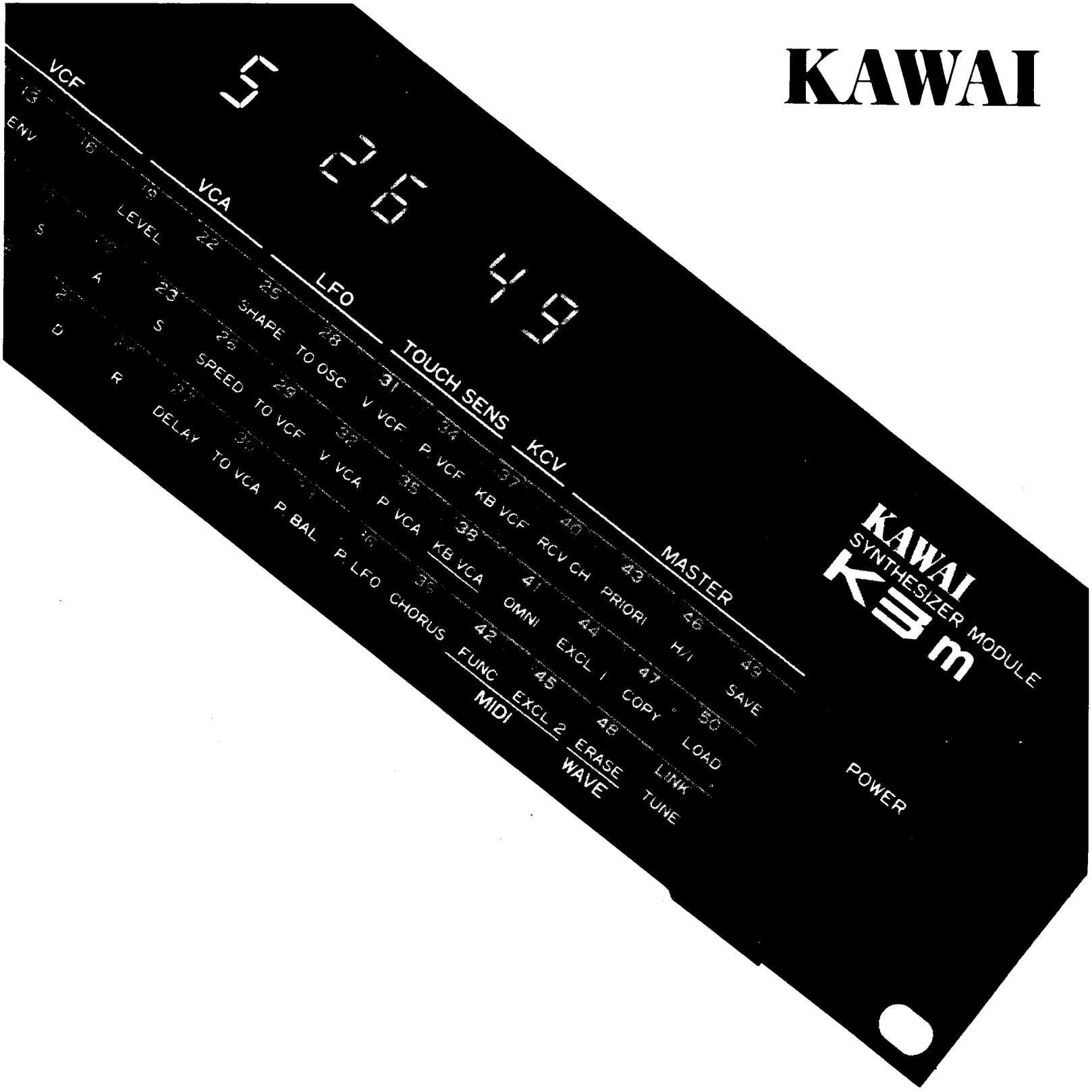
KAWAI



SYNTHESIZER MODULE

K3m OWNER'S MANUAL

Introduction

Congratulations! You are now the owner of one of the world's most technologically advanced digital synthesizer modules, the Kawai K-3m. The K-3m is truly outstanding value combining advanced microelectronics technology, innovative performance features, and superior sound quality. Your K-3m is an investment in digital synthesis technology that will provide you with many years of musical enjoyment.

A New Approach to Sound Synthesis

The Kawai K-3m synthesizer module combines wave sampling technology with true synthesis ability for a totally new approach to sound generation. It starts by constructing the waveform for a digital sound source from its harmonic components. (There are 32 such waveforms built into the synthesizer module, but you can program your own by assigning relative amplitudes for any 32 of the first 128 harmonics.) The audio signals from each oscillator are then combined and passed through filters, LFOs, envelope generators, and other components usually found only in today's more advanced analog synthesizers.

