AKAI professional

S20

MIDI STEREO DIGITAL PHRASE SAMPLER

Operator's Manual

WARNING

The S20 is designed to be used in a standard household environment.
Power requirements for electrical equipment vary from area to area. Please ensure that your S20 meets the power requirements in your area. If in doubt, consult a qualified electrician or Akai Professional dealer.

120 VAC	@ 60 Hz for USA and Canada
220230/240 VAC	@ 50 Hz for Europe
240 VAC	@ 50 Hz for Australia

PROTECTING YOURSELF AND THE S20

Never touch the AC plug with wet hands.

Always disconnect the S20 from the power supply by pulling on the plug, not the cord.

Allow only an Akai Professional dealer or qualified professional engineer to repair or reassemble the S20. Apart from voiding the warranty, unauthorized engineers might touch live internal parts and receive a serious electrical shock.

Do not put, or allow anyone to put any object, especially metal objects, into the S20.

Use only a household AC power supply. Never use a DC power supply.

If water or any other liquid is spilled into or onto the S20, disconnect the power, and call your dealer.

Make sure that the unit is well-ventilated, and away from direct sunlight.

To avoid damage to internal circuitry, as well as the external finish, keep the S20 away from sources of direct heat (stoves, radiators, etc.).

Avoid using aerosol insecticides, etc. near the S20. They may damage the surface, and may ignite.

Do not use denaturated alcohol, thinner or similar chemicals to clean the S20. They will damage the finish.

Modification of this equipment is dangerous, and can result in the functions of the S20 being impaired. Never attempt to modify the equipment in any way.

Make sure that the S20 is always well-supported when in use (either in a specially-designed equipment rack, or a firm level surface).

When installing the S20 in a 19" rack system, always allow lU of ventilated free space above it to allow for cooling. Make sure that the back of the rack is unobstructed to allow a clear airflow.

In order to assure optimum performance of your S20, select the setup location carefully, and make sure the equipment is used properly. Avoid setting up the S20 in the following locations:

1. In a humid or dusty environment
2. In a room with poor ventilation
3. On a surface which is not horizontal
4. Inside a vehicle such as a car, where it will be subject to vibration
5. In an extremely hot or cold environment

WARNING!!

To prevent fire or shock hazard, do not expose this appliance to rain or moisture.

<div align="right">1-En</div>

IMPORTANT

This equipment is fitted with an approved converter plug.

To change the fuse in this type of plug proceed as follows:
    1) Remove the fuse cover and old fuse. 2) Fit anew fuse which should be a BS1362 5
    Amp A.S.T.A. or BSI approved type. 3) Refit the fuse cover.
If the AC mains plug fitted to the lead supplied with this equipment is not suitable for your type of AC outlet sockets, it should be changed to an AC mains lead, complete with moulded plug of the appropriate type.
If this is not possible, the plug should be cut off and a correct one fitted to suit the AC outlet. This should be fused at 5 Amps.
If a plug without a fuse is used, the fuse at the distribution board should not be greater than 5 Amp.
    PLEASE NOTE: THE SEVERED PLUG MUST BE DESTROYED TO AVOID A POSSIBLE SHOCK HAZARD
                        SHOULD IT BE INSERTED INTO A 13 AMP SOCKET ELSEWHERE.
The wires in this mains lead are coloured in accordance with the following code:
<div align="center">

BLUE -NEUTRAL
BROWN-LIVE
</div>

As the colours of the wires in the mains lead of this apparatus may not correspond with the coloured markings identifying the terminals in your plug, please proceed as follows:
    The wire which is coloured BLUE must be connected to the terminal which is marked with the letter N or coloured BLACK.
    The wire which is coloured BROWN must be connected to the terminal which is marked with the letter L or coloured RED.
    DO NOT CONNECT ANY WIRE TO THE PIN MARKED E OR 1 OR COLOURED GREEN OR YELLOW 8 GREEN WHEN WIRING THE PLUG.
Ensure that all the terminals are securely tightened and no loose strands of wire exist.
Before replacing the plug cover, make certain the cord grip is clamped over the outer sheath of the lead and not simply over the wires.

<div align="right">6F-En</div>

CAUTION (Only for the product sold in Canada and U.S.A.)

To prevent electric shock, do not use this polarized AC power plug with an extension cord, receptacle, or other outlet unless the blades can be fully inserted to prevent blade exposure.

<div align="right">14-En</div>

FCC WARNING

This equipment has been tested and found to comply with the limits for a Class B digital device pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

• Reorient or relocate the receiving antenna.
• Increase the separation between the equipment and receiver.
• Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

• Consult the dealer or an experienced radio/TV technician for help.

21 B-En

AVIS POUR LES ACHETEURS CANADIENS DU S20

Le present appareil numerique n'ement pas de bruits radioelectriques depassant les limites applicables aux appareils numeriques de la Class B prescrites clans le Reglement sur le brouillage radioelectrique edicte par le ministere des Communications du Canada.

27-F

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

27-En

CHANGES OR MODIFICATIONS NOT EXPRESSLY APPROVED BY THE MANUFACTURER FOR COMPLIANCE COULD VOID THE USER'S AUTHORITY TO OPERATE THE EQUIPMENT.

32-En

Copyright Notice

WARRANTY

AKAI Electric Co. Ltd. warrants its products, when purchased from an authorized "AKAI professional" dealer, to be free from defects in materials and workmanship for a period of 12 (twelve) months from the date of purchase. Warranty service is effective and available to the original purchase only, and only on completion and return of the AKAI Warranty Registration Card within 14 days of purchase.

Warranty coverage is valid for factory-authorized updates to AKAI instruments and their software, when their installation is performed by an authorized AKAI Service Center, and a properly completed Warranty Registration has been returned to your "AKAI professional" dealer.

To obtain service under this warranty, the product must, on discovery of the detect, be properly packed and shipped to the nearest AKAI Service Center. The party requesting warranty service must provide proof of original ownership and date of purchase of the product.

If the warranty is valid, AKAI will, without charge for parts or labor, either repair or replace the defective part(s). Without a valid warranty, the entire cost of the repair (parts and labor) is the responsibility of the product's owner.

AKAI warrants that it will make all necessary adjustments, repairs and replacements at no cost to the original owner within 12 (twelve) months of the purchase date if:

1) The product fails to perform its specified functions due to failure of one or more of its components. 2)

The product fails to perform its specified functions due to defects in workmanship.

3) The product has been maintained and operated by the owner in strict accordance with the written instructions for proper maintenance and use as specified in this Operator's Manual.

Before purchase and use, owners should determine the suitability of the product for their intended use, and owner assumes all risk and liability whatsoever in connection therewith. AKAI shall not be liable for any injury, loss or damage, direct or consequential, arising out of use, or inability to use the product.

The warranty provides only those benefits specified, and does not cover defects or repairs needed as a result of acts beyond the control of AKAI, including but not limited to:

1) Damage caused by abuse, accident, negligence. AKAI will not cover under warranty any original factory disk damaged or destroyed as a result of the owner's mishandling.

2) Damage caused by any tampering, alteration or modification of the product: operating software, mechanical or electronic components.

3) Damage caused by failure to maintain and operate the product in strict accordance with the written instructions for proper maintenance and use as specified in this Operator's Manual.

4) Damage caused by repairs or attempted repairs by unauthorized persons.

5) Damage caused by fire, smoke, falling objects, water or other liquids, or natural events such as rain, floods, earthquakes, lightning, tornadoes, storms, etc.

6) Damage caused by operation on improper voltages.

IMPORTANT NOTE: This warranty becomes void if the product or its software is electronically modified, altered or tampered with in any way.

AKAI shall not be liable for costs involved in packing or preparing the product for shipping, with regard to time, labor, or materials, shipping or freight costs, or time or expense involved in transporting the product to and from AKAI Authorized Service Center or Authorized Dealer.

AKAI will not cover under warranty an apparent malfunction that is determined to be user error, or owner's inability to use the product.

THE DURATION OF ANY OTHER WARRANTIES, WHETHER IMPLIED OR EXPRESS, INCLUDING BUT NOT LIMITED TO THE IMPLIED CONDITION OF MERCHANTABILITY, IS LIMITED TO THE DURATION OF THE EXPRESS WARRANTY HEREIN.

AKAI hereby excludes incidental or consequential damages, including but not limited to:

1) Loss of time.

2) Inconvenience

3) Delay in performance of the Warranty. 4)

The loss of use of the product.

5) Commercial loss.

6) Breach of any express or implied warranty, including the Implied Warranty of Merchantability, applicable to this product.

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Introduction

Thank you for buying an AKAI S20 16-bit Stereo Phrase Sampler.

The S20 is a professional-quality 16-bit stereo sampler that has been specifically designed for phrase sampling. It combines powerful capabilities with a clear, easy-to-use interface. The S20 gives you the features you need for sampling and editing in the studio, along with dedicated controls to allow you to do on-the-fly sampling, looping and playback in a live performance situation (ideal for DJs or live broadcast use).
Of course, the S20 also provides the features of a conventional MIDI sampler, including multi-sampling and multi-timbral capabilities. So if you're already using a GM module or synthesizer, the S20 will make it easy to add new sounds, phrase samples, and sound effects to your music.

The S20 is another member of Akai's highly acclaimed S-Series family of samplers. We hope that it will provide you many years of creative satisfaction.

To get the most from your S20, please read this manual thoroughly and keep it handy for future reference.

Features

- MIDI compatible digital sampler with 8 voice polyphony

- 16-bit stereo sampling at 32/16/8 kHz sampling frequencies

- Maximum 14 second recording at 32 kHz mono sampling with the standard memory configuration; expandable to maximum 262 seconds with an additional 16 Megabyte SIMM installed

- 16 large bank keys for sample assignment and function keys for real time performance on the front panel

- Sequence feature that records and reproduces the main panel operations

- Tap feature that provides BPM (beats per minute) display according to the manual tapping

- Beat loop function that provides a tempo from a sample loop length or adjusts samples' pitch by a tempo value entry

- Resampling feature that saves memory

- Easy sample editing using the edit matrix while auditioning samples

- Simple management of samples using 16 banks with edit parameters for individual bank control

- Multi-timbral/multi-sampled sound module that is fully MIDI controllable

- Built-in floppy disk drive that accepts 3.5-inch 2HD/2DD disks

- Able to load sample data from sound library disks for almost all AKAI S-series samplers (5900/S 1000/ S 1100/S2800/S3000/S3200/52000/S01), and REMIXI6

Note: In this manual, the names of main panel controllers (keys) are represented in bold.

Panel Descriptions

Main Panel
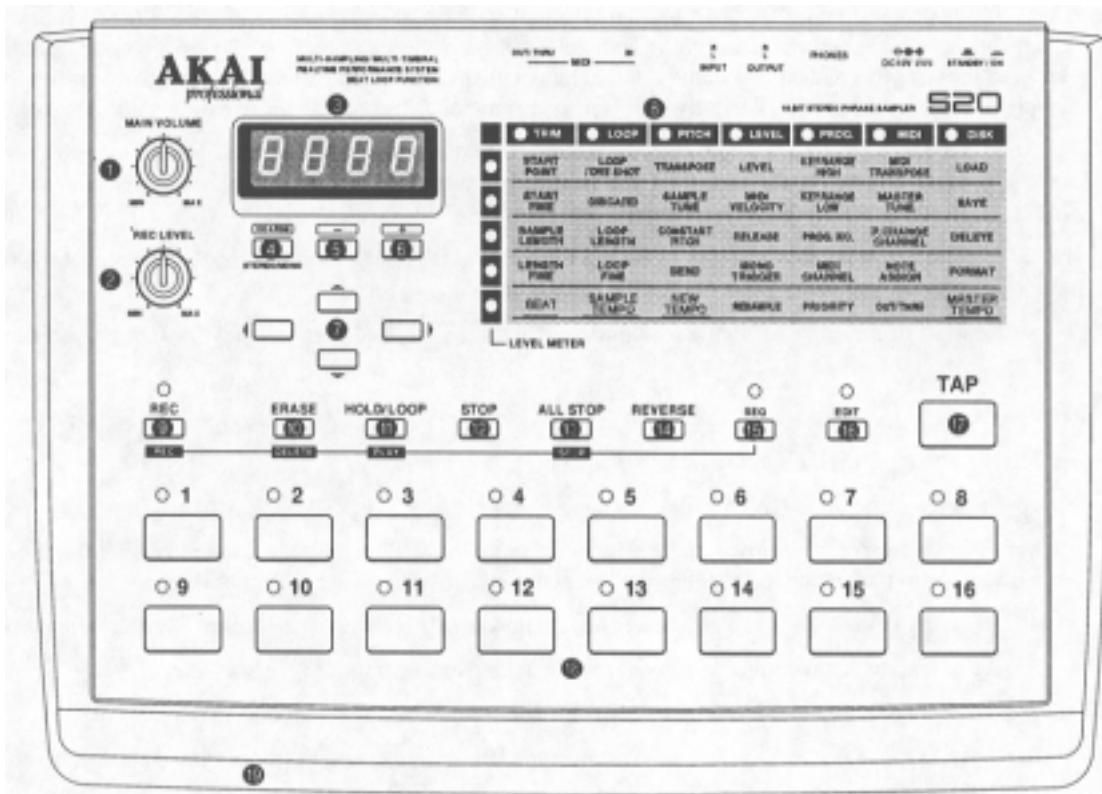
1. MAIN VOLUME
Adjusts the output level and headphone level at OUTPUT.

