EX-8000

PROGRAMMABLE
POLYPHONIC SYNTHE
MODULE
OWNER'S MANUAL

KORG

EX-8000

OSC 1		OSC 2		VCF		VCF EG		VCA EG		MG		DIGITAL DELAY		AFTER TOUCH		MIDI INDICATOR
11 OCT	16' 8' 4'	21 OCT	16' 8' 4'	31 CUTOFF	0--63	41 ATK	0--31	51 ATK	0--31	61 W F	0--3	71 TIME	0--7	81 OSC MG	0--3	
12 W F	1--16	22 W F	1--16	32 RESO	0--31	42 DEC	0--31	52 DEC	0--31	62 FREQ	0--31	72 FACTR	0--15	82 VCF	0--3	
13 LEVEL	0--31	23 LEVEL	0--31	33 KBD	0--3	43 B P	0--31	53 B P	0--31	63 DELAY	0--31	73 FR	0--15	83 VCA	0--3	
14 OSC SEL	0123	24 INTRVL	1-3345	34 POL	1 2	44 SLP	0--31	54 SLP	0--31	64 OSC	0--31	74 MOD FRQ	0--31	84 CH	1--16	
15 MODE	1 2	25 DETUNE	0--6	35 EG	0--31	45 SUS	0--31	55 SUS	0--31	65 VCF	0--31	75 MOD INT	0--31	85 ENA	1 2	
16 TIME	0--31	26 LEVEL	0--31			46 REL	0--31	56 REL	0--31	66 OSC	0--12	76 LEVEL	0--15	86 OMNI	0 1	
17 INT	0--31					47 VEL	0--7	57 VEL	0--7	67 VCF	0 1	77 TIME	0--31			
AUTO BEND		NOISE								BEND		PORTAMENTO		MIDI		

VOLUME 0 1 2 3 4 5 6 7 8 9 10 — PHONES

TAPE LOW HIGH — TO FROM

TUNE b ♯ — A4

KEY ASSIGN POLY 1 POLY 2 — UNISON 1 UNISON 2

TAPE ENABLE — ENABLE

FEATURES OF THE KORG EX-8000

1 The EX-8000 is a 2U sized rack-mountable 8-voice Polyphonic Synthesizer Module, with a built-in Digital Waveform Generator System (D.W.G.S.). The DWGS has sixteen digitally encoded waveforms stored in four 256 kilobit ROM chips. These waveforms are digitally encoded samples of actual acoustic instruments recreated by additive synthesis techniques to enable more realistic sound synthesis. (The sixteen waveforms also include simple sawtooth and pulse waveforms such as " ∿ , ⊓ " and " ∿ " which are found in conventional analog synthesizers.)

2 The EX-8000 is 2U-sized so it's rack-mountable. It saves valuable space and provides a wide range of sound synthesis possibilities when used in conjunction with your MIDI synthesizer.

▌ *Thank you and congratulations on your choice of the KORG EX-8000 Polyphonic Synthe Module. To obtain optimum performance, please read this manual carefully before using this synthesizer.*

3 Uses two Digital Oscillators, analog noise generator, and VCF and VCA modules for sound synthesis. You can enjoy the uniqueness of digital sound plus quick and logical sound synthesis as in analog control.

4 The EX-8000 accepts Initial Touch (key velocity) and After Touch (channel pressure) data, so real-time control of output volume, timbre and pitch modulation is at your fingertips when used with a synthesizer featuring these functions.

5 A programmable digital delay is included to store clear stereo effects (Chorus, Doubling, Short Delay, and Long Delay) for each of 64 tone colors in the programmer.

6 Auto Bend is included for more realistic synthesis of human voice and brass sounds.

7 Key Assign mode provides two polyphonic modes and two unison modes, which are effective for playing solo or bass parts or using Portamento.

8 Built-in Portamento produces a gradual change in pitch from one note to another.

9 The Key Window function limits the area on the keyboard which one EX-8000 controls, from one point on the keyboard to another.

IMPORTANT SAFETY PRECAUTIONS

■LOCATION
To avoid malfunction do not use this unit in the following locations for long periods of time:
- ● In direct sunlight.
- ● Exposed to extremes of temperature or humidity.
- ● In sandy or dusty places.

■POWER SUPPLY
- ● Use only with rated AC voltage. If you will be using this unit in a country having a different voltage, be sure to obtain the proper transformer to convert to rated voltage.
- ● To help prevent noise and degraded sound quality, avoid using the same outlet as other equipment or branching off extension cords shared by other equipment.

■INPUT/OUTPUT JACKS AND CONNECTION CORDS
Be sure to use standard "guitar" cables with phone plugs, such as the cable supplied with this instrument, for input and output connections to the rear panel of the EX-8000. Never insert any other kind of plug into these jacks.

■PREVENTING ELECTRICAL INTERFERENCE
As a microprocessor based device, the EX-8000 is extremely flexible in operation, yet may possibly perform erratically if exposed to electrical interference from other electrical devices and fluorescent lamps. Avoid operating the EX-8000 near possible sources of interference. If something seems to be wrong, try turning off the power, waiting about ten seconds, them turning it back on. This resets the computer circuits to their initial state so performance should return to normal.

■HANDLE GENTLY
Knobs and switches are designed to provide positive operation with a light touch. Excessive force may cause damage.

■MAINTENANCE
Wipe the exterior with a soft, dry cloth. Never use paint thinner, benzene or other solvents.

■KEEP THIS MANUAL
Store this manual in a safe place for future reference.

■MEMORY BACKUP
- ● To protect your programmed memory contents, the EX-8000 utilizes a built-in rechargeable backup battery power supply. Battery life is rated at five years or more, so replacement is recommended after five years. Contact your Korg dealer or authorized service center at that time.
- ● For maximum security, save your sound programs on tape, using the built-in tape interface system. Then if memory contents are accidentally erased or altered, you can simply load the data back into EX-8000 internal memory in seconds!
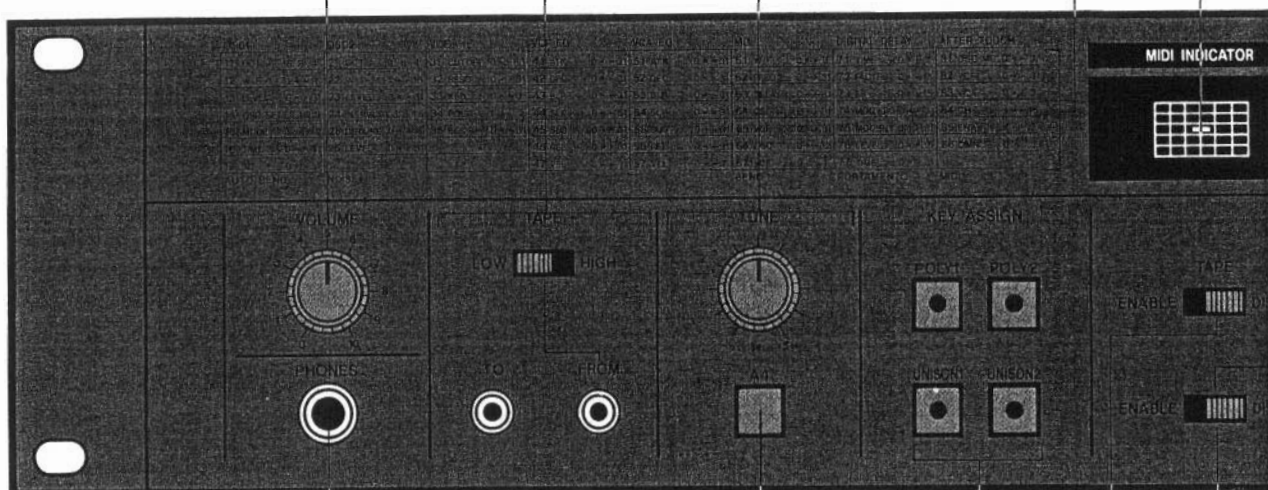
CONTENTS

FEATURES AND FUNCTIONS

1. Front Panel

Tune

Tape Interface Jack
(High/Low Switch)

Volume

MIDI INDICATOR

Phones

Tone Switch

Key Assign
(Poly 1: Poly 2: Unison 1: Unison 2)

Tape Switch

Write Switch

Program Switch

Program Write Key

Parameter List

MIDI Indicator
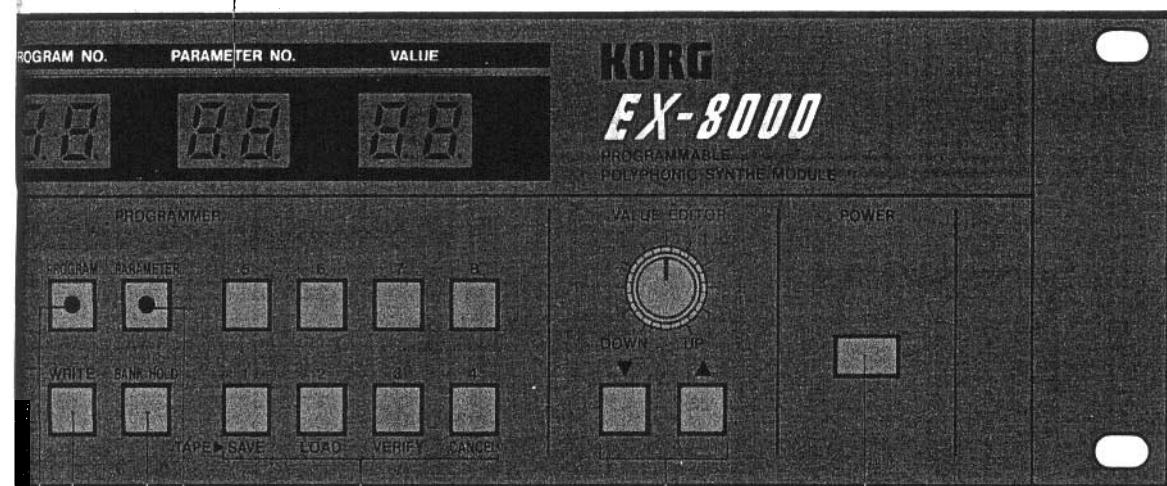
Indicators
   Program No.
   Parameter No.
   Value

Power Switch
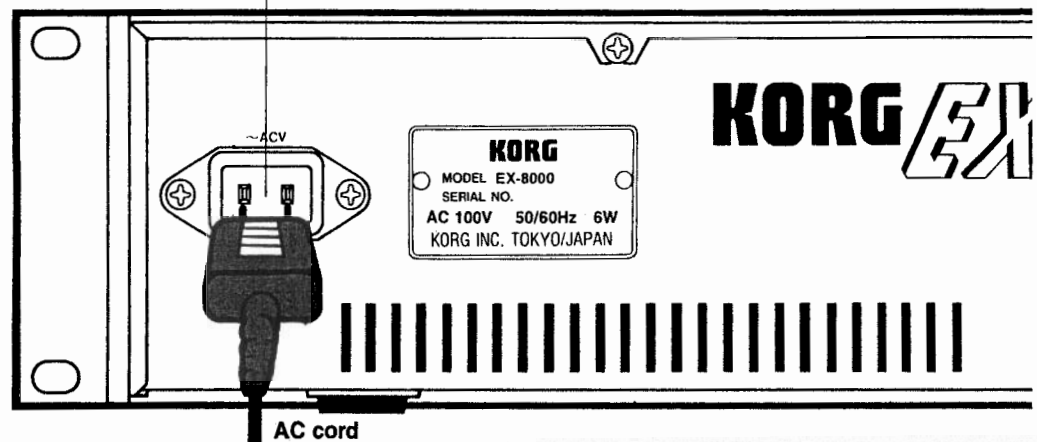
Value
(Up/Down)

Number Select
Buttons 1-8

Parameter Switch

Bank Hold Switch
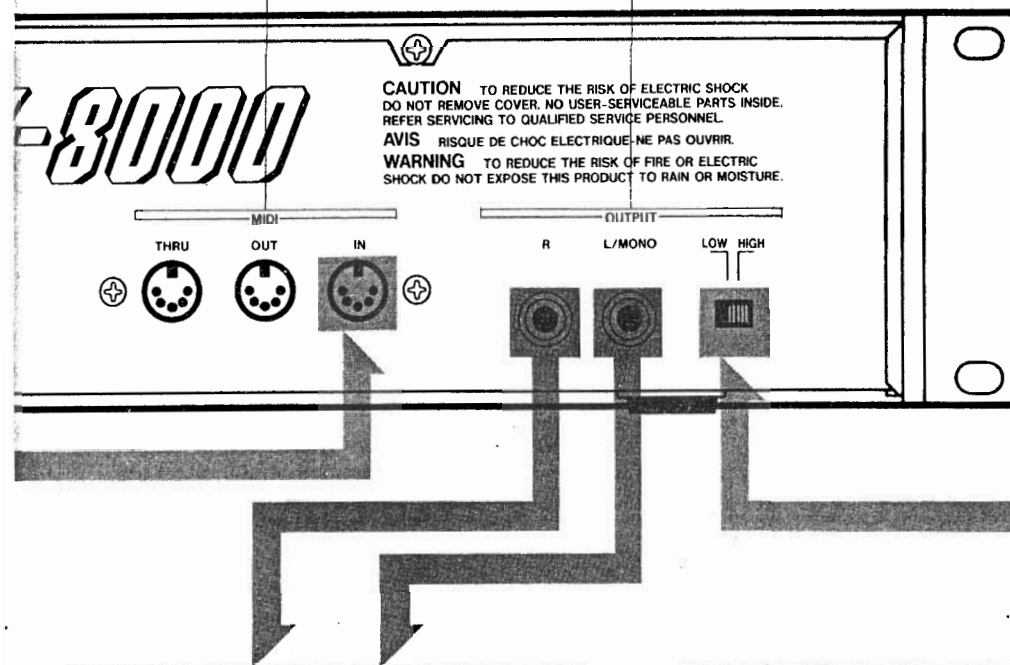
2.Rear Panel/Basic Setup

AC Cord Receptacle

~ACV

KORG
MODEL EX-8000
SERIAL NO.
AC 100V 50/60Hz 6W
KORG INC. TOKYO/JAPAN

KORG EX

AC cord

MIDI OUT

Accessory AC cord

Plug it into
a wall
socket.

KORG DW-8000

KORG SQD-1

Connect MIDI synthesizer,
sequencer, etc.

DW-8000, DW-6000
SQD-1, etc.
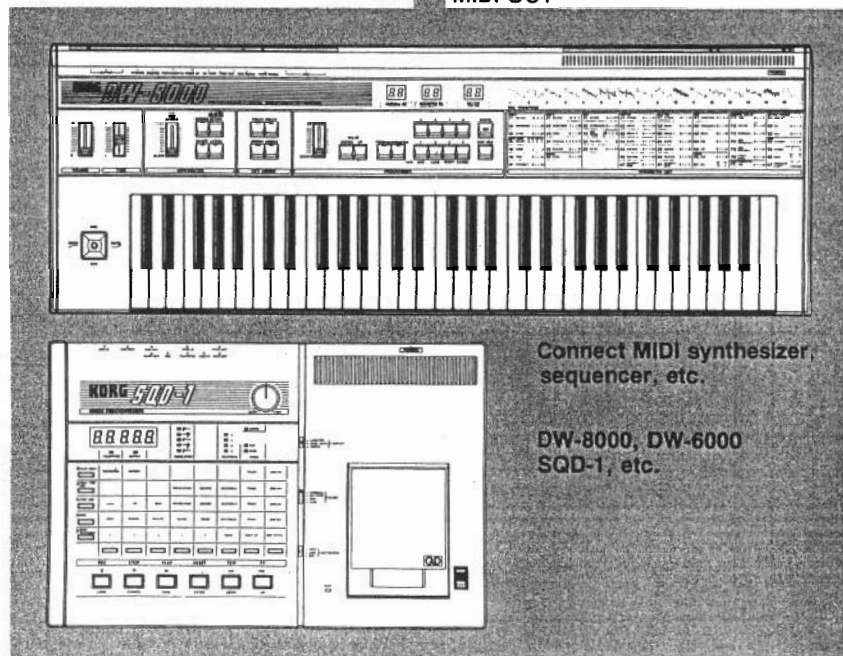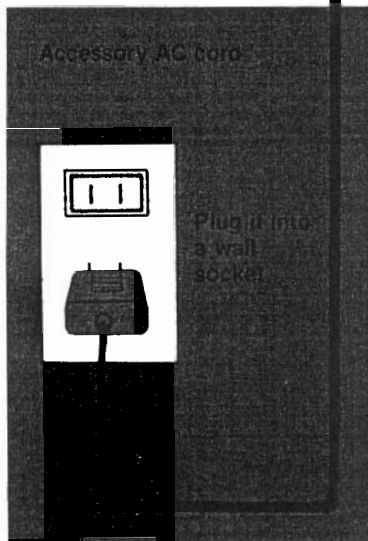
MIDI Terminals: IN, OUT, THRU

OUTPUT
(Low/High Switch, Left/Mono, Right)

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

AVIS RISQUE DE CHOC ELECTRIQUE-NE PAS OUVRIR.

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

MIDI
THRU   OUT   IN   R   L/MONO   LOW HIGH

OUTPUT

Use these jacks to connect amplifiers, mixers, or stereo systems.

KMX-62 etc.
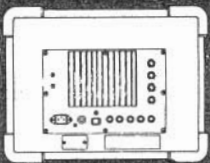
SM-75, PM-30 etc.   Stereo system

If the two output terminals are connected to independent amplifiers, stereo effects can be produced.
Use only LEFT/MONO for connection to a single amplifier or mixer channel.

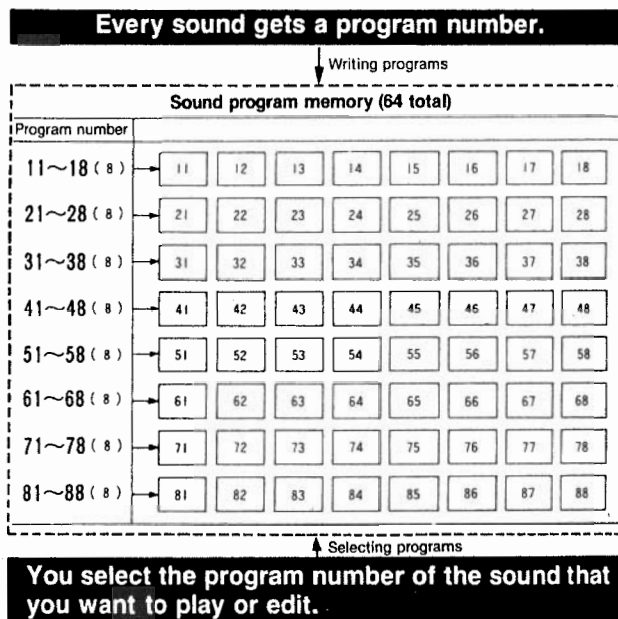Set the LOW/HIGH switch as follows according to the connected amplifier type.

