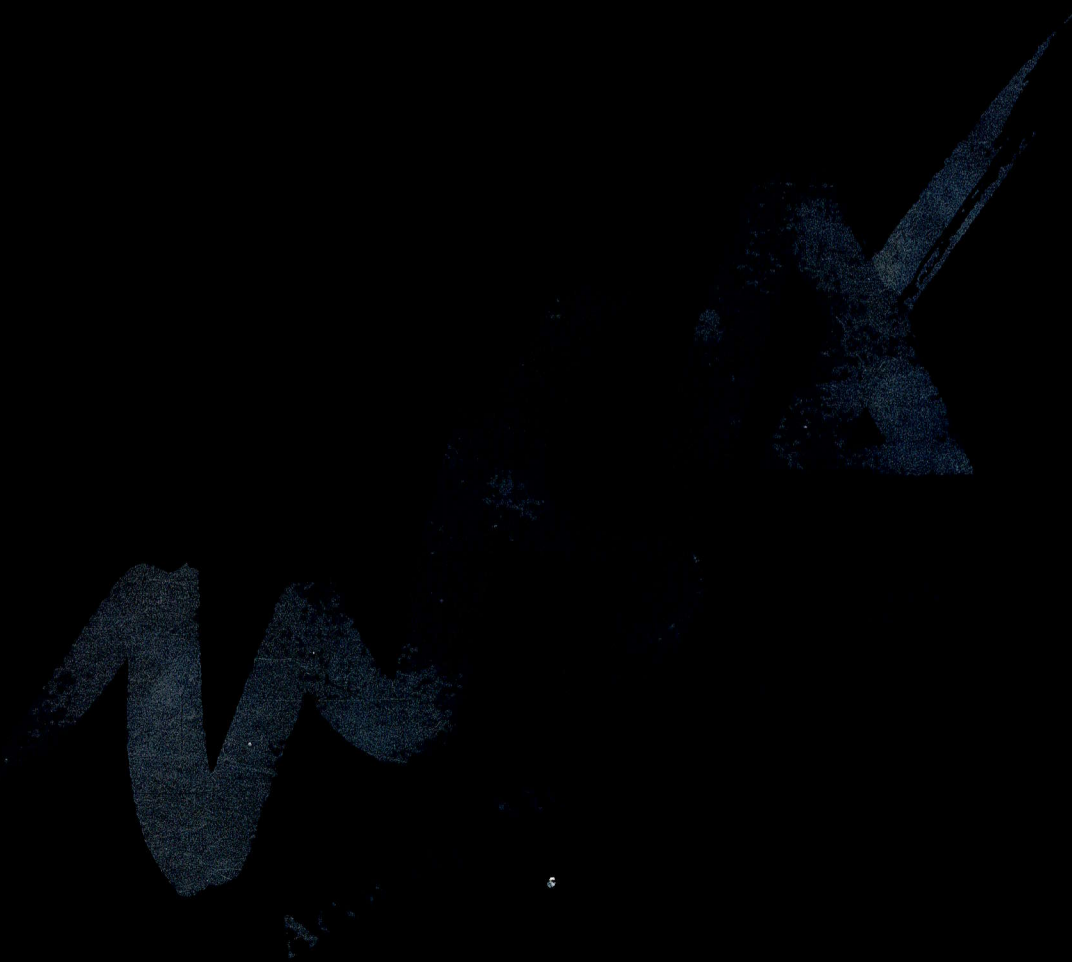


Technics

TRANSIZER

SX-WSA1

SX-WSA1R



© 1987 Technics

Technics

OWNER'S MANUAL **BASIC FUNCTIONS**

Caution

Voltage (except North America, Mexico, New Zealand, Philippines and Europe)

Be sure the voltage adjuster located on the rear panel is in accordance with local voltage in your area before using this unit. Use a screwdriver to set the voltage adjuster to the local voltage

WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRICAL SHOCK, DO NOT EXPOSE THIS PRODUCT TO RAIN OR MOISTURE.

BEFORE YOU PLAY. PLEASE READ THE CAUTIONARY COPY APPEARING ON PAGE 2.



CAUTION

CAUTION

**RISK OF ELECTRIC SHOCK
DO NOT OPEN**



TO REDUCE THE RISK OF ELECTRICAL SHOCK DO NOT REMOVE SCREWS. NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.



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



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

Before you play

For long and pleasurable use of this instrument, and to gain a thorough understanding of your **WSA1 Synthesizer/WSA1R Synthesizer Module**, it is strongly recommended that you read through this Owner's Manual once.

The Owner's Manual consists of three volumes.

BASIC FUNCTIONS

This part includes an explanation of basic procedures and points you should be aware of for proper operation of your instrument.

PRACTICAL APPLICATIONS

This part comprises a detailed explanation of all the functions of this instrument.

REFERENCE GUIDE

Reference guide for the contents of the sounds, etc.

Cautions for safest use of this unit

Installation location

- 1 A well-ventilated place
Take care not to use this unit in a place where it will not receive sufficient ventilation, and not to permit the ventilation holes to be covered by curtains, or any similar materials
- 2 Place away from direct sunlight and excessive heat from heating equipment
- 3 A place where humidity, vibration and dust are minimized

Power source

- 1 Be sure the line voltage selector is in accordance with local voltage in your area before connecting the plug to the socket
- 2 DC power cannot be used

Handling the power cord

- 1 Never touch the power cord or its plug with wet hands
- 2 Don't pull the power cord

Metal items inside the unit may result in electric shock or damage.

Do not permit metal articles to get inside the unit

Be especially careful with regard to this point if children are near this unit. They should be warned never to try to put anything inside.

If, nevertheless, some such article does get inside, disconnect the power cord plug from the electrical outlet and contact the store where the unit was purchased

If water gets into the unit

Disconnect the power cord plug from the electrical outlet, and contact the store where it was purchased

As a precaution, it is suggested that flower vases and other containers which hold liquids not be placed on the top of this unit

If operation seems abnormal

Immediately turn off the power, disconnect the power cord plug from the electrical outlet, and contact the store where it was purchased

Discontinue using the unit at once. Failure to do so may result in additional damage or some other unexpected damage or accident

- Because the power source is located inside the unit, it is normal for the cabinet to become warm

A word about the power cord

If the power cord is scarred, is partially cut or broken, or has a bad contact, it may cause a fire or serious electrical shock if used. NEVER use a damaged power cord for any appliance. Moreover, the power cord should never be forcibly bent.

Don't touch the inside parts of this unit.

Some places inside this unit have high voltage potential. Never try to remove the top or back panels of this unit, or to touch inside parts by hand or with tools.

Contact someone who is qualified in order to inspect the inside, or to replace a fuse, if such becomes necessary. Never attempt to do these things yourself.

Maintenance

The following suggestions will assist you in keeping the unit in top condition.

- Be sure to switch the instrument off after use, and do not switch the unit on and off in quick succession, as this places an undue load on the electronic components
- To keep the luster of the surface and buttons, simply use a clean, damp cloth, polish with a soft, dry cloth. Polish may be used but do not use thinners or petro-chemical-based polishes
- A wax-based polish may be used on the cabinet, although you will find that rubbing with a soft cloth will suffice

**SERVICE MUST BE CARRIED OUT BY DEALER
OR OTHER QUALIFIED PERSON**

Contents

What is ACOUSTIC MODELING SYNTHESIS?	4
How it works	4
Realtime control over articulation and sound editing	5
Sounds that are out of this world	5
Maximum of 64-note polyphony for full MIDI orchestration capability	5
More outstanding features	6
Operating principles	7
The sound-emitting structure	7
Acoustic Modeling Parameters	8
Sound Mode Structure	9
Sound generator parts	10
Controls and functions (WSA1)	12
Controls and functions (WSA1R)	14
Before you play (WSA1)	16
Before you play (WSA1R)	17
Listen to the demonstration disk	18
Playing sounds	20
REALTIME CONTROLLER (WSA1)	22
REALTIME CREATOR	23
Home screen controls	24
Playing combinations	25
Recording a performance (WSA1)	27
Application examples	27
Recording example	28
Playback	31
Playing commercial disks	32
Using MIDI	34
MIDI terminals	34
Connection examples	34
MIDI channels	35
MIDI data	35
GENERAL MIDI	36
Notes on the WSA1R setup	37



ACOUSTIC MODELING SYNTHESIS

***What is* ACOUSTIC MODELING SYNTHESIS?**

To understand the operating principles of **ACOUSTIC MODELING SYNTHESIS** is to understand the nature of acoustic sound itself. This revolutionary innovation actually simulates the way sounds are created on an acoustic instrument—but does so electronically. In **ACOUSTIC MODELING SYNTHESIS**, the tone forming the sound's base is generated by a sampling wave, and the sound is then simulated by digital signal processing of its resonant portion.

In this way, all the subtle transitions, nuances and even the more dramatic changes found in music can be artistically reproduced without deterioration of sampling realism. The result is sound sampling realism with the “feel” of acoustic instruments.

How it works

Principally, the sounds emitted from an acoustic instrument are the result of the transfer of energy from the driver (such as a bow or mouthpiece) to the resonator (strings or tubing). With a guitar for example, the pick or the musician's finger represents the driver and the string is the resonator. **Technics ACOUSTIC MODELING SYNTHESIS** simulates this transfer of energy by processing data using sophisticated algorithms. Therefore, subtle playing nuances such as changing string position, picking or plucking and muting effects can now be realistically reproduced in realtime. This level of realtime control is not available on conventional synthesizers. Only Technics offers free articulation with superb sampling realism.

Realtime control over articulation and sound editing

The **Technics** ACOUSTIC MODELING SYNTHESIZER puts you at the controls. Nearly all modeling parameters can be accessed in realtime by using various easy-to-operate controllers such as the Pitchbend and Modulation wheels, Realtime Controller, Realtime Creator, Key Touch and more. The Realtime Creator and Realtime Controller each allow you to control 2 parameters at one time (X-Y axes). The Realtime Creator knob maintains the last set position, while the Realtime Controller returns to its neutral position. In addition, up to six sets of parameters can be stored for each sound, allowing rapid assignment to the Realtime Creator or Realtime Controller!

This makes it possible to control, for example, where you strike the drum surface, the mouthpiece angle on a flute, or the embouchure of a trumpet. These controllers give you the freedom to fully express yourself in your music. At last, your creativity is limited only by the imagination.

Sounds that are out of this world

The **Technics** ACOUSTIC MODELING SYNTHESIS also gives you the power to create a virtually unlimited range of instrument sounds. For the first time, you're no longer restricted by the sound sets in your instrument. Imagine, you now have full control over the parameters for the driver and resonator. This lets you form unique combination sounds like a tom-tom "fusing" into a chopper bass, or a guitar with a flute resonator. Sounds can be "crossfaded" by key or velocity. Even more astonishing, you can construct virtual instruments that cannot be built in reality. Now, that's really out of this world!

Maximum of 64-note polyphony for full MIDI orchestration capability

With all these creative possibilities offered by the **Technics** ACOUSTIC MODELING SYNTHESIS, it would be a shame not to have sufficient polyphony. That's why this synthesizer features not one, but 64-note polyphony—the culmination of Technics' outstanding achievements in advanced LSI research. With 64-note polyphony, you have all you need fully orchestrate your music.

