEL 3	Envelope Level 3
ENV RATE 4	Envelope Rate 4
DYN SENSE	Dynamics Sensitivity
ABEND RATE	Auto Bend Rate
ABEND DPTH	Auto Bend Depth

Wave parameters can be edited while playing the keyboard.
However, the change of the sound may not be recognized if the value of the parameter is changed while a key is being played.
When the key is released and played again, the edited sound will be monitored.

When editing a parameter of a Split Structure, you can move to the parameter of other Bank by using the ▶ or ◀ buttons.

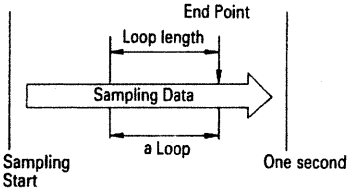
Editting B

The Display will show the new Bank for a second, and now the wave parameters of that Bank can be edited.

2. Changing Looping

If you find the looping of the sample is strange or the pitch of a loop is incorrect, edit the sample with the wave parameters.

The picture will help you understand Looping



- **Loop Type**

```
LOOP TYPE= MAN
```

Select any of the loop types; One shot, Manual or Auto.

Mode	Display	Description
One Shot	1 SHOT	No looping
Manual	MAN	Looping is performed with the loop length and the End Point set at the corresponding Wave Parameters
Auto	AUTO	The ALP and AEN which are automatically detected decide the looping.

"Manual" allows you to edit the Loop Length and End Point. These two wave parameters are independent of each other, so, adjust them alternately while actually listening to the sound.

In the Manual mode, the default of the loop length and end point is the same as that of the Auto mode.

The loop length and the end point of the Manual and the Auto are preprogrammed separatedly, therefore, you can here recall the loop length and the end point of the Auto.

- **Loop Length**

```
LP =      4 . 01%
```

A loop is a section which replays while the key is being held down.

The length of the loop can be set with the Start Point and End Point. When the loop length is too short, the loop may get out of pitch. The pitch gap less than semi-tone can be later corrected by Loop Tune parameter.

- **End Point**

```
END= 32767  100%
```

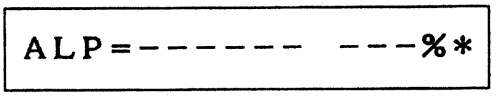
This is the end point of a loop.

- **Loop Tune**



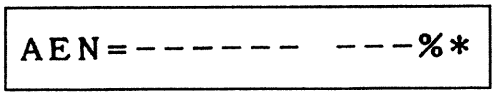
This can correct the pitch of a loop.

- **ALP**



In "Manual" mode, the loop length used in the "Auto" mode is shown just for guidance, but this cannot be altered.

- **AEN**



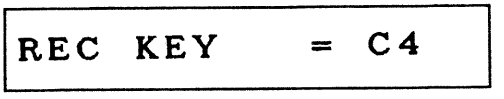
In the "Manual" mode, the end point used in the "Auto" mode is shown just for guidance, but this cannot be altered.

3. Tuning a Sample

When you have sampled the pitch diffferent from the key number shown in the Display, the pitch of the sampled sound can be tuned here.

Two wave parameters are involved, one is Sampling Key Number that does tuning in semi-tone steps, and the Bank Tune that does more delicate tuning.

- **Sampling Key Number**



When you are sampling a specific pitch, change to the relevant key number. If not, release the key, play it again and while listening to the sound, tune to other instrument using the Alpha Dial ❶.

The pitch higher than the sampled pitch by more than 21 and half tones will be substituted with the lower octave.

- **Bank Tune**



You can change the pitch in one cent step. The Display shows how many cents are raised or lowered from the pitch of the sample.

4. Scanning Mode

```
SCAN MODE =FWD
```

FWD, BWD and ALT determine how to read the samples:

- **FWD (Forward)**

This plays the samples in the sequence as they have been recorded. Usually, select this mode.

- **BWD (Backward)**

This plays the samples in the reverse sequence, just like the reverse playback of a tape recorder.

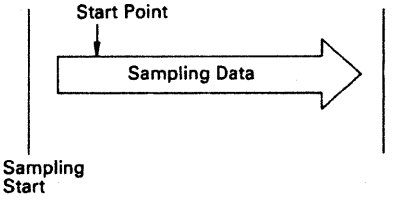
- **ALT (Alternate)**

This forwards and reverses a loop alternately. Changing the loop length, various effects can be obtained.

5. Start Point

```
ST =          0 . 00%
```

You can change the start point of the sample. The sample will be played from the set start point. This is useful for correcting the start point of the sample recorded in Manual.
Also, this can start the sample from the middle.



- **Address Display**

Address is the value that represents the time of Start Point, Loop Length and End Point. The length of a whole Bank is 32.767 address. A set of two Banks is 65.535 address. A set of four Banks is 131.071. The percentage that the address accounts for of the whole Bank is shown in the Display.
The value can be changed by rotating the Alpha Dial. Rotating the dial fast changes the value drastically.

6. Key Follow

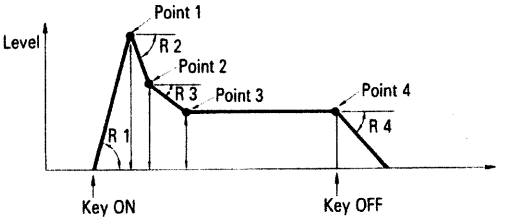
```
KEY FOLLOW= ON
```

Usually Key Follow is ON, and playing each key on the keyboard will create the corresponding pitch.

Key Follow OFF is a rather special effect that generates only the same pitch as the sampled sound whatever key may be played. The pitch to be generated, moreover, can be altered by Record Key Number and Bank Tune of the Wave Parameters.

7. Envelope

The S-10 offers you a wide range of control over the envelopes of the sampled sound.



* **R 1 and R 2 change depending on how you play the keyboard.**

Wave Parameter "Rate" is a slope from a level (volume) to the next level. Higher Rate is a steeper slope. When the level difference between the first level and the next is small, the time needed for a slope is shorter.

Envelope Parameters

L1 and L2

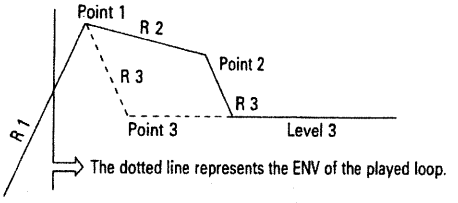
When L1 is set to exactly the same length as L1, R2 has no meaning. Points 1 and 2 become one, and R1 is followed by R3 right away.

L2 and L3

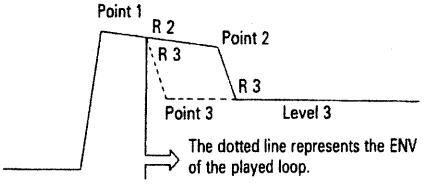
When L3 is set to exactly the same length as L2, R3 has no meaning. Points 2 and 3 become one.

Envelope and Looping

When looped before the curve reaches Point 1, Point 1 slides to Point 3 in the slope of R3.



When looped while decaying in the slope of R2, the slope changes to R3 and slides to the Point 3.



- **Envelope Rate 1 (R1)**

ENV RATE1 =127

The Envelope Rate 1 (the slope from Key-On to Point 1) can be set from 0 to 127. With the Wave Paramater "Envelope Velocity Sensitivity" set to high, the rate can be controlled by touch sensitivity on the keyboard.

- **Envelope Level 1 (L1)**

ENV LEVEL1=127

The level of the Point 1 can be set from 0 to 127.

- **Envelope Rate 2 (R2)**

ENV RATE2 =127

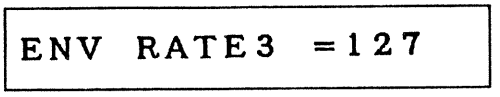
The Envelope Rate 2 (the slope from Point 1 to Point 2) can be set from 0 to 127. With the Wave Paramater "Envelope Velocity Sensitivity" set to high, the rate can be controlled by touch sensitivity on the keyboard.

- **Envelope Level 2 (L2)**

ENV LEVEL2=127

The level of the Point 2 can be set from 0 to 127.

- **Envelope Rate 3 (R3)**



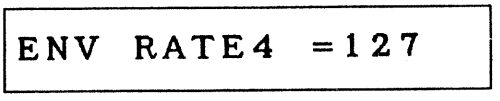
The Envelope Rate 3 (the slope from Point 2 to Point 3) can be set from 0 to 127. (The actual slope of R3 is a curve.)

- **Envelope Level 3 (L3)**



The level of the Point 2 can be set from 0 to 127.

- **Envelope Rate 4 (R4)**



This is the slope that slides down from Key-Off to volume zero. 0 to 127 is valid for R4. Higher value is quicker decay. (The actual slope of R4 is a curve.)

- **Envelope Velocity Sensitivity**



With the Envelope Velocity Sens set to higher value, the R1 and R2 are controlled by the dynamics on the keyboard. That is, playing the keyboard harder will quicken the attack time, and vice versa. Even without setting the Envelope curve (ADSR), the attack time can be controlled with the touch sencitivity of the keyboard, by raising the value of the Envelope Velocity Sensitivity.

No matter how hard you play the keyboard, you cannot obtaine the higher pitch than that of the sampled sound.

8. Dynamic Sense

```
DYN SENSE =127
```

Dynamic Sense is the maximum effect of the touch sensitivity. The volume will change more drastically with the higher value.

9. Pitch Bender On/Off

```
PITCH BEND= ON
```

This selects whether the selected Bank will take the Pitch Bender effect. The Dual function (performance parameter) allows to mix the Bank with the pitch bender effect and the Bank without it, creating a special effect.

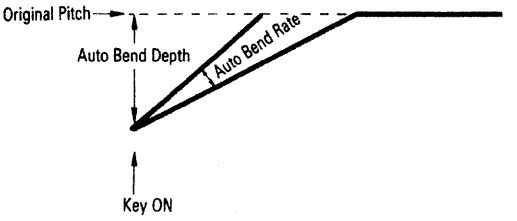
10. Vibrato On/Off

```
VIBRATO = ON
```

This selects whether the selected Bank will take the vibrato effect (the Manual or Delay Vibrato) or not. The Dual function (performance parameter) allows to mix the Bank with the vibrato and the Bank without it, creating a special effect.

11. Auto Bend

Auto Bend involves the depth and the rate of the pitch at the sound head.



- **Auto Bend Depth**

```
ABEND DPTH= 0
```

This determines how much the pitch should be lowered from the sampled sound.

- **Auto Bend Rate**

```
ABEND RATE=127
```

This determines the slope sliding to the original pitch.

12. Copying Wave Parameters

The following Wave Parameters can be copied individually or in bulk from a Bank to other Banks of a Split Structure. All what you need is to modify the copied parameters to desired forms. This would be much easier and quicker than making Wave Parameter from scratch.

Wave Parameters which can be copied are:

Loop Type
Scanning mode
Key Follow
Envelope
Envelope Velocity Sensitivity
Dynamic Range
Pitch Bender
Vibrato
Auto Bend Depth
Auto Bend Rate

a. Bulk Copy

After you have finished editing all the Wave Parameters in one Bank of the Split Structure, go to the following procedure.

While holding the Save Button ⓴ down, push either ► ⓬ or ◄ ⓭.

b. Individual Copy

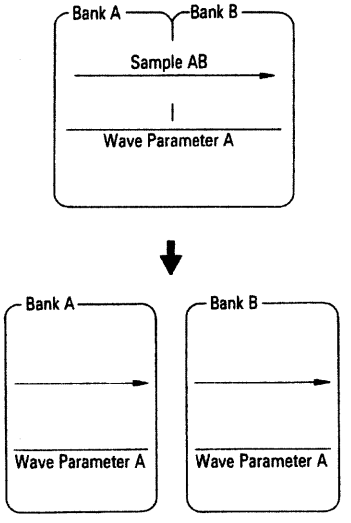
① Select the Wave Parameter you wish to copy.

