X3

MUSIC WORKSTATION

Operating Manual

GENERAL
MIDI
INSTRUMENT

AI[2] Synthesis System

KORG

Table of Contents

About This Manual

The following chart shows how the explanations on the following pages are organized.

Section title   Related LCD screen group   Section summary   LCD screens in the group

Global Oscillator Setup – 1A

These parameters are used to set the type of Program.

```
1A OSC Mode      > 1A OSC1          <
   DOUBLE          ASN:POLY HLD:OFF
```

LCD	Parameter	Range	Description
1A-1	Oscillator Mode (OSC Mode)	SINGLE DOUBLE DRUMS	Oscillator 1 Oscillators 1 and 2 A drum kit
1A-2	Assign (ASN)	POLY MONO	Polyphonic Monophonic (all voices in unison)
	Hold (HLD)	ON/OFF	Note hold after key release (set to ON for DRUMS mode)

LCD screen numbers. For example 1A-1 indicates that this is the first LCD screen in group 1A

Parameters on each LCD screen

Parameter range or available settings

Brief description. A full description is provided in the text below each parameter table

Chapter 1: Program Play Mode

In this mode you can select and play Programs. Some Program parameters can also be adjusted, allowing you to edit parameters in real time, as you play.

The following Programs can be selected: A00 ~ A99, B00 ~ B99, and GM001 ~ GM136. If a PROG/SEQ data card is inserted, Programs C00 ~ C99 and D00 ~ D99 can also be selected.

Program banks A and B are internal RAM banks, and banks C and D are PROG/SEQ data card banks. Each of these banks contains 100 Programs. Bank GM contains 136 Programs, and corresponds to GM. Programs G01 to G128 are as defined by GM. G129 to G136 are the ROM drum kits 1 to 8. Drum Program GM129 corresponds to the GM drum kit. GM bank Programs 130 to 136 can be used with data that is similar to GM. They are not used with normal GM data.

Selecting Programs

1) Press the [PROG] button.

2) Press the [BANK] button to select a Program bank.

3) Enter the required Program number using the number keypad. For example, to select Program 46, press [4] then [6]. Alternatively, press the [▲/YES] and [▼/NO] buttons repeatedly to select a Program.

The LCD screen should look something like the one shown below.
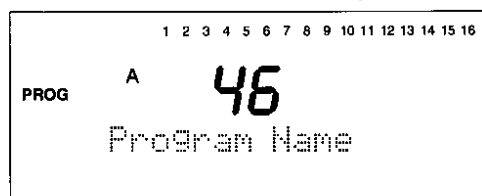
The numbers 1 to 16 at the top of the LCD correspond to MIDI Channels. The flashing number indicates the Global MIDI Channel setting. When MIDI Note ON/Off messages are received, a box below the corresponding number flashes. This works as a MIDI monitor.

Program Play Mode & MIDI

In Program Play mode, MIDI data is sent and received on the Global MIDI Channel. MIDI data generated by playing the keyboard, moving the joystick, operating the assignable pedal, etc., is sent on the Global MIDI Channel.

Using a Pedal Switch to Select Programs

You can also select Programs using a pedal switch.

1) Connect an optional Korg PS-1 or PS-2 pedal switch to the ASSIGNABLE PEDAL/SW connection.

2) In Global mode, you need to assign the pedal to either Program Up or Program Down. See "Assignable Pedal Setup – 8B" on page 163.

Using MIDI to Select Programs

You can also select Programs using MIDI Program Change messages.

1) Connect a MIDI device capable of sending MIDI Program Change messages to the X3's MIDI IN connection.

2) Set the Global MIDI Channel parameter so that it matches that of the device sending the Program Change messages. See "Global MIDI Channel & MIDI Clock Source – 3A" on page 150.

3) In Global mode, you need to set Filter1 to ENA. See "MIDI Filter1 – 3C" on page 152.

The X3 also responds to MIDI Bank Change messages that can be used to select Program banks. If you want the X3 to ignore MIDI Bank Change messages, set Filter1 to NUM. See "MIDI Filter1 – 3C" on page 152 for full details.

Editing in Program Play Mode

Some Program parameters can be edited while playing in Program Play mode.

1) Select a Program.

2) Use the [1~8] function buttons to select a parameter.

3) Use the VALUE slider or [▲/YES] and [▼/NO] buttons to adjust the selected parameter.

If the Program uses Double Oscillator mode, the selected parameter will be adjusted for both oscillators.

On the following LCD screen, the VCF Cutoff Frequency parameter is selected. The angle bracket symbols indicate that other parameters can be selected using the [←] and [→] cursor buttons.
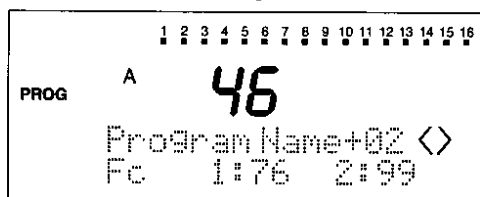
```
      1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
             A    46
PROG
      Program Name+02 <>
      Fc   1:76   2:99
```

When you've finished editing, press the [↓] cursor button to return to the previous LCD screen.

If you want to write the edited Program to memory, press the [REC/WRITE] button. The message "Are You Sure OK?" will appear. Press the [▲/YES] button to write the Program, or the [▼/NO] button to cancel the function.

```
Ephemerals +00  >   Ephemerals +00 <>   Ephemerals +00 <>   Ephemerals +00 <>
Oct  1: 8  2: 8     Fc   1:29  2:54     FEG  1:58  2:80     Atk  1:00  2:00
```

```
Ephemerals +00 <>   Ephemerals +00 <>   Ephemerals +00 <>   Ephemerals +00 <
Rel  1:86  2:86     Lev  1:99  2:50     V.AI 1:+50 2:+50    Eff  10:90 50:50
```

Function Button	Parameter	Range	
		Displayed	Actual Increment
[1] OCTAVE	OSC1, OSC2 Octave (Oct)	–3 ~ +3	32', 16', 8', 4'
[2] CUTOFF	VDF1, VDF2 Cutoff Frequency (Fc)	–10 ~ +10	±5
[3] VDF EG	VDF1, VDF2 EG Intensity (FEG)	–10 ~ +10	±3
[4] ATTACK	VDA1, VDA2 Attack Time (Atk)	–10 ~ +10	±5
[5] RELEASE	VDF1, VDF2, VDA1, VDA2 Release Time (Rel)	–10 ~ +10	±5
[6] LEVEL	OSC1, OSC2 Level (Lev)	–10 ~ +10	±5
[7] VELOCITY	VDA1, VDA2	–10 ~ +10	±5
[8] EFFECT	Effect Level Balance (Eff)	–10 ~ +10	±5

The adjustable range of the above parameters is indicated in two ways: Displayed and Actual Increments. Displayed is the amount of adjustment available, and corresponds to [▲/YES] and [▼/NO] button presses. The Actual Increment shows how much a parameter will actually be adjusted. For example, the Cutoff Frequency parameter value is actually adjusted in increments of ±5. So for one Displayed increment, the actual parameter increment will be ±5. The bottom line of the LCD screen shows the actual parameter values (1:Oscillator1 2:Oscillator2).

There are actually five parameters for Velocity [7]. To access them, press VELOCITY [7], then press the [→] button. Use the [▲/YES] and [▼/NO] buttons to select them.

If a parameter is already set to the minimum or maximum limit of its range, the Displayed value will change, but the actual value will not.

Note: *When one of the above parameters is shown on the bottom line of the LCD screen, the VALUE slider will control that parameter, not the dynamic modulation. To use the VALUE slider to control dynamic modulation, press the [↓] cursor button to return to the normal Program Play LCD screen.*

Chapter 2: Program Edit Mode

This mode allows you to edit Programs. You can create new Programs or simply edit existing ones. The following diagram shows the various parts that make up a Program. The numbers in bottom the left-hand corner of each box indicate the group of LCD screens that are used to set up that particular part.
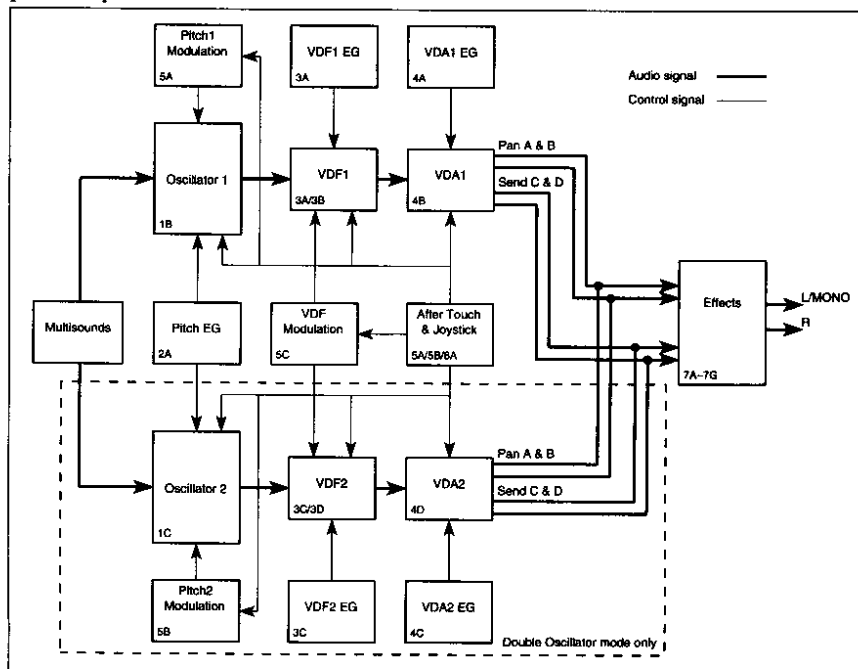
Entering Program Edit Mode.

1) Select the Program that you want to edit in Program Play mode.

2) Press the [EDIT] button.
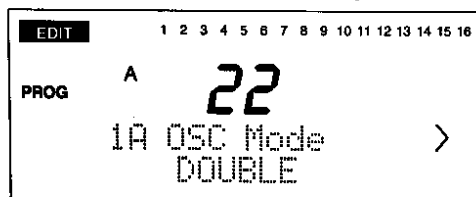
The LCD screen should look something like the one shown below.

Compare Function

While editing, you can press the [COMPARE] button to listen to the original unedited Program. That is, how the Program was before you started editing it. Pressing the [COMPARE] button again will return you to the edited version of the Program.

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ThayTu (T2-VCF)

8 Chapter 2: Program Edit Mode

Global Oscillator Setup – 1A

These parameters are used to set the type of Program.

```
1A OSC Mode    >| 1A OSC1        <
   DOUBLE        | ASN:POLY HLD:OFF
```

LCD	Parameter	Range	Description
1A–1	Oscillator Mode (OSC Mode)	SINGLE DOUBLE DRUMS	Oscillator 1 Oscillators 1 and 2 A drum kit
1A–2	Assign (ASN)	POLY MONO	Polyphonic Monophonic
	Hold (HLD)	ON/OFF	Note hold after key release (set to ON for DRUMS mode)

Oscillator mode: there are three Oscillator modes: Single, Double, and Drums. In Single mode, only oscillator 1 is used, and up to 32-note polyphony is available. In Double mode, oscillators 1 and 2 are used, and different Multisounds can be selected for each oscillator, each with independent VDF and VDA. However, polyphony is reduced to 16-notes.

In Drum mode, a drum kit is used instead of a Multisound. Drum kits are set up in Global mode. See "Drum Kit Setup1 – 7A" on page 159. There are 15 drum kits available: four internal RAM kits, four card kits, and eight internal ROM kits.

Assign: this parameter sets the Program to either polyphonic or monophonic. In Polyphonic mode, a number of notes up to the maximum available can be played simultaneously: 32 in Single mode and 16 in Double mode. In Monophonic mode, one note only can be played at a time.

Hold: this parameter determines whether or not notes continue to sound after keys are released. Typically, this parameter should be set to off, unless you want notes to drone on for eternity. However, when the Oscillator mode is set to DRUMS, this parameter should be set to ON. This will ensure that drum sounds are played in their entirety, regardless of how long you hold down keys.

Oscillator 1 Setup – 1B

These parameters are used to set up oscillator 1.

```
1B OSC1 SOUND  >  1B OSC1      <>  1B OSC1           <>  1B OSC1            <
000:A.Piano 1      Level99  OCT 8    EGint+00 Pan=CNT    SEND C = 5 D = 5
```

LCD	Parameter	Range	Description
1B–1	Multisound (SOUND)	0 ~ 339 C00 – Drum kit 1, 2	Internal Multisounds Card Multisounds (if card inserted) If Oscillator mode is DRUMS, select a drum kit
1B–2	Oscillator Level (Level)	0 ~ 99	Oscillator 1 level
	Octave (OCT)	32' 16' 8' 4'	2 octaves down 1 octave down Normal pitch 1 octave up
1B–3	Pitch EG Intensity (EGint)	–99 ~ +99	The amount of control that the Pitch EG exerts over the pitch of oscillator 1
	Pan (Pan)	A, A14–CNT–B14, B	Output pan to buses A and B
1B–4	Send C (SEND)	0 ~ 9	Output level to bus C
	Send D (D)	0 ~ 9	Output level to bus D

Multisound: this parameter is used to select one of 340 internal Multisounds for oscillator 1. Multisounds are the basic sound elements that make up a Program and provide the basic characteristics of a Program. If an optional PCM data card is inserted, Multisounds can also be selected from that card. Data card Multisound numbers have the prefix C. Press the [10's HOLD] button to select card Multisounds.

Multisounds with NT (No Transpose) at the end of their names, for example, 187 StadiumNT, produce the same pitch regardless of which keys are played.

Since each Multisound has an upper limit to its pitch range, some Multisounds may produce no sound when played high up the keyboard.

If the oscillator mode is set to DRUMS, depending on which Program bank is currently selected, you can select a drum kit from the following table. For drum kit setup details, see "Drum Kit Setup1 – 7A" on page 159.

Value	Drum Kit	Bank
0	Drum Kit A1	Internal
1	Drum Kit A2	
2	Drum Kit B1	
3	Drum Kit B2	
4	Card D.Kit1	Data Card
5	Card D.Kit2	
6	Card D.Kit3	
7	Card D.Kit4	
8	Rom D.Kit1	ROM
∫	∫	
15	Rom D.Kit8	

Oscillator Level: this parameter is used to set the volume level of oscillator 1.

Note: *For some Multisounds, a high oscillator level may result in distortion when playing chords. In such a case, reduce the oscillator level.*

Octave: this parameter allows you to shift a Multisound up and down the keyboard in one octave steps. If the oscillator mode is set to DRUMS, this parameter should be set to 8', otherwise some drum sounds will be moved out of the keyboard range. If this parameter is set to anything other than 8', take care when setting the VDA and VDF Keyboard Tracking parameters.

Pitch EG Intensity: this parameter determines the amount of control that the Pitch EG exerts over the pitch of oscillator 1. A negative value inverts the pitch levels set for the Pitch EG.

Pan: this parameter is used to pan the output of oscillator 1 between buses A and B. These buses feed the effects processors. See "Effect Placement – 7E" on page 53. When OFF is selected, no signal is sent on buses A and B. The CNT setting means center: signals of equal level are fed buses A and B.

Send C, Send D: these parameters are used to set the level of the oscillator 1 signals sent to buses C and D respectively. These buses feed the effects processors. See "Effect Placement – 7E" on page 53.

Note: *If the oscillator mode is set to DRUMS, the Pan, Send C, and Send D parameters are ignored and the drum kit settings made in Global mode are used. See "Drum Kit Setup1 – 7A" on page 159.*

Oscillator 2 Setup – 1C

These parameters are used to set up oscillator 2. These parameters are available only when the Oscillator mode it set to DOUBLE. See "Global Oscillator Setup – 1A" on page 8.

```
1C OSC2 SOUND   >  1C OSC2        <>  1C OSC2        <>  1C OSC2        <>  1C OSC2 SOUND <>
000:A.Piano 1      Level99   OCT 16   EGint+00 Pan=CNT   SEND C = 5 D = 5   Intvl+00 Detn+03
```

```
1C OSC2        <
Delay=00
```

LCD	Parameter	Range	Description
1C–1	Multisound (SOUND)	0 ~ 339 C00 ~ Drum kit 0 ~ 15	Internal Multisounds Card Multisounds (if card inserted) If Oscillator mode is DRUMS, select a drum kit
1C–2	Oscillator Level (Level)	0 ~ 99	Oscillator 2 level
	Octave (OCT)	32' 16' 8' 4'	2 octaves down 1 octave down Normal pitch 1 octave up
1C–3	Pitch EG Intensity (EGint)	–99 ~ +99	The amount of control that the Pitch EG exerts over the pitch of oscillator 2
	Pan (Pan)	OFF, A, A14~CNT~B14, B	Output pan to buses A and B
1C–4	Send C (SEND)	0 – 9	Output level to bus C
	Send D (D)	0 ~ 9	Output level to bus D
1C–5	Interval (Intvl)	–12 ~ +12	Pitch shift relative to oscillator 1
	Detune (Detn)	–50 ~ +50	Oscillators 1 and 2 detune
1C–6	Delay Start (Delay)	0 ~ 99	Oscillator 2 sound output delay relative to oscillator 1

Apart from the fact that they control oscillator 2, most of these parameters operate the same as they do for oscillator 1. See "Oscillator 1 Setup – 1B" on page 9. The following parameters are available to oscillator 2 only.

Interval: this parameter pitch shifts oscillator 2 relative to oscillator 1 in semitone steps. This can be used, for example, to form simple 2-note chords.

Detune: this parameter de-tunes oscillators 1 and 2. This is useful for creating a thicker, richer sound. For a positive (+) Detune value, the pitch of oscillator 1 is lowered and the pitch of oscillator 2 is raised. For a negative (–) Detune value, the pitch of oscillator 1 is raised and the pitch of oscillator 2 is lowered. So as the Detune value is increased, both oscillators are detuned by the specified value. Odd Detune values will lower and raise oscillator pitches by 0.5 cents.

Detune	Oscillator 1	Oscillator 2
+50	–25	+25
+25	–12.5	+12.5
0	0	0
–12	+6	–6
–50	+25	–25

Delay Start: this parameter allows you to set oscillator 2 so that it starts producing sound after oscillator 1. A setting of 0 means no delay. This is normally set to 0.

Pitch EG – 2A

The Pitch EG (Envelope Generator) determines how the pitch of oscillators 1 and 2 varies over time.

```
2A PITCH EG      >  2A PITCH EG    <>  2A PTCH.EG Vel <
SL+00 AT00 AL+00    DT00 RT00 RL+00    Levl=+99 Tim=+00
```

LCD	Parameter	Range	Description
2A–1	Start Level Pitch (SL)	–99 ~ +99	Amount of pitch change when key is first pressed
	Attack Time (AT)	0 ~ 99	Time to reach Attack level pitch when key pressed
	Attack Level Pitch (AL)	–99 ~ +99	Amount of pitch change when attack time ends
2A–2	Decay Time (DT)	0 ~ 99	Time to reach normal pitch once attack time ends
	Release Time (RT)	0 ~ 99	Time to reach Release level pitch when key is released
	Release Level Pitch (RL)	–99 ~ +99	Amount of pitch change when key is released
2A–3	EG Level Velocity Sensitivity (Levl)	–99 ~ +99	Pitch EG level sensitivity to keyboard velocity
	EG Time Velocity Sensitivity (Tim)	–99 ~ +99	Pitch EG time sensitivity to keyboard velocity

The Pitch EG can change the oscillator pitch by up to ± 1 octave. A level setting of 99 is approximately 1 octave. The extent to which the Pitch EG affects the oscillator pitch is set independently for each oscillator using the Pitch EG Intensity (EGint) parameters. See "Oscillator 1 Setup – 1B" on page 9 and "Oscillator 2 Setup – 1C" on page 11.

Probably the best way to understand the Pitch EG is to edit a Program, adjust the above parameters, and listen to the results. The main thing to remember is that the Level parameters specify the amount of pitch change, and the Time parameters specify the time it takes to reach pitch changes relative to a key being pressed and released. Negative (–) levels mean lowered pitch and positive (+) levels mean raised pitch. The following diagram should help too.
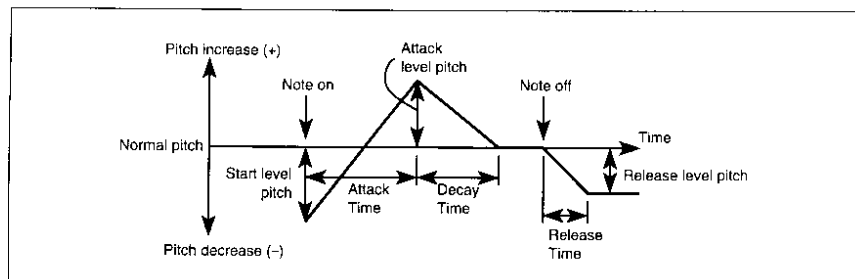
EG Level Velocity Sensitivity: this parameter allows you to control the Pitch EG pitch levels using keyboard velocity. For a positive value (+), the amount of pitch change will increase as you play stronger. A negative value (–) will have the opposite effect.
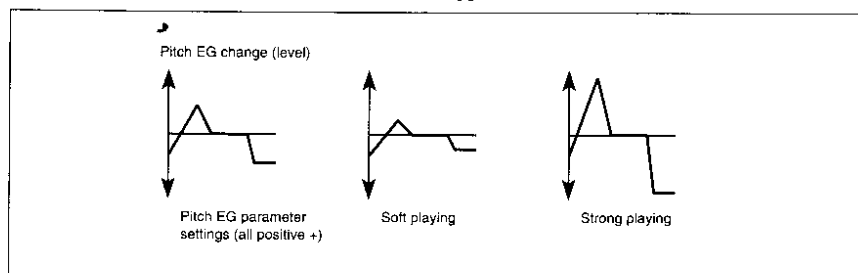
EG Time Velocity Sensitivity: this parameter allows you to control the Pitch EG Time parameters using keyboard velocity. For a positive value (+), time parameters will become shorter as you play stronger. A negative value (–) will have the opposite effect.

Pitch EG change (time)

Pitch EG parameter settings (all positive +)   Soft playing   Strong playing
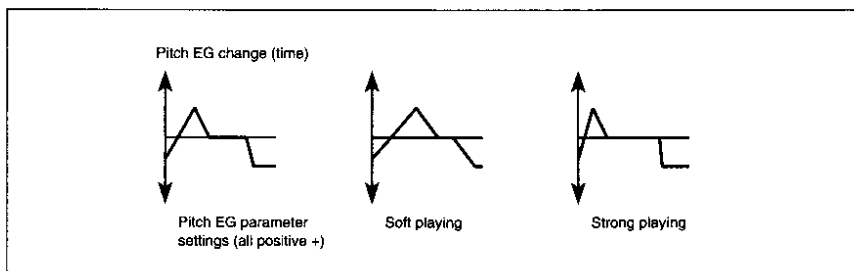
VDF1 Cutoff & EG – 3A

These parameters are used to set up the VDF (Variable Digital Filter) for oscillator 1.

```
3A VDF 1        >│3A VDF1EG      <>│3A VDF1EG      <>│3A VDF1EG      <>│3A COLOR 1       ·
Fc=19  EGint=65 │AT09 AL+08 DT00  │BP+00 ST00 SL+00 │RT00 RL+00       │Int=00   Vel=+00
```

LCD	Parameter	Range	Description
3A–1	VDF Cutoff Frequency (Fc)	0 ~ 99	VDF1 cutoff frequency
	EG Intensity (EGint)	0 ~ 99	The amount of control that the following EG parameters exert over the VDF Cutoff Frequency parameter
3A–2	Attack Time (AT)	0 ~ 99	Time to reach Attack Level after key pressed
	Attack Level (AL)	–99 ~ +99	Amount of cutoff frequency change when Attack Time ends
	Decay Time (DT)	0 ~ 99	Time to reach Break Point once Attack Time ends
3A–3	Break Point (BP)	–99 ~ +99	Amount of cutoff frequency change when Decay Time ends
	Slope Time (ST)	0 ~ 99	Time to reach Sustain Level once Decay Time ends
	Sustain Level (SL)	–99 ~ +99	Amount of cutoff frequency change until key released
3A–4	Release Time (RT)	0 ~ 99	Time to reach Release Level when key released
	Release Level (RL)	–99 ~ +99	Amount of cutoff frequency change once Release Time ends
3A–5	Color Intensity (Int)	0 ~ 99	Amount of color
	Color Velocity (Vel)	–99 ~ +99	Color sensitivity to keyboard velocity

This VDF is a basically a low-pass filter with a variable cutoff frequency parameter. This can be used to change the tonal quality of a Program. In addition, the VDF EG (Variable Digital Filter Envelope Generator) parameters allow you to determine how the cutoff frequency will change over time.

VDF Cutoff Frequency: the cutoff frequency can be set from 0 to 99. As the value is reduced, high frequencies are filtered, thus producing a darker tone.
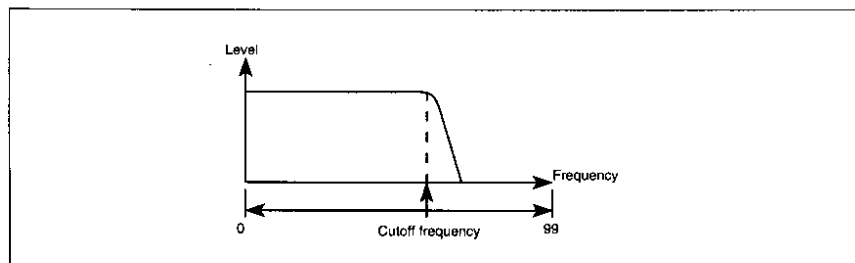
EG Intensity: this parameter determines the amount of control that the VDF EG exerts over the VDF Cutoff Frequency parameter. Effectively, it sets the overall level of the VDF EG.

VDF EG: the eight parameters on LCD screens 3A–2 to 3A–4 are used to set up the VDF EG. Level parameters specify the amount of VDF cutoff frequency change, and Time parameters specify the time it takes to reach cutoff frequency changes relative to keys being pressed and released. Positive values cause the cutoff frequency to increase, negative values cause it to decrease.

In the diagram below, all VDF EG Level parameters are positive values, negative values would cause the envelope curve to fall below the centre line.
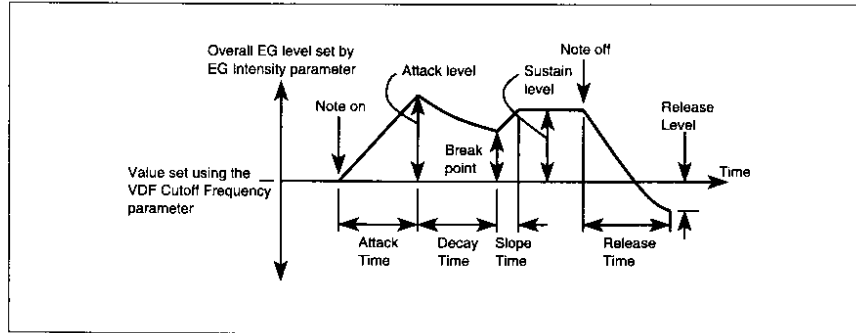
Color Intensity: This parameter determines the amount VDF color.

Color Velocity: this parameter determines how the color parameter responds to keyboard velocity. For positive values, stronger playing will increase the amount of color. Negative values will have the opposite effect.

VDF1 Velocity Sensitivity & Keyboard Tracking – 3B

VDF1 velocity sensitivity parameters determine how VDF1 EG responds to keyboard velocity. The keyboard tracking parameters determine how different areas of the keyboard affect VDF1 EG.

```
3B VDF1 V.SENS  ›  3B VDF1 V.SENS <>  3B VDF1 K.TRK  <>  3B VDF1 K.TRK  <>  3B VDF1 K.TRK  <
EGint+77 EGtm00    AT0 DT0 ST0 RT0    KeyF#4 Mode=ALL    Int=+00 EGtm=00     AT0 DT0 ST0 RT0
```

LCD	Parameter	Range	Description
3B–1	Velocity Sensitivity EG Intensity (EGint)	–99 ~ +99	VDF1 EG Intensity parameter sensitivity to keyboard velocity
	Velocity Sensitivity EG Time (EGtm)	0 ~ 99	VDF1 EG Time parameter sensitivity to keyboard velocity
3B–2	Attack Time (AT)	–, 0, +	The direction in which VDF1 EG Time parameters are affected by keyboard velocity
	Decay Time (DT)	–, 0, +	
	Slope Time (ST)	–, 0, +	
	Release Time (RT)	–, 0, +	
3B–3	Keyboard Tracking Key (Key)	C–1 ~ G9	For Low and High keyboard tracking modes, the key from which keyboard tracking starts. For All mode, the key at which VDF Cutoff Frequency and VDF EG Time parameters are not affected
	Keyboard Tracking Mode (Mode)	OFF LOW HIGH ALL	No keyboard tracking Keyboard tracking below the specified key Keyboard tracking above the specified key Keyboard tracking over the entire keyboard
3B–4	Keyboard Tracking Intensity (Int)	–99 ~ +99	VDF1 EG Intensity to keyboard tracking
	Keyboard Tracking EG Time (EGtm)	0 ~ 99	VDF1 EG Time parameter sensitivity to keyboard tracking
3B–5	Attack Time (AT)	–, 0, +	The direction in which VDF1 EG Time parameters are affected by keyboard tracking
	Decay Time (DT)	–, 0, +	
	Slope Time (ST)	–, 0, +	
	Release Time (RT)	–, 0, +	

Note: *Some of the parameters mentioned in this section operate in conjunction with parameters in "VDF1 Cutoff & EG – 3A" on page 14, so refer to that section also.*

Velocity Sensitivity EG Intensity: this parameter determines how the VDF1 EG Intensity parameter is affected by keyboard velocity. For positive values, soft playing will reduce the value of the VDF1 EG Intensity parameter, strong playing will increase the value. Negative values will have the opposite effect. In the following diagram, a positive value has been set.
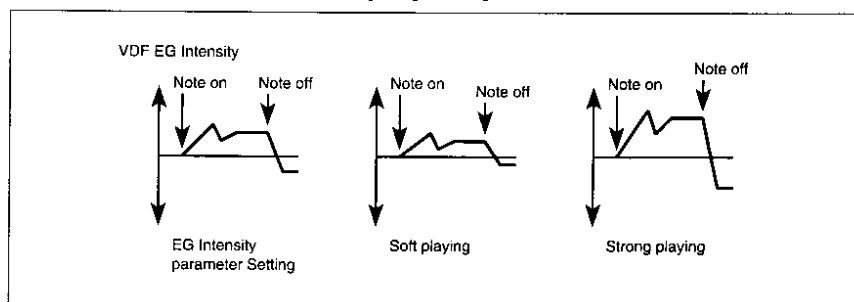
Note: *This parameter does not affect the VDF Cutoff Frequency parameter directly, it affects the EG Intensity parameter. So if the EG Intensity parameter or all other VDF EG parameters are set to 0, it will have no effect.*

Many acoustic instruments often produce less high frequency energy when played softly. Soft playing produces a darker sound, while strong playing creates many high frequency harmonics that brighten the sound. This natural phenomenon can be simulated by setting the VDF Cutoff Frequency parameter to a fairly low value, and the VDF EG Intensity, VDF EG Sustain Level, and Velocity Sensitivity EG Intensity parameters to positive values.

Velocity Sensitivity EG Time: this parameter determines how the VDF1 EG Time parameters are affected by keyboard velocity. It affects the VDF1 EG Attack, Decay, Slope, and Release Time parameters equally. Although, the direction of change can be set independently for each parameter.

Attack, Decay, Slope, Release Times: these parameters determine whether the VDF1 EG Time parameters are reduced or increased with changing keyboard velocity. For a negative (–) value, they are increased, for a positive (+) value reduced, a setting of 0 means no effect. In the following diagram, each parameter is set to positive.
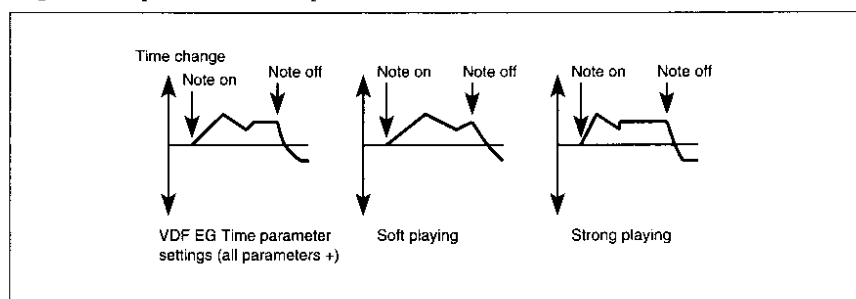
Keyboard Tracking Key: for Low and High keyboard tracking modes, this parameter specifies the key from which keyboard tracking starts. For All mode, it specifies the key around which keyboard tracking will take place. At the specified key, keyboard tracking will have no effect.

Keyboard Tracking Modes: keyboard tracking determines how the VDF affects different areas of the keyboard. There are four Keyboard Tracking modes: Off, Low, High, and All. When Off is selected, there is no keyboard tracking and the Keyboard Tracking Intensity and Keyboard Tracking EG Time parameters are disabled. When Low is selected, keyboard tracking will be active on keys below the specified Keyboard Tracking Key. When High is selected, keyboard tracking will be active on keys above the specified Keyboard Tracking Key. When All is selected, keyboard tracking will be active across the entire keyboard.

Keyboard Tracking Intensity: this parameter determines keyboard tracking intensity for the specified keyboard area. Positive values will make high notes brighter. Negative values will have the opposite effect. For a value of 0, the cutoff frequency will change linearly with regard to key pitch. For a value of –50, the cutoff frequency will be the same for all notes.
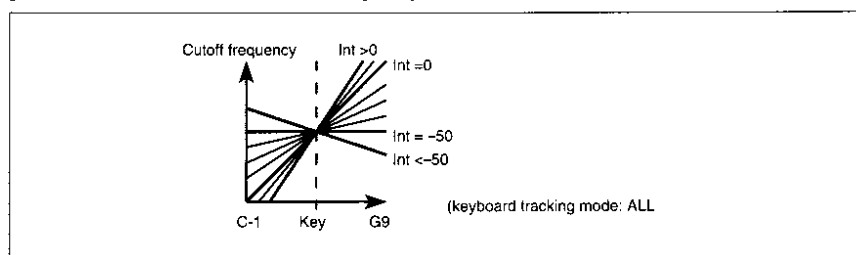
Keyboard Tracking EG Time: this parameter determines how the VDF1 EG Time parameters are affected by keyboard tracking. It affects the VDF1 EG Attack, Decay, Slope, and Release Time parameters equally. Although, the direction of change can be set independently for each parameter. The Keyboard Tracking mode and Key parameters can be used to specify the keyboard area that is affected.
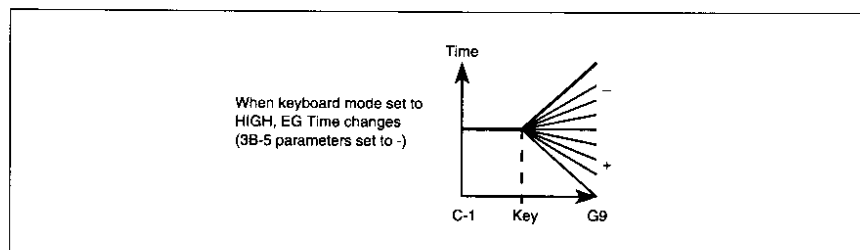
Attack, Decay, Slope, Release Times: these parameters determine whether the VDF1 EG Time parameters are reduced or increased with keyboard tracking. For a negative (−) value, notes above the specified key will have their VDF EG times increased. For a positive (+) value, notes above the specified key will have their VDF EG times decreased. A setting of 0 means no effect.
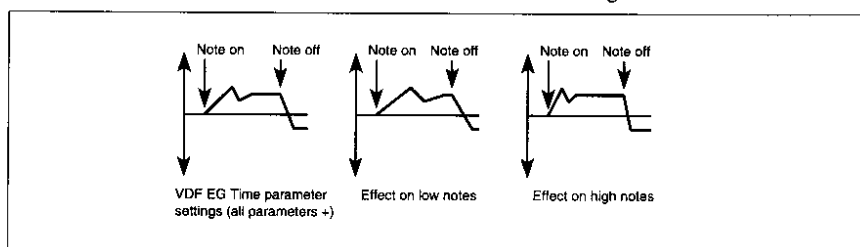
VDF2 Cutoff & EG – 3C

These parameters are used to set up the VDF (Variable Digital Filter) for oscillator 2. Operation is the same as for VDF1. See "VDF1 Cutoff & EG – 3A" on page 14.

3C VDF 2 >	3C VDF2EG <>	3C VDF2EG <>	3C VDF2EG <>	3C COLOR 2
Fc=19 EGint=65	AT09 AL+08 DT00	BP+00 ST00 SL+00	RT00 RL+00	Int=00 Vel=+00

VDF2 Velocity Sense & Keyboard Tracking – 3D

VDF2 velocity sensitivity parameters determine how VDF2 EG responds to keyboard velocity. The keyboard tracking parameters determine how different areas of the keyboard affect VDF2 EG. Operation is the same as for VDF1. See "VDF1 Velocity Sensitivity & Keyboard Tracking – 3B" on page 16.

3D VDF2 V.SENS >	3D VDF2 V.SENS <>	3D VDF2 K.TRK <>	3D VDF2 K.TRK <>	3D VDF2 K.TRK <
EGint+77 EGtm00	AT0 DT0 ST0 RT0	KeyF#4 Mode=ALL	Int=+00 EGtm=00	AT0 DT0 ST0 RT0

VDA1 EG – 4A

VDA1 EG (Variable Digital Amplifier Envelope Generator) determines how the volume of oscillator 1 varies over time.

```
4A VDA1 EG      >  4A VDA1 EG      <>  4A VDA1 EG      <
AT00 AL99 DT15     BP20 ST88 SL00      RT60
```

LCD	Parameter	Range	Description
	Attack Time (AT)	0 ~ 99	Time to reach Attack Level after key pressed
4A–1	Attack Level (AL)	0 ~ 99	Volume level when Attack Time ends
	Decay Time (DT)	0 ~ 99	Time to reach Break Point once Attack Time ends
	Break Point (BP)	0 ~ 99	Volume level when Decay Time ends
4A–2	Slope Time (ST)	0 ~ 99	Time to reach Sustain Level once Decay Time ends
	Sustain Level (SL)	0 ~ 99	Volume level when Slope Time ends
4A–3	Release Time (RT)	0 ~ 99	Time to reach zero volume when key released
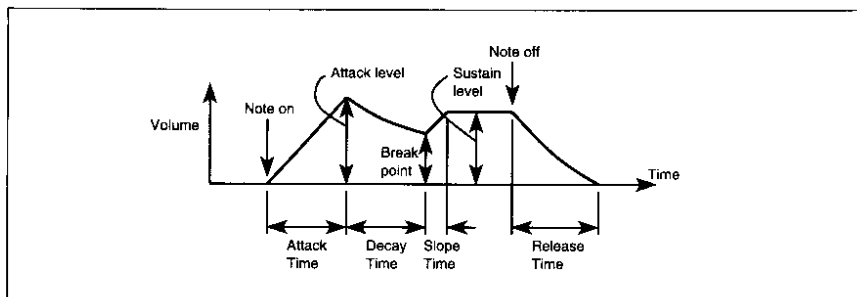
VDA1 Velocity Sensitivity & Keyboard Tracking – 4B

VDA1 velocity sensitivity parameters determine how VDA1 EG responds to keyboard velocity. The keyboard tracking parameters determine how different areas of the keyboard affect VDA1 EG.

4B VDA1 V.SENS >	4B VDA1 V.SENS <>	4B VDA1 K.TRK <>	4B VDA1 K.TRK <>	4B VDA1 K.TRK
Amp=+99 EGtm=00	AT0 DT0 ST0 RT0	KeyC#1 Mode=OFF	Amp=+00 EGtm=00	AT0 DT0 ST0 RT0

LCD	Parameter	Range	Description
4B–1	Velocity Sensitivity Amplitude (Amp)	–99 ~ +99	VDA1 EG sensitivity to keyboard velocity
	Velocity Sensitivity EG TIme (EGtm)	0 ~ 99	VDA1 EG Time parameter sensitivity to keyboard velocity
4B–2	Attack Time (AT)	–, 0, +	The direction in which VDA1 EG Time parameters are affected by keyboard velocity
	Decay Time (DT)	–, 0, +	
	Slope Time (ST)	–, 0, +	
	Release Time (RT)	–, 0, +	
4B–3	Keyboard Tracking Key (Key)	C–1 ~ G9	For Low and High keyboard tracking modes, the key from which keyboard tracking starts. For All mode, the key at which VDA1 EG parameters are not affected
	Keyboard Tracking Mode (Mode)	OFF LOW HIGH ALL	No keyboard tracking Keyboard tracking below the specified key Keyboard tracking above the specified key Keyboard tracking over the entire keyboard
4B–4	Keyboard Tracking Amplitude (Amp)	–99 ~ +99	VDA1 EG sensitivity to keyboard tracking
	Keyboard Tracking EG Time (EGtm)	0 ~ 99	VDA1 EG Time parameter sensitivity to keyboard tracking
4B–5	Attack Time (AT)	–, 0, +	The direction in which VDA1 EG Time parameters are affected by keyboard tracking
	Decay Time (DT)	–, 0, +	
	Slope Time (ST)	–, 0, +	
	Release Time (RT)	–, 0, +	

Note: *Some of the parameters mentioned in this section operate in conjunction with parameters in "VDA1 EG – 4A" on page 20, so refer to that section also.*

Velocity Sensitivity Amplitude: this parameter determines how the overall level of VDA1 EG is affected by keyboard velocity. For positive values, soft playing will reduce the volume. For negative values, soft playing will increase the volume. In the following diagram, a positive value has been selected.
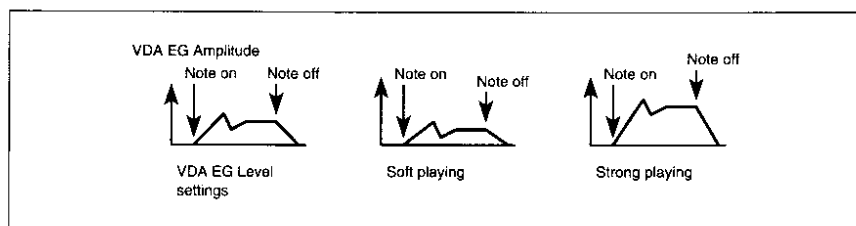
By setting the Velocity Sensitivity Amplitude parameter for VDA1 to a positive value and the Velocity Sensitivity Amplitude parameter for VDA2 to a negative value, a velocity crossfade effect can be achieved. This allows you to fade between two sounds as your playing changes from soft to strong and vice versa.

Keyboard velocity can also be used to control output panning. Set oscillator 1 and oscillator 2 parameters the same (use the "Program Oscillator Copy – 8C" on page 31), set the Velocity Sensitivity Amplitude parameters for VDA1 and VDA2 as described above, then set oscillator 1 Pan to A and oscillator 2 Pan to B. As you play softly, oscillator 2 will be sent to the right output. As your playing gradually gets stronger, the level of oscillator 2 will reduce and oscillator 1 will be sent to the left output. Because both oscillators are set identical, the Program will appear to pan from right to left as your playing gets stronger.

Velocity Sensitivity EG Time: this parameter determines how the overall level of VDA1 EG Time parameters are affected by keyboard velocity. It affects the VDA1 EG Attack, Decay, Slope, and Release Time parameters equally. Although, the direction of change can be set independently for each parameter.

Attack, Decay, Slope, Release Times: these parameters determine whether the VDA1 EG Time parameters are reduced or increased with changing keyboard velocity. For a negative (–) value, they are increased the stronger you play, for a positive (+) value they are reduced the stronger you play. In other words, for a positive setting, the stronger you play, the shorter the Attack, Decay, Slope, and Release times become. This is especially effective on string type Programs. In the following diagram, all parameters are set to positive.
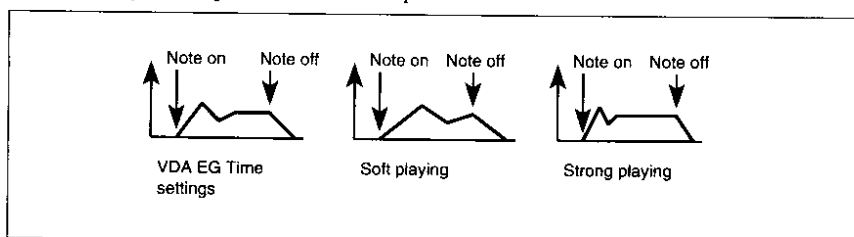
Keyboard Tracking Key: for Low and High keyboard tracking modes, this parameter specifies the key from which keyboard tracking starts. For All mode, it specifies the key around which keyboard tracking will take place. At the specified key, keyboard tracking will have no effect.
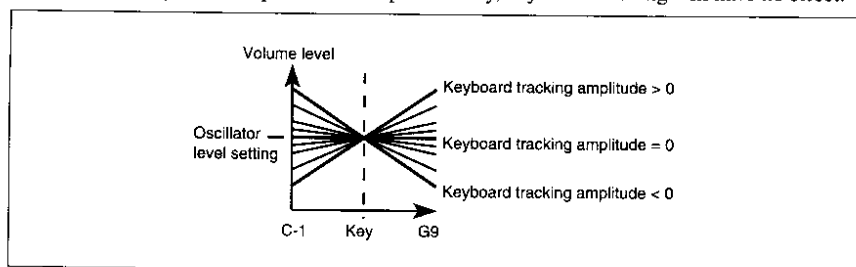
Keyboard Tracking Modes: keyboard tracking determines how the VDA EG applies to different areas of the keyboard. There are four Keyboard Tracking modes: Off, Low, High, and All. When Off is selected, there is no keyboard tracking and the Keyboard Tracking Amplitude and Keyboard Tracking EG Time parameters are disabled. When Low is selected, keyboard tracking will be

active on keys below the specified Keyboard Tracking Key. When High is selected, keyboard tracking will be active on keys above the specified Keyboard Tracking Key. When All is selected, keyboard tracking will be active across the entire keyboard.
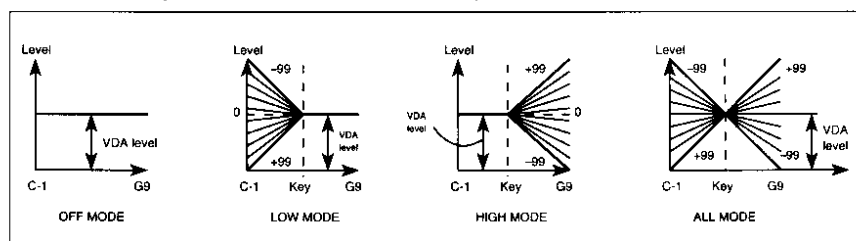

Keyboard Tracking Amplitude: this parameter determines keyboard tracking amplitude for the specified keyboard area. Positive values will make high notes louder. Negative values will have the opposite effect.

Keyboard Tracking EG Time: this parameter determines how the overall level of the VDA1 EG Time parameters are affected by keyboard tracking. It affects the VDA1 EG Attack, Decay, Slope, and Release Time parameters equally. Although, the direction of change can be set independently for each parameter. The Keyboard Tracking mode and Key parameters can be used to specify the keyboard area that is affected.

Attack, Decay, Slope, Release Times: these parameters determine whether the VDA1 EG Time parameters are reduced or increased with keyboard tracking. For a negative (–) value, notes above the specified key will have their VDA EG times increased. For a positive (+) value, notes above the specified key will have their VDA EG times decreased. In the following diagram, all parameters are set to positive.
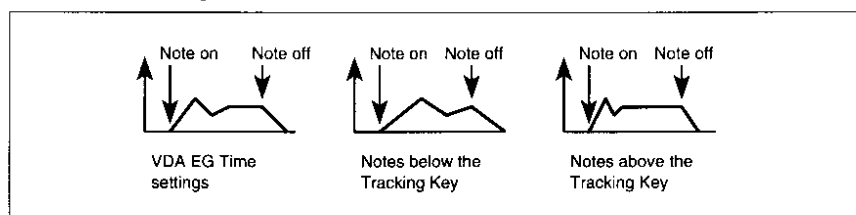
Creating a Positional Crossfade

You can specify a keyboard position at which one oscillator will fade out and the other will fade in. Set VDA1 and VDA2 to the same Keyboard Tracking Key, for example, C4, then set VDA1 to a positive Keyboard tracking Amplitude value and VDA2 to a negative Keyboard tracking Amplitude value.
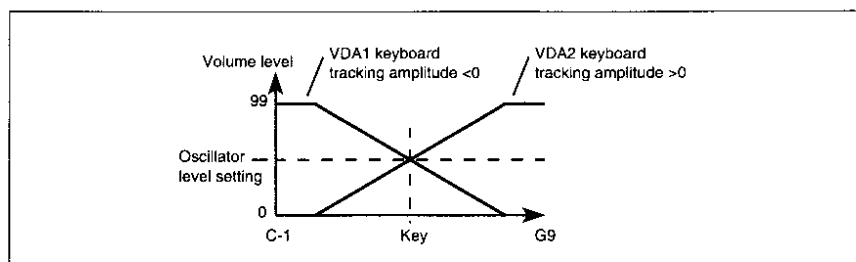
VDA2 EG – 4C

VDA2 EG (Variable Digital Amplifier Envelope Generator) determines how the volume of oscillator 2 varies over time. Operation is the same as for VDA1. See "VDA1 EG – 4A" on page 20.

```
┌─────────────────┬─────────────────┬─────────────────┐
│ 4C VDA2 EG    > │ 4C VDA2 EG   <> │ 4C VDA2 EG    < │
│ AT00 AL99 DT15  │ BP20 ST88 SL00  │ RT60            │
└─────────────────┴─────────────────┴─────────────────┘
```

VDA2 Velocity Sensitivity & Keyboard Tracking – 4D

VDA2 velocity sensitivity parameters determine how VDA2 EG responds to keyboard velocity. The keyboard tracking parameters determine how different areas of the keyboard affect VDA2 EG. Operation is the same as for VDA1. See "VDA1 Velocity Sensitivity & Keyboard Tracking – 4B" on page 21.

```
┌──────────────────┬──────────────────┬──────────────────┬──────────────────┬──────────────────┐
│ 4D VDA2 V.SENS > │ 4D VDA2 V.SENS <>│ 4D VDA2 K.TRK  <>│ 4D VDA2 K.TRK  <>│ 4D VDA2 K.TRK   <│
│ Amp=+99 EGtm=00  │ AT0 DT0 ST0 RT0  │ KeyC#1 Mode=OFF  │ Amp=+00 EGtm=00  │ AT0 DT0 ST0 RT0  │
└──────────────────┴──────────────────┴──────────────────┴──────────────────┴──────────────────┘
```

Pitch1 Modulation – 5A

These parameters allow you to modulate the pitch of oscillator 1. Modulation frequency and intensity can also be controlled using after touch and the joystick.

```
5A PITCH 1 MG    >  5A PITCH 1 MG   <>  5A PITCH 1 MG   <>  5A PMG1 FREQ    <>  5A PMG1 INT      :
TRI Fr=00 Int00     Delay00 FadeIn00    K.Sync:OFF          K.TRK+00  A+J=0     Aft=00  JoyUP=00
```

LCD	Parameter	Range	Description
5A–1	Waveform	TRI SAW1 SAW2 SQR RAND	Triangle Sawtooth 1 Sawtooth 2 Square Random
	Frequency (Frq)	0 ~ 99	Modulation Speed
	Intensity(Int)	0 ~ 99	Modulation Intensity
5A–2	Delay (Delay)	0 ~ 99	Time from key press to modulation start
	Fade In Time (Fadeln)	0 ~ 99	Rate at which modulation reaches specified Intensity
5A–3	Keyboard Sync (K.Sync)	OFF ON	Modulation will continue for subsequent notes Modulation will restart for each new note
5A–4	Keyboard Tracking (K.TRK)	–99 ~ +99	Modulation sensitivity to keyboard tracking
	After Touch & Joystick (A+J)	0 ~ 9	Modulation frequency control by after touch and joystick
5A–5	After Touch Modulation Intensity (Aft)	0 ~ 99	Modulation intensity controlled by after touch
	Joystick Modulation Intensity (JoyUp)	0 ~ 99	Modulation intensity controlled by the joystick

Waveform: this parameter selects the type of modulation waveform.

Frequency: this parameter determines the modulation frequency (speed).

Intensity: this parameter determines the modulation intensity (depth).

Delay: this parameter determines how long after a key press modulation starts.

Fade In time: this parameter specifies the time it takes modulation to reach maximum intensity.
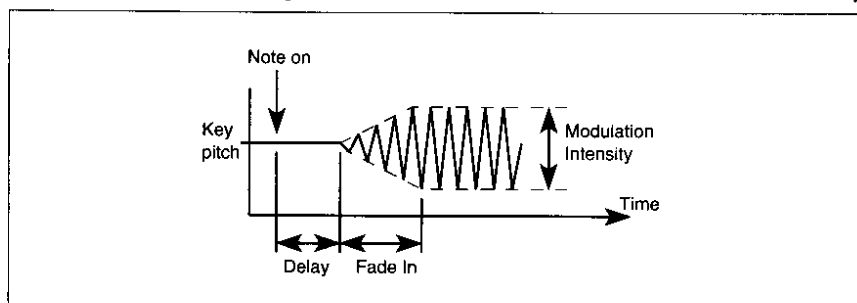
Keyboard Sync: determines how subsequent notes are affected by modulation. For a setting of OFF, modulation will be applied to subsequent notes in the same way that it is currently being applied to notes that are already held down. That is, subsequent notes will not be affected by the Delay and Fade In Time parameters. For a setting of ON, modulation will restart for each new note.

Keyboard Tracking: keyboard tracking determines how modulation affects different areas of the keyboard. For positive values, the modulation frequency will increase as higher notes are played. For negative values, the modulation frequency will decrease as higher notes are played.

After Touch & Joystick: this parameter specifies how much the modulation frequency will be increased in response to after touch and joystick.

After Touch Modulation Intensity: this parameter determines to what extent after touch affects the modulation intensity.

By setting the After Touch & Joystick and Joystick Modulation Intensity parameters, modulation frequency and intensity can both be increased by applying after touch.

Joystick Modulation Intensity: this parameter determines to what extent the joy stick affects the modulation intensity.

By setting the After Touch & Joystick and Joystick Modulation Intensity parameters, modulation frequency and intensity can both be increased by moving the joystick up.
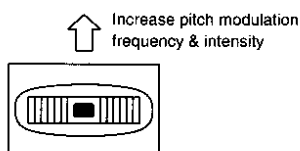
Pitch2 Modulation – 5B

These parameters allow you to modulate the pitch of oscillator 2. Modulation frequency and intensity can also be controlled using after touch and the joystick. Operation is the same as for Pitch1 Modulation. See "Pitch1 Modulation – 5A" on page 25.