2. REC LEVEL
Adjusts the input level at INPUT. The current input level is shown on the LEVEL METER. In REC standby mode, the LEDs on the left column of the Edit Matrixes function as a level meter, allowing you to check the level.

3. PROG.No./DATA
The display shows information such as a parameter, symbol, current status, etc., depending on the current mode selection.

4. COARSE
This is used while you are editing the starting point or length of a sample to move quickly through the sample data. Press [+][-] while holding down this key to increase or decrease the first two digits of the number on the display.
This also switches between stereo and monaural while you are sampling.

5. -
Press this key to decrease the number on the display. Keep pressing this key to decrease the number continuously. Also, if you press [+] while holding down this key, the number will decrease rapidly.

6. +
Press this key to increase the number on the display. Keep pressing this key to increase the number continuously. Also, if you press [-] while holding down this key, the number will increase rapidly.

7. Cursor keys
Used to select a parameter in Edit Matrix when you are working in Edit mode; The cursor keys are also used to show a total sampling time with ~ cursor key (in seconds, at 32 kHz sampling frequency, mono) or remaining sampling time with the other cursor keys in Play mode and Sequence mode.

8. Edit Matrix

This edit parameter map gives you fast access to a desired parameter; Move the light of an LED (left/ right/up/down) using cursor keys. The lit LEDs indicate the current parameter at their cross point in the matrix. The current parameter value is shown in PROG.No./DATA©.

9. REC

Pressing this key starts the sampling process; Pressing this key puts the S20 in record standby status; 'Consecutively pressing one of the bank keys starts sampling. REC is also used to execute commands in Edit mode and to start and stop sequence recording in Sequence mode.

10. ERASE (DELETE)

Pressing this key clears a sample assigned in a bank; Pressing a bank key along with ERASE will clear the sample in that bank. ERASE in Sequence mode is used to clear a track or bank data assigned in a track.

11. HOLD/LOOP (PLAY)

Pressing this key along with a bank key causes a looped sample to playback continually. You cannot have playback on hold with a sample without a loop setting (one-shot sample).

Pressing this key during sampling stops sampling and starts looped playback of that sample.

HOLD/LOOP is also used in Sequence mode to start recording a sequence.

12. STOP

For looped playback of a sample, pressing this key along with the corresponding bank key stops that playback. Multiple samples in loop playback can individually be stopped by this method.

13. ALL STOP (STOP)

Stops all sample playback immediately.

Playback of a sequence in Sequence mode can also be stopped by pressing this key.

14. REVERSE

Pressing this along with a bank key causes a reversed playback of the corresponding sample; Releasing this with the bank key held down changes to normal playback of that sample.

15. SEQ

Pressing this key lights its LED and the S20 enters Sequence mode. Pressing the key a second time returns the unit to Play mode.

16. EDIT

Pressing this key lights up its LED indicating that the S20 is in Edit mode. Pressing the key a second time turns off the LED and returns the S20 to Play mode.

17. TAP

Tapping a tempo on this key sets the current tempo to the tapped tempo. NEW TEMPO for BEAT LOOP FUNCTION can be adjusted with this method.

Also, pressing this key along with a bank key will cause repeated playback of the beginning of the corresponding sample; Press the [+][-] to adjust the playback tempo for that beginning loop.

18. Bank keys 116

Pressing any bank keys) plays the samples) assigned to individual banks.

In play mode, an available bank (that contains a sample and is playable) is indicated by its LED being lit.

In Edit mode, you can select any one bank for editing by pressing the corresponding bank key; Its LED lights, indicating that the bank is editable.

19. Floppy disk drive

Used for loading or saving sample data from or to a floppy disk. This drive accepts a 2DD or 2HD floppy disk. ,

Rear Panel
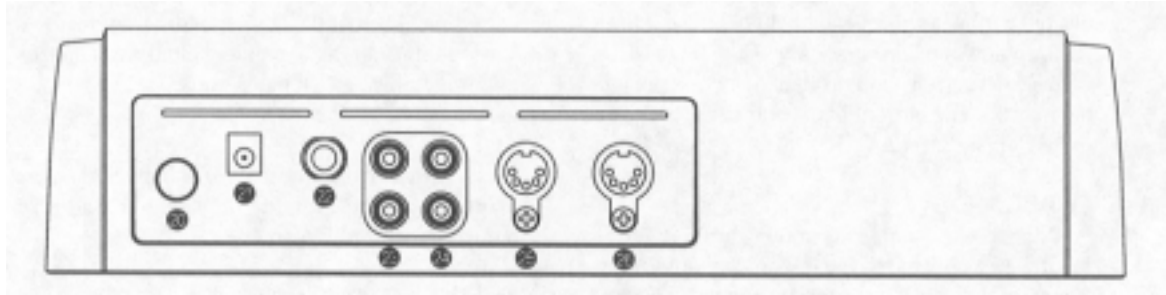
20. POWER
Turns on or off the S20.

21. DC10V
Connects to the enclosed S20 AC adapter.

22. PHONES
Connects to a pair of headphones.
The sound you monitor here also goes to
OUTPUT **23.**
(To protect your ears and headphones, turn down
MAIN VOLUME **1.** to minimum setting before
turning on the unit.)

23. OUTPUT
Audio output of sampled sounds.

24. INPUT
Connection for sound sources (such as the CD
player or tape recorder) used for sampling.

25. MIDI IN
Connects to MIDI OUT on an external MIDI con-
troller.

26. MIDI OUT/THRU
Connects to MIDI IN on an external MIDI device.
OUT or THRU operation is selected in Edit mode.

Handling Floppy Disks

THE DISK DRIVE

The 3.5 inch floppy disk drive will accept high density (2HD) and double density (2DD) disks .

Disks are inserted into the drive:

The label should be facing upwards when it is inserted (actually, it is physically impossible to insert disks the wrong way round without using an extreme amount of force!).

To eject the disk, simply press the DISK EJECT button. While loading, saving or formatting the disk, the DISK ACTIVITY LED will be lit. NEVER press DISK EJECT button while the LED is lit.
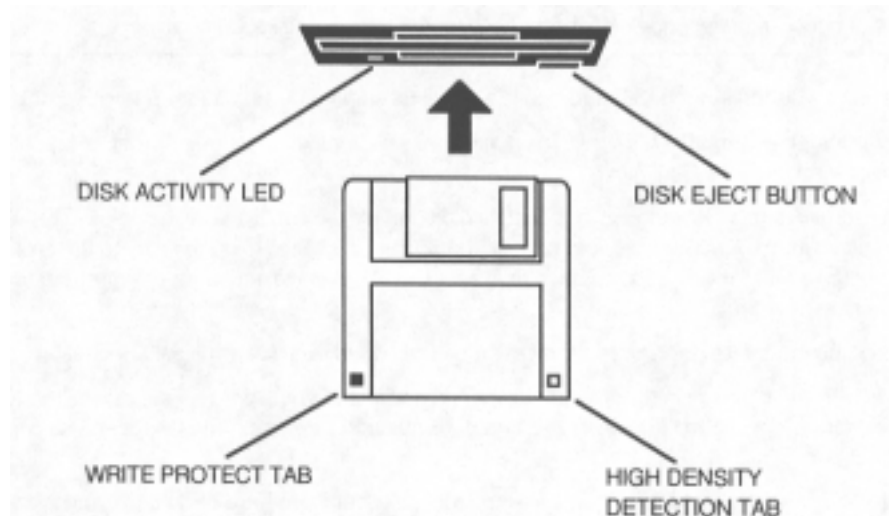
It is important to remember that, unlike a synthesizer, the S20 has no means of storing sounds in its internal memory. As a result, it is vital that you save your work to disk before turning the power off otherwise you will lose your work and, unless previously saved or backed up, it will be gone for ever. In fact, it is a good idea to regularly save your work as you are working. All good computer users do this as it prevents the accidental loss of data should power be accidentally removed from the instrument. This also serves as a form of `undo' - if you make some kind of mistake in your programming and editing and can't fix it, you can load the last level of editing back into the sampler.

It may be a bit tedious to have to stop every now and then to save your work but it is better than losing some valuable sounds.

TAKING CARE OF YOUR DISKS

These floppy disks contain valuable sound data and, as such, should be treated with extreme care. Therefore, please observe the following points:

• Never slide the metal cover back and touch the disk. Finger marks may render the disk unreadable.

• Don't leave the disk in the drive whenever possible. When the disk is in the drive, the metal protective cover slides back exposing the actual disk inside and this makes it susceptible to picking up dust which may cause read errors.

• Do not leave your disks in a hot car.

Do not place your disks next to any magnetic sources such as speakers, amplifiers, televisions, etc. Also, try to avoid X-ray machines but with the added security at airports these days, this may not be possible. At airports, it is sometimes possible to ask for your disks to be inspected by hand at security desks. Always check with the security officer, just in case. Security X-ray machines are generally safe with disks, though. If in doubt, make backup copies which should be left at home.

Note: Some checked-in luggage are X-rayed by quite powerful machines that are not as safe as those that check hand luggage. It is probably best to take your disks as hand luggage.

Do not leave your disks around liquids - one accidental spill could ruin a lot of work!

Always use high quality disks. While cheap ones may be appealing, they are prone to errors more than good ones.

Try to ensure that the write protect tab is switched on (i.e. the tab not blocking the hole). This will prevent accidental erasure, formatting and loss of data. It may be a nuisance to try to write to the disk and find it write protected but it is less of a nuisance than accidentally over-writing a set of your favourite samples and programs!

Try to get into the habit of labelling your disks - it will pay dividends when you are searching for something.

Invest in a sturdy carrying case for your floppies, especially if you are a gigging musician. Heavy duty metal camera cases are ideal and some flight case manufacturers now make special heavy duty disk flightcases.

Even if you are using a hard disk of any sort, please make sure you have backed up your work to floppy disks. It can be time consuming but it will be worth it if you ever have a problem with your hard disk!

· Supplied Disks

Your S20 comes with four sound disks. A portion of this manual is described using such disks. The following is the contents of the sound disk.

Disk 1	ALL1 file	Funky phrases (with demo sequence).	
Disk 2	ALL1 file	House music phrases (with demo sequence).	
Disk 3	ALL1 file	HipHop music phrases.	
Disk 4	ALL1 file	Sound effects 1	
	ALL2 file	Sound effects 2	
	ALL3 file	Electric bass	

Connections

- Make sure that the S20 and other connected equipment are all turned off.

- Connect the sound source you are sampling (such as a CD player) to the INPUT.

- If you want the S20 to be MIDI controlled, connect a MIDI controller's (master keyboard, sequencer, etc.) MIDI OUT to the MIDI IN of the S20.

- If you want to record your performance on the S20 as MIDI data, connect a sequencer's MIDI IN to the MIDI OUT/THRU of the S20.

- Connect the S20 OUTPUT to the line inputs of an external amplifier or mixer. Connect headphones if necessary.
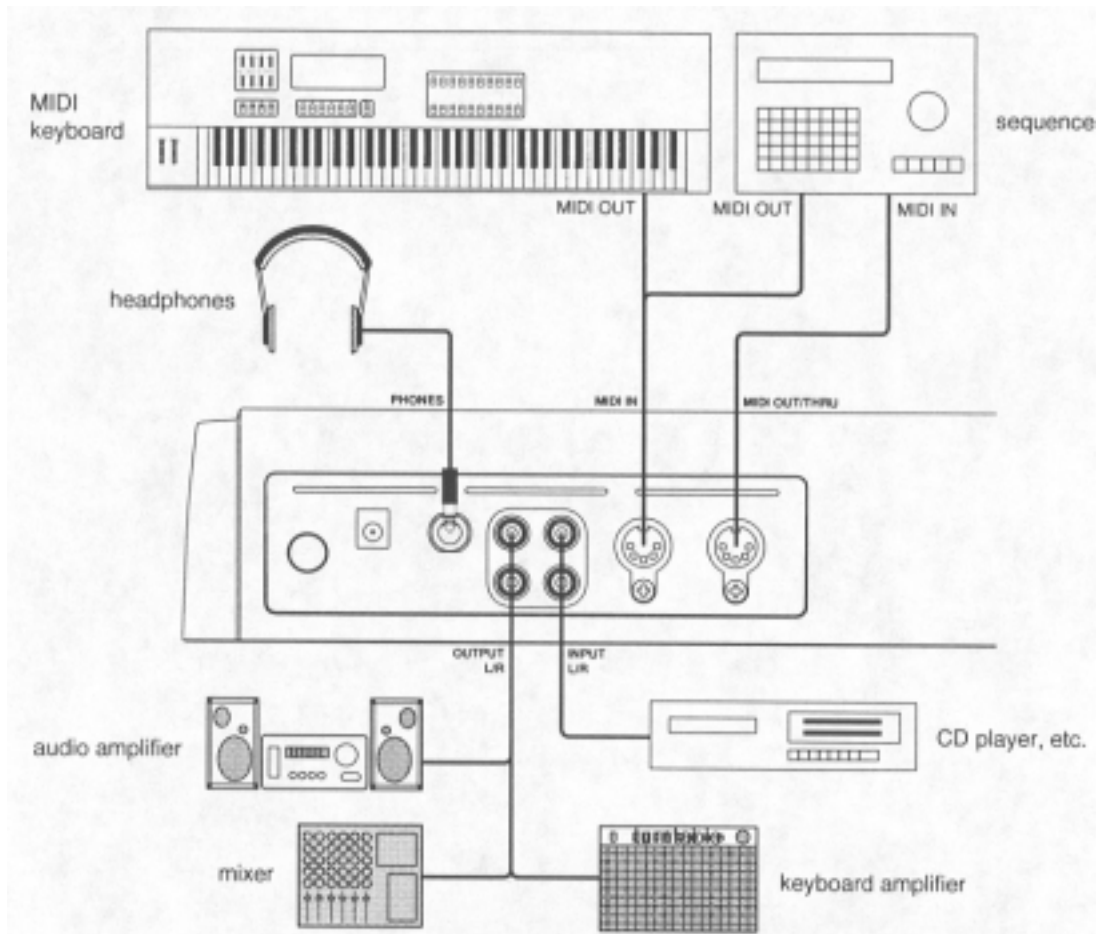
- Before turning on the S20, make sure that the amplifier is turned off and the mixer volume is turned down.