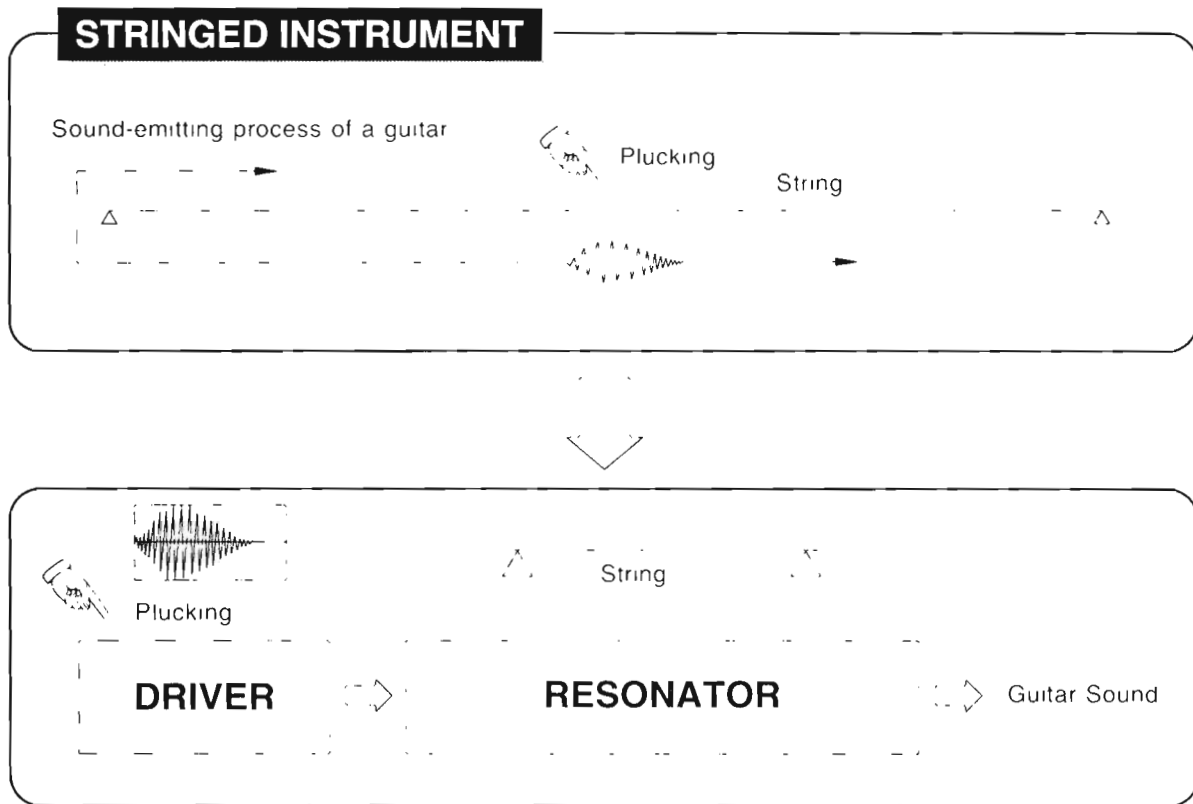
More outstanding features

The **Technics ACOUSTIC MODELING SYNTHESIZER** features a large graphic LCD screen which makes its operation both intuitive and extremely user-friendly. The 16-track, 47,000 note Sequencer includes some graphical editing capability. There are two MIDI ports (**IN/OUT/THRU**) to allow you to make the most of the 32 MIDI parts available (32-part multi-timbral), and there are four line-level outputs (two stereo pairs) to get it all to tape or the PA. If all that isn't enough, there is an optional Output Expansion Board which provides four additional line-level outputs and an S/PDIF digital coaxial output. An optional Wave Expansion Board will provide you with access to even more driver sources.

Acoustic Modeling, Real-time control, and 64-note polyphony, a 16-track Sequencer with enough MIDI parts and outputs to make the most of it. A large, graphical LCD screen to tie it all together in one powerful, easy to use package, Technics is all you need.

Operating principles

The sound-emitting structure

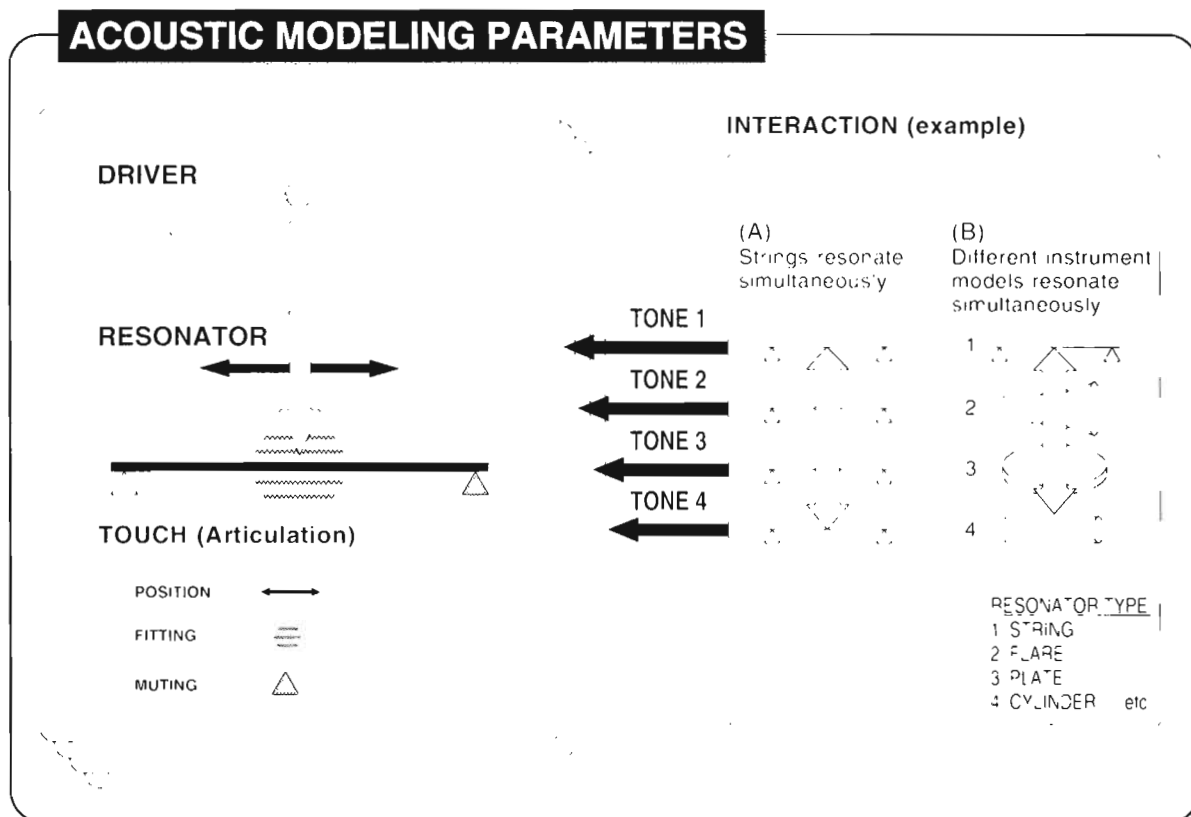


Illust. I

Illust. I shows a simplified example of the process by which sound is emitted from a guitar. When a string is plucked, the vibration travels along both sides of the string. The vibration divides and decays as it moves away from the source, then rebounds when it reaches the ends of the string. Eventually the vibrations collide with each other. This causes resonance and interference.

Technics ACOUSTIC MODELING SYNTHESIS uses mathematical algorithms to model this process electronically as shown above.

Acoustic Modeling Parameters

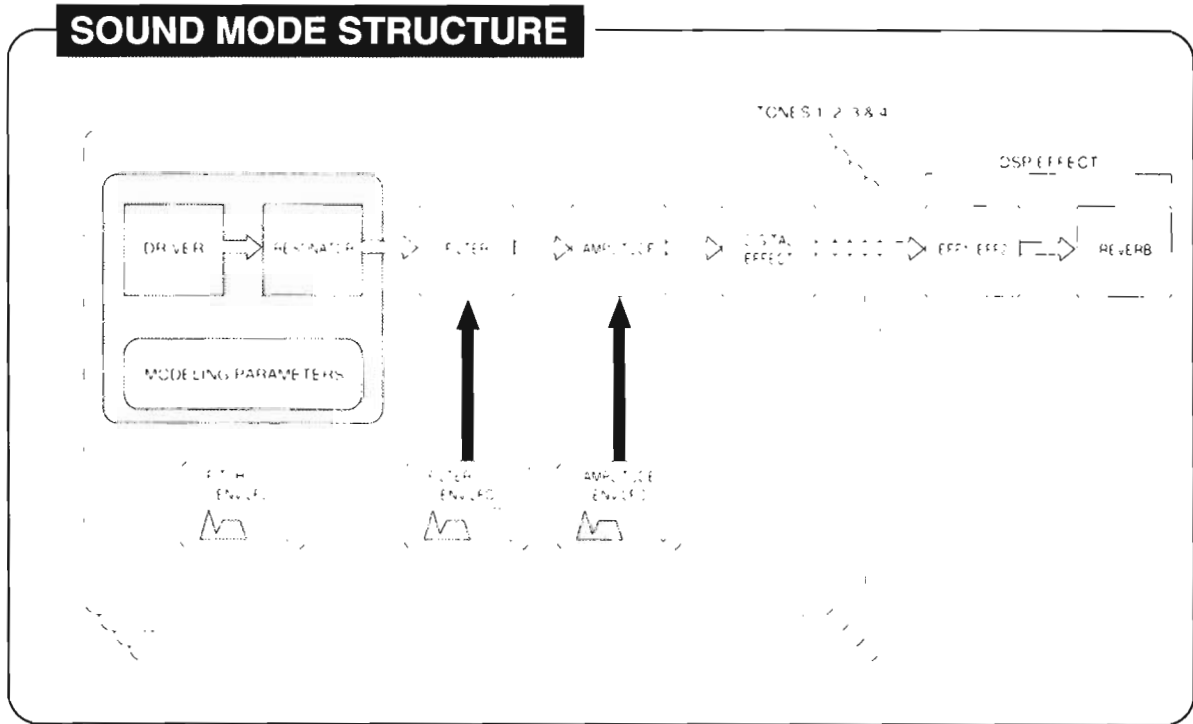


Illust. II

Illust. II indicates the Acoustic Modeling Parameters which consist of the Driver and the Resonator. The player can freely articulate sound by controlling the position*, fitting and muting parameters. Up to four tones—each consisting of driver and resonator—can be layered together. Resonators are freely selectable from among several types (string, flare, plate, cylinder, cone and membrane, etc.) which can then be connected to any desired driver. Moreover, by using the interaction feature, you can produce simultaneous resonance like the strings of a guitar, or even blend different resonators to create entirely new sounds.

* The position parameter allows you to alter plucking position on a guitar string, the pickup position on an electric guitar, microphone setting for recording piano play, and more

Sound Mode Structure



Illust. III

The total sound-emitting process of the **Technics ACOUSTIC MODELING SYNTHESIS** is described in **Illust. III**. In addition to the advanced Modeling Parameters, standard parameters included on conventional synthesizers (Pitch, Filter*, and Amplifier) are also included here. To further enhance flexibility in sound construction, Envelope and Low-Frequency Oscillator functions can be individually assigned for these parameters. Three DSP (Digital Signal Processing) Effect Units are also provided to add more depth in sound production.

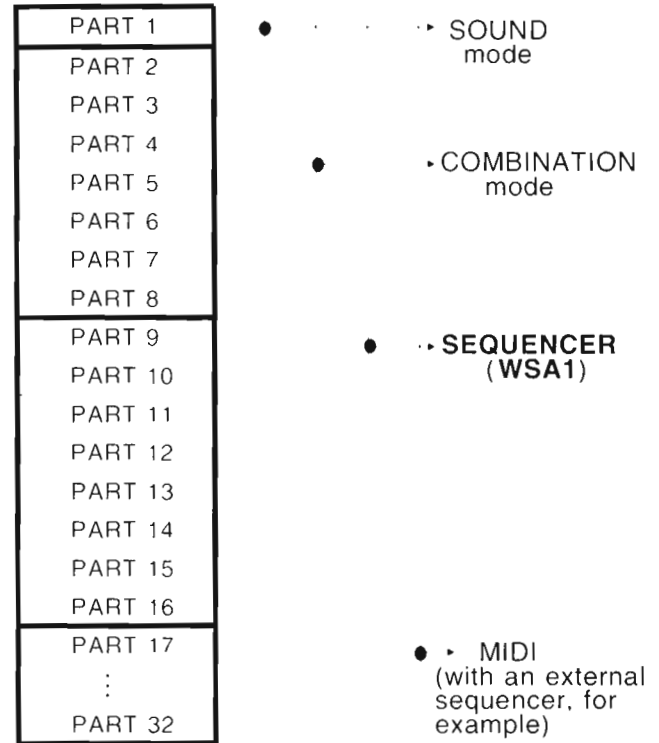
* Time variant filter with resonance.

Sound generator parts

About parts

This instrument is 32 part multi-timbral. During your performance, PART 1 is used in the **SOUND** mode, PART 1 to PART 8 in the **COMBINATION** mode. When recording in the **SEQUENCER (WSA1)**, up to 16 parts can be used. And when performing using external MIDI equipment, up to 32 parts are available.