② While holding the Recording Button ⓯ down, push either ► ⓬ or ◄ ⓭.

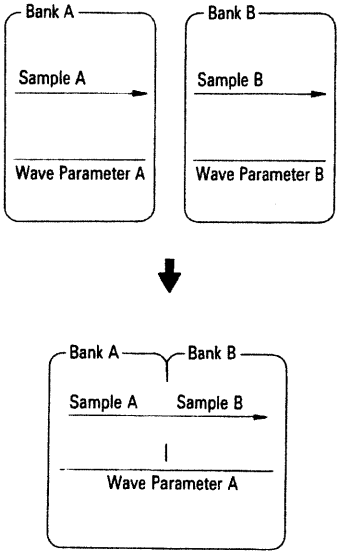
13. Structure and Wave Parameters

When more than one Bank is combined for recording a sample, these Banks are considered to be one group, and one group has a set of wave parameters.

When the Structure AB is separated into A and B, each A and B requires and is given the set of parameters owned by the Structure AB. (The Loop Type is One Shot and the Start Point is 0.)



On the other hand, when the two Structures A and B are converted to on Strucure AB, it will have the set of parameters which used to belong to the Bank A. (The Loop Type is One Shot and the Start Point is 0.) The parameters which are owned by the Bank B will be lost, therefore, to correct the pitch of the sampled sound, use the Bank A's Recording Key Number and Bank Tune. The Banks A and B will be played sequencially, but they will not be automatically set to the same pitch, unless you take an appropriate procedure for tuning two Banks.



5 Saving

A whole Bank of the sampled sound can be saved on a quick disk(QD) with the Wave Parameters, Performance Parameters, Split Point, Structure Mode, Bank Name and File Name. The saved data can be loaded back to the S-10 at any time.

1. Basic Saving

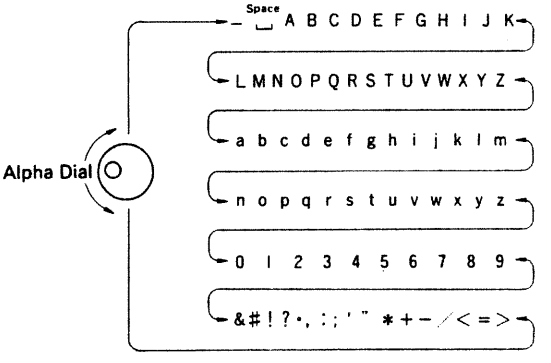
① Call the Bank to be saved and select the Structure Mode for playing it back.

② Push the Save Button ⓴.

```
Name  :  __________
```

③ Write a File Name of the data as follows.

As you rotate the Alpha Dial, an alphabet, number or sign will appear at the flashing cursor in the Display. When the first letter is written, move the cursor to the next position using the ► Button ⓬, then write the second letter with the Alpha Dial.



The cursor can be moved backward using the ◄ Button ⓭.

To make a space, simply push the Forward Button ❷.

When you are editing the data loaded from a QD, the data is already named. Rename it if you like.

④ If you have completed to write the File Name, push the Save Button.

Insert QD

⑤ Insert the QD where the data is to be saved.

When a brand new QD is used, the data will be automatically saved onto it.

Save ********

When any previous data is written on the QD, the Display will respond with:

Kill ******** ?

If you wish to retain the data saved on the QD, make sure the disk drive indicator is dark, push the Eject Button and take the QD out, then insert the other QD.

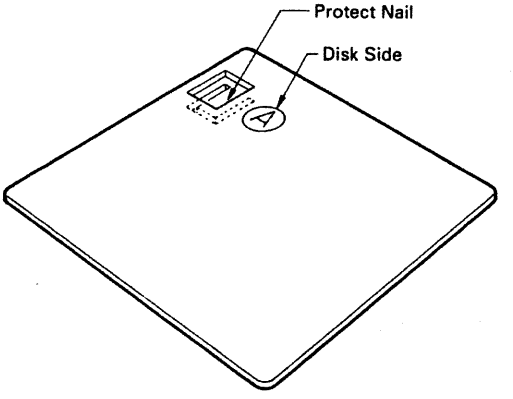
Now, push the Save Button ⑳ .

To cancel saving, push any Structure Button ⑬ .

⑥ When the saving is completed, the Display will change to as below.

Save complete

To protect the saved data from an accidental loss, take the QD out, and snap off the Protect Nail.



When more than one Bank is used in a Structure, the Display will respond with as shown below. This tells you that you need to save the other Bank to the other side of the QD.

Change QD

As the Display indicates you, remove the QD and reinsert it with the other side facing upward. (or insert other QD)

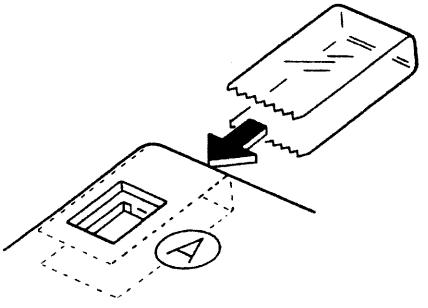
Likewise, save all the Banks of the Structure.

When saving is impossible, the following error messages will be shown.

Error

```
Write protected
```

This tells you that the Protect Nail on the QD is snapped off.
To use such a QD again for saving, attach a selophane tape as shown below.



Error

```
Verify Error
```

This tells you that the QD is damaged. Replace it with a proper one.

2. Quick Saving without Verification

This saving skips the verifying procedure whether the QD contains any previous data or not, therefore quicker. A brand new QD can be saved in this method.

Take exactly the same procedure as "1. Basic Saving", but push the F1 button before pushing the Save Button in step ②.

6 Wave Modification

Not only editing the Wave Parameters and Performance Parameters, the S-10 also allows to edit the sampled sound itself. We call this Wave Modification.

The Wave Modification actually processes the sample itself, therefore, the modified data cannot be restored. Please be sure to save the data onto a QD before performing Wave Modification.

First, select the factor to be wave-modified as follows.

① **Select the Structure by using the appropriate Structure Button ⓮.**

Depending on the factor selected later in step ③, the Structures to be selected here is limited.

② **Push the Modify Button ❼.**

The Display shows "Wave Modify" for a moment. This indicates that it is now in the Wave Modify mode. While in the Wave Modify mode, no sound can be generated by playing the keyboard.

③ **Using the Forward Button ❷ and the Backward ❸ Button, call the factor to be edited.**

Now, go to the next procedure for actual Wave Modification.

► Wave Modification of individual Bank(s).

You can wave-modify an individual Bank or Banks of combined Structure as well as the whole Structure.
e.g. You can adjust the level of the Bank C of the Structure A/B/C/D, or apply "Digital Filter" to the Banks C D of the Structure AB/CD.

1. Level Adjusting

The volume of the sampled sound in each Bank can be adjusted.

Take the step ①, selecting any Structure you like.

Take the steps ② and ③, selecting "Level Adjust".

```
Lv1 Adj Max=100%
```

④ Set the desired level using the Alpha Dial.

⑤ Push the Enter Button ⑩.

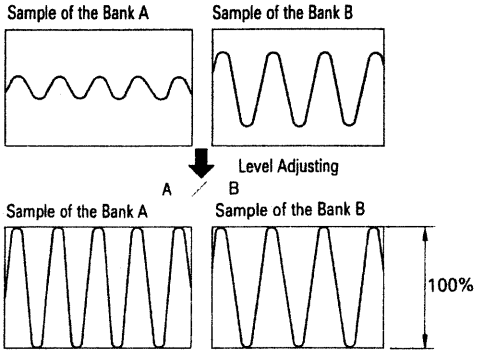
```
Lev1 ----→
```

The S-10 returns to the Playing mode.

When the level is set to 100%, each Bank will be automatically set to the maximum volume which is the level just before the sound is distorted. However, some samples are distorted every time they are played. If so, set a lower level.

When a Split Structure is selected, the volume of each Bank will become equal to the level set in the Level Adjusting.

e.g.) Level Adjustment of the Structure AB



To adjust the level of a Bank or Banks of a Split Structure, take the following procedure.

1) Simply call the relevant Bank(s) by pushing the appropriate Structure Button, then the Enter Button.

2) Adjust the level of a Bank or a group of Banks by taking step ② to ⑤.

3) Return the Bank or the group of Banks to the Structure it belongs to by pressing the same Structure Button as you pressed in the step ①, then push the Enter Button ⑩.

2. Reverse

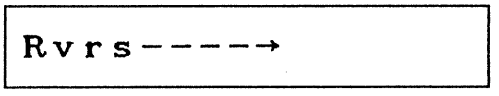
Reverse function on the S-10 plays the sample backwards; similar to the tape recorder's reverse playback. If a Structure consists of more than a Bank, the group of Banks will be played as one, while each Bank will be individually played in the Split Structure.

Take the step ①, selecting any Structure you like.

Take the steps ② and ③, selecting "Reverse".



④ Push the Enter Button ⑩ .



When the sample is played up, the Display returns to the Playing mode indication.

A loop cannot be reversed; the looping is cancelled and One Shot is set automatically.

3. Auto Loop

Even when the looping is cancelled by otherWave Midification, the Auto Loop function can detect the optimum loop length and End point.

In a Structure of combined Banks, the group of Banks is looped as one, while each Bank of the Split Structure is looped individually.

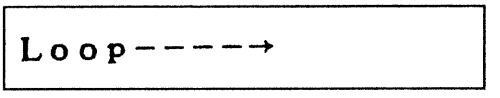
Take the step ①, selecting any Structure you like.

Take the steps ② and ③, selectign "Auto Loop".



④ By rotating the Alpha Dial, experiment and select one of the four Looping Modes.

⑤ Push the Enter Button ⑩ .



When Auto Looping is finished, the Display changes to the Playing Mode indication.

By repeating the steps ④ and ⑤, select the Looping Mode you like.

After the Auto Looping is executed, the Wave Parameters ALP and AEN will retain the detected loop lengh and the ending point and the Loop Type remains AUTO.

Manual's LP and END are not affected by the Auto Loop procedure.

The looping mode set in the above step ④ will remain till later Auto looping that follows sampling.

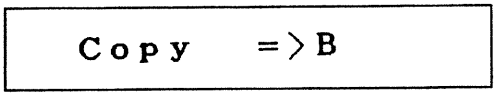
4. Copy

The sampled sound and the Wave Parameters stored in a Bank (or Structure) can be copied into a different Bank (or Structure).
The destination Bank(s) is limitted depending on the type of the source Bank(s) that you wish to copy as shown below.

- **Compatible Banks**

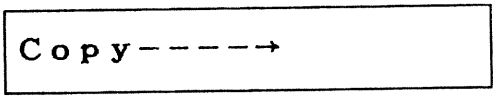
Source Bank(s)	Destination Bank(s)
A	→ B 、C、D
B	→ A 、C、D
C	→ A 、B、D
D	→ A 、B、C
AB	→ CD
CD	→ AB
A/B	→ C/D
C/D	→ A/B

Take the step ①, assigning the source Bank (Structure), and go to the steps ② and ③, selecting "Copy".



The source Bank (Structure) is shown in the Diplay. When the source Bank is A, B, C or D, you can select the destination Bank with the Alpha Dial ❶.