- Turn on the S20; Its display first blinks, then indicates r 0. It shows r 4 with a 4-Megabyte SIMM installed or r 16 with a 16-Megabyte SIMM installed. After a while, the display changes to < 1 > indicating that the S20 is ready to use.

- Turn on the amplifier or mixer; Adjust the volume accordingly.

- When you press the bank key 1 on the S20, you can audition the sampler test tone.

> **Note**: If the sample test tone is not heard, check the following:
> - All equipment is turned on.
> - All cables are properly connected.
> - Volume of the mixer or amplifier is turned up enough; MAIN VOLUME setting on the S20 is turned up enough.

Test Driving the S20

This section will get you up to running with the S20. It explains how to use the sound disks supplied and basic sampling techniques. For detailed explanations of various playing methods, sample editing, sequencing and so on, refer to the individual descriptions in the subsequent sections.

Playing Samples from Sound Disks

The following describes how to playback samples from a floppy disk.

1. Press **EDIT** to light up the EDIT LED.

2. Insert one of the supplied sound disks into the drive located on the front panel of the S20.

3. Select LOAD in the Edit Matrix by moving the LED light with **cursor keys**; LOAD is at the top of the rightmost DISK row.

4. Press **REC** to show *R L   1 in* the display. If *R L   1* is not shown, press [-] to find it.

5. Press **REC** a second time. The display will blink.

6. Press **REC** a third time; The display will change to *L o A d* to indicate that sample data is now loading.

7. Press **EDIT** to turn off the EDIT LED; You are now in Play mode.

8. You can play a sample assigned to any bank with a lit LED by simply pressing that bank key.

• You can play multiple samples at a time by pressing several bank keys simultaneously.

• For a phrase sample that loops, like ones from the sound disk, you can set the loop to hold by pressing **HOLD/LOOP** and the corresponding bank key simultaneously; That sample will go on playing in a loop after the key is released. To stop playing a sample, press the corresponding bank key along with **STOP**, simultaneously. Pressing **ALL STOP** will stop all samples currently being played.

Sampling

1. Make sure that the S20 is in Play mode (with EDIT and SEQ LEDs both turned off) and start the sound source (i.e. the CD player, cassette or turntable).

2. Press **REC**.

3. Adjust the source input level that is shown in **LEVEL METER** (the LEDs lined vertically under Edit Matrix), using **REC LEVEL**; Set the level as high as possible, but do not light up the top LED.

Set the level so this top LED does not light up.
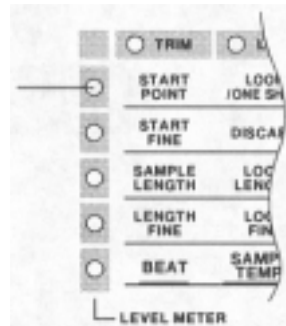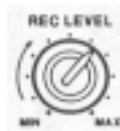
4. Press the bank key of an empty bank (one with its LED turned off) at the point you want to start sampling. Press **STOP** at the point you want to stop sampling/recording. You can have up to 16 samples within the memory of the S20.

5. The recorded sample (from the CD player or turntable) will play each time the corresponding bank key is pressed.

   Note; If F U L L blinks when you have started sampling by pressing a bank key, there is no more free memory. If you have a dispensable bank, press that bank key while holding down ERASE to erase the sound. By erasing the sound, the memory used for that bank will be accessible and you will be able to sample new sounds.

S20 Basics

Your S20 can easily record any source sounds from a CD; It can take samples of acoustic instruments such as piano, strings, percussion, etc., or sound effects such as wind, rain, human voice, etc. These or other sounds can easily be fed to the S20 as long as they are in the form of audio signals that can be connected to the S20's INPUT.

Once these sounds have been recorded or sampled, you can simply play them using the 16 bank keys or an external MIDI keyboard. Also, these samples can be edited using several edit parameters like BEAT LOOP FUNCTION that enables tempo-matched looping.

Banks

The S20 provides 16 banks, into each of which you can record a sample or load sample data from sound library disks. Each bank has edit parameters such as looping, level, pitch, etc.
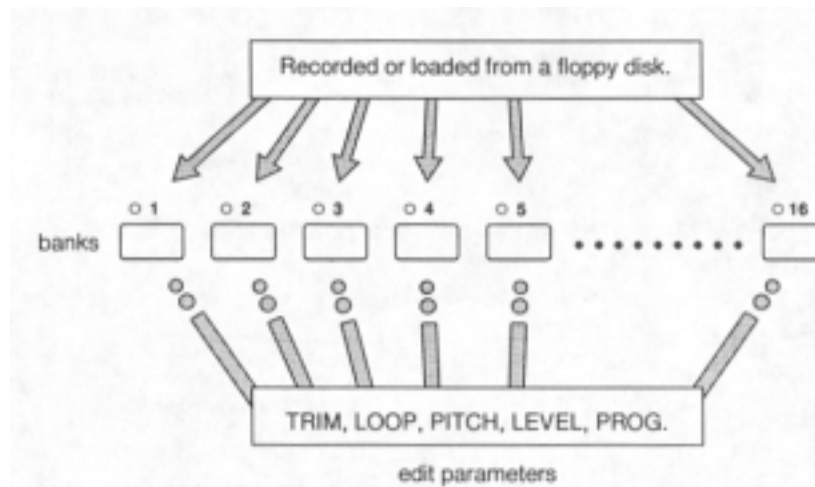
Memory

Your S20 comes with 1-megabyte of RAM installed. A portion of the S20's memory is used in the operating system. Its remaining memory is used for the user area where you can record or load up to 14 seconds of mono sample data sampled at 32 kHz.

You can display the total sampling time by pressing the up **cursor key** in Play mode; Other **cursor keys** display the remaining free memory display.

You can use the total sampling time (user area) freely for each of 16 banks; One bank can use up all the user memory or several banks can share it, as shown in the following illustrations.

Example 1: All memory used for bank 1 only.
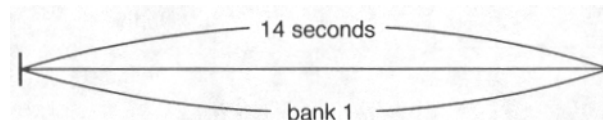
*In this case, you can no longer record or load in other banks.

Example 2: Several banks sharing the memory

14 seconds

2 seconds | 2 seconds | 1 seconds | 4 seconds

bank 1 | bank 2 | bank 3 | bank 4

*In this case, you have up to 5-seconds of recording or loading memory in other banks
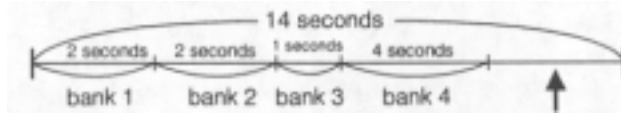
An empty memory area: 14-9=5 seconds

Example 3: Banks 1 & 2 sharing all memory, bank 2 sample replaced with a shorter one

14 seconds

bank 1 | bank 2

Replaced with a shorter sample

* In this case, you can record or load in banks 3 to 16.

bank 1 | bank 2

An empty memory area

Example 4: Recorded in banks 1 & 2. Some memory still remains.

14 seconds

bank 1 | bank 2
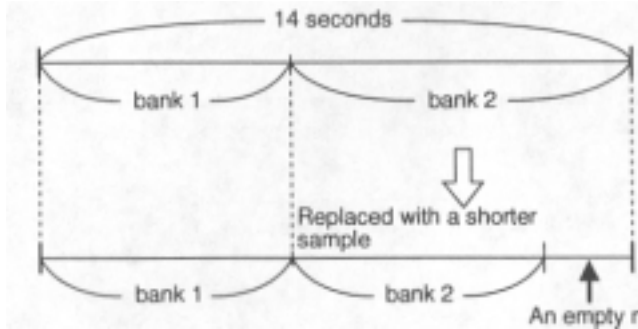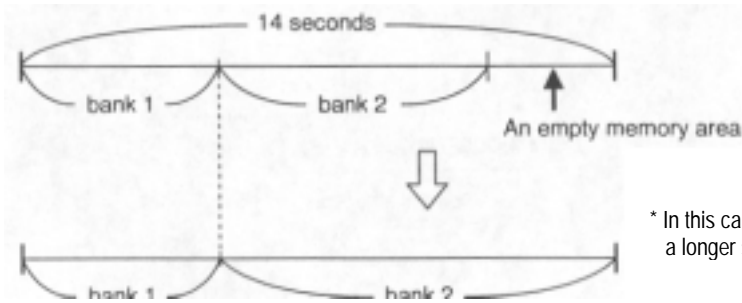
An empty memory area

* In this case, you can record or load a longer sample in bank 2.

bank 1 | bank 2

Example 5: Discarded unnecessary portions at the beginning and end of existing samples.

14 seconds

bank 1 | bank 2

An empty memory area

start | end

* In this case, you can record or load samples using the memory from the discarded portions.

bank 1 | bank 2

An empty memory area

Stereo and/or Mono Sampling

Stereo sampling requires twice the memory compared to mono sampling. Be careful in choosing stereo or mono before you start recording.

Sampling a true stereo sound in stereo makes perfect sense but in many cases the sound itself may be mono. There are cases where mono sounds are converted to stereo with effects processors. In such a case, turn the effect off and sample in mono to save memory space on the S20. It is more efficient if you use an external effect processor to convert the sound to stereo.

Drum loops and sounds off of old vinyl records are often mono therefore a mono recording from one channel would be best.

It is also possible to record a stereo sound monaurally. Input the stereo sound into a mixer and route either the mixer's effect send or AUX send for both channels to the left input of the S20.

Make the following precautions when you are sampling with a mixer, as in the above illustration.
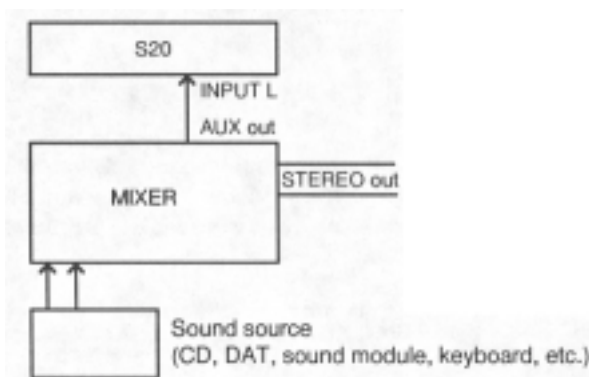
*   Make sure that the left-right balance is the same before changing the signal to mono.

*   Make sure the input gain of the mixer is properly adjusted and the noise is minimized.

*   If the output from S20 is also connected to the same mixer, you need to be careful to avoid a "feedback" loop. Make sure the level of effect send or AUX send of S20 channel is set to 0, otherwise a feedback loop may damage the speaker.

Files

The S20 handles several types of data as a file. There are three types of S20 files-ALL file; contains all banked samples with edit parameter values and sequence data, sample file that contains one banked sample with edit parameter values, and sequence file, contains only the sequence data. You can determine which file type is used when saving and loading data. Additionally, the S20 can load sample data from the sample library disks used with AKAI S-series samplers. For detailed information, see page 36.

Programs

You can use the S20 as a MIDI sound module by assigning a channel number and program number for each bank.

• Multi-sampling and Examples of Layer Setting

You can create sound layers by assigning the same MIDI channel number and program number to multiple banks.
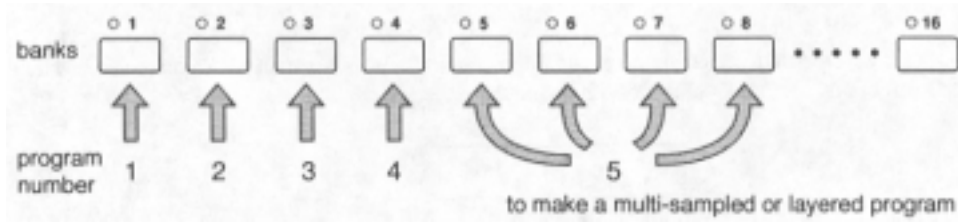
For example, use the following table when controlling the S20 with an 88-key MIDI keyboard. Sending MIDI program change 1 through 4 will allow you to play various bass sounds from a MIDI keyboard. If you send MIDI program change 5 and play, you will be able to play the strings which had been multi-sampled for each pitch.