VDF Modulation – 5C

These parameters allows you to modulate the cutoff frequency of VDF1, VDF2, or both.

```
5C VDF MG      >  5C VDF MG     <>  5C VDF MG       <
RAND Frq00 Int00  Delay00 OSC=BOTH  K.Sync:OFF
```

LCD	Parameter	Range	Description
6A-1	Waveform	TRI SAW1 SAW2 SQR RAND	Triangle Sawtooth 1 Sawtooth 2 Square Random
	Frequency (Frq)	0 ~ 99	Modulation Speed
	Intensity (Int)	0 ~ 99	Modulation Intensity
6A-2	Delay	0 ~ 99	Time from key press to modulation start
	Oscillator Select (OSC)	OFF OSC1 OSC2 BOTH	Modulation off Modulation for VDF1 Modulation for VDF2 modulation for VDF1 and VDF2
6A-3	Keyboard Sync (K.Sync)	OFF ON	OFF: modulation will continue for subsequent notes ON: modulation will restart for each new note

Waveform: this parameter selects the type of modulation waveform.
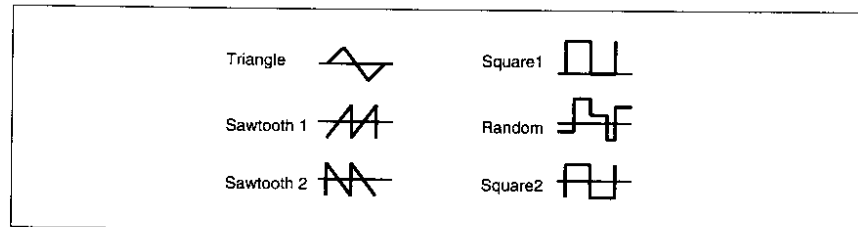
Frequency: this parameter determines the modulation frequency (speed).

Intensity: this parameter determines the modulation intensity (depth).

Delay: this parameter determines how long after a key press modulation starts. Modulation starts with a fade in time that is determined by this parameter.
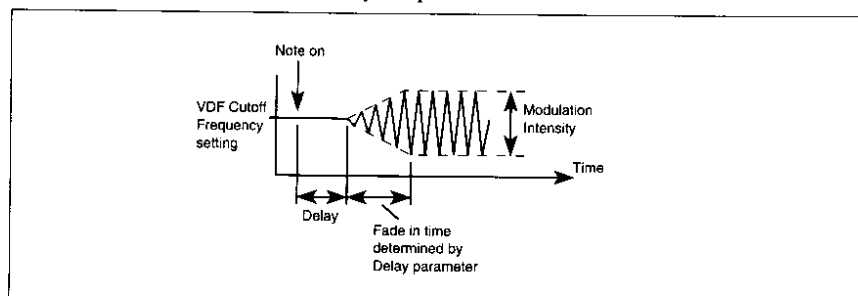
Oscillator Select: this parameter allows you to apply modulation to VDF1, VDF2, or both.

Keyboard Sync: determines how subsequent notes are affected by modulation. For a setting of OFF, modulation will be applied to subsequent notes in the same way that it is currently being applied to notes that are already held down. That is, subsequent notes will not be affected by the Delay parameter. For a setting of ON, modulation will restart for each new note.

After Touch & Joystick Control – 6A

These parameters determine how a Program responds to after touch and the joystick.

```
6B AFT CTRL      >  6B AFT CTRL     <>  6B J.STK Down  <>  6B BEND CTRL   <
P.Bend+12 Fc+00     UDF.MG00 Amp+00     UDF.MG=99           P.Bend+00 UDF+00
```

LCD	Parameter	Range	Description
6B-1	After Touch Pitch Bend (P.Bend)	–12 ~ +12	After touch pitch bend range
	After Touch VDF Cutoff Frequency (Fc)	–99 ~ +99	VDF Cutoff Frequency sensitivity to after touch
6B-2	After Touch VDF Modulation Intensity (VDF.MG)	0 ~ 99	VDF modulation sensitivity to after touch
	After Touch VDA Amplitude (Amp)	–99 ~ +99	VDA1 sensitivity to after touch
6B-3	Joystick VDF Modulation Intensity (VDF.MG)	0 ~ 99	VDF modulation sensitivity to the joystick
6B-4	Joystick Pitch Bend Range (P.Bend)	–12 ~ +12	Joystick pitch bend range and direction
	Joystick VDF Sweep Intensity (VDF)	–99 ~ +99	VDF modulation sensitivity to the joystick

After Touch Pitch Bend: this parameter determines the after touch pitch bend range (±1 octave).

After Touch VDF Cutoff Frequency: this parameter determines how the VDF Cutoff Frequency responds to after touch. For positive values, after touch will increase the Cutoff Frequency, thus making the sound brighter. Negative values will have the opposite effect. For this parameter to have any affect, you must set the VDF Cutoff Frequency to something other than 99.

After Touch VDF Modulation Intensity: this parameter determines how VDF modulation responds to after touch. When after touch is applied, the VDF Cutoff Frequency is modulated. The higher the value, the greater the modulation intensity. For this parameter to have any affect, you must set the VDF Cutoff Frequency to something other than 99, the VDF Modulation Frequency to something other than 0, and the VDF Modulation Oscillator to OSC1, OSC2, or BOTH.

After Touch VDA Amplitude: this parameter determines how the VDA responds to after touch. In other words, how after touch affects the volume of oscillator 1. For positive values, increasing after touch (pressing down on a held key) will increase the volume. Negative settings will have the opposite effect.

Joystick VDF Modulation Intensity: this parameter determines how VDF modulation responds to the joystick. When the joystick is moved down, the VDF Cutoff Frequency is modulated. The higher the value, the greater the modulation intensity. For this parameter to have any affect, you must set the VDF Cutoff Frequency to something other than 99, the VDF Modulation Frequency to something other than 0, and the VDF Modulation Oscillator to OSC1, OSC2, or BOTH.

Increase VDF modulation
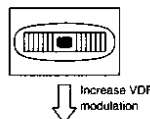
Joystick Pitch Bend Range: this parameter determines the joystick pitch bend range (±1 octave) and pitch bend direction. For positive values, the pitch will increase as the joystick is moved from left to right (as shown). For negative values, the pitch will increase as the joystick is moved from right to left.
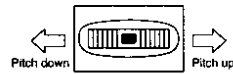
Joystick VDF Sweep Intensity: this parameter determines how the VDF Cutoff Frequency responds to the joystick. For positive values, the Cutoff Frequency will increase as the joystick is moved from left to right (as shown). For negative values, the Cutoff Frequency will increase as the joystick is moved from right to left.
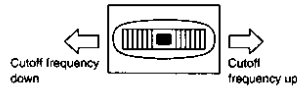
Effects – 7A ~ 7G

Effects are explained in Chapter 5: "Effects" on page 51.

When you've edited a Program's effect settings, always remember to write the Program, otherwise, the settings will be lost when you select another Program.

Program Write – 8A

This function allows you to write (save) a Program to Program bank A or B. If a PROG/SEQ data card is inserted, you can also write to bank C or D. It can also be used to reorganize Program numbering by writing Programs to different destinations.

```
8A PROG WRITE
Write→A00   OK?
```

LCD	Parameter	Range	Description
8A	Write→xxx	A00 ~ A99 B00 ~ B99 C00 ~ C99 D00 ~ D99	Select the Program write destination
	OK to Write	OK?	Executes Program write

Note: *To write a Program to bank A or B, the Program Memory Protection function must be set to OFF. See "Program Memory Protect – 4A" on page 154.*

To write a Program to a PROG/SEQ data card, it must already be formatted and its write protect switch must be set to off. You cannot save to a card bank that already contains sequencer data.

To write a Program, specify the write destination, position the cursor on OK?, then press the [▲/YES] button. The message "Are You Sure OK?" will appear. Press the [▲/YES] button to write the Program, or the [▼/NO] button to cancel the function. If you write the Program, the destination Program will be selected automatically.

Note: *The Program that already exists at the selected write destination will be lost when you execute this function.*

While editing, you may want to write (save) a Program as you proceed. To do this, press the [REC/WRITE] button. The message "Are You Sure OK?" will appear. Press the [▲/YES] button to write the Program, or the [▼/NO] button to cancel the function.

To write all Programs, Combinations, and Global settings to floppy disk, see See "Save P/C/G Data – 3B" on page 173.

Program Rename – 8B

This function allows you to rename a Program.

```
8B RENAME
A00:E.Piano
```

LCD	Parameter	Range	Description
8B	Rename	See character table below	Rename a Program

To rename a Program, use the [←] and [→] cursor buttons to position the cursor, and the [▲/YES] [▼/NO] buttons or VALUE slider to select characters. Available characters are shown in the table below. Program names can use up to 10 characters.

	!	"	#	$	%	&	'	(	)	*	+	,	-	.	/	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	[	¥	]	^	_
`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y	z	{	¦	}	→	←

Use the number keypad to insert numbers. Use the [10's HOLD/–] button to switch between uppercase and lowercase characters. Press and hold down the [ENTER] button, then press the [←] button to delete the current character. Press and hold down the [ENTER] button, then press the [→] button to insert a character.

When you've renamed a Program, always remember to write the Program, otherwise, the new name will be lost when you select another Program.

Program Oscillator Copy – 8C

This function allows you to copy the oscillator parameter settings from another Program to either oscillator 1 or oscillator 2 of the currently selected Program.

```
8C Copy OSC
OSC1← A00   OK?
```

LCD	Parameter	Range	Description
8C	Copy Destination	OSC1, OSC2	The oscillator to which the oscillator settings are to be copied
	Program Source	A00 ~ A99 B00 ~ B99 C00 ~ C99 D00 ~ D99 G001 ~ 136	The Program from which the oscillator settings are to be copied
	Oscillator Source	OSC1, OSC2	The oscillator whose settings are to be copied
	OK to Copy	OK?	Executes oscillator copy

To copy an oscillator, specify the copy destination, the Program source, and Oscillator source. Position the cursor on OK?, then press the [▲/YES] button. The message "Are You Sure OK?" will appear. Press the [▲/YES] button to copy, or the [▼/NO] button to cancel the function.

The following parameter settings are copied: Oscillator Setup, VDF Cutoff & EG, VDF Velocity Sensitivity & Keyboard Tracking, VDA EG, VDA Velocity Sensitivity & Keyboard Tracking, Pitch Modulation, and the VDF Modulation Oscilator Select parameter.

If you copy to or from a Drum mode Program, the Multisound and Octave parameters are not copied.

If the Program source is the same as the program that you are currently editing, the edited parameter settings will be copied, not the parameter settings written (saved) in that Program.

When copying oscillator parameter settings, there is no point selecting OSC2 as the oscillator source of a Program that's in single Oscillator mode.

Oscillator Copy & Swap – 8D

This function allows you to copy and swap oscillator settings between oscillators 1 and 2.

```
8D Swap OSC1-2
OSC1→OSC2   OK?
```

LCD	Parameter	Range	Description
8D	Oscillator Copy/Swap	OSC1 ——→ OSC2 OSC1 ←—— OSC2 OSC1 ←—→ OSC2	Copy OSC1 to OSC2 Copy OSC2 to OSC1 Swap OSC1 and OSC2
	OK to Copy/Swap	OK?	Executes oscillator copy/swap

To copy/swap an oscillator, specify the copy/swap direction, position the cursor on OK?, then press the [▲/YES] button. The message "Are You Sure OK?" will appear. Press the [▲/YES] button to copy/swap, or the [▼/NO] button to cancel the function.

The following parameter settings are copied: Oscillator Setup, VDF Cutoff & EG, VDF Velocity Sensitivity & Keyboard Tracking, VDA EG, VDA Velocity Sensitivity & Keyboard Tracking, Pitch Modulation, and the VDF Modulation Oscilator Select parameter.

Program Initialize – 8E

This function resets all Program parameters to their initial settings. This is useful when you want to create a new Program from scratch.

```
8E INIT PROG
           OK?
```

LCD	Parameter	Range	Description
8E	INIT PROG	OK?	Executes initialize Program

To initialize a Program, press the [▲/YES] button. The message "Are You Sure OK?" will appear. Press the [▲/YES] button to initialize, or the [▼/NO] button to cancel the function. Parameters are initialized as follows: volume set to 50, VDF Cutoff Frequency at 99, VDA EG set for organ sound, all modulation off, and no effects.

Chapter 3: Combination Play Mode

In this mode you can select and play Combinations. Some Combination parameters can also be adjusted, allowing you to edit parameters in real time – as you play.

The following Combinations can be selected: A00 to A99 and B00 to B99. If a PROG/SEQ data card is inserted, Combinations C00 to C99 and D00 to D99 can also be selected.

Selecting Combinations

1) Press the [COMBI] button.

2) Press the [BANK] button repeatedly to select a Combination bank.

3) Enter the required Combination number using the number keypad. For example, to select Combination 56, press [5] then [6]. Alternatively, press the [▲/YES] and [▼/NO] buttons repeatedly to select a Combination.

The LCD screen should look something like the one shown below.

```
        TIMBRE  1  2  3  4  5  6  7  8

COMBI    A     00
         Combi Name
```
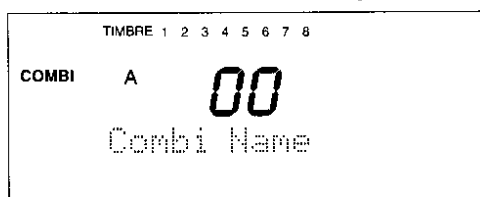
The numbers 1 to 8 at the top of the LCD correspond to Timbres. They appear for both EXT and INT mode Timbres. The flashing number indicates the Global MIDI Channel setting. When MIDI Note ON/Off messages are received, a box below the corresponding number flashes. This works as a MIDI monitor.

Combination Play Mode & MIDI

In Combination Play mode, MIDI data generated by playing the keyboard, moving the joystick, operating the assignable pedal, etc., is sent on the Global MIDI Channel.

Using a Pedal Switch to Select Combinations

You can also select Combinations using a pedal switch.

1) Connect an optional Korg PS-1 or PS-2 pedal switch to the ASSIGNABLE PEDAL/SW connection.

2) In Global mode, you need to assign the pedal to either Program Up or Program Down. See "Assignable Pedal Setup – 8B" on page 163.

Using MIDI to Select Combinations

You can also select Combinations using MIDI Program Change messages.

1) Connect a MIDI device capable of sending MIDI Program Change messages to the X3's MIDI IN connection.

2) Set the Global MIDI Channel parameter so that it matches that of the device sending the Program Change messages. See "Global MIDI Channel & MIDI Clock Source – 3A" on page 150.

3) In Global mode, you need to set Filter1 to ENA or NUM. See "MIDI Filter1 – 3C" on page 152.

The X3 also responds to MIDI Bank Change messages that can be used to select Combination banks. If you want the X3 to ignore MIDI Bank Change messages, set Filter1 to NUM. See "MIDI Filter1 – 3C" on page 152 for full details.

Combination Notes

Polyphony: up to 32-note polyphony is available for a Combination. That is, 32 notes are available to the Timbres within a Combination. Timbre Programs that use Double Oscillator mode will obviously reduce the number of available notes. For example, eight Single Oscillator mode Programs in a Combination would allow up to 32-note polyphony. Whereas, eight Double Oscillator mode Programs would allow up to 16-note polyphony.

Playing from the Keyboard: to play a Combination Timbre from the keyboard, you must set that Timbre's T.Mode to INT, and its MIDI Channel so that it matches the Global MIDI Channel setting. See "Timbre Mode – 1B" on page 38, and "MIDI Channel – 3A" on page 41. For details about setting the Global MIDI Channel, see "Global MIDI Channel & MIDI Clock Source – 3A" on page 150.

Program Effects: in Combination Play mode, the individual effect settings for each Timbre Program are ignored, and the effect settings for that Combination are used.

Editing a Combination Program: if you have just edited one of the Programs used by a Combination Timbre, the edited version of that Program (saved or not) will be used when that Combination is selected.

Editing in Combination Play Mode

In Combination Play mode you can edit the following Timbre parameters: Program number, Level, Panpot, and MIDI Channel.

1) Select a Combination.

2) Use the [1~8] function buttons to select a Timbre.

3) Use the [←] and [→] cursor buttons to select a parameter.

4) Use the VALUE slider or [▲/YES] and [▼/NO] buttons to adjust the selected parameter.

On the following LCD screen, the Program Select parameter is selected. The angle bracket symbol indicates that other parameters can be displayed using the [→] cursor button.

```
       TIMBRE 1  2  3  4  5  6  7  8

COMBI    A      OO
         T1:Program Name   >
         A02 127 CNT  16
```
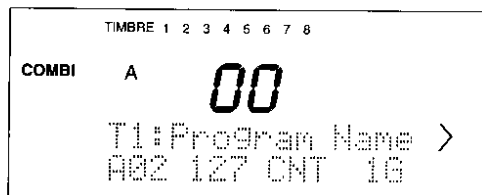
When you've finished editing, press the [↓] cursor button or the [COMBI] button to return to the previous LCD screen.

If you want to write the edited Combination to memory, press the [REC/WRITE] button, then press the [▲/YES] button. The message "Are You Sure OK?" will appear. Press the [▲/YES] button to write the Combination, or the [▼/NO] button to cancel the function.

```
T1:Program Name >  LEVEL        <>  PANPO           <> MIDI  CHANNEL
A00 100 CNT 16     A00 100 CNT 16   A00 100 CNT 16     A00 100 CNT 16
```

Parameter	Range	Description
Program	OFF A00 ~ A99 B00 ~ B99 C00 ~ C99 D00 ~ D99 G01 ~ 136 (P000 ~ P127 see text)	Selects a Program. P numbers indicate that a Timbre is set to EXT T.Mode. See "Program Select – 1A" on page 37.
Level	000 ~ 127	Timbre volume level. See "Level – 2A" on page 39.

Parameter	Range	Description
Panpot	OFF, A, A14~CNT~B14, B PRG	Timbre output panning. See "Panpot – 2B" on page 39.
MIDI Channel	1 ~ 16	Timbre MIDI Channel. See "MIDI Channel – 3A" on page 41.

Refer to the pages indicated in the above table for a full explanation of each parameter.

Soloing Individual Timbres

When a number of Timbres are layered together, you may find it difficult to distinguish between them while editing. The solo function allows you to listen to Timbres individually. To solo a Timbre, double-click the corresponding [1~8] function button. For example, to solo Timbre 6, double-click the function button [6]. The word SOLO will appear on the LCD screen as shown below.
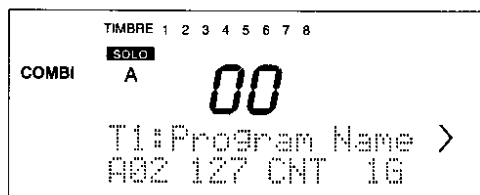
To cancel the solo function, double-click the respective [1~8] function button, or press the [COMBI] button.

Chapter 4: Combination Edit Mode

This mode allows you to edit Combinations. You can create new Combinations or simply edit existing ones. The following diagram shows how eight Timbres that make up a Combination, and what's inside each Timbre. The numbers in the bottom left-hand corner of each box indicate the group of LCD screens that are used to set up that particular item.

Inside a Combination
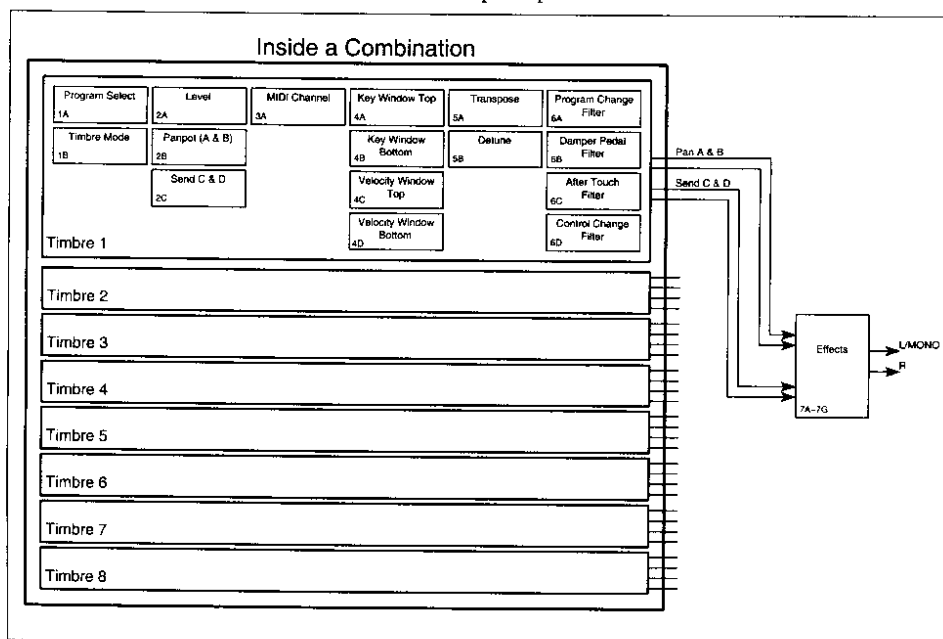
Entering Combination Edit Mode

1) Select the Combination that you want to edit.

2) Press the [EDIT] button.
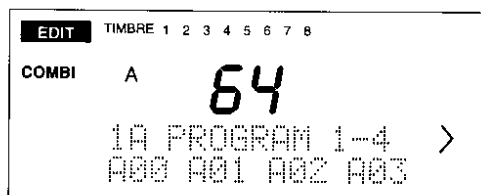
The LCD screen should look something like the one shown below.

Compare Function

While editing, you can press the [COMPARE] button to listen to the original unedited Combination. That is, how the Combination was before you started editing it. Pressing the [COMPARE] button again will return you to the edited version of the Combination.

Combination Editing Notes

Always Write Combinations: remember to write an edited Combination to memory before selecting another Combination, otherwise, the edited Combination will be lost.

Program Select – 1A

These parameters allow you to assign Programs to Timbres.

```
1A PROGRAM 1-4  >  1A PROGRAM 5-8 <
A00 A01 002 003    A04 G01 G99 128
```

LCD	Parameter		Range	Description
1A–1	Timbre 1	Select	A00 ~ A99 B00 ~ B99 C00 ~ C99 D00 ~ D99 G01 ~ 136 (P000 ~ P127 see text)	Assign a Program to a Timbre
	Timbre 2			
	Timbre 3			
	Timbre 4			
1A–2	Timbre 5			
	Timbre 6			
	Timbre 7			
	Timbre 8			

Use the VALUE slider or [▲/YES] and [▼/NO] buttons to select Programs.

Use the [10's HOLD] button to select Program banks.

An optional PROG/SEQ data card must be inserted before you can select Programs from banks C and D.

For INT mode Timbres (see "Timbre Mode – 1B" on page 38), MIDI Program Change messages received on the corresponding MIDI channel can be used to select Programs. However, if the Timbre's MIDI Channel is the same as the Global MIDI Channel, operation will depend on the Filter1 parameter setting. See "MIDI Filter1 – 3C" on page 152.

P000 ~ P127: for EXT mode Timbres (see "Timbre Mode – 1B" on page 38) you can select a MIDI Program Change number, as indicated by the prefix P. When a Combination that contains EXT mode Timbres is selected, the specified MIDI Program Change number is output via the MIDI OUT connection. This allows you to select Programs (voices, patches) on other MIDI devices such as a synthesizer or tone generator simply by selecting the appropriate Combination on the X3. It could also be used to select effect programs on an external effects units.

Note: *If the MIDI Channel of an EXT mode Timbre is the same as the Global MIDI Channel, a MIDI Program Change message will not be output by that Timbre when a Combination is selected.*

Timbre Mode – 1B

These parameters allow you to set the operating mode for each Timbre. In other words, the sound source and the way that each Timbre works with MIDI data from external MIDI devices.

```
1B T.MODE  1-4  > 1B T.MODE  5-8 <
INT INT EXT EXT   INT INT OFF OFF
```

LCD		Parameter	Range	Description
1B-1	Timbre 1	Timbre Mode	OFF	Timbre is off
	Timbre 2			
	Timbre 3			
	Timbre 4		INT	Use an internal program
1B-2	Timbre 5			
	Timbre 6		EXT	Use an external program, for use with other MIDI instruments
	Timbre 7			
	Timbre 8			

OFF: this parameter allows you to turn off a Timbre. Turn off any Timbres that you are not going to use. When a Timbre is turned OFF, the corresponding number on the top line of the LCD screen disappears.

INT: when this mode is selected, you can assign an X3 Program to a Timbre using Program Select. See "Program Select – 1A" on page 37. This mode should be selected when you want to use an X3 Program.

To play an INT mode Program using the X3 keyboard and joystick, its MIDI Channel must be the same as the Global MIDI Channel. See "MIDI Channel – 3A" on page 41. For details about setting the Global MIDI Channel, see "Global MIDI Channel & MIDI Clock Source – 3A" on page 150.

MIDI Program Change messages received on a corresponding Timbre's MIDI channel can be used to select Programs. If the Timbre's MIDI Channel is the same as the Global MIDI Channel, "MIDI Filter1 – 3C" on page 152 must be set to PRG.

To play a Timbre via an external MIDI keyboard or MIDI sequencer, set that Timbre's MIDI Channel so that it matches that of the device sending the MIDI data.

EXT: when this mode is selected, you can select a MIDI Program Change number using Program Select. See "Program Select – 1A" on page 37. This mode should be selected when you want to use Programs (voices, patches) from other MIDI devices such as a synthesizer or tone generator as part of a Combination. It could also be used to select effect programs on an external effects units.

When a Combination that contains EXT mode Timbres is selected, the specified MIDI Program Change numbers are output via the MIDI OUT connection. This allows you to select Programs (voices, patches) on other MIDI devices simply by selecting the appropriate Combination on the X3.

Furthermore, MIDI data corresponding to volume, after touch, damper pedal, and joystick movements can also be sent to external MIDI devices. However, you can filter some of this MIDI data. For example, you may not want to send joystick data to another MIDI device. These filters can be set for each Timbre individually on LCD screens 6A, 6B, 6C, and 6D.

Note: *If the MIDI Channel of an EXT mode Timbre is the same as the Global MIDI Channel, a MIDI Program Change message will not be output when a Combination is selected.*

Timbre Mode – 1B

These parameters allow you to set the operating mode for each Timbre. In other words, the sound source and the way that each Timbre works with MIDI data from external MIDI devices.

```
1B T.MODE  1-4  >|1B T.MODE  5-8 <
INT INT EXT EXT | INT INT OFF OFF
```

LCD		Parameter	Range	Description
1B–1	Timbre 1	Timbre Mode	OFF	Timbre is off
	Timbre 2			
	Timbre 3			
	Timbre 4		INT	Use an internal program
1B–2	Timbre 5			
	Timbre 6		EXT	Use an external program, for use with other MIDI instruments
	Timbre 7			
	Timbre 8			

OFF: this parameter allows you to turn off a Timbre. Turn off any Timbres that you are not going to use. When a Timbre is turned OFF, the corresponding number on the top line of the LCD screen disappears.

INT: when this mode is selected, you can assign an X3 Program to a Timbre using Program Select. See "Program Select – 1A" on page 37. This mode should be selected when you want to use an X3 Program.

To play an INT mode Program using the X3 keyboard and joystick, its MIDI Channel must be the same as the Global MIDI Channel. See "MIDI Channel – 3A" on page 41. For details about setting the Global MIDI Channel, see "Global MIDI Channel & MIDI Clock Source – 3A" on page 150.

MIDI Program Change messages received on a corresponding Timbre's MIDI channel can be used to select Programs. If the Timbre's MIDI Channel is the same as the Global MIDI Channel, "MIDI Filter1 – 3C" on page 152 must be set to PRG.

To play a Timbre via an external MIDI keyboard or MIDI sequencer, set that Timbre's MIDI Channel so that it matches that of the device sending the MIDI data.

EXT: when this mode is selected, you can select a MIDI Program Change number using Program Select. See "Program Select – 1A" on page 37. This mode should be selected when you want to use Programs (voices, patches) from other MIDI devices such as a synthesizer or tone generator as part of a Combination. It could also be used to select effect programs on an external effects units.

When a Combination that contains EXT mode Timbres is selected, the specified MIDI Program Change numbers are output via the MIDI OUT connection. This allows you to select Programs (voices, patches) on other MIDI devices simply by selecting the appropriate Combination on the X3.

Furthermore, MIDI data corresponding to volume, after touch, damper pedal, and joystick movements can also be sent to external MIDI devices. However, you can filter some of this MIDI data. For example, you may not want to send joystick data to another MIDI device. These filters can be set for each Timbre individually on LCD screens 6A, 6B, 6C, and 6D.

Note: *If the MIDI Channel of an EXT mode Timbre is the same as the Global MIDI Channel, a MIDI Program Change message will not be output when a Combination is selected.*

Send C & D – 2C

These parameters allow you to set the output level of each Timbre sent to buses C and D. These buses feed the effects processors. See "Effect Placement – 7E" on page 53.

```
2C SendCD  1-4   >  2C SendCD  5-8  <
9:0 0:9 5:5 5:5     5:5 5:5 0:0 P:P
```

LCD		Parameter	Range	Description
2C-1	Timbre 1			
	Timbre 2			
	Timbre 3			
	Timbre 4	Send C	0 ~ 9, P	Sets the output level of each Timbre sent to buses C and D
2C-2	Timbre 5	Send D		
	Timbre 6			
	Timbre 7			
	Timbre 8			

P: when this setting is selected, the Send CD settings that have been set for a Program in Program Edit mode are used. See "Oscillator 1 Setup – 1B" on page 9 and "Oscillator 2 Setup – 1C" on page 11.

If a Program is using a drum kit, the pan settings for each drum sound will be used when PRG is selected. See "Drum Kit Setup1 – 7A" on page 159 and "Drum Kit Setup2 – 7B" on page 161.

Send C and D adjustments are not sent as MIDI data.

MIDI Channel – 3A

These parameters allow you to set the MIDI Channel that each Timbre uses to send and receive MIDI data.

```
3A MIDI CH 1-4  > 3A MIDI CH 5-8 <
16  2  3   4      5  6  7   8
```

LCD		Parameter	Range	Description
3A–1	Timbre 1	MIDI Channel	1 – 16	Sets the MIDI Channel that each Timbre uses to send and receive MIDI data
	Timbre 2			
	Timbre 3			
	Timbre 4			
3A–2	Timbre 5			
	Timbre 6			
	Timbre 7			
	Timbre 8			

If you want to play your Combination via the X3's keyboard, you should set each Timbre's MIDI Channel so that it matches the Global MIDI Channel. If you are using an external MIDI sequencer, set each Timbre's MIDI Channel so that it matches the corresponding sequencer track's MIDI channel. This allows you to use the X3 like an 8-part multi-timbral tone generator.

MIDI data corresponding to volume, after touch, damper pedal, and joystick movements is sent and received on the selected MIDI channel. However, you can filter some of this MIDI data. For example, you may not want to send joystick data to another MIDI device. These filters can be set for each Timbre individually on LCD screens 6A, 6B, 6C, and 6D.

Note: *The above MIDI data is always sent on the Global MIDI Channel, so, if the Global MIDI Channel and selected Timbre MIDI Channel are the same, even with the above filters set MIDI data will still be sent. This applies to INT and EXT mode Timbres alike. For this reason, it's a good idea to set the Global MIDI Channel and Timbre MIDI Channel differently.*

For an INT mode Timbre (see "Timbre Mode – 1B" on page 38), MIDI Program Change messages received on the corresponding MIDI channel can be used to select Programs. However, if the Timbre's MIDI Channel is the same as the Global MIDI Channel, operation will depend on the Filter1 parameter setting. See "MIDI Filter1 – 3C" on page 152.

If the selected MIDI Channel is the same as the Global MIDI Channel, a G will appear next to the selected channel number. For example, 14G. In this case, the Timbre can be played via the X3 keyboard.

Key Window Top – 4A

These parameters allow you to set the top note for each Timbre's key window.

```
4A KW TOP  1-4   >  4A KW TOP  5-8  <
G9  G9  G9    G9     B4  G9  G9    G9
```

LCD		Parameter	Range	Description
4A–1	Timbre 1	Key Window Top	C–1 ~ G9	Specifies the top note for each Timbre's key window (If a note lower than the Key Window Bottom parameter is selected, that parameter will automatically use this value)
	Timbre 2			
	Timbre 3			
	Timbre 4			
4A–2	Timbre 5			
	Timbre 6			
	Timbre 7			
	Timbre 8			

A key window is the range of keys (notes) that can be used to play a Timbre. Used in conjunction with the Key Window Bottom parameters, you can designate sections of the keyboard to certain Timbres. For example, you could designate the bottom half of the keyboard to a bass Timbre and the top half to a piano Timbre. In the example shown below, Timbres 1 and 2 have been designated their own key windows, while the key window for Timbres 3 and 4 have been set the same.
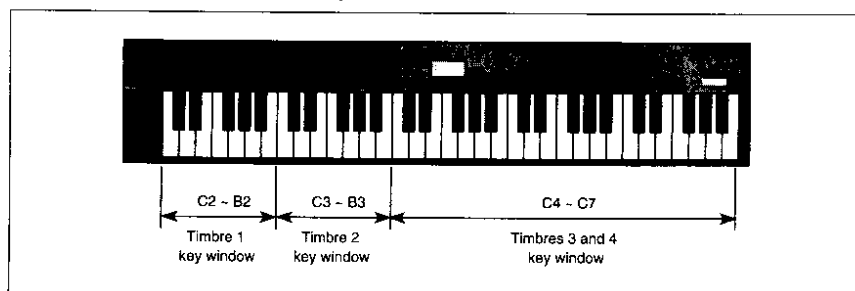
If a Timbre is set to EXT mode (see "Timbre Mode – 1B" on page 38), MIDI Note data will be sent via the X3's MIDI OUT connection when you play keys that are in that Timbre's key window.

As well as using the VALUE slider and the [▲/YES] and [▼/NO] buttons to set Key Window Top and Bottom parameters, you can use the keyboard. Select a Key Window parameter, press and hold down the [ENTER] button, then press the desired key. With the Global mode Transpose function set to +00, note values from C2 to C7 can be entered in this way.

Key Window Bottom – 4B

These parameters allow you to set the bottom note for each Timbre's key window. Refer to "Key Window Top – 4A" on page 42 for more details.

```
4B KW BTM 1-4  > 4B KW BTM 5-8  <
C-1 C-1 C-1 C-1  C-1 C-1 C-1 C-1
```

LCD		Parameter	Range	Description
4B–1	Timbre 1	Key Window Bottom	C–1 ~ G9	Specifies the bottom note for each Timbre's key window. (If a note higher than the Key Window Top parameter is selected, that parameter will automatically use this value)
	Timbre 2			
	Timbre 3			
	Timbre 4			
4B–2	Timbre 5			
	Timbre 6			
	Timbre 7			
	Timbre 8			

Velocity Window Top – 4C

These parameters allow you to set the maximum velocity for each Timbre's velocity window.

```
4C UW TOP 1-4   >  4C UW TOP 5-8  <
127 127 127 127    127 127 127 127
```

LCD		Parameter	Range	Description
4C–1	Timbre 1	Velocity Window Top	1 ~ 127	Specifies the maximum velocity for each Timbre's Velocity window
	Timbre 2			
	Timbre 3			
	Timbre 4			
4C–2	Timbre 5			
	Timbre 6			
	Timbre 7			
	Timbre 8			

A velocity window determines the range of note velocity that can be used to play a Timbre. Used in conjunction with the Velocity Window Bottom parameters, you can specify a note velocity range for each Timbre. For example, you could set a soft strings Timbre to a low velocity window, and hard strings Timbre to a high velocity window. Then, soft playing will play the soft strings and stronger playing will play the hard strings. This technique is called velocity crossover. You could set the velocity windows so that their ranges overlap.

In the example shown below, Timbre 1 will play when the note velocity is between 1 and 20, Timbre 2 between 21 and 127, and Timbre 3 between 70 and 127. Note that Timbres 2 and 3 overlap.
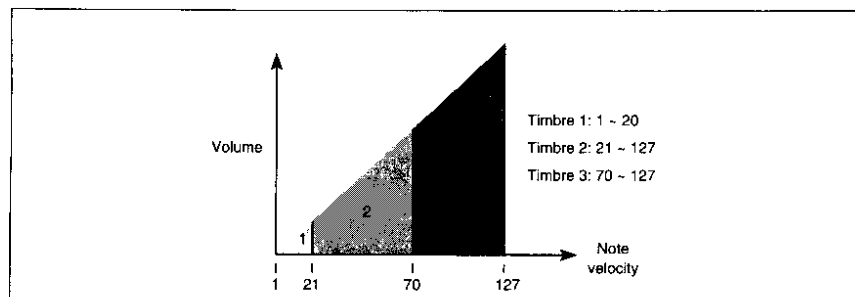
If a Timbre is set to EXT mode (see "Timbre Mode – 1B" on page 38), MIDI Notes whose velocity falls within the velocity window range will be sent via the X3's MIDI OUT connection.

Ludovi Grossard (http://www.multimania.com/grossard/anglais/anglais.html)
ThayTu (T2-VCF)

Velocity Window Bottom – 4D

These parameters allow you to set the minimum velocity for each Timbre's velocity window.
Refer to "Velocity Window Top – 4C" on page 44 for more details.

```
4D UW BTM 1-4  > 4D UW BTM 5-8  >
001 001 001 001  001 001 001 001
```

LCD		Parameter	Range	Description
4D-1	Timbre 1	Velocity Window Bottom	1 ~ 127	Specifies the minimum velocity for each Timbre's Velocity window
	Timbre 2			
	Timbre 3			
	Timbre 4			
4D-2	Timbre 5			
	Timbre 6			
	Timbre 7			
	Timbre 8			

Transpose – 5A

These parameters allow you to transpose each Timbre.

```
5A TRANS 1-4   > 5A TRANS 5-8   <
+00 +07 +00 +00  +00 +00 +00 +00
```

LCD		Parameter	Range	Description
5A–1	Timbre 1			
	Timbre 2			
	Timbre 3			
	Timbre 4	Transpose	–24 ~ +24 semitones	Transpose each Timbre in semitone steps
5A–2	Timbre 5			
	Timbre 6			
	Timbre 7			
	Timbre 8			

For INT mode Timbres (see "Timbre Mode – 1B" on page 38), transpose adjustments will affect the pitch of the Timbre, but not the pitch of MIDI Note data that is output when the keyboard is played.

If an EXT mode Timbre's MIDI Channel does not match that of the Global MIDI Channel, transpose adjustments will affect the pitch of MIDI Note data that is output when the keyboard is played.

Detune – 5B

These parameters allow you to detune each Timbre.

```
5B DETUNE 1-4   > 5B DETUNE 5-8   <
+00 +03 +00 +00  +00 +00 +00 +00
```

LCD		Parameter	Range	Description
5B–1	Timbre 1			
	Timbre 2			
	Timbre 3			
	Timbre 4	Detune	–50 ~ +50 cents	Detune each Timbre in one cent steps
5B–2	Timbre 5			
	Timbre 6			
	Timbre 7			
	Timbre 8			

Detune adjustments are not sent as MIDI data.

Program Change Filter – 6A

These parameters determine how EXT mode Timbres work with MIDI Program Change messages.

```
6A PROG CHANGE
E E D D E E E E
```

LCD		Parameter	Range	Description
6A	Timbre 1	Program Change Filter	D: Disable E: Enable	Program Change messages ignored Program Change messages can be received and sent
	Timbre 2			
	Timbre 3			
	Timbre 4			
	Timbre 5			
	Timbre 6			
	Timbre 7			
	Timbre 8			

Enable: with this setting, received Program Change messages will select Programs for a Timbre. A Combination that includes EXT mode Timbres will send the corresponding Program Change messages when it is selected.

Note: *If the Global mode MIDI Filter1 is set to DIS ("MIDI Filter1 – 3C" on page 152), Program Change messages are completely disabled. This setting overrides the above settings. Furthermore, if the Global mode MIDI Filter1 is set to ENA, Program Change messages received on the Global MIDI Channel will select Combinations. For this reason, it's a good idea to set the Global MIDI Channel and Timbre MIDI Channel differently.*

Disable: with this setting, Program Change messages are neither sent nor received for the respective Timbre.

Damper Pedal Filter – 6B

These parameters determine how each Timbre responds to damper pedal movements.

```
6B DAMPER
E E E E E E E E
```

LCD		Parameter	Range	Description
6B	Timbre 1	Damper Pedal Filter	D: Disable E: Enable	Timbre will ignore the damper pedal Timbre will respond to the damper pedal
	Timbre 2			
	Timbre 3			
	Timbre 4			
	Timbre 5			
	Timbre 6			
	Timbre 7			
	Timbre 8			

Enable: with this setting, INT mode Timbres respond to damper pedal movements. For EXT mode Timbres, the corresponding MIDI data is output via the MIDI OUT connection.

Disable: with this setting, damper pedal movements are ignored.

After Touch Filter – 6C

These parameters determine how each Timbre responds to keyboard after touch.

```
6C AFTER TOUCH
E E E E E E E E
```

LCD		Parameter	Range	Description
	Timbre 1			
	Timbre 2			
	Timbre 3			
	Timbre 4	After Touch Filter	D: Disable	Timbre will ignore after touch
6C	Timbre 5		E: Enable	Timbre will respond to after touch
	Timbre 6			
	Timbre 7			
	Timbre 8			

Enable: with this setting, INT mode Timbres respond to keyboard after touch. For EXT mode Timbres, the corresponding MIDI after touch data is output via the MIDI OUT connection.

Disable: with this setting, keyboard after touch is ignored.

Disabling after touch is useful when, for example, you are recording to a an external MIDI sequencer and you do not want to record after touch data. Because after touch is a continuous type of controller, it consumes sequencer memory quickly.

Control Change Filter – 6D

These parameters determine whether each Timbre responds to the following controllers: joystick, i.e., control pitch bend, pitch modulation, VDF Cutoff Frequency modulation, and foot controller, i.e., volume.

```
6D CONTROL CHG
E E E E E E E E
```

LCD		Parameter	Range	Description
	Timbre 1			
	Timbre 2			
	Timbre 3			
	Timbre 4	Control Change Filter	D: Disable	Timbre will ignore controllers
6D	Timbre 5		E: Enable	Timbre will respond to controllers
	Timbre 6			
	Timbre 7			
	Timbre 8			

Enable: with this setting, INT mode Timbres respond to controllers. For EXT mode Timbres, the corresponding MIDI Controller data is output via the MIDI OUT connection.

Disable: with this setting, controllers are ignored.

Effects 7A ~ 7G

In a Combination, the individual effect settings of each Program are ignored, and the settings for that Combination are used. If you want to use a Program's effect settings for a Combination, use the Effects Copy – 7F function. See "Effects Copy – 7F" on page 55.

Effects are explained in Chapter 5: "Effects" on page 51.

When you've edited a Combination's effect settings, always remember to write the Combination, otherwise, the settings will be lost when you select another Combination.

Combination Write – 8A

This function allows you to write a Combination to Combination bank A or B. If a PROG/SEQ data card is inserted, you can also write to bank C or D. It can also be used to reorganize Combination numbering by writing Combinations to different destinations.

```
8A COMB WRITE
WRITE→A00      OK?
```

LCD	Parameter	Range	Description
8A	Write→xxx	A00 ~ A99 B00 ~ B99 C00 ~ C99 D00 ~ D99	Select the Combination write destination
	OK to Write	OK?	Executes write

Note: *To write a Combination to bank A or B, the Combination Memory Protection function must be set to OFF. See "Combination Memory Protect – 4B" on page 154.*

To write a Combination to a PROG/SEQ data card, it must already be formatted and its write protect switch must be set to off. See "Save Programs & Combinations to Card – 6C" on page 157.

To write a Combination, specify the write destination, position the cursor on OK?, then press the [▲/YES] button. The message "Are You Sure OK?" will appear. Press the [▲/YES] button to write the Combination, or the [▼/NO] button to cancel the function. If you write the Combination, the destination Combination will be selected automatically.

Note: *The Combination that already exists at the selected write destination will be lost when you execute this function.*

You can write Combinations at any time. To do this, press the [REC/WRITE] button. The message "Are You Sure OK?" will appear. Press the [▲/YES] button to write the Combination, or the [▼/NO] button to cancel the function.

To write all Combinations, Programs, and Global settings to floppy disk, see See "Save P/C/G Data – 3B" on page 173.

Combination Rename – 8B

This function allows you to rename a Combination.

```
8B RENAME
A00:Organ
```
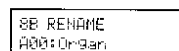
LCD	Parameter	Range	Description
8B	Rename	See character table below	Rename a Combination

To rename a Combination, use the [←] and [→] cursor buttons to position the cursor, and the [▲/YES] [▼/NO] buttons or VALUE slider to select characters. Available characters are shown in the table below. Combination names can use up to 10 characters.

		"	#	$	%	&	'	(	)	*	+	,	-	.	/	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	[	¥	]	^	_
`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y	z	{	¦	}	→	←

Use the number keypad to insert numbers. Use the [10's HOLD/–] button to switch between uppercase and lowercase characters. Press and hold down the [ENTER] button, then press the [←] button to delete the current character. Press and hold down the [ENTER] button, then press the [→] button to insert a character.

Combination Initialize – 8C

This function resets all Combination parameters to their initial settings.

```
8C INIT COMB
        OK?
```
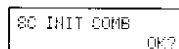
LCD	Parameter	Range	Description
8E	Initialize Combination	OK?	Executes initialize

To initialize a Combination, press the [▲/YES] button. The message "Are You Sure OK?" will appear. Press the [▲/YES] button to initialize, or the [▼/NO] button to cancel the function.

Parameters are initialized as follows: volume set to maximum, key and velocity windows fully open, MIDI Channels are assigned from 1 to 8, transpose and detune is +00, all filters are E (Enabled), and no effects.

Chapter 5: Effects

The X3 contains two digital multi-effect processors. Each processor can be set to produce one of 47 effects, and effect parameters can be edited and stored with individual Programs, Combinations, and sequencer songs. Effect parameters for a Program should be edited in Program Edit mode, a Combination in Combination Edit mode, and for a song in Sequencer mode.

When you play a Combination, the individual effect settings for each Program in that Combination are ignored, and the effect settings for that Combination are used. Likewise, for sequencer songs, the individual Program effect settings are ignored and the effect settings for that particular song are used.

Effects 1 to 37 are single effects, 38 and 39 are serial effects, and 40 to 47 are parallel effects. The parallel type effects allow up to four independent effects simultaneously.
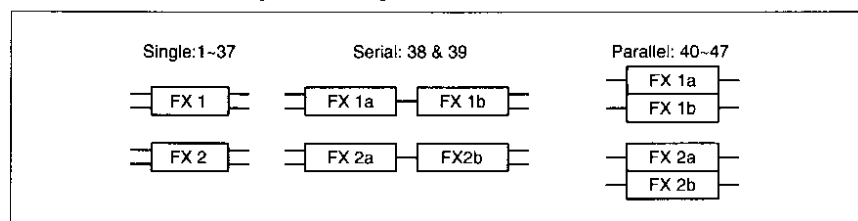
Effect Types

Effect No.	Effect
0	No Effect
1	Hall
2	Ensemble Hall
3	Concert Hall
4	Room
5	Large Room
6	Live Stage
7	Wet Plate
8	Dry Plate
9	Spring Reverb
10	Early Reflection 1
11	Early Reflection 2
12	Early Reflection 3
13	Stereo Delay
14	Cross Delay
15	Dual Mono Delay
16	Multi-Tap Delay 1
17	Multi-Tap Delay 2
18	Multi-Tap Delay 3
19	Chorus 1
20	Chorus 2
21	Quadrature Chorus
22	Crossover Chorus
23	Harmonic Chorus

Effect No.	Effect
24	Symphonic Ensemble
25	Flanger 1
26	Flanger 2
27	Crossover Flanger
28	Exciter
29	Enhancer
30	Distortion
31	Overdrive
32	Stereo Phaser 1
33	Stereo Phaser 2
34	Rotary Speaker
35	Auto Pan
36	Tremolo
37	Parametric EQ
38	Chorus–Delay
39	Flanger–Delay
40	Delay/Hall Reverb
41	Delay/Room Reverb
42	Delay/Chorus
43	Delay/Flanger
44	Delay/Distortion
45	Delay/Overdrive
46	Delay/Phaser
47	Delay/Rotary Speaker

Effect 1 Setup – 7A

```
7A EFFECT 1=01   >  7A Hall          <>  7A Hall            <
Hall         OFF    DRV:EFF=75:25        Src:JS(+Y) I+10
```

LCD	Parameter	Range	Description
7A–1	Effect Type	0 – 47	Select an effect type
	Switch (OFF)	OFF, ON	Turn the effect on or off.
7A–2	Effect Level Balance (DRY:EFF)	DRY 99:1 ~ 1:99 FX	Dry signal only Dry:effect mix Effect signal only
7A–3	Dynamic Modulation Control Source (Src)	NONE JS(+Y) JS(–Y) AFTT PEDAL1 PEDAL2 VDA EG SLIDER S+J(+) S+J(–) S+AFTT S+PDL1 S+PDL2 S+VDA	Dynamic modulation off Joystick +Y Joystick –Y After Touch Foot pedal1 Foot pedal2 (MIDI Controller No. 13) Sum of all 32 VDA EGs VALUE slider VALUE slider & joystick +Y VALUE slider & joystick –Y VALUE slider & After Touch VALUE slider & foot pedal1 VALUE slider & foot pedal2 VALUE slider & VDA EG
	Dynamic Modulation Intensity (I)	–15 ~ +15	Set the depth of dynamic modulation

Effect type: each time a different effect is selected, any parameters that you set for the previously selected effect will reset to their initial values.

Switch: is used to turn the effects on and off. Effects can also be turned on and off using a foot pedal. In Global mode, set the ASSIGNABLE PEDAL/SW parameter to "Effect 1 on/off" for Effect 1, or "Effect 2 on/off" for Effect 2. See "Assignable Pedal Setup – 8B" on page 163.

By sending MIDI Controller 92 for Effect 1 or MIDI Controller 94 for Effect 2, effects can be switched on and off by the sequencer or another MIDI device. Each time a Controller message is sent, the corresponding effect is toggled either on or off.

Note: *The high and low EQ for the following effects is valid even when the effect is set to OFF: 13:Stereo Delay, 14:Cross Delay, 19:Chorus 1, 20:Chorus 2, 28:Exciter, 35:Autopan, 36:Tremolo. To bypass these effects completely select 0: No Effect.*

Effect Level balance: this parameter allows you to set the level balance between the dry signal and effected signal. A setting of DRY means no effected signal. A setting of FX means all effect signal.

Dynamic modulation: allows you to adjust certain effect parameters, such as mix balance and modulation speed, while you play. This provides greater control for musical expression during a performance. The modulation source can be set to any one of seven controls: joystick, foot pedal, etc. To use a foot pedal, the ASSIGNABLE PEDAL/SW function must be set to Effect Control. See "Assignable Pedal Setup – 8B" on page 163. Effect parameters that can be controlled using dynamic modulation are listed with the effect parameters on the following pages.

The VDA EG control source is the sum of all 32 VDA EGs. In other words, dynamic modulation will increase as more notes are played.

Note: *When editing in Program Play mode or Combination Play mode, the VALUE slider is used to adjust parameters, so it cannot control the dynamic modulation.*

Dynamic Modulation Source: Pedal1 corresponds to the assignable pedal connected to the X3. Effect Control1 is assigned using the ASSIGNABLE PEDAL/SW function in Global mode. Pedal1 corresponds to MIDI Controller No. 12. Pedal2 corresponds to MIDI Controller No. 13, and can be controlled by MIDI only. Joystick+Y corresponds to MIDI Controller No. 1. Joystick–Y corresponds to MIDI Controller No. 2.

When the source is set to PEDAL, MIDI Controllers 12 and 13 (Effect 1 and Effect 2 respectively) In this case, set the external device's MIDI Channel so that it matches the X3 Global MIDI Channel. Likewise, if the dynamic modulation data is stored on an external MIDI sequencer track, set that track's MIDI Channel so that it matches the X3 Global MIDI Channel.

Dynamic Modulation Intensity: the dynamic modulation intensity can be set from –15 to +15. Positive values cause dynamic modulation to increase the value of the effect parameter being controlled. Negative values have the opposite effect.

Effect 1 Parameters – 7B

Effect parameters are explained from page 56 onwards.

Effect 2 Setup – 7C

These parameters are the same as for "Effect 1 Setup – 7A".

Effect 2 Parameters – 7D

Effect parameters are explained from page 56 onwards.

Effect Placement – 7E

```
7E PLACEMENT    >  7E EFF1PANPOT <>   7E E1/E2 LEVEL <
Parallel           3=50:50 4=OFF      L=5 R=5 L=5 R=5
```

LCD	Parameter	Range	Description
7E–1	Effect Placement	Serial Parallel 1 Parallel 2 Parallel 3	Effect routing configurations
7E–2	Panpots 3	OFF	No signal output
	Panpot 4	L 99:1 ~ 1:99 50:50 R	Signal is panned hard left Panned between L and R. pan centre Signal is panned hard right (this LCD screen does not appear when Parrallel 3 is selected)
7E–2	Level 1L (L)	0 ~ 9	Set the output level of each effect when Parallel 3 is selected. (this LCD is available only when Parallel 3 placement is selected)
	Level 1R (R)		
	Level 2L (L)		
	Level 2R (R)		

The effect processors can be used in one of four placements. These placements effect the way in which the four input buses (A, B, C, D) are routed through the effects.

The AB pan, C send level, and D send level parameters are set as part of an individual Program, Combination, or song. The pan 3 and pan 4 parameters are set as part of the Effect 1 and Effect 2 setup. If the Parallel 3 placement is selected, pan 3 and pan 4 are replaced by four independent level controls.

Serial Placement
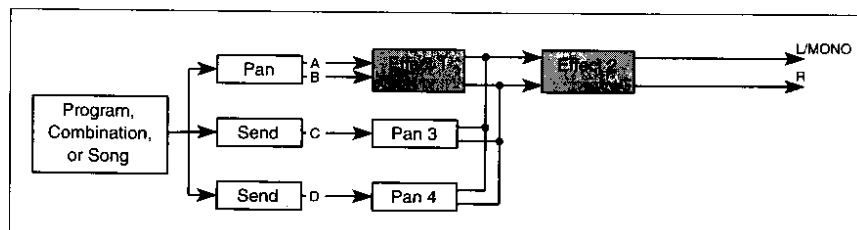
With the Serial placement, buses A and B are sent to Effect 1, Effect 2, then output. Buses C and D are mixed with the output of Effect 1, sent to Effect 2, and then output.

Buses C and D allow you to avoid applying Effect 1 to a sound, or to apply Effect 1 to a specific sound and then apply Effect 2 to all sounds.

Parallel 1 Placement
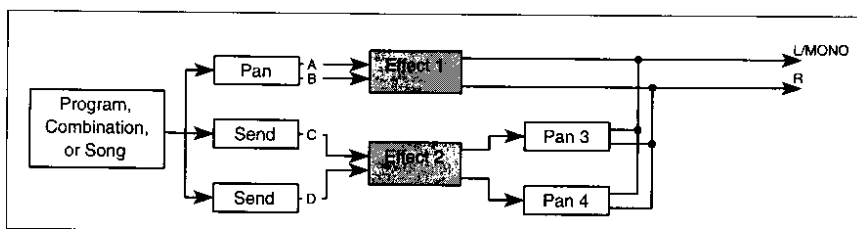
With the Parallel 1 placement, buses A and B are sent to Effect 1, then output. Buses C and D are sent to Effect 2, mixed with the output of Effect 1, then output.