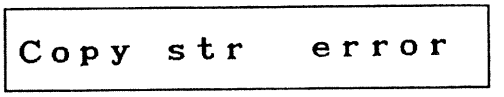
④ Push the Enter Button ⓾.



When the copying is done, the above indication disappears.

Error

When you have assinged the destination Bank (Structure) where the source Bank (Structure) cannot be copied, the follwoing error indication is shown in the Display.



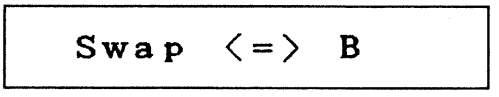
Repeat the copying procedure with a proper Bank (Structure) selected.

5. Swap

The contents (sampled sound and Wave Parameters) of two different Banks (Structures) can be swapped. The destination Bank (Structure) is limitted depending on the source Bank (Structure) that you wish to copy as shown on page 52.

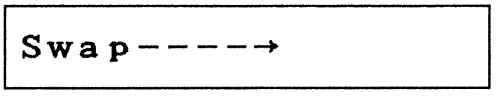
Take the step ①, selecting one of the two Banks (Strucutres) to be swapped.

Take the steps ② and ③, selecting "Swap".



Now, the data is swapped between the Bank (Structure) shown in the Display and the one whose indicator is lit. When you wish to change the Strucutre shown in the Display, use the Alpha Dial.

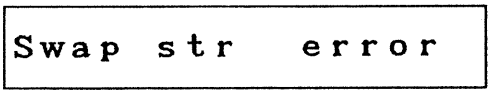
④ Push the Enter Button ⑩.



When the swapping is completed, the Display will return to the Playing mode indication.

Error

The following error indication shows that you have chosen the Strunctures which cannot be swapped.



Please repeat the swapping procedure with the proper Structures selected.

To swap a single Bank of a Structure (such as A of A/B) with other single Bank of other Struncture (such as C of C/D), it is necessary to extract the Bank from the Structure berforehand.

Select a Bank to be swapped from a Structure and push the Enter Button ⑩, then select a Bank to be swapped from another Structure and push the Enter Button.

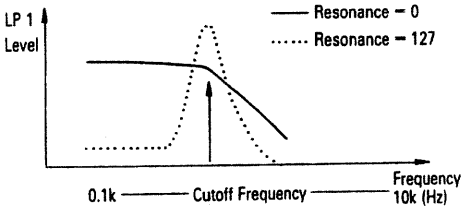
Now, take the usual swapping procedure.

When swapping is completed, push the same Structure Button as you pushed in the step ①, then push the Enter Button ⑩.

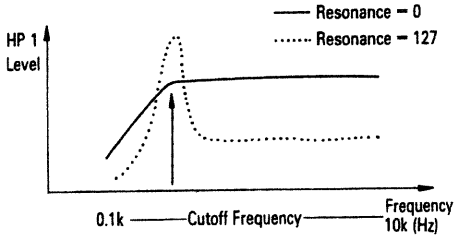
6. Digital Filter

The Digital Filter can be used to reduce the sampling noise or to change the timbre or the sampled voice.

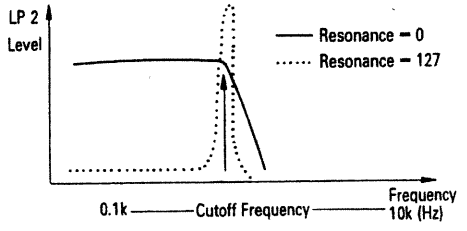
There are four different filters optional.



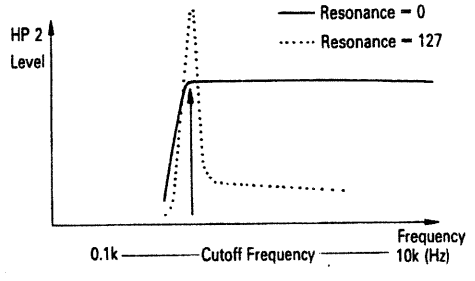
Lowpass Filter with relatively mild cutoff frequency.



Highpass Filter with relatively mild cutoff frequency.



Lowpass Filter with sharp cutoff frequency



Highpass Filter with sharp cutoff frequency

Resonance: This emphasizes the harmonic contents at the set cutoff frequency, creating electric and metalic sound.

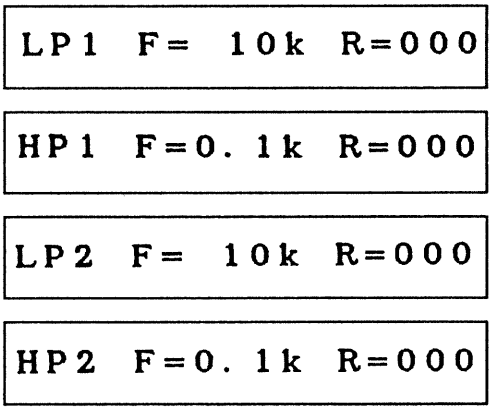
The digital filtering is processing with computer, therefore, cannot be performed while the keyboard is being played.

The filtered sample cannot be restored again. Please be sure to make a backup QD before filtering the sample.

To use two filters at a time, take the following procedure twice.

Take the step ①, selecting any Structure you like.

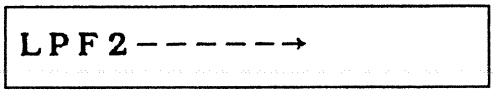
Take the steps ② and ③, selecting one of the four filters.



④ Set the Cutoff Frequency and the Resonanse.

Using the Alpha Dial ❶, set the value at the flasing cursor, and move the position of the cursor with the ▶ and ◀ Buttons.

⑤ Push the Enter Button ⓾.



When the memory is rewritten with the filtered data, the Display returns to the Playing mode indication.

7. Mixing

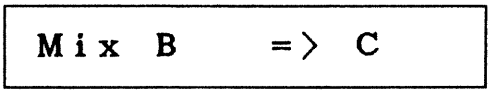
The voices of two different Banks (Structures) can be mixed. However, the pitch difference between two voices cannot be corrected later, so tune them before mixing.

The Structures to be mixed should be the same type. (For instance, the Structures A and CD cannot be mixed.)

The mixed data can be written into the source Structure or the same type Structure. The voices to be mixed should be 30 kHz sampling. 15 kHz sampling cannot be properly mixed.

Take the step ①, selecting either of the Structures to be mixed.

Take the steps ② and ③, selecting "Mix".

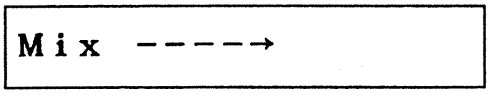


The Structure shown in the left of the Display and the one whose Structure Button is lit are mixed and rewritten into the Structure shown at the right of the Display.

The destination Struncture (shown at the right of the Display) can be selected by moving the flashing cursor with the ▶ button ⓬ and using the Alpha Dial ❶.

When the Structure A, B, C or D is selected (the indicator on), the Structure (shown at the left of the Display) which is to be mixed with the selected structure can be altered.

④ Push the Enter Button ⓾.



When the mixed data is written, the Display returns to the Playing mode indication.

Now, the Wave Parameters are reset as shown below. You may need to edit the Wave Parameters here.

Reset Values of Wave Parameters after Mixing

REC KEY	Recording Key Number	Indefinite
BANK TUNE	Bank Tune	0
LOOP TUNE	Loop Tune	0
SCAN MODE	Scanning Mode	FWD
LOOP TYPE	Loop Type	1 SHOT
ST	Start Point	0 0.0%
END	End Point (Manual)	..... 100%
LP	Loop Length (Manual)	4 .... %
AEN	End Point (Auto)	..... 100%
ALP	Loop Length (Auto)	4 .... %
KEY FOLLOW	Key Follow	ON
PITCH BEND	Pitch Bend On/Off	ON
VIBRATO	Vibrato On/Off	ON
ENV V-SENS	Envelope Velocity Sensitivity	0
ENV RATE 1	Envelope Rate 1	127
ENV LEVEL 1	Envelope Level 1	127
ENV RATE 2	Envelope Rate 2	127
ENV LEVEL 2	Envelope Level 2	127
ENV RATE 3	Envelope Rate 3	127
ENV LEVEL 3	Envelope Level 3	127
ENV RATE 4	Envelope Rate 4	127
DYN SENSE	Dynamics Sensitivity	127
ABEND RATE	Auto Bend Rate	127
ABEND DPTH	Auto Bend Depth	0

The mixing balance of the the two voices cannot be set here; it is determined by the volume of the voices before mixed. So, please take the Level Adjusting porcedure before mixing.

Error

The following error indication shows that the selected Structure is not appropriate.

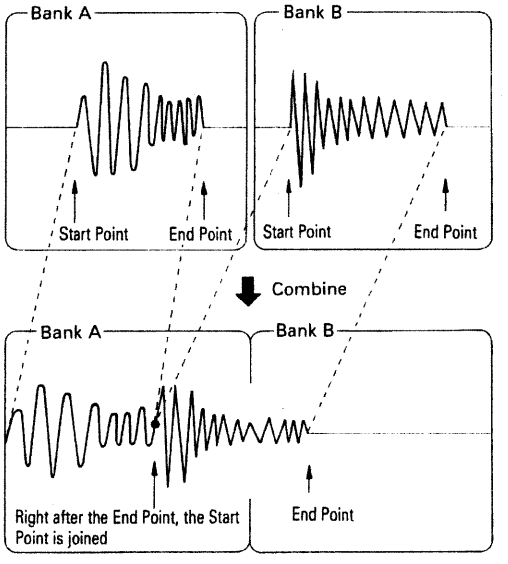
```
Mix str  error
```

Select other Structure and repeat the Mixing procedure.

8. Combine

Combining Function is joining two voices (Banks) with the unnecessary portions discarded.

When two voices stored in the two independent Banks (such as the Structure A, B, C, D, A/B, C/D, or A/B/C/D) are combined in the two Bank Structure (such as AB, CD, or AB/CD), the End Point of the first sample is directly joined to the Start Point of the second sample.

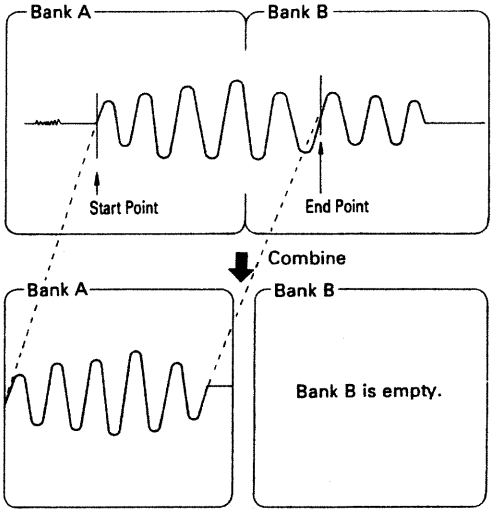


The two voices should be in the same sampling pitch.

The Structures which can be combined are:

A → B
C → D
AB → CD

* The voice in each Bank should be the same sampling clock.



The portions to be used after combined is between the Strat Point and the End Point set with the corresponding Wave Parameters.

That is, the combined data may be short enough to be rewritten in one Bank(A).

Using the Combining function, you can cut the unnecessary portions: before the Start Point of the first Bank and after the End Point of the second Bank.

a. Combining two independent Banks

① Assign the Structure A or C. To combine the Structures AB and CD, assign AB.

② Push the Modify Button ❼.

③ Using the Forward Button ❷ and the Backward Button ❸, select "Combine".

Combine *

④ Using the Alpha Dial ❶, select the Structure to be combined with the one whose Structure Button is lit.