BANK	PROG.NO.	MIDI CH.	KEY RANGE	SAMPLE
1	1	1	21 -108	Electric bass
2	2	1	21 -108	Chopper bass
3	3	1	21 -108	Acoustic bass
4	4	1	21 -108	Synthesizer bass
5	5	1	21 - 48	Strings LOW
6	5	1	49 -72	Strings LOW MID
7	5	1	73 -90	Strings MID HIGH
8	5	1	91 -108	Strings HIGH
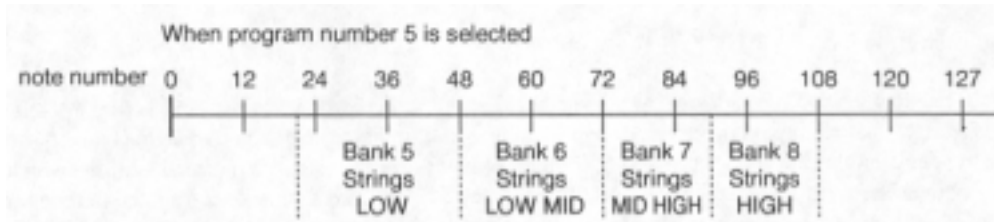
Also, if you use the following table to set the S20, a layered sound of piano and strings will play when MIDI program change 5 is sent.

BANK	PROG.NO.	MIDI CH.	KEY RANGE	SAMPLE
1	1	1	21 -108	Electric bass
2	2	1	21 -108	Chopper bass
3	3	1	21 -108	Acoustic bass
4	4	1	21 -108	Synthesizer bass
5	5	1	21 -72	Strings LOW
6	5	1	73 -108	Strings HIGH
7	5	1	21 -72	Piano LOW
8	5	1	73 -108	Piano HIGH

When program number 5 is selected
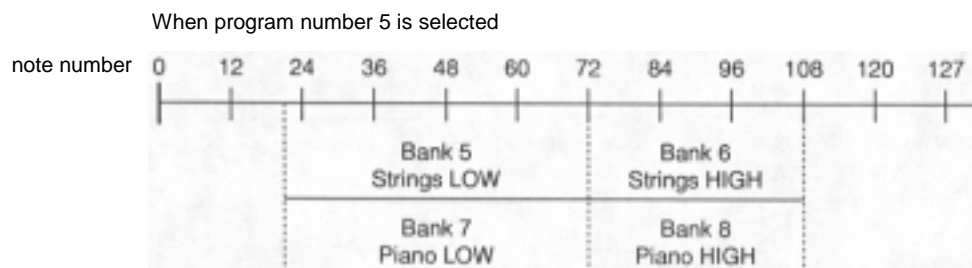
• Example of Multi-timbre Sound Source Setting

Changing the MIDI channel for each bank under the same program number will allow you to use the S20 as a multi-timbre sound source.
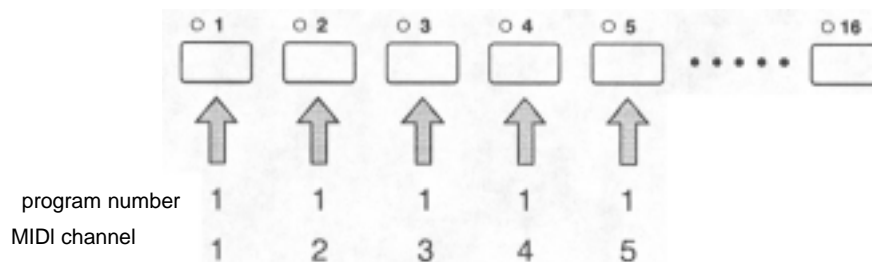
For example, if you use the following settings and control the S20 from a sequencer, you can play a string ensemble.

BANK	PROG.NO.	MIDI CH.	KEY RANGE	SAMPLE
1	1	1	0 -127	Violin 1
2	1	2	0 -127	Violin 2
3	1	3	0 -127	Viola
4	1	4	0 -127	Cello
5	1	5	0 -127	Contra bass

The Number of Simultaneously Generated Voices

The S20 generates up to eight voices at one time. A bank with stereo sampling uses two voices. If you want to play more than eight voices at one time, the PRIORITY setting (see page 32) will determine which bank will be muted.
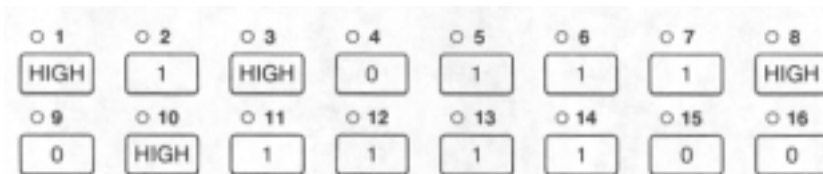
For example, set the PRIORITY of the bank as illustrated above. When the bank tries to generate more than eight simultaneous voices, the sounds set to 0; (bank 4, bank 9, bank 15, and bank 16) will stop. The bank sounds set to HIGH will not stop sounding.

Set the samples which will not affect the entire sound when stopped to "0" and set more essential as drum loops to HIGH.

> *Note*: If you set too many banks to HIGH and play them at the same time, some sounds may stop, even if they are set to HIGH.

The Mode Structure and Operation Flow

• S20 Mode Structure
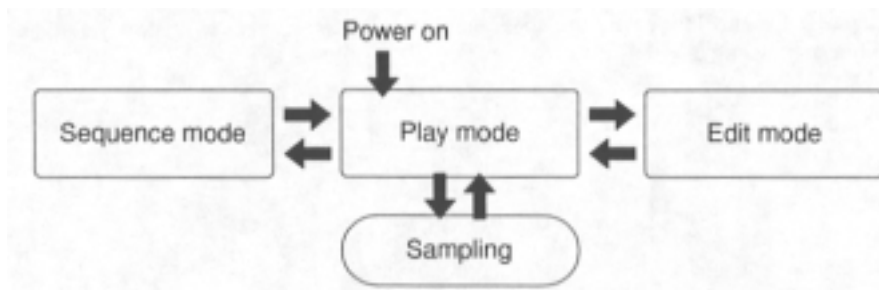
• Operational Flow
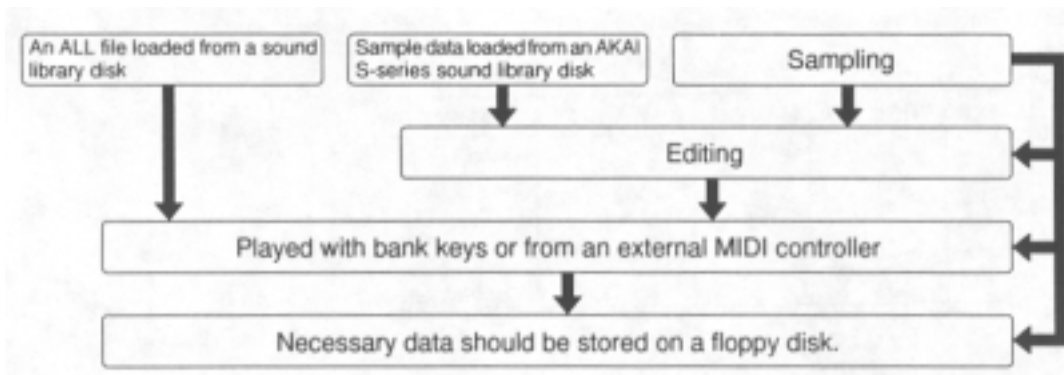
Play Mode

The S20 automatically enters Play mode when it is turned on. In Play mode you can play 16 banked samples using bank keys or other controls on the main panel. You can also use the unit as a MIDI sound module in this mode.

Playback with Bank Keys

Load the "Sound DISK #I" supplied. See page 36 for data loading. When the sample data is finished loading, LEDs for each bank containing samples will light up.
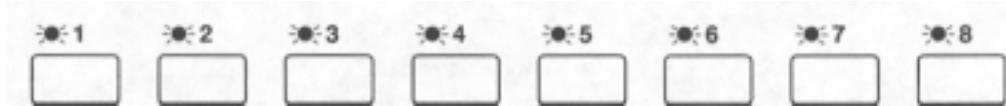
Pressing any lit bank key plays the assigned sample.

Playback with Hold Feature

By using **HOLD/LOOP,** a sample set to LOOP ON can repeatedly be played after releasing its bank key.

With the following examples use "Sound DISK #1". See page 36 for data loading.

> *Note: Banks that are set to LOOP OFF (ONE SHOT) will not produce repeated playback when their bank keys and HOLD/LOOP are pressed.*

• Making a Sound layer

• Press the bank 1 key followed by **HOLD/LOOP** for a drum loop.

• Press the bank 2 key followed by **HOLD/LOOP** for a bass phrase layered on the drum.

• Press the bank 3 key followed by **HOLD/LOOP** for a synthesizer phrase layered on the drum and bass.

• Pressing **ALL STOP** stops all playback of currently looped sample phrases.
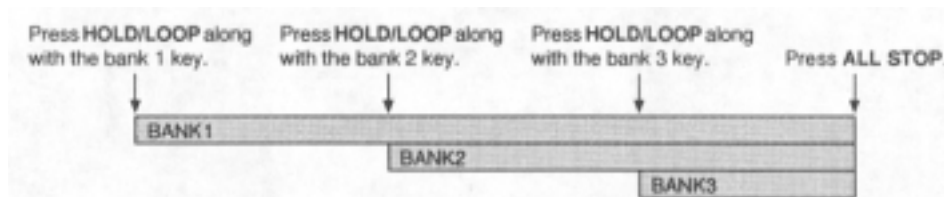
> *Note: The S20 can play up to 8 samples at a time. When you attempt to play nine or more samples, samples currently playing will stop in the order specified with PRIORITY (See page 32.).*

• Switching to Another Loop

• Press the bank I key followed by **HOLD/LOOP** for a drum loop. Consecutively press the bank 2 key followed by **HOLD/LOOP** for a bass phrase layered on the drum.

• Press **HOLD/LOOP** followed by the bank 3 key; The drum and bass loops stop and you have only the synthesizer loop from bank 3.

• Pressing **ALL STOP** stops all playback that currently loops.

Press **HOLD/LOOP** along with the bank 1 key.   Press **HOLD/LOOP** along with the bank 2 key.   Press the bank 3 key along with **HOLDILOOP**.   Press **ALL STOP**.
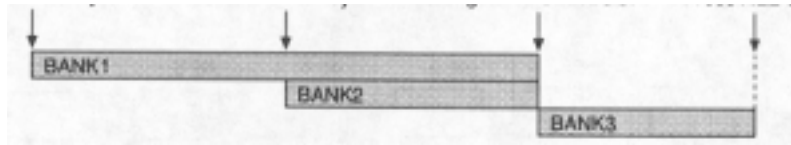
Canceling Loop Playback

• **ALL STOP**

Pressing this key stops all current playback regardless of looping or non-looping samples.

• **STOP**

Pressing this key stops a selected sample.

• Press the bank I key followed by **HOLD/LOOP** for a drum loop, press the bank 2 key followed by **HOLD/ LOOP,** and press the bank 3 key followed by **HOLD/LOOP** for a triple loop of the drum, bass and synthesizer samples.

• Pressing the bank 1 key along with **STOP** stops only the drum loop; The other two samples go on looping.

Press the bank 1 key along with **STOP**

Reversing a Sample

Pressing REVERSE along with a bank key plays the sample in reverse. When **REVERSE** is released, the playback becomes normal.

For a sample that normally plays as "A, B, C, D, E, F, G", pressing **REVERSE** at "F" results in "E, D, C, B... ". If **REVERSE** is released at "B", the playback becomes normal (as "C, D, E, F...") at that point.
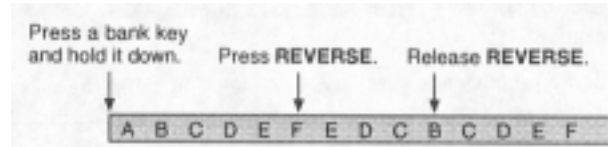
> *Hint*. When you reverse a sample with LOOP OFF, you obtain the best result by pressing its bank key with ***REVERSE*** *already held down.*

> *Note: Pressing **REVERSE** does not affect loops that are currently on hold with their bank keys released.*

Sampling

Sampling refers to a series of processes that transforms an analog waveform into digital data and stores it into memory; It consists of sampling, quantizing and digitizing.

In the sampling process, many signal levels are extracted from an analog waveform over a specific period of time. The frequency that the audio is sampled determines the frequency response of the reseeting digital audio sample. The S20 uses 32 kHz, 16 kHz and 8 kHz frequencies as a 1/32,000 second, a I/ 16,000 second and a 1/8,000 second period, respectively.

In the quantizing and digitizing processes, signal levels extracted in sampling process are measured and represented as countable numbers and then translated into binary numbers. After this, the binary numbers are stored in memory.

Quantizing is represented in "bits" and determines the dynamic range of the audio sample. The S20 uses 16 bits for quantizing and its dynamic range resolution is up to 65,536 levels.

Sampling Procedure

The S20 provides two ways to start sampling. Auto-trigger starts sampling at a specified trigger level. Manual control allows you to manually start sampling at any point.

1. **Connect a source to the S20 INPUT.**
   Connect sound sources, such as CD players, to the INPUT. Mono sources should be connected to the Left channel only.

2. **Check the available sampling time.**
   By pressing the cursor keys other than up, it is possible to check the available sampling time. The display shows 32kHz mono sampling time. Sampling at any other setting should be done cautiously.
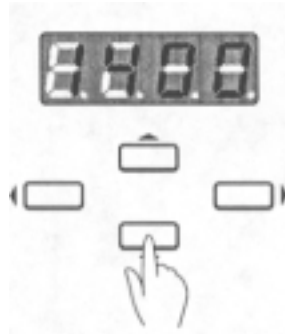
Here, it is possible to sample for 14 seconds at 32kHz mono.