Parallel 2 Placement
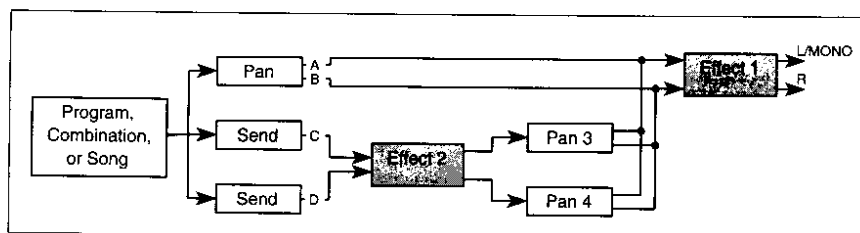
With the Parallel 2 placement, buses A and B are sent to Effect 1, then output. Buses C and D are sent to Effect 2, mixed with the input to Effect 1, then output.

Parallel 3 Placement
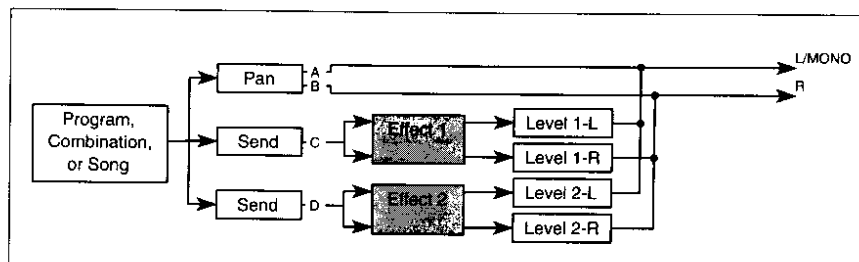
With the Parallel 3 placement, buses A and B are sent straight to the outputs. Bus C signal is sent to Effect 1 and bus D signal is sent to Effect 2. The effect outputs, each with independent level control, are then mixed down to the two outputs. This placement works well when playing a GM compatible song.

Note: *For Serial, Parallel 1, and Parallel 2 placements, if Pan 3 or Pan 4 is set to off, signals sent to bus C and bus D respectively will not be output.*

Effects Copy – 7F

This function allows you to copy the effects parameter settings from a another Program, Combination, or song to the currently selected Program, Combination, or Sequencer song.

```
7F COPY EFF
PROG   A00   OK?
```

LCD	Parameter	Range		Description
7F-1	Effect Copy Source	PROG COMBI SONG		Select the effect copy source
	Source Number	Programs	A00 ~ B99 C00 ~ D99 G01 ~ 136	Select the source number
		Combinations	A00 ~ B99 C00 ~ D99	
		Songs	SI0 ~ SI9 SC0 ~ SD9	
	OK to copy	OK?		Executes effect copy

To copy effect parameters, select the effect copy source, the source number, position the cursor on OK?, then press the [▲/YES] button. The effect parameters will be copied to the currently selected Program, Combination, or Song.

Effect Copy/Swap – 7G

This function allows you to copy or swap effects parameter settings between Effect 1 and Effect 2.

```
7G Swap FX1-2
FX1←→FX2      OK?
```

LCD	Parameter	Range	Description
7G-1	Copy/Swap direction	FX1←→FX2 FX1→FX2 FX1←FX2	Swap FX1 with FX2 Copy FX1 to FX2 Copy FX2 to FX1
	OK to copy	OK?	Executes effect swap

To copy/swap effect parameters, set the copy/swap direction, position the cursor on OK?, then press the [▲/YES] button.

Effects & Parameters

0: No Effect

When NO EFFECT is selected, the effect processors are completely bypassed.

Effects can be turned off using "Effect 1 Setup – 7A" and "Effect 2 Setup – 7C". However, for some effects the high and low EQ will still be active. Selecting 0:No Effect allows you to bypass these effects completely.

1: Hall

This effect simulates the reverb characteristics and natural ambience of a medium size hall.

2: Ensemble Hall

This effect simulates the reverb characteristics and natural ambience of an ensemble hall. Ideal for string and brass ensembles.

3: Concert Hall

This effect simulates the reverb characteristics and natural ambience of a large hall with pronounced early reflections.

4: Room

This effect simulates the reverb characteristics and natural ambience of a small room.

5: Large Room

This effect simulates the reverb characteristics and natural ambience of a large room with pronounced reverb density. Reverb times of about 0.5 seconds produce an effect similar to gated reverb.

6: Live Stage

This effect simulates the reverb characteristics and natural ambience of a large, live-perfomance space.

7: Wet Plate

This effect simulates the reverb characteristics of a steel plate type reverb with pronounced reverb density.

8: Dry Plate

This effect simulates the reverb characteristics of a steel plate type reverb with a light reverb density.

9: Spring Reverb

This effect simulates the reverb characteristics of a spring type reverb system.
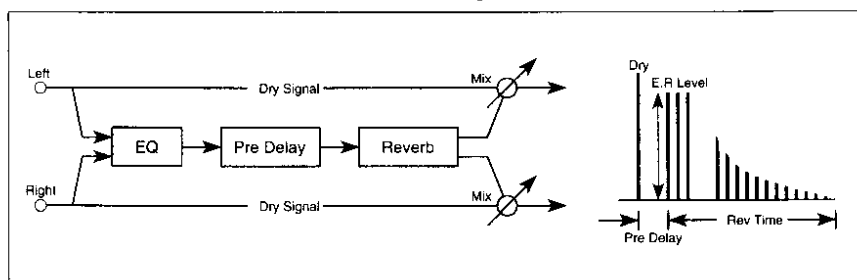
LCD	Parameter	Range	Description
7B-1	Reverb Time (Time)	0.2 ~ 9.9 sec (Hall type) 0.2 ~ 4.9 sec (Room type) 00 ~ 99 (Plate type)	The time over which the reverb effect will last
	High Damp (H.Dmp)	0 ~ 99%	High frequency decay 0 = bright reverb 99 = dark reverb
7B-2	Pre Delay (P.Dly)	0 ~ 200 ms	The delay between the original sound and the early reflections
	Early Reflection Level (E.R)	0 ~ 99 (Hall/Room) 1 ~ 10 (Plate)	The level of the early reflections
7B-3	EQ Low (EQ.L)	−12 ~ +12 dB	Low EQ cut and boost
	EQ High (H)	−12 ~ +12 dB	High EQ cut and boost

For effects 1~9, dynamic modulation can be used to control the DRY:EFF balance.

10: Early Reflection 1

Early reverb reflections are a crucial element of naturally occurring reverb. They transmit details such as room size, distance, acoustic damping, etc. This effect emphasizes the low frequency range, and is ideal for percussive sounds such as drums.

11: Early Reflection 2

This effect is similar to Early Reflection 1, although, the level of the early reflections change over time in a different way.

12: Early Reflection 3

This effect applies a reverse envelope to the early reflections. This produces an effect that is similar to playing a tape backwards, and it is ideally to sounds that have a fast attack such as crash cymbals.
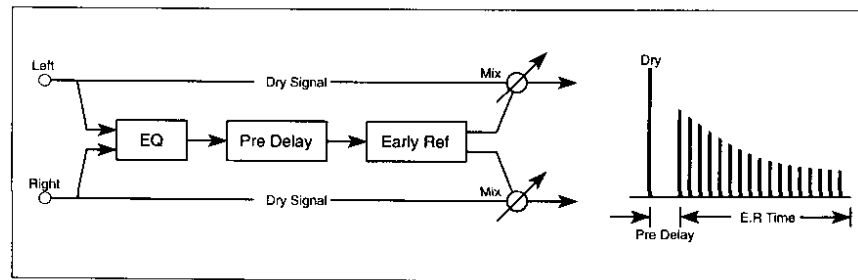
LCD	Parameter	Range	Description
7B-1	Early Reflection Time (E.R Time)	100 ~ 800 ms	Early reflection time in 10 ms steps
7B-2	Pre Delay (Pre Delay)	0 ~ 200 ms	The delay between the original sound and the early reflections
7B-3	EQ Low (EQ.L)	-12 ~ +12 dB	Low EQ cut and boost
	EQ High (H)	-12 ~ +12 dB	High EQ cut and boost

For effects 10~12, dynamic modulation can be used to control the DRY:EFF mix level.

13: Stereo Delay

This is a stereo delay effect with feedback. The delay time can be set for the left and right channels independently.

The high damp parameter can be used to produce a more natural echo effect by gradually attenuating the high frequencies of successive delay repeats.
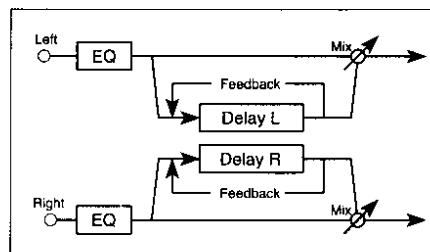
14: Cross Delay

This is a stereo delay effect with independent delay parameters for the left and right channels. The delay outputs are crossed over, and each delay receives the other delay's feedback signal. Thus, the delay repeats appear to move between the left and right outputs.
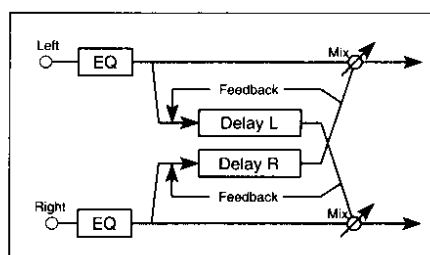
```
7B StereoDly   >  7B StereoDly  <>  7B StereoDly  <
D.TimeL=250 R260  FB 40  H.Dmp30    EQ.L+00dB H+00dB
```

LCD	Parameter	Range	Description
7B–1	Delay Time Left (D.Time)	0 ~ 500 ms	Delay time for the left channel
	Delay Time Right (R)	0 ~ 500 ms	Delay time for the right channel
7B–2	Feedback (FB)	–99 ~ +99%	The amount of delay signal that is fed back into the effect. Minus values invert the feedback signal phase
	High Damp (H.Dmp)	0 ~ 99%	High frequency decay 0 = bright delay 99 = dark delay
7B–3	EQ Low (EQ.L)	–12 ~ +12 dB	Low EQ cut and boost
	EQ High (H)	–12 ~ +12 dB	High EQ cut and boost

For effects 13 and 14, dynamic modulation can be used to control the DRY:EFF balance.

The EQ part of these effects is active even when the Effect is switched off. To bypass these effects completely, select 0:No Effect.

15: Dual Mono Delay

This effect consists of two mono delays with independent delay time, feedback, and high damp parameters for each channel.
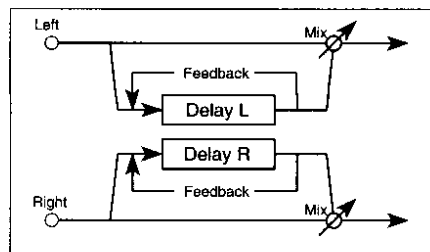

```
7B D.M Dly(L)    >  7B D.M Dly(L)  <>  7B D.M Dly(R)  <>  7B D.M Dly(R)   <
D.Time=250ms        FB+50  H.Dmp10   D.Time=250ms        FB+50  H.Dmp10
```

LCD	Parameter	Range	Description
7B–1	Delay Time Left (D.Time)	0 ~ 500 ms	Delay time for the left channel
7B–2	Feedback Left (FB)	–99 ~ +99%	The amount of delay signal that is fed back into the left channel effect. Minus values invert the feedback signal phase
	High Damp Left (H.Dmp)	0 ~ 99%	High frequency damping for the left channel
7B–3	Delay Time Right (D.Time)	0 ~ 500 ms	Delay time for the right channel
7B–4	Feedback Right (FB)	–99 ~ +99%	The amount of delay signal that is fed back into the left channel effect. Minus values invert the feedback signal phase
	High Damp Right (H.Dmp)	0 ~ 99%	High frequency damping for the right channel

For effect 15, dynamic modulation can be used to control the DRY:EFF balance.

16: Multi-Tap Delay 1

This is a two-channel multi-repeat delay. It consists of two parallel delays for each channel. The delay time for each delay can be set independently. The output of delay 2 is fed back to the inputs of delay 1 and delay 2.
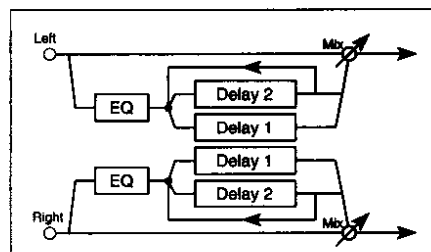
17: Multi-Tap Delay 2

This is a two-channel multi-repeat delay with cross panning.

18: Multi-Tap Delay 3

This is a two-channel multi-repeat delay with cross feedback.

```
7B M.TapDly1    >  7B M.TapDly1   <>  7B M.TapDly1    <
D1T300  D2T400     FB+50             EQ.L+00dB H+00dB
```

LCD	Parameter	Range	Description
7B–1	Delay Time 1 (D1T)	0 ~ 500 ms	Delay time for delay 1
	Delay Time 2 (D2T)	0 ~ 500 ms	Delay time for delay 2
7B–2	Feedback (FB)	–99 ~ +99%	The amount of delay signal that is fed back into the effect. Minus values invert the feedback signal phase
7B–3	EQ Low (EQ.L)	–12 ~ +12 dB	Low EQ cut and boost
	EQ High (H)	–12 ~ +12 dB	High EQ cut and boost

For effects 16, 17, and 18, dynamic modulation can be used to control the DRY:EFF balance.
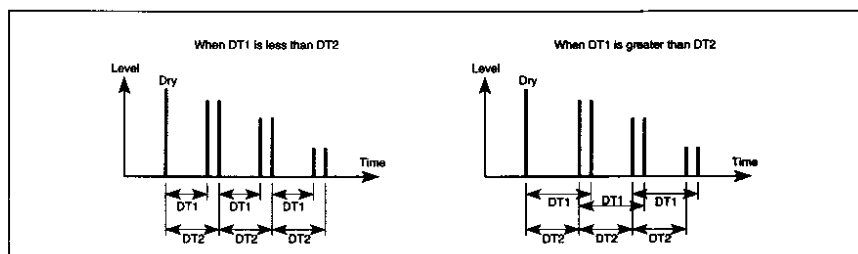
19: Chorus 1

In this chorus effect, the left channel modulation signal is out of phase with the right channel modulation signal. This produces a wide stereo chorus effect.
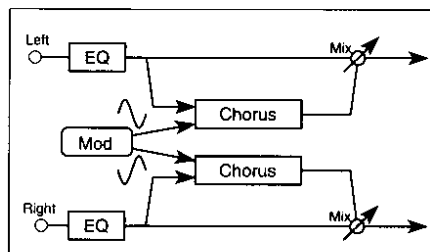
20: Chorus 2

In this chorus effect, left and right channel modulation signals are in phase.
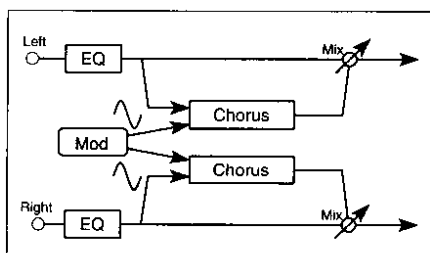
LCD	Parameter	Range	Description
7B–1	Delay Time (D.Time)	0 ~ 200 ms	Delay time
	Mod Waveform (TRI)	SIN (Sine) TRI (Triangle)	Modulation waveform type
7B-2	Mod Depth (Mod)	0 ~ 99	Modulation intensity
	Mod Speed (M.SP)	0.03 ~ 30 Hz	Modulation speed
7B-3	EQ Low (EQ.L)	–12 ~ +12 dB	Low EQ cut and boost
	EQ High (H)	–12 ~ +12 dB	High EQ cut and boost

For effects 19 and 20, dynamic modulation can be used to control the DRY:EFF balance.

The EQ part of these effects is active even when the Effect is switched off. To bypass these effects completely, select 0:No Effect.

21: Quadrature Chorus

The modulation signals fed to each channel of this stereo chorus effect are 90 degrees out of phase with each other.
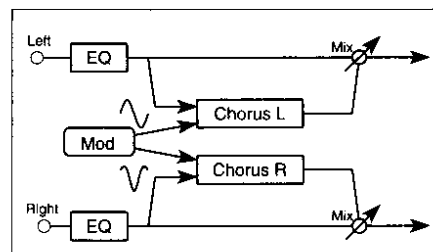
22: Crossover Chorus

The modulation signals fed to each channel of this stereo chorus effect are 90 degrees out of phase with each other. The chorused signal is mixed with the output of the other channel.
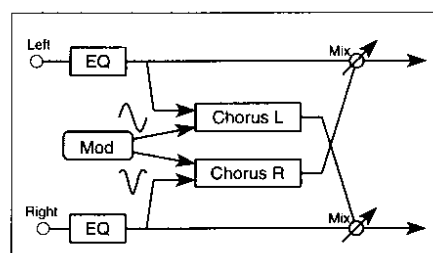
```
7B Quad.Cho      >  7B Quad.Cho    <>  7B Quad.Cho    <>  7B Quad.Cho    <
D.TimeL=011 R023    Mod50  ModSP=33    ModShape=T+00      EQ.L+00dB H+00dB
```

LCD	Parameter	Range	Description
7B-1	Delay Time L (D.TimeL)	0 ~ 250 ms	Left channel delay time
	Delay Time R (R)	0 ~ 250 ms	Right channel delay time
7B-2	Mod Depth (Mod)	0 ~ 99	Modulation depth
	Mod Speed (ModSP)	1 ~ 99	Modulation speed
7B-3	Mod Shape (ModShape)	T+10 ~ T–10, S–10 ~ S+10	Modulation waveform shape. T–Triangle, S–Sine. The range from +10 to –10 effects the waveform symmetry
7B-4	EQ Low (EQ.L)	–12 ~ +12 dB	Low EQ cut and boost
	EQ High (H)	–12 ~ +12 dB	High EQ cut and boost

For effects 21 and 22, dynamic modulation can be used to control the Mod Speed.

23: Harmonic Chorus

This effect splits the signal into two bands: HF high frequencies – LF low frequencies. The HF band is then fed to the quadrature type chorus, and the LF band is fed directly to the output. This effect is useful for low frequency instruments such as bass.
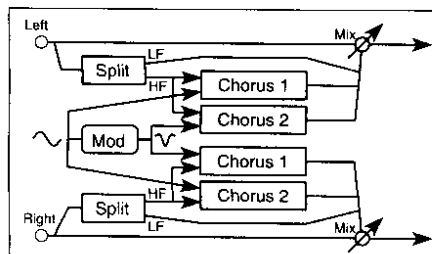
7B Harmo.Cho	7B Harmo.Cho	7B Harmo.Cho
D.TimeL=022 R046	Mod99 ModSP=35	F.Split Point=01

LCD	Parameter	Range	Description
7B–1	Delay Time1	0 ~ 500 ms	Channel 1 delay time
	Delay Time 2	0 ~ 500 ms	Channel 2 delay time
7B–2	Mod Depth (Mod)	0 ~ 99	Modulation depth
	Mod Speed (ModSP)	1 ~ 99	Modulation speed
7B–3	Frequency Split Point (F.Split Point)	0 ~ 18	The frequency at which the input signal is split into HF and LF bands

For effect 23, dynamic modulation can be used to control the Mod Speed.

24: Symphonic Ensemble

This effect is basically a multiple chorus type effect. It produces a rich, thickening effect, ideal for strings.
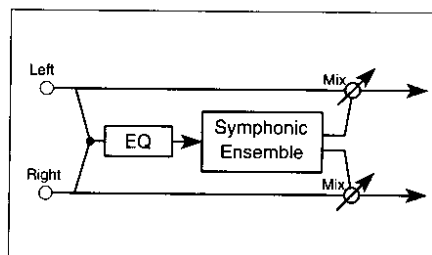
7B Symp.Ens	7B Symp.Ens
Mod98	EQ.L+00dB H+00dB

LCD	Parameter	Range	Description
7B–1	Mod Depth (Mod)	0 ~ 99	Modulation depth
7B–2	EQ Low (EQ.L)	–12 ~ +12 dB	Low EQ cut and boost
	EQ High (H)	–12 ~ +12 dB	High EQ cut and boost

For effect 24, dynamic modulation can be used to control the DRY:EFF balance.

Note: *When this effect is selected the following effect types cannot be selected for the other effect: 19~23 Choruses, 24 Symphonic Ensemble, 25~27 Flangers, 32 – 33 Phasers, 34 Rotary Speaker, 35 and 36 Tremolos, 38 – 39 Chorus Flanger/Delay, 42 Delay/Chorus, 43 Delay/Flanger, 46 Delay/Phaser, and 47 Delay/Rotary Speaker.*

25: Flanger 1

In this effect, inphase modulation is fed to both flanger channels.
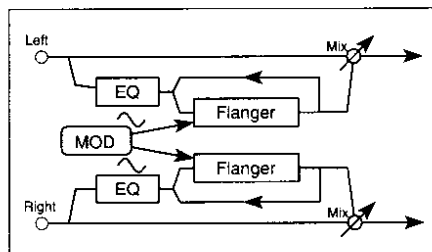
26: Flanger 2

In this effect, the left channel modulation signal is in phase and the right channel modulation signal is out of phase. This produces a wide, stereo flange effect.
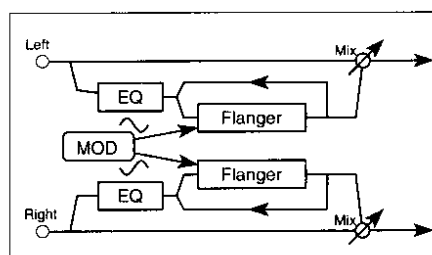
27: Crossover Flanger

In this effect, two flangers are modulated out of phase and apply feedback to each other.
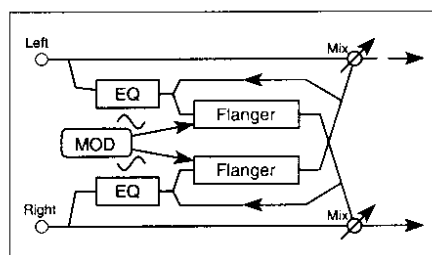
```
7B Flanger1   >  7B Flanger1   <>  7B Flanger1   <
D.Time005 Res 85  Mod99  ModSP=20  EQ.L+00dB H+00dB
```

LCD	Parameter	Range	Description
7B–1	Delay Time (D.Time)	0 ~ 200 ms	Delay time
	Resonance (Res)	–99 ~ +99	Amount of output signal fed back to the input (feedback)
7B–2	Mod Depth (Mod)	0 ~ 99	Modulation depth
	Mod Speed (ModSP)	1 ~ 99	Modulation speed
7B–3	EQ Low (EQ.L)	–12 ~ +12 dB	Low EQ cut and boost
	EQ High (H)	–12 ~ +12 dB	High EQ cut and boost

For effects 25~27, dynamic modulation can be used to control the Mod Speed.

28: Exciter

This effect increases the clarity of a sound
and gives it greater definition.
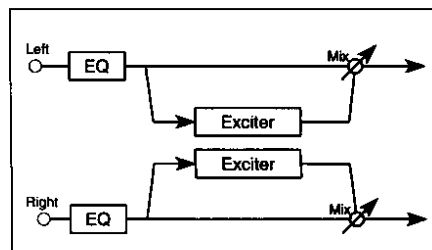

```
7B Exciter    >│7B Exciter   <>│7B Exciter    <
Blend=+50      │Emph Point=05  │EQ.L+04dB H+00dB
```

LCD	Parameter	Range	Description
7B-1	Blend (Blend)	-99 ~ +99	Mix of dry and effected signal
7B-2	Emphatic Point (Emph Point)	1 ~ 10	The central frequency around which sounds are excited
7B-3	EQ Low (EQ.L)	-12 ~ +12 dB	Low EQ cut and boost
	EQ High (H)	-12 ~ +12 dB	High EQ cut and boost

For effect 28, dynamic modulation can be used to control the DRY:EFF mix level.

29: Enhancer

This is a two-channel enhancer that includes
a delay to give a sound more spaciousness.
An enhancer makes the sound clearer and
more defined, giving the sound more
presence and bringing it up front in the mix.
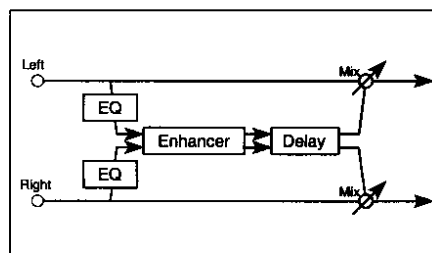

```
7B Enhancer      >│7B Enhancer    <>│7B Enhancer    <>│7B Enhancer    <
Harm Density=80   │Hot Spot=01      │S.W=50 D.Time=25  │EQ.L+01dB H+01dB
```

LCD	Parameter	Range	Description
7B-1	Harmonic Density	1 ~ 99	Level of the enhanced signal
7B-2	Hot Spot	1 ~ 20	The central frequency around which sounds are enhanced
7B-3	Stereo Width (S.W)	0 ~ 99	The width of the stereo image that is opened up by the delay
	Delay Time (D.Time)	1 ~ 99	Delay time
7B-4	EQ Low (EQ.L)	-12 ~ +12 dB	Low EQ cut and boost
	EQ High (H)	-12 ~ +12 dB	High EQ cut and boost

For effect 29, dynamic modulation can be used to control the DRY:EFF balance.

30: Distortion

This effect can provide subtle distortion through to mega power distortion. Ideal for ripping solos. The Hot Spot and Resonance parameters allow you to tune in for a wah type effect. The Hot Spot parameter can be controlled in real time using dynamic modulation.
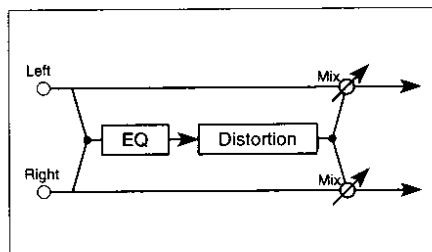
31: Overdrive

This effect produces a smooth overdrive. As with the previous distortion effect, dynamic modulation allows real time control of the wah filter's Hot Spot parameter.
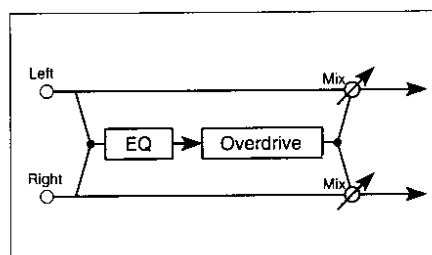
The following parameter table applies to effects 30 and 31.

```
7B Dist        >  7B Dist        <> 7B Dist        <
Drive=111 Res=80  H.Spot05 Level10  EQ.L+02dB H 12dB
```

LCD	Parameter	Range	Description
7B-1	Drive (Drive)	1 ~ 111	Distortion/Overdrive level
	Resonance (Res)	0 ~ 99	Gain of the resonant wah filter
7B-2	Hot Spot (H.Spot)	0 ~ 99	Wah filter centre frequency
	Out Level (Level)	0 ~ 99	Distortion output level
7B-3	EQ Low (EQ.L)	–12 ~ +12 dB	Low EQ cut and boost
	EQ High (H)	–12 ~ +12 dB	High EQ cut and boost

For effects 30 and 31, dynamic modulation can be used to control the Hot Spot parameter. This is useful for creating a wah-wah type effect.

32: Stereo Phaser 1

In Phaser 1, the left channel modulation signal is in phase and the right channel modulation signal is out of phase. This produces a wide stereo chorus effect.
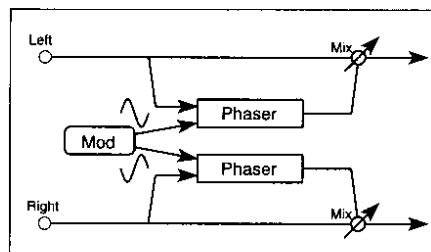
33: Stereo Phaser 2

This stereo effect contains two phasers. In-phase modulation is fed to both channels.
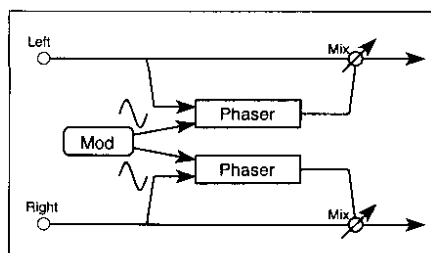
The following parameter table applies to effects 32 and 33.

LCD	Parameter	Range	Description
7B–1	Manual (Manual)	0 ~ 99	The central frequency around which phase shifting is concentrated
7B–2	Mod Depth (Mod)	0 ~ 99	Modulation depth
	Mod Speed (M.SPO.)	0.03 ~ 30 Hz	Modulation speed
7B–3	Feedback (FB)	–99 ~ +99%	The amount of phased signal that is fed back into the effect. Minus values invert the feedback signal phase
	Mod Waveform (SIN)	SIN (sine) TRI (triangular)	Modulation waveform

For effects 32 and 33, dynamic modulation can be used to control the Mod Speed.

34: Rotary Speaker

The effect is popular with organ type sounds. The rotation speed continuously cycles between the two speed settings at a rate determined by the Acceleration parameter.

Dynamic modulation can be used to switch from slow to fast speed. Regardless of how rapidly you move the controller, the rotor speed will change at the rate specified by the Acceleration parameter.
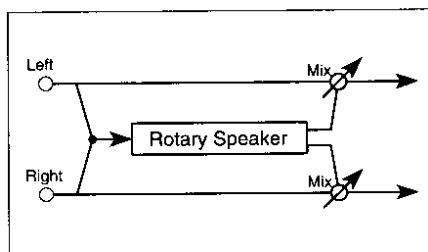

```
7B Rot.Spk      >| 7B Rot.Spk     <>| 7B Rot.Spk      <
Vibrato Depth=09 | Acceleration=04  | Speed S=25 F=70
```

LCD	Parameter	Range	Description
7B-1	Vibrato Depth	0 ~ 15	Effect depth
7B-2	Acceleration	1 ~ 15	Time taken to change from one speed to the other
7B-3	Slow Speed (S)	1 ~ 99	Slow rotation speed
	Fast Speed (F)	1 ~ 99	Fast rotation speed

For effect 34, dynamic modulation can be used to switch from slow to fast speed.

35: Auto Pan

This effect pans the signal continuously across the stereo image. The speed of panning (Mod Speed) can be set relative to song tempo, or left to produce a natural drift across the stereo image.
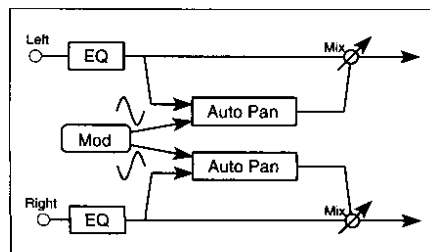
36: Tremolo

The tremolo effect modulates the signal amplitude to produce regular variations in volume level.
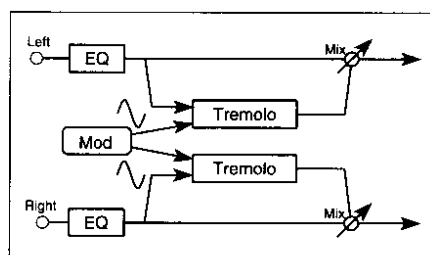
LCD	Parameter	Range	Description
7B–1	Mod Waveform (SIN)	SIN (sine) TRI (triangle)	Modulation waveform
	Mod Shape	–99 ~ +99	
7B–2	Mod Depth (Mod)	0 ~ 99	Modulation depth
	Mod Speed (M.SP1.)	0.03 ~ 30 Hz	Modulation speed
7B–3	EQ Low (EQ.L)	–12 ~ +12 dB	Low EQ cut and boost
	EQ High (H)	–12 ~ +12 dB	High EQ cut and boost

For effects 35 and 36, dynamic modulation can be used to control the DRY:EFF balance.

37: Parametric EQ

This is a 3-band parametric equalizer, with independent gain and frequency controls for each band. The width of the mid-frequency band can also be adjusted.
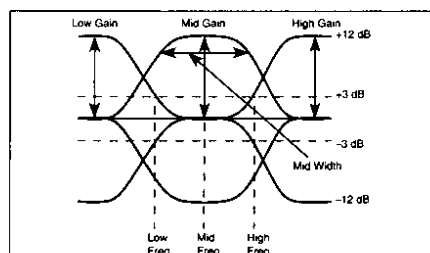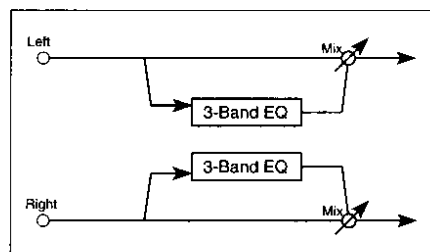
LCD	Parameter	Range	Description
7B-1	Low Freq (LowFrq)	0 ~ 29	Low center frequency
	Low Gain (Gain)	−12 ~ +12 dB	Low EQ cut and boost
7B-2	Mid Freq (MidFrq)	0 ~ 99	Mid center frequency
	Mid Gain (Gain)	−12 ~ +12 dB	Mid EQ cut and boost
7B-3	Mid Width (MidWidth)	0 ~ 99	Mid band width
7B-4	High Freq (Hi Frq)	0 ~ 29	High center frequency
	High Gain (Gain)	−12 ~ +12 dB	High EQ cut and boost

For effect 37, dynamic modulation can be used to control the Mid Freq parameter. This is useful for creating a wah type effect.

38: Chorus–Delay

This effect consists of a chorus and delay in series. The input signals are summed, then fed to two chorus units. The modulation signals fed to each chorus are 90 degrees out of phase with each other. Feedback parameters are available for both chorus and delay.
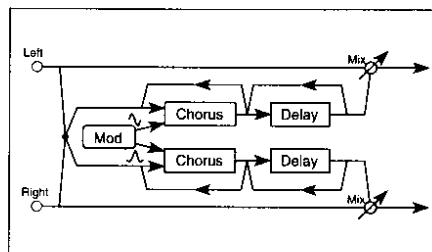
39: Flanger–Delay

This effect consists of a flanger and delay in series. The input signals are summed, then fed to two flanger units. The modulation signals fed to each flanger are 90 degrees out of phase with each other. Feedback parameters are available for both flanger and delay.
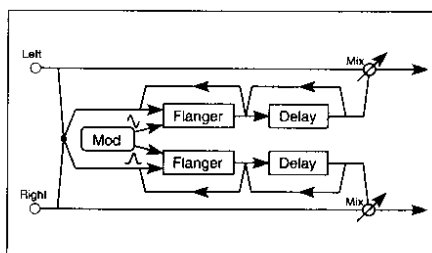
```
7B Chor-Dly      >  7B Chor-Dly    <>  7B Chor-Dly     <
Cho.DT11ms FB+10    Cho.Mod50 M.SP30   Dly.DT110 FB-10
```

Chorus, Flanger

LCD	Parameter	Range	Description
7B–1	Delay Time (Cho.DT)	0 ~ 50 ms	Chorus/Flanger delay time
	Feedback (FB)	–99 ~ +99%	The amount of effected signal that is fed back into the effect. Minus values invert the feedback signal phase
7B–2	Mod Depth Cho.Mod)	0 ~ 99	Modulation depth
	Mod Speed (M.SP)	1 ~ 99	Modulation speed

Delay

LCD	Parameter	Range	Description
7B–3	Delay Time (Dly.DT)	0 ~ 450 ms	Delay time (set in 2 ms steps)
	Delay Feedback (FB)	–99 ~ +99%	The amount of delay signal that is fed back into the effect. Minus values invert the feedback signal phase

For effects 38 and 39, dynamic modulation can be used to control the DRY:EFF mix level.

40: Delay/Hall Reverb

This effect consists of two independent effects: delay on the left channel and hall type reverb on the right.
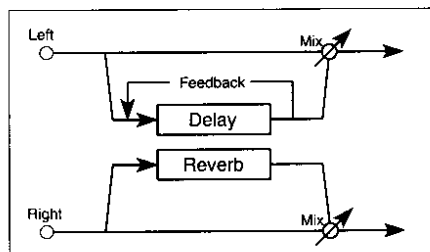
41: Delay/Room Reverb

This effect consists of two independent effects: delay on the left channel and room type reverb on the right.

The following parameter table applies to effects 40 and 41.

Delay

LCD	Parameter	Range	Description
7B–1	Delay Time (Time)	0 ~ 500 ms	Delay time
	Feedback (FB)	–99 ~ +99%	The amount of delay signal that is fed back into the effect. Minus values invert the feedback signal phase
7B–2	High Damp (H.Dmp)	0 ~ 99%	High frequency decay

Hall, Room

LCD	Parameter	Range	Description
7B–3	Reverb Time (Time)	0.2 ~ 9.9 sec (Hall)	The time over which the reverb effect will last
		0.2 ~ 4.9 sec (Room)	
	High Damp (H.Dmp)	0 ~ 99%	High frequency decay 0 = bright reverb 99 = dark reverb
7B–4	Pre Delay (P.Dly)	0 ~ 150 ms	The delay between the original sound and the early reflections

For effects 40 and 41, dynamic modulation can be used to control the DRY:EFF balance.

42: Delay/Chorus

This effect consists of two independent effects: delay on the left channel and chorus on the right.
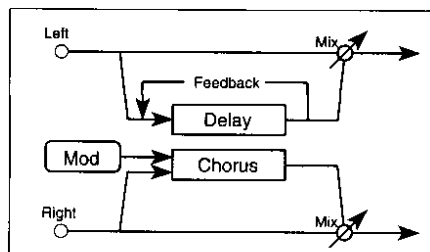

```
7B Delay(L)      >| 7B Delay(L)    <>| 7B Chorus(R)   <>| 7B Chorus(R)   <
Time250ms FB+50  | H.Dmp10         | Mod60 M.SP0.30Hz | TRI
```

Delay

LCD	Parameter	Range	Description
7B–1	Delay Time (Time)	0 ~ 500 ms	Delay time
	Feedback (FB)	–99 ~ +99%	The amount of delay signal that is fed back into the effect. Minus values invert the feedback signal phase
7B–2	High Damp (H.Dmp)	0 ~ 99%	High frequency decay

Chorus

LCD	Parameter	Range	Description
7B–3	Mod Depth (Mod)	0 ~ 99%	Modulation depth
	Mod Speed (M.SPO.)	0.03 ~ 30 Hz	Modulation speed
7B–4	Mod Waveform (TRI)	SIN (sine) TRI (triangle)	Modulation waveform

For effect 42, dynamic modulation can be used to control the DRY:EFF balance.

43: Delay/Flanger

This effect consists of two effects: delay on the left channel and flanger on the right.
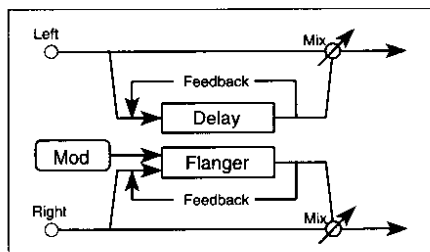

```
7B Delay(L)     >| 7B Delay(L)    <>| 7B Flanger(R) <>| 7B Flanger(R) <
Time250ms FB+50  | H.Dmp10         | Mod70 M.SP0.18Hz| FB_75
```

Delay

LCD	Parameter	Range	Description
7B–1	Delay Time (Time)	0 ~ 500 ms	Delay time
	Feedback (FB)	–99 ~ +99%	The amount of delay signal that is fed back into the effect. Minus values invert the feedback signal phase
7B–2	High Damp (H.Dmp)	0 ~ 99%	High frequency decay

Flanger

LCD	Parameter	Range	Description
7B–3	Mod Depth (Mod)	0 ~ 99%	Modulation depth
	Mod Speed (M.SPO.)	0.03 ~ 30 Hz	Modulation speed
7B–4	Feedback (FB)	–99 ~ +99%	The amount of effected signal that is fed back into the effect. Minus values invert the feedback signal phase

For effect 43, dynamic modulation can be used to control the DRY:EFF balance.

44: Delay/Distortion

This effect consists of two effects: delay on the left channel and distortion on the right.
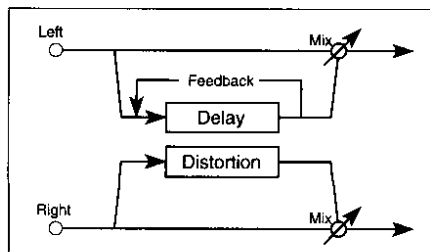
45: Delay/Overdrive

This effect consists of two effects: delay on the left channel and overdrive on the right.
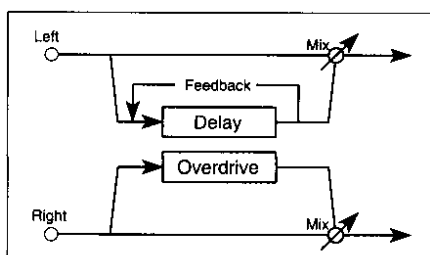
The following parameter table applies to effects 44 and 45.

```
7B Delay(L)        >│ 7B Dist(R)      <>│ 7B Dist(R)      <
Time250ms FB+40     │ Drive=111 Res=75  │ H.Spot50 Level05
```

Delay

LCD	Parameter	Range	Description
7B–1	Delay Time (Time)	0 ~ 500 ms	Delay time
	Feedback (FB)	–99 ~ +99%	The amount of delay signal that is fed back into the effect. Minus values invert the feedback signal phase

Distortion, Overdrive

LCD	Parameter	Range	Description
7B–2	Drive (Drive))	1 ~ 111	Distortion/Overdrive level
	Resonance (Res)	0 ~ 99	Gain of the resonant wah filter
7B–3	Hot Spot (H.Spot)	1 ~ 99	The wah filter frequency where it all happens
	Level (Level)	1 ~ 99	Distortion output level

46: Delay/Phaser

This effect consists of two effects: delay on the left channel and phaser on the right.
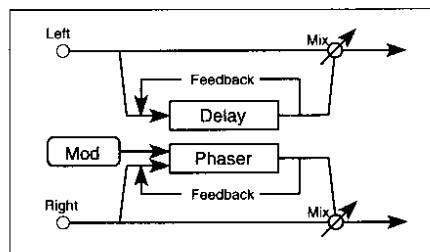

```
7B Delay(L)      >│7B Delay(L)    <>│7B Phaser(R)   <>│7B Phaser(R)   <
Time250ms FB+50  │H.Dmp10          │Mod60 M.SP0.69Hz │FB-75
```

Delay

LCD	Parameter	Range	Description
7B-1	Delay Time (Time)	0 ~ 500 ms	Delay time
	Feedback (FB)	–99 ~ +99%	The amount of delay signal that is fed back into the effect. Minus values invert the feedback signal phase
7B-2	High Damp (H.Dmp)	0 ~ 99%	High frequency decay

Phaser

LCD	Parameter	Range	Description
7B-3	Mod Depth (Mod)	0 ~ 99%	Modulation depth
	Mod Speed (M.SPO.)	0.03 ~ 30 Hz	Modulation speed
7B-4	Feedback (FB)	–99 ~ +99%	The amount of phased signal that is fed back into the effect. Minus values invert the feedback signal phase

For effect 46, dynamic modulation can be used to control the DRY:EFF balance.

47: Delay/Rotary Speaker

This effect consists of two effects: delay on the left channel and rotary speaker on the right.
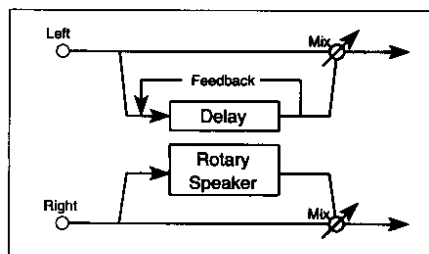

```
7B Delay(L)    >  7B Rot.SP(R)   <>  7B Rot.SP(R)   <
Time250ms FB+40   Acceleration=04    Speed S=25 F=70
```

Delay

LCD	Parameter	Range	Description
7B–1	Delay Time (Time)	0 ~ 500 ms	Delay time
	Feedback (FB)	–99 ~ +99%	The amount of delay signal that is fed back into the effect. Minus values invert the feedback signal phase

Rotary Speaker

LCD	Parameter	Range	Description
7B–2	Acceleration	1 ~ 15	Time taken to change from one speed to the other
7B–3	Slow Speed (S)	1 ~ 99	Slow rotation speed
	Fast Speed (F)	1 ~ 99	Fast rotation speed

For effect 47, dynamic modulation can be used to switch the speed change direction.

Effect Parameter Table

#		Reverb Time		Pre Delay		E.R Level		High Damp	
1	Hall	0.2 ~ 9.9 sec	(2.3)	0 ~ 200 ms	(60)	0 ~ 99	(62)	0 ~ 99%	(31)
2	Ensemble Hall	0.2 ~ 9.9 sec	(3.1)	0 ~ 200 ms	(15)	0 ~ 99	(23)	0 ~ 99%	(32)
3	Concert Hall	0.2 ~ 9.9 sec	(3.3)	0 ~ 200 ms	(80)	0 ~ 99	(46)	0 ~ 99%	(41)
4	Room	0.2 ~ 4.9 sec	(1.3)	0 ~ 200 ms	(8)	0 ~ 99	(68)	0 ~ 99%	(36)
5	Large Room	0.2 ~ 4.9 sec	(2.4)	0 ~ 200 ms	(25)	0 ~ 99	(51)	0 ~ 99%	(32)
6	Live Stage	0.2 ~ 4.9 sec	(2.2)	0 ~ 200 ms	(12)	0 ~ 99	(81)	0 ~ 99%	(36)
7	Wet Plate	0 ~ 99	(59)	0 ~ 200 ms	(29)	1 ~ 10	(7)	0 ~ 99%	(51)
8	Dry Plate	0 ~ 99	(30)	0 ~ 200 ms	(26)	1 ~ 10	(5)	0 ~ 99%	(47)
9	Spring Reverb	0 ~ 99	(23)	0 ~ 200 ms	(0)	1 ~ 10	(9)	0 ~ 99%	(20)

#		E.R Time				Pre Delay			
10	Early Reflection 1	100 ~ 800 ms	(220)			0 ~ 200 ms	(0)		
11	Early Reflection 2	100 ~ 800 ms	(180)			0 ~ 200 ms	(30)		
12	Early Reflection 3	100 ~ 800 ms	(300)			0 ~ 200 ms	(90)		

#		Delay Time L		Delay Time R		Feedback		High Damp	
13	Stereo Delay	0 ~ 500 ms	(185)	0 ~ 500 ms	(370)	-99 ~ +99%	(-40)	0 ~ 99%	(10)
14	Cross Delay	0 ~ 500 ms	(190)	0 ~ 500 ms	(380)	-99 ~ +99%	(+40)	0 ~ 99%	(10)

#		Delay Time L		Feedback L		High Damp L		Dry:Effect Mix L	
15	Dual Mono Delay	0 ~ 500 ms	(20)	-99 ~ +99%	(0)	0 ~ 99%	(0)	Dry ~ Effect	(50:50)

#		Delay Time 1		Delay Time 2				Feedback	
16	Multi-Tap Delay 1	0 ~ 500 ms	(175)	0 ~ 500 ms	(350)			-99 ~ +99%	(+30)
17	Multi-Tap Delay 2	0 ~ 500 ms	(200)	0 ~ 500 ms	(400)			-99 ~ +99%	(0)
18	Multi-Tap Delay 3	0 ~ 500 ms	(250)	0 ~ 500 ms	(500)			-99 ~ +99%	(+20)

#		Delay Time		Mod Speed		Mod Depth		Mod Waveform	
19	Chorus 1	0 ~ 200 ms	(3)	0.03 ~ 30 Hz	(0.33)	0 ~ 99	(99)	SIN, TRI	(TRI)
20	Chorus 2	0 ~ 200 ms	(2)	0.03 ~ 30 Hz	(0.42)	0 ~ 99	(84)	SIN, TRI	(TRI)

#		Delay Time L		Delay Time R		Mod Speed		Mod Depth	
21	Quadrature Chorus	0 ~ 250 ms	(24)	0 ~ 250 ms	(12)	•1 ~ 99	(30)	0 ~ 99	(50)
22	Crossover Chorus	0 ~ 250 ms	(2)	0 ~ 250 ms	(24)	•1 ~ 99	(16)	0 ~ 99	(99)

#		Delay Time L		Delay Time R				Mod Speed	
23	Harmonic Chorus	0 ~ 500 ms	(4)	0 ~ 500 ms	(12)			•1 ~ 99	(36)

#		Mod Depth							
24	Symphonic Ensemble	0 ~ 99	(92)						

#		Delay Time		Mod Depth		Mod Speed			
25	Flanger 1	0 ~ 200 ms	(5)	0 ~ 99	(50)	•1 ~ 99	(20)		
26	Flanger 2	0 ~ 200 ms	(24)	0 ~ 99	(99)	•1 ~ 99	(42)		
27	Crossover Flanger	0 ~ 200 ms	(1)	0 ~ 99	(60)	•1 ~ 99	(22)		

#		Blend				Emphatic Point			
28	Exciter	-99 ~ +99	(+60)			1 ~ 10	(1)		

#		Harmonic Density		Hot Spot		Stereo Width		Delay Time	
29	Enhancer	1 ~ 99	(28)	1 ~ 20	(3)	0 ~ 99	(85)	1 ~ 99	(25)

#		Drive		Hot Spot		Resonance		EQ Low	
30	Distortion	1 ~ 111	(107)	•0 ~ 99	(99)	0 ~ 99	(7)	-12 ~ +12 dB	(0)
31	Overdrive	1 ~ 111	(85)	•0 ~ 99	(70)	0 ~ 99	(63)	-12 ~ +12 dB	(0)

#		Manual		Mod Speed		Mod Depth		Feedback	
32	Stereo Phaser 1	0 ~ 99	(98)	•0.03 ~ 30 Hz	(0.24)	0 ~ 99	(90)	-99 ~ +99%	(+96)
33	Stereo Phaser 2	0 ~ 99	(96)	•0.03 ~ 30 Hz	(0.24)	0 ~ 99	(90)	-99 ~ +99%	(+90)

#		Vibrato Depth				Acceleration		Slow Speed	
34	Rotary Speaker *	0 ~ 15	(2)			1 ~ 15	(12)	1 ~ 99	(25)

#		Mod Waveform		Mod Wave Shape		Mod Speed		Mod Depth	
35	Auto Pan	SIN, TRI	(TRI)	-99 ~ +99	(+96)	0.03 ~ 30 Hz	(0.21)	0 ~ 99	(96)
36	Tremolo	SIN, TRI	(TRI)	-99 ~ +99	(-99)	0.03 ~ 30 Hz	(3.9)	0 ~ 99	(99)

#		Low Freq		Low Gain		Mid Freq		Mid Gain	
37	Parametric EQ	0 ~ 29	(15)	-12 ~ +12 dB	(+6)	•0 ~ 99	(50)	-12 ~ +12 dB	(+6)

#		Flg/Cho Delay		Flg/Cho Feedback		Mod Speed		Mod Depth	
38	Chorus–Delay	0 ~ 50 ms	(24)	-99 ~ +99%	(+24)	1 ~ 99	(12)	0 ~ 99	(75)
39	Flanger–Delay	0 ~ 50 ms	(1)	-99 ~ +99%	(+80)	1 ~ 99	(4)	0 ~ 99	(99)

#		Delay Time		Feedback		High Damp		Dry:Effect Mix	
40	Delay/Hall Reverb	0 ~ 500 ms	(30)	-99 ~ +99%	(0)	0 ~ 99%	(0)	•Dry ~ Effect	(FX)
41	Delay/Room Reverb	0 ~ 500 ms	(20)	-99 ~ +99%	(0)	0 ~ 99%	(0)	•Dry ~ Effect	(FX)

#		Delay Time		Feedback		High Damp		Dry:Effect Mix	
42	Delay/Chorus	0 ~ 500 ms	(220)	-99 ~ +99%	(+15)	0 ~ 99%	(50)	•Dry ~ Effect	(70:30)

#		Delay Time		Feedback		High Damp		Dry:Effect Mix	
43	Delay/Flanger	0 ~ 500 ms	(400)	-99 ~ +99%	(+20)	0 ~ 99%	(60)	•Dry ~ Effect	(70:30)

#		Delay Time		Feedback				Dry:Effect Mix	
44	Delay/Distortion	0 ~ 500 ms	(250)	-99 ~ +99%	(+40)			•Dry ~ Effect	(79:21)
45	Delay/Overdrive	0 ~ 500 ms	(350)	-99 ~ +99%	(+50)			•Dry ~ Effect	(75:25)

#		Delay Time		Feedback		High Damp		Dry:Effect Mix	
46	Delay/Phaser	0 ~ 500 ms	(300)	-99 ~ +99%	(+15)	0 ~ 99%	(60)	•Dry ~ Effect	(60:40)

#		Delay Time		Feedback				Dry:Effect Mix	
47	Delay/Rotary Speaker *	0 ~ 500 ms	(280)	-99 ~ +99%	(+15)			Dry ~ Effect	(70:30)

• A parameter that can be controlled using dynamic modulation

* Dynamic modulation can be used to change the speed cycle direction

   Values in parenthesis indicate the initial parameter value

80

	EQ Low	EQ High	Dry:Effect Mix
	−12 ~ +12 dB (−3)	−12 ~ +12 dB (−1)	• Dry ~ Effect (80:20)
	−12 ~ +12 dB (−1)	−12 ~ +12 dB (−3)	• Dry ~ Effect (80:20)
	−12 ~ +12 dB (−2)	−12 ~ +12 dB (−4)	• Dry ~ Effect (80:20)
	−12 ~ +12 dB (+1)	−12 ~ +12 dB (+2)	• Dry ~ Effect (78:22)
	−12 ~ +12 dB (−1)	−12 ~ +12 dB (+2)	• Dry ~ Effect (78:22)
	−12 ~ +12 dB (−5)	−12 ~ +12 dB (−4)	• Dry ~ Effect (75:25)
	−12 ~ +12 dB (0)	−12 ~ +12 dB (−4)	• Dry ~ Effect (80:20)
	−12 ~ +12 dB (+2)	−12 ~ +12 dB (+2)	• Dry ~ Effect (80:20)
	−12 ~ +12 dB (+2)	−12 ~ +12 dB (−4)	• Dry ~ Effect (78:22)
EQ Low		**EQ High**	**Dry:Effect Mix**
	−12 ~ +12 dB (−4)	−12 ~ +12 dB (−4)	• Dry ~ Effect (68:32)
	−12 ~ +12 dB (+1)	−12 ~ +12 dB (0)	• Dry ~ Effect (65:35)
	−12 ~ +12 dB (0)	−12 ~ +12 dB (0)	• Dry ~ Effect (75:25)
EQ Low		**EQ High**	**Dry:Effect Mix**
	−12 ~ +12 dB (0)	−12 ~ +12 dB (0)	• Dry ~ Effect (80:20)
	−12 ~ +12 dB (0)	−12 ~ +12 dB (0)	• Dry ~ Effect (80:20)
Delay Time R	**Feedback R**	**High Damp R**	**Dry:Effect Mix**
0 ~ 500 ms (40)	−99 ~ +99% (0)	0 ~ 99% (0)	• Dry ~ Effect (50:50)
EQ Low		**EQ High**	**Dry:Effect Mix**
	−12 ~ +12 dB (0)	−12 ~ +12 dB (0)	• Dry ~ Effect (80:20)
	−12 ~ +12 dB (0)	−12 ~ +12 dB (0)	• Dry ~ Effect (70:30)
	−12 ~ +12 dB (0)	−12 ~ +12 dB (0)	• Dry ~ Effect (75:25)
EQ Low		**EQ High**	**Dry:Effect Mix**
	−12 ~ +12 dB (+4)	−12 ~ +12 dB (+4)	• Dry ~ Effect (50:50)
	−12 ~ +12 dB (+3)	−12 ~ +12 dB (+4)	• Dry ~ Effect (60:40)
Mod Waveform	**EQ Low**	**EQ High**	**Dry:Effect Mix**
T+10 ~ S+10 (T+00)	−12 ~ +12 dB (0)	−12 ~ +12 dB (0)	Dry ~ Effect (50:50)
T+10 ~ S+10 (T+00)	−12 ~ +12 dB (0)	−12 ~ +12 dB (0)	Dry ~ Effect (50:50)
Mod Depth	**Split Point**		**Dry:Effect Mix**
0 ~ 99 (99)	0 ~ 18 (3)		Dry ~ Effect (25:75)
EQ Low		**EQ High**	**Dry:Effect Mix**
	−12 ~ +12 dB (0)	−12 ~ +12 dB (0)	• Dry ~ Effect (67:33)
Resonance	**EQ Low**	**EQ High**	**Dry:Effect Mix**
−99 ~ +99% (+80)	−12 ~ +12 dB (0)	−12 ~ +12 dB (0)	Dry ~ Effect (50:50)
−99 ~ +99% (+36)	−12 ~ +12 dB (0)	−12 ~ +12 dB (0)	Dry ~ Effect (50:50)
−99 ~ +99% (+80)	−12 ~ +12 dB (0)	−12 ~ +12 dB (0)	Dry ~ Effect (50:50)
EQ Low		**EQ High**	**Dry:Effect Mix**
	−12 ~ +12 dB (+3)	−12 ~ +12 dB (+3)	• Dry ~ Effect (50:50)
EQ Low		**EQ High**	**Dry:Effect Mix**
	−12 ~ +12 dB (0)	−12 ~ +12 dB (0)	• Dry ~ Effect (50:50)
EQ High	**Output Level**		**Dry:Effect Mix**
−12 ~ +12 dB (0)	0 ~ 99 (6)		Dry ~ Effect (50:50)
−12 ~ +12 dB (0)	0 ~ 99 (8)		Dry ~ Effect (50:50)
Mod waveform			**Dry:Effect Mix**
SIN, TRI (TRI)			Dry ~ Effect (50:50)
SIN, TRI (SIN)			Dry ~ Effect (50:50)
Fast Speed			**Dry:Effect Mix**
1 ~ 99 (69)			Dry ~ Effect (34:66)
EQ Low		**EQ High**	**Dry:Effect Mix**
	−12 ~ +12 dB (0)	−12 ~ +12 dB (0)	• Dry ~ Effect (20:80)
	−12 ~ +12 dB (0)	−12 ~ +12 dB (0)	• Dry ~ Effect (50:50)
Mid Width	**High Freq**	**High Gain**	**Dry:Effect Mix**
0 ~ 99 (50)	0 ~ 29 (12)	−12 ~ +12 dB (+6)	Dry ~ Effect (50:50)
Delay Time	**Feedback**		**Dry:Effect Mix**
0 ~ 450 ms (120)	−99 ~ +99% (+16)		• Dry ~ Effect (60:40)
0 ~ 450 ms (300)	−99 ~ +99% (+30)		• Dry ~ Effect (50:50)
Reverb Time	**Pre Delay**	**High Damp**	**Dry:Effect Mix**
0.2 ~ 9.9 sec (3.0)	0 ~ 150 ms (68)	0 ~ 99% (34)	• Dry ~ Effect (70:30)
0.2 ~ 9.9 sec (1.1)	0 ~ 150 ms (0)	0 ~ 99% (28)	• Dry ~ Effect (65:35)
Mod Speed	**Mod Depth**	**Mod Waveform**	**Dry:Effect Mix**
0.03 ~ 30 Hz (0.39)	0 ~ 99 (99)	SIN, TRI (TRI)	• Dry ~ Effect (50:50)
Mod Speed	**Mod Depth**	**Feedback**	**Dry:Effect Mix**
0.03 ~ 30 Hz (0.21)	0 ~ 99 (96)	−99 ~ +99% (−75)	• Dry ~ Effect (50:50)
Drive	**Hot Spot**	**Resonance**	**Output Level**
1 ~ 111 (105)	1 ~ 99 (99)	0 ~ 99 (7)	1 ~ 99 (10)
1 ~ 111 (65)	1 ~ 99 (90)	0 ~ 99 (63)	1 ~ 99 (20)
Mod Speed	**Mod Depth**	**Feedback**	**Dry:Effect Mix**
0.03 ~ 30 Hz (0.69)	0 ~ 99 (90)	−99 ~ +99% (+99)	• Dry ~ Effect (25:75)
Acceleration	**Slow Speed**	**Fast Speed**	**Dry:Effect Mix**
1 ~ 15 (10)	1 ~ 99 (25)	1 ~ 99 (69)	• Dry ~ Effect (30:70)

Chapter 6: Sequencer Mode

In Sequencer mode you can playback songs and record in real time.