The Display shows the Structure you have selected.

Combine B

⑤ Push the Enter Button ❿.

Cmbn----→

The combined data is stored in the Structure whose indicator is lit.

b. Cuttiing unnecessary portions (of Structure AB, CD or ABCD)

① Select the Structure AB, CD or ABCD.

② Push the Modify Button ❼ .

③ Using the Forward Button ❷ and the Backward Button ❸, select "Combine".

```
Combine *
```

④ Push the Enter Button ❿ .(Do not touch the Alpha Dial.)

```
Cmbn---->
```

When the Combining is completed, the Display returns to the Playing mode indication.

Error

The following error indication shows that the Structure you have selected is not appropriate.

```
Combine str err
```

Select other Strucutre and repeat the Combining procedure.

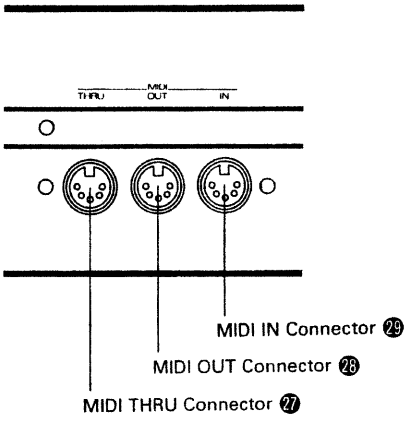
Error

The following error indication shows that the combined data will after all be exactly the same as the original voice. Please check the Start Point and the End Point of the Wave Parameters.

```
No need to Combn
```

7 MIDI

The S-10 features the following three MIDI Connectors.



- **MIDI IN Connector ㉙**

Connect the MIDI IN connector of the S-10 to the MIDI OUT of the external device (e.g. MIDI keyboard, MIDI sequencer). The S-10's sound will be played by the external device.

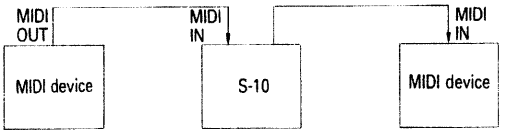
- **MIDI OUT Connector ㉘**

Connect the MIDI OUT connector of the S-10 to the MIDI IN of the device such as MIDI sound module or MIDI sequencer. The external sound module can be played with the S-10's keyboard, or the S-10's performance data can be recorded on the sequencer.

The MIDI OUT does not transmit the signal fed into the MIDI IN.

- **MIDI THRU Connector ㉗**

The exact copy of the signal fed into the MIDI IN is sent out through this connector. Using MIDI THRU connectors, one MIDI device can control more than several MIDI devices.



NOTE

The MIDI THRU connectors technically allow to connect as many MIDI devices, but in practice, we recommend to use the optional MIDI THRU Box MM-4 or MIDI Output Selector MPU-105 for the connection of more than three units.

1. Changing MIDI Functions

The setting of each MIDI Function can be changed as follows.

① Push the MIDI Button ❾.

② Select the MIDI Function you wish to change using the Forward Button ❷ and the Backward Button ❸.

③ By rotating the Alpha Dial ❶, change the setting of the MIDI Function as desired.

Repeat the steps ② and ③ as many times.

④ Push the Enter Key ❿.

- **MIDI Channel**

```
MIDI CHANNEL= 1
```

Select any of the MIDI Channels 1 to 16.

- **Bender**

```
MIDI BENDER= ON
```

ON: Receive and Transmit
OFF: Ignore

- **Hold**

```
MIDI HOLD  = ON
```

ON: Receive and Transmit
OFF: Ignore

- **Modulation**

```
MIDI MOD   = ON
```

ON: Receive and Transmit
OFF: Ignore

- **Program Change**

```
PGM CHANGE =OFF
```

ON: Receive and Transmit
OFF: Ignore

- **Active Sensing**

```
ACT SENSING=OFF
```

ON: Receive
OFF: Ignore

- **Registered Parameters**

(Bend Range Knob and Master Tune messages)

```
REG-PARAM   =OFF
```

ON: Receive and Transmit
OFF: Ignore

- **Exclusive**

```
EXCLUSIVE   =OFF
```

ON: Receive and Transmit
OFF: Ignore

You can reset all the MIDI Functions to the default settings.
Simply push the Enter Button ⑩ while holding the MIDI Button ⑨ down.

2. Program Change

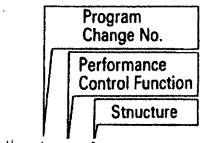
The S-10 can receive or transmit the following messages using the Program Change; the Structure Selection, ON/OFF of the Detune, Delay and Dual Functions.

The table shown on the next page represents the Program Change number assigned to each message.

The above assignment can be seen on the S-10 as follows.

① Push the F2 Button ⑬ , then the MIDI Button ⑨.

② Rotate the Alpha Dial ❶ , and the Program Change number and the corresponding message is shown in the Display.



Program Change No.	Performance Control Function	Stnucture
# 1		A
# 2		B
# 3		C
# 4		D
# 5		AB
# 6		CD
# 7		ABCD
# 8		A/B
# 9		C/D
# 10		AB/CD
# 11		A/B/C/D
# 12	DT	A
# 13	DT	B
# 14	DT	C
# 15	DT	D
# 16	DT	AB
# 17	DT	CD
# 18	DT	ABCD
# 19	DT	A/B
# 20	DT	C/D
# 21	DT	AB/CD
# 22	DT	A/B/C/D
# 23	DL	A
# 24	DL	B
# 25	DL	C
# 26	DL	D
# 27	DL	AB
# 28	DL	CD
# 29	DL	ABCD
# 30	DL	A/B
# 31	DL	C/D
# 32	DL	AB/CD
# 33	DL	A/B/C/D
# 34	Du	A B
# 35	Du	A C
# 36	Du	A D
# 37	Du	A CD
# 38	Du	A C/D
# 39	Du	B C
# 40	Du	B D
# 41	Du	B CD
# 42	Du	B C/D
# 43	Du	C D
# 44	Du	C AB
# 45	Du	C A/B
# 46	Du	D AB
# 47	Du	D A/B
# 48	Du	AB CD
# 49	Du	AB C/D
# 50	Du	CD A/B
# 51	Du	A/B C/D
# 52	VM	A B
# 53	VM	A C
# 54	VM	A D
# 55	VM	A CD
# 56	VM	A C/D
# 57	VM	B A
# 58	VM	B C
# 59	VM	B D
# 60	VM	B CD
# 61	VM	B C/D
# 62	VM	C A
# 63	VM	C B
# 64	VM	C D
# 65	VM	C AB
# 66	VM	C A/B
# 67	VM	D A
# 68	VM	D B
# 69	VM	D C
# 70	VM	D AB
# 71	VM	D A/B
# 72	VM	AB C
# 73	VM	AB D
# 74	VM	AB CD
# 75	VM	AB C/D
# 76	VM	CD A
# 77	VM	CD B
# 78	VM	CD AB
# 79	VM	CD A/B
# 80	VM	A/B C
# 81	VM	A/B D
# 82	VM	A/B CD
# 83	VM	A/B C/D
# 84	VM	C/D A
# 85	VM	C/D B
# 86	VM	C/D AB
# 87	VM	C/D A/B
# 88	VS	A B
# 89	VS	A C
# 90	VS	A D
# 91	VS	A CD
# 92	VS	A C/D
# 93	VS	B A
# 94	VS	B C
# 95	VS	B D
# 96	VS	B CD
# 97	VS	B C/D
# 98	VS	C A
# 99	VS	C B
# 100	VS	C D
# 101	VS	C AB
# 102	VS	C A/B
# 103	VS	D A
# 104	VS	D B
# 105	VS	D C
# 106	VS	D AB
# 107	VS	D A/B
# 108	VS	AB C
# 109	VS	AB D
# 110	VS	AB CD
# 111	VS	AB C/D
# 112	VS	CD A
# 113	VS	CD B
# 114	VS	CD AB
# 115	VS	CD A/B
# 116	VS	A/B C
# 117	VS	A/B D
# 118	VS	A/B CD
# 119	VS	A/B C/D
# 120	VS	C/D A
# 121	VS	C/D B
# 122	VS	C/D AB
# 123	VS	C/D A/B
# 124		A
# 125		B
# 126		C
# 127		D
# 128		AB

DT: Detune Function

DL: Delay Function

Du: Dual Function

VM: Velocity Mix Function

The structure at the left side always sounds and the one at the right side sounds only with the stronger playing manner.

VS: Velocity Switch Function

The structure at the left side sounds with the softer playing manner and the one at the right side sounds with the stronger playing manner.

Receive Only

8 ERROR MESSAGES

Error Messages shown during loading

Wrong QD

The connected QD is irrelevant with the data to be loaded.
Replace the QD with the relevant one.

Illegal QD

The connected QD contains no data.

I/O Error 1

The S-10 has broken down. Call for the Roland service station.

I/O Error 2

Replace the QD with the other one and repeat loading procedure.

I/O Error 3

The S-10 has broken down. Call for the Roland service station.

I/O Error 4

The S-10 has broken down. Call for the Roland service station.

Error Messages shown during saving

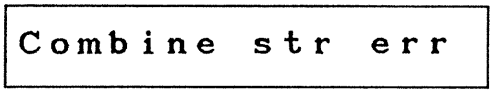
Write protected

The Protect Nail is snapped off.

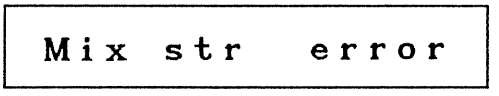
Verify Error

The connected QD is damaged. Replace it with the other QD.

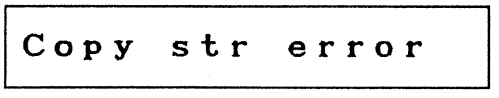
Error Messages shown during Wave Modification



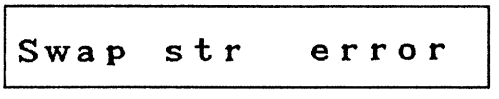
The Structures you have selected cannot be combined. Select the other Structure.



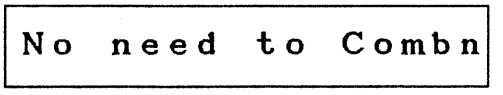
The Structure you have selected cannot be mixed. Select the other Structure.



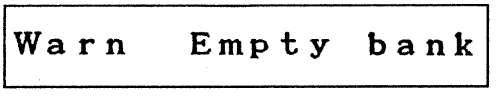
The Structure you have selected cannot be copied. Select the other Structure.



The Structure you have selected cannot be swapped. Select the other Structure.



The combined data would become exactly the same as the original voice.



There is no data in the selected Bank.



The selected Structure is not the same type as the source Structure.

8-voice digital sampling keyboard

MODEL S-10 MIDI Implementation Chart

Version:2.00

Function.....		Transmitted	Recognized	Remarks
Basic	Default	1-16	1-16	Memorized
Channel	Changed	1-16	1-16	
Mode	Default	Mode 3	Mode 3	
	Messages	×	×	
	Altered	**********		
Note Number	True voice	36-84 **********	24-103 24-103	
Velocity	Note ON	○ 9n v=8-127	○ v=1-127	
	Note OFF	× 9n v=0	×	
After Touch	Key's	×	×	
	Ch's	×	×	
Pitch Bender		*1	*1 0-12 semi	9 bit resolution
Control Change	1	*1	*1	Modulation
	64	*1	*1	Hold 1
	100,101	*1, *2 (0, 1)	*1, *2 (0, 1)	RPC LSB, MSB
	6,38	*1, *2	*1, *2	Data Entry MSB, LSB
Prog Change	True #	*1 0-122 **********	*1 0-127 0-127	
System Exclusive		*1	*1	
System Common	Song Pos	×	×	
	Song Sel	×	×	
	Tune	×	×	
System Real Time	Clock	×	×	
	Commands	×	×	
Aux Mes-sages	Local ON/OFF	×	×	
	All Notes OFF	○ (123)	○ (123-127)	
	Active Sense	*1	○	
	Reset	×	×	
Notes		*1 Can be set to ○ or × manually, and memorized. *2 RPC=Registered parameter control number. RPC #0 : Pitch bend sensitivity RPC #1 : Master fine tuning Parameter values are given by Date Entry.		