3. **Select the sampling frequency.**
   Pressing **REC** and holding it down provides a sampling frequency display. Press [+][-] to select the sampling frequency (32 kHz, 16 kHz or 8 kHz). A high sampling frequency produces a clear recording but requires more memory than lower ones. For instance, recording at 32 kHz requires twice as much memory as 16 kHz, or four times as much memory as 8 kHz.

4. Adjust the input level.

While auditioning the source, monitor the level using the **LEVEL METER** (vertical LEDs on the edit matrix) and use the **REC LEVEL** to controll the amount of signal led with the S20. The Red LEDs indicate a high level that may produce a distorted sound. Adjust the level as high as possible, without lighting the top LED. If the level is too low, the noise from the sound input source can be heard, therefore, it is important to adjust the level with care. When **REC** is released, the LED will blink and the level meter will appear.

Set the level so this top LED does not light up.
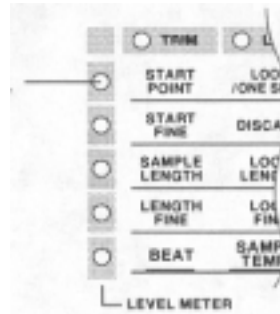
5. Setting the Stereo, Mono, and Trigger Levels.

The right side of the display shows trigger level. The left side shows whether the sample will be in stereo. Press the **STEREO/MONO** to switch settings. Nothing will appear when monaural is selected. Stereo requires twice as much memory as mono. It is better if you sample in mono unless there is a special need for a stereo effect. When mono is selected, audio is taken from the left Bourse input only. Set the trigger level with [+][-]. The display level value will blink indicating there is an input signal exceeding the trigger level.
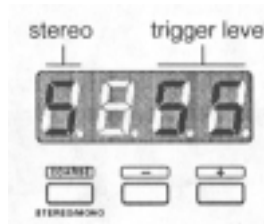
6. Select a bank.

Press the key of a bank where you wish to record and store your sample. If you cancel recording at this point, press **STOP** or any **cursor key.**
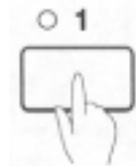
• Recording automatically starts when there is an input signal over the trigger level specified.

• With the trigger level "0", pressing a bank key immediately starts recording; If that bank contains a previous sample, the S20 will first erase it and then start recording a new sample.

• With the trigger level "100", pressing a bank key puts the S20 in record stand by (the bank must be clear of a previous sample prior to recording). Pressing **REC** a second time starts a new recording.

Note: *If pressing a bank key shows F U L L in the display, it is out of memory. First erase unnecessary samples/banks, then retry recording.*

7. Stop recording.

Pressing **STOP** immediately stops that recording. If the memory becomes full during recording, it automatically stops at that point.

• Auto-triggered Sampling

Auto-trigger starts recording when there is an input signal over the trigger level specified. It is useful to automatically cut off the silence that may exist before the target sounds.
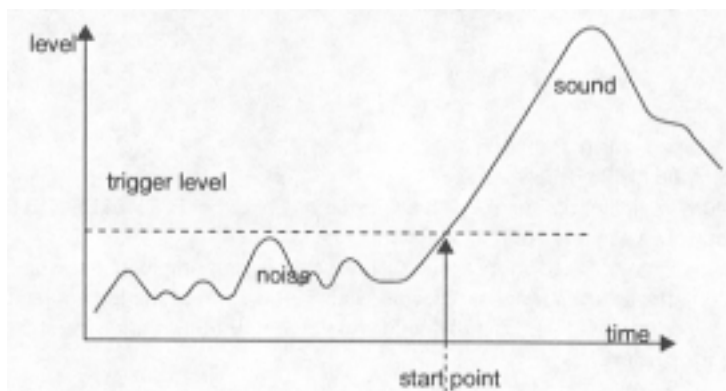
The trigger level display blinks when there is an input signal over the trigger level specified.
A too high trigger level does not start recording. On the contrary, a too low trigger level starts recording with a slight noise. Set the level appropriately.

In addition, you can manually start recording by pressing REC before there is an input signal over the trigger level.

> *Note*: Auto-trigger method may fail with a sound with a fast attack (percussive instrument, etc.); The result
> sometimes lacks the beginning of that sound. You can solve this problem with manual recording.
> Even if the result from manual recording includes unnecessary silence at its beginning, you can
> remove it using DISCARD in Edit mode.

• Manual Sampling

You can manually start recording at any point you like. It is useful to clip out a desired phrase from a long passage, especially for drum loops, etc.

With the trigger level "0", pressing a bank key immediately starts recording. In case that bank contains a previous sample, the S20 first erase it, then starts a new recording; This cause a short delay to that recording. You can avoid it if erasing a previous sample beforehand by pressing the bank key along with **ERASE**. In addition, you can see banks that contain samples by their LED lights.

With the trigger level "100", pressing a bank key stands by recording after erasing a previous sample in that bank. Pressing **REC** a second time starts a new recording.

There are a few points to quickly record manually; You should set the trigger level "100" to erase existing samples before recording, or you should first erase those by **ERASE,** then set the trigger level "0" for an immediate recording.

Tips for Sampling

To stop recording, pressing **HOLD/LOOP** instead of **STOP starts** immediate playback of that recording; It may loop depending on the bank setting.

If there is no need to change the sampling frequency or trigger level, you can make subsequent recordings by pressing **REC** and a bank key only.

In record standby status (after the step 5 described before), pressing a bank key containing a sample, along with **HOLD/LOOP,** starts playback of that sample. You can record a new sample to another bank by consecutively pressing its bank key. It is a performance-oriented way; For instance, you set the unit in record standby status and start hold playback of a sample. If you stop recording by **HOLD/LOOP,** the current playback will be replaced with the recording you have just made. Press **ALL STOP** to stop looped playback on hold.

Edit Mode

In Edit mode, you can edit a samples, set bank and MIDI parameters, as well as access the BEAT LOOP settings, sample load/save, and disk functions.

All of these edit operations are found in the Edit Matrix located on the top right of the S20 main panel, making it easy to access any editing functions.

Operational Procedure in Edit Mode

1. Press the **EDIT** button when the LED is on. You are in Edit mode.

2. Move the LED lights in the Edit Matrix using the **cursor keys,** to select an edit parameter, The row and column LED lights indicate the current parameter selection at their cross point in the matrix.
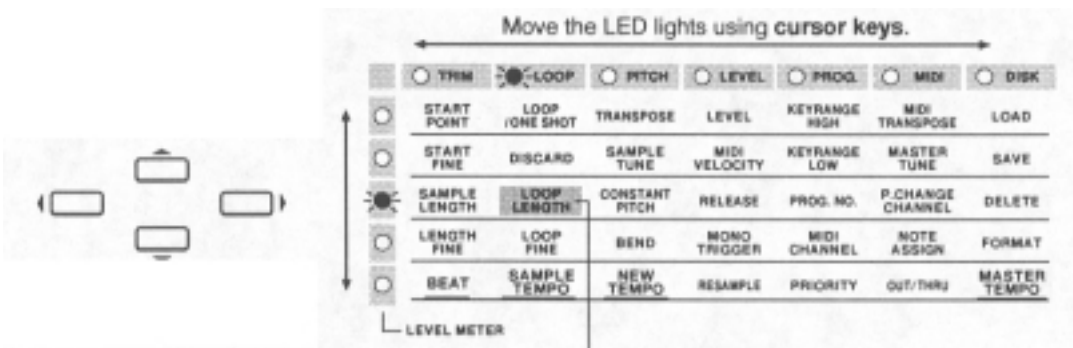
With LOOP LENGTH selected

3. Press a bank key to select a sample for editing. (In Edit mode, only one bank LED will be lit at a time) It is a target for editing.
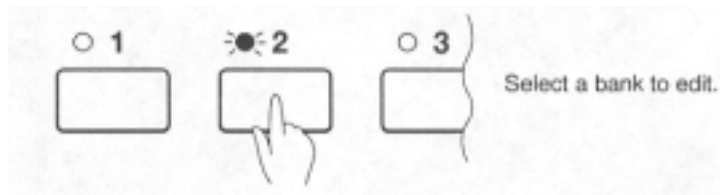
4. Set a parameter value using [+][-] keys. Hold the key down to change the value. If you press [-] while holding down [+], you can rapidly increase the value. The value will rapidly decrease in the same way if you press [+] while holding down [-].

TRIM or LOOP edit may require changing a large number. In this case, press [+][-] while holding down **COARSE** to change the first two digits of the value shown on the display.

When editing the same parameter for multiple samples, select a parameter as in the step 2 and repeat steps 3 and 4.

When editing several parameters for a single sample, select that sample by pressing its bank key and repeat steps 2 and 4.

As in Play mode, you can play a sample while in Edit mode by pressing its bank key.

> *Note*: *While in Edit mode the banks selected for editing will have their LED on.* If you *play another bank to listen and compare with the sample, the LED* of *that bank will turn on and it will be enabled for editing. Be sure to reselect the appropriate bank and check the LED before making any changes.*

TRIM

This parameter determines the actual length that a sample will play.
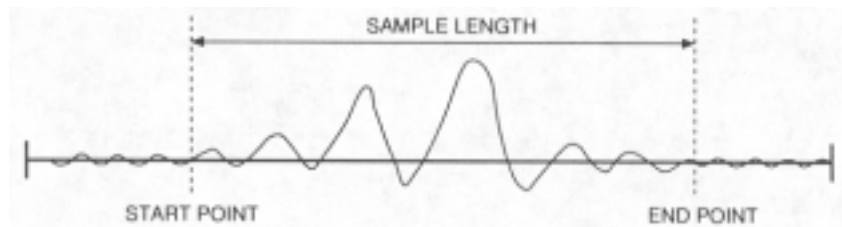
* **START POINT**
* **START FINE**

Determines the playback start point of a sample.

START FINE adjusts the lower four digits of the sampling point whereas START POINT adjusts the higher digits.

To change the value drastically, press [+][-] while holding **COARSE,** changing the higher two digits on the display.

When you change the start point value with the bank key held down, the sample plays from the new start point each time the value is changed.

• SAMPLE LENGTH
• LENGTH FINE

Determines the sample length (END POINT) for playback from the start point specified by the START POINT and START FINE parameters.

LENGTH FINE adjusts the lower four digits of the sampling point whereas SAMPLE LENGTH adjusts the higher digits.

SAMPLE LENGTH   LENGTH FINE

To change the value dramatically, press [+][-] while holding **COARSE** to change the upper two digits on the display.

When you change the sample length value with the bank key held down, the sample plays out from just before the end point each time the value is changed.

Note: BEAT is described in BEAT LOOP FUNCTION (P29).

LOOP

This description uses an example illustrated below, to explain LOOP; You can remove unnecessary portions of a sample using DISCARD as well as copying or reversing the sample, or even bank initialization.
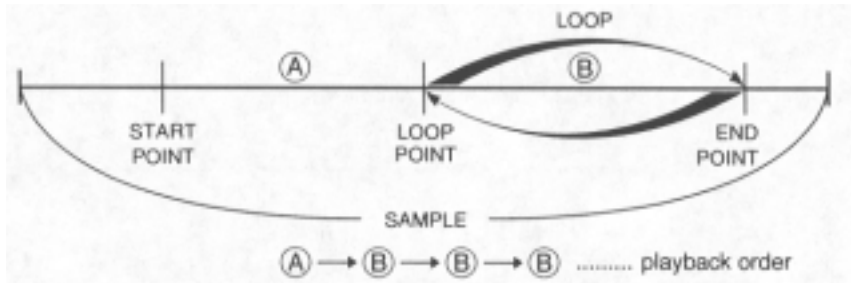
• LOOP/ONE SHOT

Determines the type of looped playback for each bank's sample.

o n	**ON**:	Looped using length specified with LOOP LENGTH. Sounds while the bank key is held down.
o F F	**OFF:**	Not looped. Even while the bank key is held down, the sample plays out once for its duration and then stops.
H o L d	**HOLD:**	You can start playback by pressing the bank key; It will continue to loop after releasing the key. You can stop the loop by pressing **ALL STOP** or by pressing the bank key along with **STOP.**
o n - S	**ONE SHOT:**	When the bank key is pressed (and released), The sample plays for its duration but does not loop. This option is useful for a drum sound.

• DISCARD

This section has additional options in addition to the discard command. Select each using the [+][-] key.

d i S C   **DISCARD:** Removes sample data not contained between the start point and end point (specified with START POINT and SAMPLE LENGTH) to save memory. If LOOP LENGTH is longer than SAMPLE LENGTH, areas not between LOOP POINT and END POINT will be removed. To execute DISCARD, press the bank key along with **REC**.
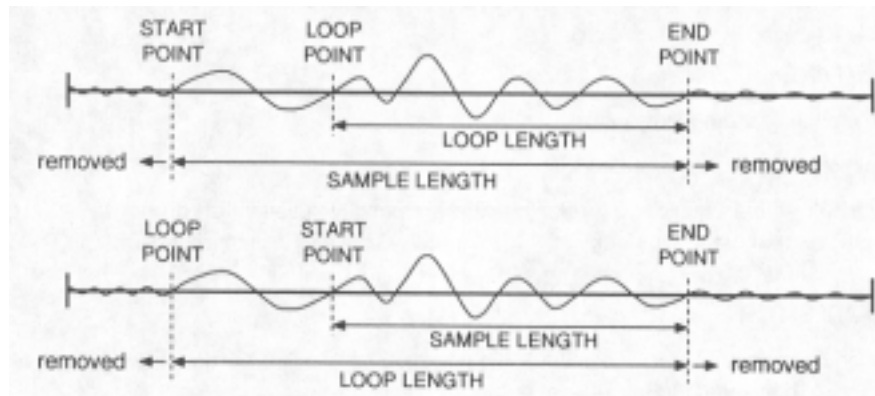
Note: Sample portions removed by DISCARD cannot be restored. You may want to make a backup of that sample on a floppy disk or within another bank before executing DISCARD.

r u r **S**   **REVERSE:** Creates a reversed sample.
To execute REVERSE, press the bank key along with REC.