Amplifier and input-terminal types	Switch position
Audio amp (AUX IN)	HIGH
Guitar amp (INPUT)	LOW
Keybord amp (INPUT)	HIGH or LOW
Mixing console (AUX, INPUT)	HIGH or LOW

SELECTING PROGRAMS

This explains how to select any of the 64 different sounds stored in the EX-8000's memory. The PROGRAMMER section on the front panel is used for this purpose.

1.Program Numbers

The EX-8000 can be store up to 64 different sound programs in its internal memory. Each of these programs has a number from 11 through 88 (the digits 0 and 9 are not used). When you want to store a sound, you must assign it a program number. When you want to recall that sound, you select it by the same program number.

Every sound gets a program number.

↓ Writing programs

Sound program memory (64 total)

Program number							
11~18 (8) →	11	12	13	14	15	16	17	18
21~28 (8) →	21	22	23	24	25	26	27	28
31~38 (8) →	31	32	33	34	35	36	37	38
41~48 (8) →	41	42	43	44	45	46	47	48
51~58 (8) →	51	52	53	54	55	56	57	58
61~68 (8) →	61	62	63	64	65	66	67	68
71~78 (8) →	71	72	73	74	75	76	77	78
81~88 (8) →	81	82	83	84	85	86	87	88

↑ Selecting programs

You select the program number of the sound that you want to play or edit.

2.How to Select a Program Number

■ **Features and Functions for Control**

1. PROGRAM switch

When this switch is activated (and its LED indicator is on), different programs may be selected using the NUMBER keys.
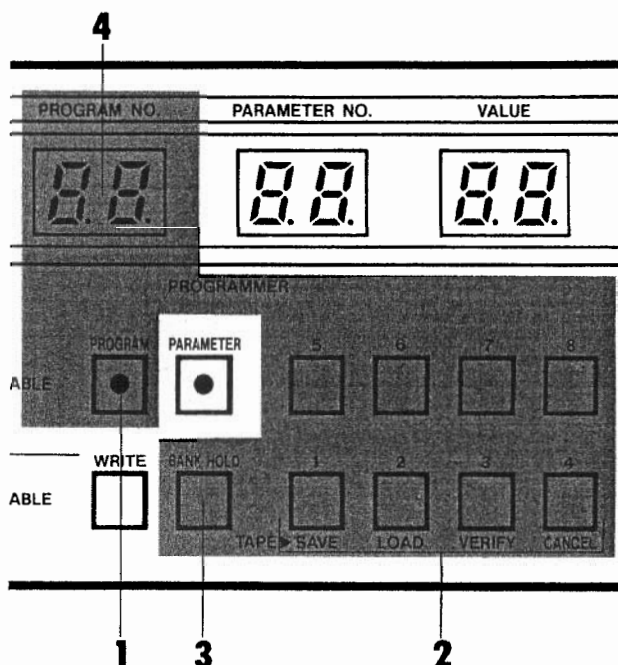
2. NUMBER keys

Press these keys to specify program numbers, which range from 11 through 88. Programs are arranged in eight "banks," signified by the left digit, with eight programs per bank, signified by the right digit; 8 × 8 = 64 total programs.

3. BANK HOLD switch

This holds the left "bank" digit so that you can use single number keys to quickly access any of the eight program numbers within a single bank.

4. PROGRAM NO. display

Shows selected program number.

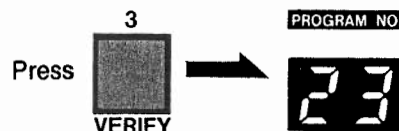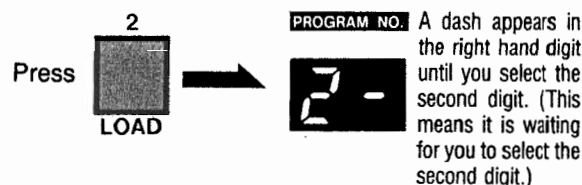**2** How to Select a Program Number

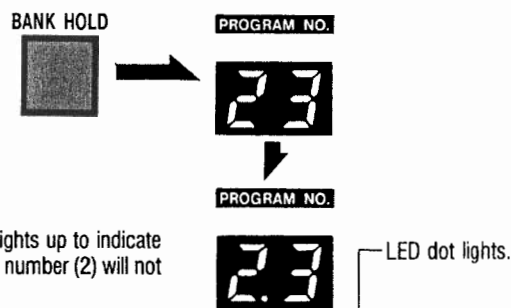**1** Make sure the PROGRAM switch is set to ON. (LED is lit.)

PROGRAM

LED is ON

2 Press the NUMBER keys to select any program number (11 ~ 88).

Example: To select program number...

2

Press

LOAD

PROGRAM NO. A dash appears in the right hand digit until you select the second digit. (This means it is waiting for you to select the second digit.)

3

Press

VERIFY

PROGRAM NO.

3 How to Select Bank Hold

1 Pressing the BANK HOLD switch preserves the left digit of the selected program number.

BANK HOLD

PROGRAM NO.

PROGRAM NO.

An LED dot lights up to indicate that the bank number (2) will not change.

LED dot lights.

2 Now if you press any of the NUMBER keys, only the right digit will change.

PROGRAM NO.

Only this digit changes when you press the number keys.
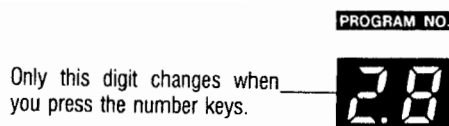
3 When you want to change to a program number in a different bank, press the BANK HOLD switch again to cancel BANK HOLD. You can now enter both digits using the NUMBER keys.

BANK HOLD

PROGRAM NO.

Now press

PROGRAM NO.

The LED dot goes out when BANK HOLD is off.
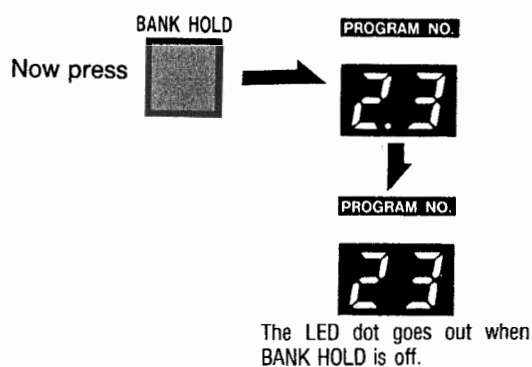
BASIC OPERATION

1.Parameters and Values

The various aspects of a sound, such as its pitch, timbre and variations in volume, are called "Parameters". To create or change a sound, you adjust the values of each of these parameters.

On the EX-8000, there are 49 parameters per program; each parameter has a number, and each parameter's value is also represented by a number. These numbers are shown on the front panel display. To create or change a sound, you select parameters and change (or "Edit") their values.

When the EX-8000 stores a sound in memory or calls it back from memory, it is actually storing and recalling the values you have given it for the sound's various parameters. All possible parameters and values are listed in the "parameter index" chart on the right side of the EX-8000 front panel. To create or change a sound, you first use the number keys to select a parameter number, then you use the edit slider and up/down keys to change its value.

Parameters for oscillator 1

OSC1

11	OCT	16′ 8′ 4′
12	W F	1 ◄ ► 16
13	LEVEL	0 ◄ ► 31

Parameter number
12 WAVEFORM

Value range: 1 ~
16

2.How to Edit Values

■ Features and Functions for Control

1. PARAMETER NUMBER display

Shows selected parameter number.

2. VALUE display

Shows current VALUE for selected parameter.

3. BANK HOLD switch

This holds the Parameter Number's left digit, so that the NUMBER keys can be used to select only the right digit. This can speed up Parameter Number selection when you are working on several parameters within the same "family" (that is, having the same left digit).

4. PARAMETER switch

When this switch is on, you can create and modify sounds by selecting different parameters (using the NUMBER keys) and varying their VALUEs (using the EDIT slider and/or DOWN/UP buttons).

5. NUMBER keys

These keys are used to select different Parameter Numbers (when the parameter switch is on).

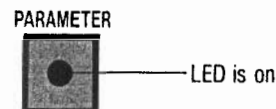Note: set these two switches to DISABLE.
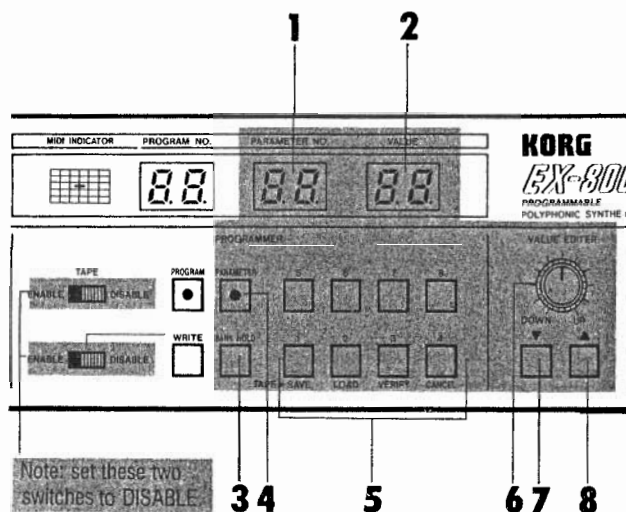
6. EDIT CONTROL

Permits rapid and easy adjustment of parameter VALUES (aspects of the sound) over a wide range.

7. / 8. DOWN/UP keys

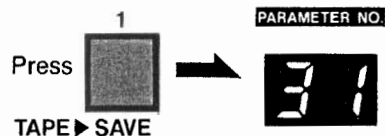Press to change parameter values up or down a step at a time.

2 How to Edit Values

1 Press the PARAMETER switch so that its LED lights up.

PARAMETER

LED is on

2 Refer to the parameter index chart to find the number of the parameter that you want to change. Press the number keys to select the desired parameter.

Example: Selecting VCF CUTOFF frequency.... This is parameter number 31, so....

3

PARAMETER NO.

Press

VERIFY

A dash in the right hand digit indicates that it is waiting for your next input.

1

PARAMETER NO.

Press

TAPE ▶ SAVE

When the BANK HOLD switch is pressed, the left digit is locked; then, you can change the right digit by using the NUMBER keys.

3 Use the Edit control or Up/Down buttons to change the parameter's value. Suggestion: Use the Edit to make large changes in value, then use the Up/Down keys to "fine tune" the sound. (VALUE display)

VALUE EDITOR

DOWN   UP
▼   ▲
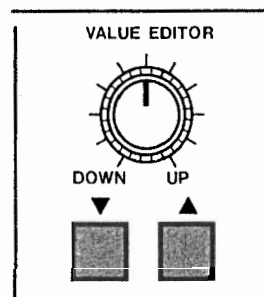
The LED dot in the corner of the VALUE display indicates that the value of the currently selected parameter has been changed. The dot goes out if the return to its original value.

VALUE

Display of VALUE number.

LED dot lights.
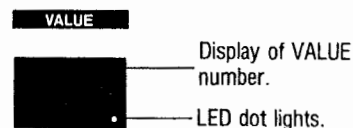
If you want to return to the original value of a parameter, just press both UP/DOWN keys at the same time.

DOWN   UP
▼   ▲

Press   simultaneously.
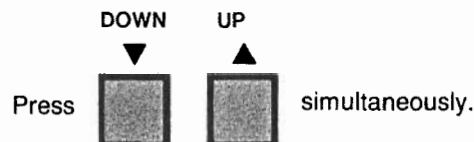
4 Repeat steps 2 and 3 for each parameter that needs to be changed.
To store your new sounds in memory, follow the operation procedures described in "WRITING PROGRAMS TO MEMORY" on page 40.
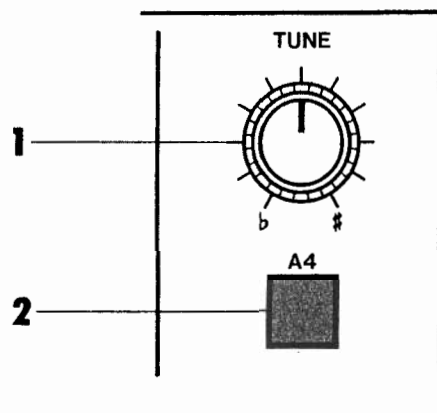
3.Tuning Procedure

1 Features and Functions for Control

1.TUNING CONTROL

This controls the EX-8000's tuning. Turning it to their right raises the pitch, and turning it left lowers pitch.

2.TONE Key

Pushing this key causes the EX-8000 to produce an A4 tone. This is the same as playing a 4th octave A note on the master keyboard. (A standard 440Hz tone will not be produced.)

2 Tuning the EX-8000

● Push the Tone Key. The EX-8000 will produce an A4 tone. (Be sure that volume control is not at "0" as the tone will not be audible in this case.)

● Tune to other instruments or to "A" on a strobe tuner by turning Tuning Control while holding down Tone Key.

● Tone will stop when Tone Key is released.

MIDI

1.MIDI Parameters

The EX-8000 operates according to MIDI data transmitted from external sources. In order to receive this external data, it is necessary to make sure that the EX-8000 Receive channel is the same as the transmitting channel. It is also necessary to set the EX-8000's Key Window function. If this is not done correctly, proper operation will be impossible. Care must be taken in setting MIDI-related parameters.

The following parameters are MIDI-related.

84 CH	1 ◄ ► 16
85 ENA	1 2
86 OMNI	0 1

MIDI

Although not shown here, Key Window parameters 87 & 88 (P. 17) and MIDI Data Transfer parameter 78 (P. 56) are also MIDI-related.

84 CH (DATA RECEIVE CHANNEL)

This parameter is used to select a channel for data receive. At power-ON, the data receive channel is set for that previously selected.

VALUE	DATA RECEIVE CHANNEL
1	CH-1
↕	↕
16	CH-16

85 ENA (Kind of Data Received)

This selects which kinds of received MIDI data the EX-8000 will receive. At value 1 (NOTE DATA), the EX-8000 receives only "note data." At value 2 (All), it receives all MIDI data specified in the EX-8000 MIDI specifications (implementation notes.)
For example, if you don't want program numbers to be changed by some external device through MIDI, then set this value to 1.
The most recently selected ENABLE value is retained when power is turned on and off.

| VALUE	Kind of Data Received
1	(NOTE DATA) NOTE ON/NOTE OFF
2	(ALL) All data

86 OMNI

When Omni is turned on, previous data is stored in the memory. However, Omni mode can also be turned on and off from the controlling (sending) device. When Omni mode is off, then the EX-8000 receives MIDI data sent only on the MIDI channel specified by parameter 84. The most recently selected Omni Mode value is retained when power is turned on and off.

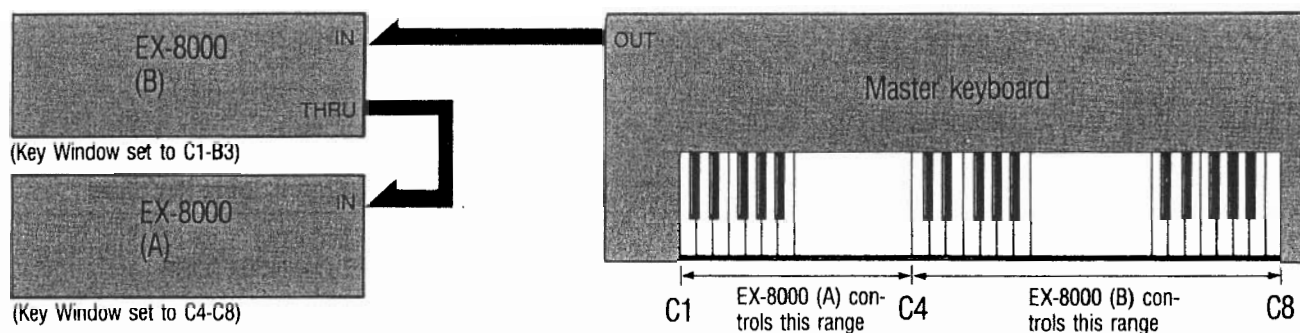| VALUE	OMNI MODE
0	OFF
1	ON

2.Key Window

The EX-8000's pitch range is shown below. At maximum, this range is C1-C8.

Pitch Range and Note Number
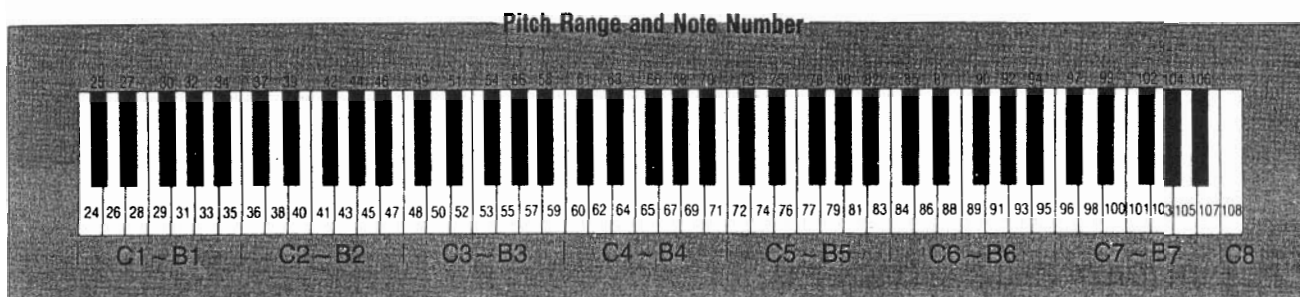
The Key Window Function limits the areas on the keyboard which one EX-8000 controls, from one point on the keyboard to another.

◼ Example of Key Window

■ In this example, multiple EX-8000s are used. This is an example of keyboard splitting. By changing the sound parameters of each EX-8000, sound utilization possibilities are expanded, and can be controlled by one master keyboard.