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

○ : Yes
× : No

8-voice digital sampling keyboard

MODEL S-10 MIDI Implementation

1. TRANSMITTED DATA

Status	Second	Third	Description	
1001 nnnn	0kkk kkkk	0000 0000	Note OFF kkkkkkk = 36 - 84	
1001 nnnn	0kkk kkkk	0vvv vvvv	Note ON kkkkkkk = 36 - 84 vvvvvvv = 8 - 127	
1011 nnnn	0000 0001	0vvv vvvv	Modulation depth vvvvvvv = 0 (OFF) vvvvvvv = 127 (ON)	*1-1
1011 nnnn	0000 0110	0vvv vvvv	Data Entry MSB	*1-1,2
1011 nnnn	0010 0110	0vvv vvvv	Data Entry LSB	*1-1,2
1011 nnnn	0100 0000	0000 0000	Hold1 OFF	*1-1
1011 nnnn	0100 0000	0111 1111	Hold1 ON	*1-1
1011 nnnn	0110 0100	0vvv vvvv	RPC LSB	*1-1,2
1011 nnnn	0110 0101	0vvv vvvv	RPC MSB RPC # = 0, 1	*1-1,2
1100 nnnn	0ppp pppp		Program Change ppppppp = 0 - 122	*1-1,3
1110 nnnn	0vvv vvvv	0vvv vvvv	Pitch Bend Change	*1-1
1011 nnnn	0111 1011	0000 0000	All Notes Off	
1111 0000	... ...	1111 0111	System exclusive	*1-1,4

Notes :

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

*1-2 When BEND RANGE or MASTER TUNE is changed, RPC (Registered parameter control number) and its value are sent as follows.

BnH, 64H, pp, 65H, qq, 06H, mm, 25H, ll
pp,qq = RPC number LSB,MSB
mm,ll = parameter value MSB,LSB

RPC #	value MSB	value LSB	Description
0	0vvv vvvv	0000 0000	(Pitch bend sensitivity) BEND RANGE 0-12 semitone, 1 semitone step
1	0vvv vvvv	0vvv vvvv	(Master fine tuning) MASTER TUNE -99 - +99 cent, 1 cent step

*1-3 Program change number indicates the condition of the 'Sampling Structure'. (See Owner's manual)

*1-4 See section 3 (EXCLUSIVE COMMUNICATION).

2. RECOGNIZED RECEIVE DATA

Status	Second	Third	Description	
1000 nnnn	0kkk kkkk	0vvv vvvv	Note OFF, velocity ignored	
1001 nnnn	0kkk kkkk	0000 0000	Note OFF kkkkkkk = 24 - 103	*2-1
1001 nnnn	0kkk kkkk	0vvv vvvv	Note ON kkkkkkk = 24 - 103 vvvvvvv = 1 - 127	*2-1
1011 nnnn	0000 0001	0vvv vvvv	Modulation depth	*2-2,3
1011 nnnn	0000 0110	0vvv vvvv	Data Entry MSB	*2-2,4
1011 nnnn	0010 0110	0vvv vvvv	Data Entry LSB	*2-2,4
1011 nnnn	0100 0000	0vvv vvvv	Hold1 OFF vvvvvvv = 0 - 63	*2-2
1011 nnnn	0100 0000	0vvv vvvv	Hold1 ON vvvvvvv = 64 - 127	*2-2
1011 nnnn	0110 0100	0vvv vvvv	RPC LSB	*2-2,4
1011 nnnn	0110 0101	0vvv vvvv	RPC MSB	*2-2,4
1100 nnnn	0ppp pppp		Program Change ppppppp = 0 - 127	*2-2,5
1110 nnnn	0vvv vvvv	0vvv vvvv	Pitch Bend Change	*2-2
1011 nnnn	0111 1011	0000 0000	ALL NOTES OFF	*2-6
1011 nnnn	0111 1100	0000 0000	OMNI OFF	*2-6
1011 nnnn	0111 1101	0000 0000	OMNI ON	*2-6
1011 nnnn	0111 1110	000m mmmm	MONO ON	*2-6
1011 nnnn	0111 1111	0000 0000	POLY ON	*2-6
1111 0000	... ...	1111 0111	System exclusive	*2-2,7

Notes :

*2-1 Note numbers outside the range 24 - 103 are ignored.

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

*2-3 vvvvvvv = 0 : modulation OFF
vvvvvvv = 1 - 127 : modulation ON (Depth ignored.)

*2-4 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.
1	0vvv vvvv	0vvv vvvv	MASTER TUNE (-99 - +99 cent, 1 cent step)

*2-5 Program number corresponds to the condition of the 'Sampling Structure'. (See Owner's manual)

*2-6 Mode Messages (123-127) are recognized as only an ALL NOTES OFF.

*2-7 See section 3 (EXCLUSIVE COMMUNICATION).

3. EXCLUSIVE COMMUNICATION

It is possible to communicate with exclusive messages, in NORMAL MODE and SAMPLE DATA DUMP MODE.

NORMAL MODE, in which it is possible to play and generate sound, is explained in section 4, 5.

SAMPLE DATA DUMP MODE has following 4 functions explained in section 6-9.
When 'F1' and 'MIDI' buttons are pressed, it becomes SAMPLE DATA DUMP MODE, and LCD shows "Sample Data Xmt". It means "ONE WAY SAMPLE DATA TRANSMIT".
Then 'FORWARD' button is pressed, LCD shows "Sample Data Xmt*". It means "HANDSHAKE SAMPLE DATA TRANSMIT".
Then 'FORWARD' button is pressed, LCD shows "Sample Data Rcv". It means "ONE WAY SAMPLE DATA RECEIVE".
Then 'FORWARD' button is pressed, LCD shows "Sample Data Rcv*". It means "HANDSHAKE SAMPLE DATA RECEIVE".
When 'BACKWARD' button is pressed, it changes reversely.

All exclusive communications are based on following structure (Roland Exclusive Format Type IV).

	Byte	Description	
a	1111 0000	Exclusive status	
b	0100 0001	Roland ID #	
c	0000 nnnn	Device-ID # = MIDI basic channel where nnnn + 1 = channel #	
d	0001 0000	Model-ID # (S-10)	
e	0aaa aaaa	Command-ID #	
[f	0bbb bbbb	Address MSB]	[] depend on Command-ID
[g	0ccc cccc	Address]	
[h	0ddd dddd	Address LSB]	
[i	0eee eeee	Data]	
[	:	]	
[j	0fff ffff	Checksum]	
k	1111 0111	End of System Exclusive	

Summed value of the all bytes between Command-ID and EOX must be 00H (7 bits). It is not include Command-ID and EOX.

4. EXCLUSIVE COMMUNICATIONS IN NORMAL MODE

4.1 Communication format

4.1.1 Request (One way) (Recognized only) RQ1 11H

	Byte	Description	
a	1111 0000	Exclusive status	
b	0100 0001	Roland ID #	
c	0000 nnnn	Device-ID # = MIDI basic channel where nnnn + 1 = channel #	
d	0001 0000	Model-ID # (S-10)	
e	0001 0001	Command-ID # (RQ1)	
f	0aaa aaaa	Address MSB	*4-1
g	0bbb bbbb	Address	
h	0ccc cccc	Address LSB	
i	0ddd dddd	Size MSB	*4-2
j	0eee eeee	Size	
k	0fff ffff	Size LSB	
l	0ggg gggg	Checksum	
m	1111 0111	End of System Exclusive	

4.1.2 Data set (One way) DT1 [2H
(Transmitted and recognized)

Byte	Description	
a 1111 0000	Exclusive status	
b 0100 0001	Roland ID #	
c 0000 nnnn	Device ID # = MIDI basic channel where nnnn + 1 = channel #	
d 0001 0000	Model-ID # (S-10)	
e 0001 0010	Command-ID # (DT1)	
f 0aaa aaaa	Address MSB	*4-1
g 0bbb bbbb	Address	
h 0ccc cccc	Address LSB	
i 0ddd dddd	Data	*4-3
:		
j 0eee eeee	Checksum	
k 1111 0111	End of System Exclusive	

Notes :

*4-1 If aaaaaaa - ccccccc doesn't indicate the top address of the parameter, the message will be ignored.

*4-2 The data size is always ignored and regarded as the size of a parameter which is addressed by aaaaaaa - ccccccc.

*4-3 Data of one parameter is sent at one time.
Data of only one parameter is recognized at one time.

5. Address mapping of parameters

Address of parameter

000000		Temporary wave parameter block-1		*5-1
0	0aaa aaaa	TONE NAME (ASCII) 8 bytes		*5-2
:				
9	0aaa aaaa	REC KEY	24 - 103	
0A	0aaa aaaa	BANK TUNE	14 - 64 - 114 (-50 - 0 - +50)	
0B	0aaa aaaa	LOOP TUNE	14 - 64 - 114 (-50 - 0 - +50)	
0C	0000 00aa	SCAN MODE	00 : FWD	
			01 : ALT	
			10 : BWD	
0D	0000 00aa	LOOP TYPE	00 : 1SHOT	
			01 : MAN	
			10 : AUTO	
0E	0000 aaaa	ST (start address)		
	0000 bbbb			
	0000 cccc	ee ddddcccc bbbbaaaa = 0 - NNNNNN		*5-3
	0000 dddd			
	0000 00ee			
13	0000 aaaa	END (end address)		
	0000 bbbb			
	0000 cccc	ee ddddcccc bbbbaaaa = 0 - MMMMMM		*5-3
	0000 dddd			
	0000 00ee			
18	0000 aaaa	LP (loop length)		
	0000 bbbb			
	0000 cccc	ee ddddcccc bbbbaaaa = 0 - MMMMMM		*5-3
	0000 dddd			
	0000 00ee			
1D	0000 aaaa	AEN (auto end address)		
	0000 bbbb			
	0000 cccc	ee ddddcccc bbbbaaaa = 4 - MMMMMM		*5-3,4
	0000 dddd			
	0000 00ee			
22	0000 aaaa	ALP (auto loop length)		
	0000 bbbb	:		
	0000 cccc	ee ddddcccc bbbbaaaa = 4 - MMMMMM		*5-3,4
	0000 dddd			
	0000 00ee			
27	0000 000a	KEY FOLLOW	0 : OFF	
			1 : ON	
28	0000 000a	PITCH BEND	0 : OFF	
			1 : ON	
29	0000 000a	VIBRATO	0 : OFF	
			1 : ON	
2A	0aaa aaaa	ENV V-SENS	0 - 127	
2B	0aaa aaaa	ENV RATE1	0 - 127	
2C	0aaa aaaa	ENV LEVEL1	0 - 127	
2D	0aaa aaaa	ENV RATE2	0 - 127	
2E	0aaa aaaa	ENV LEVEL2	0 - 127	
2F	0aaa aaaa	ENV RATE3	0 - 127	
30	0aaa aaaa	ENV LEVEL3	0 - 127	
31	0aaa aaaa	ENV RATE4	0 - 127	
32	0aaa aaaa	DYN RANGE	0 - 127	
33	0aaa aaaa	ABEND RATE	0 - 127	
34	0aaa aaaa	ABEND DPTH	0 - 127	
35	0aaa aaaa	SPT KEY#1	24 - 103	
36	0aaa aaaa	SPT KEY#2	24 - 103	*5-5
37	0aaa aaaa	SPT KEY#3	24 - 103	