C o P y   **COPY:** Copies a sample in the current bank to another.
To execute COPY, first make sure the current bank is copy source, then press the bank key for copy destination along with REC.

I n I t   **INITIALIZE:** Initializes the bank settings. You may use this command before loading sample data from a floppy disk or making a new recording to the current bank.
To execute INITIALIZE, press the bank key along with REC.

• LOOP LENGTH
• LOOP FINE

Determines the sample's loop length, from the end point to the loop start point.

LOOP FINE adjusts the lower four digits of the sampling point whereas LOOP LENGTH adjusts the higher digits.

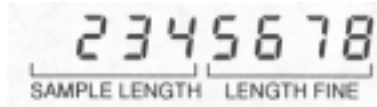

To change the value drastically, press [+][-] while holding **COARSE,** changing the higher two digits on the display to change.

When changing the loop start point value with the bank key held down, the sample plays from just before the end point, each time the value is changed.

Note: SAMPLE TEMPO is described in BEAT LOOP FUNCTION (P29.)

PITCH

This parameter determines the pitch of a sample.

• TRANSPOSE

Determines the pitch of a sample in semitones.

Pitches available from -50 to +50 semitones. One octave equals 12 semitones.

• SAMPLE TUNE

Fine tunes the pitch of a sample by cents.

One hundred cents equal one semitone.

Tuning is available within a range of 0 to 99. Pressing [+] from "99" changes the display to "0". At that point, the sample pitch is raised one semitone and the TRANSPOSE value is increased one step.

• CONSTANT PITCH

This parameter determines whether incoming MIDI note message data affects the pitch of a sample (when the S20 is used as a MIDI sound module).

With CONSTANT PITCH set to ON, the sample plays with a fixed pitch regardless of the MIDI key note received; The fixed pitch is determined by the TRANSPOSE and SAMPLE TUNE values for the original pitch.

With CONSTANT PITCH set to OFF, the banked sample plays out according to the MIDI key note received.

This parameter does not have an affect when playing samples from the S20 bank keys.

• BEND

This sets the sample pitch bend width when the pitch bend is received from S20 (when S20 is used as a MIDI sound source).

This parameter is ignored when you are playing the S20 bank keys.

Available range is between 0 and 24. "1" is selected for ±1 semitone range, "12" for ±1 octave range, and so on. "0" produces no pitch bending effect.

Note: NEW TEMPO is described in *BEAT LOOP FUNCTION (P29.)*

BEAT LOOP FUNCTION

This function is very effective when applied to recordings such as drum pattern, etc. (phrase sample).
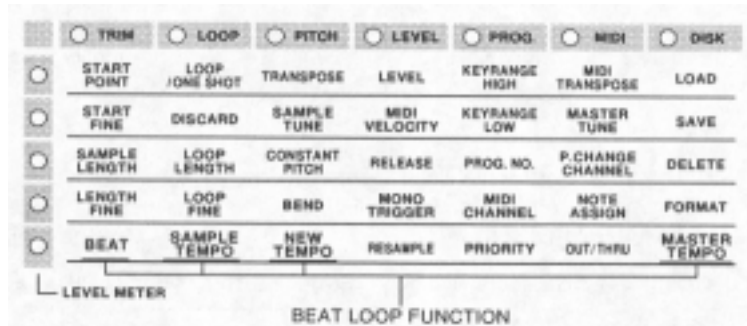
That is, it performs auto-calculation of tempo from the LOOP LENGTH value or auto-synchronizing phrase samples of different tempos.

Applications for this function are described in page 44 in details.

This function is not effective with one-shot samples or sustained tones (such as strings, flute, **etc.).**

• BEAT

This value, along with NEW TEMPO setting, is used to obtain a new tempo for a looped sample; Set the beat count of the loop length. For instance, if the loop length is 4 beat long, set the value to "4".

Available value range are 1/64 to I/2.

• SAMPLE TEMPO

This is associated with LOOP LENGTH. When the sample's BEAT setting is correct, the SAMPLE TEMPO value equals the tempo of the phrase in that sample. If you know the tempo of a phrase, you can set it here to obtain the correct LOOP LENGTH value and create a correct loop easily.

Available value range depends on the sample length.

• NEW TEMPO

Sets a new tempo for the phrase sample. If synchronizing to another sample, set this to the value of the bank you will be synchronizing.

You can also set a new tempo using **TAP**; To match the sample tempo to that of a performance, select this parameter in Edit mode and tap to the beat using the **TAP** key while listening to the line-input source, until the tempos match.

> *Note*: *If you set a new tempo for the phrase sample, its pitch will be changed because changing a playback tempo also changes its playback speed.*

• MASTER TEMPO This changes the tempo of all sample loops assigned to the 16 bank keys by the

same ratio. The value set here will increase or decrease the tempo set in NEW TEMPO for each sample.

Available value range is -13.6 to 0 to 15.8.

> *Note*: *^ ^ ^ ^ will appear when the value of the SAMPLE TEMPO or NEW TEMPO exceeds 9,999.*

LEVEL

This section determines the sample level settings and changes to sample frequency playback.

• LEVEL

Adjusts the sample volume. You can adjust the volume balance between samples from other banks here.

• MIDI VELOCITY

Determines whether a bank receives MIDI velocity controller changes when the S20 is used as a MIDI sound module; With the ON setting, the banked sample plays out according to the incoming MIDI velocity data; With the OFF setting, it ignores the MIDI velocity.

This parameter does not have any effect when playing samples from the S20 bank keys.

• RELEASE

Adjusts the sample's release time. This setting affects to both sample release played from the bank key and incoming MIDI note off data.
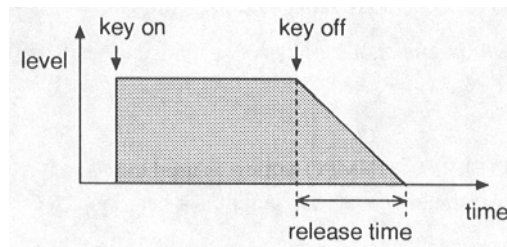
Available value range is between 0 and 100; "0" produces no release and stops the sample playback immediately after the bank key is released or the MIDI note off data is received; "100" sustains the playback even when the bank key is released or the MIDI note off data is received. If you want to stop the playback, press **ALL STOP.**

• MONO TRIGGER

Samples with this parameter set to ON affect each other during playback. For instance, if there are two hihat cymbal samples, one for a closed hi-hat sound and another for an open hi-hat sound, and both of them with MONO TRIGGER set to ON, you can perform natural hi-hat sounds using these two samples because playback of one immediately stops the other.
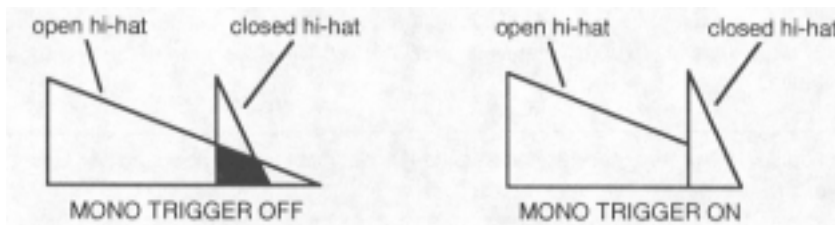
This parameter is useful for other purposes such as limiting polyphony within certain banks, etc.

• **RESAMPLE** Applies half sampling frequency to a sample. The sampling frequency of the current sample is shown in the display. Each time **REC** is pressed, the displayed value is reduced by half (resampling), down to 4 kHz.

At 32 kHz sampling frequenc

Resampling saves memory that the sample used, but degrades the sound quality because it removes high frequencies of the sample. However, it may be useful to make `lo-fi' sounds.

PROG.

This section determines a bank's base MIDI parameters such as key range, program number, MIDI channel, note priority, etc., when using the S20 as a MIDI sound module.

• KEYRANGE HIGH
• KEYRANGE LOW

Determines the key range where the banked sample plays according to incoming MIDI key notes, using higher limit (HIGH) and lower limit (LOW). These limits are within the MIDI key note range (01~27).
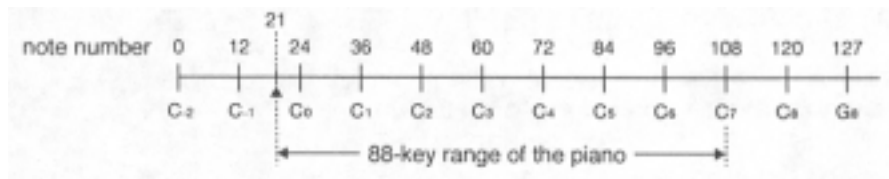
For a bank assigned with "KEYRANGE HIGH=72" and "KEYRANGE LOW--6O", the sample contained in that bank will play out only when a MIDI key note within a range of C3 (60) to C4 (72) is received in. If you want a sample to play with a specific key note, set the same value for HIGH and LOW in its bank.

You can also set multiple banks to the same key range and MIDI channel, creating a sound layer composed of samples from those banks.

Sound from bank 1 and 2 are played on all the tones of an 88 key keyboard.
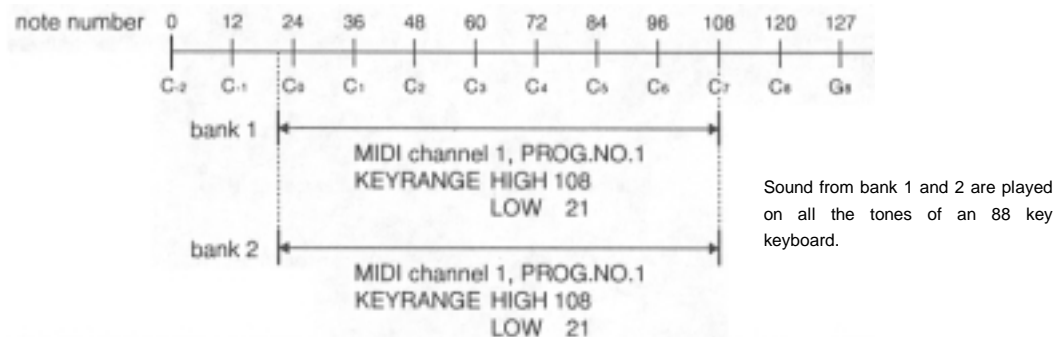
This parameter does not have an affect on performance when using the bank keys.

• PROG.NO.

Determines a MIDI program number for a bank when the S20 is used as a MIDI sound module. The bank is selected for playback by an incoming MIDI program change from an external MIDI controller. See page 14 for more information.

This parameter has no affect when using the bank keys.

• MIDI CHANNEL

Determines a MIDI channel for a bank when the S20 is used as a MIDI sound module.

Available values are ON, 1-16: When a bank is set to ON, its sample accepts all MIDI channel messages. This

parameter has no affect when using the bank keys.

• PRIORITY

Note priority is similar to voice reservation for each bank within the 8 polyphonic voices the S20 provides.

It is very useful to give priorities to banks when a performance requires many bank key operations or there are many MIDI note events coming in.

Available values are 0,1, HIGH; When a bank's set to "0", its sample will be muted first when the 8 polyphonic voices is exceeded. You should set HIGH to a bank that contains a significant sample such as a drum loop, etc.; It will be the last bank to be muted.

MIDI

This section determines MIDI global settings for the entire S20. You do not need to select any bank because the following parameters determine global operations of the S20.

• MIDI TRANSPOSE

Transposes the pitch of the entire S20. This does not affect banks with "CONSTANT PITCH=ON".

The available value range is from -24--0-+24; "+12" raises the pitch one octave higher.

• MASTER TUNE

Fine tunes the pitch of the entire S20. However, it does not affect banks with "CONSTANT PITCH=ON".

An available value range is within 0 to 99. Pressing [+] one more time from "99" changes the display to "0". However, the MIDI TRANSPOSE parameter is raised one point.

• P.CHANGE CHANNEL

Determines the MIDI channel for program change reception from an external MIDI controller when the S20 is used as a MIDI sound module.

Available values are ON, 1-16, OFF: With ON, the S20 accepts program changes on all MIDI channels. With OFF, it does not accept any program changes.

• NOTE ASSIGN

With this parameter, you can control the S20's bank key operation from an external MIDI controller.

Normally (NOTE ASSIGN=OFF), the S20 is MIDI controlled with MIDI settings for individual banksprogram number, MIDI channel, key range, etc. This parameter enables global control of the S20 by assigning its main panel keys to MIDI key notes. See P.45 for details.