Sequencer Edit mode allows you to edit your real-time recordings, record in step time, and create patterns in either step time or real time. See "Sequencer Edit Mode" on page 101.

X3 Sequencer Specs

- 10 songs and 100 patterns can be held in memory simultaneously.

- 32,000 events (notes, etc.) can be recorded for the 10 songs and 100 patterns. However, one track or pattern may contain a maximum of 16,000 events.

- A song can contain up to 16 tracks.

- A track may contain up to 999 measures.

- A pattern may contain up to 99 measures.

- Base Resolution can be either 48 PPQN or 96 PPQN.

- Effects can be set individually for each song. Program effect settings are ignored.

- Program Change messages can be used to select different Programs at any time.

- By setting a track to EXT status ("Track Status – 1B" on page 102), external MIDI devices can be controlled by the sequencer.

- Up to 32-notes are available for all tracks simultaneously.

- All sequencer data is retained in memory when the power is off. However, we do recommend that you save your data at regular intervals.

Sequencer Data, RAM Cards, & Floppy Disks

Sequencer data on a floppy disk must be loaded before you can play or edit it.

Sequencer data on a PROG/SEQ data card can be played without loading. Although, you must load it before editing.

A PROG/SEQ data card can store up to 7,000 events. See "Save Sequencer Data to Card – 6D" on , page 158.

If the amount of free sequencer memory is less than 77%, the sequencer data cannot be saved to card. In this case, save to floppy disk. See "Save Sequencer Data – 3C" on page 174.

Ways to Record Tracks

- **Real-Time Track Recording:** is similar to recording on a tape machine – you select a track, start recording, start playing, then stop. Real-time recording is carried out in Sequencer mode. See "Real-Time Recording" on page 86.

- **Step-Time Track Recording:** allows you enter notes one by one – you select a position, specify the note, its velocity, and length, then insert it into a track. Step-time recording is carried out in Sequencer Edit mode. See "Step-Time Track Recording – 2A" on page 105.

- **Patterns:** can contain up to 99 measures. They allow you to use the same data in a number of tracks, at various times. Patterns can be copied to tracks or put to tracks. Putting a pattern to a track means that you do not have to duplicate (copy) the data. Thus, saving sequencer memory. Any changes made to a put pattern will be reflected in all tracks into which that pattern has been put. This makes it simple to, for example, update the snare drum pattern used in all choruses.

Ways to Record Patterns

- **Real-time Pattern Recording:** this is similar to real-time track recording except the pattern repeats while recording, allowing you to build up patterns by overdubbing. For example, you could record a bass drum in the first pass, a snare drum in the second, hi-hats in the third, etc.

- **Step-Time Pattern Recording:** allows you enter notes one by one – you select a position, specify the note, its velocity, and length, then insert it into a pattern.

- **Copy Data from a Track:** you can select a number of measures from a track, and copy the data into a pattern. The pattern can then be edited, and put or copied into other tracks.

What's in a Song?

The following diagram shows what's in a song:

Inside a Song

Track 1:	Program, MIDI Channel, Level, Pan	Track data: measures, patterns
Track 2:	Program, MIDI Channel, Level, Pan	Track data: measures, patterns
Track 3:	Program, MIDI Channel, Level, Pan	Track data: measures, patterns
Track 4:	Program, MIDI Channel, Level, Pan	Track data: measures, patterns
Track 5:	Program, MIDI Channel, Level, Pan	Track data: measures, patterns
Track 6:	Program, MIDI Channel, Level, Pan	Track data: measures, patterns
Track 7:	Program, MIDI Channel, Level, Pan	Track data: measures, patterns
Track 8:	Program, MIDI Channel, Level, Pan	Track data: measures, patterns
Track 9:	Program, MIDI Channel, Level, Pan	Track data: measures, patterns
Track 10:	Program, MIDI Channel, Level, Pan	Track data: measures, patterns
Track 11:	Program, MIDI Channel, Level, Pan	Track data: measures, patterns
Track 12:	Program, MIDI Channel, Level, Pan	Track data: measures, patterns
Track 13:	Program, MIDI Channel, Level, Pan	Track data: measures, patterns
Track 14:	Program, MIDI Channel, Level, Pan	Track data: measures, patterns
Track 15:	Program, MIDI Channel, Level, Pan	Track data: measures, patterns
Track 16:	Program, MIDI Channel, Level, Pan	Track data: measures, patterns
Tempo Track:	Tempo and time signature changes	

Pan A & B → Effects → L/MONO
Send C & D → R
7A–7G

What's in a Pattern?

The following diagram shows what's in a pattern:

Inside a Pattern

Pattern parameters: time signature	Pattern data: measures
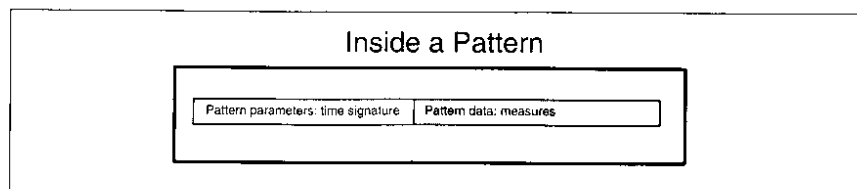
Entering Sequencer Mode

1) Press the [SEQ] button.

The LCD screen should look something like the one shown below.
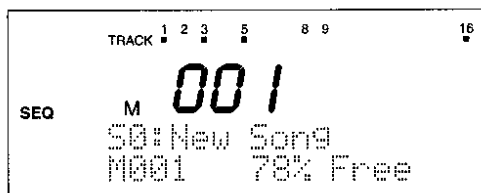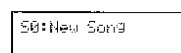
Playing Songs

This section explains how to play songs.

Songs can be in any one of three places: in the internal sequencer memory, on a PROG/SEQ data card, or on a floppy disk. If the song that you want to play is in the sequencer memory or on a PROG/SEQ data card, proceed to step 1. If it is on a floppy disk, you must load it into the sequencer memory before it can be played. See "Load Sequencer Data – 1C" on page 169.

1) If you haven't already, press the [SEQ] button to enter Sequencer mode.

2) Press function button [8]. The following LCD screen will appear.

```
S0:New Song
```

3) Use the VALUE slider, [▲/YES] and [▼/NO] buttons, or number keypad to select a song.

   If the song is on a PROG/SEQ data card, press the [BANK] button, then select the song.

4) Press the [START/STOP] button to start playback.

   Press the [START/STOP] button again to pause playback.
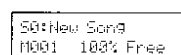
   To continue playback, press the [START/STOP] button. Playback will continue from the point at which playback was paused.

   To return to the beginning of the song, press the [RESET] button. Tracks whose status is set to EXT will send the corresponding MIDI Bank Select, Program Change, volume, etc., messages. So any external MIDI devices will be ready to start playback from the first measure.

   At the end of the song, playback will stop, and the song will return to the first measure. If a Next Song has been specified, that song will played. See "Next Song – 8C" on page 142.

Playback from a Specific Measure

To start playback at a specific measure in a song, press function button [1]. The following LCD screen will appear:
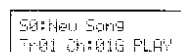
```
S0:New Song
M001   100% Free
```

Position the cursor on the measure parameter (M001), use the VALUE slider, [▲/YES] and [▼/NO] buttons, or number keypad to select a measure, then press the [START/STOP] button to start playback. At the end of the song, the song will return to measure at which playback was started.

Muting Individual Tracks

While playing a song, you can mute individual tracks.

1) Press function button [3]. The following LCD screen will appear:

```
S0:New Song
Tr01 Ch:01G PLAY
```

2) Position the cursor on the Tr01 parameter, then use the VALUE slider, [▲/YES] and [▼/NO] buttons, or number keypad to select the track that you want to mute.

3) Position the cursor on the PLAY parameter, then use the VALUE slider or the [▲/YES] and [▼/NO] buttons to select MUTE.

   Set the parameter back to PLAY, for normal playback.

Soloing Individual Tracks

The solo function allows you to listen to tracks individually. To solo a track, double-click function button [2] (TRACK). The currently selected track only will be heard. The currently selected track is indicated by a flashing number on the LCD screen. To listen to other tracks, select the Tr parameter on the LCD screen, and use the VALUE slider, [▲/YES] and [▼/NO] buttons, or number keypad.

On the LCD screen shown below, track 3 has been soloed.
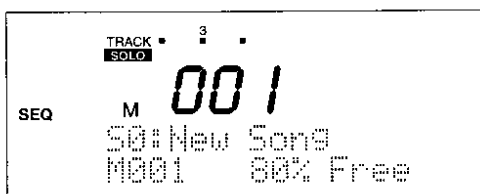
To cancel the solo function, double-click function button [2] (TRACK).

Song Playback Notes

You can edit a song's effect settings during playback. This allows you to try different effects and edit effect parameters, just like a mixdown on a real mixing console. Press function button [7] to access the effects. See "Effects 7A ~ 7G" on page 141.

Program, level, and pan parameters can also be edited during playback. See "Track Program, Level, & Pan" on page 94.

Note: *If you sometimes use an external MIDI clock to synchronize the X3 sequencer, remember to set the X3's Clock Source back to INT when not using that external clock. Otherwise, the X3 will not playback. See "Global MIDI Channel & MIDI Clock Source – 3A" on page 150.*

Real-Time Recording
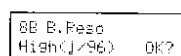
This section explains how to record in real time.

1) Press the [SEQ] button to enter Sequencer mode.

2) Press function button [8]. The following LCD screen will appear:

```
S0:
```
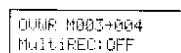
3) Use the VALUE slider, [▲/YES] and [▼/NO] buttons, or number keypad to select a new song.

4) Now you must set the song's base resolution, because once you record something, it cannot be changed. Press the [EDIT] button to enter Sequencer Edit mode, then locate the LCD screen shown below, 8B:

```
8B B.Reso
High(J/96)    OK?
```

Set the base resolution to either 1/48 or 1/96. See "Song Base Resolution – 8B" on page 141 for full details.
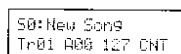
5) Press the [SEQ] button to return to Sequencer mode.

6) Press function button [7]. The following LCD screen will appear:

```
OVWR M003+004
MultiREC:OFF
```
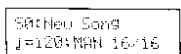
If you want to record one track only, set the MultiREC parameter to OFF. If you want to record on more than one track simultaneously, set it to ON. See "Multitrack Recording – MultiREC" on page 91 for more details about multitrack recording.

7) Press function button [7], and check the amount of free memory. If you think there in not enough free sequencer memory for your new song, save another song to floppy disk ("Save Sequencer Data – 3C" on page 174) or a PROG/SEQ data card ("Save Sequencer Data to Card – 6D" on page 158), then erase it ("Erase Song – 2G" on page 119). This will free up some sequencer memory.

8) Press function button [2]. The following LCD screen will appear:

```
S0:New Song
Tr01 A08 127 CNT
```

9) Select a track for recording. Then select a Program, and set the level and pan parameters. See "Track Program, Level, & Pan" on page 94 for full details. If you change any of these parameters while recording, that change will be recorded.

If you want to record a GM (General MIDI) compatible song, see "GM Song Mode – 8F" on page 144.

10) If you are recording a new song, ignore this step. If you are re-recording tracks, make sure that the track protect parameter is set to off. See "Track Status – 1B" on page 102.

11) If you want to record using quantize, see "Real-Time Quantize" on page 99.

12) If you want to use the metronome, see "Metronome" on page 99.

13) Press the [REC/WRITE] button.

The word REC will appear on the LCD screen.

14) Press function button [4]. The following LCD screen will appear:

```
S0:New Song
J=120:MAN 16/16
```

Set the song tempo and time signature parameters as required.

15) Press function button [7]. The following LCD screen will appear:

```
AUTP M003→004
MultiREC:ON
```

Select a Recording mode.

What you do next depends on the Recording mode that you selected. See the following explanations of each Recording mode.

Overwriting – OVWR

In this Recording mode, any existing data in the selected track will be overwritten (lost) from the measure at which you start recording.

1) Follow the steps for "Real-Time Recording" on page 86, and select OVWR as the Recording mode.

2) To select the start measure, press function button [1]. The following LCD screen will appear:

```
S0:
M001   100% Free
```

Position the cursor on the measure parameter (M001), use the VALUE slider, [▲/YES] and [▼/NO] buttons, or number keypad to select a measure.

3) Press the [START/STOP] button.

After the specified count-in ("Metronome – 8D" on page 142), recording will begin. Other tracks that contain data will play depending their Track Status ("Track Status – 1B" on page 102).

4) To stop recording, press the [START/STOP] button.

The song will be returned to the measure at which recording started. Simply press the [START/STOP] button to start playback.

If you record on a section of a track that contained a put pattern, the pattern data and the new data will be added to the track.

Overdubbing – OVDB

In this Recording mode, any existing data in the selected track will be merged with new data.

1) Follow the steps for "Real-Time Recording" on page 86, and select OVDB as the Recording mode.

2) To select the start measure, press function button [1]. The following LCD screen will appear:

```
S0:
M00:   100% Free
```

Position the cursor on the measure parameter (M001), use the VALUE slider, [▲/YES] and [▼/NO] buttons, or number keypad to select a measure.

3) Press the [START/STOP] button.

After the specified count-in ("Metronome – 8D" on page 142), recording will begin. Other tracks that contain data will play depending their Track Status ("Track Status – 1B" on page 102).

4) To stop recording, press the [START/STOP] button.

The song will be returned to the measure at which recording started. Simply press the [START/STOP] button to start playback.

If you record on a section of a track that contained a put pattern, the pattern data and the new data will be added to the track.

Auto Punch In/Out Recording – AUTP

In this Recording mode, you can re-record a specified measure(s) on a track that already contains data.

1) Follow the steps for "Real-Time Recording" on page 86, and select AUTP as the Recording mode.

As shown on the LCD screen below, the options for punch in and punch out measures will appear.

```
AUTP M001 →001
MultiREC:OFF
```

2) Use the VALUE slider or [▲/YES] and [▼/NO] buttons to specify the punch in and punch out measures.

3) Press function button [1]. The following LCD screen will appear:

```
S0:New Song
M001   100% Free
```

Position the cursor on the measure parameter (M001), and select a measure that is several measures before the specified punch in measure.

4) Press the [START/STOP] button.

After the specified count-in ("Metronome – 8D" on page 142), **playback** will begin.

When the specified punch in measure is reached, recording will begin.

When the specified punch out measure is reached, recording will stop (playback will continue).

5) Press the [START/STOP] button to stop playback.

The song will be returned to the measure at which recording started. Simply press the [START/STOP] button to start playback. If you don't like what you just recorded and you want to do it again, return to step 3.
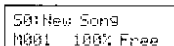
If you punch in/out on measures that contain Controller data such as pitch bend or damper pedal, leaving the Controller stuck at a value other than that of its natural resting place, you will probably have to use the Event Edit function to set correct the data. Alternatively, erase the Controller data.

If you record on a section of a track that contained a put pattern, the pattern data and the new data will be added to the track.

Manual Punch In/Out Recording – MANP

This Recording mode is similar to Auto punch in/out, except that you use the [REC/WRITE] button or a pedal switch to punch in/out when you like.

1) Follow the steps for "Real-Time Recording" on page 86, except step 13 (do not press the [REC/WRITE] button), and select MANP as the recording mode.

2) Press function button [1]. The following LCD screen will appear:

```
S0:New Song
M001   100% Free
```

Position the cursor on the measure parameter (M001), and select a measure that is several measures before the point at which you want to manually punch in.

3) Press the [START/STOP] button.

Playback will begin.

4) When the point at which you want to punch in is reached, press the [REC/WRITE] button to start recording.

5) To stop recording, press the [REC/WRITE] button again.

Steps 4 and 5 can also be performed using a pedal switch. Connect an optional Korg PS-1 or PS-2 pedal switch to the ASSIGNABLE PEDAL/SW connection. Then, in Global mode, assign the pedal to SEQ punch in/out. See "Assignable Pedal Setup – 8B" on page 163. Instead of pressing the [REC/WRITE] button in steps 4 and 5, press the pedal switch.

If you punch in/out at a point that contains Controller data such as pitch bend or damper pedal, leaving the Controller stuck at a value other than that of its natural resting place, you will probably have to use the Event Edit function to set correct the data. Alternatively, erase the Controller data.

If you record on a section of a track that contained a put pattern, the pattern data and the new data will be added to the track.

Multitrack Recording – MultiREC

Normally, you will record one track at a time. If, however, you want to record a number of tracks simultaneously, for example, you want to record a number of tracks from another MIDI sequencer, etc., you need to use the MultiREC mode. In this mode, MIDI data received via the MIDI IN connection will be recorded onto tracks whose MIDI Channels correspond the MIDI Channels used by the incoming data.

1) In Global mode, set the Clock Source parameter to EXT. See "Global MIDI Channel & MIDI Clock Source – 3A" on page 150.

   It is important that the X3 uses the external sequencer's MIDI clock, otherwise, data may not be recorded correctly.

2) Select the corresponding MIDI Channels for the tracks that you want to record the incoming data.

3) Select which tracks you want to record, play, or be muted. See "Track MIDI Channel & Mode" on page 95.

4) Follow the steps for "Real-Time Recording" on page 86, and select a Recording mode.

   You cannot select LOOP for MultiREC.

```
OVWR
MultiREC:ON
```

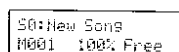5) Start playback on the external sequencer.

   The X3 sequencer will automatically start recording. This is because the external sequencer sends a MIDI Start message to the X3.

6) To stop recording, press the [START/STOP] button, or stop the external sequencer.

   The X3 sequencer will automatically stop recording. This is because the external sequencer sends a MIDI Stop message to the X3.

   The X3 sequencer can record the following types of MIDI data from an external device:

Note On/Off
Pitch Bend
Program Change
Channel Pressure After Touch
Polyphonic Key Pressure After Touch
Controllers 0 ~ 101

If one track on the external sequencer contains far more data than the other tracks, a memory full message may appear even though there is enough free sequencer memory. In this case, mute the large track, record the other tracks, then record the large track after.

Synchronization

The X3 sequencer can be synchronized to other MIDI devices such as sequencers, drum machines, etc. This allows you to start and stop a number of MIDI devices by using the start and stop buttons on the master MIDI device. The X3 can work as either master of slave.

The MIDI Clock source of the master device is set to INT (internal), and the slave device is set to EXT (external). See "Global MIDI Channel & MIDI Clock Source – 3A" on page 150. Refer to the manual of your other MIDI device for details about selecting MIDI clock sources.

The MIDI OUT of the master device should be connected to the MIDI IN of the slave device, as shown below:
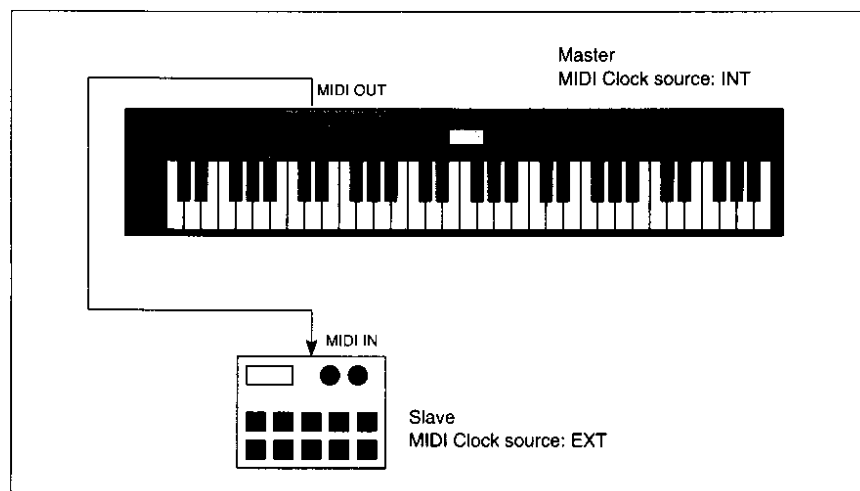
The slave device will start and stop when the corresponding functions on the master device are executed.

The tempo of the slave device is determined by the tempo of the master device.

If the slave device responds to MIDI Song Select and MIDI Song Position Pointer messages, the slave device will automatically select songs and measures when they are selected on the master device.

Real-Time Record/Play Parameters

Measure Position & Free Memory

These parameters indicate the current measure and the amount of free sequencer memory.

```
S0:New Song
M001   100% Free
```

LCD	Parameter	Range	Description
1A-1	Measure Position	001 ~ 999	Indicates and selects the current measure

The current measure is also indicated by the three large digits in the middle of the LCD screen.

To start playback form a particular measure, position the cursor on the M001 parameter, and use the VALUE slider or the [▲/YES] and [▼/NO] buttons to select a measure. Press the [START/STOP] button to start playback from the specified measure.

Track Program, Level, & Pan

These parameters allows you to select a Program and set the volume level and pan for each track.

```
S0:
Tr01 A00 :27 CNT
```

LCD	Parameter	Range	Description
1A-2	Track	1 ~ 16	Select a track for recording, editing, soloing, etc
	Program	OFF A00 ~ A99 B00 ~ B99 C00 ~ C99 D00 ~ D99 G01 ~ 136	Select a Program for each track
	Level	0 ~ 127	Set the level for each track
	Pan	OFF, A, A14 ~ CNT ~ B14, B, PRG	Set the pan for each track

Track: this parameter allows you to select a track for recording – the current track. The X3 keyboard plays the current track, and the corresponding track number flashes at the top of the LCD screen.

```
TRACK  1  2  3  -5-      8  9            16

SEQ    M  001
       S0:SongSong
       M001    78% Free
```
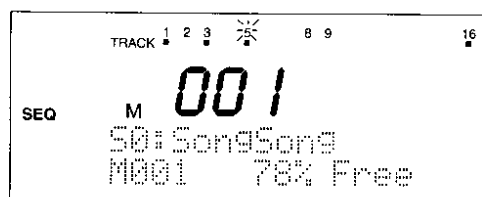
Program: this parameter allows you to select a Program for each track.

Level: this parameter allows you to set the level of each track.

Pan: when PRG is selected, the selected Program's pan settings will be used. See "Oscillator 1 Setup – 1B" on page 9 and "Oscillator 2 Setup – 1C" on page 11. If the selected Program is using a drum kit, the pan settings that have been set in Global mode will be used. See "Drum Kit Setup1 – 7A" on page 159. For Double mode Programs, the pan settings of each oscilator will be used.

These parameters can be adjusted during playback. This is useful when you want to, for example, try a different Program for a track. However, if data corresponding to one of these parameters is recorded in a track, that data will set the parameter automatically during playback. For example, if at the beginning of a song you adjust the volume, but then some volume data that was previously recorded in the track is played, the volume will be reset by the recorded volume data.

While recording, real time only, you can select other Programs and adjust the level and pan parameters. These adjustments will be recorded along with other events (notes, etc.), and they can be edited using Event Edit. See "Event Edit – 2B" on page 109. They can also be adjusted using Create Controller Data. See "Create Controller Data – 3D" on page 124.

Pan adjustments made during playback or recording affect subsequent notes, not notes that are currently playing. The corresponding values of Program, level, and pan adjustments recorded in a track will be displayed during playback.

Track MIDI Channel & Mode

These parameters allows you to select a MIDI Channel and Track mode for each track.

```
S0:
Tr01 Ch:01G MUTE
```

LCD	Parameter	Range	Description
1A-3	Track	1 ~ 16	Select a track for recording, editing, soloing, etc.
	MIDI Channel	1 ~ 16	Select a MIDI Channel for each track
	Track Mode	REC PLAY MUTE	Track will be recorded Track will playback Track muted

Track: this parameter allows you to select a track for recording – the current track. The X3 keyboard plays the current track, and the corresponding track number flashes on the LCD screen as shown below.
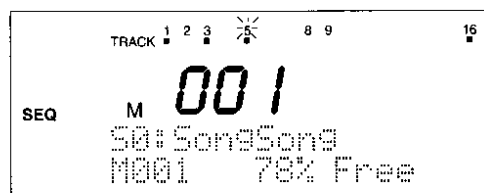
MIDI Channel: this parameter determines the MIDI Channel that each track uses to send and receive MIDI data. If the selected MIDI Channel is the same as the Global MIDI Channel, a G will appear after the Channel number.

The X3 keyboard plays the currently selected track. However, any tracks that are set to the same MIDI Channel as the currently selected track will also be played.

By assigning two or more tracks to the same MIDI Channel, and selecting different Programs for each, you can play Programs in unison. This is sometimes called layering. Likewise, data from two or more tracks can be used to play one Program by setting those tracks to the same MIDI Channel. For example, you could record note data on one track, and Controller data on another track.

Tracks with a Track Status of EXT or BOTH use this MIDI Channel to send and receive MIDI data to and from other MIDI devices.

Track Mode: this parameter determines whether a track plays or not during playback and recording. When Play is selected, data on the track will play. When Mute is selected, data on the track will not be played and the corresponding track number will disappear from the LCD screen. When Rec is selected, the track is armed for recording and the corresponding track number will flash on the LCD screen.

When a track contains some data, a small box will appear under the corresponding track number.

When the MultiREC parameter is set to on ("Recording Mode" on page 100), use these parameters to select which tracks you want to play, record, and mute.

Song Tempo, Tempo Mode, & Time Signature

These parameters allows you to set the song tempo, Tempo mode, and time signature.

```
S0:
♩=120:MAN 16/16
```

LCD	Parameter	Range	Description
1A-4	Tempo	40 ~ 240, EXT	Set the song tempo (EXT when MIDI Clock Source is EXT)
	Tempo Mode	MAN AUT REC	Recording
		MAN AUT	Playback
	Time Signature	1/4 ~ 9/4 1/8 ~ 16/8 1/16 ~ 16/16	Low base resolution
		1/4 ~ 5/4 1/8 ~ 10/8 1/16 ~ 16/16	High base resolution

Tempo: this parameter determines the song tempo. When the Tempo mode is set to MAN, you can use the VALUE slider or the [▲/YES] and [▼/NO] buttons to adjust the tempo. However, when the Tempo mode is set to AUT you cannot adjust the tempo. In this case, tempo data recorded on the tempo track determines the tempo.

When the MIDI Clock Source parameter is set to EXT ("Global MIDI Channel & MIDI Clock Source – 3A" on page 150), the tempo value will show EXT. In this case, the tempo is determined by the tempo of the external MIDI device.

Tempo Mode: this parameter determines how the tempo track functions during playback and recording. Three options, MAN, AUT, and REC, can be selected in Record Ready mode, and two options, MAN and AUT, during playback.

To record some tempo changes, press the [REC/WRITE] button, then select REC. Press the [START/STOP] button to start recording and adjust the tempo as required. To playback the tempo changes, select AUT. If MAN is selected, the recorded tempo changes will not affect recording or playback tempo.

Time Signature: this parameter determines the time signature. Available time signatures depend on the song's base resolution: High or Low. See "Song Base Resolution – 8B" on page 141.

Note: *The base resolution must be set before recording. Once a song contains some data, it cannot be changed.*

Base Resolution	Time Signature
Low	1/4, 2/4, 3/4, 4/4, 5/4, 6/4, 7/4, 8/4, 9/4 1/8, 2/8, 3/8, 4/8, 5/8, 6/8, 7/8, 8/8, 9/8, 10/8, 11/8, 12/8, 13/8, 14/8, 15/8, 16/8 1/16, 2/16, 3/16, 4/16, 5/16, 6/16, 7/16, 8/16, 9/16, 10/16, 11/16, 12/16, 13/16, 14/16, 15/16, 16/16
High	1/4, 2/4, 3/4, 4/4, 5/4 1/8, 2/8, 3/8, 4/8, 5/8, 6/8, 7/8, 8/8, 9/8, 10/8 1/16, 2/16, 3/16, 4/16, 5/16, 6/16, 7/16, 8/16, 9/16, 10/16, 11/16, 12/16, 13/16, 14/16, 15/16, 16/16

Once a measure has been recorded, the same time signature will be used for all subsequent recordings. A value of **/** means that the previous time signature will be used. As shown below:
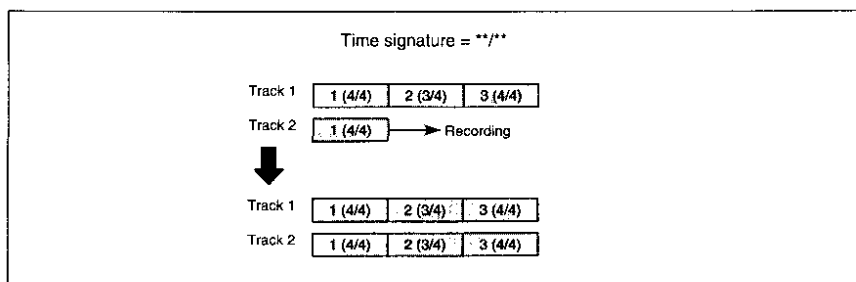
If you want to change the time signature, change the **/** value. After recording a different time signature, the time signature of other track measures occurring at the same time will be changed. For example, if you record the second measure of track 2 using 7/8 time, existing second measures on all other tracks will also change to 7/8 time.
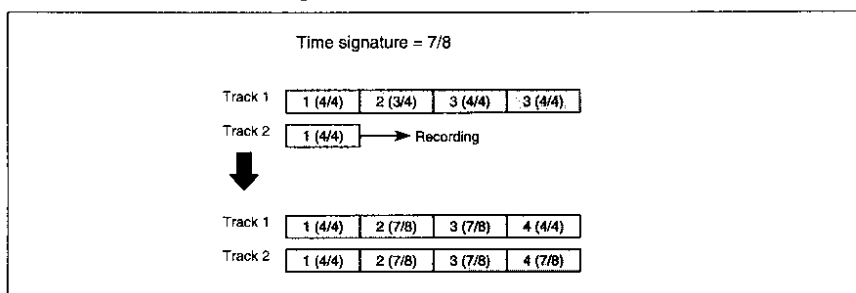
By assigning measures different time signatures, you can change the time signature at any point in a song. However, measures that occur at the same time in different tracks cannot have different time signatures. In other words, you cannot have the third measure of track 2 in 4/4 time and the third measure of track 7 in 7/8 time.

If you change a measure's time signature through recording or editing, the time signature of other track measures occurring at the same time will be changed. For example, if you **change** the fifth measure of track 6 to 3/4 time, the fifth measure on all other tracks will also change to 3/4 time. Likewise, if you **record** the fifth measure of track 6 using 3/4 time, existing fifth measures on all other tracks will also change to 3/4 time.

Measures that become longer will have rests inserted into them, and measures that become shorter will not play the data that exceeds the new length of the measure. However, this data will not be lost, and if you change the measure back to its original time signature, that data will play again.
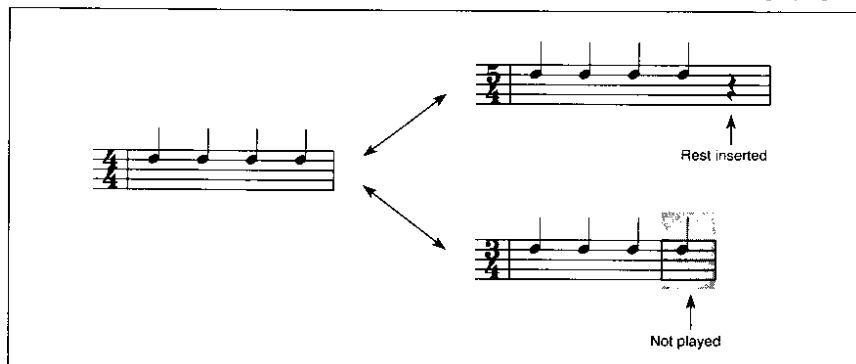
Real-Time Quantize

Recording quantize determines how the timing accuracy of your playing is corrected while recording.

```
50:
Real Quant:HI
```

LCD	Parameter	Range	Description
1A-5	Recording Quantize	HI ♪₃ ♪ ♪₃ ♪ ♪₃ ♪ ♩	

For setting of HI, the quantize value is determined by the song's base resolution. See "Song Base Resolution – 8B" on page 141.

For a setting of ♩, everything you play will be recorded at quarter note (crochet) intervals.

In the following diagram, the quantize value is set to ♪.

If you record Controller data such as pitch bend with a low quantize value, for example, ♩, pitch bend playback will be jerky and unnatural. In this case, record using a higher quantize value, then use the "Quantize – 3A" function on page 120 to quantize note events.

Metronome

This is where you set up the metronome.

```
50:
Metronome:ON
```

LCD	Parameter	Range	Description
1A-6	Metronome	OFF ON REC	Metronome off Metronome for playback only Metronome for recording only

When the metronome is set to ON or REC, the metronome symbol appears on the LCD screen.

For the instant that the metronome sounds, the 32-note polyphony will be reduced by one.

Recording Mode

These parameters allows you to set the Recording mode.

```
OVWR
MultiREC:OFF
```

LCD	Parameter	Range	Description
1A-7	Recording Mode	OVWR OVDB AUTP MANP LOOP	Overwrite (see page 86) Overdub (see page 87) Auto punch in (see page 88) Manual punch in (see page 89) Loop (page 90)
	MultiREC	OFF, ON	Multitrack recording
	Start Measure	001 ~ 999	Measure at which recording will start (AUTP & LOOP only)
	End Measure	001 ~ 999	Measure at which recording will end (AUTP & LOOP only)

Function Buttons

LCD	Parameter	Range	Description
[7]	Add/Remove	[ADD] [REMOVE]	
[8]	Delete		

Recording Mode: there are five recording modes. For details about each mode, see the pages listed in table above.

While the Recording mode is set to LOOP, playback will also loop between the specified start and end measures.

MultiREC: when this parameter is set to on, you can record up to 16 tracks simultaneously. See "Multitrack Recording – MultiREC" on page 91.

Start & End Measure: these parameters are available only when AUTP or LOOP Recording mode is selected. The

For loop mode recording, function buttons [7] and [8] can be used to add/remove or delete respectively. See "Loop Recording – LOOP" on page 90.

Song Select

This parameter allows you to select songs for playback and recording.

```
S0:New Song
```

LCD	Parameter	Range	Description
1A-8	Song Select	S0 ~ S9	Select a song to play or record

1) Use the VALUE slider, [▲/YES] and [▼/NO] buttons, or number keypad to select songs.

Sequencer data on a PROG/SEQ data card can be played without loading. Although, you must load it before editing.

To play a song on a PROG/SEQ data card, press the [BANK] button, then select a song on the card.

Chapter 7: Sequencer Edit Mode

In Sequencer Edit mode, you can edit your real-time recordings, record in step time, and create patterns in either step time or real time.

Use Sequencer mode for song playback and real-time recording. See "Sequencer Mode" on page 81.

Entering Sequencer Edit Mode

1) Press the [SEQ] button.
2) Press the [EDIT] button.

The LCD screen should look something like the one shown below.

```
 ┌─────────────────────────────────────────┐
 │ ▉EDIT  TRACK ▪ 2 3  5    8 9          16 │
 │          ▪   ▪   ▪   ▪   ▪ ▪           ▪ │
 │                                          │
 │              ___ ___  ___                │
 │         M   |   |   ||   |                │
 │ SEQ         |   |   ||   |                │
 │         S0:New Song                      │
 │         M001    100% Free                │
 └─────────────────────────────────────────┘
```
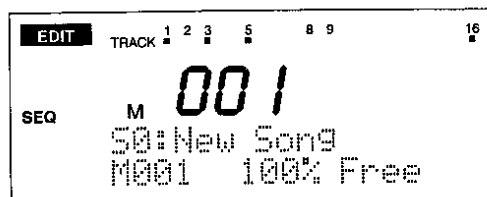
Opening Patterns

For many of the edit functions in this mode, you will be asked whether you want to open patterns, when you try to execute them. If you want to continue with the chosen edit function, press the [▲/YES] button. The pattern will be opened, its data copied into the track, and the function executed. The pattern itself is unaffected by this. The same result could be achieved by copying the pattern into the track ("Copy to Track – 4F" on page 132), then executing the edit function.

If you do not want to continue press the [▼/NO] button.

In some cases, an error message may appear when trying to execute an edit function. See "Sequencer Mode Error Messages" on page 185.

Real-Time Recording & Patterns

If a pattern overlaps the specified range for real-time recording, that pattern will be opened automatically when recording stops. However, if there is not enough sequencer memory available to open the pattern, the options YES and NO will appear.

Press the [▲/YES] button to copy the pattern data into the track, or the [▼/NO] button to discard the data just recorded.

Quick Undo

If you execute an edit function by mistake, you can press the [COMPARE] button to restore the previous data. For example, if after quantizing a pattern you decide that you do not like the results, press the [COMPARE] button to restore the previous data.

If you execute a function when there is not much free memory, the undo function may not be available. In this case, you will be asked whether you want to continue with the chosen function. Press the [▲/YES] button to execute the function, or the [▼/NO] button to cancel the function.

Note: *This function can only undo the last function executed. So, before executing a number of functions, the results of which you are not sure of, save your sequencer data to floppy disk or RAM card first.*

Send C & D – 1A

These parameters allow you to set the output level of each track sent to buses C and D. These buses feed the effects processors. See "Effect Placement – 7E" on page 53. The output level to buses A and B is set in Sequencer mode. See "Track Program, Level, & Pan" on page 94.

```
1A C/D SEND
Tr01 C = 4 D = 4
```

LCD	Parameter	Range	Description
1A	Track	1 ~ 16	Select a track
	Send C	0 ~ 9, PRG	Set the output level sent to bus C for the selected track
	Send D	0 ~ 9, PRG	Set the output level sent to bus D for the selected track

PRG: when this setting is selected, the Send C & D settings that have been set for a Program in Program Edit mode are used. See "Oscillator 1 Setup – 1B" on page 9 and "Oscillator 2 Setup – 1C" on page 11.

If a Program is using a drum kit Multisound, the Send C & D settings that have been set in Global mode will be used when PRG is selected. See "Drum Kit Setup1 – 7A" on page 159 and "Drum Kit Setup2 – 7B" on page 161.

Track Status – 1B

These parameters allow you to set the status of each track, and protect tracks.

```
1B STAT/PROT
Tr01 BOTH ON
```

LCD	Parameter	Range	Description
1B	Track	1 ~ 16	Select a track
	Status	INT EXT BOTH	Track will play an internal Program Track will output data to external MIDI device via MIDI OUT Track will play an internal Program and output MIDI data
	Protect	OFF ON	Unprotected Protected

Status: this parameter determines the status of each track.

When set to INT, a track will play the internal Program selected for that particular track, and that Program can be played using the X3 keyboard.

When set to EXT, the track's data will be output via the MIDI OUT connection. MIDI data will also be output when the X3 keyboard is played.

When set to BOTH, track data will play the internal Program selected for that particular track, and track data will be output via the MIDI OUT connection. When the X3 keyboard is played, the selected Program will play and the corresponding MIDI data will be output.

Protect: this parameter allows you to protect tracks against editing, accidental over-recording, and deletion.

Program Change Filter & Pitch Bend Range – 1C

These parameters determine how a track works with MIDI Program Change messages, and its pitch bend range.

```
1C P.CHG/BEND
Tr01 ENA +02
```

LCD	Parameter	Range	Description
1C	Track	1 ~ 16	Select a track
	Program Change Filter	DIS ENA	Program Change messages ignored Program Change messages select track Programs
	Pitch Bend Range	–12 ~ +12, PRG	Set a track's pitch bend range

Program Change Filter: when set to DIS, received Program Change messages are ignored. When set to ENA, received Program Change messages select Programs for tracks. To select a Program using a MIDI Program Change message, set the track's MIDI channel so that it matches that of the device sending the Program Change message.

Pitch Bend Range: this parameter determines a track's pitch bend range. For positive values, the pitch will increase as the joystick is moved from left to right (as shown). For negative values, the pitch will increase as the joystick is moved from right to left.

When set to PRG, the joystick pitch bend range specified for the track's Program will be used. See "After Touch & Joystick Control – 6A" on page 28.

Transpose & Detune – 1D

These parameters allow you to transpose and detune each track.

```
1D TRANS/DETUNE
Tr01 T+00 D+00
```

LCD	Parameter	Range	Description
1D	Track	1 ~ 16	Select a track
	Transpose	–24 ~ +24 semitones	Transpose each track in semitone steps
	Detune	–50 ~ +50 cents	Detune each track in one cent steps

These transpose and detune parameters have no effect on a track's MIDI data output.

Velocity Window – 1E

These parameters determine the range of note velocities that each track's Program responds to.

```
1E VEL WINDOW
Tr01 001 →127
```

LCD	Parameter	Range	Description
1E	Track	1 – 16	Select a track
	Velocity Window Bottom	1 – 127	Specify the velocity window bottom note
	Velocity Window Top	1 ~ 127	Specify the velocity window top note

1) Select a track.

2) Specify the velocity window top and bottom parameters.

Notes with velocities outside of the specified range will not be recorded.

Recorded notes outside of the specified range will not playback.

If the bottom value is set higher than the top, it will automatically become the top value. Likewise, if the top value is set lower than the bottom value, it will automatically become the bottom value.

By setting two or more tracks to the same MIDI Channel, but with different velocity windows, you can record and playback velocity switching Programs.

Key Window – 1F

These parameters determine the range of notes (keys) that each track's Program responds to.

```
1F KEY WINDOW
Tr01 C-1 →G9
```

LCD	Parameter	Range	Description
1F	Track	1 ~ 16	Select a track
	Key Window Top	C–1 ~ G9	Specify the key window top note
	Key Window Bottom	C–1 ~ G9	Specify the key window bottom note

1) Select a track.

2) Specify the key window top and bottom parameters.

Notes outside of the specified key range will not be recorded.

Recorded notes outside of the specified key range will not playback.

As well as using the VALUE slider and the [▲/YES] and [▼/NO] buttons to set Key Window Top and Bottom parameters, you can also use the keyboard. Select a Key Window parameter so that it is flashing, press and hold down the [ENTER] button, then press the desired key.

If the bottom value is set higher than the top, it will automatically become the top value. Likewise, if the top value is set lower than the bottom value, it will automatically become the bottom value.

By setting two or more tracks to the same MIDI Channel, but with different key windows, you can record and playback Programs that are split across the keyboard.

Step-Time Track Recording – 2A

This section explains how to record and edit a track in step time. Step-time recording allows you to enter notes one by one, specifying the duration, velocity, and value for each note. This is useful when recording something that is difficult record in real time.

Note: *If you step-time record on a measure that already contains some data, that data will be lost.*

```
2A Step Rec
Tr01 M311
```

LCD	Parameter	Range	Description
2A	Track	1 ~ 16	Select a track to record/edit
	Measure	1 ~ 999	Select measure at which to start recording

1) Select the track that you want to record or edit.

2) Select the measure at which you want to start recording.

   The following LCD screen will be shown:

```
2A MP→--++++..
Tr01 M908
```

   This screen shows 10 measures (1 character per measure), with the current measure at the far left. The meaning of each character is explained below:

   + event exists

   − no data in measure

   ∗ track has finished

   P pattern has been put

   → pattern overlapping from previous measure

   For the previous LCD screen:

   measures 908 and 909 are patterns
   measures 910 and 911 are not played
   measures 912 to 915 are played and
   measure 915 is at the end of the track

3) Press the [REC/WRITE] button.

4) Press the [START/STOP] button.

   The following LCD screen will appear.

```
EDIT    TRACK 1 2 3  5    8 9         16

        M  004 REC      STEP
SEQ
        1:00      04/04
        ♩-- V064 085% C#1
```

The value indicated at the left-hand side, top line, of the LCD screen indicates the current position within the measure. The current measure is indicated by the three large digits in the center of the LCD screen. The measure number is not shown while recording.

LCD	Parameter	Range	Description
	Time Signature	1/4 ~ 9/4 1/8 ~ 16/8 1/16 ~ 16/16	Base resolution = Low
		1/4 ~ 5/4 1/8 ~ 10/8 1/16 ~ 16/16	Base resolution = High
	Note Type	♫ ♪ ♪ ♩ ♩ o 𝄾 𝄾 𝄾 𝄾 — –	Note/Rest
	Triplet Normal Dot	3 — .	Triplet note of specified Note Duration Note as specified by Note Duration Dotted note of specified Note duration
	Velocity	2 ~ 126 Key	Specify note velocity Set velocity by pressing key
	Note Length	1 ~ 100%	Note length
	Note	C–1 ~ G9	Note range

Function Buttons

[5]	Rest		Inserts a rest
[6]	Tie		Inserts a tie
[8]	Delete		Delete current step and go back one step

5) If you are recording a new track, specify the time signature.

If you have already recorded some tracks, the time signature set for those tracks will be selected. If you change the time signature here, it will be changed for those tracks too.

6) Specify the note type and whether it's a dot, triplet, or normal. The following table shows how normal note durations are affected by dots and triplets:

Note Type	♬	♪	♪	♩	♩	o
Normal	♬ 0:12	♪ 0:24	♪ 0:48	♩ 1:00	♩ 2:00	o 4:00
Dot	♬. 0:18	♪. 0:36	♪. 0:72	♩. 1:48	♩. 3:00	o· 6:00
Triplet	⌐3¬ ♬ 0:08	⌐3¬ ♪ 0:16	⌐3¬ ♪ 0:32	⌐3¬ ♩ 0:64	⌐3¬ ♩ 1:32	⌐3¬ o 2:64

7) Specify the note length from 1 to 100%.

A note length of 80% is normal.

A note length of 50% makes a note staccato.

A note length of 100% makes a note tenuto.

8) Specify the note velocity from 2 to 126. If key is selected, the velocity of the key you press in the next step will be used. The note velocity can be set to even values only.

9) Press a key, or play a chord to enter the corresponding notes. When entering a chord, timing is not critical, because as long as one note is held down, all subsequent notes will be entered at the current step. When all keys are released, the next step is selected automatically.

The note type, note value, velocity, and length are displayed when each key is pressed.

10) Repeat steps 6 to 9 to enter more notes.

11) To end step-recording, press the [START/STOP] button.

Entering Rests

To enter a rest at the current step, specify the note type (rest duration), then press function button [5]. The current position will be moved forward by the amount specified in steps 6 and 7.

Entering Ties

To tie the previously entered note, press function button [6]. The note length will be increased by the amount specified in steps 6 and 7.

To enter a note that is longer than the specified note type, you can either change the note type, or use a tie. The resultant note length is different for each method.
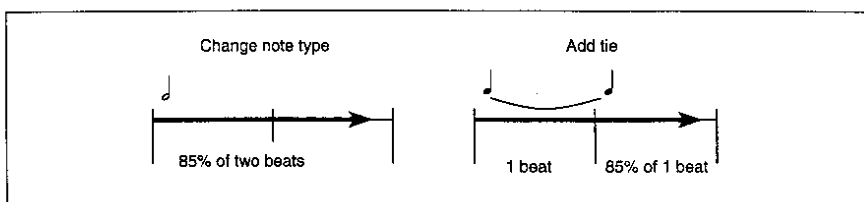
Ties can also be entered while entering notes. Press and hold down a key, then press function button [6]. The note length will be increased by the specified note type. Because the entered tie only applies to notes whose corresponding key is held down, you can use this technique to apply different note lengths to individual notes within a chord, as shown below:
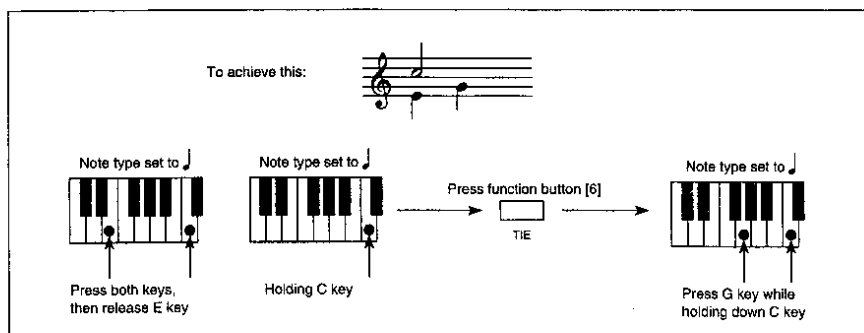
Deleting Notes

Press function button [8] to delete data at the current step and go back one step.

Function button [8] can also be used to enter different note types. See below:
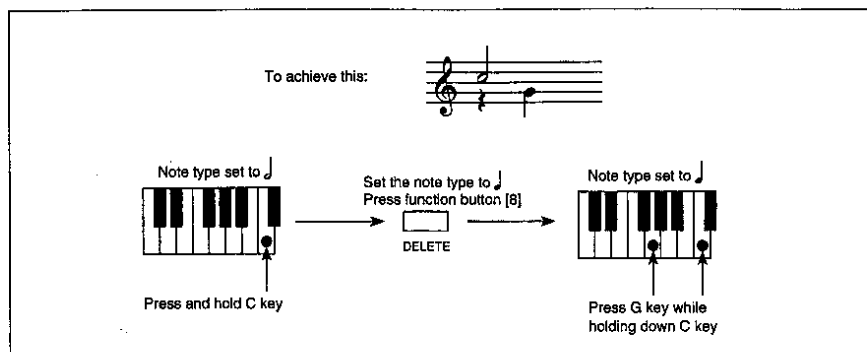
Step Recording & Controller Data

You cannot enter Controller data while step-time recording. However, you can record Controller data in real time, then use bounce track ("Bounce Track – 2D" on page 116). Alternatively, use event edit ("Event Edit – 2B" on page 109), or create control data ("Create Controller Data – 3D" on page 124.

Event Edit – 2B

This section explains how to edit, insert, and delete events recorded in a track. Note type events consist of note value, velocity, and length. Other event types, Controllers, Program Change, etc., usually consist of just one variable.

Note: *When you edit events, you are actually editing data in the track. So, if you make a mistake, you cannot restore the original data. Beware of this while editing.*

```
2B Event Edit
Tr01 NOTE:ENA
```

2B	Event Filter	NOTE	Note data
		CTRL	Controller data
		AFTT	After Touch data
		BEND	Pitch Bend data
		PROG	Program Change data
		PAFT	Polyphonic After Touch data
	DIS/ENA	DIS	Editing disabled
		ENA	Editing enabled

1) Select a track.

2) Disable or enable event types as required.

Disabled event types cannot be edited.

If you selected the Tempo track, only tempo related events can be edited.

3) Press the [REC/WRITE] button.

4) Press the [START/STOP] button.