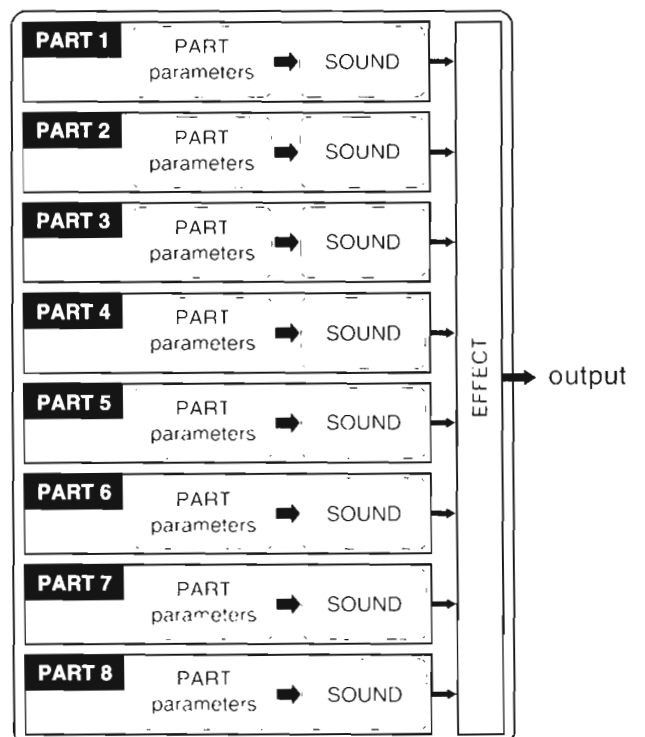
- In the initialized state, PART 1 through PART 16 are already assigned to the **SEQUENCER**, but you can assign any 16 parts to the **SEQUENCER**.



Using parts

■ COMBINATION

In this instrument you can assign a different SOUND to each of 8 parts to create an ensemble. This group of 8 parts is called a COMBINATION.

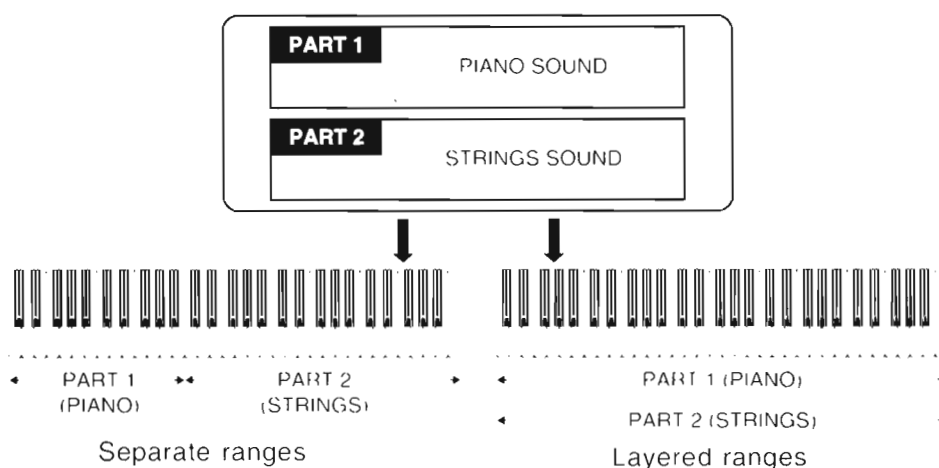


Playing multiple sounds

By specifying the COMBINATION settings, you can layer and play two or more sounds at one time, or have different ranges of the keyboard produce different sounds.

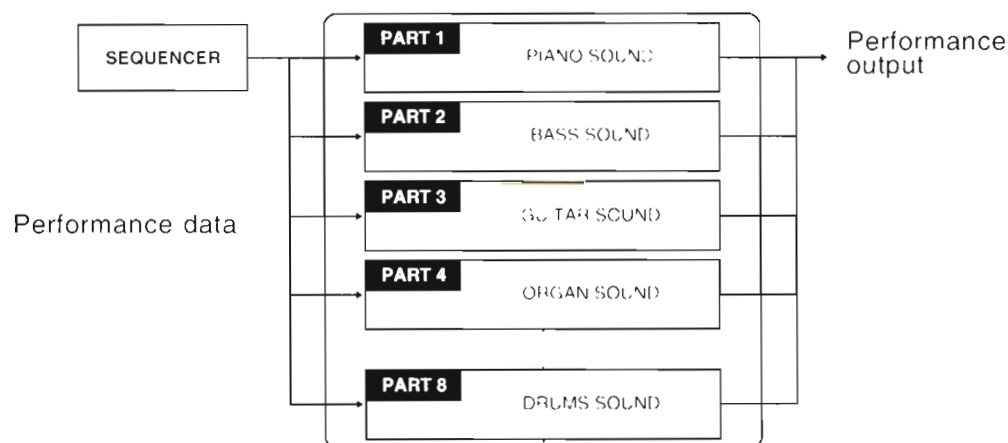
For example, if you wish to produce the SOUND in PART 1 and the SOUND in PART 2 at the same time, specify the same note range for PART 1 and PART 2.

Or you can divide the keyboard into several note ranges, and assign the PART 1 sound to one range, the PART 2 sound to another range, and so on.



■ SEQUENCER (WSA1)

You can select different sounds—drums, bass, piano, guitar etc.—for each part to make an ensemble, and use the **SEQUENCER** to construct a song and for automatic playback of your performance. Just think of each part as a performer playing his instrument, and the **SEQUENCER** as the conductor.



- When using the **SEQUENCER**, the individual EFFECT settings for each SOUND and COMBINATION can be disabled (multi mode). In this case, set the EFFECT & OUTPUT settings for the DATA LOAD FILTER to OFF (Refer to page 58 in the PRACTICAL APPLICATIONS volume)

Controls and functions (WSA1)

REALTIME CONTROLLER REALTIME CREATOR

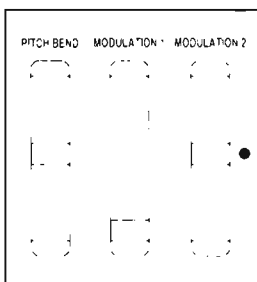
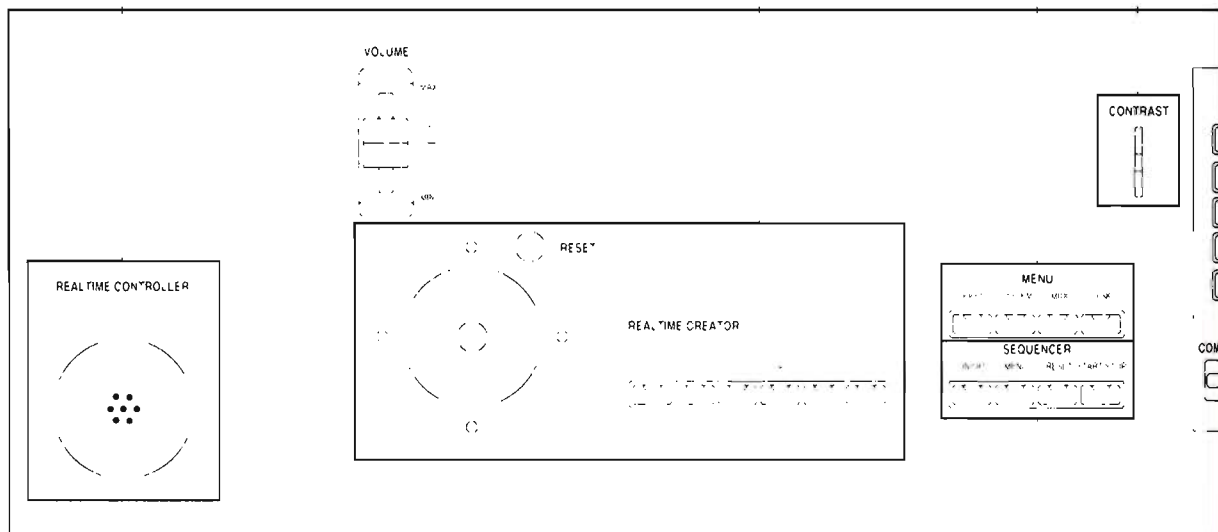
Modify the characteristics of the sounds during your performance.

CONTRAST

Adjust the contrast of the display so that it is easy to read.

MENU

Access controls for the Disk Drive, MIDI, etc.



PITCH BEND/ MODULATION Wheels

Control various effects which enhance the sound capability.

SEQUENCER

Record, play back, and edit performances.

LCD Display

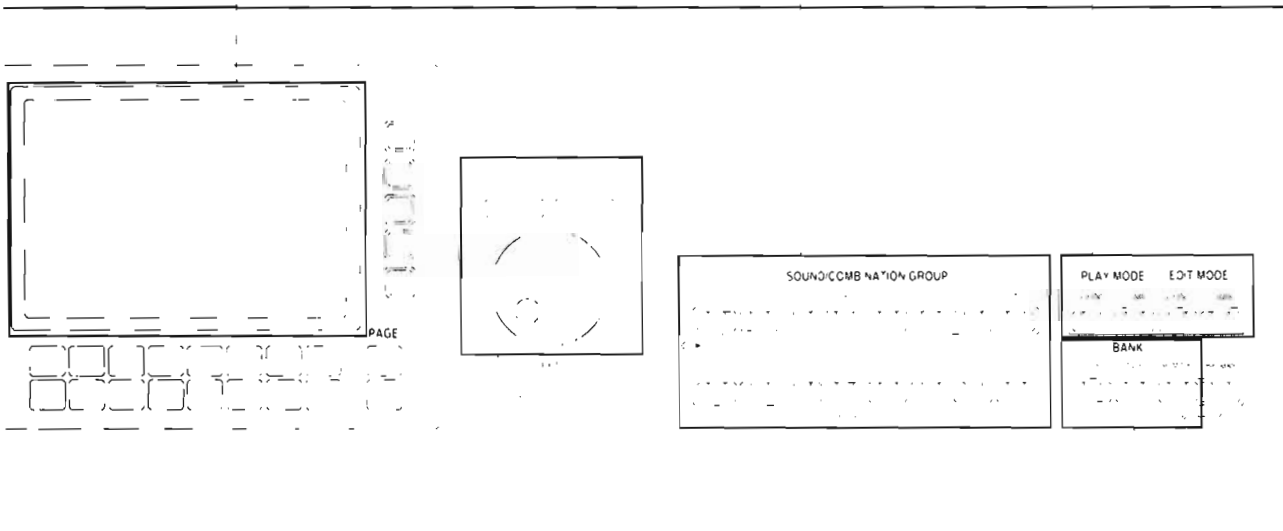
Large, graphical user interface
Information on the screen shows
current settings and explains use of
surrounding buttons

SOUND/COMBINATION GROUP

There are 16 groups of sounds and
combinations in each bank. Each group
contains 8 sounds or combinations

PLAY/EDIT MODE

Use the **PLAY MODEs** to select
sounds or combinations for
performance Use the **EDIT MODEs**
to edit them



Data entry buttons/dial

Use these controls when
setting a function and
specifying a numerical value.

BANK

Groups of sounds and
combinations are stored in banks.

WARNING

Backup memory

The panel settings and the MIDI settings, etc. are maintained in a backup memory for about one week after the power to this instrument is turned off. The **SEQUENCER** memory is maintained for about 80 minutes. If you wish to keep the memory contents, before you turn off the instrument, use the **SAVE** procedure to store the desired data on a disk for recall at a later time.

- The backup memory does not function unless the power has been on for about 10 minutes.

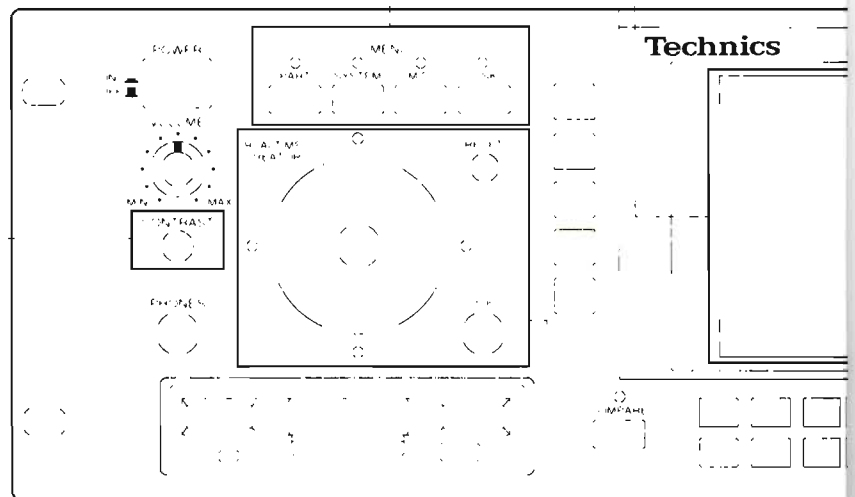
Controls and functions (WSA1R)

MENU

Access controls for the Disk Drive, MIDI, etc

LCD Display

Large, graphical user interface. Information on the screen shows current settings and explains use of surrounding buttons.