The note number of each key is assigned as in the following table:

Key	MIDI Note Offset	Key y	MIDI Note Offset	Key y	MIDI Note Offset	Key y	MIDI Note Offset
BANK1	0	BANK2	1	BANK3	2	BANK4	3
BANKS	4	BANK6	5	BANK?	6	BANK8	7
BANKS	8	BANK10	9	BANK11	10	BANK12	11
BANK13	12	BANK14	13	BANK15	14	BANK16	15
HOLD/LOOP	18	STOP	19	ALL STOP	20	REVERSE	21
SEQUENCE	22	TAP	23				

When selecting NOTE ASSIGN and pressing [+], you see the following display.

Set the base key note number by pressing [+][-] while holding down **COARSE.**

Press [+][-] to switch this mode on or off. A right numeric value is the base key note number that can be changed by pressing [+][-] while holding down **COARSE.** This base key note number and the offset number in the above table is the assigned MIDI note number.

> *Hint*. *You can record the key operations, to an external MIDI sequencer and play it back. Please note, MIDI output channel on the S20 is fixed to "1 ".*
> *Also, when doing this, set the following MIDI OUTITHRU parameter value to OUT.*

> *Note: When using the S20 as a MIDI sound module, set the NOTE ASSIGN value to OFF.*

• OUT/THRU

Determines how the MIDI jack functions on the S20's rear panel.

In the OUT setting, the connection functions as MIDI OUT; Along with "NOTE ASSIGN=ON", the panel key operations are output as MIDI note events.

In the TI-IRU setting, the connection functions as MIDI THRU and outputs the same MIDI events received at the MIDI IN jack.

DISK

This section includes disk related operations. See page 36 for detailed information.

Sequence Mode

The S20 in Sequence mode memorizes a sequence composed of 4 tracks in which you can record the main panel key operations, up to approximately 30,000 steps.
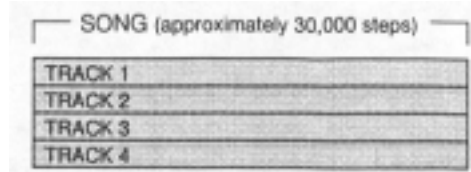
Recordable keys are bank keys, **HOLD/LOOP, REVERSE, STOP** and **ALL STOP.** However, pressing **ALL STOP** during recording will stop the sequence recording itself.

Recording Key Operations

1. From Play mode, press SEQ to enter Sequence mode. The SEQ LED lights up, enabling the **REC, DELETE, PLAY** and **STOP** keys.
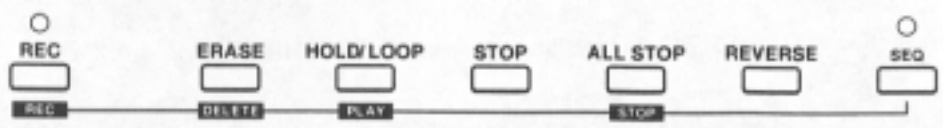
Sequence operation keys

The display shows the current track from a previous recording. If there are no previous recorded tracks, the display shows - - - - .

Tracks 1 and 2 have been recorded
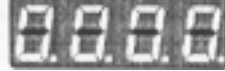
No tracks are recorded

2. Press REC; Recordable tracks blink in the display and the S20 stands by ready to record. To select a recording track, press [+][-] with **REC** held down.
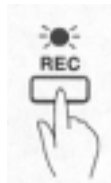
Recording track indication that blinks

In case there are no recordable tracks available the display will show *F UL L* when pressing **REC.** In this case you will need to first empty a track by erasing unnecessary contents. For erasing a track, see the section below, "Erasing A Track.".

3. You can start recording by pressing any bank key. The S20 will then seeped subsequent bank key operations.
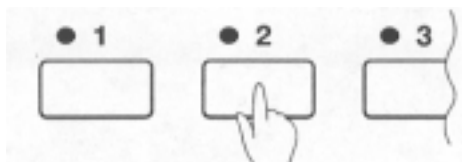
Current recording track is indicated.

If you do not want to record from the first bank key operation, you can start recording by pressing **PLAY (HOLD/LOOP).**

While recording, you can also monitor any existing tracks.

4. To stop recording, press **REC**.

The display shows the 4-track status again.

To record onto another track, repeat steps 2 through 4.

> **Note:** *It is also possible to stop the recording with **STOP (ALL STOP).** However, since ALL STOP will also be recorded as sequence data, the performance will stop while there is performance data on a recorded track. Normally press **REC** to stop recording.*

Playback of the Sequence

Playback of the existing sequence is available in Sequence mode by pressing **PLAY.**

If you want to play a track selectively, select it by pressing [+][-] with **PLAY** held down. Since all four tracks normally playback with this operation, stop the sequence and, then press **PLAY** for playback of a single selected track.

Erasing a Track

• To erase the entire contents of a track

Select a destination track by pressing [+][-] with **DELETE** held down; The destination track number blinks in the display.

Pressing **REC** along with **DELETE** erases the entire contents of that track.

• To erase certain bank data contained in a track

Select a destination track by pressing [+][-] with **DELETE** held down; The destination track number blinks in the display.

Pressing the bank key along with **DELETE** erases the bank data contained in that track.

• To erase a bank data area contained in a track

Select a destination track by pressing [+][-] with **DELETE** held down; The destination track number blinks in the display.

During playback of the sequence, pressing the bank key to erase (and holding it down if necessary) along with **DELETE** erases that bank data area contained in that track.

> **Note**: *In case you failed in erasing, release the DELETE key BEFORE releasing the bank key; If undelefes the bank data.*

Disk Operations

Sound reference data on the S20 is all stored temporarily while the unit is on and is lost the minute the unit is turned off. Therefore, it is neccessary to save important data onto a floppy disk. Of course, the next time you use that data, you must first load it from the disk where it is saved.

This chapter explains the various disk operations-loading, saving, and deleting data, initializing a disk, etc.

Such disk operations are available from Edit mode.

Loading Data

You can load bulk data into the S20 user area as an ALL file or selectively as single sample data. You can also load sample data from S-series sound library disks.

1. Press **EDIT** to enter Edit mode. The LED will light.

2. Put a floppy disk into the S20's disk drive.
3. Select LOAD in the Edit Matrix using **cursor keys** (by positioning the row LED light at right most DISK and the column LED light at the top).
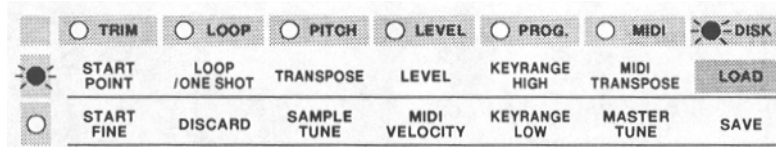
4. Press **REC**.

5. Select the data to load by pressing [+][-].

A l I	An ALL file that includes 16 samples, bank parameter settings, sequence data, etc., fully occupying the user memory area on the 520. If the disk contains multiple ALL files, they are shown in numerical order as AL 1, AL 2, AL 3, etc.
	Raw sample data contained in bank 1 in the ALL 1 file without edit parameter settings for that bank. The number on the right is the bank number.
A I I	Sequence data included in the ALL file #l.
5 I	Single sample data. The number given on the right in the display represents the sample data number in that disk.
S E I	Single sequence data. The number given on the right in the display represents the sequence data number in that disk.
5 9 I	Sample data for the 5900/950 sampler.

S 1 1 Sample data for the S 1000/ 1100 sampler. Stereo samples are loaded in the same bank.

5 3 1 Sample data for the 52800/3000/3200 sampler. Stereo samples are loaded in the same bank.

6. When loading an individual sample to a bank, press the bank key to select it.

7. Press **REC** a second time; The data type display will blink. To cancel loading at this point, press **EDIT** or **cursor keys.**

8. Press **REC** to start loading; The display changes to *L o A d*. While loading data, the bank LED blinks.

• Notes on Loading Files into S20

Note: If you insert a disk not formatted for the S20 or if there is no disk, inserted in the floppy drive, you will see *n o* F *o* in the display. Also, if the disk contains no file, you will see - - - - in the display. In either case, you should select a different disk.

Note: When an ALL file is loaded, it replaces all data on the S20. If necessary, you should save the current data in the S20 before loading an ALL file. Also, when loading a sample, selecting a bank that contains a sample replaces the current sample with the new one you are about to load. Be sure that you are ready to erase the current data or select an empty bank.

Note: When loading data that exceeds the current free memory on the S20, the unit will display *F U L L* and loading will not occur. To load that data, you will need to erase unnecessary samples or expand the physical memory of the S20.

Note: When an ALL file on a SO1 disk is loaded, the level parameter of banks with no sample assigned is set to "0" value. The levels parameter has to be adjusted when these banks are used.

Note: If you turn on the S20 with a readable disk in the floppy disk drive, an ALL file is automatically loaded. If that disk contains no ALL file or only sample files such as an S-series sound library disk, automatic loading will not occur. On startup, the S20 loads a test tone from the units ROM to bank 1 as a normal operation.

• Notes on Loading Samples for S1000/1100 Samplers

•   The S20 can load loop settings along with sample data. However, the loop start point setting may not correctly load and may cause a noise in looped playback of that sample. In this case, you should redo loop settings on the S20.

•   The S01/1000/1100 samplers can load sample data made on the S20. However, they will not load correctly from "continued" disks.

•   Samples for S 1000/ 1100 samplers are recorded at various sampling frequencies. Samples recorded at 32 kHz sampling frequency has the best compatibility with the S20. Samples recorded at other frequencies cause pitch changes when loaded; You can solve such problem by adjusting the TRANSPOSE or SAMPLE TUNE settings on the S20.

Saving Data

You can save bulk data in the S20 user area as an ALL file or selectively as single sample data.

1. Press **EDIT** to enter Edit mode. The LED will light.

2. Put a floppy disk into the S20' disk drive.

3. Select SAVE in the Edit Matrix using **cursor keys** (by positioning the row LED light at right most DISK and the column LED light at the second from the top).
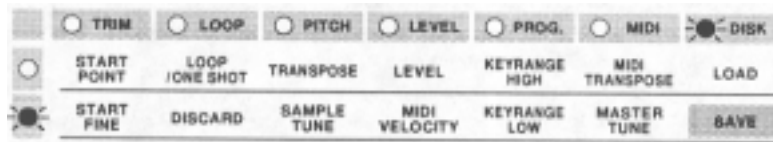
4. Press **REC**.
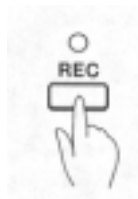
5.   Select the data to save, pressing [+][-].

   A L L   All data in the user area.

   S A   Single sample data in the selected bank.

   S E 9   Sequence data (without other data).

6. When saving an individual sample selectively, press the bank key to select it.

7. Press **REC** a second time; The display shows *G o*

8. If you wish to save data onto a disk that already has some data stored on it, you have two options.
   1. Add new data by simply pressing REC again.
   2. Erase existing data on the disk before saving new data; select *C L E A* by pressing [+] then press **REC**.
   In either case, the display shows *S A u E*. *While* saving a sample, you will see a corresponding bank LED blink during execution.

When you have finished saving the data, the file name of the saved file will appear. To load a file from the disk, it is necessary to select the file name displayed here. Therefore it is recommended that the file name is written and stored with the disk.

> **Note:** If you insert a disk not formatted for the S20 or if there is no disk inserted in the S20's drive, you will see *n o F o* in the display. Select a different disk.

> **Note:** When the disk is write-protected, the display shows *P r o t*. Set the write protect to off and refry saving.

> **Note**: If you press REC according to the u *o* indication and the disk does not have enough memory, the display will show *F U L L*. You should erase the data on the disk or use another blank disk. Also, if display shows *F U L L* during saving execution, you can continue saving to another disk. For more information about this, refer to the following section, "Handling Data That Exceeds a Disk Capacity".

> **Note:** In a saving process, the S20 numbers each file from "1"; according to its file type (ALL, sample, sequence), in the saved order. If the disk already has some files saved on it, the S20 gives a subsequent number to the new files.

> **Hint**: A 2DD disk can hold a sample of up to 12 seconds in length (mono 32 kHz sampling frequency). A 2HD disk can contain a sample of up to 25 seconds in length (mono 32 kHz sampling frequency).

• Handling Data That Exceeds a Floppy Disk Capacity

If you have a large sample that cannot be saved onto a single disk, you can divide it and save onto several disks.

1. When a disk becomes full during a saving process, the S20 display shows F *U L L* blinking.

2. Replace that disk with a new one that has been formatted for the S20; Press **REC**. The S20 display then shows *C L E R* blinking. This means that the S20 will erase the contents of the new disk and continue to save data onto it.

3. Press **REC** to continue.

4. When the saving process is complete, the S20 shows e o n to indicate that the current disk contains data continued from another disk.

>   *Note: To cancel saving, press any key other than REC while* F ᴜ *UL L or C L E R is being shown. However, this will cause incomplete storage of that sample data.*

>   *Note: You cannot use a `continued' disk for other data storage. If you use it to save other data, the `continued' data will be lost.*

>   *Note: `Continued' data must be loaded into the S20 in the saved order. For `continued' disks that divide single large samples, you should number them in the saved order.*

To load `continued' data that is stored onto several disks, insert the first disk and load it with the normal loading procedure.

1. When loading from the first disk is complete, the display shows *c o n* blinking.

2. Replace it with the second disk and press **REC**.

If you have a next disk, repeat the steps 1-2 as necessary to complete loading of that sample data.