The following LCD screen will appear.

```
EDIT   TRACK 1 2 3  5   8 9          16

                            EVENT
         M  004 REC
SEQ
       M005 #00
       BAR  BEAT:04/04
```
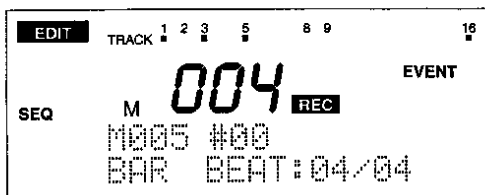
5) Use the [↑] and [↓] cursor buttons to select events.

To quickly locate events in a song, play the song, press the [START/STOP] button, then enter this event edit function. The measure at which playback was stopped will be selected automatically.

Measures that contain patterns cannot be edited.

6) Use the [▲/YES] and [▼/NO] buttons or number keypad to edit event values.

7) When you've finished editing, press the [START/STOP] button.

The following LCD screens are available for event editing. The tempo LCD screen appears only when the Tempo track has been selected.

Note Event

```
M001 #001 1:00  >
C#2  V064 0:72
```

The note event LCD screen shows note value (C#2), velocity (V064), and length (0:72).

Note velocity cannot be set to an odd value.

Note events will play as you edit them.

Pitch Bend

```
M001 #002 1:00 <>
BEND +3281
```

The pitch bend LCD screen shows the pitch bend value (+3281).

After Touch

```
M001 #003 1:00 <>
AFTT 058
```

The After Touch LCD screen shows the After Touch value (058).

Program Change

```
M001 #004 1:00 <>
PROG   A:125
```

The Program Change LCD screen shows the bank (A) and Program Change number (125).

Controller

```
M001 #005 1:00
CTRL 007:127
```

The Program Controller LCD screen shows the Controller type (007) and Controller value (127).

Polyphonic After Touch

```
M001 #006 1:00 <>
PAFT C#4:098
```

The polyphonic After Touch LCD screen shows the note value (C#4) and amount of After Touch (098).

Tempo

```
M001 #001 1:00 <
TEMPO    120
```

The tempo LCD screen shows the tempo.

	Event Type	BAR	Bar line
		C-1 ~ G9	Note
		BEND	Pitch bend
		AFTT	Channel After Touch
		PROG	Program Change
		CTRL	Controller
		PAFT	Polyphonic After Touch
		TEMPO	Tempo (Tempo track only)

	Beat	1/4 ~ 9/4 1/8 ~ 16/8 1/16 ~ 16/16	Base resolution = Low
		1/4 ~ 5/4 1/8 ~ 10/8 1/16 ~ 16/16	Base resolution = High
	Velocity Bend After Touch Program Bank Controller No. Poly After touch Key Tempo	2~126 –8192 ~ 8191 0 ~ 127 A, B, C, D, 4 ~ 127, GM, GMD 0 ~ 101 C~1 ~ G9 40 ~ 240	(for notes) (even number steps) (for pitch bend) (for channel after touch) (for program changes) (for control changes) (for poly after touch) (for tempo changes) (Tempo track only)
	Length Program Number Data Value Data	0:00 ~ 9:00, TIE 00 ~ 127 0 ~ 127 0 ~ 127	Note length (for notes) (for program changes) (Control No. = 10 Pan)) Control data (for control changes)

Function Buttons

[7]	Insert		Insert a note event	
[8]	Delete	.	Delete the current note event	

The following three values are shown on all event edit LCD screens. They are, from left to right, current measure, event index number, and event time in measure.

Use the [↑] and [↓] buttons, or change the Measure and Index No. values to select events for editing.

Measure	1 ~ 999	Select measure to edit
Index No.	0 ~	Event Index number
Event time	1:00 ~9:95, TIE	Time of event in measure

Each event in a measure has an index number. When an event is deleted, moved, or new events inserted, existing events are re-indexed (reordered).

The event time corresponds to the beat in the bar and the beat clock. For example, 2:48 indicates an event 48 clock ticks after the second beat in a measure.

Beats are divided into 96 clock ticks (one MIDI Clock tick is equivalent to four X3 clock ticks). However, in Low base resolution ("Song Base Resolution – 8B" on page 141), beats are divided into 48 clock ticks. So adjustments will be in steps of two.

Event Edit Notes

Time Signature: the following bar beat LCD screen appears at the beginning of each measure:

```
M001 #000
BAR  BEAT:04/04
```

If the time signature (beat) is changed, that change is reflected across all tracks.

End of Track: when the end of the track is reached, the following message will appear:

```
M001 #007
End Of Track
```

Patterns in Measures: if a measure contains a pattern, the pattern name will be shown, as below:

```
M002 PAT00(H)
BAR  BEAT:04/04
```

The (H) indicates that the head of the pattern (start) is within the measure.

Polyphonic After Touch: the X3 does not support Polyphonic After Touch. However, this type of event can be recorded and played by the sequencer for use with external MIDI devices.

Tempo Track

The tempo track allows you to put tempo change events into a song. Tempo change events affect all tracks in a song.

Moving Events

Events can be moved within a measure.

1) Select the event that you want to move.

2) Position the cursor on the event time field.

3) Use the [▲/YES] and [▼/NO] buttons or the number keypad to change the event time.

When events are moved, index numbers are reordered automatically.

Deleting Events

1) Select the event that you want to delete.

2) Press function button [8] (DELETE).

If you delete an event by mistake, press function button [7] (INSERT) to retrieve it. For tied notes, only the note will be restored, you'll have to add the tie yourself.

Inserting New Events

1) Press function button [7] (INSERT) to insert one event just before the currently selected event.

2) Edit the event time and event type as required.

If you have just deleted an event, that event will be inserted when function button [7] is pressed.

Events can also be inserted into a new track. Although, you must insert some measures first. See "Insert Measure – 4D" on page 129.

Cutting & Pasting Events between Measures

1) Select the event, and press function button [8] (DELETE).

2) Select another measure, and press function button [7] (INSERT).

The event cut in step 1 will be inserted automatically. Adjust the event data as required.

Tied Notes

Notes that overlap bar lines are treated as tied notes. The following LCD screens show a note that overlaps measures 2 and 3.

A	B
M002 #001 1:00 C#2 U064 TIE	M003 #001 TIE C#2 2:04

LCD screen A shows the note value, velocity, and its length is shown as TIE. LCD screen B shows the same note value and index number as A. However, its event time is shown as TIE, and the length of the tied note is shown.

To edit the note value and velocity, use LCD screen A. LCD screen B will be updated automatically.

To edit the note length, use LCD screen B.

To delete a tied note, first delete on LCD screen A, then LCD screen B. If you delete on LCD screen B only, the note will continue to the end of the measure in which it starts.

If the note length value on LCD screen A is changed to anything other than TIE, an event time of 1:00 will be set on LCD screen B.

To insert tied A and B notes, insert a note at 1:00 in B, then insert note A and set its note length to TIE. Set the note value and velocity for both notes the same. This procedure also applies to tied notes that overlap measures.

Controller Event Edit Notes

The following table shows which Controllers the X3 uses.

Controller No.	Controller	Value	Notes
0	Bank Select (MSB)	0 ~ 127	MSB of MIDI Bank Select message
1	Pitch Modulation	0 (off) ~ 127	Move the joystick up
2	VDF Modulation	0 (off) ~ 127	Move the joystick down
4	Foot Controller	0~63(main), 64~127(sub)	Select scale (main, sub)
6	Data Entry	0 ~ 127	For RPN Edit (MSB)
7	Volume	0 ~ 127	
10	Panpot	000~002 : A 003~006 : 14A 007~010 : 13A 011~015 : 12A 016~019 : 11A 020~023 : 10A 024~027 : 9A 028~032 : 8A 033~036 : 7A 037~040 : 6A 041~044 : 5A 045~049 : 4A 050~053 : 3A 054~057 : 2A 058~061 : 1A 062~066 : CNT 067~070 : 1B 071~074 : 2B 075~079 : 3B 080~083 : 4B 084~087 : 5B 088~091 : 6B 092~096 : 7B 097~100 : 8B 101~104 : 9B 105~108 : 10B 109~113 : 11B 114~117 : 12B 118~121 : 13B 122~125 : 14B 126~127 : B	A value of PRG sets the panpot to the value set in the Program (see also table below)
11	Expression	0 ~ 127	Same as volume
12	Effect Control 1	0 ~ 127	Effect dynamic modulation 1
13	Effect Control 2	0 ~ 127	Effect dynamic modulation 2
32	Bank Select (LSB)	0 ~ 127	LSB of MIDI Bank Select message
38	Data Entry	0 ~ 127	For RPN Edit (LSB)
64	Damper Switch	0~63(off), 64~127 (on)	
72	Release Time	0~64~127	Play mode edit release time
73	Attack Time	0~64~127	Play mode edit attack time
74	Brightness	0~64~127	Play mode edit cutoff

Controller No.	Controller	Value	Notes
91	Reverb Level	000~013 : 0 014~026 : 1 027~040 : 2 041~053 : 3 054~067 : 4 068~080 : 5 081~094 : 6 095~107 : 7 108~121 : 8 122~127 : 9	Send C Level
92	Effect1 on/off	0 (off), 1~127 (on)	Effect 1 on/off
93	Chorus Level	000~013 : 0 014~026 : 1 027~040 : 2 041~053 : 3 054~067 : 4 068~080 : 5 081~094 : 6 095~107 : 7 108~121 : 8 122~127 : 9	Send D Level
94	Effect2 on/off	0 (off), 1~127 (on)	Effect 2 on/off
100	RPN	0 = Pitch Bend Sensitivity 1 = Fine Tune 2 = Coarse Tune	Registered parameter No. (LSB)
101	RPN	00	Registered parameter No. (MSB)

Controller 102, VDF Cutoff Frequency, is not sent or received via MIDI.

Effect control 1, 2 and Effect 1, 2 switches use the track data on the track that matches the Global MIDI Channel.

MIDI Panpot, Send Data

Panpot		Panpot Controller Value	X3 Panpot Setting
MIDI IN Pan Data (vv)	**X3 Pan**		
0~2	A15	43~46	B1
3~6	A14	47~4A	B2
7~A	A13	4B~4F	B3
B~F	A12	50~53	B4
10~13	A11	54~57	B5
14~17	A10	58~5B	B6
18~1B	A9	5C~60	B7
1C~20	A8	61~64	B8
21~24	A7	65~68	B9
25~28	A6	69~6C	B10
29~2C	A5	6D~71	B11
2D~31	A4	72~75	B12
32~35	A3	76~79	B13
36~39	A2	7A~7D	B14
3A~3E	A1	7E~7F	B15
3F~42	CNT		

On the X3, use Send level C controller to control Reverb Depth Bn, 5B, vv, and Send level D controller to control Chorus Depth Bn, 5D, vv.

Send	
MIDI IN Send Data (vv)	X3 Send
0~D	0
E~1A	1
1B~28	2
29~35	3
36~43	4
44~50	5
51~5E	6
5F~6B	7
6C~79	8
7A~7F	9

Quick Undo

If you make a mistake while event editing, press the [↑] and [↓] buttons simultaneously to restore the previous data.

Erase Track – 2C

This function allows you to erase a track.

```
2C Erase Track
Tr01        OK?
```

LCD	Parameter	Range	Description
2C	Track	1 ~ 16	Select track to erase
	OK to Erase Track	OK?	Executes track erase

1) Select a track.

2) Position the cursor on OK?, and press the [▲/YES] button.

Quick Undo

If you erase a track by mistake, press the [COMPARE] button to restore the previous data.

Bounce Track – 2D

This function allows you to merge data from two tracks into one.

```
2D Bnce Track
Tr01→Tr02    OK?
```

LCD	Parameter	Range	Description
2D	Source Track	1 ~ 16	Select a source track
	Destination Track	1 ~ 16	Select a destination track
	OK to Bounce Track	OK?	Executes track bounce

1) Select the source track.

2) Select the destination track.

3) Position the cursor on OK?, and press the [▲/YES] button.

If either track contains patterns that have been put into them, you will be asked whether you want to open the patterns. Press the [▲/YES] button to open the patterns, copy their data to the tracks, and merge as required, or the [▼/NO] button to ignore the pattern data.

The data in the source track will be erased.

Track parameter settings such as Program and MIDI Channel will be determined by the destination track.

Note: *If the source and destination tracks both contain MIDI Controller data, the resulting Controller data will probably be unusable. In this case, use the "Erase Measure – 4B" function on page 127 to erase the MIDI Controller data before bouncing*

Quick Undo

If you bounce the wrong tracks, press the [COMPARE] button to restore the previous data.

Copy Track – 2E

This function allows you to copy data from one track to another.

```
2E Copy Track
Tr01→Tr02    OK?
```

LCD	Parameter	Range	Description
2E	Source Track	1 ~ 16	Select a source track
	Destination Track	1 ~ 16	Select a destination track
	OK to Copy Track	OK?	Executes track copy

1) Select the source track.

2) Select the destination track.

3) Position the cursor on OK?, and press the [▲/YES] button.

Quick Undo

If you copy a track by mistake, press the [COMPARE] button to restore the previous data.

Append Song – 2F

This function allows you to append a song onto the end of the current song. It can also be used to copy songs.

```
2F Append Song
SONG0        OK?
```

LCD	Parameter	Range	Description
2F	Source Song	0 ~ 9	Select a source song
	OK to Append Song	OK?	Executes append

1) Select the source song.

2) Position the cursor on OK?, and press the [▲/YES] button.
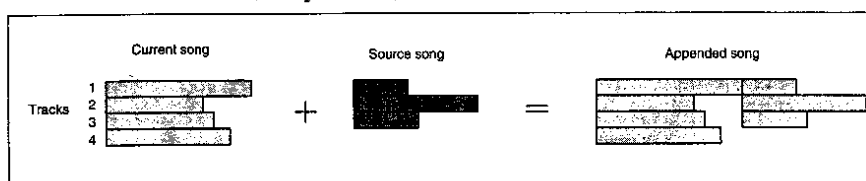
Track settings of the current song will be used.

If the current song has some unused measures at the end of it, delete them. See "Delete Measure – 4A" on page 126.

The source song is not affected by this function.

Note: *You cannot append songs that have different base resolutions.*

Song Copy

This function can also be used to copy songs.

1) Make sure that there is no data in the current song. If there is, erase it. See "Erase Track – 2C" on page 116.

2) Select the source song.

3) Position the cursor on OK?, and press the [▲/YES] button.

Quick Undo

If you append songs by mistake, press the [COMPARE] button to restore the previous data.

It's a good idea to save important songs to either floppy disk or RAM card. See "Save Sequencer Data – 3C" on page 174 and "Save Sequencer Data to Card – 6D" on page 158 respectively.

Erase Song – 2G

This function allows you to erase all the data in the currently selected song.

```
2G Erase Song
SONG0        OK?
```

LCD	Parameter	Range	Description
2G	OK to Erase Song	OK?	Executes song erase

1) Press the [▲/YES] button.

If you want to erase a song other than the currently selected song, in Sequencer mode, press function button [8] to select the song select LCD screen. Select a song, then return to this function.

Quick Undo
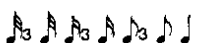
If you erase the wrong song, press the [COMPARE] button to restore the previous data.

It's a good idea to save important songs to either floppy disk or RAM card. See "Save Sequencer Data – 3C" on page 174 and "Save Sequencer Data to Card – 6D" on page 158 respectively.

Quantize – 3A

This function allows you to improve the timing of data recorded in a track.

```
3A Quantize     > 3A Quantize     <
Tr01 M123→135 HI  ALL 0+00 100 OK?
```

LCD	Parameter	Range	Description
3A-1	Track	1 ~ 16, Tempo Track	Select a track to be quantized
	Start Measure	1 ~ 999	Select first measure to be quantized
	End Measure	1 ~ 999	Select last measure to be quantized
	Quantize Resolution	HI ♪₃ ♪ ♪₃ ♪ ♪₃ ♪ ♩	
3A-2	Data to Quantize (Track 1~16 only)	ALL NTE CNT ATT BND PRG	All data Note data Controller data After touch data Pitch bend data Program Change data
	Offset	–96 ~ +96	Quantize offset
	Intensity	0 ~ 100%	Quantize intensity
	OK to Quantize	OK?	Executes quantizing erase

1) Select a track.

2) Select the start and end measures.

3) Set the quantize resolution.

4) Select the data to be quantized. This option does not appear when the Tempo track has been selected.

5) Set the offset and intensity.

6) Position the cursor on OK?, and press the [▲/YES] button.

This quantize function does not affect note length.

If the quantize resolution is set to HI, data will be quantized at the same resolution as that set for the song. See "Song Base Resolution – 8B" on page 141. In this case, note data is unaffected. This allows you to thin out Controller data and free up sequencer memory.

Aftertouch: when ATT is selected, Channel After Touch data and Polyphonic After Touch data will be quantized. The X3 does not support Polyphonic After Touch. However, this type of event can be recorded and played by the sequencer for use with external MIDI devices.

Controllers: if quantization moves two or more Controllers to the same event time, they will be combined into one event. This allows you to thin out Controllers and free up sequencer memory.

Quick Undo

If you don't like the quantized result, press the [COMPARE] button to restore the previous data.

It's a good idea to save important songs to either floppy disk or RAM card. See "Save Sequencer Data – 3C" on page 174 and "Save Sequencer Data to Card – 6D" on page 158 respectively.

The following examples show how notes are affected by the offset and intensity parameters:
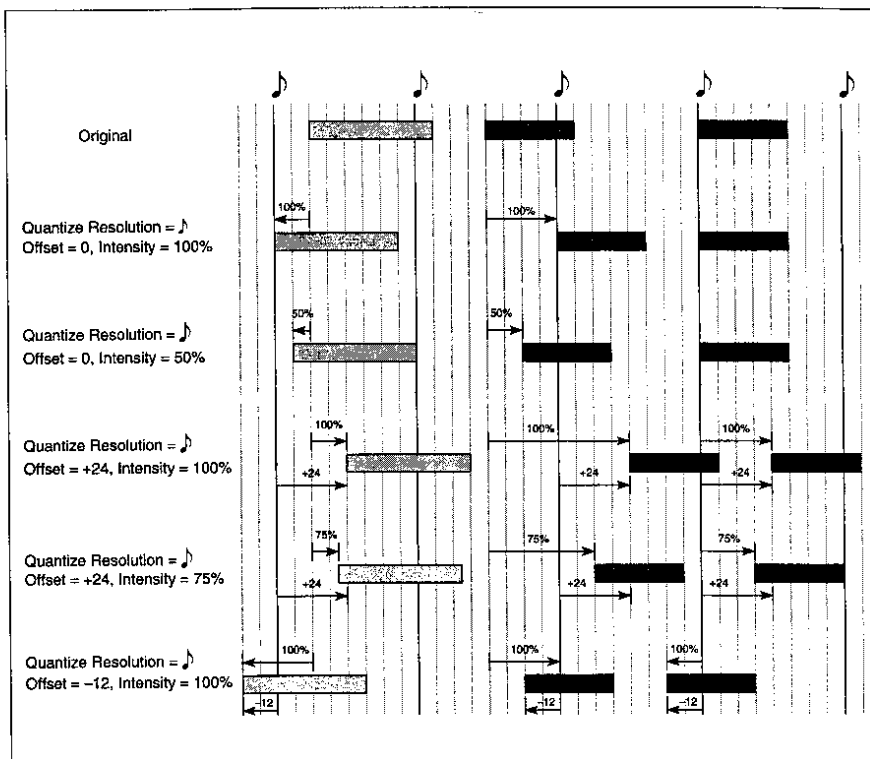
Shift Note – 3B

This function allows you to shift the pitch of a specified range of notes in specified measures.

```
3B Shift Note   >  3B Shift Note   <
Tr01 M123÷135      C-1÷C-1 S+00 OK?
```

LCD	Parameter	Range	Description
3B-1	Track	1 ~ 16	Select a track
	Start Measure	1 ~ 999	Select first measure for note shift
	End Measure	1 ~ 999	Select last measure for note shift
3B-2	Note Range Bottom	C–1 ~ G9	Set the lowest note in the range
	Note Range Top	C–1 ~ G9	Set the highest note in the range
	Note Shift Amount	–24 ~ +24 semitones	Amount of pitch shift
	OK to Note Shift	OK?	Executes note shift

1) Select a track.

2) Select the start and end measures.

3) Set the low and high notes of the range. Notes outside this range are unaffected.

4) Set the amount of pitch shift.

5) Position the cursor on OK?, and press the [▲/YES] button.

If the specified range of measures contains a pattern that has been put into the track, you will be asked whether you want to open the pattern. Press the [▲/YES] button to open the pattern, copy the pattern data into the track, and pitch shift it, or the [▼/NO] button to ignore the pattern data

Modify Velocity – 3C

This function allows you to modify note velocity over a number of measures. This is useful for creating crescendo type effects.

```
3C Modify Vel   > 3C Modify Vel   <
Tr01 M123→135 C1  002→126 I000 OK?
```

LCD	Parameter	Range	Description
3C-1	Track	1 ~ 16	Select a track
	Start Measure	1 ~ 999	Select first measure for note shift
	End Measure	1 ~ 999	Select last measure for note shift
	Curve	1 ~ 6	Velocity curve
3C-2	Start Velocity	2 ~ 126	Velocity value for the first note in the selected start measure
	End Velocity	2 ~ 126	Velocity value for the last note in the selected end measure
	Intensity	0 ~ 100%	Modify velocity intensity
	OK to Modify Velocity	OK?	Executes modify velocity

1) Select a track.

2) Select the start and end measures.

3) Select a velocity curve.

4) Set the start and end velocity values.

5) Set the intensity.

6) Position the cursor on OK?, and press the [▲/YES] button.

Intensity: for a setting of 0%, there will be no change. For a setting of 100%, note velocities will be changed as specified by the start velocity and end velocity parameters.

If the specified range of measures contains a pattern that has been put into the track, you will be asked whether you want to open the pattern. Press the [▲/YES] button to open the pattern, copy the pattern data into the track, and pitch shift it, or the [▼/NO] button to ignore the pattern data.
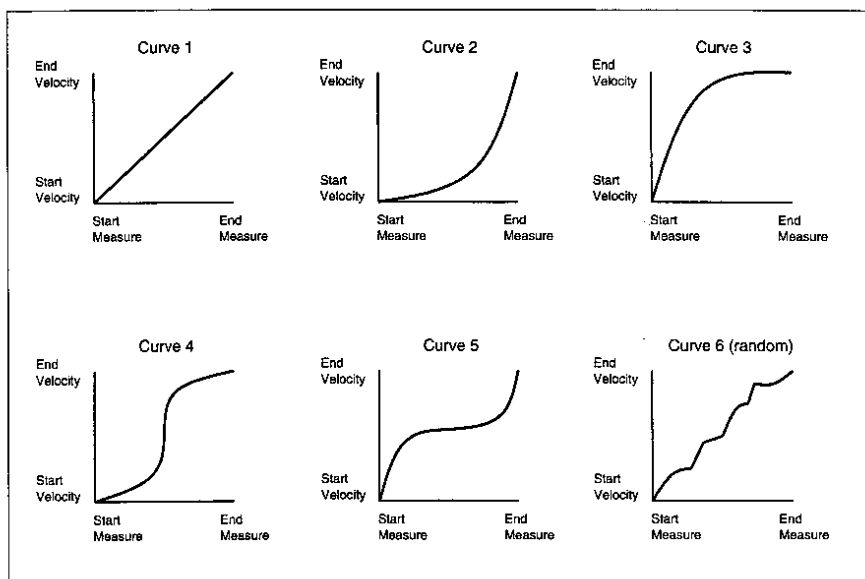
Create Controller Data – 3D

This function allows you to edit controller data such as pitch bend, after touch, etc.

```
3D Create Ctl   >  3D Create Ctl  <>  3D Create Ctl  <
Tr01 M123 1:00     M126 1:00 C000     120+000       OK?
```

LCD	Parameter	Range	Description
3D-1	Track	1 ~ 16, Tempo Track	Select a track
	Start Measure	1 ~ 999	Select the start measure
	Start Location	1:00 ~ 9:95	Specify a position within the start measure
3D-2	End Measure	1 ~ 999	Select the end measure
	End Location	1:00 ~ 9:95	Specify a position within the end measure
	Controller (track 1~16 only)	BEND AFTT CNT 000~101	Select a Controller to edit (see the table in "Controller Event Edit Notes" on page 113 for a list of X3 compatible Controllers)
3D-3	End Value	ERA, –8192 ~ +8191	Pitch bend
		ERA, 40 ~ 240	Tempo track
		ERA, 0 ~ 127	Other Controllers
	OK to Create Control Data	OK?	Executes create control data

1) Select a track.
2) Select the start measure and the position within that measure from where you want to edit.
3) Select the end measure and the position within that measure at which you want to stop editing.
4) Select the Controller that you want to edit.
5) Specify the end value for the Controller data.

If you specify ERA, the specified Controller data in the specified range will be erased.

6) Position the cursor on OK?, and press the [▲/YES] button.

The start and end locations correspond to the beat in the bar and the beat clock. For example, 2:48 indicates an event 48 clock ticks after the second beat in a measure.

Beats are divided into 96 clock ticks. However, in Low base resolution ("Song Base Resolution – 8B" on page 141), beats are divided into 48 clock ticks. So adjustments will be in steps of two.

In the following example, the start location is set to 3:48, the end location to 4:24, the Controller type is AFTT, and the end value is 100. The value of the after touch data rises to the new value of 100, between the specified start and end locations:
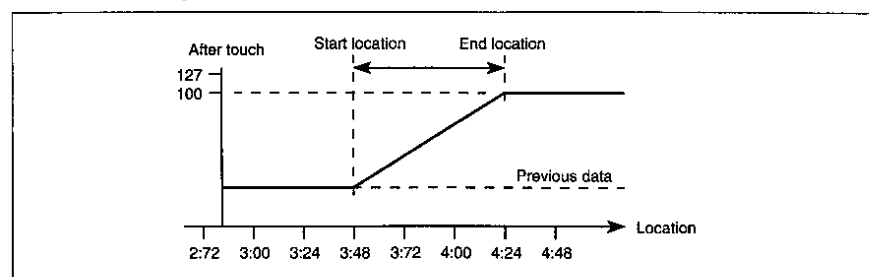
If a pattern is located between the specified start and end locations that have been put into the track, you will be asked whether you want to open the pattern. Press the [▲/YES] button to open the pattern, copy its data into the track, and edit the Controller data as necessary, or the [▼/NO] button to ignore the pattern data.

Editing a lot of Controller data uses a large amount of sequencer memory, so, if there is not much sequencer memory available, you may not be able to edit the Controller data. In this case, thin out the Controller data using the quantize function. See "Quantize – 3A" on page 120.

X3 Programs can be panned to any one of 31 positions. Some MIDI devices can be panned to any one of 128 positions (0 ~127). However, this type of pan data uses a lot of sequencer memory. So editing will use a lot of sequencer memory. This type of pan data is best recorded in real time or using event edit.

Delete Measure – 4A

This function allows you to delete measures.

```
4A Delete Meas  >   4A Delete Meas <
Tr01 M123→135              OK?
```

LCD	Parameter	Range	Description
4A-1	Track	1 ~ 16, ALL	Select a track
	Start Measure	1 ~ 999	Select first measure for deletion
	End Measure	1 ~ 999	Select last measure for deletion
4A-2	OK to Delete Measure	OK?	Executes delete measure

1) Select a track.

2) Select the start and end measures.

3) Position the cursor on OK?, and press the [▲/YES] button.

When selecting measures, the start measure, end measure, and any measures in-between are deleted. Subsequent measures after the end measure are moved forward. For example, in the following diagram, measures 3 to 5 have been deleted, and measures 6, 7, and 8 move forward to take the place of the deleted measures:
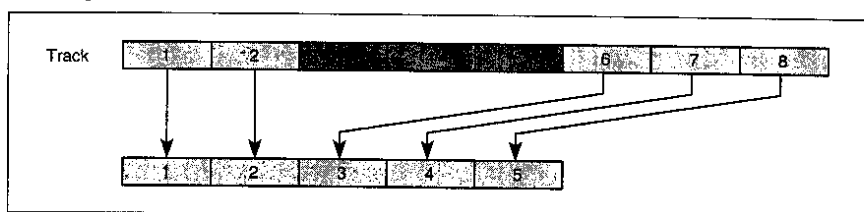
Measures that are moved forward use the same time signature as measures in other tracks. For example, in the following diagram, two 3/4 time measures are deleted from track 2. Subsequent measures are moved forward, and set to the same time signature as the measures on track 1.
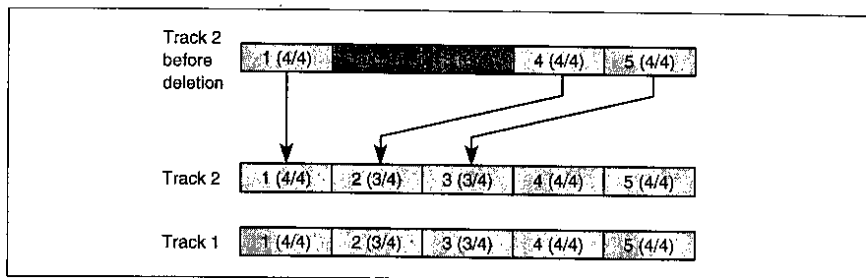
If the track parameter is set to ALL, the specified measures from all tracks will be deleted, including the Tempo track.

If a note overlaps the range of measures being deleted, that note will be shortened accordingly.

If the end measure contains a pattern that has been put into the track, you will be asked whether you want to open the pattern. Press the [▲/YES] button to open the pattern, copy the pattern data into the track, and delete as necessary, or the [▼/NO] button to ignore the pattern data.

If the start measure contains a pattern that has been put into the track, subsequent measures that also used that pattern will no longer use it after the start measure has been deleted.

Quick Undo

If you delete a measure by mistake, press the [COMPARE] button to restore the previous data.

Erase Measure – 4B

This function allows you to erase data within a pattern. Unlike the Delete Measure function that actually deletes the measure, this function deletes only the data in a measure.

```
4B Erase Meas   >  4B Erase Meas   <
Tr01 M123→M135     NTE         OK?
```

LCD	Parameter	Range	Description
4A-1	Track	1 ~ 16, ALL	Select a track
	Start Measure	1 ~ 999	Select first measure to be erased
	End Measure	1 ~ 999	Select last measure to be erased
4A-2	Data to Erase	ALL NTE CNT ATT BND PRG	All data Note data Controller data After Touch data Pitch bend data Program Change data
	OK to Erase Measure	OK?	Executes erase measure

1) Select a track.

2) Select the start and end measures.

3) Select the data that you want to erase.

4) Position the cursor on OK?, and press the [▲/YES] button.

When selecting measures, the start measure, end measure, and any measures in-between are erased. In the following diagram, measures 3 to 5 have been deleted:
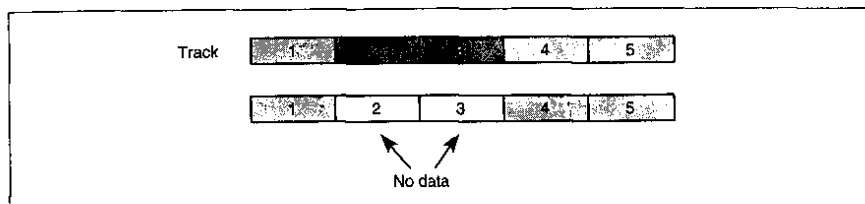
When ATT is selected, Channel After Touch data and Polyphonic After Touch data are erased. The X3 does not support Polyphonic After Touch. However, this type of event can be recorded and played by the sequencer for use with external MIDI devices.

If the track parameter is set to ALL, the specified measures will be erased from all tracks, including the Tempo track.

If a note overlaps the range of measures, only the overlap will be erased.

If the end measure contains a pattern that has been put into the track, you will be asked whether you want to open the pattern. Press the [▲/YES] button to open the pattern, copy the pattern data into the track, and erase as necessary, or the [▼/NO] button to ignore the pattern data.

If the start measure contains a pattern that has been put into the track, subsequent measures that also used that pattern will no longer use it after the start measure has been erased.

If you erase a measure that contains Controller data such as pitch bend or damper pedal, leaving the Controller stuck at a value other than that of its natural resting place, you will probably have to use the Event Edit function to set correct the data. Alternatively, erase the Controller data.

To delete the tempo track, use the Event Edit or Create Control data functions. See "Event Edit – 2B" on page 109 and "Create Controller Data – 3D" on page 124 respectively.

Quick Undo

If you erase a measure by mistake, press the [COMPARE] button to restore the previous data.

Copy Measure – 4C

This function allows you to copy measures to other tracks.

```
4C Copy Meas    > | 4C Copy Meas    <
Tr01 M123→135     | Tr02 M001    OK?
```

LCD	Parameter	Range	Description
4C-1	Source Track	1 ~ 16, ALL	Select a source track
	Source Start Measure	1 ~ 999	Select first measure to be copied
	Source End Measure	1 ~ 999	Select last measure to be copied
4C-2	Destination Track	1 ~ 16, ALL	Select a destination track
	Destination Start Measure	1 ~ 999	Select a destination start measure
	OK to Copy Measure	OK?	Executes measure copy

1) Select a source track.

2) Select the source start and end measures.

3) Select the destination track.

4) Select the destination start measure.

5) Position the cursor on OK?, and press the [▲/YES] button.

In the following example, the source is track 1, the start measure is set to 5, the end measure to 7, the destination track is 2, and the destination start measure to 3. Hence, track 1 measures 5 to 7 are copied to track 2 measures 3 to 5. Existing data in track 2 measures 3 to 5 is overwritten.
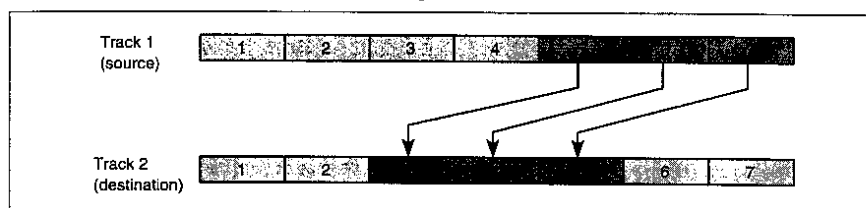
Existing data in the specified destination measures will be overwritten.

If you specify some source measures that contain no data, empty measures are copied.

The copied measures will use the same time signature as corresponding measures in other tracks (if any other tracks exist).

If the track parameter is set to ALL, the specified measures from all tracks including the tempo track will be copied. This is useful when creating repetitive song sections such as choruses, verses, etc.

If either the source start measure or the last measure at the destination contains a pattern that has been put into the track, you will be asked whether you want to open the pattern. Press the [▲/YES] button to open the pattern, and copy its data, or the [▼/NO] button to ignore the pattern data.

If the last measure of the copy destination contains a pattern that has been put into the track, it will be ignored, and the copied data will play.

If the destination start measure contains a pattern that has been put into the track, measures starting at this point will be replaced with the copied measures.

If the start measure contains a pattern that has been put into the track, subsequent measures that also used that pattern will no longer use it after the start measure has been erased.

Quick Undo

If you copy by mistake, press the [COMPARE] button to restore the previous data.

Insert Measure – 4D

This function allows you to insert new measures into tracks.

```
4D Ins Meas    >  4D Ins Meas    <
Tr01 M123 L00Z    **/**        OK?
```

LCD	Parameter	Range	Description
4D-1	Destination Track	1 ~ 16, ALL	Select a destination track
	Destination Measure	1 ~ 999	Specify where to insert measure(s)
	Number of Measures	1 ~ 999	Specify the number of measures to be inserted
4D-2	Time Signature	**/**	Use time signature of measures in other tracks
		1/4 ~ 9/4 1/8 ~ 16/8 1/16 ~ 16/16	Low base resolution
		1/4 ~ 5/4 1/8 ~ 10/8 1/16 ~ 16/16	High base resolution
	OK to Insert Measure	OK?	Executes measure insert

1) Select the destination track, and specify the destination measure.

2) Specify the number of new measures to be inserted.

3) Specify the time signature for the new measures.

4) Position the cursor on OK?, and press the [▲/YES] button.

In the following example, two new measures are inserted into track 1, and the destination measure is set to 3.
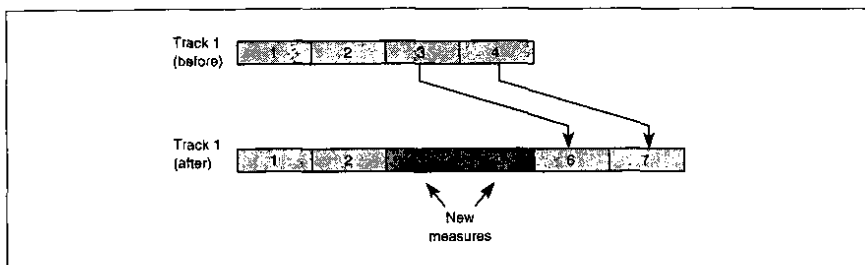
If the time signature parameter is set to **/**, the new measures will use the time signature of corresponding measures in other tracks. If a time signature value is set, the new measures and all corresponding track measures will use that value. The following example shows both cases:
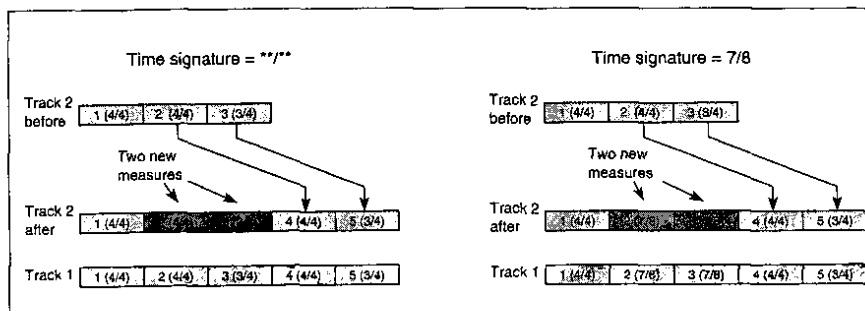
If the track parameter is set to ALL, new measures will be inserted into all tracks.

If a existing note overlaps into the specified destination measure, it will be divided into two notes.

If the new measures apply to a section that contains a pattern that has been put into the track, you will be asked whether you want to open the pattern. Press the [▲/YES] button to open the pattern, and insert the new measures, or the [▼/NO] button to ignore the pattern data.

Quick Undo

If you erase a measure by mistake, press the [COMPARE] button to restore the previous data.

Put to Track – 4E

This function allows you to put patterns to tracks. Unlike the Copy to track function, the track will not contain the pattern data, just its name. In the computer world, this is sometimes referred to as an alias or link. It allows you to share common patterns in tracks and songs without having to duplicate (copy) the same data, which would use more sequencer memory.

This could be used, for example, with a drum pattern that is used for each chorus. Rather than copy the data, make a pattern, then put that pattern into the track at the required times. Any changes made to that pattern will be reflected in all tracks in which that pattern has been put.

```
4E Put To Tr    >  4E Put To Tr    <
Pat00 Tr01 M123              OK?
```

LCD	Parameter	Range	Description
	Pattern	0 – 99	Select pattern to put in track
4E-1	Destination Track	1 – 16	Select destination track
	Destination Measure	1 – 999	Select destination measure
4E-2	OK to Put to Track	OK?	Executes put to track

1) Select the pattern to put.

2) Select the track and measure into which the pattern is to be put.

3) Position the cursor on OK?, and press the [▲/YES] button.

In the following example, pattern DrumChor1 is put into track 10 at each chorus.
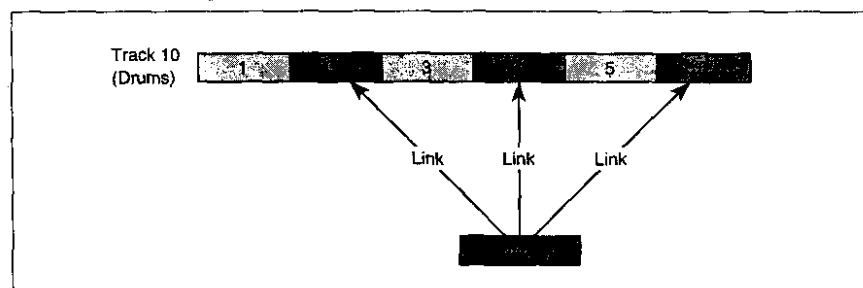
Existing data in the destination measure will be deleted, and subsequent measures will be moved forward depending on the number of measures in the pattern. For example, if you put a pattern that contains only one measure, data in the destination measure will be deleted, and subsequent measures will not move. However, if you put a pattern that contains three measures, data in the destination measure will be deleted, and subsequent measures will move forward by two measures.

The pattern's base resolution will be adjusted to match that of the song.

The pattern will use the same time signature as the corresponding measures in other tracks.

Quick Undo

If you put a pattern by mistake, press the [COMPARE] button to restore the previous data.

Copy to Track – 4F

This function allows you to copy patterns into tracks.

```
4F Copy To Tr   >  4F Copy To Tr   <
Pat00 Tr01 M123              OK?
```

LCD	Parameter	Range	Description
4F-1	Pattern	0 ~ 99	Select pattern to copy to track
	Destination Track	1 ~ 16	Select destination track
	Destination Measure	1 ~ 999	Select destination measure
4F-2	OK to Copy to Track	OK?	Executes copy to track

1) Select the pattern to copy.

2) Select the track and measure into which the pattern is to be copied.

3) Position the cursor on OK?, and press the [▲/YES] button.

In the following example, pattern SynthSolo is put into track 2.
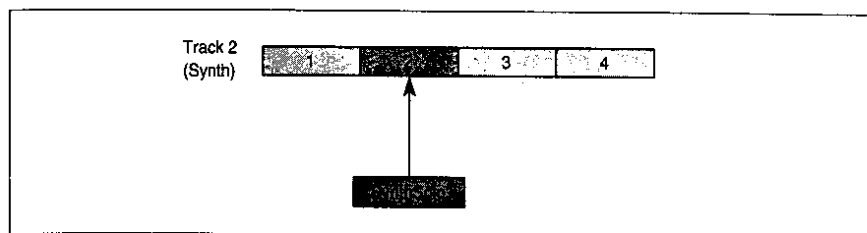
Existing data in the destination measure will be deleted, and subsequent measures will be moved forward depending on the number of measures in the pattern. For example, if you copy a pattern that contains only one measure, data in the destination measure will be deleted, and subsequent measures will not move. However, if you copy a pattern that contains three measures, data in the destination measure will be deleted, and subsequent measures will move forward by two measures.

The pattern's base resolution will be adjusted to match that of the song.

The pattern will use the same time signature as the corresponding measures in other tracks.

Quick Undo

If you copy a pattern by mistake, press the [COMPARE] button to restore the previous data.

Real-Time Pattern Record/Edit – 5A

This section explains how to record and edit a pattern in real time.

```
5A Real Rec      >  5A Real Rec      <
P00 ♩=120 Q:HI      MM:ON
```

LCD	Parameter	Range	Description
5A-1	Pattern	0 ~ 99	Select pattern to record/edit
	Tempo	40 ~ 240, EXT	Set the pattern tempo (EXT when MIDI Clock Source is EXT)
	Metronome	OFF ON REC	Metronome off Metronome for playback only Metronome for playback and recording
5A-2	Recording Quantize	HI ♪₃ ♪ ♪₃ ♪ ♪₃ ♪ ♩	
	Add/Remove	[ADD] [REMOVE]	Overdubs data on subsequent passes through the pattern Removes corresponding data while a key is held down

Function Buttons

[8]	Delete		Deletes data while held down

Before recording a pattern, select the track that you intend to use the pattern in. The selected track's Program will be used while you record the pattern. If, after recording, a pattern is copied to another track, it will use the Program assigned to that track.

1) Set the "Pattern Setup Parameters – 6A" on page 137.

2) Select the pattern that you want to record or edit.

   Patterns that were recorded in step time can also be selected.

3) Set the tempo, metronome, and recording quantize parameters as required.

4) Press the [REC/WRITE] button to engage record ready mode.

5) Press the [START/STOP] button to start recording, then start playing.

   When the end of the last measure in the pattern is reached, recording will continue from the first measure in the pattern, just like loop recording a song. What you play on subsequent passes through the pattern will be overdubbed onto the previously recorded data. This allows you to buildup a pattern in layers.

6) To stop recording, press the [START/STOP] button.

   To play the pattern, press the [START/STOP] button.

   If you want to add more to the pattern, repeat steps 4 to 6.

   If you want to erase some data that you have just recorded, see below.

Deleting Data while Recording

There are two ways to delete data:

1) Start recording, then press and hold down function button [8]. Data will be deleted while the button is held down. Release the button to stop deleting.

2) Start recording, position the cursor on [ADD], then press the [▲/YES] button. [ADD] will change to [RMV]. To delete a specific note, press the corresponding keyboard key. All corresponding notes will be deleted while that key is held down.

   This technique can also be used to delete joystick and pitch bend data. Just before the joystick or pitch bend data that you want to delete is played, move the joystick or pitch bender. While the joystick or pitch bender is not in its normal resting position, all joystick or pitch bend data will be deleted.

   The [RMV]/[ADD] parameter is set to [ADD] automatically each time recording is started.

Real-Time Pattern Record Notes

If you record Controller data such as Joystick, Pitch Bend, & Pedal, etc., make sure that the controller is returned to its normal resting position before the end of the pattern is reached. Otherwise, the controller may remain stuck at the same position for the remained of the song. Overdubbing Controller data will probably produce unusable results, so it is best avoided.

When recording at a high resolution, a note that you played right at the beginning of a pattern may sometimes be added to the end the pattern. Recording at a low resolution will prevent this.

Step-Time Pattern Recording – 5B

This section explains how to record and edit a pattern in step time.

```
5B Step Rec
P00
```

LCD	Parameter	Range	Description
5B	Pattern	0 ~ 99	Select pattern to record/edit

Before recording a pattern, select the track that you intend to use the pattern in. The selected track's Program will be used while you record the pattern. If, after recording, a pattern is copied to another track, it will use the Program assigned to that track.

1) Set the "Pattern Setup Parameters – 6A" on page 137.

2) Select the pattern that you want to record or edit.

3) Press the [REC/WRITE] button to engage record ready mode.

4) Press the [START/STOP] button. The following LCD screen will appear, and the following note parameters will be available:

The value indicated at the left-hand side, top line, of the LCD screen indicates the current position within the pattern.

```
1:00   16/16
♩- V064 075% C#1
```

LCD	Parameter	Range	Description
	Time Signature	1/4 ~ 9/4 1/8 ~ 16/8 1/16 ~ 16/16	Low base resolution
		1/4 ~ 5/4 1/8 ~ 10/8 1/16 ~ 16/16	High base resolution
	Note Type	♪, ♪, ♪, ♩, ♩, o	Note duration
	Dot Normal Triplet	. — 3	Dotted note of specified Note duration Note as specified by Note Duration Triplet note of specified Note Duration
	Velocity	2 ~ 126 Key	Specify note velocity Set velocity by pressing key
	Note Length	1 ~ 100%	Note length

Function Buttons

[5]	Rest		Inserts a rest
[6]	Tie		Inserts a tie
[8]	Delete		Delete current step and go back one step

5) Follow the procedure for "Step-Time Track Recording – 2A" on page 105.

Unlike step-time track recording, which continues until you press the [START/STOP] button, step-time pattern recording will continue from the first measure in the pattern when the end of the last measure in the pattern is reached. What you play on subsequent passes through the pattern will be overdubbed onto the previously recorded data. This allows you to buildup a pattern in layers.

6) To stop recording, press the [START/STOP] button.

Pattern Event Edit – 5C

This section explains how to edit event data in a pattern.

```
5C Event Edit
P00  NOTE:ENA
```

LCD	Parameter	Range	Description
5C	Pattern	0 ~ 99	Select pattern for event editing
	NOTE CTRL (Controllers) AFTT (After Touch) BEND (Pitch Bend) PROG (Program Change) PAFT (Polyphonic After Touch)	ENA DIS	Event type can be edited Event type cannot be edited

1) Select the pattern that you want to edit.

2) Disable or enable event types as required.

   Disabled event types cannot be edited.

3) Press the [REC/WRITE] button.

4) Press the [START/STOP] button.

5) Follow the procedure for "Event Edit – 2B" on page 109.

6) Press the [START/STOP] button to end event editing.

Pattern Setup Parameters – 6A

These parameters allow you to set up a pattern before recording, and modify a pattern after recording.

```
6A Pat Param    >  6A Pat Param    <
P00* 16/16 L01     B.Res:HI    OK?
```

LCD	Parameter	Range	Description
6A-1	Pattern	0 ~ 99	Select a pattern
	Time Signature	1/4 ~ 9/4 1/8 ~ 16/8 1/16 ~ 16/16	Low base resolution
		1/4 ~ 5/4 1/8 ~ 10/8 1/16 ~ 16/16	High base resolution
	Pattern Length	1 ~ 99	Number of measures in pattern
6A-2	Base Resolution	Low High	48 pulses per quarter note 96 pulses per quarter note
	OK to Set Parameters	OK?	Set the specified parameters

1) Select the pattern to set up.

   If the selected pattern is used in a song, an asterisk (*) will appear next to the pattern number.

2) Set the parameters as required.

3) Position the cursor on OK?, and press the [▲/YES] button.

   Base Resolution: this parameter determines the timing precision for a pattern. When set to Low, the timing resolution will be 48 PPQN (pulses per quarter note), i.e., 1/48 of a quarter note. When set to High, the timing resolution will be 96 PPQN (pulses per quarter note), i.e., 1/96 of a quarter note. See also "Song Base Resolution – 8B" on page 141.

   If the base resolution of a pattern is different to that of the song it is being used in, the pattern data is modified accordingly.

Erase Pattern – 6B

This function allows you to erase a pattern.

```
6B Erase Pat
P00*          OK?
```
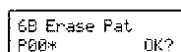
LCD	Parameter	Range	Description
6B	Pattern	0 ~ 99	Select pattern to erase
	OK to Erase Pattern	OK?	Executes pattern erase

1) Select a pattern.

   If the selected pattern is used in a song, an asterisk (*) will appear next to the pattern number.

2) Position the cursor on OK?, and press the [▲/YES] button.

Quick Undo

If you erase the wrong pattern, press the [COMPARE] button to restore the previous data.

Get from Track – 6C

This function allows allow you to copy data from a track into a pattern.

```
6C Get From Tr  >  6C Get From Tr >
P00 S0 Tr01 M123              OK?
```

LCD	Parameter	Range	Description
6C-1	Destination Pattern	0 ~ 99	Select destination pattern
	Source Song	0 ~ 9	Select the source song
	Source Track	1 ~ 16	Select the source track
	Source Start Measure	1 ~ 999	Select the source start measure
6C-2	OK to Get from Track	OK?	Executes get from track

1) Select the destination pattern.

   The length of the destination pattern ("Pattern Setup Parameters – 6A" on page 137) determines the number of measures that will be copied.

2) Select the source song.

3) Select the source track.

4) Select the source start measure.

5) Position the cursor on OK?, and press the [▲/YES] button.

   If the specified range of measures contains a pattern that has been put into the source track, you will be asked whether you want to open the pattern. Press the [▲/YES] button to open the pattern and copy its data, or the [▼/NO] button to ignore the pattern data.

   The destination pattern's base resolution and time signature is determined by the source song.

   If a tied note overlaps the specified range of measures, as determined by the Destination Pattern parameter, that tie will be erased.

Quick Undo

If you make a pattern, press the [COMPARE] button to restore the previous data.

Pattern Edit Note

If you want to use track editing functions such as quantize, create control data, etc., on a pattern, copy the pattern to an empty track ("Copy to Track – 4F" on page 132), do your editing, then use this function to copy the data back into the pattern.

Bounce Pattern – 6D

This function merges data from two patterns into one.

```
6D Bnce Pat
P00→P01      OK?
```

LCD	Parameter	Range	Description
6D	Source Pattern	0 ~ 99	Select the source pattern
	Destination Pattern	0 ~ 99	Select the destination pattern
	OK to Bounce pattern	OK?	Executes pattern bounce

1) Select a source pattern.

2) Select a destination pattern.

3) Position the cursor on OK?, and press the [▲/YES] button.

The time signature, pattern length, and base resolution is determined by the destination pattern.

Quick Undo

If you bounce the wrong pattern, press the [COMPARE] button to restore the previous data.

Copy Pattern – 6E

This function allows you to copy the data from one pattern to another.

```
6E Copy Pat
P00→P01      OK?
```

LCD	Parameter	Range	Description
6E	Source Pattern	0 ~ 99	Select the source pattern
	Destination Pattern	0 ~ 99	Select the destination pattern
	OK to Copy pattern	OK?	Executes pattern copy

1) Select a source pattern.

2) Select a destination pattern.

3) Position the cursor on OK?, and press the [▲/YES] button.

The time signature, pattern length, and base resolution is determined by the source pattern.

Quick Undo

If you copy the wrong pattern, press the [COMPARE] button to restore the previous data.

Effects 7A ~ 7G

In a song, the individual effect settings, panpot settings, and send C and D settings of each Program are ignored, and the settings for that song are used. If you want to use a Program or Combination's effect settings for a song, use the Effects Copy – 7F function. See "Effects Copy – 7F" on page 55.

Effects are explained in Chapter 5: "Effects" on page 51.

Dynamic Modulation & the Sequencer

To record and playback dynamic modulation data for the effects, set the track to be used to record the data to the same MIDI Channel as that used by the Global MIDI Channel.

Rename Song – 8A

This function allows you to rename a song.

```
8A RENAME
S0:SongName00
```

LCD	Parameter	Range	Description
8A	Rename Song	See character table below	Rename a song

To rename a song, use the [←] and [→] cursor buttons to position the cursor, and the [▲/YES] [▼/NO] buttons or VALUE slider to select characters. Available characters are shown in the table below. Song names can use up to 10 characters.

	!	"	#	$	%	&	'	(	)	*	+	,	-	.	/	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	[	¥	]	^	_
`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y	z	{			}	→	←

Use the number keypad to insert numbers. Use the [10's HOLD/–] button to switch between uppercase and lowercase characters. Press and hold down the [ENTER] button, then press the [←] button to delete the current character. Press and hold down the [ENTER] button, then press the [→] button to insert a character.

Song Base Resolution – 8B

This parameter allows you to set the base resolution for each song.

```
8B B.Reso
High(♩/96)   OK?
```

LCD	Parameter	Range	Description
8B	Base Resolution	Low High	48 pulses per quarter note 96 pulses per quarter note
	OK to set base resolution	OK?	Sets base resolution

Note: *The base resolution must be set before recording. Once a song contains some data, it cannot be changed.*

Base Resolution: this parameter determines the timing precision for each song. When set to Low, the timing resolution will be 48 PPQN (pulses per quarter note), i.e., 1/48 of a quarter note. When set to High, the timing resolution will be 96 PPQN (pulses per quarter note), i.e., 1/96 of a quarter note.

To capture your real-time recording with greater accuracy, i.e., capture the subtle nuances of your playing, set the base resolution to High.

The selected base resolution affects the number of time signature values that are available. More are available when the base resolution is set to Low. See the table below.