CONTRAST

Adjust the contrast of the display so that it is easy to read.

REALTIME CREATOR

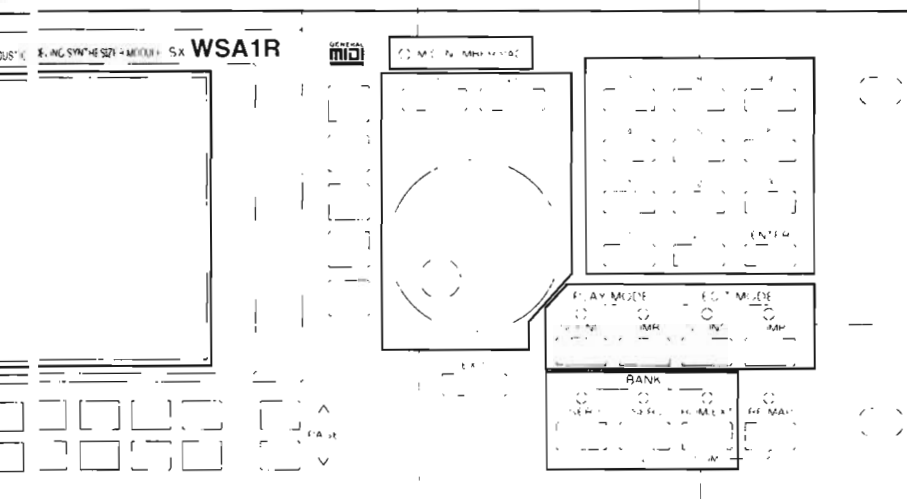
Modify the characteristics of the sounds during your performance.

MIDI/NUMBER PAD indicator

The indicator is lit when MIDI data is being received, or when the number pad can be used to enter numbers.

Number pad

Input and enter numbers during setting procedures



PLAY/EDIT MODE

Use the **PLAY MODES** to select sounds or combinations for performance. Use the **EDIT MODES** to edit them.

Data entry buttons/dial

Use these controls when setting a function and specifying a numerical value

BANK

Groups of sounds and combinations are stored in banks.

WARNING

Backup memory

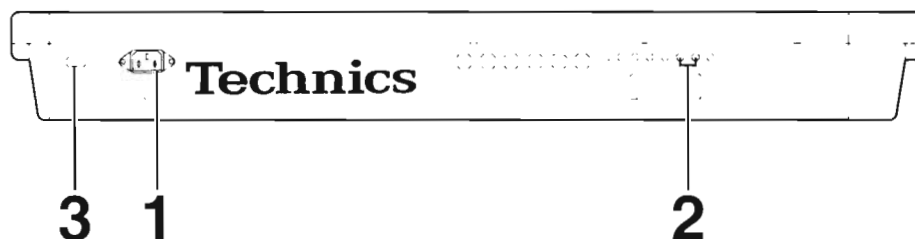
The panel settings and the MIDI settings, etc. are maintained in a backup memory for about one week after the power to this instrument is turned off. If you wish to keep the memory contents, before you turn off the instrument, use the SAVE procedure to store the desired data on a disk for recall at a later time.

- The backup memory does not function unless the power has been on for about 10 minutes.

Before you play (WSA1)

Before making the connections, be sure that the power to all the equipment is turned off.

(Rear panel)

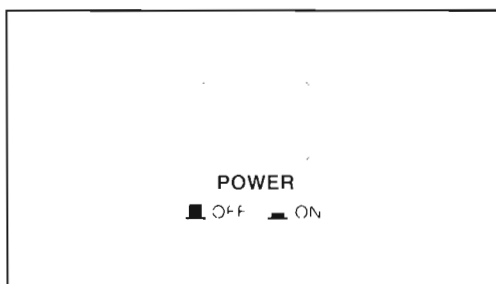


1 | Connect the power cord.

2 | Connect the **MAIN OUT R** and **L/MONO** terminals to a speaker amplifier, etc

- To output monaural signals, connect the external equipment to the **L/MONO** terminal (Do not connect the **R** terminal)
- If using headphones, connect them to the **PHONES** terminal

3 | Turn on the **POWER** button



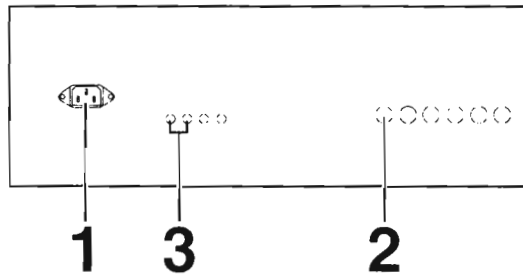
- Also turn on the power to the connected speaker amplifier, and adjust the volume to a suitable level.

- The pitch of this instrument can be adjusted. Refer to page 51 in the PRACTICAL APPLICATIONS volume

Before you play (WSA1R)

Before making the connections, be sure that the power to all the equipment is turned off.

(Rear panel)



1 | Connect the power cord

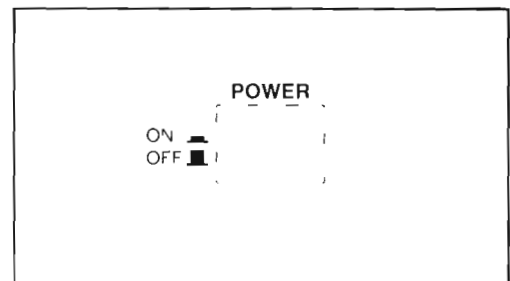
2 | Connect the MIDI OUT terminal of a MIDI instrument (for example, a MIDI keyboard) to the **MIDI IN** terminal of the **WSA1R**.

- The **WSA1R** has two sets of MIDI terminals, for connecting two MIDI instruments

3 | Connect the **MAIN OUT R** and **L/MONO** terminals to a speaker amplifier, etc.

- To output monaural signals, connect the external equipment to the **L/MONO** terminal. (Do not connect the **R** terminal.)
- If using headphones, connect them to the **PHONES** terminal on the front of the unit.

4 | Turn on the **POWER** button.
(Front panel)



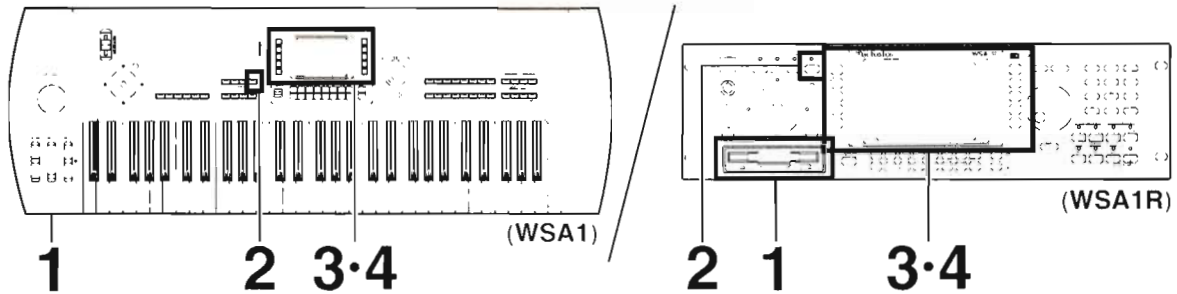
- Also turn on the power to the connected speaker amplifier, and adjust the volume to a suitable level.

- Make the appropriate adjustments to match the MIDI channels of this equipment to those of the connected instrument(s). The MIDI channel settings of this equipment are explained on page 54 of the PRACTICAL APPLICATIONS volume.

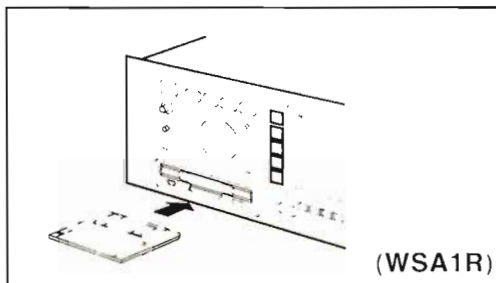
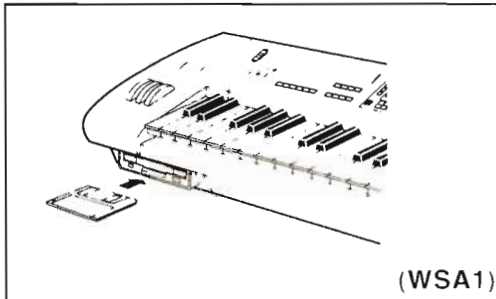
- The pitch of this instrument can be adjusted. Refer to page 51 in the PRACTICAL APPLICATIONS volume.

Listen to the demonstration disk

Play the accessory disk to hear demonstration melodies that illustrate just a few of the many voices available in this instrument

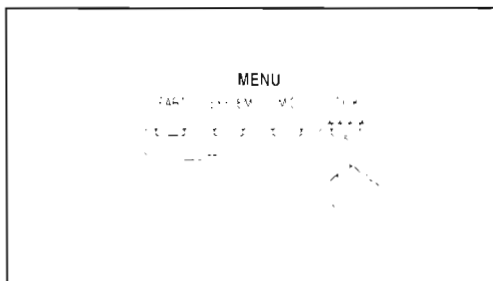


1 Insert the accessory disk into the Disk Drive.



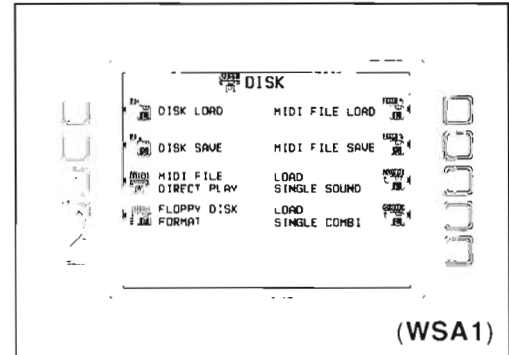
- With the label facing up, push the disk all the way in until you hear a click

2 In the **MENU** section, turn on the **DISK** button

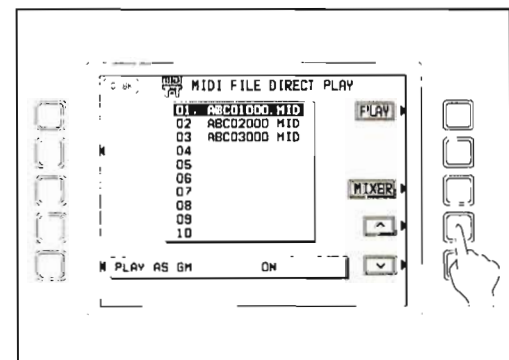


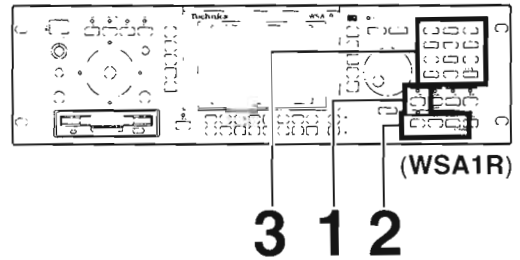
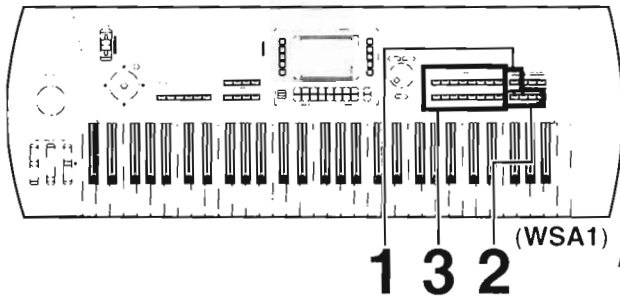
- The display changes to the DISK menu display.