■ When one EX-8000 is used in conjunction with a MIDI synthesizer, EX-8000 sounds (for example Bass sounds) can be added on to the synthesizer's own sounds, within the range on the keyboard controlled by the EX-8000.

2 Parameters Related to Key Window (These 2 parameters are not displayed on panel.)

87 KEY WINDOW BOTTOM

This parameter sets the low-end range. This can be set in half-steps. The most recently selected point's value is retained when power is turned on and off.

VALUE	POINT
C8	High C
↕	↕
C1	Low C

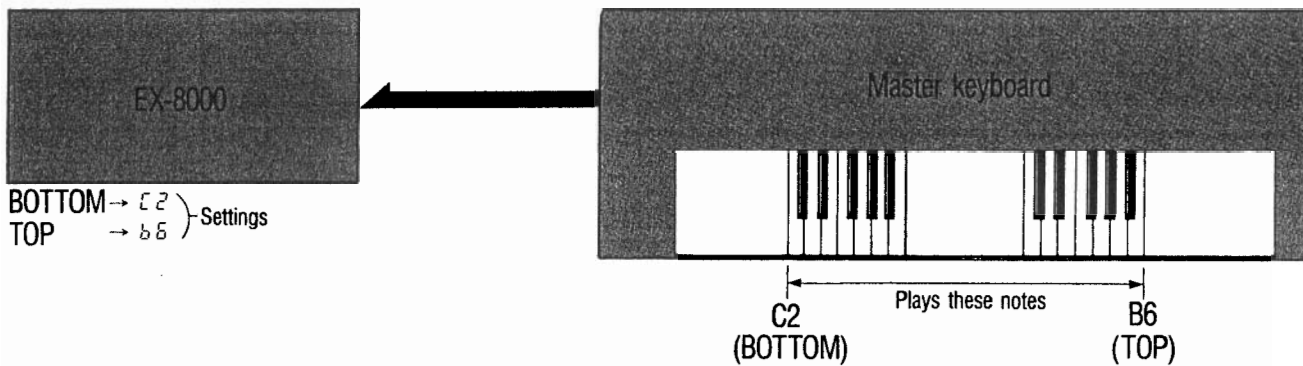Note: When the Key Window Bottom is set to C1, notes lower than note 23 will be registered as the same note in octave 24-35.

88 KEY WINDOW TOP

This parameter sets the high-end range. This can be set in half-steps. The most recently selected point's value is retained when power is turned on and off.

VALUE	POINT
C8	High C
↕	↕
C1	Low C

Note: When the Key Window Top is set to C8, notes higher than note 108 will be registered as the same note in octave 97-108.

■ When the values of parameters 87 and 88 are changed by half-steps, the sharps (♯) are shown by a decimal point on the display: C1 - C.1 - d1 - d.1 Flats (♭) are not shown.

When editing, value can be approximated by using the Edit Control (Edit Control changes notes in major thirds-C1→E1→G#1→C2), and set exactly by pushing the Up/Down keys.
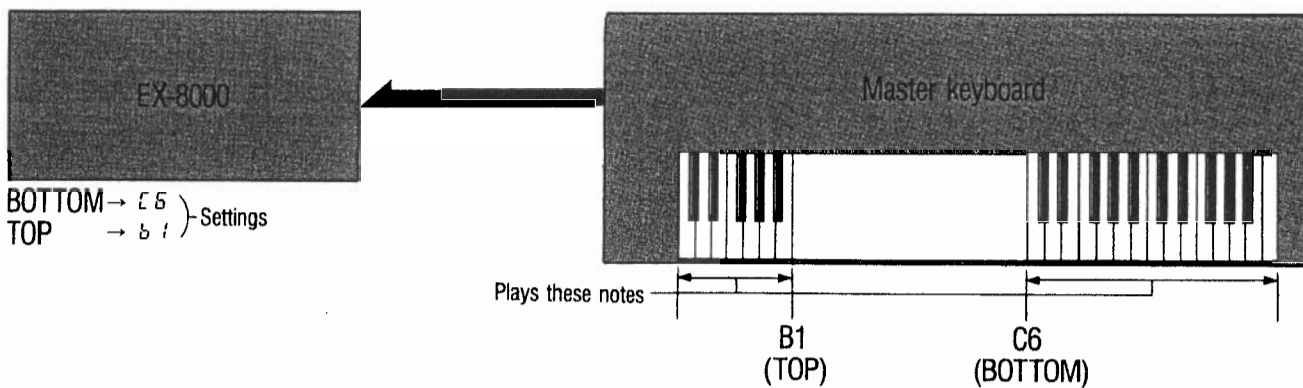
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3 Relationship Between Key Bottom and Key Top

These parameters can be set anywhere throughout the 85 notes on the keyboard, however there are 2 particular relationships which are possible.

■ **When Key Bottom is set lower than Key Top.**

BOTTOM→ *C 2* ⎫
TOP   → *b 6* ⎭ Settings

C2
(BOTTOM)   Plays these notes   B6
                                         (TOP)

■ **When Key Bottom is set higher than Key Top.**

BOTTOM→ *C 6* ⎫
TOP   → *b 1* ⎭ Settings

Plays these notes

B1   C6
(TOP)   (BOTTOM)

*   However, when this setting is used, note data other than that set in EX-8000 is cancelled even if it is received.

3. Transmitted/Received MIDI Data and MIDI Indicators____

■ Received MIDI Data

■ **Note OFF**
■ **Note ON**
■ **Control change:**

  No. 1 OSC modulation
  No. 2 VCF modulation
  No. 7 Volume
  No. 64 Damper pedal on/off
  No. 65 Portamento on/off

■ **Program change**
■ **Channel pressure (After Touch)**
■ **Pitch bender change**
■ **All notes OFF**
■ **Omni MODE OFF**
■ **Omni MODE ON**
■ **Active sensing**
■ **System exclusive information**

■ Transmitted MIDI Data

■**Program Change**
■**System Exclusive Messages**

■ MIDI indicator

The MIDI indicator lights when the above MIDI data is received. When it is not properly received the indicat or does not light, so verification is simple.

MIDI INDICATOR

4.MIDI Jacks

1. MIDI IN

Receives MIDI data.

2. MIDI OUT

MIDI OUT is used only when transmitting internal MIDI data to external MIDI equipment, so it is not normally used. (Does not transmit program change data, etc.)

3. MIDI THRU

Retransmits unchanged MIDI data received through the MIDI IN Jack.

Rear Panel

MIDI

| THRU | OUT | IN |

MIDI THRU   MIDI OUT   MIDI IN

3   2   1
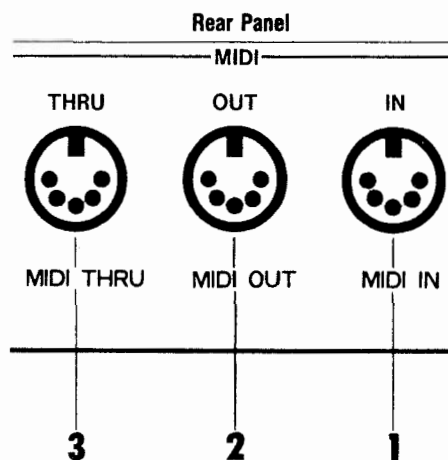
■ **Resetting MIDI**

If the EX-8000 is being used in a MIDI connected system and starts producing erratic results (making a continuous sound, going out of tune, producing erratic modulation, etc.) press the front panel WRITE key. This resets the circuitry. However, if the write switch is set to ENABLE, the WRITE made is effected. Push the WRITE key after setting to DISABLE.

WRITE

Press
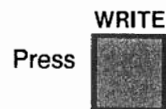
CREATING SOUNDS

1.Sound Synthesis Techniques_____

To create new sounds on the EX-8000, you change or edit old programs. You do not start with a "blank slate". There are 64 sounds already in memory. If you have a new sound in mind, the easiest approach is to first select a sound that resembles the sound you want to create. Then "edit" (change the selected sound until you get the sound you want. If you don't find a similar sound, it doesn't matter; start with any sound you like.)

After you finish editing your sound, you store it into memory. At this point you can give it a different program number (thereby preserving the sound you started with) or the same program (thereby erasing or "overwriting" the old sound). (See page 40 Program Write)

| **Selecting a Program:** Finding a current programmed sound that resembles the new one you wish to create. | **Creating Sounds (Editing):** Changing the values of the parameters that need to be changed to obtain the desired sound. | **Writing the Program to Memory:** Giving the sound a program number and storing it in memory. |

2.Parameters Stored in Memory_____

This section describes parameters which can be stored in the EX-8000's memory to create your sounds.

◼ OSC1

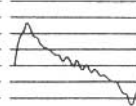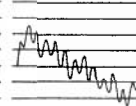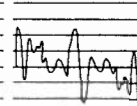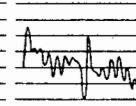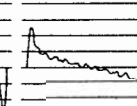| OSC1 | Parameters in this module determine the basic pitch range (OCTAVE) and timbre (WAVEFORM). |
11 OCT 16′ 8′ 4′	
12 W F 1 ◄ ► 16	
13 LEVEL 0 ◄ ► 31	

11 OCT
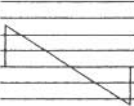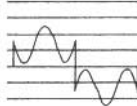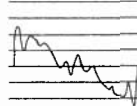
Here you select the basic pitch range of oscillator 1. The higher the value, the lower the pitch. You have three choices which correspond to 16′ (16 foot), 8′, 4′.
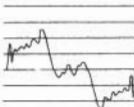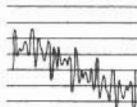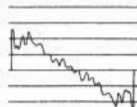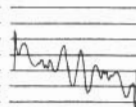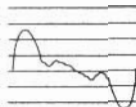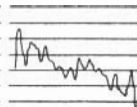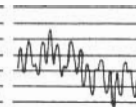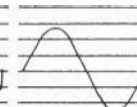
VALUE	OCTAVE
16	16′ (low)
8	8′ (middle)
4	4′ (high)

12 W F

The choice of waveform will have more effect on the tonal characteristics (timbre or tone color) of the sound than will any other parameter. You have sixteen basic waveforms to choose from.

VALUE	1	2	3	4	5	6	7	8
WAVEFORM								
INSTRUMENT FAMILY	Brass, strings, and analog synthesizers	Clarinet and analog synthesizers (harmonics components are the same with "∏")	Acoustic piano	Electric piano	Electric piano (hard)	Clavi	Organ	Brass

VALUE	9	10	11	12	13	14	15	16
WAVEFORM								
INSTRUMENT FAMILY	Saxophone	Violin	Acoustic guitar	Guitar (distorted)	Electric bass	Digital bass	Bell	Organ and whistle

13 LEVEL

Sets output level (volume) of oscillator 1. This is useful for adjusting overall volume to match other programs, and for balancing OSC1 with OSC2 and/or noise as desired.

VALUE	OUTPUT LEVEL
0	No sound from OSC1
↕	↕
31	Maximum volume

2 AUTO BEND

14 OSC SEL 0 1 2 3	This parameter adjusts the change in pitch produced when a note is played on the keyboard.
15 MODE 1 2	As soon as a key is pressed, the pitch is shifted to the pitch level of the pressed key. This is useful for the synthesis of human voice and brass sounds.
16 TIME 0 ◄ ► 31	
17 INT 0 ◄ ► 31	
AUTO BEND	

14 OSC SEL

Selects the oscillator(s) for AUTO BEND.

VALUE	Oscillator Used for AUTO BEND
0	No oscillator (AUTO BEND OFF)
1	OSC1
2	OSC2
3	OSC1 and OSC2

15 MODE

Selects between UP and DOWN modes. In UP mode, the pitch rises to the pitch of the pressed key. In DOWN mode, the pitch falls to the pitch of the pressed key.

VALUE	Pitch Change after Key Pressing
1	Pitch rises to the key level
2	Pitch falls to the key level

Pitch ▲ Pitch change

DOWN mode

Pressed key pitch

UP mode
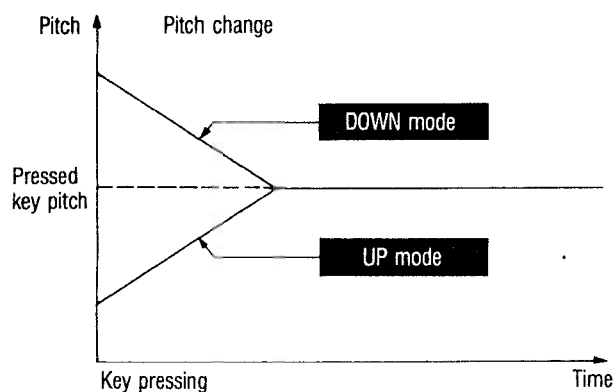
Key pressing — Time

16 TIME

Sets a period of time from the key pressing to the time when the pitch reaches the pitch of the pressed key.

Pitch ▲   Pitch change

Pressed key pitch

Period set by TIME
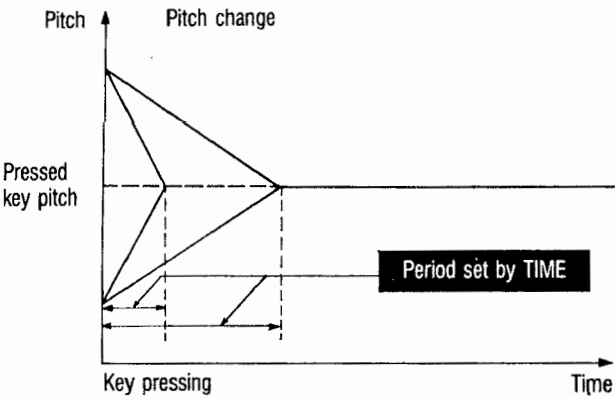
Key pressing   Time

VALUE	Time Period from Key Pressing to the Pitch's Reaching the Key Level
0	Short
↕	↕
3 1	Long

17 INT

Specifies the pitch where pitch change starts.

Pitch ▲   Pitch change

Pitch interval set by INTENSITY

Pressed key pitch

Pitch interval set by INTENSITY

Key pressing   Time
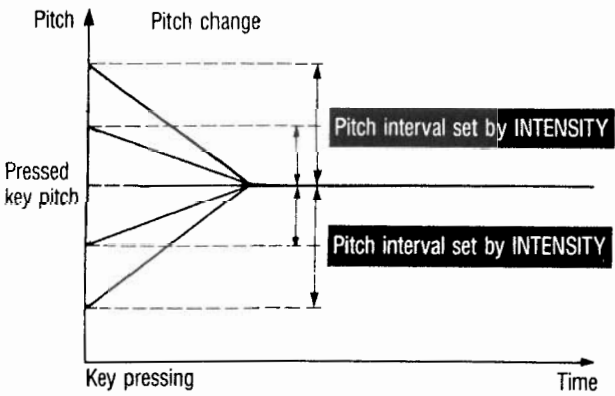
VALUE	Pitch Change width
0	No pitch change (AUTO BEND OFF)
↕	↕
3 1	Max. bend width (2 octave)

3 OSC2

OSC2	This is your second sound source, designed to be used together with OSC1 to create thicker, richer and more complex sounds.
21 OCT 16′ 8′ 4′	
22 W F 1 ◄ ► 16	
23 LEVEL 0 ◄ ► 31	
24 INTRVL 1-3 3 4 5	
25 DETUNE 0 ◄ ► 6	

21 OCT

As with OSC1, you have a choice of three pitch ranges: 4′, 8′, and 16′.

22 W F

Once again, you have sixteen waveforms to choose from.

23 LEVEL

Adjusts output level as in OSC1.
Raising levels of this parameter or of OSC1 (*13*) too high may cause distortion.

24 INTRVL

This lets you transpose or offset the pitch of OSC2 so that it sounds a constant interval above OSC1. Selectable intervals are: Unison (same as OSC1), a minor 3rd, major 3rd, perfect 4th, or perfect 5th above.

*You will get different intervals (from those shown above) depending on the OCTAVE values for the two oscillators.

VALUE	INTERVAL
1	Unison
-3	Minor 3rd
3	Major 3rd
4	Perfect 4th
5	Perfect 5th

25 DETUNE

For fine pitch adjustment of OSC2 relative to OSC1. The higher the value, the greater the pitch difference between the two oscillators. Detuning can help achieve a fatter, more animated sound.

VALUE	PITCH DIFFERENCE
0 ↕ 6	Minimum (no detuning—same pitch) ↕ Maximum (25 cents)

4 NOISE

26 LEVEL 0◄ ►31 NOISE	Provides white noise (a mixture of all frequencies) as a separate sound source. This is useful for adding "breath noise" to simulated acoustic instrument sounds, and for creating special effect sounds such as wind, surf, gunshot sounds, etc.

26 LEVEL

Adjusts noise volume.

VALUE	LEVEL
0 ↕ 31	No noise ↕ Maximum

5 VCF

VCF	This EX-8000's eight voltage controlled filters (one per voice) remove or emphasize portions of the basic waveform harmonics. This affects the timbre of the OSC1, OSC2, and NOISE waveforms. These VCF are low-pass filters, which remote frequencies above the selected CUTOFF frequency (while allowing lower frequencies to pass through).
31 CUTOFF 0◄ ►63 32 RESO 0◄ ►31 33 KBD 0◄ ► 3 34 POL 1 2 35 EG 0◄ ►31	

3 1 CUTOFF

This determines the cutoff frequency of the low-pass filter. The higher the cutoff frequency, the less effect the filters have on the basic waveforms (since more frequencies are passed).
At the highest value, 63, all harmonics are passed. The lower the value, the more harmonics are cutoff, so the sound becomes progressively rounder or less bright.

VALUE	TIMBRE
0 ↕ 63	Dull or rounded ↕ Bright, unchanged timbre

Low-pass filter's function and cutoff frequency
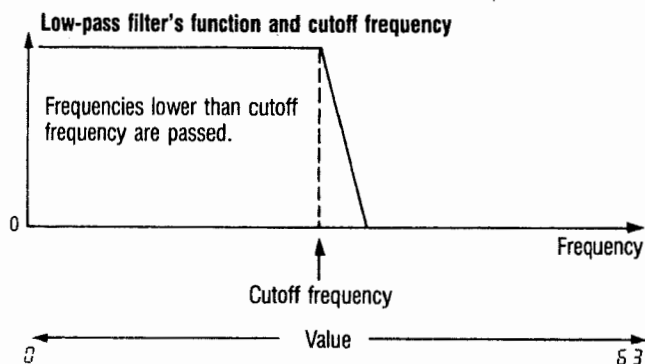
3 2 RESO

This emphasizes the harmonics near the cutoff frequency, producing a characteristic peaky or bandpass type of sound.
The higher the value, the higher the resonance peak and the more obvious the effect. At or near the maximum value 31, the VCFs go into self-oscillation, producing a pure sine wave, which can be used as an additional sound source for special effects. The pitch of the VCF tone is affected by the Cut Off, Keyboard Track, EG INT, and MG VCF parameters.