000100		Temporary wave parameter block-2		
:				
37				
000200		Temporary wave parameter block-3		
:				
37				
000300		Temporary wave parameter block-4		
:				
37				
000800		Performance parameters		*5-6
0	0aaa aaaa	VIB RATE	0 - 127	
1	0aaa aaaa	M-VIB DPTH	0 - 127	
2	0aaa aaaa	D-VIB DPTH	0 - 127	
3	0aaa aaaa	D-VIB DLAY	0 - 127	
4	0000 000a	BEND MODE	0 : CONT	
			1 : CHRM	
5	0000 000a	ARP SYNC	0 : INT	
			1 : EXT	
6	0aaa aaaa	ARP RATE	0 - 127	
7	0000 00aa	ARP MODE	00 : UP	
			01 : DOWN	
			10 : U/D	
			11 : RND	
8	0000 00aa	ARP RANGE	00 : 1oct	
			01 : 2oct	
			10 : 3oct	
9	000a aaaa	ARP REPEAT	1 - 16	
A	0000 aaaa	ARP DECAY	1 - 10	
B	0aaa aaaa	V-MX THRSH	0 - 127	
C	0aaa aaaa	V-SW THRSH	0 - 127	
D	0000 000a	DTUN MOD	0 : FIX	
			1 : VELO	
E	0aaa aaaa	DTUN RANGE	0 - 127	
F	0000 000a	ABEND DES	0 : BOTH	
			1 : HALF	
10	0000 000a	BEND DEST	0 : BOTH	
			1 : HALF	
11	0aaa aaaa	DELAY TIME	0 - 127	
12	0aaa aaaa	DELAY LEVL	0 - 127	
13	0aaa aaaa	KEY OFFSET	52 - 64 - 76 (-12 - 0 - +12)	
14	0aaa aaaa	TRG G-TIME	0 - 127	
15	0aaa aaaa	TRIGGER KEY #1	23(OFF) - 103	
16	0aaa aaaa	TRIGGER KEY #2	23(OFF) - 103	
17	0aaa aaaa	TRIGGER KEY #3	23(OFF) - 103	
18	0aaa aaaa	TRIGGER KEY #4	23(OFF) - 103	
000900		Structure # of temporary wave parameter blocks		*5-7
0	0000 aaaa	aaaa : structure # of block-1		
	0000 bbbb	bbbb : structure # of block-2		
	0000 cccc	cccc : structure # of block-3		
	0000 dddd	dddd : structure # of block-4		
001000	0aaa aaaa	Write command switch		*5-8
001001	0000 000a	ARPEGGIO on/off	0 : OFF	*5-9
			1 : ON	
001002	0aaa aaaa	Sample dump mode switch		*5-10

Notes :

*5-1 Temporary wave parameters
Transmitted when the parameter (except TONE NAME) is edited or 'Request data' is received.
When 'Data set' command is recognized, the corresponding parameter will be changed.
1-tone uses 1-temporary block, as following chart.
When layer mode (dual-tone, v-mix, v-switch) is selected, 2nd structure (whose LED is blinking) uses block-2,3.

sampling structure	block # (layer block #)
A	0 (2)
B	0 (2)
C	0 (2)
D	0 (2)
AB	0 (2)
CD	0 (2)
ABCD	0 -
A/B	0/1 (2/3)
C/D	0/1 (2/3)
AB/CD	0/1 -
A/B/C/D	0/1/2/3 -

*5-2 Transmitted only when 'Request data' is received.
If 2 or 4 blocks are used, the top block of them should be used for the communication.

*5-3 These value (NNNNNN, MMMMMM) depends on the sampling structure, as following chart.

structure	NNNNNN		MMMMMM	
A	32763	(7FFBH)	32767	(7FFFH)
B	32763	(7FFBH)	32767	(7FFFH)
C	32763	(7FFBH)	32767	(7FFFH)
D	32763	(7FFBH)	32767	(7FFFH)
AB	65531	(FFFBH)	65536	(FFFFH)
CD	65531	(FFFBH)	65536	(FFFFH)
ABCD	131067	(1FFFBH)	131071	(1FFFFH)
A/B	32763	(7FFBH)	32767	(7FFFH)
C/D	32763	(7FFBH)	32767	(7FFFH)
AB/CD	65531	(FFFBH)	65536	(FFFFH)
A/B/C/D	32763	(7FFBH)	32767	(7FFFH)

And the address values must satisfy following conditions.
1: "[start address]+[loop length]" is equal to or less than "[end address]".
2: "[loop length]" is equal to or more than 4.

*5-4 Auto loop addresses are transmitted when it is displayed in edit mode. When Data set command is recognized, the parameter will be changed.

*5-5 If 2 or 4 blocks are used, the SPT KEY # of top block should be used for the communication.
Sampling structure A/B's or C/D's split point is SPT KEY#2.

*5-6 Performance parameters
Transmitted when the parameter (except TONE NAME) is edited or 'Request data' is received.
When Data set command (DT1) is recognized, the corresponding parameter will be changed.

*5-7 Structure # of temporary wave parameter
These can't be changed by Data set command (DT1).
Transmitted only when Request data command (RQ1) is received.
If the data of this address is requested to send, structure # of the temporary wave parameter block-n will be transmitted.
If the block would not be used, structure # is 0FH.

structure #	sampling structure
0	A
1	B
2	C
3	D
4	AB
5	CD
6	ABCD
0FH	Not used

*5-8 Write command switch
Transmitted when 'ENTER' button is pressed.
If any data would be written to this address, write the parameters in temporary area to wave parameter area of the banks on the condition of the sampling structure.
Request data command (RQ1) for this address is ignored.

*5-9 Arpeggio on/off switch
Transmitted when 'ARPEGGIO' button is pressed.
When Data set command (DT1) is recognized, arpeggio will turn to ON or OFF.
Request data command (RQ1) for this address is ignored.

*5-10 Sample dump mode switch
Transmitted when 'F1' and 'MIDI' button are pressed.
If any data is written to this address, the mode will change from NORMAL MODE to SAMPLE DATA DUMP MODE.
The transmitter should be wait more then 10msec for changing the mode.
Request data command (RQ1) for this address is ignored.

6. TRANSMITTED EXCLUSIVE MESSAGES IN SAMPLE DATA DUMP MODE

Sample data is determined by sampling structure.
It is transmitted in following order.

WAVE DATA - WAVE PARAMETER - PERFORMANCE PARAMETER

6.1 One way transfer

6.1.1 Data set DT1 12H

Transmitted when 'ENTER' button is pressed in 'Sample Data Xmt' mode.

Byte	Description	
a 1111 0000	Exclusive status	
b 0100 0001	Roland ID #	
c 0000 nnnn	Device-ID # = MIDI basic channel where nnnn + 1 = channel #	
d 0001 0000	Model-ID # (S-10)	
e 0001 0010	Command-ID # (DT1)	
f 0aaa aaaa	Address MSB	*6-1
g 0bbb bbbb	Address	
h 0ccc cccc	Address LSB	
i 0ddd dddd	Data	*6-2
:		
j 0eee eeee	Checksum	
k 1111 0111	End of System Exclusive	

6.2 Handshaking communication

6.2.1 Want to send data WSD 40H

Transmitted when 'ENTER' button is pressed in 'Sample Data Xmt' mode.

Byte	Description	
a 1111 0000	Exclusive status	
b 0100 0001	Roland ID #	
c 0000 nnnn	Device-ID # = MIDI basic channel where nnnn + 1 = channel #	
d 0001 0000	Model-ID # (S-10)	
e 0100 0000	Command-ID # (WSD)	
f 0aaa aaaa	Address MSB	*6-1
g 0bbb bbbb	Address	
h 0ccc cccc	Address LSB	
i 0ddd dddd	Size MSB	*6-3
j 0eee eeee	Size	
k 0fff ffff	Size LSB	
l 0ggg gggg	Checksum	
m 1111 0111	End of System Exclusive	

6.2.2 Request data RQD 41H

Transmitted when 'ENTER' button is pressed in 'Sample Data Rcv' mode.

Byte	Description	
a 1111 0000	Exclusive status	
b 0100 0001	Roland ID #	
c 0000 nnnn	Device-ID # = MIDI basic channel where nnnn + 1 = channel #	
d 0001 0000	Model-ID # (S-10)	
e 0100 0001	Command-ID # (RQD)	
f 0aaa aaaa	Address MSB	*6-1
g 0bbb bbbb	Address	
h 0ccc cccc	Address LSB	
i 0ddd dddd	Size MSB	*6-3
j 0eee eeee	Size	
k 0fff ffff	Size LSB	
l 0ggg gggg	Checksum	
m 1111 0111	End of System Exclusive	

6.2.3 Data set DAT 42H

Byte	Description	
a 1111 0000	Exclusive status	
b 0100 0001	Roland ID #	
c 0000 nnnn	Device-ID # = MIDI basic channel where nnnn + 1 = channel #	
d 0001 0000	Model-ID # (S-10)	
e 0100 0010	Command-ID # (DAT)	
f 0aaa aaaa	Address MSB	*6-1
g 0bbb bbbb	Address	
h 0ccc cccc	Address LSB	
i 0ddd dddd	Data	*6-2
:		
j 0eee eeee	Checksum	
k 1111 0111	End of System Exclusive	

6.2.4 Acknowledge ACK 43H

Byte	Description
a 1111 0000	Exclusive status
b 0100 0001	Roland ID #
c 0000 nnnn	Device-ID # = MIDI basic channel where nnnn + 1 = channel #
d 0001 0000	Model-ID # (S-10)
e 0100 0011	Command-ID # (ACK)
f 1111 0111	End of System Exclusive

6.2.5 End of data EOD 45H

Byte	Description
a 1111 0000	Exclusive status
b 0100 0001	Roland ID #
c 0000 nnnn	Device-ID # = MIDI basic channel where nnnn + 1 = channel #
d 0001 0000	Model-ID # (S-10)
e 0100 0101	Command-ID # (EOD)
f 1111 0111	End of System Exclusive

6.2.6 Communication error ERR 4EH

Byte	Description
a 1111 0000	Exclusive status
b 0100 0001	Roland ID #
c 0000 nnnn	Device-ID # = MIDI basic channel where nnnn + 1 = channel #
d 0001 0000	Model-ID # (S-10)
e 0100 1110	Command-ID # (ERR)
f 1111 0111	End of System Exclusive

6.2.7 Rejection RJC 4FH

Byte	Description
a 1111 0000	Exclusive status
b 0100 0001	Roland ID #
c 0000 nnnn	Device-ID # = MIDI basic channel where nnnn + 1 = channel #
d 0001 0000	Model-ID # (S-10)
e 0100 1111	Command-ID # (RJC)
f 1111 0111	End of System Exclusive

Notes :

*6-1 Address is determined by sampling structure.