3 Select **MIDI FILE DIRECT PLAY** from the display.

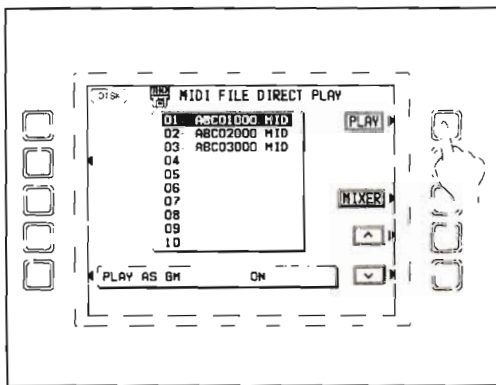


4 Use the \wedge and \vee buttons to select the demonstration performance you wish to hear.



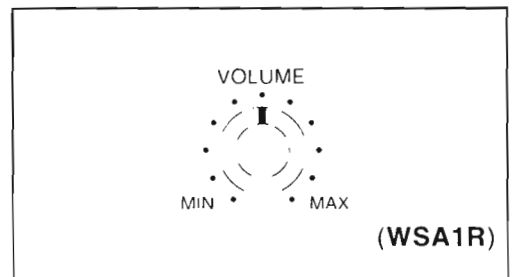
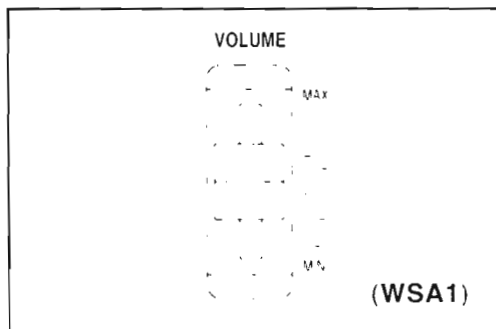


5 Press the PLAY button.



- The demonstration performance corresponding to your selection will begin.

6 Set the volume to an appropriate level with the **VOLUME** control



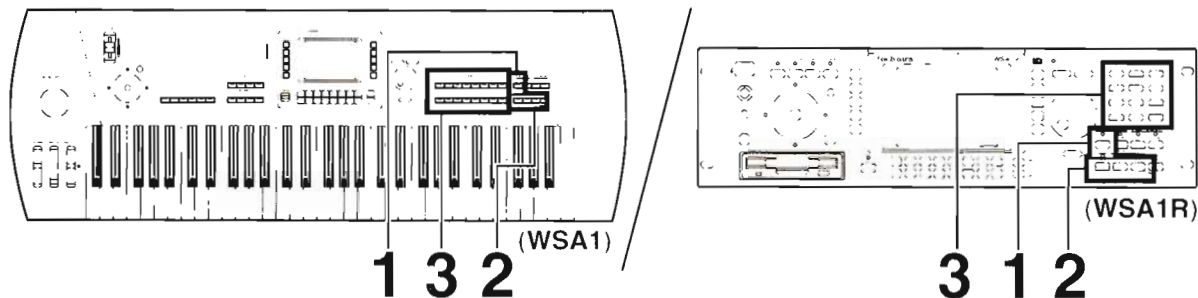
- To end the demonstration before it has finished, press the STOP button.
- Repeat steps 4 and 5 to listen to other melodies on the disk.

7 When you are finished listening to the demonstration tunes, turn off the **DISK** button in the **MENU** section

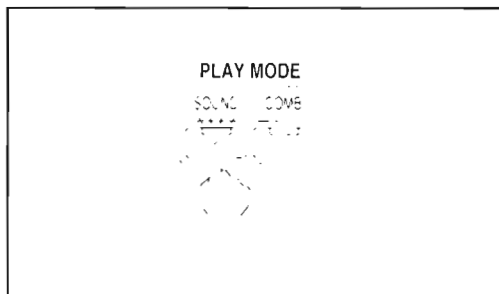
- In addition to the demonstration melodies, the accessory disk also contains backup data for the data which is in the **SOUND** and **COMBINATION USER** banks at the time of shipment from the factory. You can use the **DISK LOAD** procedure to load this data to your instrument. (Refer to page 93 in the **PRACTICAL APPLICATIONS** volume.)
- The demonstration performances use **SOUNDS** stored in the **USER** banks. If you have edited **SOUNDS** in the **USER** banks, the demonstration performance playback may be flawed. For accurate playback, use the **DISK LOAD** procedure to load the **SOUND** data from the accessory disk to your instrument
- Please keep the accessory disk in a safe place free from dust and accidental damage.

Playing sounds

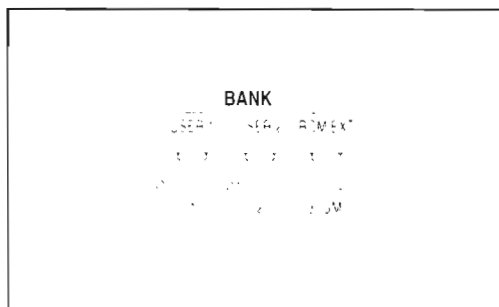
A great number of high-quality sounds created by Acoustic Modeling Synthesis are preset in this instrument. Choose these sounds, and you can begin playing immediately. Try using the controllers to alter the sounds in realtime.



1 In the **PLAY MODE** section, turn on the **SOUND** button.

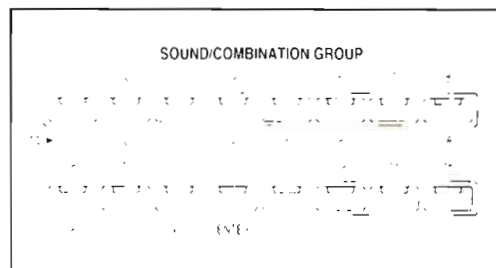


2 Select a bank.

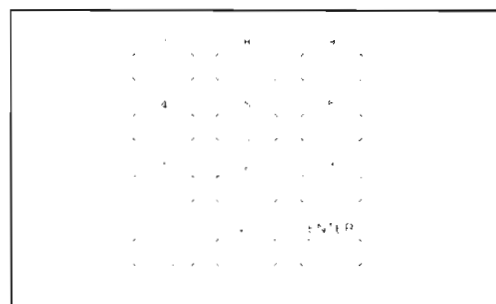


- Information about the sounds stored in each bank can be found in the separate REFERENCE GUIDE provided.

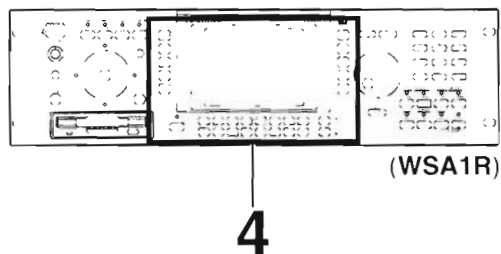
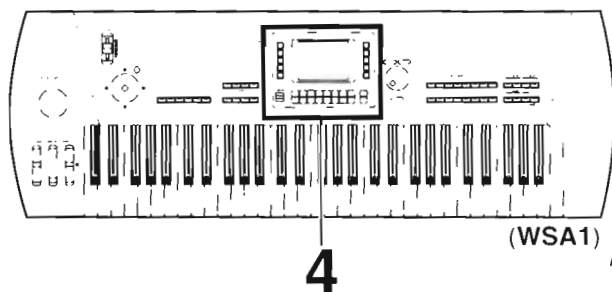
3 **WSA1:** Use the number buttons in the **SOUND/COMBINATION GROUP** to select a **SOUND GROUP** number (1 to 16)



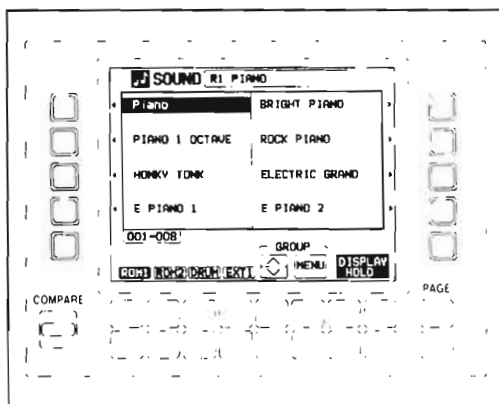
WSA1R Use the number pad (0 to 9) to specify the number of the desired **SOUND GROUP**, and then press **ENTER**.



- The display changes to show the list of sounds in the selected **SOUND GROUP**.
- If the **ROM/EXT** bank was selected in step 2, use the **ROM1** or **ROM2** button to select a bank.



4 Use the buttons to the right and left of the display to select a sound

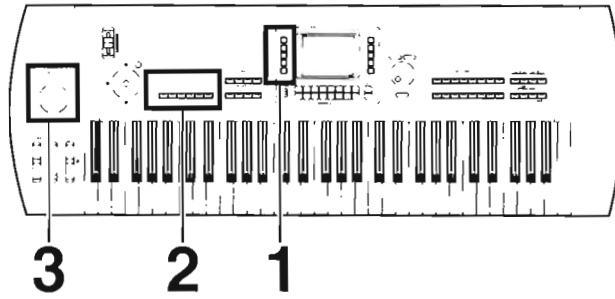


(The display looks similar to this, although the contents may be different)


5 Play the keyboard

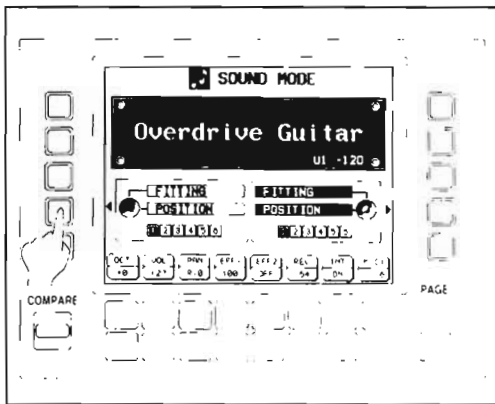
- If the **EXIT** button is pressed, the display returns to the **SOUND MODE** display, which is the home screen.

- Select other banks and/or sound groups to hear the many other sounds preset in the instrument.
- **Note** A sound is not selected until it is highlighted in the screen.

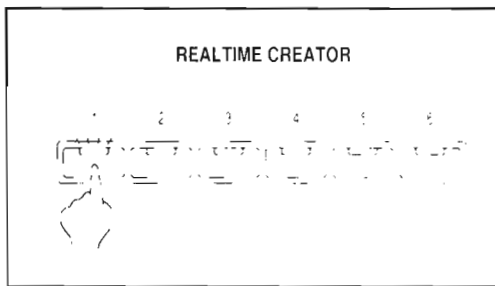


REALTIME CONTROLLER (WSA1)

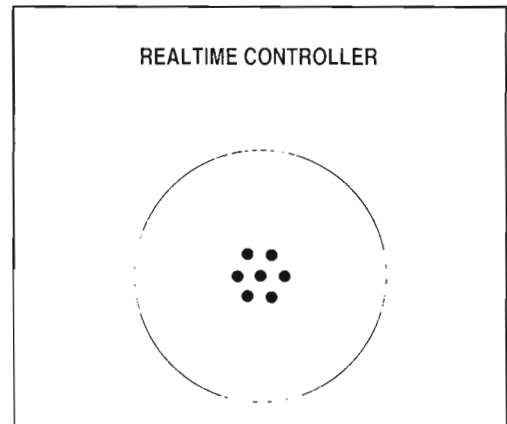
- 1** On the SOUND MODE display, select the REALTIME CONTROLLER .



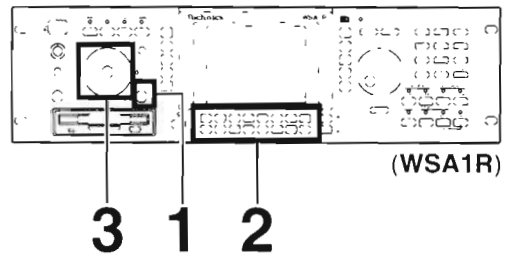
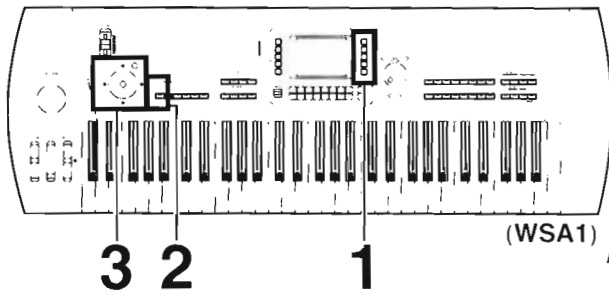
- 2** Press REALTIME CREATOR number button 1



- 3** While pressing the keyboard keys, manipulate the REALTIME CONTROLLER.