VALUE	EFFECT
0 ↕ 31	None ↕ Self-oscillation, very "peaky" sound.
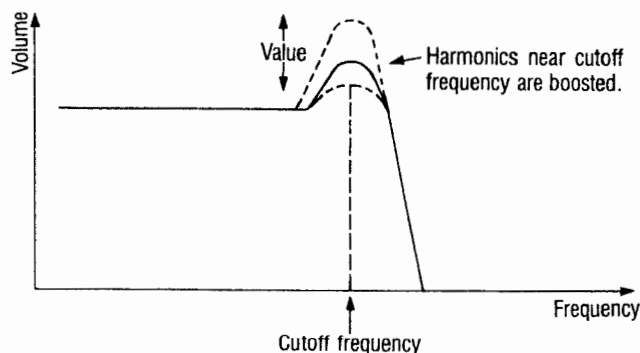
33 KBD

Keyboard tracking affects how the cutoff frequency changes as you play notes higher or lower on the keyboard. At full tracking (VALUE = 3), cutoff rises in exact proportion to keyboard pitch, maintaining the same relative timbre for all notes. At half tracking (VALUE 2) it rises a half octave for every full octave on the keyboard. (The difference will be obvious if resonance is set to a high value.)

VALUE	KBD Track Effect
0	0 0% (No change in cutoff)
1	$\frac{1}{4}$ 25%
2	$\frac{1}{2}$ 50%
3	1 100% (Max. effect)

34 POL

Determines how the VCF cutoff frequency is affected by the VCF EG (Envelope Generator). With normal polarity (VALUE = 1), the cutoff frequency rises during the EG's Attack and falls during Decay. Use "inverted" polarity (VALUE = 2) for special sounds where you want the opposite effect. (See page 29 VCF EG)

VALUE	POLARITY	
1	/\⌐\	Cutoff frequency is swept up during the attack portion of the envelope, and down during the decay portion, etc.
2	\/⌐/	Cutoff frequency is swept down during the attack portion, and up during the decay portion of the envelope.

35 EG

The "EG Intensity" parameter determines how much the VCF Envelope Generator (EG) will affect the cutoff frequency. The higher the value, the more obvious the change in tone color (timbre). (See page 29 VCF EG)

VALUE	INTENSITY
0	No effect
↕	↕
3 1	Maximum change in tone color.

6 VCF EG

VCF EG

41 ATK	0 ◄ ► 31	
42 DEC	0 ◄ ► 31	
43 B P	0 ◄ ► 31	
44 SLP	0 ◄ ► 31	
45 SUS	0 ◄ ► 31	
46 REL	0 ◄ ► 31	
47 VEL	0 ◄ ► 7	

This envelope generator controls the "contour" (or changes over time, in terms of the sound's attack, sustain, decay, and other dynamic characteristics) of each programmed sound. The "voltage changing over time" generated by the VCF EG is controlled by the parameters "34 POLARITY" and "35 EG INT" and, then, modulates VCF cutoff frequencies to create "timbre changes over time." (See POLARITY and EG INT on page 28.) The output voltage of VCF EG is determined by the following parameters.
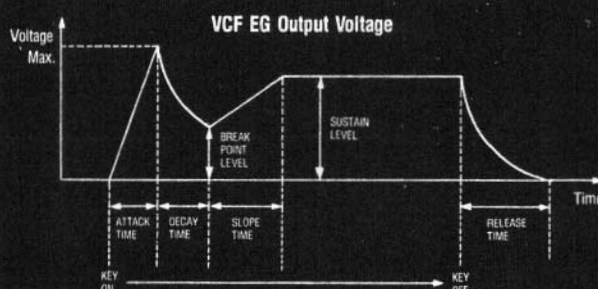
This section also includes are parameter to change timbre according to the speed of playing a note on the keyboard.

41 ATK (Rate)

The parameter controls how long it takes for the VCF EG output voltage to rise from zero to its maximum level.

VALUE	ATTACK TIME
0	Short
↕	↕
31	Long

42 DEC (Rate)

This parameter controls how long it takes for VCF EG output voltage to fall from its maximum level (after an attack time) to the break point level.

VALUE	DECAY TIME
0	Short
↕	↕
31	Long

43 B P (Break Point Level)

This parameter determines the VCF EG output voltage after the decay time. If this is set to the same value as the sustain level, then the envelope becomes a conventional ADSR type.

VALUE	BREAK POINT LEVEL
0	0
↕	↕
3 1	Max.

44 SLP (Rate)

This parameter controls how long it takes for the VCF EG output voltage to change from the break point level to the sustain level.

VALUE	SLOPE TIME
0	Short
↕	↕
3 1	Long

45 SUS (Level)

This parameter determines the VCF EG output voltage after the slope time.

VALUE	SUSTAIN LEVEL
0	0
↕	↕
3 1	Max.

46 REL (Rate)

This parameter determines how long it takes for the VCF EG output voltage to fall to zero level after the note is released on the keyboard.

VALUE	RELEASE TIME
0	Short
↕	↕
3 1	Long

47 VEL

Controls the degree of timbre change according to the speed of playing a note on the keyboard.
When the value is made larger, the degree of timbre change becomes greater. (Actually, change of EG output becomes larger.)
Set value at "0" when using a MIDI keyboard without Touch Sensitivity.

VALUE	DEGREE OF TIMBRE CHANGE
0	No change
↕	↕
7	Max. change

Ex: When the value is changed for a fixed envelope.

EG output (Cutoff)

— Valve set to 7.

— Valve set to 3.

— Value set to "0"
(No change)
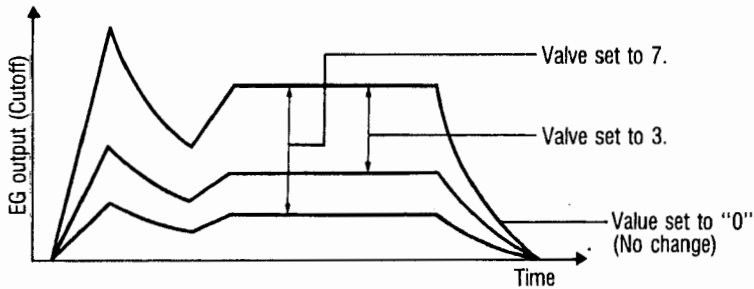
Time

7 VCA EG

VCA EG	
51 ATK	0 ◄ ► 31
52 DEC	0 ◄ ► 31
53 B P	0 ◄ ► 31
54 SLP	0 ◄ ► 31
55 SUS	0 ◄ ► 31
56 REL	0 ◄ ► 31
57 VEL	0 ◄ ► 7

This envelope generator determines how volume changes over time. Similar to VCF EG, the following six parameters determine the volume change.

Six parameters of VCA EG and volume change

Voltage Max.

SUSTAIN LEVEL

BREAK POINT LEVEL

ATTACK TIME DECAY TIME SLOPE TIME RELEASE TIME

KEY ON KEY OFF

Time

This section also includes the parameter to change volume according to the speed of playing a note on the keyboard.

---

5 1 ATK (Rate)

Controls how long it takes for the volume to rise from zero to its maximum level after a note is played on the keyboard.

VALUE	ATTACK TIME
0	Short
↕	↕
3 1	Long

5 2 DEC (Rate)

Determines how long it takes for the volume to fall from its maximum attack level to the break point level.

VALUE	DECAY TIME
0	Short
↕	↕
3 1	Long

53 B P (Break Point Level)

Determines the level at which volume stops dropping during the decay. If this is set to the same value as the sustain level, then the envelope becomes a conventional ADSR type (as if it had no break point or slope parameters).

VALUE	BREAK POINT LEVEL
0	0
↓	↓
31	Max.

54 SLP (Rate)

Determines how long it takes for volume to change from the break point level to the sustain level. Note that if the break point is lower than the sustain level, then the slope functions as a second attack. If the break point is higher than sustain, then slope functions as a second decay.

VALUE	SLOPE TIME
0	Short
↓	↓
31	Long
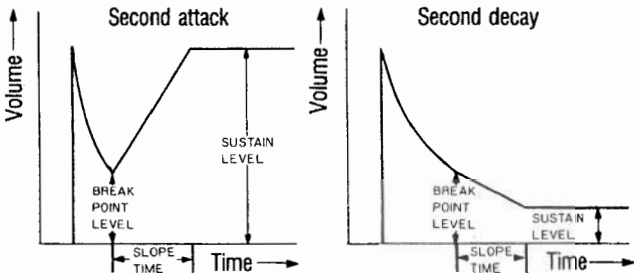
55 SUS (Level)

Determines the level at which volume is held after the attack, decay, and slope phases are completed, for as long as the note is held down on the keyboard.

VALUE	SUSTAIN LEVEL
0	0
↓	↓
31	Max.

56 REL (Rate)

Determines how long it takes for the sound to fade away after you release the note on the keyboard.

| VALUE	RELEASE TIME
0	Short
↓	↓
31	Long

5 7 VEL

Control the degree of volume change according to the speed of playing a note on the keyboard. When the value is made larger, the degree of volume change becomes larger. Set value at "0" when using a MIDI keyboard without Touch Sensitivity.

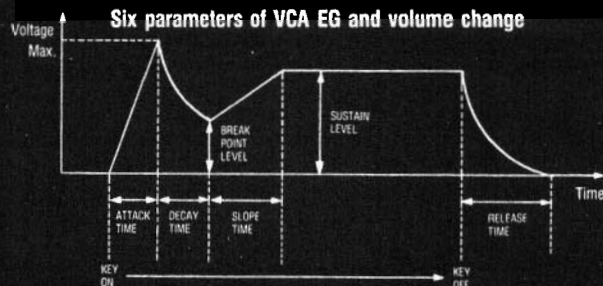| VALUE	DEGREE OF VOLUME CHANGE
0	No change
↕	↕
7	Max. change

Ex.: When the value is changed for a fixed envelope.

Value set to "7".
Value set to "3".
Value set to "0" (No change)

Time
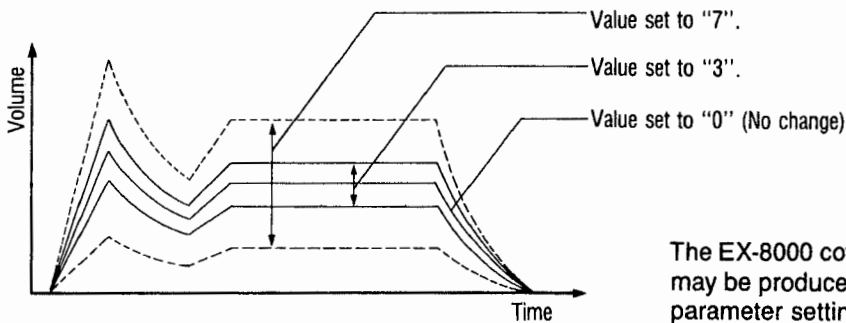
The EX-8000 covers a wide range of sound, so a "click" may be produced when a key is pressed, depending on parameter settings.

8 MG

MG	
61 W F	0 ◄ ► 3
62 FREQ	0 ◄ ► 31
63 DELAY	0 ◄ ► 31
64 OSC	0 ◄ ► 31
65 VCF	0 ◄ ► 31

This stands for Modulation Generator. (LFO) The MG section utilizes a low frequency oscillator to modulate the EX-8000's oscillator pitch (creating vibrato effects) and/or VCF cutoff frequency (creating filter mod or "wah-wah" effects).

6 1 W F

Selects the waveform to modulate oscillator/VCF.

VALUE	WAVEFORM
0	△
1	◁
2	◁
3	⊓

62 FREQ

Determines the speed of the cyclic pitch or tonal variation. The higher the value, the faster the speed.

VALUE	SPEED OF VIBRATO OR FILTER MOD
0	Slow
↕	↕
31	Fast

63 DELAY

Determines the amount of delay following key depression prior to the onset of vibrato or other modulation effects. At 0, there is no delay, and modulation begis immediately when the first note is played. The higher the value, the longer the delay.

VALUE	DELAY TIME
0	None: modulation effect starts immediately ↕
↕	
31	Long delay

64 OSC (vibrato depth)

Controls the amount of pitch variation in the vibrato effect (that is, the depth of frequency modulation).

VALUE	VIBRATO DEPTH
0	No effect
↕	↕
31	Deep modulation

65 VCF (filter mod depth)

Controls the depth of cyclic filter mod effects (that is, the depth of VCF cutoff frequency modulation).

VALUE	FILTER MOD DEPTH
0	No effect
↕	↕
31	Deep modulation

9 BEND

66 OSC	0 ◄ ►12
67 VCF	0 1

BEND

This parameter lets you determine the maximum change in pitch produced by the joystick or pitch bender on the master keyboard. It also lets you choose whether or not they will effect the VCF cutoff frequency.

66 OSC

Determines the maximum change in pitch produced by moving the joystick or bender, in exact semitone steps. The higher the value, the greater the pitch change (up to 1 octave).

VALUE	PITCH BEND
0	None
↕	↕ (change in semitone steps according to the value)
12	1 octave

67 VCF

Enables or disables "sweeping" of the VCF cutoff frequency via the joystick, or bender.

VALUE	JOYSTICK VCF EFFECT
0	OFF
1	ON

When the VCF parameter value is 1 (ON) then moving the joystick to the right produces a brighter sound; moving it to the left produces a darker or duller sound.

10 DIGITAL DELAY

DIGITAL DELAY

71 TIME	0 ◄ ► 7
72 FACTR	0 ◄ ►15
73 FB	0 ◄ ►15
74 MOD FRQ	0 ◄ ►31
75 MOD INT	0 ◄ ►31
76 LEVEL	0 ◄ ►15

This module lets you produce digital delay effects, including chorus and short delay.

71 TIME (Delay time)

Adjusts delay time coarsely. Fine adjustment is performed by using the FACTOR parameter.

VALUE	DELAY TIME RANGE
0	About 2 ~ 4ms
1	About 4 ~ 8ms
2	About 8 ~ 16ms
3	About 16 ~ 32ms
4	About 32 ~ 64ms
5	About 64 ~ 128ms
6	About 128 ~ 256ms
7	About 256 ~ 512ms

72 FACTR

Performs fine adjustment of delay time in a range specified by the TIME parameter (71).

VALUE	DELAY TIME LENGTH
0 ↕ 15	(×0.5) Short ↕ (×1) Long

73 FB

Controls feedback quantity.

VALUE	FEEDBACK QUANTITY
0 ↕ 15	0% (No feedback) ↕ 100%

74 MOD FRQ (Modulation frequency)

Determines the speed of the low-frequency oscillator output used to modulate delay time.

VALUE	FREQUENCY
0 ↕ 31	Slow ↕ Fast

75 MOD INT (Modulation intensity)

Determines the modulation depth for delay time modulation.

VALUE	MODULATION DEPTH
0	No modulation
↕	↕
31	Large

76 LEVEL

Control the volume of effect sounds mixed in direct sound (the sound without delay effect).

VALUE	LEVEL
0	No effect sound
↕	↕
15	Max.

⑪ PORTAMENTO

77 TIME 0 ◄ ► 31	This parameter lets you produce a poly-
PORTAMENTO	phonic note gliding effect at various rates.

77 TIME (Portamento)

Determines how gradual the change in pitch is.

VALUE	PORTAMENTO TIME
0	No portamento effect (instant change)
↕	↕
31	Slow change in pitch from one note to the next.

[12] AFTER TOUCH

AFTER TOUCH	
81 OSC MG 0 ◄ ► 3	The EX-8000 receives AFTER TOUCH (channel pressure) enabling you to control the vibrato depth, tone brightness, and volume by pressing harder after playing a note on the keyboard. AFTER TOUCH is used to determine the degree of these effects.
82 VCF 0 ◄ ► 3	
83 VCA 0 ◄ ► 3	

81 OSC MG

Determines the depth of vibrato controlled by the pressure on the keyboard. However this is not effective when 64 is at its highest value in MG parameter.

VALUE	CHANGE OF VIBRATO DEPTH
0	No change
↕	↕
3	Max. change

82 VCF

Determines the change of tone brightness controlled by the pressure on the keyboard. However this is not effective when sustain level 45 is at maximum level in VCF EG parameter.

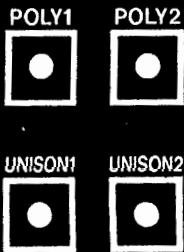| VALUE	BRIGHTNESS CHANGE
0	No change
↕	↕
3	Max. change

83 VCA

Determines the change of volume controlled by the pressure on the keyboard. However this is not effective when sustain level 55 is at maximum level in VCA EG parameter.

VALUE	CHANGE OF VOLUME
0	No change
↕	↕
3	Max. change

🔳 KEY ASSIGN

KEY ASSIGN

POLY1   POLY2

UNISON1   UNISON2

The EX-8000 has eight synthesizer voices. The KEY ASSIGN function determines which voice is used (and how it is used) to produce the sound when a note is played on the keyboard.
The KEY ASSIGN section provides four modes — POLY1, POLY2, UNISON1, and UNISON2 — to give you an optimum choice for playing your new sounds.
When you write a program to the EX-8000, the KEY ASSIGN mode being selected at that time will be stored in memory.

■POLY1 Mode

This mode is used for normal polyphonic playing. The EX-8000's eight voices are assigned sequentially as notes are played. If you play more than eight notes, then the most recent notes will cancel out the earliest notes still sounding. In this mode, sounds using long release times will create an effect of "overlapping" notes, which will create a spacious sound.
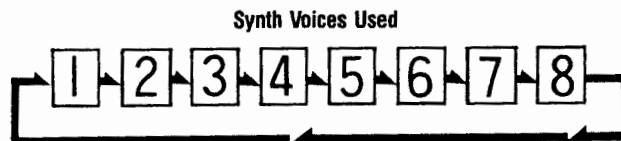
Synth Voices Used

When one note is played, the eight voices are used sequentially.