Address of first Data set command (DT1, DAT), Want to send data (WSD) or Request data (RQD) is as follows.

structure	WAVE DATA	WAVE PARAMETER	PERFORMANCE PARAMETER
A	020000	010000	010800
B	060000	:	:
C	0A0000	:	:
D	0E0000	:	:
AB	020000	:	:
CD	0A0000	:	:
ABCD	020000	:	:
A/B	020000	:	:
C/D	0A0000	:	:
AB/CD	020000	:	:
A/B/C/D	020000	010000	010800

*6-2 Number of data in one Data set command (DT1) is as follows.

structure	WAVE DATA	WAVE PARAMETER	PERFORMANCE PARAMETER
A	128	73	28
B	:	:	:
C	:	:	:
D	:	:	:
AB	:	:	:
CD	:	:	:
ABCD	:	73	:
A/B	:	146	:
C/D	:	:	:
AB/CD	:	:	:
A/B/C/D	128	146	28

*6-3 Size (MSB - LSB) is as follows.

structure	WAVE DATA	WAVE PARAMETER	PERFORMANCE PARAMETER
A	040000	000049	00001C
B	:	:	:
C	:	:	:
D	040000	:	:
AB	080000	:	:
CD	080000	:	:
ABCD	100000	000049	:
A/B	080000	000112	:
C/D	080000	:	:
AB/CD	100000	000112	:
A/B/C/D	100000	000224	00001C

7. RECOGNIZED EXCLUSIVE MESSAGES IN SAMPLE DATA DUMP MODE

Transmitted Sample data is determined by sampling structure.
It must be transmitted in following order.
WAVE DATA - WAVE PARAMETER - PERFORMANCE PARAMETER

*Following exclusive message is recognized only in SAMPLE DATA DUMP MODE.
When all sample data is received completely, sampling structure changes accordingly.

7.1 One way receive

7.1.1 Data set DT1 12H

Byte	Description	
a 1111 0000	Exclusive status	
b 0100 0001	Roland ID #	
c 0000 nnnn	Device-ID # = MIDI basic channel where nnnn + 1 = channel #	
d 0001 0000	Model-ID # (S-10)	
e 0001 0010	Command-ID # (DT1)	
f 0aaa aaaa	Address MSB	*7-1
g 0bbb bbbb	Address	
h 0ccc cccc	Address LSB	
i 0ddd dddd	Data	*7-2
:		
j 0eee eeee	Checksum	
k 1111 0111	End of System Exclusive	

7.2 Handshaking communication

7.2.1 Want to send data WSD 40H

Byte	Description	
a 1111 0000	Exclusive status	
b 0100 0001	Roland ID #	
c 0000 nnnn	Device-ID # = MIDI basic channel where nnnn + 1 = channel #	
d 0001 0000	Model-ID # (S-10)	
e 0100 0000	Command-ID # (WSD)	
f 0aaa aaaa	Address MSB	*7-1
g 0bbb bbbb	Address	
h 0ccc cccc	Address LSB	
i 0ddd dddd	Size MSB	*7-3
j 0eee eeee	Size	
k 0fff ffff	Size LSB	
l 0ggg gggg	Checksum	
m 1111 0111	End of System Exclusive	

7.2.2 Request data RQD 41H

Byte	Description	
a 1111 0000	Exclusive status	
b 0100 0001	Roland ID #	
c 0000 nnnn	Device-ID # = MIDI basic channel where nnnn + 1 = channel #	
d 0001 0000	Model-ID # (S-10)	
e 0100 0001	Command-ID # (RQD)	
f 0aaa aaaa	Address MSB	*7-1
g 0bbb bbbb	Address	
h 0ccc cccc	Address LSB	
i 0ddd dddd	Size MSB	*7-3
j 0eee eeee	Size	
k 0fff ffff	Size LSB	
l 0ggg gggg	Checksum	
m 1111 0111	End of System Exclusive	

7.2.3 Data set DAT 42H

Byte	Description	
a 1111 0000	Exclusive status	
b 0100 0001	Roland ID #	
c 0000 nnnn	Device-ID # = MIDI basic channel where nnnn + 1 = channel #	
d 0001 0000	Model-ID # (S-10)	
e 0100 0010	Command-ID # (DAT)	
f 0aaa aaaa	Address MSB	*7-1
g 0bbb bbbb	Address	
h 0ccc cccc	Address LSB	
i 0ddd dddd	Data	*7-2
:		
j 0eee eeee	Checksum	
k 1111 0111	End of System Exclusive	

7.2.4 Acknowledge ACK 43H

Byte	Description
a 1111 0000	Exclusive status
b 0100 0001	Roland ID #
c 0000 nnnn	Device-ID # = MIDI basic channel where nnnn + 1 = channel #
d 0001 0000	Model-ID # (S-10)
e 0100 0011	Command-ID # (ACK)
f 1111 0111	End of System Exclusive

7.2.5 End of data EOD 45H

Byte	Description
a 1111 0000	Exclusive status
b 0100 0001	Roland ID #
c 0000 nnnn	Device-ID # = MIDI basic channel where nnnn + 1 = channel #
d 0001 0000	Model-ID # (S-10)
e 0100 0101	Command-ID # (EOD)
f 1111 0111	End of System Exclusive

7.2.6 Communication error ERR 4EH

Byte	Description
a 1111 0000	Exclusive status
b 0100 0001	Roland ID #
c 0000 nnnn	Device-ID # = MIDI basic channel where nnnn + 1 = channel #
d 0001 0000	Model-ID # (S-10)
e 0100 1110	Command-ID # (ERR)
f 1111 0111	End of System Exclusive

7.2.7 Rejection RJC 4FH

Byte	Description
a 1111 0000	Exclusive status
b 0100 0001	Roland ID #
c 0000 nnnn	Device-ID # = MIDI basic channel where nnnn + 1 = channel #
d 0001 0000	Model-ID # (S-10)
e 0100 1111	Command-ID # (RJC)
f 1111 0111	End of System Exclusive

Notes :

*7-1 Address of first Data set command (DT1, DAT), Want to send data (WSD) or Request data (RQD) is as follows.

structure	WAVE DATA	WAVE PARAMETER	PERFORMANCE PARAMETER
A	020000	010000	010800
B	060000	:	:
C	0A0000	:	:
D	0E0000	:	:
AB	020000	:	:
CD	0A0000	:	:
ABCD	020000	:	:
A/B	020000	:	:
C/D	0A0000	:	:
AB/CD	020000	:	:
A/B/C/D	020000	010000	010800

*7-2 Number of data in data set is as follows.

structure	WAVE DATA	WAVE PARAMETER	PERFORMANCE PARAMETER
A	2 - 244	73	28
B	:	:	:
C	:	:	:
D	:	:	:
AB	:	:	:
CD	:	:	:
ABCD	:	73	:
A/B	:	146	:
C/D	:	:	:
AB/CD	:	:	:
A/B/C/D	2 - 244	146	28

Number of data of WAVE DATA must be even.

*7-3 Size (MSB - LSB) is as follows.

structure	WAVE DATA	WAVE PARAMETER	PERFORMANCE PARAMETER
A	040000	000049	00001C
B	:	:	:
C	:	:	:
D	040000	:	:
AB	080000	:	:
CD	080000	:	:
ABCD	100000	000049	:
A/B	080000	000112	:
C/D	080000	:	:
AB/CD	100000	000112	:
A/B/C/D	100000	000224	00001C