Base Resolution	Time Signature
Low	1/4, 2/4, 3/4, 4/4, 5/4, 6/4, 7/4, 8/4, 9/4 1/8, 2/8, 3/8, 4/8, 5/8, 6/8, 7/8, 8/8, 9/8, 10/8, 11/8, 12/8, 13/8, 14/8, 15/8, 16/8 1/16, 2/16, 3/16, 4/16, 5/16, 6/16, 7/16, 8/16, 9/16, 10/16, 11/16, 12/16, 13/16, 14/16, 15/16, 16/16
High	1/4, 2/4, 3/4, 4/4, 5/4 1/8, 2/8, 3/8, 4/8, 5/8, 6/8, 7/8, 8/8, 9/8, 10/8 1/16, 2/16, 3/16, 4/16, 5/16, 6/16, 7/16, 8/16, 9/16, 10/16, 11/16, 12/16, 13/16, 14/16, 15/16, 16/16

When the Recording Quantize parameter (See "Real-Time Record/Play Parameters" on page 93.), or the Quantize Resolution parameter (See "Quantize – 3A" on page 120.) is set to HI, the base resolution specified using this function determines the quantize resolution.

Step Recording ("Step-Time Track Recording – 2A" on page 105), Create Control Data ("Create Controller Data – 3D" on page 124), and Event Edit ("Event Edit – 2B" on page 109) will advance two steps when the base resolution parameter is set to Low, and one step when set to High.

Next Song – 8C

This function allows you to specify the next song to be played after the current song.

```
8C NEXT SONG
S0+OFF      PLAY
```

LCD	Parameter	Range	Description
8C	Next Song	OFF, 0 ~ 9	Select the next song
	Next Song Mode	STOP PLAY	Press [START/PLAY] to play next song Next song plays automatically

Next Song: this parameter specifies the next song to be played when the current song ends.

Next Song Mode: this parameter determines how the next song will play. When PLAY is selected, the next song will start playing when the current song ends.

When STOP is selected, playback will stop when the current song ends, and you will have to press the [START/STOP] button to start the next song playing.

If, while the next song is playing, the [RESET] button is pressed, the previous song will be selected.

Metronome – 8D

These parameters allow you to set the metronome count-in, level, and pan.

```
8D METRONOME
I=2 L=99 P=A+B
```

LCD	Parameter	Range	Description
8D	Count In	0 ~ 2	Number of measures for count-in
	Level	0 ~ 99	Metronome level
	Pan	A, A+B, B, C, C+D, D, ALL	Metronome output pan

Count-In: this parameter determines the number of count-in measures before recording starts.

Level: this parameter determines the level of the metronome.

Pan: this parameter determines which buses the metronome will be output on.

For the instant that the metronome is sounding, the available note polyphony will be reduced by one.

Copy from Combination – 8E

This function allows you to copy settings from the eight Timbres within a Combination into tracks 1 to 8 or tracks 9 to 16.

```
8E Copy Combi
No=A00→T1-8  OK?
```

LCD	Parameter	Range	Description
8E	Source Combination	A00 ~ A99 B00 ~ B99 C00 ~ C99 D00 ~ D99	Select the Combination to copy
	Destination Tracks	1–8, 9–16	Select the eight destination tracks
	OK to Copy from Combination	OK?	Executes Combination copy

The following Timbre parameter settings are copied: Program, volume, transpose, detune, pan, key window, velocity window, MIDI Channel, and Timbre mode (track status). The Combination's effect settings are also copied. Other song parameters remain the same.

When a Combination containing EXT mode Timbres is selected, MIDI Program Change messages are sent via the X3's MIDI OUT. However, when EXT mode Timbres are copied to song tracks, you will have to insert a Program Change message at the beginning of the track's data. In this way, Programs (patches, voices) on external MIDI devices will be selected automatically when the song starts playing.

If some track's MIDI Channels are set the same, the same track data will play the Programs assigned to those tracks.

GM Song Mode – 8F

This function conforms a song to the GM (General MIDI) settings. It should be used when you want to make a new GM compatible song from scratch, and when you want to playback a GM song file that you received in the SMF format.

```
8F Set To GM
SONG0        OK?
```

LCD	Parameter	Range	Description
8F	Song	0 ~ 9	Select a song
	OK to set Song to GM Mode	OK?	Sets song to GM mode ·

The selected song's parameters are set as follows. Track 10 is set for drums:

Parameter	Tracks 1 ~ 9 & 11 ~ 16	Track 10	
Program	G01	G129 (Drum kit)	*
Level	100	100	*
Pan	CNT	PRG	*
Send C & D	2:2	P=0	*
Transpose	0	0	*
Detune	0	0	*
Pitch Bend Range	+2	0	*
Program Change Filter	ENA	ENA	
Effect 1	—	—	Hall
Effect 2	—	—	Chorus
Effect Placement	—	—	Parallel 3
MIDI Channel	1 ~ 9, 11 ~ 16	10	

* Can be set via MIDI

If you are playing a GM song file, track Programs will be selected automatically when the song starts playing. GM song files contain Program Change messages that specify the required program for each track.

If you are creating a new GM compatible song from scratch, you can select Programs for tracks as required.

When a MIDI GM System On message (F0, 7E, nn, 09, 01, F7) is received, these parameters are set automatically.

Chapter 8: Global Mode

The functions in this mode allow you to set parameters that affect the overall performance of the X3. For example, master tuning, MIDI, memory protection, PROG/SEQ data card operations, and drum kit setup.

Entering Global Mode

1) Press the [GLOBAL] button.

The LCD screen should look something like the one shown below.

```
          1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16


GLOBAL  1A MASTER TUNE
        Tune+00:440.00Hz
```
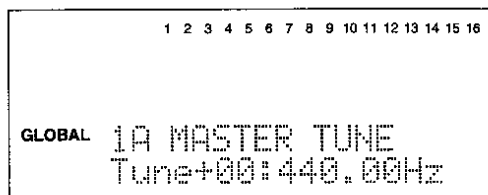
Saving Global Setup Data

All global settings are remembered when the X3 is powered off.

Global settings (except LCD contrast and memory protect) related to a specific project can be saved to either floppy disk or data card. They are saved in bank A. See "Save Programs & Combinations to Card – 6C" on page 157 and "Save P/C/G Data – 3B" on page 173.

Master Tune – 1A

This function allows you to tune the X3.

```
1A MASTER TUNE
Tune+00:440.00Hz
```
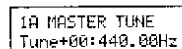
LCD	Parameter	Range	Description
1A	Master Tune	–50 ~ +50	Used to tune the X3 in 1 cent steps

The selected tuning is also indicated in Hz, with 0 cents being equal to 440 Hz.

The X3 can also be tuned via external MIDI devices that can output MIDI RPN Fine Tune messages (the X3 cannot output these messages). In Sequence mode, these messages are received on the individual MIDI Channels specified for each track, and they control the Detune parameters. In all other modes, they are received on the Global MIDI Channel, and can be used to set this master tune function.

Transpose – 1B

This function allows you to transpose the X3. This is useful when you want to play a song in a different key. The Transpose function can be positioned after the keyboard or before the X3's tone generator.

```
1B TRANSPOSE     >  1B POSITION    <
     Trans+00           AfterKBD
```

LCD	Parameter	Range	Description
1B-1	Transpose	–12 ~ +12	Used to transpose the X3 in 1 semitone steps
1B-2	Position	AfterKBD BeforeTG	Transpose function after keyboard Transpose function before tone generator

AfterKBD: with this setting, the transpose is after the keyboard, so note numbers are changed. This affects the keyboard data recorded by the sequencer, the keyboard data played by the tone generator, and the keyboard data output to the MIDI OUT. MIDI IN data and sequencer playback data is unaffected. Use this setting when you are using the X3 as a MIDI master keyboard.
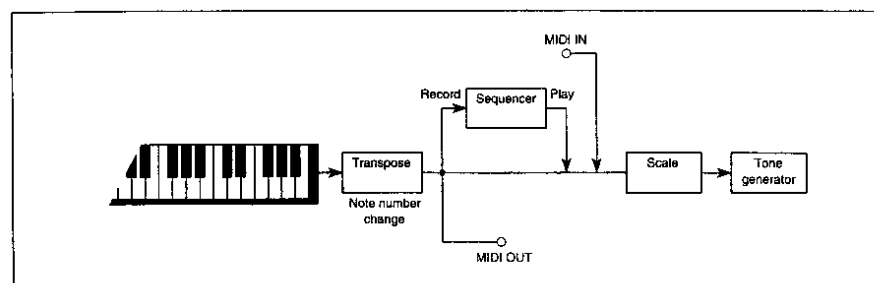
BeforeTG: with this setting, the transpose is just before the tone generator, so played notes will change. This affects the keyboard data played by the tone generator and MIDI IN data. Keyboard data and sequencer playback data sent to the MIDI OUT is unaffected. Use this setting when you are using the X3 as a MIDI tone generator.
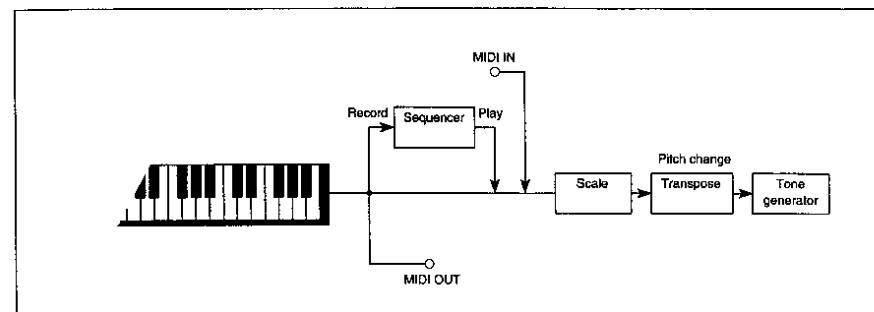
Keyboard After Touch & Velocity Response Curve – 1C

These functions allow you to adjust the keyboard's after touch and velocity response to suit your playing style.

```
1C CURVE
Vel=5    Aft=1
```

LCD	Parameter	Range	Description
1C	Velocity Response	1 ~ 8	Keyboard velocity response curve
	After Touch Response	1 ~ 8	Keyboard after touch response curve

Velocity Response: this parameter allows you to adjust the keyboard's velocity response. For a low setting, strong playing is required to achieve the maximum value (insensitive). For a high setting, maximum value will be achieved with soft playing (sensitive). Select a curve to suit your playing style. Remember that keyboard velocity can be used to control VDAs and VDFs.
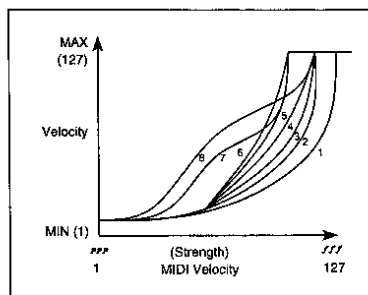
After Touch Response: this parameter allows you to adjust the keyboard's after touch response. For a low setting, the keyboard must be pressed hard to activate after touch (insensitive). For a high setting, pressing softly will activate after touch (sensitive). Select a curve to suit your playing style.
Remember that keyboard after touch can be used to control pitch, VDAs, and VDFs.
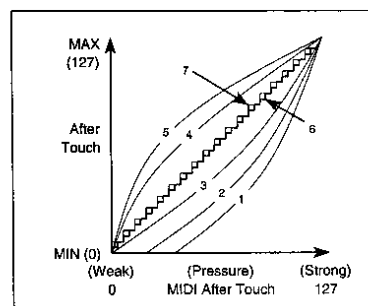
Keyboard Scale – 2A

This function allows you to select scales other than the usual equal temperament scale. You can also create your own User scale.

```
2A SCALE TYPE   >  2A SCALE KEY   <>  2A User Scale  <>  2A User Scale  <>  2A User Scale  <>
User Scale         Key=C              C+00 C#+00 D+00    D#+00 E+00 F+00    F#+00 G+00 G#+00
```

```
2A User Scale  <>  2A Copy Scale  <>  2A SUB SCALE    <>  2A SUB KEY      <
A+00 A#+00 B+00    from Slendro  OK?  Equal Temp          Key=C
```

LCD	Parameter		Range	Description
2A-1	Scale Type		Equal Temperament	Most commonly used equal temperament keyboard scale. Songs can easily be transposed into different keys.
			Equal Temperament2	Like equal temperament, but with slight random pitch variations between subsequent key presses. This is useful for simulating the unstable pitch of an acoustic instrument.
			Pure Major	Intervals such as third and fifth are perfectly in tune. Other intervals will correspondingly be out of tune, so you must specify a key. See LCD screen 2A-2.
			Pure Minor	Like the pure major scale, but minor.
			Arabic (quarter tone scales often used in Arabic music)	**Scale** — **Key** RAST DO / BAYATI RE — C RAST FA / BAYATI SOL — F RAST SOL / BAYATI LA — G RAST RE / BAYATI MI — D RAST Sib / BAYATI DO — A# (B♭)
			Pythagorean	Ancient Greek tuning, useful when playing melodies
			Werkmeister	Equal temperament style that was used in the latter part of the baroque period.
			Kirnberger	Developed in the 18th Century, used mainly for harpsichord.
			Slendro	Indonesian gamelan tuning with 5 notes per octave. When key is set to C, notes C, D, F, G, A are used. Other notes are set to equal temperament.
			Pelog	Like the slendro scale, but with 7 notes per octave. When key is set to C, notes C, D, E, F, G, A, B are used.
			User Scale	This allows you to create your own tuning, and is set up using LCD screens 2A-3 to 2A-6.
2A-2	Key		C ~ B	Specifies the tonic (key note) of the scale.
2A-3	User Scale	C	–99 ~ +99	Used to tune the individual notes for the user scale in 1 cent steps
		C#		
		D		
2A-4		D#		
		E		
		F		
2A-5		F#		
		G		
		G#		
		A		
2A-6		A#		
		B		
2A-7	Copy Scale		Same as 2A-1	Copy a preset scale to the user scale (key not copied)
	OK to Copy		OK?	Executes scale copy
2A-8	Sub Scale		Same as 2A-1	See 2A-1 descriptions above (excluding User Scale)
2A-9	Sub Scale Key		C ~ B	Specifies the tonic (key note) of the sub scale

Scale Type: as well as the usual equal temperament scale, 11 other scales including a user definable scale are available.

User Scale: this scale allows you to define your own personal tuning scale. The tuning of each keyboard note can be adjusted ±99 cents on LCD screens 2A-3 to 2A-6. To edit one of the preset scales, first copy it (2A-7), then edit it as a user scale.

Note: *The 2A-2 Key and 2A-9 Sub Scale Key parameters are affected by the Transpose – 1B function when the transpose position is set to AfterKBD. They are not affected when it is set to BeforeKBD.*

If the Transpose Position – 1B-2 is set to AfterKBD and the Transpose – 1B is set to +1, in the user scale you tune note C up +10 cents and leave note B set at 00, C +10 cents will sound when you play a B on the X3 keyboard, and C# will sound when you play a C.

Sub Scale: it is possible to switch between two scales, the main scale and sub scale, using a pedal switch.

1) Connect an optional Korg PS-1 or PS-2 pedal switch to the ASSIGNABLE PEDAL/SW connection.

2) In Global mode, assign the pedal to Scale Switching. See "Assignable Pedal Setup – 8B" on page 163.

When the pedal is pressed, the Sub Scale is selected and the MIDI message Bn, 04, 7F will be sent to the MIDI OUT. When the main scale is selected, the message Bn, 04, 7F will sent to the MIDI OUT.

If the MIDI message Bn, 04, 00 ~ Bn, 04, 3F is received, the main scale is selected. If the MIDI message Bn, 04, 40 ~ Bn, 04, 7F is received, the sub scale is selected. Normally, in Combination mode they can be selected by any Timbre. In Sequencer mode, they can be selected by any Track.

These messages are normally sent on the Global MIDI Channel. In Combination mode, they are sent on the MIDI Channels of EXT mode Timbres.

Global MIDI Channel & MIDI Clock Source – 3A

These parameters allow you to set the Global MIDI Channel and select a MIDI Clock source.

```
3A CH/CLOCK
   1 INT
```

LCD	Parameter	Range	Description
3A	Global MIDI Channel	1 ~ 16	Set the Global MIDI Channel
	Clock Source	INT EXT	Use the X3's internal MIDI Clock Use an external MIDI Clock

Global MIDI Channel: the Global MIDI Channel is used as follows: to send and receive MIDI data in Program mode, to select Combinations in Combination mode (except when MIDI Filter1 is set to PRG), to control effects, and for MIDI Data Dump.

Note: *MIDI data for individual Timbres in a Combination and tracks in a song is sent and received on the MIDI Channels specified in Combination Edit mode and Sequencer mode respectively.*

Clock Source: to synchronize another MIDI device (external sequencer, drum machine, etc.) to the X3, set the Clock Source to INT. In this mode, MIDI Clock data such as Start, Stop, Continue, Song Select, and Song Position will be sent via the X3's MIDI OUT connection when the X3's sequencer is used.

To synchronize the X3 to another MIDI device, set the Clock Source to EXT. In this mode, the X3 sequencer will respond to MIDI Clock data such as Start, Stop, Continue, Song Select, and Song Position that is received via the X3's MIDI IN connection, and the X3 tempo setting will have no effect.

Note: *If you are not synchronizing the X3 to an external MIDI Clock source, select INT.*

Local Control & Note Filter – 3B

The Local Control parameter determines whether the X3 keyboard, joystick, etc., control the X3. The Note Filter determines whether the X3 responds to even notes, odd notes, or all notes from the keyboard and MIDI IN connection.

```
3B LOCAL/NoteR
   ON    ALL
```

LCD	Parameter	Range	Description	
3B	Local Control	ON OFF	X3 keyboard and joystick control of tone generator off X3 keyboard and joystick control of tone generator on	
	Note Receive Filter	EVEN ODD ALL	Respond to even notes only Respond to odd notes only Respond to all notes	•

Local Control: when set to off, the X3's keyboard and joystick will not play the X3 tone generator. However, MIDI data generated by the keyboard and joystick will still be sent. The X3 sequencer will send and receive MIDI data only, that is, it will not respond to the X3's keyboard.

Normally, this parameter should be set to ON. However, to prevent a MIDI data loop when using the X3 with, for example, an external sequencer, set this to OFF. In this case, MIDI data from the X3 keyboard will be sent to the sequencer via the MIDI OUT, and if the sequencer's MIDI thru or echo function is turned on, returned back to the X3 via MIDI IN.
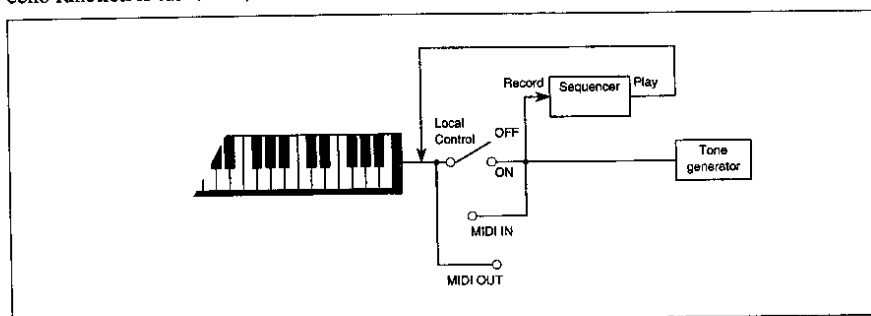
Note Receive Filter: normally, this should be set to ALL. However, if you want to double the number of available notes by using two X3s simultaneously, feed data to both X3s, and set one to respond to odd notes and the other to respond to even notes.

MIDI Filter1 – 3C

MIDI filter1 determines how the X3 sends and receives MIDI Program Change messages and After Touch.

```
3C FILTER1
PROG:ENA AFT:ENA
```

LCD	Parameter	Range	Description
3C	Program Change Filter	DIS ENA PRG NUM	Program Change operation disabled Program Change messages select Combinations & Programs Program Change messages select Timbre Programs MIDI Bank Select messages ignored
	After Touch Filter	DIS ENA	After touch send / receive disabled After touch send / receive enabled

Filter1 affects the MIDI data recorded by the sequencer, but has no effect on the MIDI data played back by the sequencer.

Program Change Filter

When DIS is selected, MIDI Program Change messages are neither sent nor received.

When ENA is selected, MIDI Program Change messages received on the Global MIDI Channel select Programs in Program mode and Combinations in Combination mode. MIDI Bank Select messages will select banks in the selected mode. In Combination mode, MIDI Program Change messages received on other channels will select Programs for corresponding Timbres. If the Global MIDI Channel and a Timbre's MIDI Channel are set the same, the Global MIDI Channel has priority. So a Combination will be selected, the Timbre's Program will remain the same.

When PRG is selected, MIDI Program Change messages received on the Global MIDI Channel will still select Programs in Program mode, but in Combination mode, Timbre Programs are selected. MIDI Bank Select messages will select banks in the selected mode.

When NUM is selected, operation is basically the same as for ENA except that MIDI Bank Select messages are ignored.

After Touch Filter

The X3 uses Channel After Touch only, not Polyphonic After Touch.

Disabling after touch is useful when, for example, you are recording to the sequencer and you do not want to record after touch data. Because after touch is a continuous type of controller, it consumes sequencer memory quickly.

MIDI Filter2 – 3D

MIDI filter1 determines how the X3 responds to MIDI Controllers and System Exclusive data.

```
3D FILTER2
CTRL:ENA  EX:DIS
```

LCD	Parameter	Range	Description
3D	MIDI Controller Filter	DIS ENA	MIDI Controller operation disabled MIDI Controllers sent and received
	System Exclusive Filter	DIS ENA	System Exclusive operation disabled System Exclusive data sent and received

When the MIDI Controller filter is set to DIS, MIDI Controller messages such as pitch bend, damper pedal, volume, and joystick are neither sent nor received by the X3, and the sequencer does not record them.

When the MIDI System Exclusive Filter is set to DIS, System Exclusive data for parameter editing is neither sent nor received by the X3. Normally, this should be set to DIS, however, when using an X3 editing program on a personal computer, set it to ENA.

By connecting the MIDI OUT of one X3 (A) to the MIDI IN of another X3 (B), and setting the System Exclusive filters to ENA, both units can be controlled by editing parameters on X3 A.

Program Memory Protect – 4A

This function allows you to protect Program memory.

```
4A PROTECT
PROGRAM:OFF
```

LCD	Parameter	Range	Description
4A	Program Protect	ON OFF	Program memory is not protected Program memory is protected

When set to on, Programs cannot be written to internal Program banks A and B.

Combination Memory Protect – 4B

This function allows you to protect Combination memory.

```
4B PROTECT
COMBINATION:OFF
```

LCD	Parameter	Range	Description
4B	Combination Protect	ON OFF	Combination memory is not protected Combination memory is protected

When set to on, Combinations cannot be written to internal Combination banks A and B.

Sequencer Memory Protect – 4C

This function allows you to protect sequencer memory.

```
4C PROTECT
SEQUENCE:OFF
```

LCD	Parameter	Range	Description
4C	Sequencer Protect	ON OFF	Sequencer memory is not protected Sequencer memory is protected

When set to on, sequencer data cannot be written to the sequencer memory.

Note: *PROG/SEQ data card Programs, Combinations, and sequencer data can be protected by setting the card's write protect switch to protect.*

Page Memory On/Off – 4D

The Page Memory function remembers which LCD screen is selected when you exit a mode. Next time you enter that particular mode, that LCD screen is selected automatically.

```
4D PAGE MEMORY
      OFF
```

LCD	Parameter	Range	Description
4D	Page Memory	ON OFF	Page Memory function off Page Memory function on

MIDI Data Dump – 5A

MIDI Data Dump allows you to save X3 data to an external MIDI device such as a MIDI data recorder, MIDI computer, or another X3.

```
5A MIDI DUMP
PROGRAM      OK?
```

LCD	Parameter	Range	Description
5A	MIDI Data Dump	Program Combination Global setup Drum kit Sequence All data	Dump 200 Programs in banks A and B Dump 200 Combinations in banks A and B Dump Global setup data Dump 4 drum kits from banks A and B Dump all sequencer data (10 songs, 100 patterns) Dump all the above data
	OK to Data Dump	OK?	Executes Data Dump

Saving Data with MIDI Data Dump

To save X3 data using MIDI Data Dump, you must connect a MIDI device capable of receiving MIDI Data Dump to the X3's MIDI OUT connection. Although not required by all MIDI devices, set the external devices MIDI Channel to match the X3's Global MIDI Channel. Specify the X3 data that you want to save, position the cursor on OK?, then press the [▲/YES] button to dump.

Note: *While dumping, do not press any buttons, keys, or move the joystick.*

The following table lists the approximate data size and dump time for each type of Data Dump data.

Type of Data Dump	Approx. Data Size	Approx. Dump Time (Seconds)
Program	37.5 KB	12.0
Combination	31.1 KB	9.9
Global setup	39 bytes	0.1
Drum kit	1.9 KB	0.6
Sequence	4.2 KB ~ 150.5 KB	1.4 ~ 48.2
All data	74.8 KB ~ 221.0 KB	24.0 ~ 70.8

Loading Data with MIDI Data Dump

To load the data back into the X3, connect the external MIDI device to the X3's MIDI IN connection, and make sure that the external devices MIDI Channel matches the X3's Global MIDI Channel. If you are loading Program, Combination, or sequence data, make sure that the respective memory protect function is set to off. See "Program Memory Protect – 4A" on page 154, "Combination Memory Protect – 4B" on page 154, or "Sequencer Memory Protect – 4C" on page 154. Send the Data Dump data.

If you are transfering data between X3s, make sure that both X3s are set to the same Global MIDI Channel, and the respective memory protect function is set to off.

While the above MIDI DUMP LCD screen is shown, MIDI Data Dump can be received regardless of the System Exclusive Filter setting ("MIDI Filter2 – 3D" on page 153). However, to receive MIDI Data Dump while other LCD screens are shown, the filter must be set to ENA.

For more detailed information on MIDI Data Dumps, see "MIDI" on page 188.

Load Programs & Combinations from Card – 6A

This function allows you to load individual banks containing Programs, Combinations, drum kits, and Global setup data from a PROG/SEQ data card.

```
6A Load Card
P/C  C → A    OK?
```

LCD	Parameter	Range	Description
6A-1	Source Bank	C D C+D	Load data from card bank C Load data from card bank D Load data from card banks C and D
	Destination Bank	A B A+B	Load to internal bank A Load to internal bank B Load to internal bank A and B
	OK to Load	OK?	Executes load

Each card bank can contain 100 Programs, 100 Combinations, 2 drum kits, and global settings, or sequencer data (10 songs, 100 patterns). Sequencer data is loaded using LCD screen 6B. See below.

To load the data, insert a PROG/SEQ data card, select the card bank that you want to load, and the destination, position the cursor on OK?, then press the [▲/YES] button.

When C+D is selected as the source, A+B is automatically selected as the destination. Data must already be saved in banks C and D. See "Save Programs & Combinations to Card – 6C" on page 157. Data from card bank C is loaded into internal bank A, and data from card bank D is loaded into internal bank B.

Note: *Existing internal bank data will be overwritten when this load function is executed. So be careful that you don't overwrite (loose) some valuable data.*

Note: *You cannot load Programs or Combinations if the corresponding memory protect function is set to on. See "Program Memory Protect – 4A" on page 154 and "Combination Memory Protect – 4B" on page 154.*

Note: *Global settings are stored in bank A, so when you load from card to bank A, the Global settings saved on the card will overwrite the current Global settings (except LCD contrast and memory protect).*

Load Sequencer Data from Card – 6B

This function allows you to load sequencer data from a PROG/SEQ data card.

```
6B Load Card
SEQ  C        OK?
```

LCD	Parameter	Range	Description
6B	Load Sequencer Data	C D	Load sequencer data from card bank C Load sequencer data from card bank D
	OK to load	OK?	Executes Sequencer data load

Sequencer data consists of 10 songs and 100 patterns, and can be loaded from card bank C or D.

To load the sequencer data, insert a PROG/SEQ data card, select the card bank that you want to load, position the cursor on OK?, then press the [▲/YES] button.

Note: *Existing sequencer data will be overwritten when this load function is executed. So be careful that you don't overwrite (loose) some valuable data.*

Note: *Card sequencer data can be played from the card. However, to edit the data you must load it first.*

Save Programs & Combinations to Card – 6C

This function allows you to save individual banks containing Programs, Combinations, drum kits, and Global setup data to a PROG/SEQ data card.

```
6C Save Card
P/C  A → C    OK?
```

LCD	Parameter	Range	Description
6C	Source Bank	A B A+B	Save data from internal bank A Save data from internal bank B Save data from internal banks A & B
	Destination Bank	C D C+D	Save to card bank C Save to card bank D Save to card banks C and D
	OK to Save	OK?	Executes Save

Each card bank can contain 100 Programs, 100 Combinations, 2 drum kits, and global settings, or sequencer data (10 songs, 100 patterns). Sequencer data is saved using LCD screen 6D. See below. PROG/SEQ data cards are formatted automatically when you save data onto them, so there are no card formatting functions.

When you save Programs, Combinations, etc., using this function, the destination card bank will be formatted for storing Programs, Combinations, etc. If you save sequencer data using "Save Sequencer Data to Card – 6D" the destination card bank will be formatted for storing sequencer data. In either case, once data has been saved to a bank, it can be loaded, re-saved, and played directly from the card bank.

Note: *Existing data in the selected destination bank will be overwritten when this load function is executed. So be careful that you don't overwrite (loose) some valuable data.*

Note: *Make sure that the card's write protect switch is set to off.*

To save the data, insert a PROG/SEQ data card, select the internal bank that you want to save, and the destination bank, position the cursor on OK?, then press the [▲/YES] button. The message ""Are You Sure OK?" will appear. Press the [▲/YES] button to save, or the [▼/NO] button to cancel the function.

When A+B is selected as the source, C+D is automatically selected as the destination. Data from internal bank A is saved to card bank C, and data from internal bank B is saved to card bank D.

Save Sequencer Data to Card – 6D

This function allows you to save sequencer data to a PROG/SEQ data card.

```
6D Save Card
SEQ    C    OK?
```

LCD	Parameter	Range	Description
6D	Destination Bank	C D	Save sequencer data to card bank C Save sequencer data to card bank D
	OK to Save	OK?	Executes Sequencer data Save

Sequencer data consists of 10 songs and 100 patterns, and can be loaded from card bank C or D.

Note: *Existing sequencer data in the selected bank will be overwritten when this load function is executed. So be careful that you don't overwrite (loose) some valuable data.*

To save the sequencer data, insert a PROG/SEQ data card, select the card bank that you want to save to, position the cursor on OK?, then press the [▲/YES] button. The message ""Are You Sure OK?" will appear. Press the [▲/YES] button to save, or the [▼/NO] button to cancel the function.

Note: *If the amount of free sequencer memory is less than 77%, sequencer data cannot be saved to card. In this case, save to floppy disk. See "Save Sequencer Data – 3C" on page 174.*

Drum Kit Setup1 – 7A

These parameters allow you to set up drum kits. This explanation also applies to "Drum Kit Setup2 – 7B".

Before entering Global mode to edit a drum kit, you must select a Program that is using that drum kit. That is, a Program whose Oscillator mode is set to DRUMS.

Because drum kits are selected like Multisounds in a Program, adjustable parameters in Program Edit mode can also be used when editing a drum kit. For example, VDF, VDA, joystick pitch bend, and even drum modulation is possible.

```
7A DRUM A1 #01   >  7A KEY/TUNE/L  <>  7A DECAY/ASGN  <>  7A PAN/SEND      <
105:Timpani          D#4 T+019  L+65    Dcy+00  Asgn:EX1    Pan=CNT C=0 D=0
```

LCD	Parameter	Range	Description
7A-1	Drum Kit	A1, A2, B1, B2 C1, C2, D1, D2 ROM kits 1 ~ 8	Select a drum kit for editing
	Index	0 ~ 59	Select an index
	Drum Sound	---, 000 ~ 163	Select a drum sound for an index
7A-2	Key	C0 ~ G8	Select a key (note) for an index
	Tune	–120 ~ +120 units	Tune an index (1 unit = 10 cents, 10 units = 1 semitone, 120 units = 1 octave)
	Level	–99 ~ +99	Set the index volume level
7A-3	Decay	–99 ~ +99	Set the index decay
	Group Assign	---, EX1 ~ EX6, SLF	Assign an index to an exclusive group
7A-4	Pan	OFF, A, A14 ~ CNT ~ B14, B	Output pan to buses A and B
	Send C	0 ~ 9	Output level to bus C
	Send D	0 ~ 9	Output level to bus D

Drum Kit: this parameter allows you to select a drum kit for editing. You can edit internal drum kits A1, A2 and B1, B2. PROG/SEQ data card drum kits, C1, C2, D1, and D2, can be viewed using this group of LCD screens, however, they cannot be edited. To edit one of these drum kits, copy it to internal drum kit A1, A2, B1, or B2. See "Drum Kit Copy – 7C" on page 161.

Rom drum kits 1 to 8 are used in GM Programs 129 to 136. These kits can be viewed using this group of LCD screens, however, they cannot be edited. To edit one of these drum kits, copy it to internal drum kit A1, A2, B1, or B2. See "Drum Kit Copy – 7C" on page 161. ROM drum kits cannot be overwritten.

Index: X3 drum kits consist of indexes. Think of an index as an empty drum case, into which you put a drum sound, select a keyboard note, set a volume level, and pan. Up to 60 indexes are available per drum kit.

As well as using the VALUE slider and the [▲/YES] and [▼/NO] buttons to select indexes, you can also use the keyboard. Position the cursor on the index parameter, press and hold down the [ENTER] button, then press a key. The index assigned to that key will be selected.

Indexes that have not been assigned a drum sound display the message "No Assign" when selected.
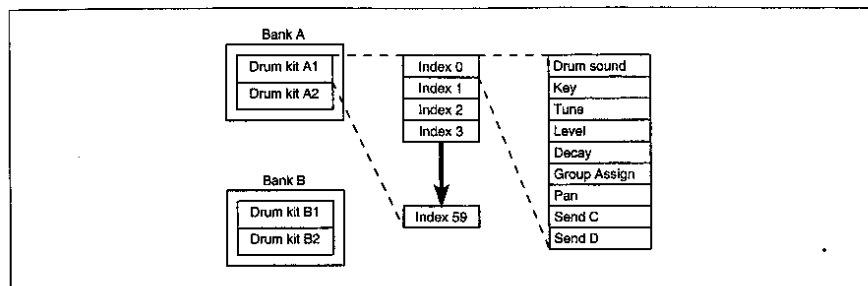
Drum Sound: this parameter allows you to select a drum sound for the currently selected index. If an optional PCM data card that contains drum sounds is inserted, those drum sounds can also be selected. The same drum sound can be selected for any number of indexes. A setting of --- means that no drum sound is selected.

Key: this parameter allows you to select the key (note) that will trigger the index. That is, the X3 keyboard note and corresponding MIDI note. It is not possible to select the same key for two indexes. So, if you want to select a key that is being used by another index, set the other index to a different key first.

As well as using the VALUE slider and the [▲/YES] and [▼/NO] buttons to select keys, you can also use the keyboard. Select the Key parameter so that it is flashing, press and hold down the [ENTER] button, then press a key.

If a key is selected for an index, but no drum sound is assigned to that index, the drum sound assigned to the next key up will play when that key is pressed. The pitch of the drum sound will lowered one semitone. This can be corrected using the Tune parameter.
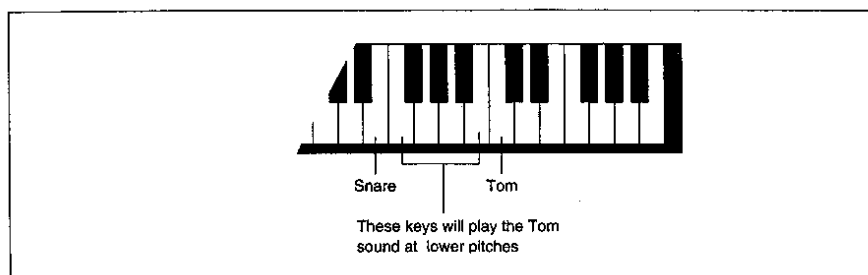
Tune: this parameter allows you to tune individual indexes ±120 units (1 unit = 10 cents, 10 units = 1 semitone, 120 units = 1 octave). For example, you may use the same snare drum sound for two indexes, but tune them differently. Use this parameter to make hi, mid, and low tom-toms from one tom drum sound.

Level: this parameter allows you to set the level of individual indexes. You can use this parameter to set up your drum mix. The overall volume level is determined by the current Program's Oscillator Level parameter.

Decay: this parameter allows you to set the decay time of individual indexes. This parameter works in conjunction with the Program's VDA EG Decay Time parameter. So, depending on that parameter setting, you may find that increasing or decreasing this value has little or no affect.

Group Assign: this parameter determines how an index is played in relation to other indexes.

In an exclusive group (EX1 to EX6), only one index can play at a time (monophonic). If, while an index is playing, another index in that group is triggered, the first index will stop, and the new index will play. This is useful for creating realistic hi-hats. By assigning an open hi-hat and a closed hi-hat to the same exclusive group, the sound of the open hi-hat can be cut short by triggering the closed hi-hat. Just like pressing a real hi-hat pedal.

When SLF is selected, the index will be monophonic. In other words, while a long drum sound such as a crash cymbal is playing, if it is re-triggered, the original cymbal sound will be cut short, and the drum sound will play again from the beginning.

Pan: this parameter is used to pan the index between buses A and B. These buses feed the effects processors. See "Effect Placement – 7E" on page 53. When OFF is selected, no signal is sent on buses A and B. The CNT setting means center: signals of equal level are fed buses A and B. This parameter can be used to simulate the stereo spread of a real drum kit with, for example, tom toms panned between the stereo outputs.

Send C, Send D: these parameters are used to set the level of the index sent to buses C and D respectively. These buses feed the effects processors. See "Effect Placement – 7E" on page 53.

Note: *The Program's Pan parameter is ignored when its Oscillator mode is set to DRUMS. In this case, the drum kit Pan parameter specified on LCD screen 7A-4 is used.*

Drum Kit Setup2 – 7B

These parameters allow you to set up a drum kit. Operation is the same as for "Drum Kit Setup1 – 7A" on page 159.

```
7B DRUM A1 #01  >| 7B KEY/TUNE/L  <>| 7B DECAY/ASGN  <>| 7B PAN/SEND    <
105:Timpani        D#4 T+019  L+65   Dcy+00  Asgn:EX1   Pan:CNT C=0 D=0
```

Drum Kit Copy – 7C

This function allows you to copy a drum kit to an internal drum kit.

```
7C Copy D.Kit
ROM1  →   A2 OK?
```

LCD	Parameter	Range	Description
7C	Drum Kit Source	A1, A2, B1, B2 C1, C2, D1, D2 ROM 1 ~ 8	Select the source drum kit
	Drum Kit Destination	A1, A2, B1, B2	Select the destination drum kit
	OK to Copy	OK?	Executes the copy

Drum kits C1, C2, D1, and D2 can be copied only when a PROG/SEQ data card is inserted.

To copy a drum kit, select the source and destination, position the cursor on OK?, then press the [▲/YES] button. The message ""Are You Sure OK?" will appear. Press the [▲/YES] button to copy, or the [▼/NO] button to cancel the function.

Note: *The drum kit at the specified destination will be overwritten when this function is executed. So be careful that you don't overwrite (loose) a valuable drum kit.*

LCD Contrast – 8A

This function allows you to adjust the LCD contrast. When the LCD screen is viewed from a different height or angle, you may need adjust the LCD contrast to maintain good readability.

```
8A LCD CONT
     3
```

LCD	Parameter	Range	Description
8A	LCD Contrast	0 ~ 7	Adjusts the LCD contrast for good readability

If you power on the X3, but cannot see anything on the LCD screen (sometimes caused by extremely low temperatures), press the [GLOBAL] button, then function button [8], and use the VALUE slider or the [▲/YES] and [▼/NO] buttons to adjust the LCD contrast.

Assignable Pedal Setup – 8B

This parameter assigns a function to the ASSIGNABLE PEDAL/SW.

```
8B ASGN PEDAL
  Scale Switch
```

LCD	Parameter	Range	Pedal	Description
8B	Pedal Assign	OFF		No function
		Program Up	F/S	Increment Programs in Program mode and Combinations in Combination mode. When pressed, a corresponding MIDI Program Change message is output.
		Program Down		Decrement Programs in Program mode and Combinations in Combination mode. When pressed, a corresponding MIDI Program Change message is output.
		SEQ start/stop		Start and stop the sequencer. When pressed, the corresponding MIDI Start or Stop message is output.
		SEQ punch in/out		Punch in and punch out the sequencer in Manual Punch In/Out recording.
		Effect 1 on/off		Switch Effect 1 on and off. When pressed, the corresponding MIDI Effect 1 on or off message is output.
		Effect 2 on/off		Switch Effect 2 on and off. When pressed, the corresponding MIDI Effect 2 on or off message is output.
		Scale Switch		Switch between the main and sub scales. See "Keyboard Scale – 2A" on page 148.
		Volume	F/C	Control the X3 volume. When pressed, the corresponding MIDI Volume messages are output.
		Expression		Operates the same as volume. Although, a different MIDI message is output.
		VDF cutoff		Control the VDF Cutoff Frequency parameter. Pressing the foot controller increases the Cutoff Frequency.
		Effect control		Control effect dynamic modulation. When pressed, MIDI Effect Control messages are output. See "Effect 1 Setup – 7A" on page 52.
		Data entry		Adjusts the selected parameter in Program Edit mode, Combination Edit mode, and Sequencer Edit mode, just like using the VALUE slider.

The Pedal column indicates the type of pedal needed for each function. For F/S (footswitch) use a Korg PS-1 foot pedal. For F/C, use a continuous foot controller such as a Korg KVP-002 or EXP-2.

Damper Pedal Polarity – 8C

This parameter allows you to use normally open and normally closed type foot pedals as the damper (sustain) pedal.

```
8C DAMPER POL
  –
```

LCD	Parameter	Range	Description
8C	Damper Pedal Polarity	– +	Korg PS-1 Other pedals

When using a Korg PS-1 foot pedal, set the polarity to –. Other foot pedals may require the + setting. Basically, if the connected foot pedal does not cause notes to sustain while it is pressed, select the other polarity. When no damper pedal is connected, this should be set to –.

Chapter 9: Disk Mode

In this mode you can save and load data to and from the X3's internal floppy disk drive. The floppy disk drive is recessed into the left-hand end cheek of the X3.

What Type of Floppy Disk?

Use only 3.5 inch 2DD type floppy disks with the X3.

Handling Floppy Disks

Observe the following precautions when handling floppy disks.

* Do not open the shutter or touch the surface of a disk.

* Do not transport the X3 with a floppy disk in the disk drive. Vibration may cause the disk drive head to scratch the disk, making it unusable.

* Do not store or place floppy disks near to a television, computer monitor, loudspeaker, power transformer, or any other device that generates a magnetic field. Doing so may render the disk unusable.

* Do not store or place floppy disks in locations subject to extremes of temperature and humidity, direct sunlight, or excessive dust and dirt.

* Do not place objects on top of a floppy disk.

* Always return disks to their protective cases after use.

Write Protect Tab

A disk's write protect tab allows you to protect valuable data from being accidentally overwritten. Use a pen or other pointed object to set the tab as shown below.

When the hole is uncovered, data **cannot** be saved to disk – **protected.**

When the tab covers the hole, data **can** be saved to disk – **unprotected.**
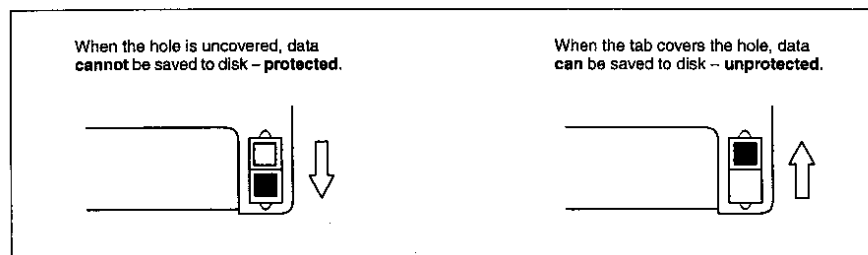
Inserting a Floppy Disk

Insert the disk into the disk drive label side up, shutter first. Push it in until it clicks into place. Do not force disks into the drive. Make sure that you hold the disk straight while inserting it.
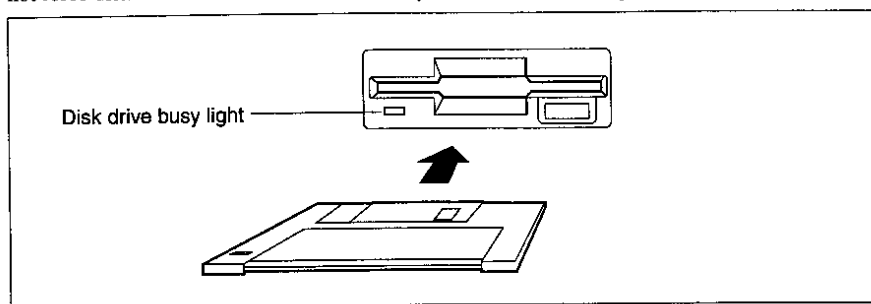
Ejecting a Floppy Disk

Before ejecting a disk, make sure that the disk drive busy light is off, and that no "Loading" or "Saving" messages are shown on the LCD screen. Then, press the eject button, and remove the disk.
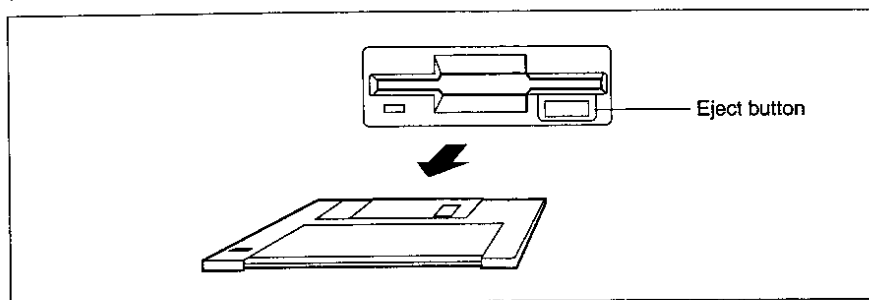
Disk Drive Head Cleaning

If, after a prolonged period of use, disk save and load errors become frequent, the disk drive head may need cleaning. This can be done using a good-quality fluid-type head cleaning kit for 3.5 inch DD (double-sided) disk drives. Do not use a cleaning kit intended for single-sided disk drives.

1) Moisten the cleaning disk with cleaning fluid.

2) Insert the cleaning disk into the disk drive.

3) Execute any type of load function. An error message will appear. This is normal.

4) After approximately 10 seconds, eject the disk.

Do not use the disk drive for about 5 minutes.

X3 File Types

The X3 has four file types:

File Type		File Contents		File Extension
1	Program/Combination/Global	Programs	A00 ~ A99, B00 ~ B99	.PCG
		Combinations	A00 ~ A99, B00 ~ B99	
		Drum kits	A1, A2, B1, B2	
		Global settings		
2	Sequencer	Songs	0 ~ 9	.SNG
		Patterns	00 ~ 99	
3	MIDI Exclusive data	MIDI Exclusive data		.EXL
4	SMF (Standard MIDI File)	1 SMF format song		.MID

Program/Combination/Global: this type of file contains 200 Programs from banks A and B, 200 Combinations from banks A and B, four drum kits, and the Global mode settings.

The LCD contrast and memory protect function settings are not saved in this file.

Sequencer: this type of file contains 10 songs and 100 patterns.

MIDI Exclusive Data: this type of file allows you to use the X3 as a MIDI data recorder. It can be used to store MIDI Exclusive data from external MIDI devices onto X3 floppy disks.

SMF (Standard MIDI File): this type of file contains songs in the SMF format. This format can be read by many different sequencers, making it ideal for transferring songs between systems. You can save X3 sequencer songs in the SMF (Standard MIDI File) format. The X3 can also read SMF format songs from third party suppliers.
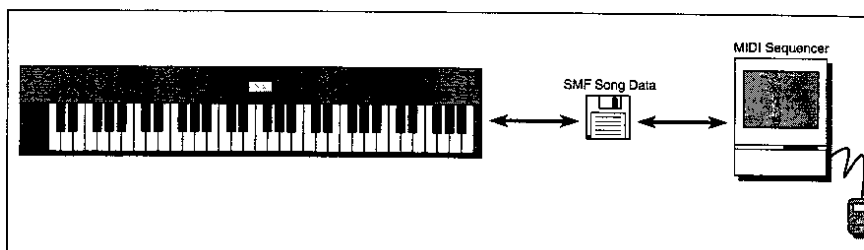
SMF songs can be transferred to and from various computers using 720 KB 2DD floppy disks.

Entering Disk Mode

1) Press the [DISK] button.

The LCD screen should look something like the one shown below.

```
        1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16


DISK    1A Load ALL
        Directory     OK?
```
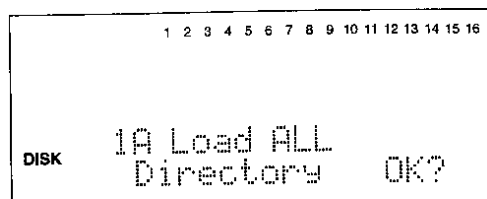
Loading & Saving Notes

Important: Do not attempt to eject a floppy disk while a "Loading" or "Saving" message is shown. Doing so may damage the X3's disk drive. Wait until a "Completed" message is shown.

New Disks: new floppy disks, and disks that have been used on other equipment must be formatted before you can save data to them. See "Format Disk – 8A" on page 180.

Directory: when you insert a disk or change disks, load functions will display "Directory", and "OK?" will flash on the LCD screen. At this point, the X3 does not know what files are on the disk. Press the [▲/YES] button, and the X3 will read the disk. Available files can then be selected using the VALUE slider or the [▲/YES] and [▼/NO] buttons.

Valuable Data: existing X3 data will be overwritten (lost) when you use the various load functions. Make sure that you have any valuable data saved to disk or card.

Memory Protect: if a Program, Combination, or Sequencer memory protect function is set on, the respective data cannot be loaded from floppy disk into the X3. See "Program Memory Protect – 4A" on page 154, "Combination Memory Protect – 4B" on page 154, and "Sequencer Memory Protect – 4C" on page 154.

Disk Write Protect: make sure that the floppy disk's write protect tabs are set to unprotected before attempting to save data. See "Write Protect Tab" on page 164.

Always Name Files: if you save a file with the same name as that of a file already stored on a disk, the existing file will be overwritten.

File Name Extensions: these are the three characters after the period in a file's name. They are added to file names automatically. You do not have to specify them yourself.

Loading & Saving Errors: when a load or save operation has finished, the message "Completed" should appear. At this point, the floppy disk can be ejected. If an error message appears instead of the "Completed" message, reinsert the disk, and try again. See "Disk Mode Error Messages" on page 185.

Naming Files

The following characters are available:

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

Names can be up to eight characters long, but with no spaces within the name.

Load All Data – 1A

This function allows you to load a .PCG (Program/Combination/Global) file and a .SNG (Sequencer) file simultaneously, both files must have the same name. Both files can be saved to floppy disk with the same name using the "Save All Data – 3A" function on page 173.

```
1A Load ALL
FACTORY1    OK?
```

LCD	Parameter	Range	Description
1A-1	Load All Data	Files on disk	Select a file name (.PCG and .SNG files with same name)
	OK to Load	OK?	Executes the load function

1) Insert a floppy disk that contains the data into the disk drive.

   The message "Directory OK?" will appear.

2) Press the [▲/YES] button.

3) Use the VALUE slider or [▲/YES] and [▼/NO] buttons to select a name.

4) Position the cursor on OK?

5) Press the [▲/YES] button.

6) If you are sure that you want to load the data, press the [▲/YES] button again. Press the [▼/NO] button to cancel the function.

   First, the .PCG file is loaded, then the .SNG file. If either file cannot be found, an error message will appear.

   When finished, the message "Completed" will appear.

Load P/C/G Data – 1B

This function allows you to load a .PCG (Programs/Combinations/Global settings) file from floppy disk.

```
1B Load P/C/G
FACTORY1    OK?
```

LCD	Parameter	Range	Description
1B-1	Load P/C/G	Files on disk	Select a file
	OK to Load	OK?	Executes the load function

1) Insert a floppy disk that contains the data into the disk drive.

   The message "Directory OK?" will appear.

2) Press the [▲/YES] button.

3) Use the VALUE slider or [▲/YES] and [▼/NO] buttons to select a file.

4) Position the cursor on OK?

5) Press the [▲/YES] button.

   While the file is being loaded, the message "Now Loading .PCG" is shown.

   When finished, the message "Completed" will appear.

Load Sequencer Data – 1C

This function allows you to load a .SNG (10 songs, 100 patterns) file from floppy disk.

```
1C Load SONG
FACTORY1    OK?
```

LCD	Parameter	Range	Description
1B-1	Load SNG	Files on disk	Select a file
	OK to Load	OK?	Executes the load function

1) Insert a floppy disk that contains the data into the disk drive.

   The message "Directory OK?" will appear.

2) Press the [▲/YES] button.

3) Use the VALUE slider or [▲/YES] and [▼/NO] buttons to select a file.

4) Position the cursor on OK?

5) Press the [▲/YES] button.

   While the file is being loaded, the message "Now Loading .SNG" is shown.

   When finished, the message "Completed" will appear.

Load 1 Combination – 2A

This function allows you to load 1 Combination from a .PCG file. You may need to load the Programs used by the Combination Timbres too. See "Load 1 Program – 2B" on page 170.

```
2A Load 1 CMBI  >  2A CombiName0   <
FACTORY1           A00 → B00    OK?
```

LCD	Parameter	Range	Description
2A-1	Load 1 Combination	Files on disk	Select a file
2A-2	Combination to Load	A00 – A99, B00 – B99	Select a Combination to load
	Destination	A00 – A99, B00 – B99	Select the destination
	OK to Load	OK?	Executes the load function

1) Insert a floppy disk that contains the data into the disk drive.

   The message "Directory OK?" will appear.

2) Press the [▲/YES] button.

3) Use the VALUE slider or [▲/YES] and [▼/NO] buttons to select a file.

4) Press the [→] button.

5) Select the Combination to load.

   The X3 may take a few seconds to check what Combinations are available on disk. After which, names of available Combinations will be shown.

6) Select the destination.

7) Position the cursor on OK?

8) Press the [▲/YES] button.

   While the Combination is being loaded, the message "Now Loading…" is shown.

   When finished, the message "Completed" will appear.

Load 1 Program – 2B

This function allows you to load 1 Program from a .PCG file. If the Program uses a drum kit, you'll have to load that too. See "Load 1 Drum Kit – 2E" on page 172.

```
2B Load 1 PROG  >  2B ProgName00  <
FACTORY1           A00 ÷ B00    OK?
```

LCD	Parameter	Range	Description
2B-1	Load 1 Program	Files on disk	Select a file
2B-2	Program to Load	A00 ~ A99, B00 ~ B99	Select a Program to load
	Destination	A00 ~ A99, B00 ~ B99	Select the destination
	OK to Load	OK?	Executes the load function

1) Insert a floppy disk that contains the data into the disk drive.

   The message "Directory OK?" will appear.

2) Press the [▲/YES] button.

3) Use the VALUE slider or [▲/YES] and [▼/NO] buttons to select a file.