■POLY2 Mode

This is most useful for certain instrumental sounds, and for sounds using polyphonic portamento effects. If a one note passage is being played, the first synth voice (out of eight) is used continuously. If two notes are played, the first two voices are used continuously, and so forth.

Synth Voices Used
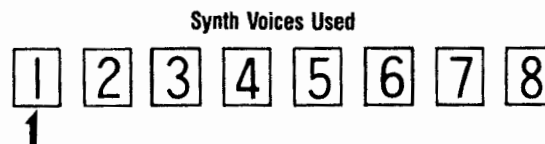
When one note is played, the first voice is always used. When two or more notes are played, other voices also are used.

■UNISON 1, 2 Mode

This mode assigns all eight voices to each key depression, following a "last note played" priority system. Because all eight voices are automatically detuned when this mode is selected, this produces a very fat, rich sound. This mode is useful when the EX-8000 is used for soloing or playing bass parts.
UNISON 1 causes the envelope to retrigger every time a new key is pressed, regardless of other keys being held.
UNISON 2 will result in single trigger operation (only the first key pressed will activate the envelope).

Synth Voices Used
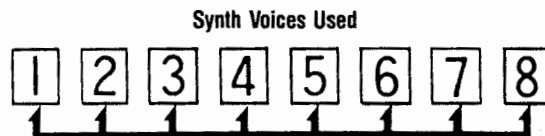
All voices are used for each note played.

3.Writing Programs to Memory_____

1 Features and Functions for Control

1. NUMBER Keys

Used to specify the program number.

2. WRITE Key

Used to start writing programs.

3. PROGRAM NO. Display

Shows presently selected program number.
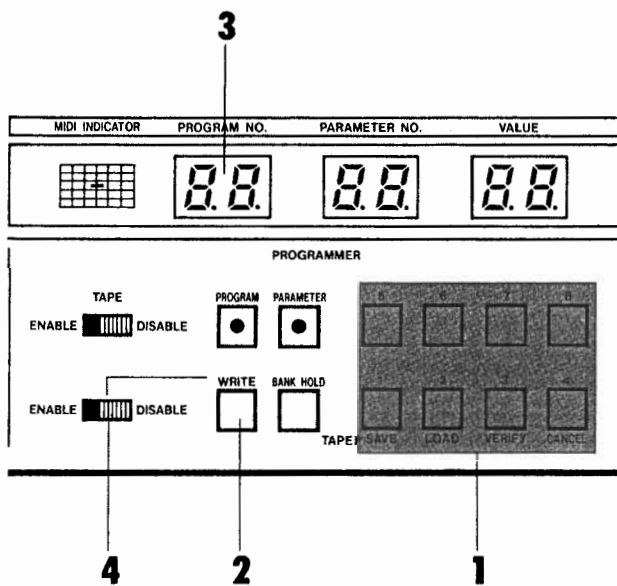
4. WRITE Switch

When this switch is set to ENABLE, memory write operation is enabled.
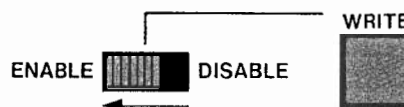
2 Program Write Procedure

Create a sound (as described in the previous section of this manual).

1 Set the front panel WRITE switch to the ENABLE posision.

2 Press the WRITE key on the front panel.

Press
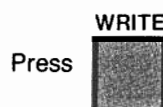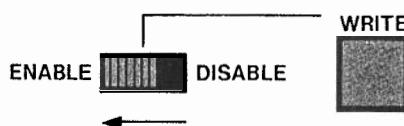
3 At this time, the program number flashes.

Flashing

④ Use the NUMBER keys to select the program number where you want to store your sound. The new sound is stored in the specified memory location immediately after the program number selection. (Previous contents of the selected memory location are erased.)

☆ A selected parameter can be stored in memory with a program. It will be very helpful if you specify a parameter (e.g., cutoff frequency) during programming which will be edited often during live performance.

Example: Storing your sound at program number 34.

Press | 3 VERIFY | → | PROGRAM NO. | Display will show a dash in the right digit. (Waiting for input)

Press | 4 CANCEL | → | PROGRAM NO. |
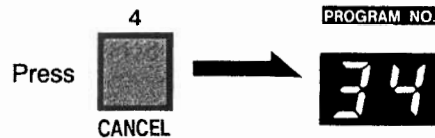
Your sound now occupies the memory space called program number 34.
The previous contents of the space have been erased.

```
Caution:
Be sure to return the front panel WRITE switch to
the DISABLE position after completing this proce-
dure. This helps protect against accidental over-
writing (erasure) of memory contents.
If you accidentally press the WRITE key and do
not wish to "write" a program into memory, simp-
ly switch the front panel WRITE switch to the DIS-
ABLE position. This will cancel the write proce-
dure.
```

❸ Repositioning Sounds in Memory

If you always use particular sounds in the same order in a song or stage performance, then you can simplify matters by storing the sounds in the same order in which they will be used. That is, store your first sound under program number 1, the second sound under program number 2, and so on. You can then use a footswitch to advance from one sound to the next, as you need it. Sounds are repositioned by copying them from their present program number to a different program number.

① Set the front panel WRITE switch to the ENABLE position.

ENABLE ▦ DISABLE   WRITE
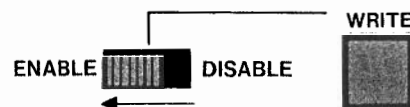
② Use the NUMBER keys to select the program number of the sound that you want to reposition.

3 Press the WRITE key on the front panel.
The program number selected in step 2 flashes.

Press **WRITE** ⬛ ➡️ **PROGRAM NO.** 🔢 —Flashing

4 Use the NUMBER keys to select the program number where you want the sound to be located. When the selection is done, the sound specified by step 2 is repositioned to the selected program number. (The previous contents under the program number are erased.)

☆ If the previous contents should not be erased, the previous contents must be repositioned to another unused program location before step 4.

5 Follow step 2 through 4 above, to rearrange your sounds in the order that is most convenient for performance.

TAPE INTERFACE

The EX-8000 is equipped with a tape interface that lets you SAVE all sound data stored in memory on cassette tape. Later you can LOAD the data from the tape back into the EX-8000's internal memory. A wide variety of sound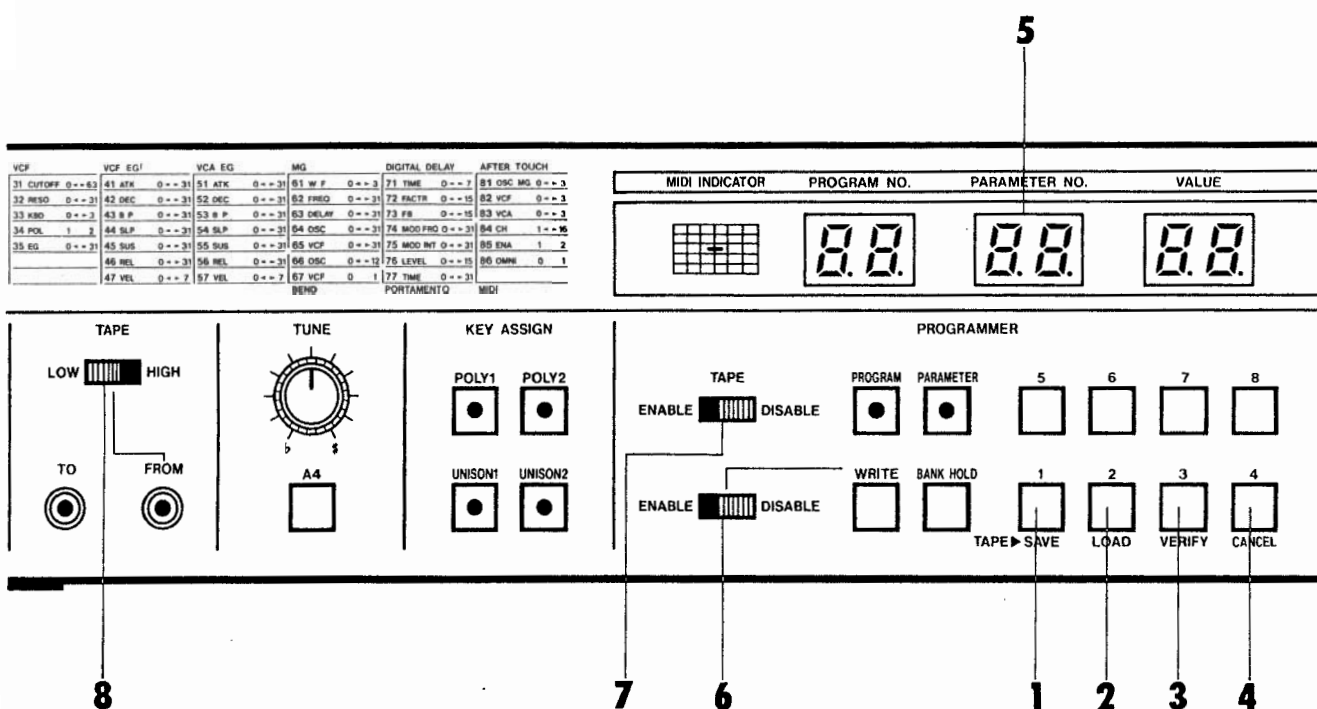 data can be stored on cassette tape. The LOAD operation is so fast (a little more than 10 seconds) that you can even change your programs during a performance.

1.Features and Functions for Control___

VCF		VCF EG		VCA EG		MG		DIGITAL DELAY		AFTER TOUCH	
31 CUTOFF	0↔63	41 ATK	0↔31	51 ATK	0↔31	61 W F	0↔3	71 TIME	0↔7	81 OSC MG	0↔3
32 RESO	0↔31	42 DEC	0↔31	52 DEC	0↔31	62 FREQ	0↔31	72 FACTR	0↔15	82 VCF	0↔3
33 KBD	0↔3	43 B P	0↔31	53 B P	0↔31	63 DELAY	0↔31	73 FB	0↔15	83 VCA	0↔3
34 POL	1 2	44 SLP	0↔31	54 SLP	0↔31	64 OSC	0↔31	74 MOD FRQ	0↔31	84 CH	1↔16
35 EG	0↔31	45 SUS	0↔31	55 SUS	0↔31	65 VCF	0↔31	75 MOD INT	0↔31	85 ENA	1 2
		46 REL	0↔31	56 REL	0↔31	66 OSC	0↔12	76 LEVEL	0↔15	86 OMNI	0 1
		47 VEL	0↔7	57 VEL	0↔7	67 VCF	0 1	77 TIME	0↔31		
						BEND		PORTAMENTO		MIDI	

MIDI INDICATOR	PROGRAM NO.	PARAMETER NO.	VALUE

TAPE — LOW / HIGH — TO / FROM
TUNE — A4
KEY ASSIGN — POLY1 POLY2 / UNISON1 UNISON2
PROGRAMMER — TAPE ENABLE/DISABLE, ENABLE/DISABLE — PROGRAM PARAMETER 5 6 7 8 — WRITE BANK HOLD 1 2 3 4 — TAPE▶ SAVE LOAD VERIFY CANCEL

1. SAVE key
Press this key to write EX-8000 program memory contents to your connected tape recorder.

2. LOAD key
Press this button to read data from your tape recorder while playing back a tape.

3. VERIFY key
This is used to check recorded data (immediately after the SAVE or LOAD procedure) to make sure that it has been properly performed.

4. CANCEL
If an error occurs during SAVE or LOAD operation, pressing this key lets you start over again, if you press the CANCEL key during SAVE, LOAD, or VERIFY operation, it will immediately interrupt and cancel the operation.

5. DISPLAY
This gives you messages to keep you informed of tape interface operations and possible problems.

6. WRITE switch
This is set to ENABLE to enable LOAD operation.

7. TAPE switch
This switch is set to ENABLE to make tape interface possible.

8. HIGH/LOW switch
This switch is used to make the EX-8000 match the output level of the connected tape recorder during VERIFY or LOAD operation.

2.Saving Program Data on Tape

■ Follow the procedures below to write EX-8000 program memory contents to your connected tape recorder.

[1] Connect the EX-8000 front panel TO TAPE jack to the microphone (mic) input jack on the tape recorder. You may need a plug adaptor or special connection cord if the input jack is not the usual "mini jack" size. When the input of the tape recorder is stereo, use the left channel.

[2] Set the TAPE switch to the ENABLE (ENA) position.
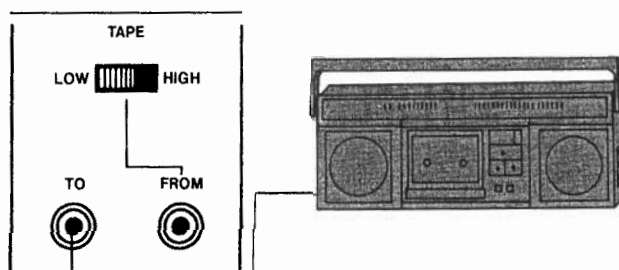
The DISPLAY will now appear as shown here.
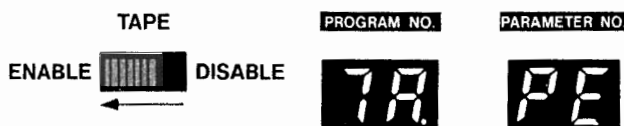
[3] Prepare the tape recorder for recording. Begin recording. and let the tape advance until it is past the leader tape (at the beginning of the cassette).

[4] Press the recorder's pause key at the point from which you will begin recording data.
At this point, the EX-8000 is sending out a test tone as a reference for setting recording level (input level) on the tape recorder. Adjust the tape recorder's recording level as you would normally (refer to tape recorder's instruction manual).

[5] After setting recording level, release the pause key so that the recorder begins recording.

[6] Press the SAVE key on the EX-8000.

(A ５Ａ♂Ｅ message indicates SAVE mode)
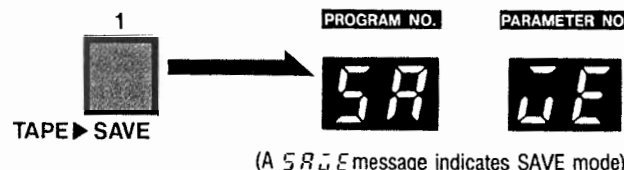
The EX-8000 will start sending data and the DISPLAY will appear as shown here.
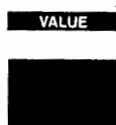
This shows the bank number (left digit of program number) 1-8 during data output.

7 When the DISPLAY again shows TAPE, then you can stop the tape recorder.
This completes the SAVE procedure. However, it is good practice to repeat the SAVE procedure several times, as a hedge against the possibility of losing data because of tape dropouts.

PROGRAM NO. PARAMETER NO.

7A **PE**
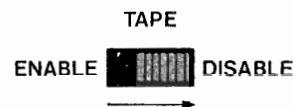
8 Reset the EX-8000 front panel TAPE switch to the DISABLE position.

TAPE

ENABLE ▓▓ DISABLE

───▶

9 Do not change any settings on the EX-8000 until you complete the VERIFY procedure (in the following section).

■ **If you listen to a tape of recorded data, you will hear the following tones:**

Level set tone (lower pitched "oooh...")

↓

Leader tone (high-pitched "eee...")

↓

Data tone (medium-pitched "noise")

↓

End tone (high-pitched "eee...")

↓

Level set tone (lower pitched "oooh")
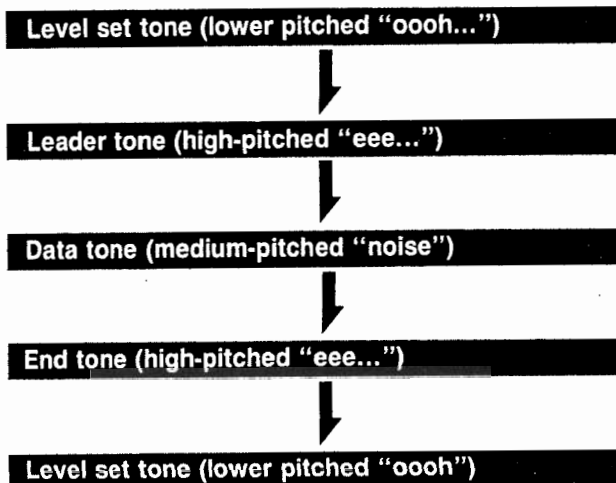
Leader tone: Indicates the start of VERIFY and LOAD operations.

Data tone: The actual digital data from EX-8000 sound program memory.

End tone: Indicates the end of the operation.

3.VERIFY Procedure

■ **The VERIFY procedure should always be used immediately after you finish a SAVE (or LOAD) operation. This is to make sure that data has been properly recorded. It is also useful for determining the best playback level setting for your recorder.**

[1] Connect the EX-8000 front panel FROM TAPE jack to the output jack (earphone, line out, etc.) of your recorder. Set the High/Low switch to match your tape recorder's output signal level.

Recorder output jack	HIGH/LOW
AUX (line out)	LOW
Earphone or headphone output	HIGH

From recorder
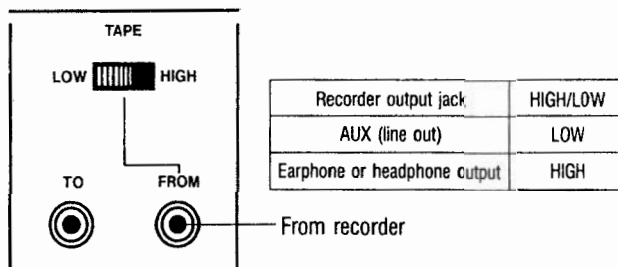
[2] Set the EX-8000 panel TAPE switch to the ENABLE position.

This shows the EX-8000 is in the tape interface mode.

[3] Set the tape recorder's playback volume a bit higher than usual. If the recorder has tone controls, set them to the center positions.

[4] Rewind the tape. Begin tape playback. Stop the tape (using the stop or pause key) when you reach the beginning of the leader tone.

[5] Press the VERIFY key on the EX-8000.
The DISPLAY will show "VERIFY" to confirm the VERIFY mode.

[6] Start the tape recorder (press the play key or release the pause key). The DISPLAY will show "VERIFY" to confirm the VERIFY mode.

The DISPLAY will show the bank number (1-8) for the VERIFY operation.

7 If the recorded data match the EX-8000 internal memory data then the DISPLAY will give a "Good" message. The DISPLAY will appear as shown here if data is successfully verified.