8. Address mapping of SAMPLE DATA

```
Address

010000  ;       Wave parameter of block-1

010000  ; 0aaa aaaa ; TONE NAME

     9  ; 0000 aaaa ; SAMPLING STRUCTURE
     A  ; 0000 aaaa ; DESTINATION BANK
     B  ; 0000 abcd ;
                        a  BENDER              0 : OFF
                                               1 : ON

                        b  KEY FOLLOW          0 : OFF
                                               1 : ON

                        c  VIBRATO             0 : OFF
                                               1 : ON

                        d  SAMPLING RATE       0 : 30 kHz
                                               1 : 15 kHz

     C  ; 0000 aabb ;
                        aa LOOP MODE           00 : 1SHOT
                                               01 : MAN
                                               10 : AUTO

                        bb SCAN MODE           00 : FORWARD
                                               01 : ALTERNATE
                                               10 : BACKWARD

     D  ; 0000 aaaa ;
     E  ; 0000 bbbb ;
                        bbbb aaaa  REC KEY NUMBER

     F  ; 0000 0000 ; dummy
    10  ; 0000 0000 ; dummy
    11  ; 0000 aaaa ;
    12  ; 0000 bbbb ;
    13  ; 0000 cccc ;
    14  ; 0000 dddd ;
    15  ; 0000 eeee ;
    16  ; 0000 ffff ;
    17  ; 0000 gggg ;
    18  ; 0000 hhhh ;
    19  ; 0000 iiii ;
    1A  ; 0000 jjjj ;
    1B  ; 0000 kkkk ;
    1C  ; 0000 llll ;
    1D  ; 0000 mmmm ;
    1E  ; 0000 nnnn ;
    1F  ; 0000 oooo ;
    20  ; 0000 pppp ;
    21  ; 0000 qqqq ;
    22  ; 0000 rrrr ;
    23  ; 0000 ssss ;
    24  ; 0000 tttt ;
    25  ; 0000 uuvv ;
    26  ; 0000 ww00 ;
    27  ; 0000 0000 ; dummy
    28  ; 0000 xxyy ;
                        ww bbbbaaaa ddddcccc  START ADDRESS
                        uu ffffeeee hhhhgggg  MANUAL LOOP LENGTH
                        vv jjjjiiii llllkkkk  MANUAL END ADDRESS
                        xx nnnnmmmm ppppoooo  AUTO LOOP LENGTH
                        yy rrrrqqqq ttttssss  AUTO END ADDRESS

    29  ; 0000 aaaa ;
    2A  ; 0000 bbbb ;
                        bbbbaaaa  BANK TUNE

    2B  ; 0000 aaaa ;
    2C  ; 0000 bbbb ;
                        bbbbaaaa  LOOP TUNE

    2D  ; 0000 aaaa ;
    2E  ; 0000 bbbb ;
                        bbbbaaaa  VELOCITY SENSE

    2F  ; 0000 aaaa ;
    30  ; 0000 bbbb ;
                        bbbbaaaa  ENVELOPE RATE-1

    31  ; 0000 aaaa ;
    32  ; 0000 bbbb ;
                        bbbbaaaa  ENVELOPE RATE-2

    33  ; 0000 aaaa ;
    34  ; 0000 bbbb ;
                        bbbbaaaa  ENVELOPE RATE-3

    35  ; 0000 aaaa ;
    36  ; 0000 bbbb ;
                        bbbbaaaa  ENVELOPE RATE-4

    37  ; 0000 aaaa ;
    38  ; 0000 bbbb ;
                        bbbbaaaa  ENVELOPE LEVEL-1

    39  ; 0000 aaaa ;
    3A  ; 0000 bbbb ;
                        bbbbaaaa  ENVELOPE LEVEL-2

    3B  ; 0000 aaaa ;
    3C  ; 0000 bbbb ;
                        bbbbaaaa  ENVELOPE LEVEL-3

    3D  ; 0000 aaaa ;
    3E  ; 0000 bbbb ;
                        bbbbaaaa  KEY SPLIT POINT-1

    3F  ; 0000 aaaa ;
    40  ; 0000 bbbb ;
                        bbbbaaaa  KEY SPLIT POINT-2

    41  ; 0000 aaaa ;
    42  ; 0000 bbbb ;
                        bbbbaaaa  KEY SPLIT POINT-3

    43  ; 0000 aaaa ;
    44  ; 0000 bbbb ;
                        bbbbaaaa  DYNAMIC SENS

    45  ; 0000 aaaa ;
    46  ; 0000 bbbb ;
                        bbbbaaaa  AUTO BEND RATE

    47  ; 0000 aaaa ;
    48  ; 0000 bbbb ;
                        bbbbaaaa  AUTO BEND DEPTH

010049  ;
   :    ;       Wave parameter of block-2
010111  ;

010112  ;
   :    ;       Wave parameter of block-3
01015A  ;

01015B  ;
   :    ;       Wave parameter of block-4
010224  ;

010800  ;       Performance parameter

     0  ; 0000 aaaa ;
     1  ; 0000 bbbb ;
                        bbbbaaaa  EXTERNAL TRIGGER KEY NUMBER-1

     2  ; 0000 aaaa ;
     3  ; 0000 bbbb ;
                        bbbbaaaa  EXTERNAL TRIGGER KEY NUMBER-2

     4  ; 0000 aaaa ;
     5  ; 0000 bbbb ;
                        bbbbaaaa  EXTERNAL TRIGGER KEY NUMBER-3

     6  ; 0000 aaaa ;
     7  ; 0000 bbbb ;
                        bbbbaaaa  EXTERNAL TRIGGER KEY NUMBER-4

     8  ; 0000 aaaa ;
     9  ; 0000 bbbb ;
                        bbbbaaaa  EXTERNAL TRIGGER TRIGGER TIME

     A  ; 0000 aaaa ;
     B  ; 0000 bbbb ;
                        bbbbaaaa  ARPEGGIO RATE
     C  ; 0000 aa00 ; ARPEGGIO SYNC     00 : INTERNAL CLOCK
                                        01 : EXTERNAL CLOCK

     D  ; 0000 aabb ;
                        aa ARPEGGIO MODE    00 : UP
                                            01 : DOWN
                                            10 : UP/DOWN
                                            11 : RANDOM

                        bb ARPEGGIO RANGE   00 : 1 OCTAVE
                                            01 : 2 OCTAVE
                                            10 : 3 OCTAVE

     E  ; 0000 aaaa ;
     F  ; 0000 bbbb ;
                        bbbbaaaa  ARPEGGIO REPEAT TIME

    10  ; 0000 aaaa ;
    11  ; 0000 bbbb ;
                        bbbbaaaa  ARPEGGIO DECAY RATIO

    12  ; 0000 aaaa ;
    13  ; 0000 bbbb ;
                        bbbbaaaa  VIBRATO RATE

    14  ; 0000 aaaa ;
    15  ; 0000 bbbb ;
                        bbbbaaaa  MANUAL VIBRATO DEPTH
```

```
16  ¦ 0000 aaaa ¦
17  ¦ 0000 bbbb ¦
                  bbbbaaaa  DELAY VIBRATO DEPTH
18  ¦ 0000 aaaa ¦
19  ¦ 0000 bbbb ¦
                  bbbbaaaa  DELAY VIBRATO TIME
1A  ¦ 0000 aaaa ¦
1B  ¦ 0000 bbbb ¦
                  bbbbaaaa  DELAY TIME OF DELAY MODE
1C  ¦ 0000 aaaa ¦
1D  ¦ 0000 bbbb ¦
                  bbbbaaaa  DELAY LEVEL OF DELAY MODE
1E  ¦ 0000 aaaa ¦
1F  ¦ 0000 bbbb ¦
                  bbbbaaaa  DELAY KEY OFFSET OF DELAY MODE
20  ¦ 0000 aaaa ¦
21  ¦ 0000 bbbb ¦
                  bbbbaaaa  DETUNE RANGE OF DETUNE MODE
22  ¦ 0000 aaaa ¦
23  ¦ 0000 bbbb ¦
                  bbbbaaaa  THRESHOLD LEVEL
                             OF VELOCITY MIX MODE
24  ¦ 0000 aaaa ¦
25  ¦ 0000 bbbb ¦
                  bbbbaaaa  THRESHOLD LEVEL
                             OF VELOCITY SWITCH MODE
26  ¦ 0000 abcd ¦
                  a  AUTO BEND DESTINATION OF DETUNE MODE
                                0 : BOTH
                                1 : HALF

                  b  BEND DESTINATION OF  DETUNE MODE
                                0 : BOTH
                                1 : HALF

                  c  BENDER MODE   0 : CONTINUOUS
                                   1 : CHROMATIC

                  d  DETUNE MODE   0 : FIX
                                   1 : VELOCITY

27  ¦ 0000 0000 ¦ dummy

020000  ¦      Wave data of bank-1
    0   ¦ 0aaa aaaa ¦
    1   ¦ 0bbb bb00 ¦
                  aaaa aaabbbbb  Wave data
                            (12 bit 2's complement)
  :     ¦
057F7F  ¦

060000  ¦
  :     ¦      Wave data of bank-2
097F7F  ¦

0A0000  ¦
  :     ¦      Wave data of bank-3
0D7F7F  ¦
0E0000  ¦
  :     ¦      Wave data of bank-4
127F7F  ¦
```

9. Sequence of communication

9.1 When one way data set of WAVE DATA is transmitted

```
this unit          message              objective unit
---------      --------------------     --------------

        DT1(WAVE DATA) ------------------>

            * time interval about 20 ms

        DT1(WAVE DATA) ------------------>
                       :
                       :
        DT1(WAVE DATA) ------------------>

        DT1(WAVE PARAMETER) ------------->

      [ DT1(WAVE PARAMETER) ------------->  ]

        DT1(PERFORMANCE PARAMETER) ------>
```

9.2 When one way data set of WAVE DATA is received

```
this unit          message              objective unit
---------      --------------------     --------------

        <------------------ DT1(WAVE DATA)

           * wait time more than 20 ms

        <------------------ DT1(WAVE DATA)
                       :
                       :
        <------------------ DT1(WAVE DATA)

        <------------- DT1(WAVE PARAMETER)

      ( <------------- DT1(WAVE PARAMETER) )

        <------ DT1(PERFORMANCE PARAMETER)
```

9.3 When want to send data is received

```
this unit          message              objective unit
---------      --------------------     --------------

        <------------------ WSD(WAVE DATA)
        ACK ------------------------------>

        <------------------ DAT(WAVE DATA)
        ACK ------------------------------>
                       :
                       :
        <------------------ DAT(WAVE DATA)
        ACK ------------------------------>

        <------------------------------ EOD
        ACK ------------------------------>

        <-------------- WSD(WAVE PARAMETER)
        ACK ------------------------------>

        <-------------- DAT(WAVE PARAMETER)
        ACK ------------------------------>

      [ <-------------- DAT(WAVE PARAMETER) ]
      ( ACK ------------------------------> )
        <------------------------------ EOD
        ACK ------------------------------>

        <------ WSF(PERFORMANCE PARAMETER)
        ACK ------------------------------>

        <------ DAT(PERFORMANCE PARAMETER)
        ACK ------------------------------>

        <------------------------------ EOD
        ACK ------------------------------>
```

9.4 When request data is received

```
this unit          message              objective unit
---------      --------------------     --------------

        <------------------ RQD(WAVE DATA)

        DAT(WAVE DATA) ------------------>
        <------------------------------ ACK
                       :
                       :
        DAT(WAVE DATA) ------------------>
        <------------------------------ ACK

        EOD ------------------------------>
        <------------------------------ ACK

        <-------------- RQD(WAVE PARAMETER)

        DAT(WAVE PARAMETER) -------------->
        <------------------------------ ACK

      ( DAT(WAVE PARAMETER) --------------> )
      ( <------------------------------ ACK )

        EOD ------------------------------>
        <------------------------------ ACK
        <------ RQD(PERFORMANCE PARAMETER)

        DAT(PERFORMANCE PARAMETER) ------>
        <------------------------------ ACK

        EOD ------------------------------>
        <------------------------------ ACK
```

Notes :

*When it receives ERR, it sends same data set again.

*When a transmitting S-10 receives any illegal command
(ie. a note on etc.), it ignores and waits for legal command.

*When a receiving S-10 receives any illegal command
(ie. a note on etc.), it ignores and waits for legal command.

*It sends RJC and stops sample dump sequence immediately,
when sampling structure button is pressed.

*It stops the sequence immediately when it receives RJC.

SPECIFICATIONS

S-10: Digital Sampling Keyboard

Keyboard: 8 voice polyphonic, C scale, 49 keys, 4 octaves with dynamics

Front Panel

Structure Buttons
F1/ ▶ Button
F2/ ◀ Button
Tune Button
Parameter Button
Modify Button
Performance Button
MIDI Button
Enter Button
Forward Button
Backward Button
Record Button
Mode Button
Stand-by Button
Start Button
Load Button
Save Button

Performance Controllers

Alpha Dial
Arpeggio Button
Volume Knob
Bend Range Knob
Recording Level Knob
Pitch Bender/Modulation Lever

Display

16 figure Liquid Crystal Display (back lit)

Disk Drive

2.8 inch Quick Disk (QD)

Rear Panel

Output Jack
Output Level Switch
Headphones Jack
Hold/REC Start Jack
Input Level Switch
MIDI Connectors (IN, OUT, THRU)
Power Switch

Dimensions

945(W) × 271(D) × 77(H) mm/
37-3/16"× 10-11/16" × 3" (without the QD Case)

Weight

9.5 kg / 20 lb.

Power Consumption

19 W

Accessories

Disk Case
Connection Cable (PJ-1)
Sample Sound QD

Options

Headphones RH-100
Pedal Switch DP-2
Pad PD-20
Microphone
Keyboard Stand KS-6
Quick Disk QD-10

DISK MEMO

Disk No.	A B	Name	
Structure	[Split Point:]		

Performance Parameter		Wave Parameter	
VIB RATE		REC KEY	
M - VIB DPTH		BANK TUNE	
D - VIB DPTH		LOOP TUNE	
D - VIB DLAY		SCAN MODE	
BEND MODE		LOOP TYPE	
ARP SYNC		ST	
ARP RATE		END	
ARP MODE		LP	
ARP RANGE		AEN	
ARP REPERT		ALP	
ARP DECAY		KEY FOLLOW	
V - MX THRSH		PITCH BEND	
V - SW THRSH		VIBRATO	
DTUN MODE		ENV V - SENS	
DTUN RANGE		ENV RATE 1	
ABEND DEST		ENV LEVEL 1	
BEND DEST		ENV RATE 2	
DELAY TIME		ENV LEVEL 2	
DELAY LEVL		ENV RATE 3	
KEY OFFSET		ENV LEVEL 3	
TRG G - TIME		ENV RATE 4	
Ext Gate Play		DYN SENSE	
		ABEND RATE	
		ABEND DPTH	

Disk No.	A B	Name	
Structure	[Split Point:]		

Performance Parameter		Wave Parameter	
VIB RATE		REC KEY	
M - VIB DPTH		BANK TUNE	
D - VIB DPTH		LOOP TUNE	
D - VIB DLAY		SCAN MODE	
BEND MODE		LOOP TYPE	
ARP SYNC		ST	
ARP RATE		END	
ARP MODE		LP	
ARP RANGE		AEN	
ARP REPERT		ALP	
ARP DECAY		KEY FOLLOW	
V - MX THRSH		PITCH BEND	
V - SW THRSH		VIBRATO	
DTUN MODE		ENV V - SENS	
DTUN RANGE		ENV RATE 1	
ABEND DEST		ENV LEVEL 1	
BEND DEST		ENV RATE 2	
DELAY TIME		ENV LEVEL 2	
DELAY LEVL		ENV RATE 3	
KEY OFFSET		ENV LEVEL 3	
TRG G - TIME		ENV RATE 4	
Ext Gate Play		DYN SENSE	
		ABEND RATE	
		ABEND DPTH	

Roland®

10664

UPC 10664



10981

S-10

Roland

'86-10-CG2-2B