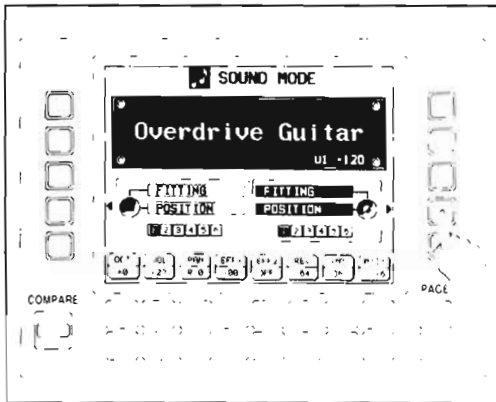


- When the REALTIME CONTROLLER is released, it returns automatically to the neutral position
- In step 2, select different number buttons to affect other characteristics of the sound.

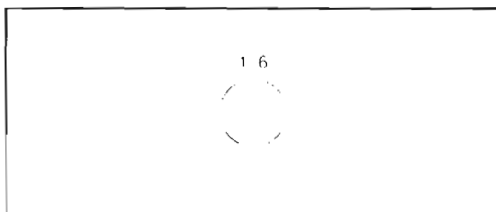


REALTIME CREATOR

- 1** WSA1: On the SOUND MODE display, select the REALTIME CREATOR .

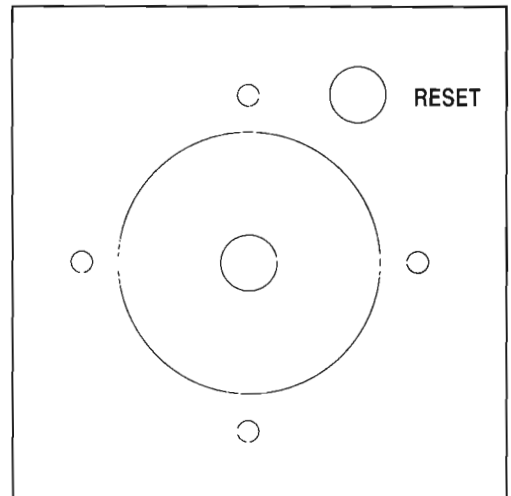


WSA1R: Press the 1-6 button



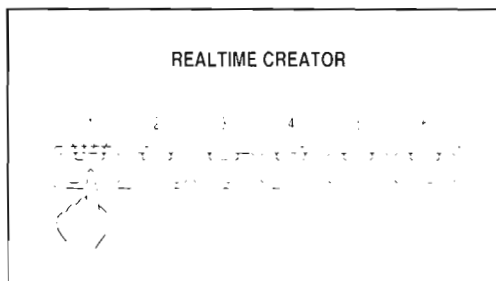
- On the display, number buttons 1 to 6 are shown

- 3** While pressing the keyboard keys, manipulate the REALTIME CREATOR.

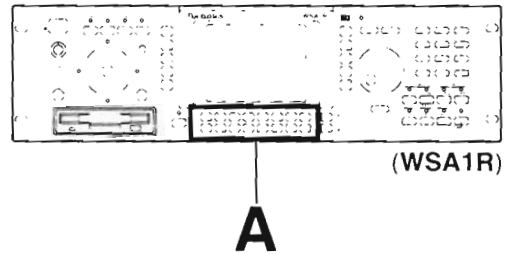
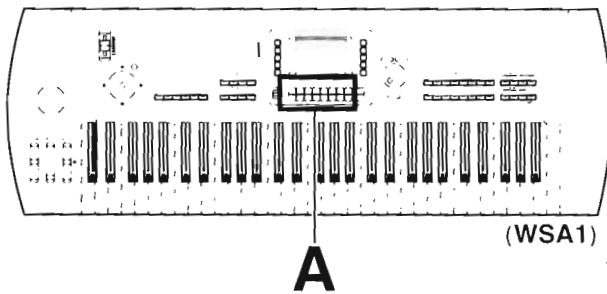


- You can press the **RESET** button to return the sound to its original state.
- In step 2, select different number buttons to affect other characteristics of the sound.

- 2** WSA1: Press REALTIME CREATOR number button 1.



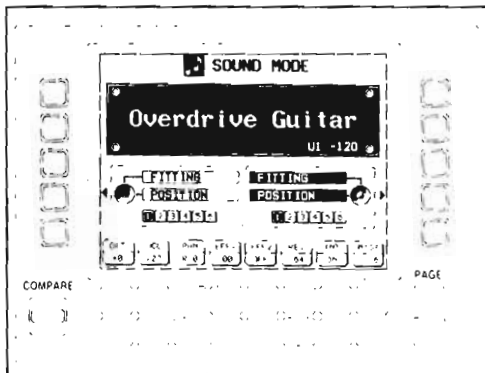
WSA1R: On the display, select 1.



Home screen controls

A The home screen in SOUND MODE allows access to several parameters in addition to the **REALTIME CONTROLLER/CREATOR** assignments

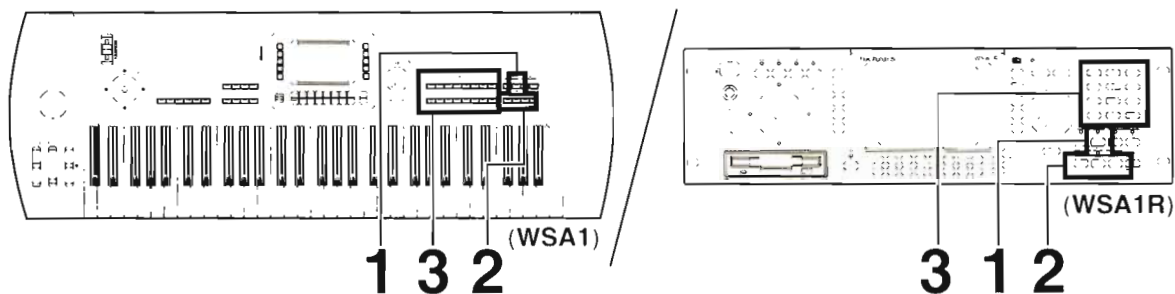
- These settings actually change the PART 1 settings (except for OCT)
- If INT is turned OFF, no sound is produced from this instrument.



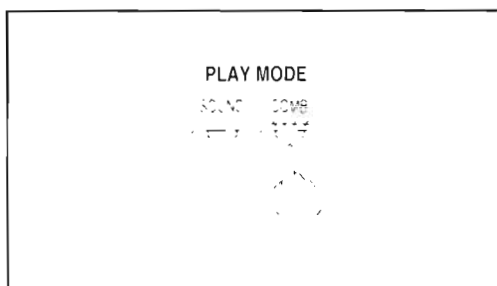
- Use the buttons below the display to adjust parameters of the sound part.
- OCT. The octave of this instrument's keyboard
- VOL. Change the volume of the sound.
- PAN: Set the stereo balance of the sound.
- EFF1 Change the level of EFFECT 1
- EFF2. Turn EFFECT 2 on or off.
- REV Change the level of REVERB.
- INT: Turn the settings for this instrument's sound generator on or off
- MIDI. MIDI port and channel setting.

Playing combinations

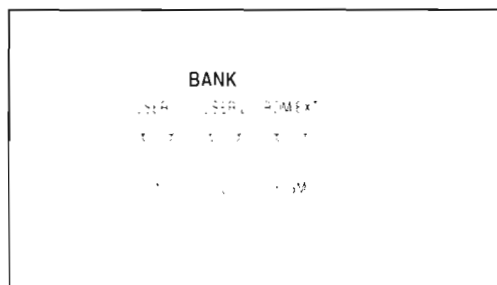
A COMBINATION is a group made up of several sounds. This instrument can play sound combinations consisting of up to 8 sound parts, creating the atmosphere of a live performance. You can give depth and spirit to your playing, for example, by layering the sounds or assigning them to different ranges of the keyboard. Start off with one of the many preset combinations to get a feel for the **COMBI** mode



- 1** In the **PLAY MODE** section, turn on the **COMBI** button.

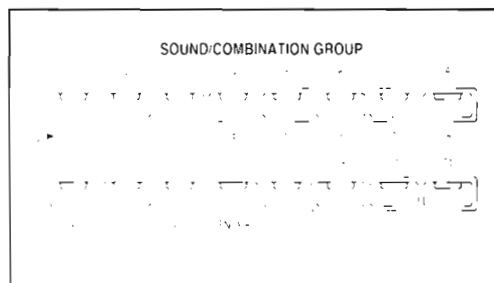


- 2** Select a bank

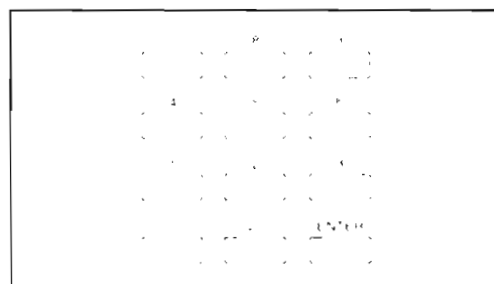


- Select the **USER 1** bank or the **ROM** bank. The **USER 2** bank cannot be selected.
- Information about the combinations stored in each bank can be found in the separate **REFERENCE GUIDE** provided

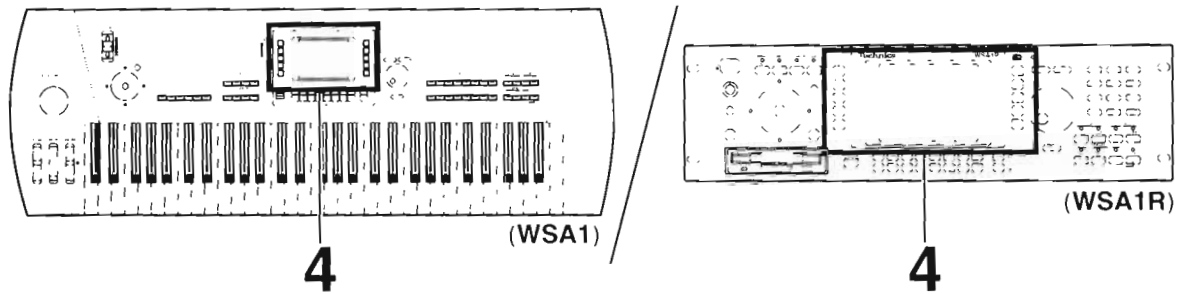
- 3** **WSA1:** Use the number buttons in the **SOUND/COMBINATION GROUP** to select a COMBINATION GROUP number (1 to 16)



- WSA1R:** Use the number pad (0 to 9) to specify the number of the desired COMBINATION GROUP, and then press **ENTER**



- The display changes to show the list of combinations in the selected COMBINATION GROUP.



4 | Use the buttons to the right and left of the display to select a combination.

5 | Play the keyboard.

- If the **EXIT** button is pressed, the display returns to the **COMBINATION MODE** display, which is the home screen.

- Select other banks and/or combination groups to hear the many other combinations preset in this instrument. A list of combinations can be found in the separate **REFERENCE GUIDE** provided.
- Note: A combination is not selected until it is highlighted in the screen
- On the **WSA1R**, MIDI channel assignments must be considered when playing combinations.

- The **REALTIME CREATOR** and **REALTIME CONTROLLER (WSA1)** can also be used in the **COMBINATION MODE**.
- You can easily make broad changes to the selected combination on the normal **COMBINATION MODE** display. Refer to page 13 in the **PRACTICAL APPLICATIONS** volume.
- You can create your original combinations. Refer to page 41 in the **PRACTICAL APPLICATIONS** volume.

Recording a performance (WSA1)

This instrument's **SEQUENCER** has 16 recording tracks, with which you can record and play back up to 10 performances.

Application examples

■ **Record a performance in realtime**

You can use **REALTIME RECORD** to record a performance just like with a tape recorder.

Multi-track recording of up to 16 tracks is possible.

■ **Record in the step recording mode**

Use **STEP RECORD** to record a performance note-by-note on the display. This is an especially effective method for storing complicated passages that are difficult to play or when the exact timing of a part is critical.