PROGRAM NO.	PARAMETER NO.
Go	od

● **If you get an error (Err) message as shown here**
Press the CANCEL Key, lower (or raise) the tape recorder's output volume, and repeat steps 4 - 6 .

PROGRAM NO.	PARAMETER NO.
E	rr

Press 4 CANCEL

● **If the DISPLAY does not change after ten seconds of tape playback**
Raise the tape recorder's output volume level and repeat steps 4 - 6 .

PROGRAM NO.	PARAMETER NO.
ur	FY

8 When you get a "Good" message, you can stop the tape recorder. Make a note of the recording level, playback level, and HIGH/LOW switch setting that resulted in the "Good" message.

PROGRAM NO.	PARAMETER NO.
Go	od

9 Set the EX-8000 front panel TAPE switch to the DISABLE position.
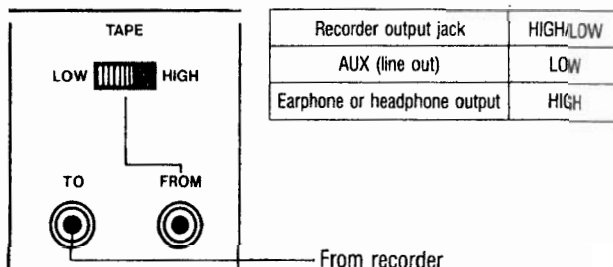
TAPE
ENABLE ▦ DISABLE

Note: You will not get a "Good" message if the recorded data is different in any way from the data in the EX-8000's internal memory. If you change a single parameter value or the key assign mode and then try VERIFY, you will get an error "Err" message.
If you still don't get a "Good" message after trying many different output level settings on the tape recorder (and HIGH/LOW switch settings on the EX-8000) then your recording level may be wrong. Try saving again at a different recording level.

4.LOAD Procedure

■ **This procedure is used to put recorded data back into the EX-8000's internal memory.**

1 Connect the EX-8000 front panel FROM TAPE jack to the output jack (earphone, line out, etc.) of your recorder. Set the HIGH/LOW switch to match your tape recorder's output signal level.

Recorder output jack	HIGH/LOW
AUX (line out)	LOW
Earphone or headphone output	HIGH

From recorder

2 Set the EX-8000 front panel WRITE switch and TAPE switch to the ENABLE (ENA) positions.
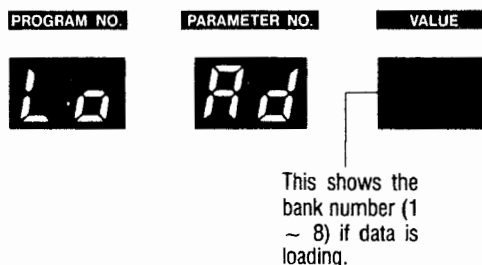
The DISPLAY will now appear as shown here.

3 Set the tape recorder's playback volume to the level that produced a "Good" message when you use the VERIFY procedure. If the recorder has tone controls, set them to the center positions.

4 Rewind the tape. Begin tape playback. Stop the tape (using the stop or pause key) when you reach the beginning of the leader tone.

5 Press the LOAD key.
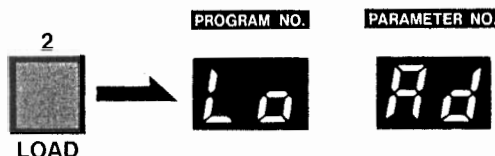
6 Start tape playback (press the play key or release the pause key). The Display will appear as shown here.

This shows the bank number (1 ~ 8) if data is loading.

7 If the data has successfully loaded into internal memory the DISPLAY will give a "Good" message.

PARAMETER NO.	VALUE

Go **od**

A "Good" message indicates the completion of loading.

■ **If you get an error (Err) message as shown here**
Press the CANCEL Key, lower (or raise) the tape recorder's output volume, and repeat steps 4 - 6.

PARAMETER NO.	VALUE

E **r r**

■ **If the DISPLAY does not change after ten seconds of tape playback**
Raise the tape recorder's output volume level and repeat steps 4 - 6.

PROGRAM NO.	PARAMETER NO.

Lo **Ad**

8 When you get a "Good" message, you can stop the tape recorder.

9 Set the EX-8000 front panel WRITE switch to the DISABLE position.

WRITE

ENABLE ▊▊▊ DISABLE

Follow the VERIFY procedure to check if the data from the tape has precisely loaded into the programmer or not.

10 Set the EX-8000 front panel TAPE switch to the DISABLE position.

TAPE

ENABLE ▊▊▊ DISABLE
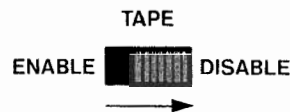
5. Tape Interface Precautions

1

2

3

4

MIDI IMPLEMENTATION

1.Transmitted Data_____

■ CHANNEL MESSAGES

① PROGRAM CHANGE

STATUS	SECOND	THIRD	DESCRIPTION
1 1 0 0 n n n n	0 p p p p p p p	———————	Program Change p p p p p p p=0 – 63

☆ nnnn — 0 ~ 15: channel number specified by parameter 84.

NOTE:
1. PROGRAM NUMBER (0ppppppp) correspond to DISPLAY NUMBER on the PANEL which will be the following:

```
DISPLAY NUMBER        PROGRAM NUMBER
    #11 ————————————————► 0
    #12 ————————————————► 1
     :                    :
    #87 ————————————————► 62
    #88 ————————————————► 63
```

■ SYSTEM EXCLUSIVE MESSAGE

① DEVICE ID

BYTE	DESCRIPTION
1 1 1 1 0 0 0 0	Exclusive status
0 1 0 0 0 0 1 0	KORG ID 42H
0 0 1 1 n n n n	Format ID 3*H (* =ch) (NOTE 6)
0 0 0 0 0 0 1 1	EX -8000 ID 03H
1 1 1 1 0 1 1 1	EOX

★ nnnn = 0 ~ 15: channel number (channel provisions within System Exclusive Messages) specified by parameter 84.

NOTE
2. If DEVICE ID REQUEST is received, DEVICE ID message will be sent.

② DEVICE ID REQUEST

BYTE	DESCRIPTION
1 1 1 1 0 0 0 0	Exclusive status
0 1 0 0 0 0 1 0	KORG ID 42H
0 1 0 0 n n n n	Format ID 4*H (* =ch) (NOTE 6)
1 1 1 1 0 1 1 1	EOX

★ nnnn = 0 ~ 15: channel number (channel provisions within System Exclusive Messages) specified by parameter 84.

MIDI IMPLEMENTATION

③ DATA DUMP

BYTE	DESCRIPTION
I I I I 0 0 0 0	Exclusive status
0 I 0 0 0 0 I 0	KORG ID 42H
0 0 I I n n n n	Format ID 3∗H (∗ =ch) (NOTE 6)
0 0 0 0 0 0 I I	EX -8000 ID 03H
0 I 0 0 0 0 0 0	Data Dump 40H
0 v v v v v v v	Data 5I Bytes
⋮	(See EX -8000 BIT MAP)
0 v v v v v v v	
I I I I 0 I I I	EOX

★ nnnn = 0 ~ 15: channel number (channel provisions within System Exclusive Messages) specified by parameter 84.

NOTE
3. If DATA DUMP REQUEST is received, DATA DUMP will be sent.

④ DATA DUMP REQUEST

BYTE	DESCRIPTION
I I I I 0 0 0 0	Exclusive status
0 I 0 0 0 0 I 0	KORG ID 42H
0 0 I I n n n n	Format ID 3∗H (∗ =ch) (NOTE 6)
0 0 0 0 0 0 I I	EX -8000 ID 03H
0 0 0 I 0 0 0 0	Data Save Request I0H
I I I I 0 I I I	EOX

★ nnnn = 0 ~ 15: channel number (channel provisions within System Exclusive Messages) specified by parameter 84.

⑤ WRITE COMPLETED

BYTE	DESCRIPTION
I I I I 0 0 0 0	Exclusive status
0 I 0 0 0 0 I 0	KORG ID 42H
0 0 I I n n n n	Format ID 3∗H (∗ =ch) (NOTE 6)
0 0 I 0 0 0 I I	EX -8000 ID 03H
0 0 0 0 0 0 0 I	Write Completed 2IH
I I I I 0 I I I	EOX

★ nnnn = 0 ~ 15: channel number (channel provisions within System Exclusive Messages) specified by parameter 84.

NOTE
4. If WRITE REQUEST is received and program write is completed, a WRITE COMPLETED message will be sent.

⑥ WRITE ERROR

BYTE	DESCRIPTION
I I I I 0 0 0 0	Exclusive status
0 I 0 0 0 0 I 0	KORG ID 42H
0 0 I I n n n n	Format ID 3*H (* =ch) (NOTE 6)
0 0 0 0 0 0 I I	EX -8000 ID 03H
0 0 I 0 0 0 I 0	Write error 22H
I I I I 0 I I I	EOX

★ nnnn = 0 ~ 15: channel number (channel provisions within System Exclusive Messages) specified by parameter 84.

NOTE
5. If WRITE REQUEST is received and program write is not completed (if WRITE DISABLE is chosen on the rear panel), a WRITE ERROR message will be sent.

⑦ WRITE REQUEST

BYTE	DESCRIPTION
I I I I 0 0 0 0	Exclusive status
0 I 0 0 0 0 I 0	KORG ID 42H
0 0 I I n n n n	Format ID 3*H (* =ch) (NOTE 6)
0 0 0 0 0 0 I I	EX -8000 ID 03H
0 0 0 I 0 0 0 I	Write Request I I H
0 p p p p p p p	Program Number (p p p p p p p = 0 −63)
I I I I 0 I I I	EOX

★ nnnn = 0 ~ 15: channel number (channel provisions within System Exclusive Messages) specified by parameter 84.

NOTE
6. When a Format ID is received, channel numbers set at parameter No. 84 and messages with abnormal numbers are ignored. (Not related to OMNI mode.)

2.Recognized Receive Data

1 CHANNEL MESSAGES

STATUS	SECOND	THIRD	DESCRIPTION
1 0 0 0 n n n n	0 k k k k k k k	0 x x x x x x x	Note OFF (NOTE 1) Velocity will be ignored.
1 0 0 1 n n n n	0 k k k k k k k	0 v v v v v v v	Note ON (NOTE 1) v v v v v v v = 1 − 127 (15 steps)
1 0 0 1 n n n n	0 k k k k k k k	0 0 0 0 0 0 0 0	Note OFF (NOTE 1)
1 0 1 1 n n n n	0 0 0 0 0 0 0 1	0 v v v v v x x	OSC Modulation (5 Bits resolution)
1 0 1 1 n n n n	0 0 0 0 0 0 1 0	0 v v v v v x x	VCF Modulation (5 Bits resolution)
1 0 1 1 n n n n	0 0 0 0 0 1 1 1	0 v v v v v v v	Volume (7 Bits resolvtion)
1 0 1 1 n n n n	0 1 0 0 0 0 0 0	0 0 0 0 0 0 0 0	Damper Pedal OFF
1 0 1 1 n n n n	0 1 0 0 0 0 0 0	0 1 1 1 1 1 1 1	Damper Pedal ON
1 0 1 1 n n n n	0 1 0 0 0 0 0 1	0 0 0 0 0 0 0 0	Portamento OFF
1 0 1 1 n n n n	0 1 0 0 0 0 0 1	0 1 1 1 1 1 1 1	Portamento ON
1 0 1 1 n n n n	0 1 1 1 1 0 1 1	0 0 0 0 0 0 0 0	All Notes OFF
1 0 1 1 n n n n	0 1 1 1 1 1 0 0	0 0 0 0 0 0 0 0	Omni Mode OFF (All Notes OFF)
1 0 1 1 n n n n	0 1 1 1 1 1 0 1	0 0 0 0 0 0 0 0	Omni Mode ON (All Notes OFF)
1 0 1 1 n n n n	0 1 1 1 1 1 1 0	0 x x x x x x x	(All Notes OFF)
1 0 1 1 n n n n	0 1 1 1 1 1 1 1	0 0 0 0 0 0 0 0	(All Notes OFF)
1 1 0 0 n n n n	0 p p p p p p p	———	Program Change (NOTE 2)
1 1 0 1 n n n n	0 v v v v v v x	———	After Touch (6 Bits resolution)
1 1 1 0 n n n n	0 x x x x x x x	0 b b b b b b b	Pitch Bender Change LSB will be ignored. MSB will be recognized. (b b b b b b b=64 : CENTER)

★ nnnn = 0 ~ 15:
Channel number specified by parameter 84. When the mode is OMNI ON, all the data will be received. When the mode is OMNI OFF, only data of the channel designated by the parameter will be received. As to MODE MESSAGE, however, designated channel data only will be received even if the mode is OMNI ON.

NOTE
1. NOTE NUMBER (0kkkkkkk) = 24 ~ 108. If data outside this range is received, the data will be transposed to the same note on the nearest octave. If keywindow parameter 87 and 88 are specified, the data will be changed accordingly.
2. PROGRAM NUMBER (0pppppp) = 0 ~ 63. If the data is larger than 63, it will be recognized as a number that has 64 subtracted from it.

☑ SYSTEM EXCLUSIVE MESSAGES

① DEVICE ID

② DEVICE ID REQUEST

③ DATA DUMP

④ DATA DUMP REQUEST

⑤ WRITE COMPLETED

⑥ WRITE ERROR

⑦ WRITE REQUEST

The above system exclusive messages are the same as Transmitted Data. Refer to page 51.

⑧ PARAMETER CHANGE

BYTE	DESCRIPTION
I I I I 0 0 0 0	Exclusive status
0 I 0 0 0 0 I 0	KORG ID 42H
0 0 I I n n n n	Format ID 3∗H (∗ =ch) (NOTE 3)
0 0 0 0 0 0 I I	EX -8000 ID 03H
0 I 0 0 0 0 0 I	Parameter Change 41H
0 v v v v v v v	Parameter Offset (See EX -8000 BIT MAP)
0 v v v v v v v	Parameter Value (See EX -8000 BIT MAP)
I I I I 0 I I I	EOX

★ nnnn = 0 ~ 15: channel number (channel provisions within System Exclusive Messages) specified by parameter 84.

NOTE

3. Messages with channel numbers different from those specified by parameter 84 are ignored.
   (This has no relation to OMNI mode setting.)

⑨ SYSTEM REAL TIME MESSAGE

STATUS	DESCRIPTION
I I I I I I I 0	ACTIVE SENSING(440ms)

3.Communication Between EX-8000 and Other Equipment_____

▮ EX-8000 Transmits/Receives information in the form of the following System Exclusive Messages.

Transmitted/Received Messages

DEVICE ID   : Data regarding type of equipment being used. Transmits this data when a DEVICE ID is received.
DEVICE ID REQUEST   : Requests data on what type of equipment EX-8000 is communicating with.
DATA DUMP   : Information on sound data. Transmits this data when a DATA DUMP REQUEST is received.
DATA DUMP REQUEST   : Information requesting sound data.
WRITE COMPLETED   : Verifies that Program Write has been performed correctly. Responds to WRITE REQUEST.
WRITE ERROR   : Informs that WRITE switch is set to DISABLE and Program Write cannot be performed. Responds to WRITE REQUEST.
WRITE REQUEST   : Information used to write received data in EX-8000 programmer.

Received Only

PARAMETER CHANGE   : Information used to change value of sound parameters.

■ By using these System Exclusive Messages, the EX-8000 can communicate with other MIDI capable equipment such as the DW-8000, and computers. (Proper software is necessary in the case of computer communication.)

▮ Sound Data Transfer

MIDI Data Transfer allows sound data to be passed between multiple EX-8000's, DW-8000's, etc. via system exclusive messages. In addition, particular sounds can be transferred to open Program numbers. To accomplish this, MIDI channels of relative equipment must be the same as the EX-8000's.
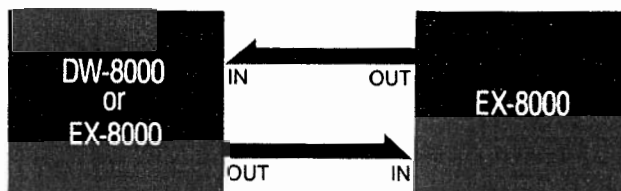
As shown above, connect the EX-8000's MIDI OUT to MIDI IN of other MIDI equipment and EX-8000 MIDI IN to other equipment's MIDI OUT.

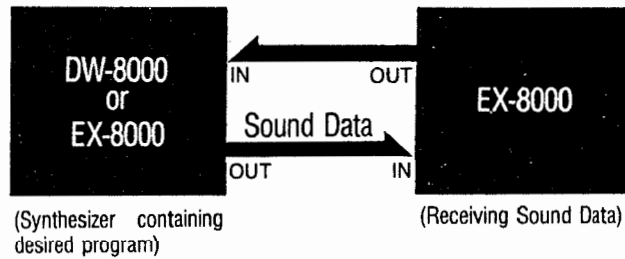## MIDI Data Transfer-Related Parameters

78 MIDI DATA TRANSFER

This parameter controls data transfer modes. (not shown on panel)

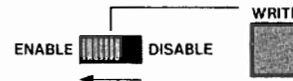| VALUE	DATA TRANSFER MODE
0	DISABLE
1	Single Program Load (Receives one sound only)
2	All Program Load (Receives all 64 sounds)
3	Single Program Save (Transmits one sound only)
4	All Program Save (Transmits all 64 sounds)

A How to Receive Data from another EX-8000, DW-8000, etc.

Data reception from a DW-8000 or another EX-8000 can only be controlled through the operation of the EX-8000. (For details on Transmitted/Received System Exclusive Messages, see page 62.)

DW-8000 or EX-8000 — Sound Data → EX-8000

(Synthesizer containing desired program) (Receiving Sound Data)

1 SINGLE PROGRAM LOAD (Receives 1 Program Only)
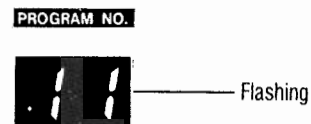
1. Set WRITE Switch to ENABLE.

2. Set value of parameter 78 to 1.

3. Specify desired program number with number keys.

4. Push WRITE key [ ] Program Number flashes.

5. Specify program number which data is to be loaded into with number keys.
   ──► **Received**

   If the data has successfully loaded into the internal memory the Display will give a "Good" message. If it has not successfully loaded, an "Err" message will appear. In this case, push the WRITE key and repeat steps 3-5.