4) Press the [→] button.

5) Select the Program to load.

   The X3 may take a few seconds to check what Programs are available on disk. After which, names of available Programs will be shown.

6) Select the destination.

7) Position the cursor on OK?

8) Press the [▲/YES] button.

   While the Program is being loaded, the message "Now Loading…" is shown.

   When finished, the message "Completed" will appear.

Load 1 Song – 2C

This function allows you to load 1 song from a .SNG file. You may need to load some patterns too. In this case, load the patterns first. See "Load 1 Pattern – 2D" on page 172.

```
2C Load 1 SONG  >  2C SongName00 <
FACTORY1           SONG0→SONG0 OK?
```

LCD	Parameter	Range	Description
2C-1	Load 1 Song	Files on disk	Select a file
2C-2	Song to Load	SONG1 ~ SONG9	Select a song to load
	Destination	SONG1 ~ SONG9	Select the destination song
	OK to Load	OK?	Executes the load function

1) Insert a floppy disk that contains the data into the disk drive.

    The message "Directory OK?" will appear.

2) Press the [▲/YES] button.

3) Use the VALUE slider or [▲/YES] and [▼/NO] buttons to select a file.

4) Press the [→] button.

5) Select the song to load.

    The X3 may take a few seconds to check what songs are available on disk. After which, names of available songs will be shown.

6) Select the destination.

7) Position the cursor on OK?

8) Press the [▲/YES] button.

    While the song is being loaded, the message "Now Loading…" is shown.

    When finished, the message "Completed" will appear.

Load 1 Pattern – 2D

This function allows you to load 1 pattern from a .SNG file.

```
2D Load 1 PAT   >  2D Load 1 PAT   <
  FACTORY1         P00 → P00    OK?
```

LCD	Parameter	Range	Description
2D-1	Load 1 Pattern	Files on disk	Select a file
	Pattern to Load	P00 ~ P99	Select a pattern to load
2D-2	Destination	P00 ~ P99	Select the destination pattern
	OK to Load	OK?	Executes the load function

1) Insert a floppy disk that contains the data into the disk drive.

   The message "Directory OK?" will appear.

2) Press the [▲/YES] button.

3) Use the VALUE slider or [▲/YES] and [▼/NO] buttons to select a file.

4) Press the [→] button.

5) Select the pattern to load.

6) Select the destination.

7) Position the cursor on OK?

8) Press the [▲/YES] button.

   While the pattern is being loaded, the message "Now Loading…" is shown.

   When finished, the message "Completed" will appear.

Load 1 Drum Kit – 2E

This function allows you to load 1 drum kit from a .PCG file.

```
2E Load 1 DRUM  >  2E Load 1 DRUM  <
  FACTORY1         KitA1→KitA1 OK?
```

LCD	Parameter	Range	Description
2E-1	Load 1 Drum Kit	Files on disk	Select a file
	Drum Kit to Load	A1, A2, B1, B2	Select a drum kit to load
2E-2	Destination	A1, A2, B1, B2	Select the destination drum kit
	OK to Load	OK?	Executes the load function

1) Insert a floppy disk that contains the data into the disk drive.

   The message "Directory OK?" will appear.

2) Press the [▲/YES] button.

3) Use the VALUE slider or [▲/YES] and [▼/NO] buttons to select a file.

4) Press the [→] button.

5) Select the drum kit to load.

6) Select the destination.

7) Position the cursor on OK?

8) Press the [▲/YES] button.

   While the drum kit is being loaded, the message "Now Loading…" is shown.

   When finished, the message "Completed" will appear.

Save All Data – 3A

This function allows you to save all data to floppy disk. That is, a .PCG (Program/Combination/Global) file and a .SNG (Sequencer) file simultaneously. Both files will be saved with the same name (different file extensions).

```
3A Save ALL
FACTORY1    OK?
```

LCD	Parameter	Range	Description
3A-1	Save All Data		Name the files (.PCG and .SNG files will use same name)
	OK to Save	OK?	Executes the save function

1) Insert a formatted X3 floppy disk into the disk drive.

2) Use the [←] and [→] cursor buttons to position the cursor, and the VALUE slider or [▲/YES] and [▼/NO] buttons to select characters. See "Naming Files" on page 167.

3) Position the cursor on OK?

4) Press the [▲/YES] button.

First, the .PCG file is saved, then the .SNG file.

When finished, the message "Completed" will appear.

If a file with the same name already exists on the disk, the message "PCG(SNG) exists OK?" will appear. In this case, press the [▲/YES] button to save (overwritting the existing file), or the [▼/NO] button to cancel the function.

Save P/C/G Data – 3B

This function allows you to save a .PCG (Programs/Combinations/Global settings) file to floppy disk.

```
3B Save P/C/G
FACTORY1    OK?
```

LCD	Parameter	Range	Description
3B-1	Save P/C/G Data		Name the file
	OK to Save	OK?	Executes the save function

1) Insert a formatted X3 floppy disk into the disk drive.

2) Use the [←] and [→] cursor buttons to position the cursor, and the VALUE slider or [▲/YES] and [▼/NO] buttons to select characters. See "Naming Files" on page 167.

3) Position the cursor on OK?

4) Press the [▲/YES] button.

While the data is being saved, the message "Now Saving..." is shown.

When finished, the message "Completed" will appear.

If a file with the same name already exists on the disk, the message "PCG(SNG) exists OK?" will appear. In this case, press the [▲/YES] button to save (overwritting the existing file), or the [▼/NO] button to cancel the function.

Save Sequencer Data – 3C

This function allows you to save a .SNG (10 songs, 100 patterns) file to floppy disk.

```
3C Save SONG
FACTORY1    OK?
```

LCD	Parameter	Range	Description
3B-1	Save Sequencer Data		Name the file
	OK to Save	OK?	Executes the save function

1) Insert a formatted X3 floppy disk into the disk drive.

2) Use the [←] and [→] cursor buttons to position the cursor, and the VALUE slider or [▲/YES] and [▼/NO] buttons to select characters. See "Naming Files" on page 167.

3) Position the cursor on OK?

4) Press the [▲/YES] button.

While the Sequencer data is being saved, the message "Now Saving..." is shown.

When finished, the message "Completed" will appear.

Load MIDI Exclusive Data – 4A

This function allows you to transmit MIDI Exclusive data that is stored on an X3 floppy disk to other MIDI devices. The Exclusive data for a particular MIDI device must have been saved to disk first. For example, you cannot send MIDI Exclusive data saved from a drum machine to an effects unit. See "Save MIDI Exclusive Data – 4B" on page 175.

```
4A Load EXCL
MYSETTING   OK?
```

LCD	Parameter	Range	Description
4A-1	Load EXCL	Files on disk	Select an Exclusive data file to load
	OK to Load	OK?	Executes the load function

1) Connect the X3's MIDI OUT to the receiving device's MIDI IN.

2) Insert the floppy disk that contains the data you want to send.

The message "Directory OK?" will appear.

3) Press the [▲/YES] button.

4) Select the MIDI Exclusive file that you want to send.

5) Position the cursor on OK?

6) Press the [▲/YES] button.

The message "Transmitting..." will appear.

When finished, the message "Completed" will appear.

Save MIDI Exclusive Data – 4B

This function allows you to use the X3 as a MIDI data recorder. It can be used to store MIDI Exclusive data from external MIDI devices onto X3 floppy disks.

```
4B Save EXCL    >  4B Save EXCL    <
Awaiting data      MYSETTING    OK?
```

LCD	Parameter	Range	Description
4B-1	Awaiting data		Exclusive data receive
4B-2	Name		Name the EXCL file to be saved
	OK to Save	OK?	Executes the Save function

1) Connect the MIDI OUT of the sending device to the X3's MIDI IN.

2) Insert a formatted X3 floppy disk into the disk drive.

3) With this function selected, send the MIDI Exclusive data from the external MIDI device. Refer to the device's operating manual for details about sending MIDI Exclusive data, sometimes referred to as MIDI Bulk Dump.

   When the external device has finished sending its data, the amount of data received will be shown on the X3 LCD screen.

4) Press the [→] cursor button.

5) Use the [←] and [→] cursor buttons to position the cursor, and the VALUE slider or [▲/YES] and [▼/NO] buttons to select characters. See "Naming Files" on page 167.

6) Position the cursor on OK?

7) Press the [▲/YES] button.

8) If you are sure that you want to save the data, press the [▲/YES] button again. The Exclusive data will be saved to floppy disk.

   The message "Now Saving .EXL" will appear.

   When finished, the message "Completed" will appear.

   The "Load MIDI Exclusive Data – 4A" function on page 174 can be used to transmit the Exclusive data back to the external MIDI device.

MIDI Exclusive Notes

For the Load and Save MIDI Exclusive Data functions, MIDI Exclusive data is sent and received regardless of the X3's Global MIDI Channel setting and the Global mode MIDI Exclusive Filter setting.

Up to 64 KB of MIDI Exclusive data can be received and saved by the X3. Free sequencer memory must be more than 52%. If more data is received, the error message "Not Enough Mem" will appear. 64 KB is approximately 21 seconds of continuous data reception.

Load SMF (Standard MIDI File) – 5A

This function allows you to load an SMF (Standard MIDI File) into the X3. This is useful when you want to use a MIDI song that was recorded on a different type of MIDI sequencer system. SMF songs can be transferred to and from various computers using 720 KB 2DD floppy disks.

```
5A Load SMF      > 5A Load SMF      <
  STDMIDIF.MID     →Song 0      OK?
```

LCD	Parameter	Range	Description
5A-1	Load SMF	Files on disk	Select an SMF file to load
5A-2	Load Destination	0 ~ 9	Select the load destination
	OK to Load	OK?	Executes the load function

1) Insert the floppy disk that contains the SMF carefully into the disk drive.

2) Use the VALUE slider or [▲/YES] and [▼/NO] buttons to select the SMF that you want to load. X3 SMF files use the file extension "MID". However, other manufacturers may use something else.

3) Press the [→] button.

4) Select the load destination.

5) Position the cursor on OK?

6) Press the [▲/YES] button.

While the file is being loaded, the message "Now Loading..." is shown.

When finished, the message "Completed" will appear.

Save SMF (Standard MIDI File) – 5B

This function allows you to save an X3 song in the SMF (Standard MIDI File) format. The SMF format can be read by many different sequencers, making it ideal for transferring songs between systems.

```
5B Save SMF      >  5B Save SMF    <
SONG0:YOURSONG      Format0    OK?
```

LCD	Parameter	Range	Description
5B-1	Save SMF	Song 0 ~ 9	Select a song to save in SMF format
	Name		Name the SMF file to be saved
5B-2	SMF Format	0, 1	Select an SMF format
	OK to Save	OK?	Executes the save function

1) Make sure that the floppy disk's write protect tabs are set to unprotected. See "Write Protect Tab" on page 164.

2) Insert the floppy disk carefully into the disk drive.

3) Use the VALUE slider or [▲/YES] and [▼/NO] buttons to select the song that you want to save.

4) If you want to change the file name, use the [←] and [→] cursor buttons to position the cursor within the existing name, and the VALUE slider or [▲/YES] and [▼/NO] buttons to select characters. See "Naming Files" on page 167. In addition to the characters shown on page 167, lower case roman characters and some symbols can be used. When you select songs, the first eight characters of the song name are displayed, these will be used as the file name when you save.

Note: *X3 song names can be up to 10 characters long. However, file names can use 8 characters only. So the last two characters of a 10 character song name are not used.*

5) Press the [→] cursor button.

6) Select either format 0 or format 1.

   Format 0: MIDI data from the 16 tracks is merged into one track.

   Format 1: MIDI data is saved as individual tracks, maintaining track integrity.

   Normally, format 1 should be selected. If, however, the MIDI device that you are transferring to cannot read format 1, use format 0.

7) Position the cursor on OK?

8) Press the [▲/YES] button.

   If a file with the same name already exists, the message "File Exists" will appear. Press the [▲/YES] button to overwrite the existing file, or the [▼/NO] button to cancel the function.

   While the file is being saved, the message "Now Saving .MID…" is shown.

   When finished, the message "Completed" will appear.

Note: *Songs that contain a lot of patterns can become quite large when saved in SMF format. In some case you may not be able to load the SMF back into the X3.*

Rename File - 6A

This function allows you to rename floppy disk files.

```
6A Rename File
FACTORY1.PCS OK?
```

LCD	Parameter	Range	Description
6A-1	Rename File	Files on disk	Select a file to rename
	OK to Rename	OK?	Executes the rename function

1) Make sure that the floppy disk's write protect tabs are set to unprotected. See "Write Protect Tab" on page 164.

2) Insert the floppy disk carefully into the disk drive.

   The message "Directory OK?" will appear.

3) Press the [▲/YES] button.

4) Use the VALUE slider or [▲/YES] and [▼/NO] buttons to select the file that you want to rename.

   Note: *When selecting files, pay attention to file names and extensions. Remember that when you Save All Data, .PCG and .SNG files are saved with the same name. See "X3 File Types" on page 166.*

5) Press the [→] cursor button.

6) Use the [←] and [→] cursor buttons to position the cursor within the existing name, and the [▲/YES] and [▼/NO] buttons to select characters. See "Naming Files" on page 167.

   Important: *Do not change the three letter extension at the end of the file name (the three characters after the period). If you do, the X3 will not be able to read the file. The file extension can be changed back to something that the X3 can read using an MS-DOS based personal computer.*

7) Position the cursor on OK?

8) Press the [▲/YES] button.

   While the file is being renamed, the message "Processing..." is shown.

   If a file already exists with the name you specify, the message "Same name found" appears. In this case, choose another name.

Delete File – 6B

This function allows you to delete floppy disk files.

```
6B Delete File      6B Delete File
  Directory   OK?  FACTORY1.PCS OK?
```

LCD	Parameter	Range	Description
6B-1	Delete File	Files on disk	Select a file to delete
	OK to Delete	OK?	Executes the delete file function

1) Make sure that the floppy disk's write protect tabs are set to unprotected. See "Write Protect Tab" on page 164.

2) Insert the floppy disk carefully into the disk drive.

3) Press the [▲/YES] button.

4) Use the [▲/YES] and [▼/NO] buttons to select the file that you want to delete.

   Note: *When selecting files, pay attention to file names and extensions (the three characters after the period). Remember that when you Save All Data, .PCG and .SNG files are saved with the same name. See "X3 File Types" on page 166.*

5) Position the cursor on OK?

6) Press the [▲/YES] button.

7) The message "Are You Sure OK?" will appear. Press the [▲/YES] button to delete the file, or the [▼/NO] button to cancel the function.

   While the file is being deleted, the message "Processing…" is shown.

   When finished, the message "Completed" will appear.

Set Date – 7A

This function allows you to date stamp files. The date must be set before you save the file.

A file's date cannot be displayed on the X3. However, this function may be useful if you manage your X3 floppy disk files using an MS-DOS based personal computer.

```
7A Set Date
JAN - 01 - 1980
```

LCD	Parameter	Range	Description
	Month	JAN ~ DEC	Set the month
7A-1	Day	01 ~ 31	Set the day
	Year	1980 ~ 2079	Set the year

Set Time – 7B

This function allows you to time stamp files. The time must be set before you save the file.

A file's time cannot be displayed on the X3. However, this function may be useful if you manage your X3 floppy disk files using an MS-DOS based personal computer.

```
7B Set Time
  00 : 00
```

LCD	Parameter	Range	Description
7B-1	Hour	0 ~ 23	Set the hour
	Minute	00 ~ 59	Set the minute

Format Disk – 8A

This function allows you to format a floppy disk. Floppy disks have to be formatted before you can save data to them. Formatting prepares the disk so that it is ready to store X3 data.

Use only 3.5 inch 2DD type floppy disks with the F3.

```
8A Format Disk
           OK?
```

LCD	Parameter	Range	Description
8A-1	Format Disk		Format a floppy disk
	OK to Format	OK?	Executes the disk format function

1) Make sure that the floppy disk's write protect tabs are set to unprotected. See "Write Protect Tab" on page 164.

2) Insert the floppy disk carefully into the disk drive.

   Note: *Any data already stored on the floppy disk will be deleted during disk formatting. Now might be a good time to check the disk contents to see if there is any data that you want to keep.*

3) Press the [▲/YES] button.

4) The message "Are you Sure OK?" will appear. Press the [▲/YES] button to format the disk, or the [▼/NO] button to cancel the function.

   While disk formatting is in progress, the message "Now Formatting…" is shown. Disk formatting takes approximately two minutes.

   When finished, the message "Completed" will appear. The floppy disk can then be used to save X3 data.

   When you have saved some X3 data to disk, write on the disk label what is stored on the disk.

   Note: *If, instead of the message "Completed", an error message appears, eject the disk, reinsert it, then format it again. If the same error message appears, try another disk. Faulty floppy disks are not uncommon.*

Chapter 10: Data Cards

Using X3 data cards you can expand the number of available Multisounds, experiment with third-party Programs and Combinations, and save your own Programs and sequencer data. See your Korg dealer for more information about available data cards.

PCM Data Cards

PCM data cards typically contain Multisounds. By now, you are probably aware that Multisounds are the basic elements that make up Programs. Hence, increasing your library of Multisounds gives you the power to create some exciting new Programs. Which can, of course, be combined into Combinations, or used in songs. Some PCM data cards also contain drum sounds.

See "Oscillator 1 Setup – 1B" on page 9 for details about selecting PCM data card Multisounds.

PROG/SEQ Data Cards

PROG/SEQ data cards can be either RAM or ROM type cards.

ROM cards typically contain third-party Programs and/or Combinations, and they allow you to expand your Program and Combination library with ease.

RAM cards can be used to save Programs, Combinations, and sequencer data. Although you can also save this data to floppy disk, you have to load it into the X3 before you can use it. Whereas, Programs, Combinations, and sequencer data stored on a RAM card can be accessed at any time (sequencer data can be played, but you must load it for recording and editing).

The following diagram shows how PROG/SEQ data cards can be used:

PROG/SEQ data cards store data in two banks (C, D), and each bank can contain:	100 Programs 100 Combinations 2 Drum kits Global Setup	or	Sequencer data: 10 songs 100 patterns (7,000 events max.)
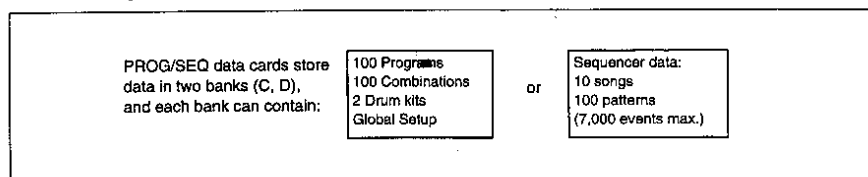
See Global mode pages 156 and 157 for details about saving and loading Programs, Combinations, and sequencer data.

The following table shows where the various PROG/SEQ data card load and save functions are located:

Type of Data	Save	Load
100 Programs 100 Combinations 2 Drum kits Global Setup	See "Save Programs & Combinations to Card – 6C" on page 157.	See "Load Programs & Combinations from Card – 6A" on page 156.
Sequencer data: 10 songs 100 patterns	See "Save Sequencer Data to Card – 6D" on page 158.	See "Load Sequencer Data from Card – 6B" on page 156.
1 Program	See "Program Write – 8A" on page 30.	See "Selecting Programs" on page 3.
1 Combination	See "Selecting Combinations" on page 33.	See "Combination Write – 8A" on page 49.
1 Drum kit	See "Drum Kit Copy – 7C" on page 161.	See "Oscillator 1 Setup – 1B" on page 9.

RAM Card Write Protect Switch

Data on RAM cards can be protected by setting the RAM card's write protect switch to ON. In this case, data cannot be saved to the card, and existing card data is protected against accidental erasure.

Set the RAM card's write protect switch to OFF when you want to save data to the card.

The write protect switch is located on the side of the RAM card.

Inserting & Removing Data Cards

- Insert data cards with the label facing upwards.
- Do not insert or remove data cards while the X3 is producing sound.
- Do not insert PROG/SEQ data cards in the PCM DATA card slot, and vice versa.

Formatting RAM cards

A new RAM card is formatted automatically the first time that you save data to it. Therefore, there is no dedicated RAM card format function.

Using the "Save Programs & Combinations to Card – 6C" on page 157 or "Save Sequencer Data to Card – 6D" on page 158 function will format a new RAM data card. Individual Programs or Combinations cannot be written to a card that has not been formatted using one of these functions.

Ram Card Battery

RAM cards need a long-life lithium battery to be able to store data. A battery, type CR2016, should be included when you buy a RAM card, however, you will have to install it yourself. See below for details.

Installing the RAM Card Battery

1) Turn the RAM card over so that its contacts are facing down.
2) Locate the battery slot in the card.
3) Install the battery so that its positive (+) side if facing upwards.

Replacing the RAM Card Battery

We recommend that you replace the RAM card battery once every year to protect the data stored on the card. Battery life is reduced if stored at temperatures above 40°C (104°F). CR2016 type lithium batteries are available from your Korg dealer.

1) Power on the X3, and insert the RAM card into the PROG/SEQ slot.
2) Remove the old battery.
3) Insert the new battery.
4) Remove the RAM card.

If you replace the battery while the RAM card is not inserted in a powered on X3, its data will be lost.

184   *Appendix.*

Trouble	What To Do
Cannot write a Program or Combination.	Is the Program or Combination memory protect function set to ON. See "Program Memory Protect – 4A" on page 154.
Some drum sounds in a Program cannot be played.	Does the drum kit use drum sounds from a PCM data card that is not inserted.
Keys do not play the specified drum sounds.	Is the Transpose function set to something other than +00? See "Transpose – 1B" on page 146.
	Is the oscillator octave parameter set to 8'?
Cannot play GM compatible song data.	Make sure that the song data is GM compatible.
	If you are sending GM compatible song data to the X3 via MIDI, you must conform the selected X3 song to GM. See "GM Song Mode – 8F" on page 144.

Floppy Disk & Data Card Troubleshooting

Trouble	What To Do
Cannot format a floppy disk.	Are you using 3.5 inch 2DD type floppy disks?
	Make sure that the disk is inserted correctly.
	Make sure that the disk's write protect tabs are not set to protect.
Cannot save data to floppy disk.	Make sure that the disk is inserted correctly.
	Make sure that the disk's write protect tabs are not set to protect.
Cannot load data from floppy disk.	Make sure that the disk is inserted correctly.
	Does the disk contain any data?
	Is the memory protected. See "Program Memory Protect – 4A" on page 154, "Combination Memory Protect – 4B" on page 154, and "Sequencer Memory Protect – 4C" on page 154
Cannot save data to card.	Make sure that the card's write protect switch is not set to protect.
	Make sure that you are not using a ROM card. You can save data to RAM type cards only.
	Make sure that the card is inserted correctly.
	When a Program or Combination is saved to a card bank, that bank is formatted for storing Programs and Combinations. Are you trying to save sequencer data to such a card bank?
Cannot load data from card.	Make sure that the card is inserted correctly.
	Does the card contain any data?
	Is the memory protected. See "Program Memory Protect – 4A" on page 154, "Combination Memory Protect – 4B" on page 154, and "Sequencer Memory Protect – 4C" on page 154

General Error Messages

Error Message	Meaning
Battery Low (Internal)	The voltage of the internal battery is low. Please contact your Korg dealer to have the battery replaced. Do not attempt to replace the battery yourself.
Memory Protected	The memory into which you are trying to load data is protected. See "Program Memory Protect – 4A" on page 154, "Combination Memory Protect – 4B" on page 154, and "Sequencer Memory Protect – 4C" on page 154.
Write Error	Data was not saved to card correctly. Reinsert the card and try again.

Sequencer Mode Error Messages

Error Message	Meaning
Beat or Length Mismatch	You are trying to place a track or pattern data into a track with a different time signature, or to bounce or copy patterns of different lengths.
Blank Measure	No data in the specified source measure.
Blank Pattern	No data in the specified source pattern.
Blank Track	No data in the specified source track.
Can't Open Pat	The pattern cannot be opened.
Can't Undo	Cannot perform undo due to insufficient free memory.
Card Memory Full	The sequencer data is to large to save to a PROG/SEQ card. Internal sequencer memory capacity is 32,000 events. PROG/SEQ cards can store 7,000 events.
Measure Overflow	The operation you are trying will exceed the 999 measure limit for a track.
Memory Full	The total number of events used by all songs and patterns has reached 32,000 – the maximum.
Mismatch B Resol	Song's base resolution is different.
No Events Exist	The track or pattern selected for event editing does not contain any data.
Ocpd by Pat	A pattern overlaps into the measure that you have specified for punch in/out or the measure that you have specified for a measure edit destination.
Pat Across Src	If you are copying from a track, the specified source contains part of a pattern. If you are executing a get from track function, the specified source contains part or all of a pattern.
Pat Confl Event	You are trying to bounce a track that contains a pattern with a track that contains an event or pattern in the same measure.
Pattern Used in Song	The pattern cannot be loaded because it is used in a song.
Song Not Empty	The selected song contains data.
Src Across Dst	While copying measures within a track, the source and destination data overlaps.
Track Protected	The selected track is protected. See "Track Status – 1B" on page 102.

Disk Mode Error Messages

Error Message	Meaning
Can't Make File	There are 112 files on the disk (maximum).
Data Error	The data that was saved to disk or read from disk is incomplete or meaningless. Or the disk is not for use with the X3. Data errors also occur if: a disk is scratched, the wrong disk type is used, the disk drive heads are dirty.
	If a data error message appears, try the following: Eject the disk, reinsert it, then try again. Try a new floppy disk. Clean the disk drive. See "Disk Drive Head Cleaning" on page 165.
Disk Type Error	The disk is not for use with the X3.
Disk Full	The disk is full. Use another disk.
Drive Not Ready	No disk in the disk drive.
File Protected	File is set to read only.
File Type Error	The file has a .PCG, .SNG, .EXL file extension, but the file format is different.

Error Message	Meaning
Illegal SMF FMT	The file that you have loaded is not a format 0 or format1 SMF.
Illegal SMF Divi	The file that you have loaded is timecode based.
Illegal SMF Data	The SMF that you have loaded contains some erorrs.
Measure Overflow	The SMF that you are trying to load contains more than 999 measures.
Memory Full	When loading SMF, sequencer memory becomes full.
Memory Overflow	While saving MIDI data via MIDI filer, the received data exceeded 64kbytes.
No Combination	You have tried to Load 1 COMB from an i2 or i3 .PCG file.
No Data	No events in the loaded SMF
	No MIDI data for MIDI Filer to save.
No File	The file specified does not exist on the disk.
Not Enough Mem	There is not enough memory for the MIDI filer to save the data.
Same File	A file with that name already exists.
Song Data Error	When saving or loading sequencer data, the data contains an error.
Src Is Empty	When saving SMF, there are no track events.
Tr Memory Over	The SMF that you are trying to load contains a track with more than 16,000 events.
Tr Number Over	The SMF that you are trying to load contains more than 16 tracks.
Write Protected	The disk's write protect tabs are set to the protected position. See "Write Protect Tab" on page 164.

Global Mode Error Messages

Message	Meaning
CARD Battery Low	The voltage of the card battery is low. Replace the battery. See "Ram Card Battery" on page 182.
Card Format Mismatch	The data that you are trying to load does not exist on the card.
Combi/Prog in the Bank (C/D)	The card bank from which you tried to load sequencer data contains Programs and/or Combinations.
Invalid (Unformatted) CARD	The card does not contain any data, or it is not for use with the X3.
Invalid Bank (C/D)	The card bank does not contain any data.
No CARD Inserted	No card is inserted.
ROM Protected	You cannot write to a ROM card, or a RAM card whose write protect switch is set to ON.
SEQ in the Bank (C/D)	The card bank from which you tried to load Programs, Combinations, and/or drum kits contains sequencer data.

Specifications

Tone Generation System	AI² (Advanced Integrated) Synthesis
Tone Generator	Single mode: 32 voice, 32 oscillators
	Double mode: 16 voice, 32 oscillators
	Dynamic voice allocation
Keyboard	61 keys. Initial and after touch sensitivity
PCM Waveform Memory	6MB
Effects	Two digital multi-effect processors
Programs	336 (200 internal RAM, 136 internal ROM)
Combinations	200 internal RAM
Sequencer	16 tracks
	10 songs
	100 patterns
	32,000 event capacity
Control Inputs	Damper pedal
	Assignable pedal
Outputs	L/MONO, R
	PHONES
Floppy Disk Drive	3.5 inch 2DD
Card Slots	PCM DATA
	PROG/SEQ DATA
MIDI Connections	IN, OUT, THRU
LCD	Custom LCD with backlight
Power Consumption	20 W
Dimensions (W x D x H)	1055 x 338.3 x 96 mm (41.5 x 15.3 x 3.8 inch)
Weight	10 kg (22 lbs)

Appearance and specifications subject to change without notice.

Options

Cards	SRC-512 RAM card
	PCM data card
	ROM card
Foot Pedals	PS-1 pedal switch
	PS-2 pedal switch
	DS-1 Damper Pedal
	KVP-002 Volume Pedal
	EXP-2 Expression Pedal
	FC6 Foot Controller

MIDI Implementation Chart

Function		Transmitted	Recognized	Remarks
Basic Channel	Default	1 ~ 16	1~16	Memorized
	Changed	1 ~ 16	1~16	
Mode	Default		3	
	Messages	X	X	
	Altered	*********************		
Note Number:		24 ~ 108	0~127	When sequencer data is sent 0 ~ 127
	True Voice	*********************	0~127	
Velocity	Note On	O 9n, V=1 ~ 127	O 9n, V=1 ~ 127	When sequencer data is sent 2 ~ 126
	Note Off	X	X	
After touch	Keys	O	O	Seq data single key *A
	Chs	O	O	*A
Pitch bend		O	O	*C
Control Change	0, 32	O	O	Bank Select (MSB, LSB) *P
	1, 2	O	O	Modulation (pitch, cutoff) *C
	4, 64	O	O	Pedal (scale, damper) *C
	6, 38	O	O	Data Entry (MSB, LSB)
	7, 11	(7 : O, 11 : X)	O	Volume, expression *C
	10, 91, 93	O	O	A:B panpot, send C, D *C
	12, 13	(12 : O, 13 : X)	O	Effect controller 1, 2 *C
	72, 73, 74	X	O	EG time (release, attack), brightness *C
	92 ,94	O	O	Effects 1, 2 on/off *C
	96, 97	X	O	Data Inc, Dec
	100, 101	X	O	RPN (LSB, MSB) *1
	120, 121	X	O	All sound off, Reset all Cntrls
	0 ~ 101	O	O	(Sequencer data)
Program Change		O 0 ~ 127	O 0~127	*P
	True#	*********************	0 ~ 127	0 ~ 99 except bank GM
System Exclusive		O	O	*2 *E
System Common	Song pos	O	O	*3
	Song Sel	O 0 ~ 29	O 0 ~ 29	*3
	Tune	X	X	
System Real Time	Clock	O	O	*3
	Command	O	O	*3
Aux Messages	Local On/Off	X	O	
	All Notes Off	X	O (123~127)	
	Active Sense	O	O	
	Reset	X	X	
Notes		*C, *P, *A, *E: Sent and received when MIDI Filter (Controller, Program Change, After touch, System Exclusive) set to ENA. *1: LSB, MSB = 00,00: pitch bend range, =01,00: fine tune, =02,00: course tune *2 Applies to Inquire message, GM system, master balance, master volume, not Korg Exclusive. *3 When clock set to internal, not sent or received. When set to external, sent and received.		

Mode 1:OMNI ON, POLY   Mode 2:OMNI ON, MONO   O: Yes
Mode 3:OMNI OFF, POLY   Mode 4:OMNI OFF, MONO   X: No

MIDI Data Format

1-2 SYSTEM COMMON MESSAGES

Status (Hex)	Second (Hex)	Third (Hex)	Description
1111 0010 (F2)	0sss ssss (ss)	0ttt tttt (tt)	Song Position Pointer sss ssss : Least significant (LSB) ttt tttt : Most significant (MSB)
1111 0011 (F3)	000s ssss (ss)	---- ----	Song Select s ssss : Song No. = 0~29 (10~29:Card)

Transmits when in Sequencer Mode (Internal Clock)
Then change the Song No. Transmits (Song Select) and Each Track's(Status=EXT.BOTH
[Bank Select].(Program Change].(Volume].(Panpot]. Last of all (Song Position Pointer].

*3 : For Example Time Signature = 4/4. 8/8
tt.ss = 06.10 / Measure

1-3 SYSTEM REALTIME MESSAGES

Status (Hex)	Description	
1111 1000 (F8)	Timing Clock	*4
1111 1010 (FA)	Start	*4
1111 1011 (FB)	Continue	*4
1111 1100 (FC)	Stop	*4
1111 1110 (FE)	Active Sensing	

*4 : Transmits when in Sequencer Mode (Internal Clock)

1-4 UNIVERSAL SYSTEM EXCLUSIVE MESSAGES (DEVICE INQUIRY REPLY)

Byte (Hex)	Description	
1111 0000 (F0)	Exclusive Status	
0111 1110 (7E)	Non Realtime Message	
0000 gggg (0g)	MIDI GLOBAL CHANNEL	(DEVICE ID)
0000 0110 (06)	INQUIRY MESSAGE	
0000 0010 (02)	IDENTITY REPLY	
0100 0010 (42)	KORG ID	(MANUFACTURERS ID)
0011 0101 (35)	X3 ID	(FAMILY CODE (LSB))
0000 0000 (00)		(" " (MSB))
0000 0000 (00)		(MEMBER CODE (LSB))
0000 0000 (00)		(" " (MSB))
0ooo oooo (oo)	ROM No. 1~	(Minor Ver. (LSB))
0000 0000 (00)		(" " (MSB))
0sss ssss (ss)	SOFT VER. 1~	(Major Ver. (LSB))
0000 0000 (00)		(" " (MSB))
1111 0111 (F7)	END OF EXCLUSIVE	

Transmits when INQUIRY MESSAGE REQUEST Received

MIDI IMPLEMENTATION

1. TRANSMITTED DATA

1-1 CHANNEL MESSAGES

Status (Hex)	Second (Hex)	Third (Hex)	Description		EWA
1000 nnnn (8n)	0kkk kkkk (kk)	0100 0000 (40)	Note Off	kkk kkkk=24~108 (61keys+Transpose)	A
1001 nnnn (9n)	0kkk kkkk (kk)	0vvv vvvv (vv)	Note On	kkk kkkk=24~108 (61keys+Transpose) vvv vvvv=1~127	A
1010 nnnn (An)	0kkk kkkk (kk)	0vvv vvvv (vv)	Poly Key Pressure	(Seq Recorded Data)	T.Q
1011 nnnn (Bn)	0000 0000 (00)	0mmm mmmm (mm)	Bank Select(MSB)	(BANK Key. etc) *1,2	P
1011 nnnn (Bn)	0000 0001 (01)	0vvv vvvv (vv)	Modulation 1	(Joy Stick(+Y))	C
1011 nnnn (Bn)	0000 0010 (02)	0vvv vvvv (vv)	Modulation 2	(Joy Stick(-Y))	C
1011 nnnn (Bn)	0000 0100 (04)	0000 0000 (00)	Foot Pedal	(Select Main Scale)	C
1011 nnnn (Bn)	0000 0100 (04)	0111 1111 (7F)	Foot Pedal	(Select Sub Scale)	C
1011 nnnn (Bn)	0000 0110 (06)	0vvv vvvv (vv)	Data Entry (MSB)	(Value Slider)	A
1011 nnnn (Bn)	0000 0111 (07)	0vvv vvvv (vv)	Volume	(Assign Pedal. etc) *1	C
1011 nnnn (Bn)	0000 1010 (0A)	0vvv vvvv (vv)	Panpot	(by A-B Panpot)	C
1011 nnnn (Bn)	0000 1100 (0C)	0vvv vvvv (vv)	Effect Control	(Assignable Pedal)	C
1011 nnnn (Bn)	0010 0000 (20)	0bbb bbbb (bb)	Bank Select(LSB)	(BANK Key. etc) *1,2	P
1011 nnnn (Bn)	0010 0110 (26)	0vvv vvvv (vv)	Data Entry (LSB)	(Value Slider)	A
1011 nnnn (Bn)	0100 0000 (40)	0000 0000 (00)	Hold 1 Off	(Damper Pedal)	C
1011 nnnn (Bn)	0100 0000 (40)	0111 1111 (7F)	Hold 1 On	(Damper Pedal)	C
1011 nnnn (Bn)	0ccc cccc (cc)	0vvv vvvv (vv)	Control Data	(Seq Recorded Data) *1,2	C,Q
			ccc cccc=00~101		
1100 nnnn (Cn)	0ppp pppp (pp)	---- ----	Program Change	(Prog/Comb Change) *1,2	P
1101 nnnn (Dn)	0vvv vvvv (vv)	---- ----	Channel Pressure	(After Touch)	T
1110 nnnn (En)	0bbb bbbb (bb)	0bbb bbbb (bb)	Bender Change	(Joy Stick(X))	C

nnnn : MIDI Channel No.(0~15) Usually Global Channel. When using Sequencer. each track's channel.
and when in Combination Mode, each timbre's channel.
kkkk : Always Global Channel No. (0~15)
vvvv : Value.

EWA = A : Always Enabled
C : Enabled when Control Filter in GLOBAL Mode is EWA
P : Enabled when Program Filter in GLOBAL Mode is EWA
T : Enabled when After Touch Filter in GLOBAL Mode is EWA
Q : Enabled when Sequencer is Playing(Trans).Recording(Receive)
T.Q : T and Q
C.Q : C and Q

*1 : When change the Combination No.. Transmits [Bank Select].[Program Change] of Selected
Combination. and Each Timbre's[Mode+EXT].(Bank Select].[Program Change].[Volume].

*2 :

Program	MIDI Out (Hex)		Combination	MIDI Out (Hex)	
BankA 00~99 :	mm.bb.pp = 00.00.00~63		BankA 00~99 :	mm.bb.pp = 00.00.00~63	
" B 00~99 :	"	00.01.00~63	" B 00~99 :	"	00.01.00~63
" C 00~99 :	"	00.02.00~63	" C 00~99 :	"	00.02.00~63
" D 00~99 :	"	00.03.00~63	" D 00~99 :	"	00.03.00~63
" G 01~/128:	"	38.00.00~7F			
" G 129	"	38.00.00			
" G 130	"	38.00.10			
" G 131	"	38.00.13			
" G 132	"	38.00.20			
" G 133	"	38.00.28			
" G 134	"	38.00.40			
" G 135	"	38.00.18			
" G 136	"	38.00.30			

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2. RECOGNIZED RECEIVE DATA

2-1 CHANNEL MESSAGES

Status (Hex)	Second (Hex)	Third (Hex)	Description	E N A
1000 nnnn (8n)	0kkk kkkk (kk)	0xxx xxxx (xx)	Note Off	A
1001 nnnn (9n)	0kkk kkkk (kk)	0000 0000 (00)	Note Off	A
1001 nnnn (9n)	0kkk kkkk (kk)	0vvv vvvv (vv)	Note On vvv vvvv=1~127	A
1010 nnnn (An)	0kkk kkkk (kk)	0vvv vvvv (vv)	Poly Key Pressure (For Seq Recording) *1	T.Q
1011 nnnn (Bn)	0000 0000 (00)	0mmm mmmm (mm)	Bank Select(MSB)	P
1011 nnnn (Bn)	0000 0001 (01)	0vvv vvvv (vv)	Modulation1 Depth (Pitch Modulation)	C
1011 nnnn (Bn)	0000 0010 (02)	0vvv vvvv (vv)	Modulation2 Depth (Cutoff Modulation)	C
1011 nnnn (Bn)	0000 0100 (04)	00vv vvvv(≤3F)	Foot Pedal Off (Select Main Scale)	C
1011 nnnn (Bn)	0000 0100 (04)	01vv vvvv(≥40)	Foot Pedal On (Select Sub Scale)	C
1011 nnnn (Bn)	0000 0110 (06)	0vvv vvvv (vv)	Data Entry (MSB) (For RPM & DynaMod Slider)	C
1011 nnnn (Bn)	0000 0111 (07)	0vvv vvvv (vv)	Volume (A:B Panpot)	C
1011 nnnn (Bn)	0000 1010 (0A)	0vvv vvvv (vv)	Panpot	C
1011 nnnn (Bn)	0000 1011 (0B)	0vvv vvvv (vv)	Expression	C
1011 nnnn (Bn)	0000 1100 (0C)	0vvv vvvv (vv)	Effect Control (Dyna Mod Src= PEDAL1)	C
1011 nnnn (Bn)	0000 1101 (0D)	0vvv vvvv (vv)	Effect Control (Dyna Mod Src= PEDAL2) *1	P
1011 nnnn (Bn)	0010 0000 (20)	0bbb bbbb (bb)	Bank Select(LSB)	C
1011 nnnn (Bn)	0010 0110 (26)	0vvv vvvv (vv)	Data Entry (LSB) (For RPM & DynaMod Slider)	C
1011 nnnn (Bn)	0100 0000 (40)	00xx xxxx(≤3F)	Hold1 Off (Damper Off)	C
1011 nnnn (Bn)	0100 0000 (40)	01xx xxxx(≥40)	" On (Damper On)	C
1011 nnnn (Bn)	0100 1000 (48)	0vvv vvvv (vv)	Release Time (Perf Edit Rel Time)*4	C
1011 nnnn (Bn)	0100 1001 (49)	0vvv vvvv (vv)	Attack Time (" " Atk Time)*4	C
1011 nnnn (Bn)	0100 1010 (4A)	0vvv vvvv (vv)	Brightness (" " Cutoff) *4	C
1011 nnnn (Bn)	0101 1011 (5B)	0vvv vvvv (vv)	Reverb Level (Send C Level)	C
1011 nnnn (Bn)	0101 1100 (5C)	0000 0000 (00)	Effect1 Level (FX1 Off)	C
1011 nnnn (Bn)	0101 1100 (5C)	0xxx xxxx (≥1)	" " (FX1 On)	C
1011 nnnn (Bn)	0101 1101 (5D)	0vvv vvvv (vv)	Chorus Level (Send D Level)	C
1011 nnnn (Bn)	0101 1110 (5E)	0000 0000 (00)	Effect2 Level (FX2 Off)	C
1011 nnnn (Bn)	0101 1110 (5E)	0xxx xxxx (≥1)	" " (FX2 On)	C
1011 nnnn (Bn)	0110 0000 (60)	0000 0000 (00)	DATA Increment (For RPM Edit)	C
1011 nnnn (Bn)	0110 0001 (61)	0000 0000 (00)	DATA Decrement (For RPM Edit)	C
1011 nnnn (Bn)	0110 0100 (64)	0000 00rr (0r)	RPM Parameter No. (LSB) *3	A
1011 nnnn (Bn)	0110 0101 (65)	0000 0000 (00)	RPM Parameter No. (MSB) *3	A
1011 nnnn (Bn)	0111 1000 (78)	0000 0000 (00)	All Sound Off	C
1011 nnnn (Bn)	0111 1001 (79)	0000 0000 (00)	Reset All Controllers	C
1011 nnnn (Bn)	0ccc cccc (cc)	0vvv vvvv (vv)	Control Data (For Seq Recording) ccc cccc=00~101	C,Q
1011 nnnn (Bn)	0111 1010 (7A)	0000 0000 (00)	Local Control Off	A
1011 nnnn (Bn)	0111 1010 (7A)	0111 1111 (7F)	Local Control On	A
1011 nnnn (Bn)	0111 1011 (7B)	0000 0000 (00)	All Notes Off	A
1011 nnnn (Bn)	0111 110x (7x)	0000 0000 (00)	Omni Mode Off/On (All Notes Off)	A
1011 nnnn (Bn)	0111 1110 (7E)	000m mmmm(≤10)	Mono Mode On (All Notes Off) m mmmm=0~16	A
1011 nnnn (Bn)	0111 1111 (7F)	0000 0000 (00)	Poly mode On (All Notes Off)	A
1100 nnnn (Cn)	0ppp pppp (pp)	---- ----	Program Change (Prog.Comb Chg) *1,2	P
1101 nnnn (Dn)	0vvv vvvv (vv)	---- ----	Channel Pressure (After Touch)	T
1110 nnnn (En)	0bbb bbbb (bb)	0bbb bbbb (bb)	Bender Change (Pitch Bend)	C

nnnn : MIDI Channel No.(0~15) ...... Usually Global Channel.
  When in Combi/Seq Mode, each timbre's/Track's channel.
ggg : Always Global Channel No.(0~15)

x : Random

EMA ----- Same as TRANSMITTED DATA

1-5 STRUCTURE OF KORG SYSTEM EXCLUSIVE MESSAGES

```
1st Byte = 1111 0000 (F0) : Exclusive Status
2nd Byte = 0100 0010 (42) : KORG  ID               EX.Header
3rd Byte = 0011 **ggg** (3g) : Format ID  g:Global ch.
4th Byte = 0011 0101 (35) : X3 ID
5th Byte = 0fff ffff (ff) : Function Code  (See Func Code List)
6th Byte = 0ddd dddd (dd) : Data

LastByte = 1111 0111 (F7) : End of Exclusive ------ EOX
```

1-6 Transmits Function Code List

Func	Description	R	D	E	C
42	MODE DATA	O	O		
47	ALL DRUM SOURD(PCM CARD) NAME DUMP	O	O		
45	ALL MULTISOUND(PCM CARD) NAME DUMP				
4E	MODE CHANGE				O*5
41	PARAMETER CHANGE				O*6
53	DRUMKIT PARAMETER CHANGE				O*7
40	PROGRAM PARAMETER DUMP		O		O*8
4C	ALL PROGRAM PARAMETER DUMP	O	O		
49	COMBINATION PARAMETER DUMP	O	O		O*9
4D	ALL COMBINATION PARAMETER DUMP	O	O		
48	ALL SEQUENCE DATA DUMP	O	O		
51	GLOBAL DATA DUMP	O	O		
52	DRUMS DATA DUMP	O	O		
50	ALL DATA(GLOBAL,DRUM,COMBI,PROG,SEQ) DUMP	O	O		
26	RECEIVED MESSAGE FORMAT ERROR			O	
23	DATA LOAD COMPLETED (ACK)			O	
24	DATA LOAD ERROR (NAK)			O	
21	WRITE COMPLETED			O	
22	WRITE ERROR			O	

Transmitted when

R : Request Message is received
D : Data dump by SW (Don't respond to Exclusive EMA DIS)
E : EX.Message received
C : Mode or No. is changed by SW

Some Request Message is not received in some mode. See 2-8.

* When transmits series of EX Messages to X3. Wait until [DATA LOAD COMPLETED] or [WRITE COMPLETED] of several Messages was received.

*5 : Transmits when change a Mode.

*6 : Transmits when edit a parameter in EDIT PROGRAM. EDIT COMBINATION and PROGRAM (Performance Edit) Mode.

*7 : Transmits when edit a DrumKit's parameter in GLOBAL Mode.

*8 : Transmits when Enter to EDIT PROGRAM Mode. or Edit a Performance Edit's parameter.

*9 : Transmits when change a Combination No.

2-5 UNIVERSAL SYSTEM EXCLUSIVE MESSAGE (REALTIME)

Byte (Hex)	Description
1111 0000 (F0)	EXCLUSIVE STATUS
0111 1111 (7F)	REALTIME MESSAGE
0ggg gggg (gg)	MIDI CHANNEL
0000 0100 (04)	SUB ID 1
0000 00bb (0b)	SUB ID 2
0vvv vvvv (vv)	VALUE(LSB)
0mmm mmmm (mm)	VALUE(MSB)
1111 0111 (F7)	END OF EXCLUSIVE

*8 : b : 01 : MASTER VOLUME (mm.vv = 00.00~7F.7F : Min~Max)
       = 02 : MASTER BALANCE (mm.vv = 00.00~40.00~7F.7F : L~Center~R)

2-6 SYSTEM EXCLUSIVE MESSAGES
* Don't receive when Sequencer is Playing,Recording and if in the DATA FILER Page.

Function Code List

Func	Description	G	C	P	A	No.
12	MODE REQUEST	O	O	O		42
1F	ALL DRUM SOUND (PCM CARD)NAME DUMP REQUEST	O	O	O		47
1E	ALL MULTISOUND (PCM CARD)NAME DUMP REQUEST	O	O	O		45
10	PROGRAM PARAMETER DUMP REQUEST			O		40
1C	ALL PROGRAM PARAMETER DUMP REQUEST	◎		O		4C
19	COMBINATION PARAMETER DUMP REQUEST		O			49
1D	ALL COMBINATION PARAMETER DUMP REQUEST	◎	O			4D
18	ALL SEQUENCE DATA DUMP REQUEST	◎	O			48
0E	GLOBAL DATA DUMP REQUEST	◎	O			51
0D	DRUMS DATA DUMP REQUEST	◎	O			52
0F	ALL DATA(GLOBAL,DRUMS,COMBI,PROG,SEQ)DUMP REQ	◎	O			50
11	PROGRAM WRITE REQUEST			O		21
1A	COMBINATION WRITE REQUEST		O			21
40	PROGRAM PARAMETER DUMP			O		23
4C	ALL PROGRAM PARAMETER DUMP	◎		O		23
49	COMBINATION PARAMETER DUMP		O			23
4D	ALL COMBINATION PARAMETER DUMP	◎	O			23
48	ALL SEQUENCE DATA DUMP	◎	O			23
51	GLOBAL DATA DUMP	◎	O			23
52	DRUMS DATA DUMP	◎	O			23
50	ALL DATA(GLOBAL,DRUMS,COMBI,PROG,SEQ) DUMP	◎	O			23
46	MODE CHANGE	O	O	O		23
41	PARAMETER CHANGE	O	O	O		23
53	DRUM KIT PARAMETER CHANGE				O	23

Receive when in
  G : GLOBAL Mode
     (◎ : Does not respond to Exclusive ENA.DIS in DATA DUMP Page)
  C : COMBI, E.COMBI Mode
  P : PROG, E.PROG Mode
  A : ANY OTHER Mode

No.: MIDI Out Function No.
    (transmitted after the message has been received.)

---

*1 :

MIDI in (Hex)		Program	MIDI in (Hex)	Combination
mm.bb.pp = 00.00.00~63 : BankA 00~99	mm.bb.pp = 00.00.00~63 : BankA 00~99			
00.00.64~7F : " A 00~27		" A 00~27	00.00.64~7F : " A 00~27	
09.01.00~63 : " B 00~99		" B 00~99	00.01.00~63 : " B 00~99	
00.01.64~7F : " B 00~27		" B 00~27	00.01.64~7F : " B 00~27	
00.02.00~63 : " C 00~99		" C 00~99	00.02.00~63 : " C 00~99	
00.02.64~7F : " C 00~27		" C 00~27	00.02.64~7F : " C 00~27	
00.03.00~63 : " D 00~99		" D 00~99	00.03.00~63 : " D 00~99	
00.03.64~7F : " D 00~27		" D 00~27	00.03.64~7F : " D 00~27	
3A~3B.xx.xx : " G 01~128				
39.xx.00~7F : " G 01~128				
3E.xx.00~0F : BankG 129	OFF			
3E.xx.10~17 : " G 130				
3E.xx.18 : " G 131				
3E.xx.19 : " G 131				
3E.xx.1A~1F : " G 135				
3E.xx.20~27 : " G 132				
3E.xx.28~2F : " G 133				
3E.xx.30~37 : " G 135				
3E.xx.38~3F : " G 129				
3E.xx.40~47 : " G 134				
3E.xx.48~7F : " G 129				
3F.xx.xx : " OFF				

xx : Random
*1-1: When in PROGRAM Mode.
      It is ignored.

*2 : After Processing (While Exclusive EMA).
     Transmits Exclusive Message[DATA LOAD COMPLETED]or[DATA LOAD ERROR].

*3 : rr = 0 : Pitch Bend Sens (Only in SEQ Mode).
         = 1 : Detune   "   "
         = 2 : Transpose   "   "

When Received Ch = Global Ch.
Act as Master Tune (Other Mode

*4 : vv =3F : Fast or Dark
        =40 : Don't change
        =41 : Slow or Bright

2-2 SYSTEM COMMON MESSAGES

Status (Hex)	Second (Hex)	Third (Hex)	Description
1111 0010 (F2)	0sss ssss (ss)	0ttt tttt (tt)	Song Position Pointer
1111 0011 (F3)	000s ssss (ss)	------	Song Select

Receive when in Sequencer Mode (External Clock)

2-3 SYSTEM REALTIME MESSAGES

Status (Hex)	Description	
1111 1000 (F8)	Timing Clock	*5
1111 1010 (FA)	Start	*5
1111 1011 (FB)	Continue	*5
1111 1100 (FC)	Stop	*5
1111 1110 (FE)	Active Sensing	

*5 : Receive when in Sequencer Mode (External Clock)

2-4 UNIVERSAL SYSTEM EXCLUSIVE MESSAGE (NON REALTIME)

Byte (Hex)	Description	
1111 0000 (F0)	EXCLUSIVE STATUS	
0111 1110 (7E)	NON REALTIME MESSAGE	
0ggg gggg (gg)	MIDI CHANNEL	*6
0000 aaaa (0a)	SUB ID 1	*7
0000 00bb (0b)	SUB ID 2	*7
1111 0111 (F7)	END OF EXCLUSIVE	

*6 : gg = 0~F : Receive if Global Channel
        = 7F : Receive any Channel

*7 : a.b = 06.01 : INQUIRY MESSAGE REQUEST
          = 09.01 : GENERAL MIDI MODE ON
                   (Receive anytime except for Seq playing/Recording. DATA FILER Page)

3. MIDI EXCLUSIVE FORMAT (R : Receive, T : Transmit)

See 1-5 'STRUCTURE OF KORG SYSTEM EXCLUSIVE MESSAGES'

(1) MODE REQUEST   R

Byte	Description	
F0,42,3g,35	EXCLUSIVE HEADER	
0001 0010 (12)	MODE REQUEST	12H
1111 0111 (F7)	EOX	

Receives this message, and transmits Func=42 message.

(2) PROGRAM PARAMETER DUMP REQUEST   R

Byte	Description	
F0,42,3g,35	EXCLUSIVE HEADER	
0001 0000 (10)	PROGRAM PARAMETER DUMP REQUEST	10H
1111 0111 (F7)	EOX	

Receives this message, and transmits Func=40 or Func=24 message.

(3) ALL DRUM SOUND (PCM CARD) NAME DUMP REQUEST   R

Byte	Description	
F0,42,3g,35	EXCLUSIVE HEADER	
0001 1111 (1F)	ALL DRUM SOUND NAME DUMP REQUEST	1FH
0000 0000 (00)		
1111 0111 (F7)	EOX	

Receives this message, and transmits Func=47 or Func=24 message.

(4) ALL MULTISOUND (PCM CARD) NAME DUMP REQUEST   R

Byte	Description	
F0,42,3g,35	EXCLUSIVE HEADER	
0001 0110 (16)	ALL MULTISOUND NAME DUMP REQUEST	16H
0000 0000 (00)		
1111 0111 (F7)	EOX	

Receives this message, and transmits Func=45 or Func=24 message.

(5) ALL PROGRAM PARAMETER DUMP REQUEST   R

Byte	Description	
F0,42,3g,35	EXCLUSIVE HEADER	
0001 1100 (1C)	ALL PROGRAM PARAMETER DUMP REQUES	1CH
1111 0111 (F7)	EOX	

Receives this message, and transmits Func=4C or Func=24 message.