■ **Edit the recorded data**

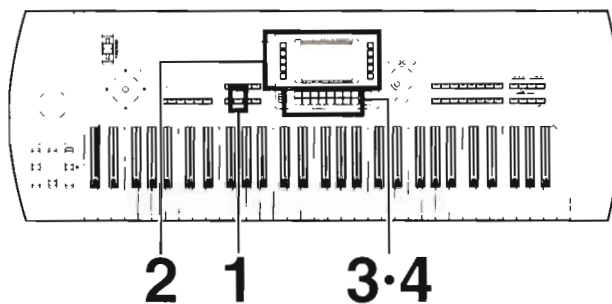
Comprehensive editing functions allow you to modify the recorded performance. Performance (**NOTE**) data can be visually input and edited on a piano roll display, and there is also a specialized display for editing the **DRUMS** part data. The various editing functions give you complete control over your performance. To give just one example, you can use the **QUANTIZE** function to make precise adjustments to the timing. And there are many more.

■ **Save your performances on disks**

All the data of your recorded performances can be stored on floppy disks. The built-in Disk Drive also allows you to play commercially sold Standard MIDI File disks on this instrument.

- Features and operation of the built-in Disk Drive are explained on page 91 in the **PRACTICAL APPLICATIONS** volume.

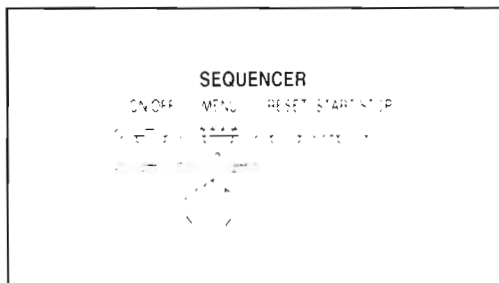
-
- Operation of the **SEQUENCER** is explained in full from page 66 in the **PRACTICAL APPLICATIONS** volume.



Recording example

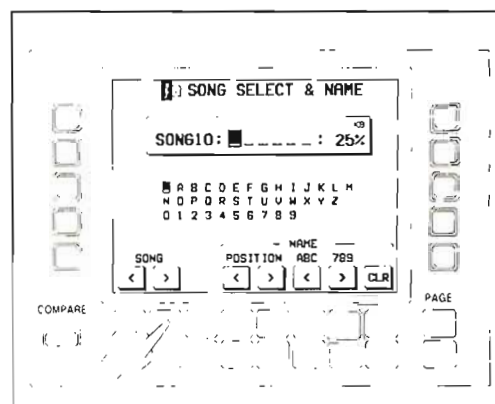
Follow these step-by-step instructions to record a performance in the **SEQUENCER** using the **REALTIME RECORD** mode

- 1** In the **SEQUENCER** section, turn on the **MENU** button

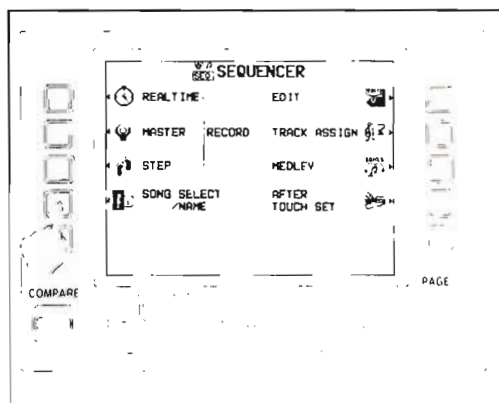


- 3** Use the **SONG <** and **>** buttons to select a song number.

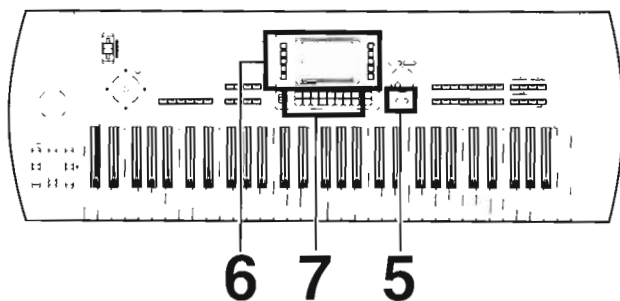
- For this example, select 1.



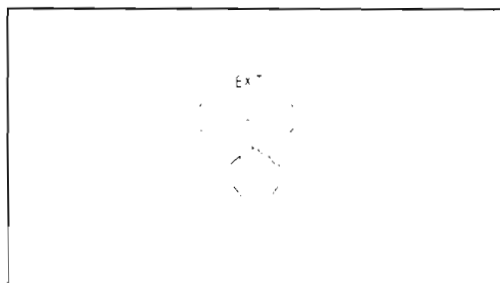
- 2** Select **SONG SELECT/NAME** from the display



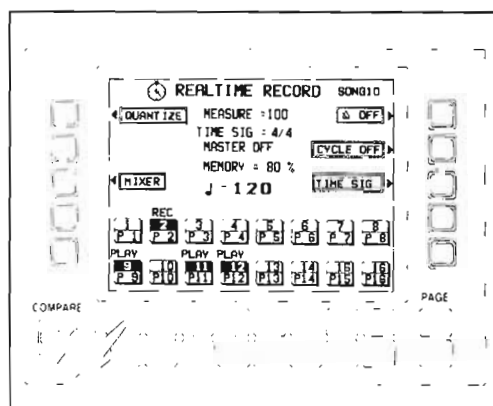
- 4** Type a name for the song.
- Use the **POSITION <** and **>** buttons to highlight the character position. Use the **ABC••789 <** and **>** buttons to select the alphanumeric character. Repeat these steps to type the whole name.



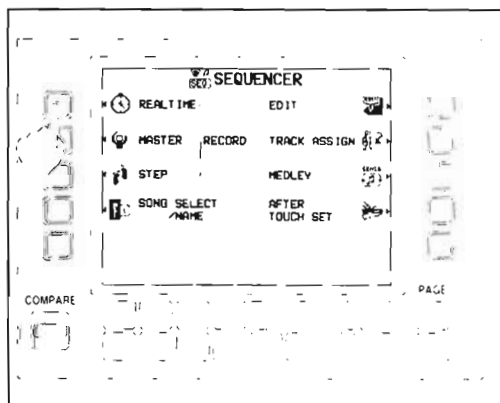
- 5** Press the **EXIT** button.
- This display returns to the previous display



- 7** Select the recording track(s).

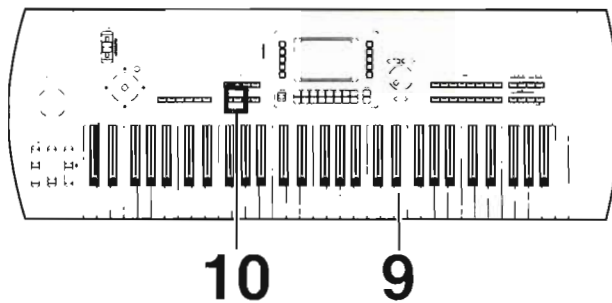


- 6** Select **REALTIME RECORD** from the display.



- Use the buttons below the display to select record mode for a track "REC" will be displayed above the track number selected. The upper row of buttons is used to select from tracks 1 to 8, and the lower row for tracks 9 to 16.
- For this example, select track 1.

- 8** Use the **BANK** buttons, the **SOUND/COMBINATION GROUP** buttons, and the display to select the **PIANO** sound

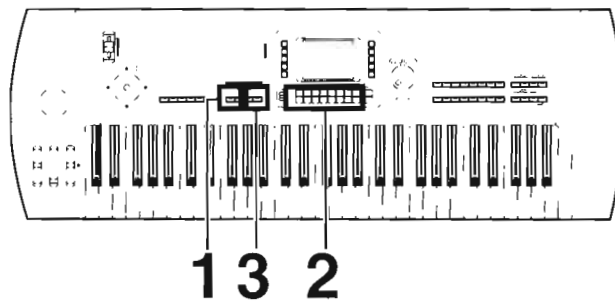


9 | Play the keyboard.
• Recording begins

10 | When you have finished recording,
turn off the **MENU** button.
• The recording status is terminated.

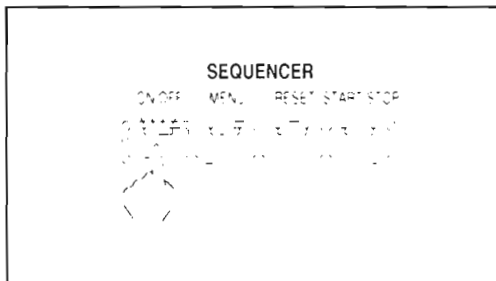
Sound: Piano

A musical score for piano in G major, 4/4 time. The score is presented in two systems, each with a grand staff (treble and bass clefs). The first system consists of four measures, and the second system also consists of four measures. The music features a melodic line in the right hand and a supporting bass line in the left hand. The key signature has one sharp (F#), and the time signature is 4/4. The notation includes quarter notes, eighth notes, and sixteenth notes, with some notes beamed together. There are also some rests and dynamic markings.



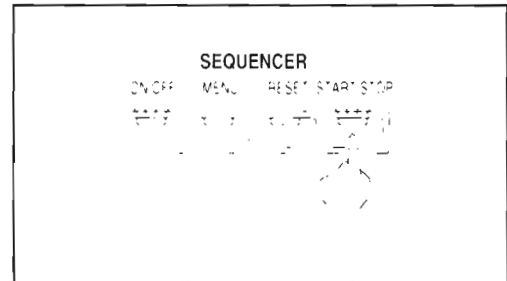
Playback

1 In the **SEQUENCER** section, turn on the **ON/OFF** button.



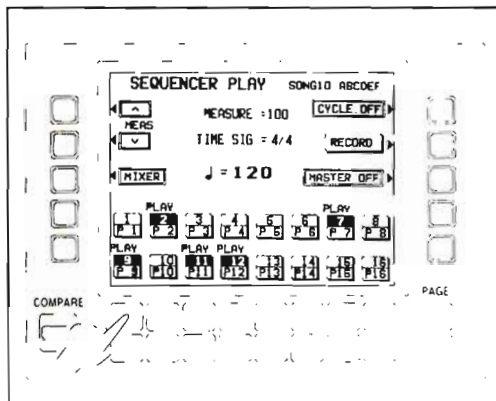
- This step is not necessary if you have just finished recording.

3 Press the **START/STOP** button.



- The recorded performance is played back.

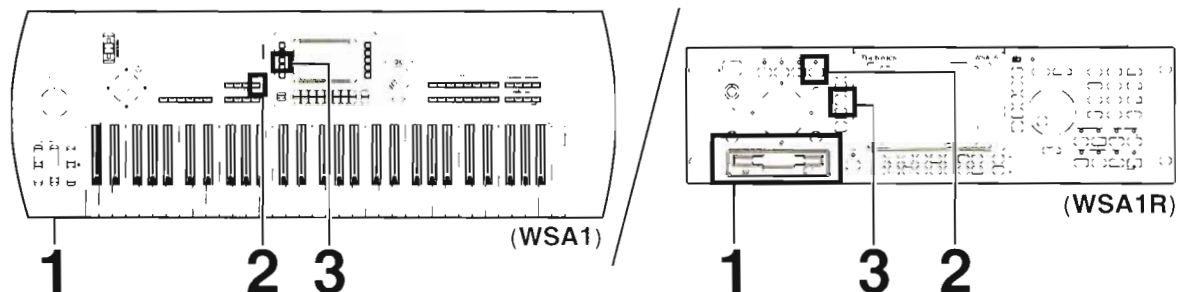
2 Select the playback track(s).