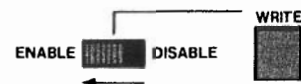6. Push WRITE key [ ] Display returns to normal.

7. To Receive other data, repeat steps 3-6.

8. Return WRITE Switch to DISABLE.

2 ALL PROGRAM LOAD

1. Set WRITE Switch to ENABLE.

2. Set value of parameter 78 to 2.

3. Push WRITE key ▪ Program number flashes.

4. Specify Program number 11 with number keys. ──→ **Received**

   If the data has successfully loaded into the internal memory the display will give a "Good" message. If it has not successfully loaded, an "Err" message appears. In the case, push the WRITE key and repeat steps 3-4.
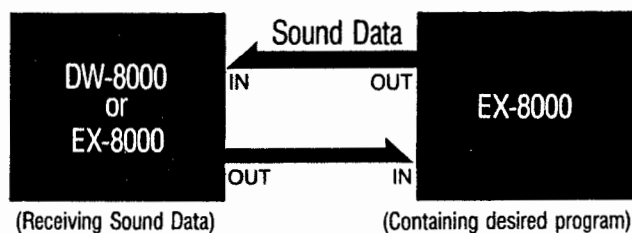
5. Push WRITE key ▪ Display returns to normal.

6. Return WRITE Switch to DISABLE.

B **How to Transfer data to another EX-8000,**
DW-8000, etc.

Sound data is transferred from EX-8000 to DW-8000 or
another EX-8000.
(For details on Transmitted/Received System Exclusive
Messages see page 62.)

Sound Data

DW-8000	IN	OUT	
or			EX-8000
EX-8000	OUT	IN	

(Receiving Sound Data) (Containing desired program)

1 SINGLE PROGRAM SAVE

1. Set WRITE Switch to ENABLE.

    ENABLE ▮▮▮ DISABLE   WRITE ▮

2. Set value of parameter 78 to 3.

    PARAMETER NO. | VALUE
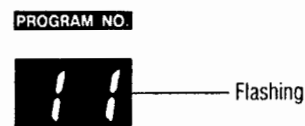   78   3

3. Specify Program number of data to be transferred with number keys.

4. Push WRITE key ▮ Program number flashes.

    PROGRAM NO.
    11 ——— Flashing

5. Specify Program number of program into which data is to be transmitted (other equipment) with EX-8000 number keys. ——► **Transmitted**

    If the data has successfully loaded into the internal memory the display will give a "Good" message. If it has not successfully loaded, an "Err" message will appear. In this case, push the WRITE key and repeat steps 3-5.

6. Push WRITE key ▮ Display returns to normal.

7. To Transmit other sound data, repeat steps 3-6.

8. Return WRITE Switch to DISABLE.

    ENABLE ▮▮▮ DISABLE   WRITE ▮

2 **ALL PROGRAM SAVE**

1. Set WRITE Switch to ENABLE.

2. Set value of parameter 78 to 4.

3. Push WRITE key [WRITE] Program number flashes.

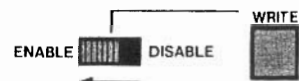4. Specify Program number 11 with number keys. ──→ **Transmitted**

   If the data has successfully loaded into the internal memory the display will give a "Good" message. If it has not successfully loaded, an "Err" message appears. In the case, push the WRITE Key and repeat steps 3-5.

5. Push WRITE key [WRITE] Display returns to normal.

6. Return WRITE Switch to DISABLE.

NOTE:
When this operation is completed, set value of parameter 78 back to "0". This disables WRITE function. When power is turned ON, this parameter is reset at "0".
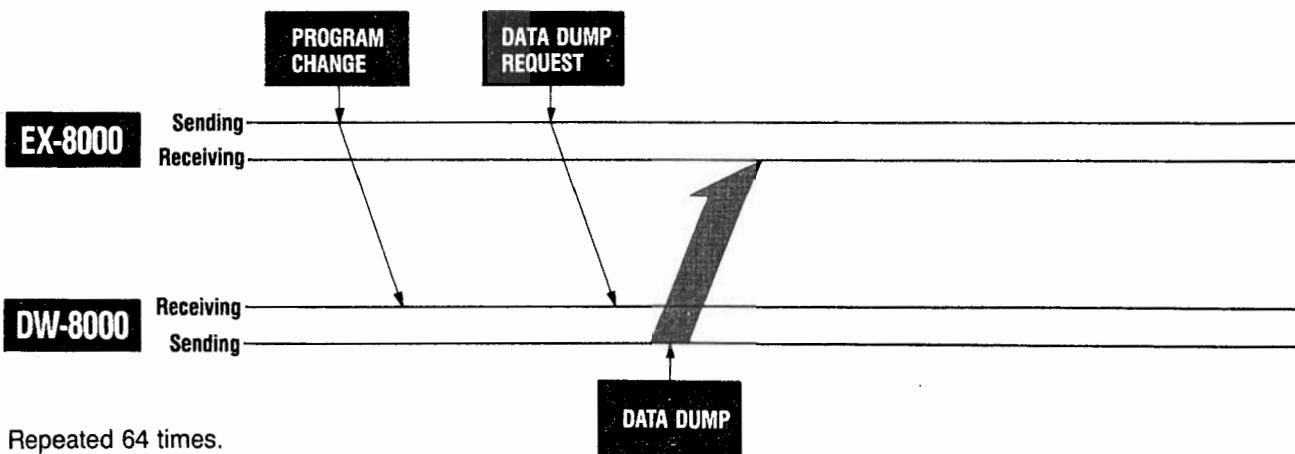

4.Examples of System Exclusive Messages Used in Communicating with Other Equipment

[A] Data transmission between EX-8000 and DW-8000 (See page 56 for connection details)
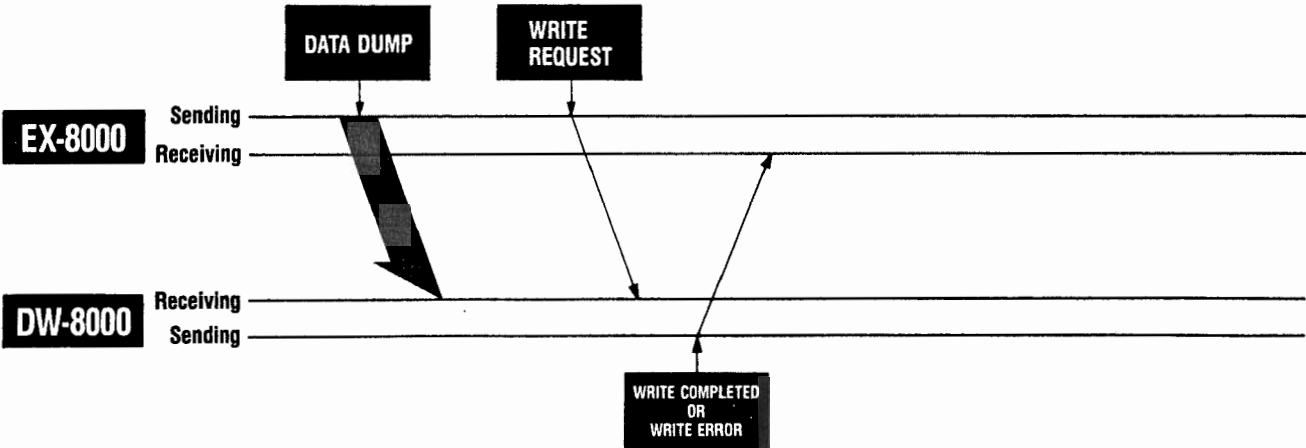
[1] Single Program Load
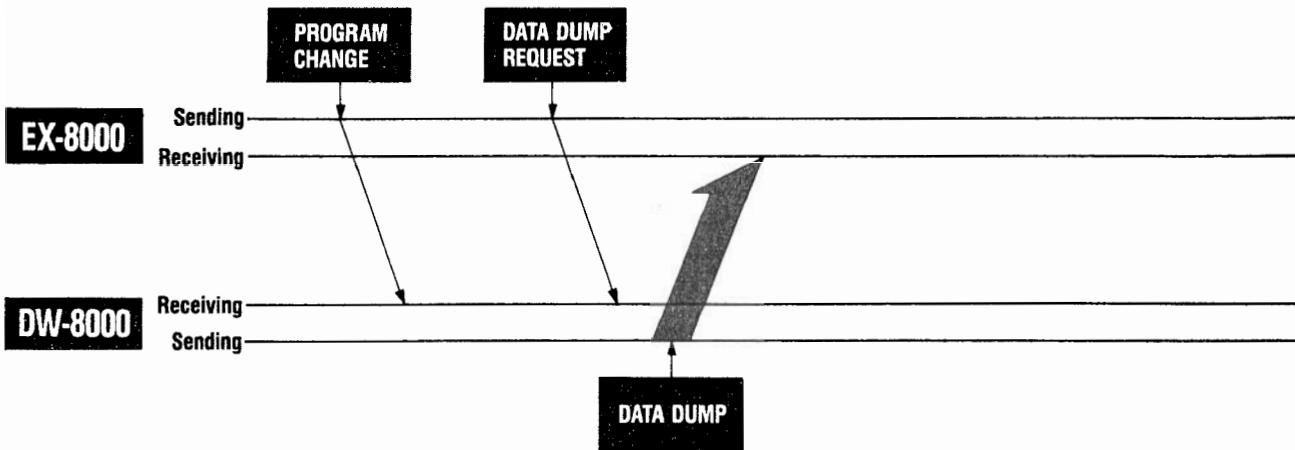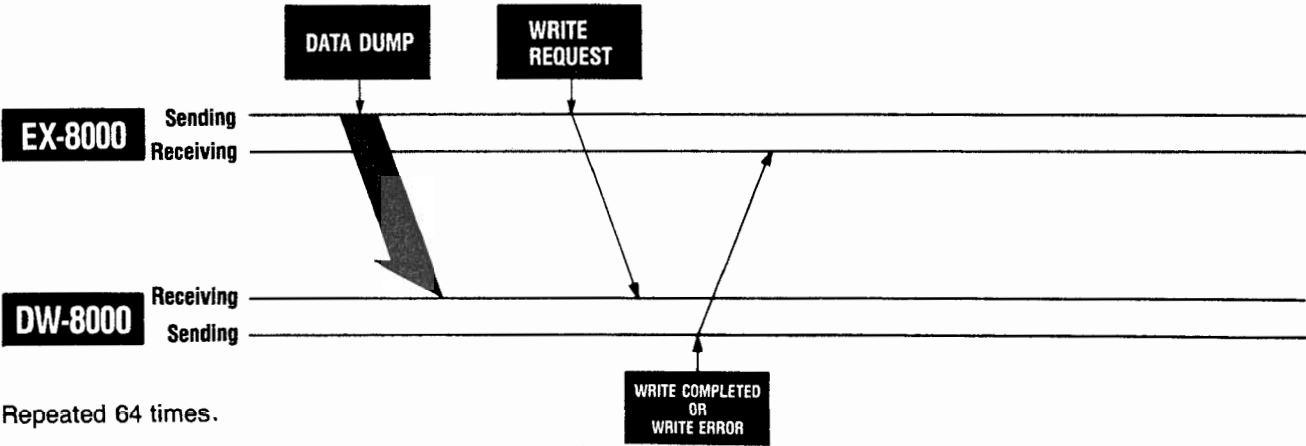

[2] All Program Load

Repeated 64 times.

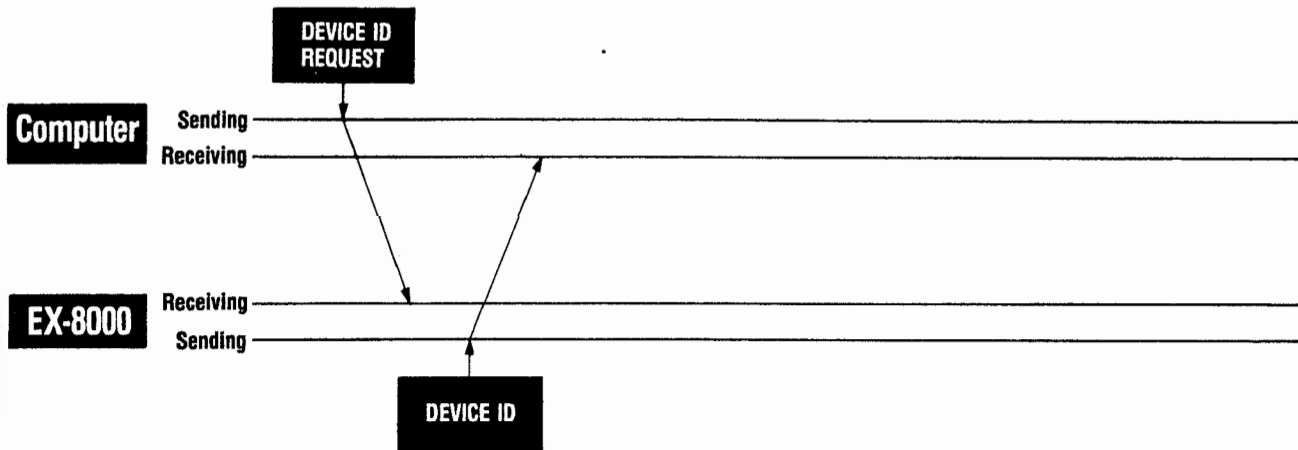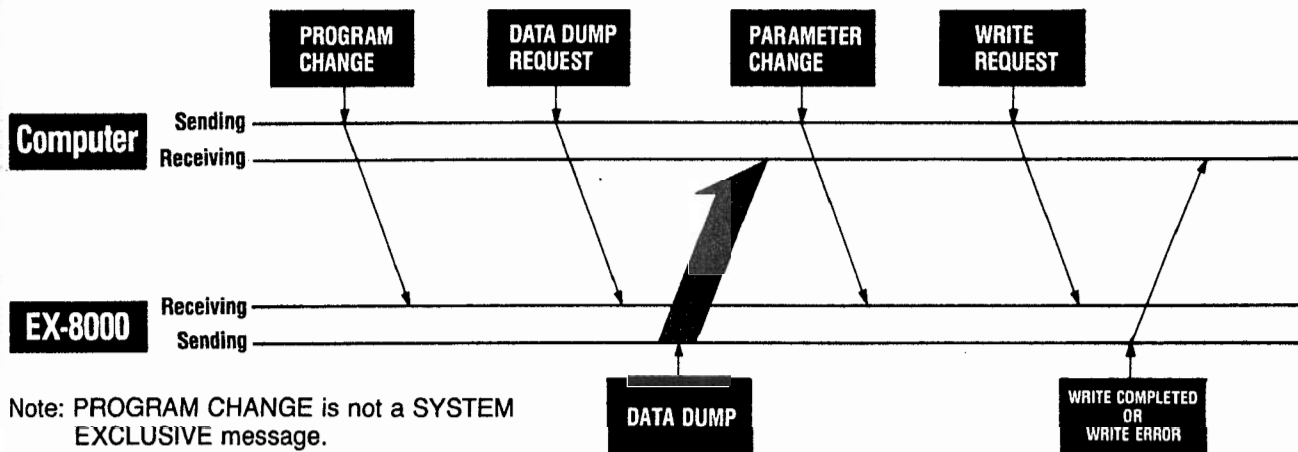## ③ Single Program Save

④ All Program Save

Repeated 64 times.

⑧ Data transmission between EX-8000 and computer.

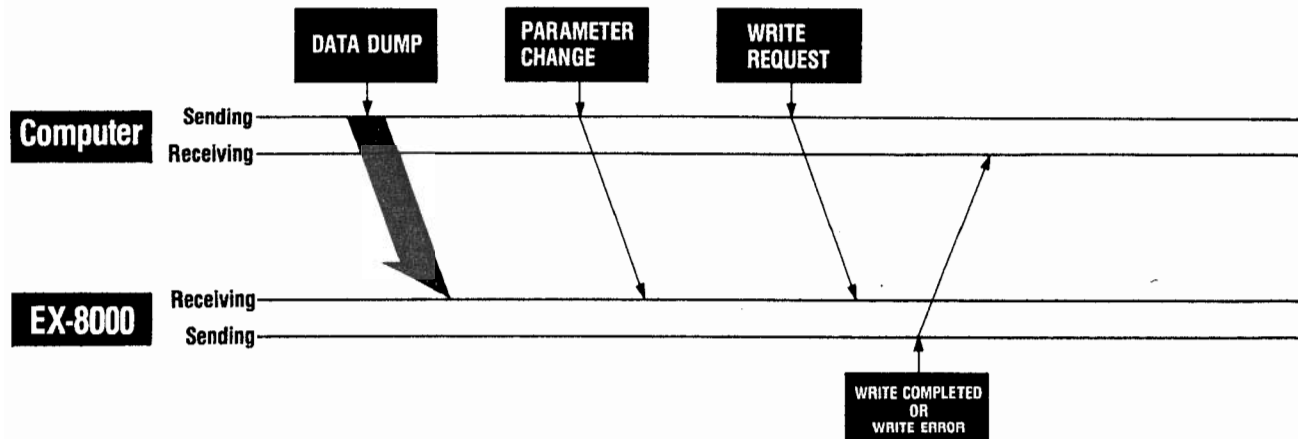① To find the ID number for equipment connected to the computer.

		DEVICE ID REQUEST

Computer — Sending / Receiving

EX-8000 — Receiving / Sending

DEVICE ID

② To edit sound data within the EX-8000.

PROGRAM CHANGE	DATA DUMP REQUEST	PARAMETER CHANGE	WRITE REQUEST

Computer — Sending / Receiving

EX-8000 — Receiving / Sending

Note: PROGRAM CHANGE is not a SYSTEM EXCLUSIVE message.

DATA DUMP

WRITE COMPLETED OR WRITE ERROR

③ To edit data already available in the computer.