(6) COMBINATION PARAMETER DUMP REQUEST   R

Byte	Description	
F0,42,3g,35	EXCLUSIVE HEADER	
0001 1001 (19)	COMBINATION PARAMETER DUMP REQUEST	19H
1111 0111 (F7)	EOX	

Receives this message, and transmits Func=49 or Func=24 message.

(7) ALL COMBINATION PARAMETER DUMP REQUEST   R

Byte	Description	
F0,42,3g,35	EXCLUSIVE HEADER	
0001 1101 (1D)	ALL COMBI. PARAMETER DUMP REQUEST	1DH
0000 0000 (00)		
1111 0111 (F7)	EOX	

Receives this message, and transmits Func=4D or Func=24 message.

(8) ALL SEQUENCE DATA DUMP REQUEST   R

Byte	Description	
F0,42,3g,35	EXCLUSIVE HEADER	
0001 1000 (18)	ALL SEQUENCE DATA DUMP REQUEST	18H
0000 0000 (00)		
1111 0111 (F7)	EOX	

Receives this message, and transmits Func=48 or Func=24 message.

(9) GLOBAL DATA DUMP REQUEST   R

Byte	Description	
F0,42,3g,35	EXCLUSIVE HEADER	
0000 1110 (0E)	GLOBAL DATA DUMP REQUEST	0EH
0000 0000 (00)		
1111 0111 (F7)	EOX	

Receives this message, and transmits Func=51 or Func=24 message.

(10) DRUMS DATA DUMP REQUEST   R

Byte	Description	
F0,42,3g,35	EXCLUSIVE HEADER	
0000 1101 (0D)	DRUMS DATA DUMP REQUEST	0DH
0000 0000 (00)		
1111 0111 (F7)	EOX	

Receives this message,and transmits Func=52 or Func=24 message.

(11) ALL DATA(GLOB.DRUMS.COMBI.PROG.SEQ) DUMP REQUEST   R

Byte	Description	
F0,42,3g,35	EXCLUSIVE HEADER	
0000 1111 (0F)	ALL DATA(GLB.CMB.PRG.SEQ) DUMP REQ	0FH
0000 0000 (00)		
1111 0111 (F7)	EOX	

Receives this message, and transmits Func=50 or Func=24 message.

(12) PROGRAM WRITE REQUEST   R

Byte	Description	
F0,42,3g,35	EXCLUSIVE HEADER	
0001 0001 (11)	PROGRAM WRITE REQUEST	11H
0000 00bb (0b)	Write Program Bank	(NOTE 1)
0ppp pppp (pp)	Write Program No.(0-99)	
1111 0111 (F7)	EOX	

If pp > 99 ...... pp → pp-100
Don't change a Bank

Receives this message. Writes the data and transmits Func=21 or Func=24 message.

(13) COMBINATION WRITE REQUEST   R

Byte	Description	
F0,42,3g,35	EXCLUSIVE HEADER	
0001 1010 (1A)	COMBINATION WRITE REQUEST	1AH
0000 00bb (0b)	Write Combination Bank	(NOTE 1)
0ppp pppp (pp)	Write Combination No.(0-99)	
1111 0111 (F7)	EOX	

If pp > 99 ...... pp → pp-100
Don't change a Bank

Receives this message. Writes the data and transmits Func=21 or Func=24 message.

(14) PROGRAM PARAMETER DUMP   R, T

Byte	Description	
F0,42,3g,35	EXCLUSIVE HEADER	
0100 0000 (40)	PROGRAM PARAMETER DUMP	40H
0ddd dddd (dd)	Data	(NOTE 2,3)
	.	
1111 0111 (F7)	EOX	

Receives this message & data, and transmits Func=23 or Func=24 message.
Receives Func=10 message, and transmits this message & data
When Enter the EDIT PROGRAM Mode or Edit the PERFORMANCE EDIT by SW, transmits this message & data.

(15) ALL PROGRAM(BANK A, B) PARAMETER DUMP   R, T

Byte	Description	
F0,42,3g,35	EXCLUSIVE HEADER	
0100 1100 (4C)	ALL PROGRAM PARAMETER DUMP	4CH
0000 0000 (00)		
0ddd dddd (dd)	Data	(NOTE 2,4)
1111 0111 (F7)	EOX	

Receives this message & data, and transmits Func=23 or Func=24 message.
Receives Func=1C message, and transmits this message & data.
Transmits this message & data when DATA DUMP is executed.

(16) COMBINATION PARAMETER DUMP   R, T

Byte	Description	
F0,42,3g,35	EXCLUSIVE HEADER	
0100 1001 (49)	COMBINATION PARAMETER DUMP	49H
0ddd dddd (dd)	Data	(NOTE2,5)
1111 0111 (F7)	EOX	

Receives this message & data, and transmits Func=23 or Func=24 message.
Then the Combi No. is changed by SW, transmits this message & data.

(17) ALL COMBINATION(BANK A, B) PARAMETER DUMP   R, T

Byte	Description	
F0,42,3g,35	EXCLUSIVE HEADER	
0100 1101 (4D)	ALL COMBINATION PARAMETER DUMP	4DH
0000 0000 (00)		
0ddd dddd (dd)	Data	(NOTE 2,6)
1111 0111 (F7)	EOX	

Receives this message & data, and transmits Func=23 or Func=24 message.
Receives Func=1D message, and transmits this message & data.
Transmits this message & data when DATA DUMP is executed.

(18) ALL SEQUENCE DATA(INTERNAL) DUMP   R, T

Byte	Description	
F0,42,3g,35	EXCLUSIVE HEADER	
0100 1000 (48)	ALL SEQUENCE DATA DUMP	48H
0000 0000 (00)		
0sss ssss (ss)	Seq Data Size	(NOTE 7-1)
0ddd dddd (dd)	Control Data	(NOTE 2,7-2)
0ddd dddd (dd)	Sequence Data	(NOTE 2,7-3)
1111 0111 (F7)	EOX	

Receives this message & data, and transmits Func=23 or Func=24 message.
Receives Func=18 message, and transmits this message & data.
Transmits this message & data when DATA DUMP is executed.

(19) GLOBAL DATA DUMP   R, T

Byte	Description	
F0,42,3g,35	EXCLUSIVE HEADER	
0101 0001 (51)	GLOBAL DATA DUMP	51H
0000 0000 (00)		
0ddd dddd (dd)	Data	(NOTE 2,8)
1111 0111 (F7)	EOX	

Receives this message & data, and transmits Func=23 or Func=24 message.
Receives Func=0E message, and transmits this message & data.
Transmits this message & data when DATA DUMP is executed.

(20) DRUMS DATA(BANK A, B) DUMP   R, T

Byte	Description	
F0,42,3g,35	EXCLUSIVE HEADER	
0101 0010 (52)	DRUMS DATA DUMP	52H
0000 0000 (00)		
0ddd dddd (dd)	Data	(NOTE 2,9)
1111 0111 (F7)	EOX	

Receives this message & data, and transmits Func=23 or Func=24 message.
Receives Func=0D message, and transmits this message & data.
Transmits this message & data when DATA DUMP is executed.

(21) ALL DATA(GLOBAL,DRUMS,COMBI,PROG,SEQ.) DUMP   R, T

Byte	Description	
F0,42,3g,35	EXCLUSIVE HEADER	
0101 0000 (50)	ALL DATA(GLOBAL,COMBI,PROG,SEQ.) DUMP	50H
0000 0000 (00)		
0sss ssss (ss)	Seq.Data Size	(NOTE 7-1)
0ddd dddd (dd)	Data	(NOTE 2,10)
1111 0111 (F7)	EOX	

Receives this message & data, and transmits Func=23 or Func=24 message.
Receives Func=0F message, and transmits this message & data.
Transmits this message & data when DATA DUMP is executed.

(22) MODE CHANGE   R, T

Byte	Description	
F0,42,3g,35	EXCLUSIVE HEADER	
0100 1110 (4E)	MODE CHANGE	4EH
0000 mmmm (0m)	Mode Data	(NOTE 11)
0000 0000 (00)		
1111 0111 (F7)	EOX	

Receives this message & data, changes the Mode, and transmits Func=23 or Func=24 message.
When the Mode is changed by SW, transmits this message & data.

(23) PARAMETER CHANGE   R, T

Byte	Description	
F0,42,3g,35	EXCLUSIVE HEADER	
0100 0001 (41)	PARAMETER CHANGE	41H
0ppp pppp (pp)	Parameter No.(LSB)	(TABLE 6~9)
0ppp pppp (pp)	Parameter No.(MSB)	(TABLE 6~9)
0vvv vvvv (vv)	Value (LSB bit6~0)	(NOTE 12)
0vvv vvvv (vv)	Value (MSB bit13~7)	(NOTE 12)
1111 0111 (F7)	EOX	

Receives this message & data, and transmits Func=23 or Func=24 message.
When the Parameter No. is changed by SW. transmits this message & data.

(24) DRUM KIT PARAMETER CHANGE   R, T

Byte	Description	
F0,42,3g,35	EXCLUSIVE HEADER	
0101 0011 (53)	DRUM KIT PARAMETER CHANGE	53H
0000 00kk (0k)	DRUM KIT No.	(NOTE 17)
00ss ssss (ss)	Index No. (ss=00~59)	
0000 pppp (0p)	Parameter No.	(TABLE10)
0vvv vvvv (vv)	Value (LSB bit6~0)	(NOTE 12)
0vvv vvvv (vv)	Value (MSB bit13~7)	(NOTE 12)
1111 0111 (F7)	EOX	

Receives this message & data, and transmits Func=23 or Func=24 message.

(25) ALL DRUM SOUND (PCM CARD)NAME   T

Byte	Description	
F0,42,3g,35	EXCLUSIVE HEADER	
0100 0111 (47)	ALL DRUM SOUND NAME	47H
0000 0000 (00)		
0nnn nnnn (nn)	Number of Drum Sound	(NOTE 13-1)
0ddd dddd (dd)	Data	(NOTE 13-2)
:	:	
1111 0111 (F7)	EOX	

Receives Func=1F message, and transmits this message & data or transmits Func=24 message.

(26) ALL MULTISOUND (PCM CARD)NAME   T

Byte	Description	
F0,42,3g,35	EXCLUSIVE HEADER	
0100 0101 (45)	ALL MULTISOUND NAME	45H
0000 0000 (00)		
0nnn nnnn (nn)	Number of Multisound	(NOTE 14-1)
0ddd dddd (dd)	Data	(NOTE 14-2)
:	:	
1111 0111 (F7)	EOX	

Receive Func=16 message, and transmits this message & data or transmits Func=24 message

(27) MODE DATA   T

Byte	Description	
F0,42,3g,35	EXCLUSIVE HEADER	
0100 0010 (42)	MODE DATA	42H
0000 mmm (0m)	Mode Data	(NOTE 11)
0000 0000 (00)		
00cc 00vv (cv)	Card Variation	(NOTE 15)
0000 01cc (0c)	PCM Memory Status	(NOTE 16)
1111 0111 (F7)	EOX	

Receives Func=12 message, and transmits this message & data.

(28) MIDI IN DATA FORMAT ERROR   T

Byte	Description	
F0,42,3g,35	EXCLUSIVE HEADER	
0010 0110 (26)	MIDI IN DATA FORMAT ERROR	26H
1111 0111 (F7)	EOX	

Transmits this message when there is an error in the MIDI IN message (ex data length).

(29) DATA LOAD COMPLETED (ACK)   T

Byte	Description	
F0,42,3g,35	EXCLUSIVE HEADER	
0010 0011 (23)	DATA LOAD COMPLETED	23H
1111 0111 (F7)	EOX	

Transmits this message when DATA LOAD PROCESSING have been completed.

(30) DATA LOAD ERROR (NAK)   T

Byte	Description	
F0,42,3g,35	EXCLUSIVE HEADER	
0010 0100 (24)	DATA LOAD ERROR	24H
1111 0111 (F7)	EOX	

Transmits this message when DATA LOAD PROCESSING have not been completed (ex.protected).

(31) WRITE COMPLETED   T

Byte	Description	
F0,42,3g,35	EXCLUSIVE HEADER	
0010 0001 (21)	WRITE COMPLETED	21H
1111 0111 (F7)	EOX	

Transmits this message when DATA WRITE MIDI has been completed.

(32) WRITE ERROR   T

Byte	Description	
F0,42,3g,35	EXCLUSIVE HEADER	
0010 0010 (22)	WRITE ERROR	22H
1111 0111 (F7)	EOX	

Transmits this message when DATA WRITE MIDI has not been completed.

NOTE 8 : GLOBAL DATA (IN INTERNAL MEMORY) DUMP FORMAT   (See TABLE 3 , NOTE 2)
        (Global Data (28Byte))
                        28=7x4+0 → 8x4 :32Byte

NOTE 9 : DRUMS DATA (IN INTERNAL MEMORY) DUMP FORMAT   (See TABLE 4 , NOTE 2)
        [Drum Kit Data (7x60x2x28Byte)]   (0.6sec)
                        1680Byte =7x240+0 → 8x240 :1920Byte

NOTE 10 : ALL DATA (GLOBAL.DRUMS.COMBI.PROG.SEQ) DUMP FORMAT
        [Global Data].
        [Drums Data].   (See NOTE 2)
        [All Combination Parameter Data].   (See NOTE 8)
        [All Program Parameter Data].   (See NOTE 9)
        [All Sequence Data]   (See NOTE 6)
                28+1680+27200+32800+3702+n(Seq Data Step)Byte + 7xC+0   (See NOTE 4)
                                            → 8xC+(1+D)Byte   (See NOTE 7-2.7-3)
                                                              (24.0~70.8Sec)

NOTE 11 : mnm = 0 : COMBINATION   3 : EDIT PROG.   6 : GLOBAL
               1 : EDIT COMBI.   4 : SEQUENCER   7 : DISK
               2 : PROGRAM   5 : EDIT SEQUENCER

NOTE 12 : VALUE DATA FORMAT (Use at PARAMETER CHANGE.DRUM KIT PARAMETER CHANGE)
        Bit15~13 of Value Data is the Sign Flag, and each bit has the same value

        Value Data

        MIDI Data

NOTE 13-1 : NUMBER OF DRUMSOUND
          nnn nnnn = 1 ~

NOTE 13-2 : ALL DRUM SOUND (PCM CARD) NAME DATA FORMAT
          [Drum Sound 1 Name (10Byte)]......[Drum Sound n Name (10Byte)]
          n : Number of DrumSound (Data   ASCI Format)

NOTE 14-1 : NUMBER OF MULTISOUND
          nnn nnnn = 1 ~

NOTE 14-2 : ALL MULTISOUND (PCM CARD) NAME DATA FORMAT
          [Multisound 1 Name (10Byte)]......[Multisound n Name (10Byte)]
          n : Number of Multisound (Data   ASCI Format)

NOTE 15 :cc.vv v : 0.0 : Card Off
               = 0.1 : NG Card (ROM or protected RAM)
               = 0.2 : "   (RAM)
          cc = 1 : EDM Card   vv : bit0-·Bank C. bit1- Bank 0
             = 2 : RAM Card (Protect Off)   = 0 : Prog/Combi Data
             = 3 : "   (On)   = 1 : Seq Data

NOTE 16 : cc   v = 0 : Card Off
                  = 1 : NG Card
                  = 2 : PCM Card In

NOTE 17 : kk = 00 : BankA DrumKit1
              01 : " A " 2
              02 : " B " 1
              03 : " B " 2

NOTE 1 : PROGRAM.COMBINATION BANK
        bb=0 : Bank A
           1 : Bank B
           2 : Bank C (Card)
           3 : Bank D (Card)

NOTE 2 :
        DUMP DATA CONVERT n=0~   for NOTE 3. 4. 5. 6. 7-2. 8. 10. 13-2. 14-2

        DATA (iset = 8bit x 7Byte)

        7n+0   7n+1   ~   7n+5   7n+6

        MIDI DATA (iset = 7bit x 8Byte)

        7n+8.5.4.3.2.1.0.

NOTE 3 : PROGRAM PARAMETER (IN CURRENT BUFFER) DUMP FORMAT   (See TABLE 1 . NOTE 2
        [Parameter No.00].......[Parameter No.163]
        164Byte = 7x23+3 → 8x23+(1+3) + 188Byte

NOTE 4 : ALL PROGRAM PARAMETER (IN INTERNAL MEMORY) DUMP FORMAT   (See NOTE 2
        [Prog A 00 (164Byte)]........[Prog B 99 (164Byte)]
        164x200Byte = 7x4685+5 → 8x4685+(1+5) + 37488Byte   (12.6Sec)

NOTE 5 : COMBINATION PARAMETER (IN CURRENT BUFFER) DUMP FORMAT   (See TABLE 2 . NOTE 2
        [Parameter No.00].......[Parameter No.135]
        136Byte = 7x19+3 → 8x19+(1+3) + 156Byte

NOTE 6 : ALL COMBINATION PARAMETER (IN INTERNAL MEMORY) DUMP FORMAT   (See NOTE 2
        [Combi A 00 (136Byte)].......[Combi B 99 (136Byte)]
        136x200Byte = 7x3885+5 → 8x3885+(1+5) + 31108Byte   (9.9Sec)

NOTE 7 : ALL SEQUENCE DATA (IN INTERNAL MEMORY) DUMP FORMAT

7-1 : Sequence Data Size (2Byte)   4Step(16Byte)/1Size
      [Data Size (bit6~0)].
      [Data Size (bit13~7)]

7-2 : Control Data Dump Format (3702Byte)   (See TABLE 5-1 . NOTE 2
      [Control Data   (Song Size(296) x 10 = 2960Byte)].
      [Pattern Data   (200Byte)].
      [Song0-Tr.1 Addr (2Byte)] ...[Song0-Tr.16 Addr].[Song0-Tempo Track Addr].
      [Song9-Tr.1 Addr] ...[Song9-Tr.16 Addr].[Song9-Tempo Track Addr] (340Byte).
      [Pattern0 Addr (2Byte)]........[Pattern99 Addr] (200Byte).
      [Pattern End Addr   (2Byte)]

7-3 : Sequence Data Dump Format * 0 ~ 32000   (See TABLE 5-2 . NOTE 2
      [Sequence 1st Data(4Byte)].......[Seq.nth Data]
      n : Seq.Data Step * 0 ~ 32000
      3702Byte+n+4(Seq.Data Step)Byte = 7xA+B → 8xA+(1+B)Byte
      ∴ 8·1.8~2.8·3 : 2·8xA+(1+B)Byte   (1.4~48.2Sec

COMBINATION PARAMETER (TABLE2)

No.	PARAMETER	Data(Hex) : VALUE
	COMBINATION CONTROLLER	
00	COMBI NAME (Head)	20~7F : ~
:	:	:
09	COMBI NAME (Tail)	
10	(RESERVE)	00
	EFFECT PARAMETER	
11		
:		*17
39		
	TIMBRE 1 PARAMETER	
40	PROGRAM NO.	00~7F : C-1~G9
41	OUTPUT LEVEL	00~7F : 00~127 *6
42	TRANSPOSE	E8~18 : -24~24
43	DETUNE	CE~32 : -50~50
44	A:B PAN	00~1E.1F.FF *5
45	D SEND LEVEL	bit0~3 : 0~9.PRG
	C SEND LEVEL	bit4~7 : 0~9.PRG
46	KEY WINDOW TOP	00~7F : C-1~G9
47	KEY WINDOW BOTTOM	00~7F : C-1~G9
48	VEL WINDOW TOP	01~7F : 01~127
49	VEL WINDOW BOTTOM	01~7F : 01~127
50	CONTROL FILTER	*7
51	MIDI CHANNEL	bit0~3 : 1~16
	TIMBRE MODE	bit4:0:ON. =1:OFF / bit5:0:INT. =1:EXT
	TIMBRE 2~8 PARAMETER	
62	SAME AS TIMBRE 1(40~51) x 7	
135		

GLOBAL PARAMETER (TABLE3)

No.	PARAMETER	Data(Hex) : VALUE
	GLOBAL PARAMETER	
00	MASTER TUNE	CE~32 : -50~50
01	KEY TRANSPOSE	F4~0C : -12~12
02	DAMPER POLARITY	00 : 01 :
03	ASSIGNABLE PEDAL 1	00~0B *8
04	ASSIGNABLE PEDAL 2	00~0B *8
05	MAIN SCALE TYPE	00~0A *9
06	MAIN SCALE KEY	00~0B : C~B
07	USER SCALE	CE~32 : -50~50
:		
18		
19	VELOCITY CURVE	0~7 : 1~8
20	AFTER TOUCH CURVE	0~7 : 1~8
21	SUB SCALE TYPE	00~0A *9
22	SUB SCALE KEY	00~0B : C~B
23~27	(RESERVE)	00

DRUMS PARAMETER (TABLE4)

No.	DRUM KIT A:1~INDEX#0	
00	KEY	00:OFF.01~A4:INT.C0~:CARD
01		0C~73 : C0~G8
02	A:B PAN	bit0~4 *10
	EXCLUSIVE ASSIGN	bit5~7 *10
03	TUNE	88~78 : -120~120
04	LEVEL	9D~63 : -99~99
05	DECAY	9D~63 : -99~99
	D SEND LEVEL	bit0~3 : 0~9
06	C SEND LEVEL	bit4~7 : 0~9
	DRUM KIT A:1~INDEX#1 ~ DRUM KIT B:2~#58	
07	SAME AS DRUM KIT A:1~#0 (00~06)	
:		x(60x2x2-1)
1879		

*5 00 : A
    0F : CRT
    1E : B
    1F : PRG (Only Comb.Seq Data)
    FF : OFF

*6 00~63 : Bank A00~A99 or C00~C99
    64~C7 : Bank B00~B99 or D00~D99
    00~87 : Bank C01~C136

*7 bit0 : PROGRAM CHANGE   =0:DIS. =1:ENA
    bit1 : DAMPER   "
    bit2 : AFTER TOUCH   "
    bit3 : CONTROL CHANGE   "
    bit6.7:0.0 : Bank A.B Program
    1.0 : " C.D
    *.1 : " G
    *1 : " all

Program is selected by *6 and *7(bit6.7).

PROGRAM PARAMETER (TABLE 1)

No	PARAMETER	Data(Hex) : VALUE		PARAMETER	Data(Hex) : VALUE
00	PROGRAM NAME (Head)	20~7F : ~		VDF-1	
:			50	CUTOFF VALUE	00~63 : 00~99
09	PROGRAM NAME (Tail)		51	KBD TRACK KEY	00~7F : C-1~G9
	OSCILLATOR		52	CUTOFF KBD TRACK	9D~63 : -99~99
10	OSCILLATOR MODE	0.1.2 *1	53	EG INTENSITY	00~63 : 00~99
11	ASSIGN	bit0:0:POL. =1:MON	54	EG TIME KBD TRACK	00~63 : 00~99
	HOLD	bit1:0:OFF. =1:ON	55	EG TIME VEL TRACK	00~63 : 00~99
12	OSC-1 M/D.SOUND(LSB)	0~???? : 0~????	56	EG INT VEL.SENSE	9D~63 : -99~99
13	OSC-1 M/D.SOUND(MSB)	*13		VDF-1 EG	
14	OSC-1 OCTAVE	FE~01 : 32 ~4'	57	ATTACK TIME	00~63 : 00~99
15	OSC-2 M/D.SOUND(LSB)	0~???? : 0~????	58	ATTACK LEVEL	9D~63 : -99~99
16	OSC-2 M/D.SOUND(MSB)	*13	59	DECAY TIME	00~63 : 00~99
17	OSC-2 OCTAVE	FE~01 : 32 ~4'	60	BREAK POINT	9D~63 : -99~99
18	INTERVAL	F4~0C : -12~12	61	SLOPE TIME	00~63 : 00~99
19	DETUNE	CE~32 : -50~50	62	SUSTAIN LEVEL	9D~63 : -99~99
20	DELAY START	00~63 : 00~99	63	RELEASE TIME	00~63 : 00~99
	PITCH EG		64	RELEASE LEVEL	9D~63 : -99~99
21	START LEVEL	9D~63 : -99~99		VDA-1	
22	ATTACK TIME	00~63 : 00~99	65	OSCILLATOR LEVEL	00~63 : 00~99
23	ATTACK LEVEL	9D~63 : -99~99	66	KBD TRACK KEY	00~7F : C-1~G9
24	DECAY TIME	00~63 : 00~99	67	AMP. KBD TRACK INT	9D~63 : -99~99
25	RELEASE TIME	00~63 : 00~99	68	AMP. VELOCITY SENSE	9D~63 : -99~99
26	RELEASE LEVEL	9D~63 : -99~99	69	EG TIME KBD TRACK	00~63 : 00~99
27	TIME VELOCITY SENSE	9D~63 : -99~99	70	EG TIME VEL SENSE	9D~63 : -99~99
28	LEVEL VELOCITY SENSE	9D~63 : -99~99		VDA-1 EG	
	CUTOFF WG		71	ATTACK TIME	00~63 : 00~99
29	WAVE FORM	bit0~2 : 0~5 *2	72	ATTACK LEVEL	00~63 : 00~99
	OSC-1 WG ENABLE	bit5:0:OFF. =1:ON	73	DECAY TIME	00~63 : 00~99
	OSC-2 WG ENABLE	bit6:0:OFF. =1:ON	74	BREAK POINT	00~63 : 00~99
	KEY SYNC	bit7:0:OFF. =1:ON	75	SLOPE TIME	00~63 : 00~99
30	FREQUENCY	00~63 : 00~99	76	SUSTAIN LEVEL	00~63 : 00~99
31	DELAY	00~63 : 00~99	77	RELEASE TIME	00~63 : 00~99
32	INTENSITY	00~63 : 00~99		OSC-1 EG TIME KBD TRACK VEL. SW & POLARITY	
	AFTER TOUCH		78	P.EG TIME K.T SW&POL	bit0~7 *3
33	PITCH BEND RANGE	F4~0C : -12~12	79	P.EG TIME VEL.SW&POL	bit0~7 *3
34	VDF CUTOFF	9D~63 : -99~99	80	A.EG TIME K.T SW&POL	bit0~7 *3
35	VDF WG INT	00~63 : 00~99	81	A.EG TIME VEL.SW&POL	bit0~7 *3
36	VDA AMPLITUDE	9D~63 : -99~99		OSC-1 SEND	
	JOY STICK		82	D SEND LEVEL	bit0~3 : 0~9
37	KEY SYNC	bit0~2 : 0~5 *2		C SEND LEVEL	bit4~7 : 0~9
38	VDF SWEEP INT	bit17:0:OFF. =1:ON		COLOR-1	
39	VDF WG INT	9D~63 : -99~99	83	INTENSITY	00~63 : 00~99
	OSC-1 PITCH EG		84	VELOCITY SENSE	9D~63 : -99~99
40	PITCH EG INT	9D~63 : -99~99		VDF-1. VDA-1 KBD TRACK MODE	
	OSC-1 PITCH WG		85	F-1. A-1 KBD TRACK MODE	*4
41	WAVE FORM	bit0~2 : 0~5 *2		OSC-1 PANPOT	
	KEY SYNC	bit17:0:OFF. =1:ON	86	A:B PAN	00~1E.FF *5
42	FREQUENCY	9D~63 : -99~99		OSC-2 PARAMETER	
43	DELAY	00~63 : 00~99	87	SAME AS OSC-1(40~86)	
44	FADE IN	00~63 : 00~99	:		
45	INTENSITY	00~63 : 00~99	133		
46	FREQ MOD BY KBD TRK	9D~63 : -99~99	134	(RESERVE)	00
47	FREQ MOD BY AT	00~63 : 00~99		EFFECT PARAMETER	
48	INTENSITY MOD BY AT	00~63 : 00~99	135		
49	FREQ MOD BY AT+JS	00~09 : 0~9	:		*17
			153		

*1 0 : SINGLE
    1 : DOUBLE
    2 : DRUMS

*2 0 : TRIANGLE
    1 : UP SAW
    2 : DOWN SAW
    3 : SQUARE1
    4 : RANDOM
    5 : SQUARE2

*3 bit0 : ATTACK TIME SW   =0:OFF. =1:ON
    bit1 : DECAY TIME SW   "
    bit2 : SLOPE TIME SW   "
    bit3 : RELEASE TIME SW   "
    bit4 : ATTACK TIME POLARITY   =0:+. =1:-
    bit5 : DECAY TIME   "
    bit6 : SLOPE TIME   "
    bit7 : RELEASE TIME   "

*4 bit0.1 ... VDF   0 : OFF
    bit4.5 : VDA   1 : LOW
                       2 : HIGH
                       3 : ALL

SEQUENCER CONTROL DATA

No.	PARAMETER	DATA(Hex) : VALUE
	SONG 0 CONTROL DATA	
00	MIDI Channel(Tr.1)	00~0F : 1~16
:	:	
15	MIDI Channel(Tr.16)	*11
16	STATUS (Tr.1)	
:	STATUS (Tr.16)	
31		
32	BEND RANGE (Tr.1)	00~0C : 00~12
:	BEND RANGE (Tr.16)	
47		
48	BEAT	*12
49	TEMPO	28~F0 : 40~240
50	PROTECT (Tr.1)	bit0=0:OFF, =1:ON
	PROTECT (Tr.8)	bit7
51	PROTECT (Tr.9)	bit0=0:OFF, =1:ON
	PROTECT (Tr.16)	bit7 *14
52	NEXT SONG NO.	20~7F : ~
53	SONG NAME (Head)	
82	SONG NAME (Tail)	
83	(RESERVE)	00
84	EFFECT PARAMETER	*17
:		
92		
	TRACK 1 CONTROL DATA	*6
93	PROGRAM NO.	00~7F : 00~127
94	OUTPUT LEVEL	E8~18 : -24~24
95	KEY TRANSPOSE	C8~32 : -50~50
96	DETUNE	C8~32 :
97	A:B PAN	00~16,1F,FF *5
98	D SEND LEVEL	bit0~3 : 0~9.PRG
	C SEND LEVEL	bit4~7 : 0~9.PRG
99	KEY WINDOW TOP	00~7F : C-1~G9
100	KEY WINDOW BOTTOM	00~7F : C-1~G9
101	VEL WINDOW TOP	01~7F : 01~127
102	VEL WINDOW BOTTOM	01~7F : 01~127 *7
103	CONTROL FILTER	
104	MIDI CHANNEL	00~0F : 1~16
	TRACK 2~16 CONTROL DATA	
105	SAME AS TRACK 1(93~104) x 15	
284		
285~290	(RESERVE)	00
291	METRONOME LEVEL	00~63 : 0~99
292	METRONOME PAN	00~06 : *15
293	METRONOME LEAD IN	0~2 : 0~2
294	TEMPO TRACK ON/OFF	0:OFF, 1:ON
295	(RESERVE)	00
	SONG 1~9 CONTROL DATA	
296	SAME AS SONG 0 (00~295) x 9	
:		
2959		

(TABLE 5-1)

	PATTERN 0 CONTROL DATA	*12
2960	BEAT	
2961	LENGTH	01~63 : 1~99
	PATTERN 1~99 CONTROL DATA	
2962	SAME AS PATTERN 0(2960.2961) x 99	
:		
3158		
	SONG0-TRACK1 DATA ADDRESS	
3160	DATA ADDRESS(LSB)	0000 (Start Addr)
3161	" " (MSB)	
	SONG0-TRACK2 ~ TRACK16 DATA ADDRESS	
3162	SAME AS SONG0-TRACK1 ADDRESS(3160.3161)	x 15
3191		
	SONG0 TEMPO TRACK DATA ADDRESS	
3192	DATA ADDRESS (LSB)	
3193	" " (MSB)	
	SONG1~9 TRACK DATA ADDRESS	
3194	SAME AS SONG0 TRACK ADDRESS(3160~3193)	x 9
3499		
	PATTERN 0 DATA ADDRESS	
3500	DATA ADDRESS (LSB)	
3501	" " (MSB)	
	PATTERN 1 ~ PATTERN 99 DATA ADDRESS	
3502	SAME AS PATTERN 0(3500.3501)	
3699		
3700	End Pattern Addr(L)	
3701	" " (H)	

SEQUENCE DATA (TABLE 5-2)

No.	PARAMETER	DATA(Hex) : VALUE
	SEQUENCE DATA 1	
3702	DATA (1-L)	*16
3703	DATA (1-H)	*16
3704	DATA (2-L)	*16
3705	DATA (2-H)	*16
	SEQUENCE DATA 2 ~	
3706	SAME AS SEQUENCE DATA 1(3702~3705)	

*8 : 0 : OFF
1 : PROGRAM(COMBINATION) UP
2 : "   "   DOWN
3 : SEQUENCER START/STOP
4 : SEQUENCER PUNCH IN/OUT
5 : EFFECT 1 ON/OFF
6 : "   2 "
7 : SCALE CHANGE
8 : VOLUME
9 : EXPRESSION
A : VDF CUTOFF
B : EFFECT CONTROL
C : DATA ENTRY

*0 : 0 : EQUAL TEMP
1 : EQUAL TEMP 2
2 : PURE MAJOR
3 : PURE MINOR
4 : ARABIC
5 : PYTHAGOREAN
6 : WERKMEISTER
7 : KIRNBERGER
8 : SLENDRO
9 : PELOG
A : USER SCALE

*10 : bit0~4 = 00 : A
:
0F : CNT
1E : B
1F : OFF
bit5~7 = 0 : EX Off
1 : EX Group1
B : EX Group6
7 : Self

*11 : bit0.1 = 0 : OFF
1 : INT
2 : EXT
3 : BOTH
bit2 = 0 : Play, = 1 : Mute

*12 : bit0~5 10~18 : 1/4 ~ 9/4
20~2F : 1/8 ~ 16/8
30~3F : 1/16 ~ 16/16
bit7 = 0 : High Resolution
1 : Low Resolution

*13 : When at Single/Double Mode
0000 : Int Multisound 0
0153 : Int Multisound 339
1000 : Card Multisound 0
1??? : Card Multisound ?
When at Drum Mode
00 : Drum Kit A1
07 : "   D2
08 : ROM Drum Kit 1
0F : "   8

*14 : bit0~6 = 0 : Song0
9 : Song9
7F : OFF
bit 7 = 0 : Stop, -1 : Play

*15 : 0 : A   3 : C   6 : All
1 : A+B   4 : C+D
2 : B   5 : D

*16 : SEQUENCE DATA FORMAT
DATA(1-H) DATA(1-L) DATA(2-H) DATA(2-L)

*16-1 NOTE ON/OFF
| 1vvv vvv t | tttt tttt | kkkk kkk g | gggg gggg |
Velocity Event Time Key No.   Length
t •30 : ♪, t •1FE : Tie from Last Bar
g •30 : ♪, g •1FE : Tie to Next Bar

*16-2 PITCH BEND
| 0001 000 t | tttt tttt | 0 vvv vvvv | 0 vvv vvvv |
Event Time   Value(H)   Value(L)

*16-3 AFTER TOUCH
| 0010 000 t | tttt tttt | 0000 0000 | 0 vvv vvvv |
Event Time   Value

*16-4 PROGRAM CHANGE
| 0011 000 t | tttt tttt | bbbb bbbb | 0ppp pppp |
Event Time   Bank   Program No.
b= 0~3 : A~D (INT), 0~7F : 0~127 (EXT)
80 : GM. 81 : Drum Prog. 92 : No Bank
p= 00~C7 : 00~99

*16-5 CONTROL CHANGE
| 0100 000 t | tttt tttt | vvv vvvv | 0ccc cccc |
Event Time   Value   Control No.
c= 00~65 : Same as MIDI Control Change
= 66 : Assignable Pedal

*16-6 POLY KEY PRESSURE
| 0101 000 t | tttt tttt | 0 vvv vvvv | 0 kkk kkkk |
Event Time   Value   Key No.

*16-7 BAR
| 0110 00bb | bbbb bbbb | xx ss ssss | 0ppp pppp |
Bar No.   Type Beat   Pattern No.
xx= 00 : Doesn't use Pattern
= 10 : Pattern continual
= 11 : Pattern Start
s= 10~18 : 1/4~9/4
= 20~2F : 1/8~16/8
= 30~3F : 1/16~16/16

*16-8 TRACK END
| 0111 000 t | tttt tttt | 0000 00bb | bbbb bbbb |
Event Time   Last Bar No.

*17 EFFECT PARAMETER

No.	PARAMETER	DATA(Hex) : VALUE
(00)	Effect 1 Type No.	0.1~2F OFF.1~47
(01)	" 2 "	0.1~2F OFF.1~47
(02)	" 1 L-Ch & Balnc	00~84 : 00~100
(03)	" 1 R-Ch "	00~84 : 00~100
(04)	" 2 L-Ch "	00~84 : 00~100
(05)	" 2 R-Ch "	00~84 : 00~100
(06)	Output 3 Pan	00.01~65 *17-1
(07)	" 4 "	00.01~65 *17-1
(08)	Effect I/O	bit5~0 *17-2
(09)	Effect 1 Parameter	*17-3
...		
(17)	Effect 1 Mod Source	00~0D *17-4
(18)	Effect 1 Mod Amount	F1~0F : -15~15
(19)	Effect 2 Parameter	*17-3
(20)		
(27)	Effect 2 Mod Source	00~0D *17-4
(28)	Effect 2 Mod Amount	F1~0F : -15~15

*17-1 : 00 : Off
01 : R   bit0=0:Efct1 L-Ch Off.=1:0n
02 : 01:99 bit1=0: " 1 R-Ch Off.=1:0n
            bit2=0: " 2 L-Ch Off.=1:0n
84 : 99:01 bit3=0: " 2 R-Ch Off.=1:0n
85 : L   bit4.5=0:Serial
                      1:Parallel
                      2:Parallel 2
                      3:Parallel 3
*17-2 :

*17-3 : Effect Parameter (8Byte) 47 Type

Offset	PARAMETER	DATA(Hex) : VALUE
1~9:Hall, (4,5:Room, 6:Live Stage)		
(00)	Reverb Time	00~8|(2F):0.2~8.9(4.9)
(01)	(NUL)	00
(02)	High Damp	00~63 : 00~99
(03)	Pre Delay	00~C8 : 00~200
(04)	E R Level	00~63 : 00~99
(05)	(NUL)	00
(06)	EQ Low	F4~0C : -12~12
(07)	EQ High	F4~0C : -12~12

Don't display NUL. from here, and that must be 00
7:Wet Plate, 8:Dry Plate, 9:Spring

	Pre Delay(L)	00~C8 : 00~200
(00)	" (H)	
(01)	E R Level	01~0A : 01~10
(02)	Reverb Time	00~63 : 00~99
(03)	High Damp	00~63 : 00~99
(04)	EQ Low	F4~0C : -12~12
(06)	EQ High	F4~0C : -12~12

10~12:Early Reflection 1,2,3

(00)	E R Time	00~46 : 100~800
(01)	Pre Delay	00~C8 : 00~200
(06)	EQ High	F4~0C : -12~12
(07)	EQ Low	F4~0C : -12~12

13:Stereo Delay, 14:Cross Delay

(00)	Delay Time L (L)	00~1F4 : 00~500
(01)	" (H)	
(02)	Feed Back	9D~63 : -99~99
(03)	High Damp	00~63 : 00~99
(04)	Delay Time R (L)	00~1F4 : 00~500
(05)	" (H)	
(06)	EQ High	F4~0C : -12~12
(07)	EQ Low	F4~0C : -12~12

15:Dual Delay

(00)	Delay Time 1 (L)	00~1F4 : 00~500
(01)	" (H)	
(03)	Feed Back L	9D~63 : -99~99
(03)	High Damp L	00~63 : 00~99
(04)	Delay Time R (L)	00~1F4 : 00~500
(05)	" (H)	
(06)	Feed Back R	9D~63 : -99~99
(07)	High Damp R	00~63 : 00~99

16~18:Multi Tap Delay 1,2,3

19,20:Stereo Chorus 1,2

(00)	Delay Time 1(L)	00~1F4 : 00~500
(01)	" (H)	
(02)	Delay Time 2(L)	00~1F4 : 00~500
(03)	" (H)	
(04)	Feed back	9D~63 : -99~99
(06)	EQ Low	F4~0C : -12~12
(07)	EQ High	F4~0C : -12~12

19,20:Stereo Chorus 1,2

(00)	Mod Depth	00~63 : 00~99
(01)	Mod Speed	00~D8 *17-3-2
		bit0=0:Sin. =1:Tri
		bit1 =- 1
(02)	MG Status *17-3-3	bit2 =- 0

21:Quadrature Chorus, 22:X Over Chorus

(04)	Delay Time	00~C8 : 00~200
(06)	EQ High	F4~0C : -12~12
(07)	EQ Low	F4~0C : -12~12
(00)	Delay Time L	00~FA : 00~250
(01)	Delay Time R	00~FA : 00~250
(02)	Mod Speed	01~63 : 01~99
(03)	Mod Depth	00~63 : 00~99
(04)	Mod Waveform	BB~14 *17-3-4
(06)	EQ Low	F4~0C : -12~12
(07)	EQ High	F4~0C : -12~12

23:Harmonic Chorus

(00)	Delay Time L (L)	00~1F4 : 00~500
(01)	" (H)	
(02)	Delay Time R (L)	00~1F4 : 00~500
(03)	" (H)	
(04)	Mod Speed	01~63 : 01~99
(05)	Mod Depth	00~63 : 00~99
(06)	EQ High	F4~0C : -12~12
(07)	EQ Low	F4~0C : -12~12

24:Symphonic Ensemble

(00)	Mod Depth	00~63 : 00~99
(06)	EQ High	F4~0C : -12~12
(07)	EQ Low	F4~0C : -12~12

25,26:Flanger1,2, 27:X Over Flanger

(00)	Delay Time	00~C8 : 00~200
(01)	Mod Depth	00~63 : 00~99
(02)	Mod Speed	01~63 : 01~99
(03)	Resonance	9D~63 : -99~99
(06)	EQ Low	F4~0C : -12~12
(07)	EQ High	F4~0C : -12~12

28:Exciter

(00)	Blend	9D~63 : -99~99
(01)	Emphatic Point	01~0A : 01~10
(06)	EQ High	F4~0C : -12~12
(07)	EQ Low	F4~0C : -12~12

29:Enhancer

(00)	Harmonic Density	01~63 : 01~99
(01)	Hot Spot	01~14 : 01~20
(02)	Stereo Width	00~63 : 00~99
(03)	Delay	01~63 : 01~99
(06)	EQ Low	F4~0C : -12~12
(07)	EQ High	F4~0C : -12~12

30:Distortion, 31:Over Drive

(00)	Drive (Edge)	01~8F : 01~111
(01)	Hot Spot	00~63 : 00~99
(02)	Resonance	00~63 : 00~99
(03)	Out Level	00~63 : 00~99
(06)	EQ Low	F4~0C : -12~12
(07)	EQ High	F4~0C : -12~12

32,33:Phaser 1,(2)

(00)	Mod Depth	00~63 : 01~99
(01)	Mod Speed	00~D8 : *17-3-2
		bit0=0:Sin. =1:Tri
		bit1 =- 1 (.0)
(02)	MG Status *17-3-3	bit2 =- 0

34:Rotary Speaker

	Feedback	9D~63 : -99~99
(04)	Manual	00~63 : 00~99

44:Rotary Speaker

(00)	Vibrato Depth	00~0F : 00~15
(01)	Acceleration	01~0F : 01~15
(02)	Slow Speed	01~63 : 01~99
(03)	Fast Speed	01~63 : 01~99

35:Auto Pan, (36:Tremolo)

(00)	Depth	00~63 : 00~99
(01)	Speed	00~D8 : *17-3-2
		bit0=0:Sin. =1:Tri
		bit1 =- 1. (0)
(02)	MG Status *17-3-3	bit2 =- 0

37:Parametric EQ

(00)	Low Freq	00~1D : 00~29
(01)	Low Gain	F4~0C : -12~12
(02)	Mid Freq	00~63 : 00~99
(03)	Mid Gain	F4~0C : -12~12
(04)	Mid Width	00~63 : 00~99
(05)	High Freq	00~10 : 00~29
(06)	High Gain	F4~0C : -12~12

38:Chorus-Delay, 39:Flanger-Delay

(00)	Delay Time	00~32 : 00~50
(01)	Mod Speed	01~63 : 01~99
(02)	Mod Depth	00~63 : 00~99
(03)	Feed back	9D~63 : -99~99
(04)	Delay Time	00~61 : 00~150
(05)	Feed back	9D~63 : -99~99

40:Delay / Hall

(00)	Delay Time (L)	00~1F4 : 00~500
(01)	Delay Time (H)	
(02)	Reverb Time	9D~63 : -99~99
(03)	High Damp	00~63 : 00~99
(04)	Reverb Time	00~61 : 00~99
(06)	High Damp	00~63 : 00~99
(07)	Pre Delay	00~96 : 00~150

41:Delay / Room

(00)	Delay Parameter	*17-3-1
(03)		
(04)	Reverb Time	00~2F : 0.2~4.9
(06)	High Damp	00~63 : 00~99
(07)	Pre Delay	00~98 : 00~150

42:Delay / Chorus, (43:Delay / Flanger)

(00)	Delay Parameter	*17-3-1
(03)		
(04)	Depth	00~63 : 00~99
(05)	Speed	00~D8 : *17-3-2
		bit0=0:S.=1:T (=-0.)
(08)	MG Status *17-3-3	bit1 =- 0
		bit2 =- 0. (=-1)

45:Delay / Over Drive

(07)	Feed Back	0. (9D~63:-99~99)
(00)	Delay Time (L)	00~1F4 : 00~500
(01)	" (H)	
(02)	Feed back	9D~63 : -99~99
(03)	Drive	01~0F : 01~111
(04)	Hot Spot	01~63 : 01~99
(05)	Resonance	00~63 : 00~99
(06)	Out Level	01~63 : 01~99

46:Delay / Phaser

(00)	Delay Parameter	*17-3-1
(03)	Depth	00~63 : 00~99
(05)	Speed	00~D8 : *17-3-2
(06)	Feedback	9D~63 : -99~99
(07)	EQ High	F4~0C : -12~12

47:Delay / Rotary Speaker

(00)	Delay Time (L)	00~1F4 : 00~500
(01)	" (H)	
(02)	Feed back	9D~63 : -99~99
(03)	Acceleration	00~0F : 01~15
(04)	Slow Speed	01~63 : 01~99
(05)	Fast Speed	01~63 : 01~99

PROGRAM PARAMETERS

No.	PARAMETER	No. of TABLE 1
	OSCILLATOR	
00	OSC MODE	10 bit0
01	ASSIGN	11 bit0
02	HOLD	11 bit1
	PITCH EG	
03	START LEVEL	21
04	ATTACK TIME	22
05	ATTACK LEVEL	23
06	DECAY TIME	24
07	RELEASE TIME	25
08	RELEASE LEVEL	26
09	EG INT BY VEL SENSE	28
10	EG TIME BY VEL SENSE	27
	CUTOFF MG	
11	WAVE FORM	29 bit0~2
12	FREQUENCY	30
13	INTENSITY	32
14	DELAY	31
15	OSC SELECT	29 bit5,6
16	KEY SYNC	29 bit7
	AFTER TOUCH	
17	PITCH BEND RANGE	33
18	VDF CUTOFF	34
19	VDF MG INT	35
20	VDA AMPLITUDE	36
	JOY STICK	
21	VDF MG INT	39
22	PITCH BEND RANGE	37
23	VDF SWEEP INT	38
	OSC-1	
24	MULTISOUND	12,13
25	LEVEL	65
26	OCTAVE	14
27	PITCH EG INT	40
28	A:B PAN	86
29	C SEND LEVEL	82 bit4~7
30	D SEND LEVEL	82 bit0~3
	VDF-1	
31	CUTOFF VALUE	50
32	EG INTENSITY	53
	COLOR-1	
33	INTENSITY	83
34	INT BY VEL SENSE	84
	VDF-1 EG	
35	ATTACK TIME	57
36	ATTACK LEVEL	58
37	DECAY TIME	59
38	BREAK POINT	60
39	SLOPE TIME	61
40	SUSTAIN LEVEL	62
41	RELEASE TIME	63
42	RELEASE LEVEL	64
43	EG INT BY VEL SENSE	56
44	EG TIME BY VEL SENSE	55

PARAMETER No. for PARAMETER CHANGE TABLE U

No.	PARAMETER	No.
	VDF-1 EG TIME MOD BY VEL SENSE	
45	ATTACK TIME	79 bit0.4
46	DECAY TIME	79 bit1.5
47	SLOPE TIME	79 bit2.6
48	RELEASE TIME	79 bit3.7
	VDF-1 KBD TRACK	
49	KBD TRACK KEY	51
50	MODE	85 bit0.1
51	CUTOFF	52
52	EG TIME	54
	VDF-1 EG TIME MOD BY KBD TRACK	
53	ATTACK TIME	78 bit0.4
54	DECAY TIME	78 bit1.5
55	SLOPE TIME	78 bit2.6
56	RELEASE TIME	78 bit3.7
	VDA-1 EG	
57	ATTACK TIME	71
58	ATTACK LEVEL	72
59	DECAY TIME	73
60	BREAK POINT	74
61	SLOPE TIME	75
62	SUSTAIN LEVEL	78
63	RELEASE TIME	77
64	EG INT BY VEL SENSE	68
65	EG TIME BY VEL SENSE	70
	VDA-1 EG TIME MOD BY VEL SENSE	
66	ATTACK TIME	81 bit0.4
67	DECAY TIME	81 bit1.5
68	SLOPE TIME	81 bit2.6
69	RELEASE TIME	81 bit3.7
	VDA-1 KBD TRACK	
70	KBD TRACK KEY	86
71	MODE	85 bit4.5
72	INTENSITY	67
73	EG TIME	69
	VDA-1 EG TIME MOD BY KBD TRACK	
74	ATTACK TIME	80 bit0.4
75	DECAY TIME	80 bit1.5
76	SLOPE TIME	80 bit2.6
77	RELEASE TIME	80 bit3.7
	OSC-1 PITCH MG	
78	WAVE FORM	44 bit0~2
79	FREQUENCY	42
80	INTENSITY	45
81	DELAY	43
82	FADE IN	44
83	KEY SYNC	41 bit7
84	FREQ MOD BY KBD TRACK	46
85	FREQ MOD BY A.T+J.S	49
86	INTENSITY MOD BY A.T	47
87	INTENSITY MOD BY J.S	48

---

*17-3-1 : Delay Parameter
Same as #0+(00)~(03)

*17-3-2 : Data(Hex) Value(Hz)
00~63   0.03~ 3.00   (0.03step)
64~C7   3.1 ~13.0   (0.1 step)
C8~D8   14 ~30.0   (1 step)

*17-3-3 : MG Status
bit0 : Wave Form =0:Sin. =1:Tri
bit1 : Phase =0:0° =1:180°
bit2 : Wave Shape =0: Normal
                    =1: for Flanger

*17-3-4 : Waveform
EB : T~10
FF : T-10
00 : S-10
14 : S+10

*17-4 : Dynamic Modulation Source
0 : Mode
1 : Joy Stick (+Y)
2 : Joy Stick (-Y)
3 : After Touch
4 : Asgn Pedal 1
5 : Asgn Pedal 2
6 : VDA EG
7 : Value Slider
8 : V.S + J.S(+Y)
9 : V.S + J.S(-Y)
A : V.S + A.Touch
B : V.S + Pedal 1
C : V.S + Pedal 2
D : V.S + VDA EG

COMBINATION PARAMETER

PARAM No. for PARAM CHANGE (TABLE 8)

n = 0~7 (: Timbre 1~8)

No.	PARAMETER	No. of TABLE 2
0+n	PROGRAM NO.	40,50,51+12n *
8+n	OUTPUT LEVEL	41+12n
16+n	MIDI CHANNEL	51+12n b0~3
24+n	KEY WINDOW TOP	46+12n
32+n	KEY WINDOW BOTTOM	47+12n
40+n	VEL WINDOW TOP	48+12n
48+n	VEL WINDOW BOTTOM	49+12n
56+n	TRANSPOSE	42+12n
64+n	DETUNE	43+12n
72+n	PROGRAM CHANGE FILTER	50+12n b0
80+n	DAMPER FILTER	50+12n b1
88+n	AFTER TOUCH FILTER	50+12n b2
96+n	CONTROL CHANGE FILTER	50+12n b3
104+n	A:B PAN	44+12n
112+n	C SEND LEVEL	45+12n b4~7
120+n	D SEND LEVEL	45+12n b0~3
128+n	TIMBRE MODE	51+12n b4,5
138	EFFECT PARAMETER	(TABLE 8-1)
168		

Value	40+12n	50+12n b6,7	51+12n b4
00			1
	01~100	00~99	0	0
101~236	0~135	0.0	0.1

*

In COMBINATION Mode

n = 0~7 (: Timbre 1~8) (TABLE 9)

No.	PARAMETER
0+n	PERFORMANCE EDIT PROGRAM NO.
8+n	" OUTPUT LEVEL
16+n	" PANPOT
24+n	" MIDI CHANNEL

DRUM KIT PARAMETERS

PARAM No. for DRUM PARAM CHANGE (TABLE 10)

n = 0~58 (: Index)

No.	PARAMETER	No. of TABLE 4
0	INST NO.	0+7n
1	KEY	1+7n
2	TUNE	3+7n
3	OUTPUT LEVEL	4+7n
4	DECAY	5+7n
5	EXCLUSIVE ASSIGN	2+7n b5~7
6	A:B PAN	2+7n b0~4
7	C SEND LEVEL	6+7n b4~7
8	D SEND LEVEL	6+7n b0~3

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155	EFFECT PARAMETER	
187		(TABLE 8-1)

EFFECT PARAMETERS (TABLE 6-1)

No. of TABLE.7		PARAMETER
PROG	COMB	
155	136	EFFECT 1 TYPE
156	137	EFFECT 2 TYPE
157	138	EFFECT 1 OFF/ON
158	139	EFFECT 2 OFF/ON
159	140	OUT3 PANPOT (Seri.Para1.2)
160	141	OUT4 PANPOT (Seri.Para1.2)
161	142	OUT 3-L LEVEL (Para3)
162	143	OUT 3-R LEVEL (Para3)
163	144	OUT 4-L LEVEL (Para3)
164	145	OUT 4-R LEVEL (Para3)
165	146	PLACEMENT
EFFECT 1		
166	147	DYNAMIC MOD SOURCE
167	148	DYNAMIC MOD INT
168	149	PARAMETER 1
174	155	PARAMETER 7
175	156	BALANCE 1
176	157	BALANCE 2
EFFECT 2		
177	150	SAME AS EFFECT 1 (166 ~ 176 : PROG)
187	168	(147 ~ 157 : COMB)

In PROGRAM Mode (TABLE 7)

No.	PARAMETER
00	PERFORMANCE EDIT OSC OCTAVE
01	" VDF CUTOFF
02	" VDF EG INTENSITY
03	" VDA ATTACK TIME
04	" VDF,A RELEASE TIME
05	" VDA LEVEL
06	" VELOCITY SENSE
07	EFFECT LEVEL

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X3

MUSIC WORKSTATION

Operating Manual

GENERAL
MIDI
INSTRUMENT

āi AI^2 Synthesis System

KORG

Ⓔ ①