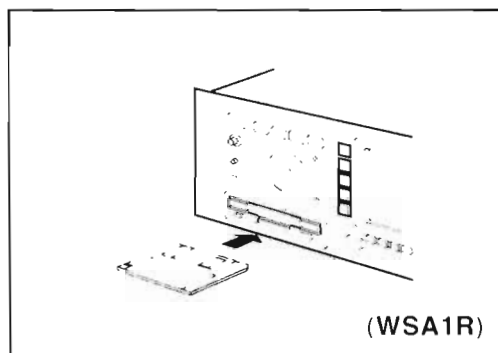
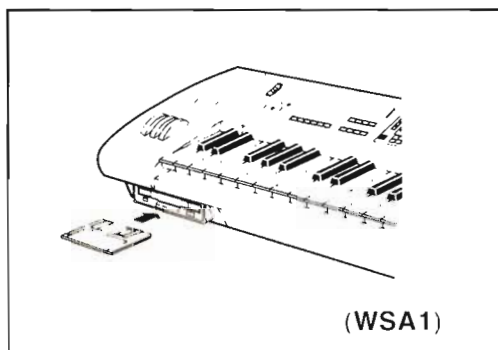
- Use the buttons below the display to select play mode for a track "PLAY" will be displayed above the track numbers selected.
- Immediately after recording, play mode is already selected

Playing commercial disks

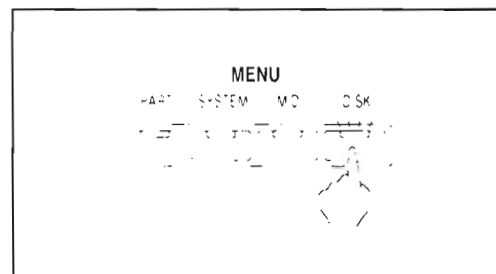
Enjoy playing commercially sold Standard MIDI File (SMF) format song disks. With MIDI FILE DIRECT PLAY, you can play back SMF format song data (FORMAT 0 only) directly from a disk without loading the data to this instrument's memory.



- 1** Insert the song disk into the Disk Drive slot.

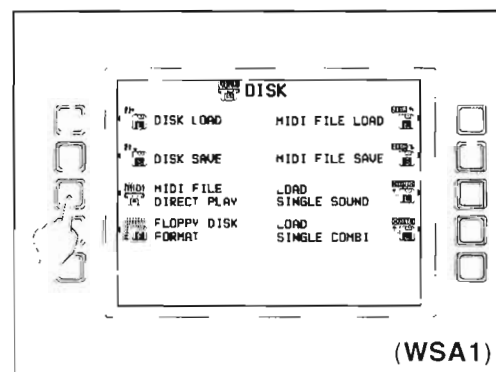


- 2** In the **MENU** section, press the **DISK** button to turn it on.

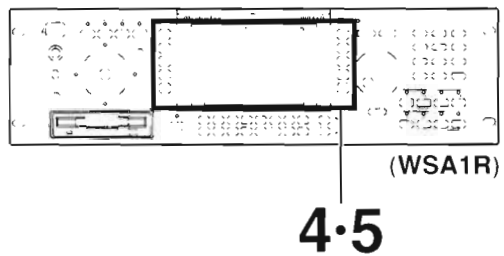
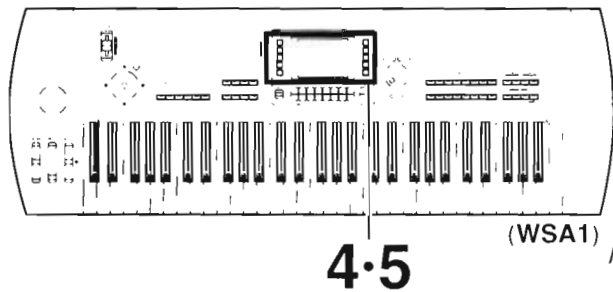


- The display changes to the DISK display.

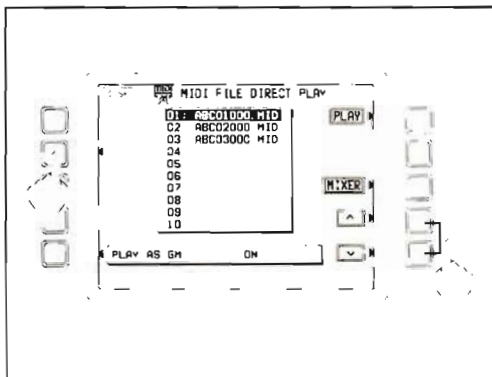
- 3** Press the button next to the display to select MIDI FILE DIRECT PLAY.



- The display changes to the MIDI FILE DIRECT PLAY display.

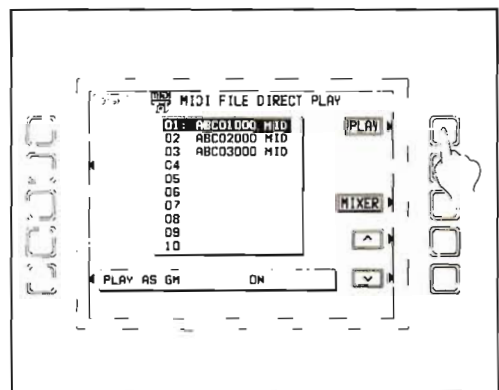


- 4** Select the song list box, and use the \wedge and \vee buttons to select the song to play back



- You can select the PLAY AS GM box, and use the \wedge and \vee buttons to specify whether or not (ON/OFF) the song is played back as GM (GENERAL MIDI).

- 5** Press the PLAY button



- The selected song is played back
- To adjust the volume balance etc., press the MIXER button
- The PLAY button becomes the STOP button. Press this button if you wish to stop playback before it has finished

- You can use the same procedure to play back other songs on the disk

- Direct play is possible only from FORMAT 0 disks. Direct play from FORMAT 1 disks is not possible
- WSA1** To play FORMAT 1 disks, follow the MIDI FILE LOAD procedure (page 94 in the PRACTICAL APPLICATIONS volume).

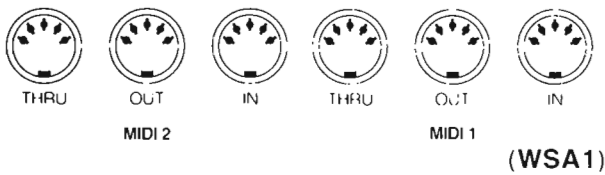
Using MIDI

MIDI (Musical Instrument Digital Interface) is the international standard that allows electronic musical instruments to exchange data with each other. The MIDI applications can greatly enhance the scope of your performance.

MIDI terminals

The MIDI terminals are used for connecting MIDI instruments. This instrument has two sets of MIDI terminals.

Rear panel



IN: The terminal by which this instrument receives data from other equipment

OUT: The terminal that transmits data from this instrument to other equipment

THRU: The terminal that transfers data from the **IN** terminal directly to other equipment.

- For these connections, use a commercially available MIDI cable

Connection examples

Here are a few typical connection examples

- To generate sound from a connected instrument by playing this instrument



- **WSA1R:** Connection to a master keyboard is necessary

- To generate sound from this instrument by operating a connected instrument



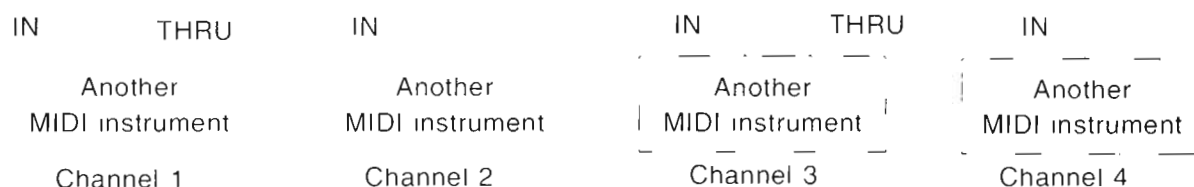
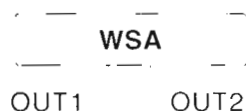
- To connect with a MIDI sequencer or a personal computer



MIDI channels

Many different kinds of performance data are sent using just one MIDI cable. This is possible because MIDI signals are sent and received through 16 different "basic channels" (numbered 1 to 16). In order for the exchange of data to take place, the channels on the transmission side must match the channels on the receiving side. This characteristic also makes it possible to link multiple sound generators and to control each by matching specific channels.

Example:



- This instrument is equipped with two MIDI ports and 32 sound generator parts. Up to 16 channels of data can be transmitted and received on each MIDI port.

MIDI data

■ NOTE data

This is the most basic kind of MIDI data which is exchanged, and is used to specify which keys are played and how hard they are played.

NOTE NUMBER: Number specifying which key is played.

NOTE ON: Specifies that a key is played.

NOTE OFF: Specifies that a key is released.

VELOCITY: Specifies how hard a key is struck.

- MIDI notes are assigned numbers from 0 to 127, with middle C (C3) as 60. NOTE pitches are in semitone increments, with the higher numbers assigned to the higher pitches.

■ PROGRAM CHANGE

This is patch change data. When a patch (or sound) is selected on the transmitting instrument, the same patch (or PROGRAM CHANGE) number is selected on the receiving instrument. Note: The sounds associated with a particular PROGRAM CHANGE number vary among instruments and manufacturers unless you are in GENERAL MIDI (GM) mode.

■ CONTROL CHANGE

This data specifies when a controller other than a key is moved to modify a sound (e.g. modulation wheel, control pedal, etc.). Each control can be assigned various controller numbers and there is some variation among instruments and manufacturers.

■ EXCLUSIVE data

This data is instrument specific data which may include sound edit parameters and sequencer contents. Large blocks of information can be transmitted and received using the DUMP command.

- For details, refer to the separate REFERENCE GUIDE provided.

GENERAL MIDI

GENERAL MIDI (GM) is a standard agreed upon by manufacturers to allow greater compatibility among instruments without the need for resetting a lot of parameters. In GENERAL MIDI mode, a specific sound is assigned to each PROGRAM CHANGE number, percussion instruments are assigned to specific note numbers, and drum/percussion data is always found on channel 10. In addition, sequencer files have been standardized into two formats to allow compatibility among GM instruments.

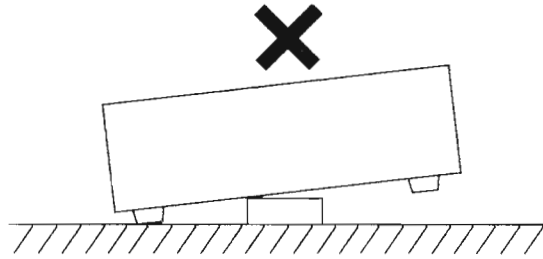
- Equipment which conforms to GENERAL MIDI standards is indicated by the following logo.



- This instrument can be used as a GENERAL MIDI sound generator. Refer to page 104 in the PRACTICAL APPLICATIONS volume.

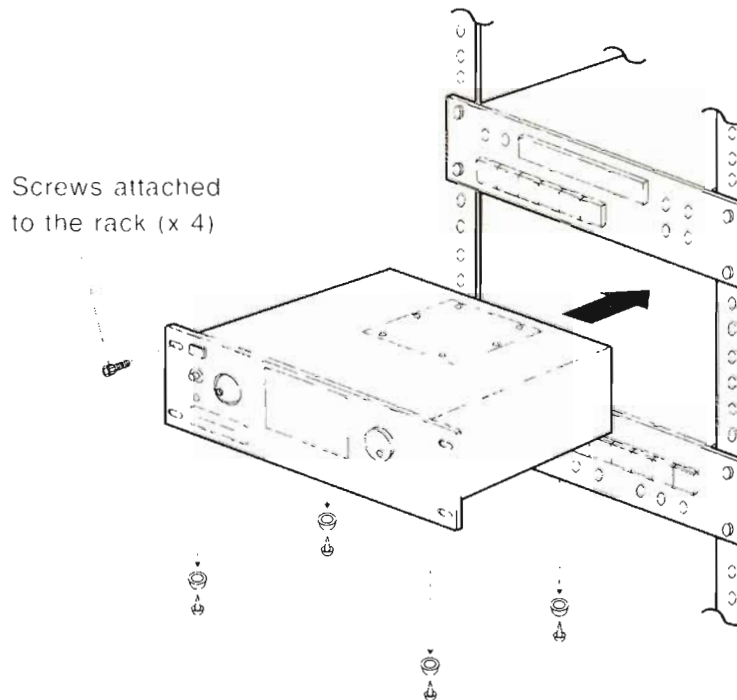
Notes on the WSA1R setup

Please be sure that the WSA1R is placed on a smooth, flat, horizontal surface



■ For rack-mount use

- If mounting on a rack, be sure that all screws are tightened securely, in order to prevent the unit from accidentally dropping or other damage which could deform the unit
- If the rack dimensions interfere with mounting the unit, you can use a screwdriver to remove the four feet from the bottom of the unit. (Keep the feet and screws in case of future use)



- If you are reattaching the feet to the unit, be sure to use the same screws to affix the feet in their original positions. Be especially careful of this point when replacing the front left foot below the Disk Drive.