DATA DUMP	PARAMETER CHANGE	WRITE REQUEST

Computer — Sending / Receiving

EX-8000 — Receiving / Sending

WRITE COMPLETED OR WRITE ERROR

④ To load all 64 sound programs from the computer to the EX-8000.

| PROGRAM CHANGE | DATA DUMP REQUEST |

Computer — Sending
— Receiving

EX-8000 — Receiving
— Sending

| DATA DUMP |

Repeated 64 times.
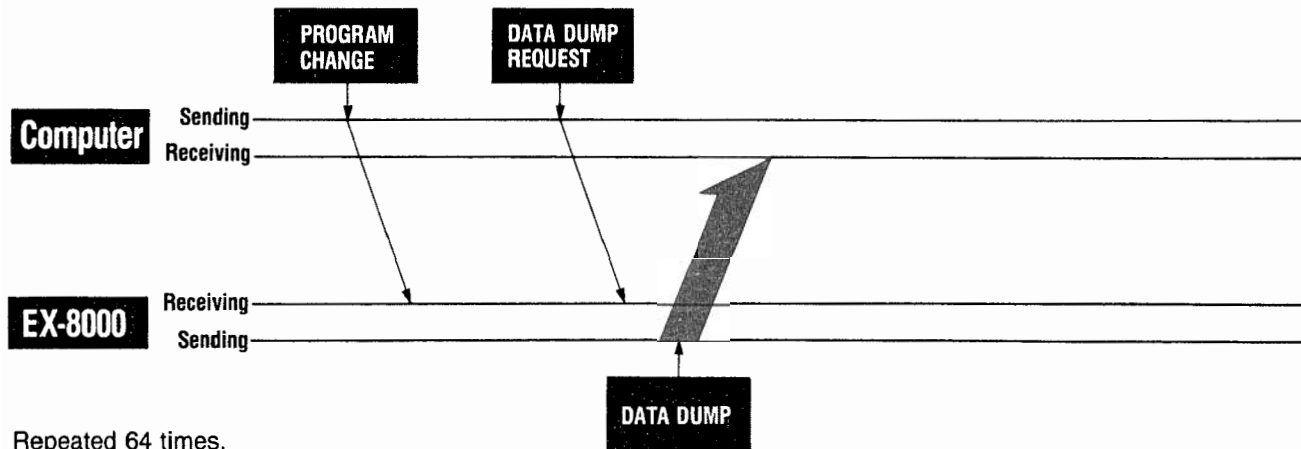
⑤ To save all 64 sound programs from the EX-8000 to the computer.

| DATA DUMP | WRITE REQUEST |

Computer — Sending
— Receiving

EX-8000 — Receiving
— Sending

| WRITE COMPLETED OR WRITE ERROR |

Repeated 64 times.
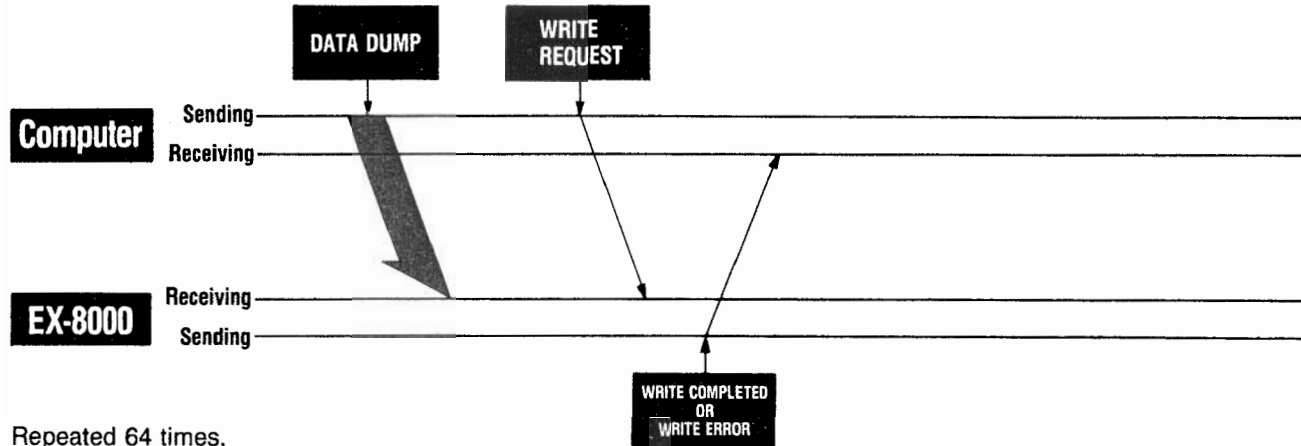
5.EX-8000 BIT MAP

❶ EX-8000 BIT MAP

PARAMETER OFFSET	PARAMETER VALUE							
	b7	b6	b5	b4	b3	b2	b1	b0
0	0	0	0	0	0	0	OSC I OCTAVE	
1	0	0	0	0	OSC I WAVE FORM			
2	0	0	0	OSC I LEVEL				
3	0	0	0	0	0	0	AUTO BEND SELECT	
4	0	0	0	0	0	0	0	A. BEND MODE
5	0	0	0	A. BEND TIME				
6	0	0	0	A. BEND INTENSITY				
7	0	0	0	0	0	0	OSC 2 OCTAVE	
8	0	0	0	0	OSC 2 WAVE FORM			
9	0	0	0	OSC 2 LEVEL				
10	0	0	0	0	0	INTERVAL		
11	0	0	0	0	0	DETUNE		
12	0	0	0	NOISE LEVEL				
13	0	0	0	0	0	0	ASSIGN MODE	
14	0	0	PARAMETER NO. MEMORY					
15	0	0	CUTOFF					
16	0	0	0	RESONANCE				
17	0	0	0	0	0	0	KBD. TRACK	
18	0	0	0	0	0	0	0	POLA-RITY
19	0	0	0	EG. INTENSITY				
20	0	0	0	VCF ATTACK				
21	0	0	0	VCF DECAY				
22	0	0	0	VCF BREAK P.				
23	0	0	0	VCF SLOPE				
24	0	0	0	VCF SUSTAIN				

PARAMETER OFFSET	PARAMETER VALUE							
	b7	b6	b5	b4	b3	b2	b1	b0
25	0	0	0	VCF RELEASE				
26	0	0	0	0	0	VCF VELOCITY SENS.		
27	0	0	0	VCA ATTACK				
28	0	0	0	VCA DECAY				
29	0	0	0	VCA BREAK P.				
30	0	0	0	VCA SLOPE				
31	0	0	0	VCA SUSTAIN				
32	0	0	0	VCA RELEASE				
33	0	0	0	0	0	VCA VELOCITY SENS.		
34	0	0	0	0	0	0	MG WAVE FORM	
35	0	0	0	MG FREQUENCY				
36	0	0	0	MG DELAY				
37	0	0	0	MG OSC				
38	0	0	0	MG VCF				
38	0	0	0	0	BEND OSC			
40	0	0	0	0	0	0	0	BEND VCF
41	0	0	0	0	0	DELAY TIME		
42	0	0	0	0	DELAY FACTOR			
43	0	0	0	0	DELAY FEEDBACK			
44	0	0	0	DELAY FREQUENCY				
45	0	0	0	DELAY INTENSITY				
46	0	0	0	0	DELAY EFFECT LEVEL			
47	0	0	0	PORTAMENTO				
48	0	0	0	0	0	0	AFTER T.OSC MG	
49	0	0	0	0	0	0	AFTER T.VCF	
50	0	0	0	0	0	0	AFTER T.VCA	

## ② EX-8000 BIT MAP AND CORRESPONDING PARAMETER VALUES

PARAMETER NAME	PARAMETER OFFSET	BIT	CORRESPONDING PANEL VALUE	PARAMETER NUMBER
OSC 1 Octave	0	b1 – b0	00 = 16 01 = 8 10 = 4 11 = INHIBIT	11
OSC 1 Wave Form	1	b3 – b0	0000 – 1111 = 1 – 16	12
OSC 1 Level	2	b4 – b0	00000 – 11111 = 0 – 31	13
A. B. Select	3	b1 – b0	00 = OFF 01 = OSC1 10 = OSC2 11 = BOTH	14
A. B. Mode	4	b0	0 = UP 1 = DOWN	15
A. B. Time	5	b4 – b0	00000 – 11111 = 0 – 31	16
A. B. Int.	6	b4 – b0	00000 – 11111 = 0 – 31	17
OSC 2 Octave	7	b1 – b0	00 = 16 01 = 8 10 = 4 11 = INHIBIT	21
OSC 2 Wave Form	8	b3 – b0	0000 – 1111 = 1 – 16	22
OSC 2 Level	9	b4 – b0	00000 – 11111 = 0 – 31	23
OSC 2 Interval	10	b2 – b0	000 = 1 001 = – 3 010 = 3 011 = 4 100 = 5 101 – 111 = INHIBIT	24
OSC 2 Detune	11	b2 – b0	000 – 110 = 0 – 6 111 = INHIBIT	25
Noise Level	12	b4 – b0	00000 – 11111 = 0 – 31	26
Cutoff	15	b5 – b0	000000 – 111111 = 0 – 63	31
Resonance	16	b4 – b0	00000 – 11111 = 0 – 31	32
KBD Track	17	b1 – b0	00 = (0) 01 = 1(1/4) 10 = 2(1/2) 11 = 3(1)	33
Polarity	18	b0	0 = 1(⌐) 1 = 2(⌐)	34
VCF EG Int.	19	b4 – b0	00000 – 11111 = 0 – 31	35
VCF Attack	20	b4 – b0	00000 – 11111 = 0 – 31	41
VCF Decay	21	b4 – b0	00000 – 11111 = 0 – 31	42
VCF Break P.	22	b4 – b0	00000 – 11111 = 0 – 31	43
VCF Slope	23	b4 – b0	00000 – 11111 = 0 – 31	44
VCF Sustain	24	b4 – b0	00000 – 11111 = 0 – 31	45
VCF Release	25	b4 – b0	00000 – 11111 = 0 – 31	46
VCF V. Sens	26	b2 – b0	000 – 111 = 0 – 7	47
VCA Attack	27	b4 – b0	00000 – 11111 = 0 – 31	51

VCA Decay	28	b4 — b0	00000 — 11111 = 0 — 31	52
VCA Break P.	29	b4 — b0	00000 — 11111 = 0 — 31	53
VCA Slope	30	b4 — b0	00000 — 11111 = 0 — 31	54
VCA Sustain	31	b4 — b0	00000 — 11111 = 0 — 31	55
VCA Release	32	b4 — b0	00000 — 11111 = 0 — 31	56
VCA V.Sens.	33	b2 — b0	000 — 111 = 0 — 7	57
MG Wave Form	34	b1 — b0*	0=1(∧) 1=2(∿) 2=3(⟋) 3=4(⊓)	61
MG Frequency	35	b4 — b0	00000 — 11111 = 0 — 31	62
MG Delay	36	b4 — b0	00000 — 11111 = 0 — 31	63
MG OSC	37	b4 — b0	00000 — 11111 = 0 — 31	64
MG VCF	38	b4 — b0	00000 — 11111 = 0 — 31	65
Bend OSC	39	b3 — b0	0000 — 1100 = 0 — 12 1101 — 1111 = INHIBIT	66
Bend VCF	40	b0	0 = 0(OFF) 1 = 1(ON)	67
Delay Time	41	b2 — b0	000 — 111 = 0 — 7	71
Delay Factor	42	b3 — b0	0000 — 1111 = 0 — 15	72
D. Feedback	43	b3 — b0	0000 — 1111 = 0 — 15	73
D. Frequency	44	b4 — b0	00000 — 11111 = 0 — 31	74
D. Intensity	45	b4 — b0	00000 — 11111 = 0 — 31	75
D. Eff. Level	46	b3 — b0	0000 — 1111 = 0 — 15	76
Portamento	47	b4 — b0	00000 — 11111 = 0 — 31	77
A.T.OSC MG	48	b1 — b0	00 — 11 = 0 — 3	81
After T. VCF	49	b1 — b0	00 — 11 = 0 — 3	82
After T. VCA	50	b1 — b0	00 — 11 = 0 — 3	83

PARAMETER NAME	PARAMETER OFFSET	BIT	CORRESPONDING PANEL DISPLAY / MEMORY
Assign Mode	13	b1 — b0	00 = POLY1 01 = POLY2 10 = UNISON1 11 = UNISON2
Par. NO. Memo.	14	b5 — b0	000000 - 111110 = 0 - 62 (7, 14, 15, 21, 22, 23, 31, 39, 47, = INHIBIT)

RACK-MOUNTING THE EX-8000
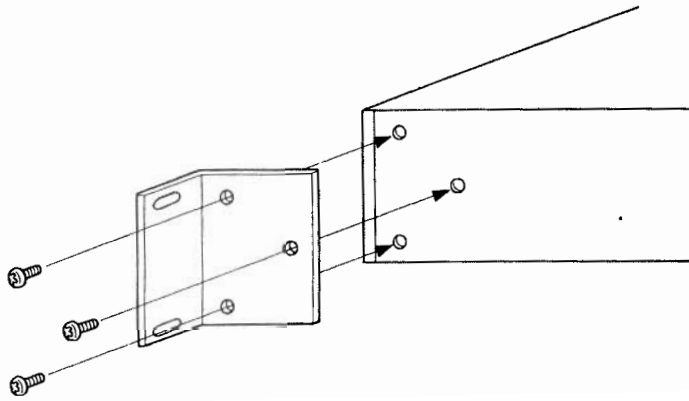
Attach the rack-mount adapters to
the EX-8000 with screws (small) provided.

Mount with screws
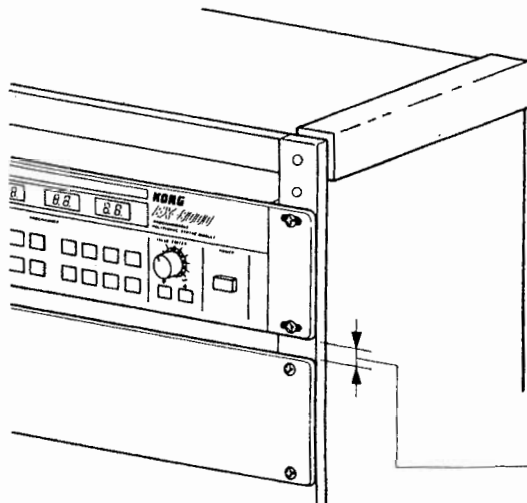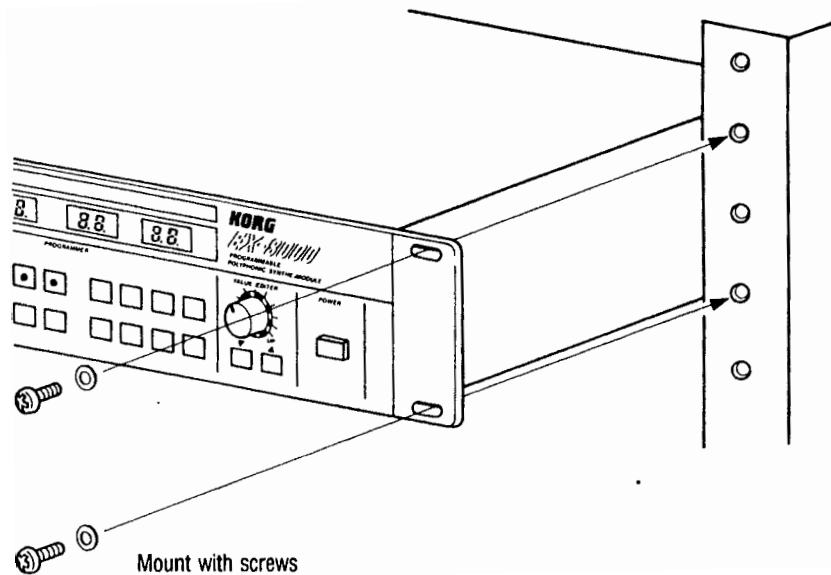
If there is more than a 3mm space between
equipment, insert a support. (Styrofoam, etc.)

SPECIFICATIONS & OPTIONS

(*Programmable)

Voice	: 8 voice
OSC1*	: Octave (16′, 8′, 4′), Waveform (1 ~ 16), Level adjustment
OSC2*	: Octave (16′, 8′, 4′), Waveform (1 ~ 16), Interval (Unison, Minor 3rd, Major 3rd, Perfect 4th, Perfect 5th), Detune (25 cents MAX), Level adjustment
Auto bend*	: Select (OFF, OSC1, OSC2, Both), Mode (UP/DOWN), Time, Intensity
Noise*	: Level adjustment (White noise)
VCF*	: Cutoff frequency, Resonance, Keyboard track (0, 1/4, 1/2, 1), EG polarity (/ⁿ⌐, \⌐/), EG intensity
VCF EG*	: Attack time, Decay time, Breakpoint level, Slope time, Sustain level, Release time, Velocity sensitivity
VCA EG*	: Attack time, Decay time, Breakpoint level, Slope time, Sustain level, Release time, Velocity sensitivity
MG*	: Waveform (∧ , ∿ , ⁄⌐ , ⌐⌐), Frequency, Delay time, OSC intensity, VCF intensity
Bend*	: Max. OSC bend (±1 octave), VCF bend ON/OFF
Portamento*	: Portamento time
Digital delay*	: Time (approx. 4 ~ 512ms), Factor (×0.5 ~ 1.0), Feedback level, Modulation frequency (max. 9Hz), Modulation intensity, Effect level
After touch*	: OSC MG, VCF, VCA
Key assign mode*	: POLY 1, POLY 2, UNISON 1, UNISON 2
MIDI	: Receive channel (ch 1 ~ 16), ENABLE (NOTE DATA/ALL), OMNI (ON/OFF), Arpeggio clock, Key window bottom, Key window top, MIDI data transfer
Volume	: (0 ~ max.)
Tune	: ±50 cents, tone switch.
Programmer	: PROGRAM/PARAMETER switches, Number select buttons, (1 ~ 8), WRITE switch, BANK HOLD switch
Value	: Edit control, UP/DOWN Switches
Display	: Program number, Parameter number*, Parameter value
Tape interface	: Save, Load, Verify, Cancel
Input jacks	: FROM TAPE (HIGH/LOW)
Output jacks	: Output (R, L/MONO, HIGH/LOW), PHONES, TO TAPE
Tape switch	: ENABLE/DISABLE
Write switch	: ENABLE/DISABLE
MIDI jacks	: IN, OUT, THRU
Power consumption	: 31W
Power supply	: Local voltage
Weight	: 7.5kg
Dimensions	: 430(W) × 412.5(D) × 90(H)mm
Accessories	: AC power cord, Connection cord, Data cassette, Program card, Rack Mount Adapter
Options	: MIDI Cable (7m/10m/12m), Dynamic Stereo Headphones KH-1000, Memory expander MEX-8000, 2U Rack case, SYNC/MIDI cable (1.5m/3m/5m).