>   *Note: To cancel loading, press any key other than* **REC** *while* c o n is *being shown. However, this will result in incomplete sample data that cannot play.*

>   *Note: If you load `continued' data and insert a same-numbered `continued' disk with other data, the S20 will continue to loading from that disk. As a result, you may have `strange' data. Also, if you attempt to continue loading with a wrong `non-continued' disk, the loading process will be aborted.*

>   *Note: A `continued' disk cannot be loaded first,' The S20 simply shows c o n . If a continued' ALL file contains a sample that has not been divided, you can load it A divided sample cannot be loaded without other `continued' disks that complete it.*

Deleting a File in a Floppy Disk

You can delete unnecessary files contained on a floppy disk.

1. Press EDIT to enter Edit mode. The LED will light.

2. Insert a floppy disk into the S20's disk drive.

3. Select DELETE in the Edit Matrix using **cursor keys** (by positioning the row LED light at right most DISK and the column LED light at the third from the top).

○ TRIM	○ LOOP	○ PITCH	○ LEVEL	○ PROG.	○ MIDI	●─ DISK
START POINT	LOOP /ONE SHOT	TRANSPOSE	LEVEL	KEYRANGE HIGH	MIDI TRANSPOSE	LOAD
START FINE	DISCARD	SAMPLE TUNE	MIDI VELOCITY	KEYRANGE LOW	MASTER TUNE	SAVE
SAMPLE LENGTH	LOOP LENGTH	CONSTANT PITCH	RELEASE	PROG. NO.	P.CHANGE CHANNEL	DELETE
LENGTH FINE	LOOP FINE	BEND	MONO TRIGGER	MIDI CHANNEL	NOTE ASSIGN	FORMAT

4. Press **REC**.

5. Select the file to delete, using [+][-]. See page 36 for file types you can choose from.

6. Press **REC** a second time; The file display blinks. To cancel deleting at this point, press **EDIT** or **cursor keys**.

7. Press **REC** to delete the file.

8. The S20 finally confirms with the d F L P indication. To execute deleting, press **REC**.

> *Note*: You cannot selectively delete a sample contained in an ALL file; Also, deleting an ALL file deletes all samples in it.

Formatting a Floppy Disk

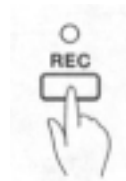The S20 only accepts a formatted disk to read or write data.

1. Press **EDIT** to enter Edit mode. The LED will light.
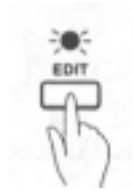
2. Insert a floppy disk into the S20's disk drive.

3. Select FORMAT in the Edit Matrix using **cursor keys** (by positioning the row LED light at right most DISK and the column LED light at the second to the bottom).

	○ TRIM	○ LOOP	○ PITCH	○ LEVEL	○ PROG.	○ MIDI	◉ DISK
○	START POINT	LOOP /ONE SHOT	TRANSPOSE	LEVEL	KEYRANGE HIGH	MIDI TRANSPOSE	LOAD
○	START FINE	DISCARD	SAMPLE TUNE	MIDI VELOCITY	KEYRANGE LOW	MASTER TUNE	SAVE
○	SAMPLE LENGTH	LOOP LENGTH	CONSTANT PITCH	RELEASE	PROG. NO.	P.CHANGE CHANNEL	DELETE
◉	LENGTH FINE	LOOP FINE	BEND	MONO TRIGGER	MIDI CHANNEL	NOTE ASSIGN	FORMAT

4. Press **REC**.

5. The display shows *F o r* for disks already formatted or *U n F o* for ones not formatted for the S20. It also shows *P r o t* if the disk is write-protected. Set the write protect off to continue the process.
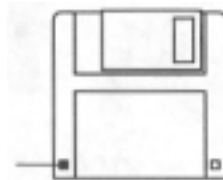
Close the write protection tab to format disk.

6. Press **REC** a second time.

7. Select a format type from *2 H d* and *2 d d* using [+][-], according to the disk you put in the drive.

8. Press REC a third time; The display shows *G o ??* blinking.
   To cancel formatting at this point, press EDIT or cursor keys.

9. To execute formatting, press **REC**.
   During formatting, the display shows F o r H for a 2HD disk or F o r *d* for a 2DD disk.
   When the display goes out, the formatting is complete.

   Note: *Formatting process permanently eases contents in the disk. So, before formatting, you should make sure that the disk is completely new or only contains unnecessary data.*

Applications

This chapter explains describes the S20 features as well as detailed explanations of them. Several examples will help you better understand its functions capabilities.

Effective Use of BEAT LOOP FUNCTION

BEAT LOOP FUNCTION is used to synchronize the tempo of several phrase samples.

When you use BEAT LOOP FUNCTION, you match the beat by directly entering the tempo rather than by setting the, transpose or tune. This allows you to freely set the tempo. You can also use MASTER TEMPO to change all the sample loop tempo at once.

> **Note**: Changing the tempo of a phrase also changes its pitch. Similarly, changing the pitch of a phrase with the transposition or tuning function also changes its tempo.

1. Set the beat count of a phrase sample using the BEAT parameter. If the phrase is 4 beats long, set the value to "4".

2. When the beat count is correct, SAMPLE TEMPO shows the original tempo of that phrase.

3. Set value for NEW TEMPO; This may be used to synchronize with other phrase samples. When a new tempo is set, the pitch of that phrase is automatically calculated to play at the new tempo. If you do not know the exact tempo value to set to match the tempo of, you can tap the tempo to the beat of the song on the **TAP** key to set a NEW TEMPO value.

4. You should repeat the steps above all phrase samples you wish to play together.

• Tips for Looping

• To create a seamless loop for a phrase sample or rhythm sample, you need to precisely set the START POINT; Setting the start point before the correct point produces extra space or sound. The start point after the correct point results in lack of the beginning.

• LOOP LENGTH is obtained from SAMPLE TEMPO. It is easily calculated by setting START POINT to the known SAMPLE TEMPO value. Then set SAMPLE LENGTH to the same value as LOOP LENGTH to create a seamless loop.

• If you have made your loop correct by, that SAMPLE LENGTH and LOOP LENGTH will have the same value. If the values do not match, the phrase correctly for some measures and not others. To play several phrases synchronized throughout, SAMPLE LENGTH and LOOP LENGTH should have the same values.

Controlling the S20 from a MIDI Keyboard

You **can** use the S20 as a MIDI sound module with MIDI settings for individual banks-program number, MIDI channel, key range, etc. In addition, setting NOTE ASSIGN to ON in Edit mode assigns a MIDI key note to each panel key on the S20. You can then control the panel key operations from an external MIDI keyboard.

Each main panel key is assigned as in the following table:

Key	MIDI Note Offset	Key y	MIDI Note Offset	Key y	MIDI Note Offset	Key y	MIDI Note Offset
BANK1	0	BANK2	1	BANK3	2	BANK4	3
BANK5	4	BANK6	5	BANK?	6	BANK8	7
BANK9	8	BANK10	9	BANK11	10	BANK12	ti
BANK13	12	BANK14	13	BANK15	14	BANK16	15
HOLD/LOOP	18	STOP	19	ALL STOP	20	REVERSE	21
SEQUENCE	22	TAP	23				

As seen in the table above, the key note number along with a base key note number and a MIDI note offset value in the table can control the corresponding key on the S20 main panel.

When you use, for instance, a 60-key MIDI keyboard to control the S20, you may set the base key note to " 36" (C 1) to control the bank 1 key (MIDI note offset-0=base key note) by the lowest key (C 1) on the keyboard. Using the MIDI note offset value for each panel key, you can control other panel keys using a two octave range on the keyboard.

• Recording Panel Key Operations to the Sequencer

With "NOTE ASSIGN-0N", you **can** record a serees of selected panel buttons to an external MIDI sequencer and play it back. This allows you to reproduce the panel key operations by playing back the recorded data from an external sequencer. (Note that the MIDI output channel on the S20 is fixed to "1 ".)

When doing this, it is impotant to set the same base key note when you record and play the performance. Otherwise, you will not have correct playback.

When recording the performance, set the MIDI OUT/THRU parameter value to OUT in Edit mode.

Appendix

General Information about Optional Components

The S20 offers an optional memory expansion.

For detailed information, contact your AKAI professional dealer. Also, consult your dealer regarding installation of these components. Improper self-servicing may cause malfunction or damage to the unit.

• Memory Expansion

The S20 comes with 1-megabyte memory soldered on the main PC board and one memory expansion slot to install an additional 72-pin SIMM (Single Inline Memory Module).

You can expand memory using a 4-megabyte or 16-megabyte SIMM with access time 70 ns (nanosecond) or faster. Please note that the S20 does not accept other types.

At 32 kHz mono sampling, the S20 records up to 14 seconds with standard I -megabyte memory, up to 79.5 seconds with 4-megabyte memory expansion, and up to 262.1 seconds with 16-megabyte memory expansion.

The S20, when it is turned on, checks memory installation and indicates no memory expansion as r *0*, 4-megabyte expansion as r *4*, or 16-megabyte expansion as *r 16* . This lets you know whether memory expansion has been properly installed.

Specifications

Model	: 16-bit Stereo Phrase Sampler S20
Sampling Method	: 16-bit Linear Encoding
Sampling Frequency	: 32 kHz, 16 kHz, 8 kHz

Total Sampling Time :

		Stereo	Mono
With 1 MB memory	32 kHz	7 sec.	14 sec.
	16 kHz	14 sec.	28 sec.
	8 kHz	28 sec.	56 sec.
With 17 MB memory	32 kHz	131 sec.	262 sec.
	16 kHz	262 sec.	524 sec.
	8k Hz	524 sec.	1048 sec.

Polyphony	: 8 voices
ADC	: 4th order 64 times over-sampling
DAC	: 4th order 64 times over-sampling, 8 times interpolation filter
Internal Memory	: 1 Megabytes (expandable to 4Mb or 16Mb by 72 pin SIMM)
Data Storage Device	: 3.5-inch 2DD/2HD Floppy Disk Drive

Edit Parameters

TRIM ....START POINT, START FINE, SAMPLE LENGTH, LENGTH FINE

LOOP ....LOOP/ONE SHOT, DISCARD, LOOP LENGTH, LOOP FINE

PITCH ....TRANSPOSE, SAMPLE TUNE, CONSTANT PITCH, BEND

LEVEL ....LEVEL, MIDI VELOCITY, RELEASE, MONO TRIGGER, RESAMPLE

PROG . ...KEYRANGE HIGH, KEYRANGE LOW, PROG.NO., MIDI CHANNEL,
....PRIORITY

MIDI ....MIDI TRANSPOSE, MASTER TUNE, RCHANGE CHANNEL, NOTE AS
....SIGN, OUT/THRU

DISK ....LOAD, SAVE, DELETE, FORMAT

BEAT LOOP FUNCTION.BEAT, SAMPLE TEMPO, NEW TEMPO, MASTER TEMPO

Panel Controls : MAIN VOLUME
REC LEVEL
Cursor Keys
REC
ERASE (DELETE)
HOLD/LOOP (PLAY)
STOP
ALL STOP (STOP)
REVERSE
TAP
SEQ
Bank Keys 1-16
COARSE (STEREO/MONO)
EDIT

Connectors : **INPUT** RCA pin jack/47k 2
OUTPUT RCA pin jack/270 2
MIDI DIN5P (IN,OUT/THRU) 2
PHONES I/4" (6.3p mm) stereo phone jack/ 100 1

Specifications

Power Source	:	120 VAC	60 Hz 18 W.	for U.S.A. and Canada
		220 - 240 VAC	50 Hz	for Europe

Dimensions   : 290 x 65.5 (80.4*) x 204 (205*) mm (W x H x D, unit: mm, *: max.)

Weight   : 2.0 kg

Accessories   : AC Adaptor 1

                           Sound Disk 4

                           Operator's Manual 1

* Above Specifications are subject to change without notice.

S20 MIDI Implementation Chart

Date:NOV.1996

Version 1.00

Function	Transmitted	Recognized	Remarks
Basic Default	O 1	O 1	Without disk
Channel Changed	X	O 1 - 16	Memorized (disk)
Default	X	Mode 1	Without disk
		Model - 4	Memorized (disk)
Mode Messages		OMNI ON/OFF, P/M	
Altered	***********	X	
Note	X	0 - 127	
Number . True Voice	*********	0 - 127	
Velocity Note on	X	O 9n V=1 - 127	
Note off	X	X 8n V-1 -127	
After- Key's	X	X	
touch Ch's	X	X	
Pitchbend	X	O	0 - 24 semitone steps
			(Full resolution)
Control 1	X	X	Modulation wheel
Change 7	X	O	Volume
64	X	O	Sustain pedal
67	X	X	Soft pedal
Program Change	X	1 - 128	
True No.	***********		by Preset number
			Value
System Exclusive	X	O	Sample Dump Standard
			Only ('1)
System Song position	X	X	
Common : Song select	X	X	
Tune	X	X	
System Clock	X	X	
Real time : Commands	X	X	
Aux Local ON/OFF	X	X	
Messages: All Notes OFF	X	O (123)	
Active Sense	X	X	
Reset	X	X	

Mode 1 : OMNI ON, POLY   Mode 2 : OMNI ON, MONO   O : Yes

Mode 3 : OMNI OFF, POLY   Mode 4 : OMNI OFF, MONO   X : No

('1) Full details of System Exclusive data formats can be obtained by contacting your AKAI dealer.

AKAI

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