Wave sampling yields very faithful reproduction of the original because it produces a highly accurate description of sound produced by a piano, trombone, bass guitar, or any other instrument. The technology used, however, calls up a fixed sample and plays it back in a fashion not unlike a tape recorder. Using such a fixed sound source sacrifices control over the articulation, the way in which the sound varies over time after the musician first strikes the key. Analog synthesizers, on the other hand, generally provide greater control over articulation and other parameters required to produce a more "live" sound – only to lose sampling accuracy and the ability to easily program the synthesizer to emulate an existing instrument. The Kawai K-3m's digitally programmed sound sources give you the best of both worlds: lifelike samples and complete control of articulation.

Other Features

The Kawai K-3m synthesizer module has several other advanced features as well:

- Programmable velocity and aftertouch (pressure), that allow you to personalize keyboard response for each tone patch
- Programmable stereo chorus and delay for creating tone patches with realistic, studio quality effects
- Slot for a removable memory cartridge, an external storage device which holds 50 additional tone patches
- Advanced MIDI implementation including support for "system exclusive" messages which expand the control possible with this world standard interface.
- The "Scope" feature allows the K-3m to read or respond only to specified notes within the zone and makes the "Split" feature possible.
- Mastering the K-3m from the K-3 synthesizer allows up to 12 notes to be played at the same time using the unique "Spillover" feature.
- Analog and digital sound synthesis – the best of both worlds!

Do not let all these advanced features overwhelm you. The Kawai K-3m synthesizer module also has many of the standard features which you already know how to use. (See "In a Hurry?" below.) We do suggest, however, that you study this manual and keep it handy as a reference so that you can get the most from the wide range of advanced features available to you.

Note: The abbreviation LED stands for "light-emitting diode" and, when used as a noun, refers to the on/off status indicator located just above a front panel control switch. (Larger LEDs are used to form letters and digits on the LED display above these switches.)

In a Hurry?

(1) To play:

- Carefully unpack your new K-3m and plug the AC cord into a power outlet with the proper voltage.
- Plug a set of stereo headphones into the jack provided (on the front edge, at the left) or connect the audio output jacks (left for mono; both for stereo) on the rear panel to an amplifier.
- Connect MIDI IN jack on the rear panel to MIDI OUT jack of a MIDI keyboard.
- Turn on the K-3m and the MIDI keyboard. (The LED next to the PROGRAM INT switch should light; the PGM/COUNT part of the LED display should read "1".)
- Select a tone patch number: INT or CART plus one of the fifty numbered keys to the right of the control switches.
- Adjust volume and play.

(2) To program a patch:

- Select the number for a tone patch to edit.
- Press the PARA switch. (The LED next to it will light.)
- Select a parameter from the fifty numbered keys to the right of the control switches. (The parameter number will appear in the PARA/HARMO part of the LED display.)
- Press one of the VALUE switches to adjust the VALUE/INTEN. part of the LED display.
- Turn the PARA switch on and off to compare the effects of the edited and unedited versions on the K-3m output.

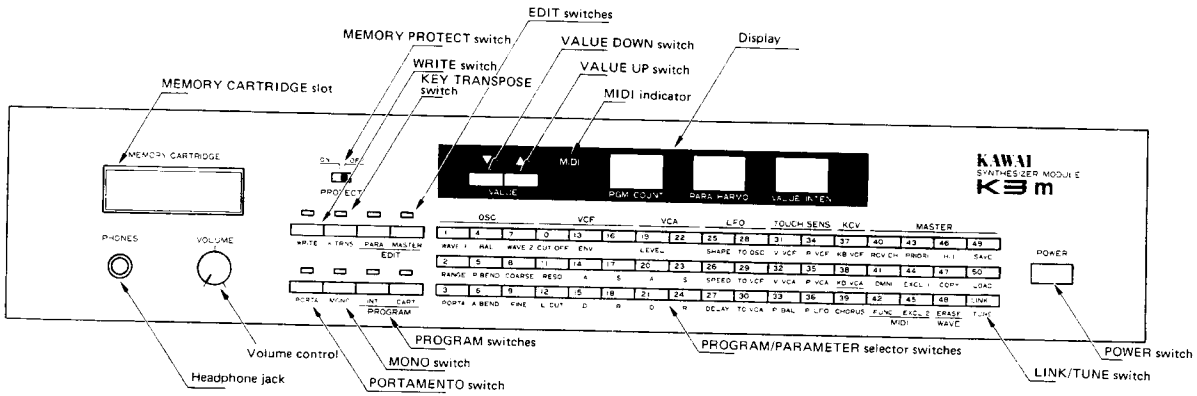
(3) To store an edited patch:

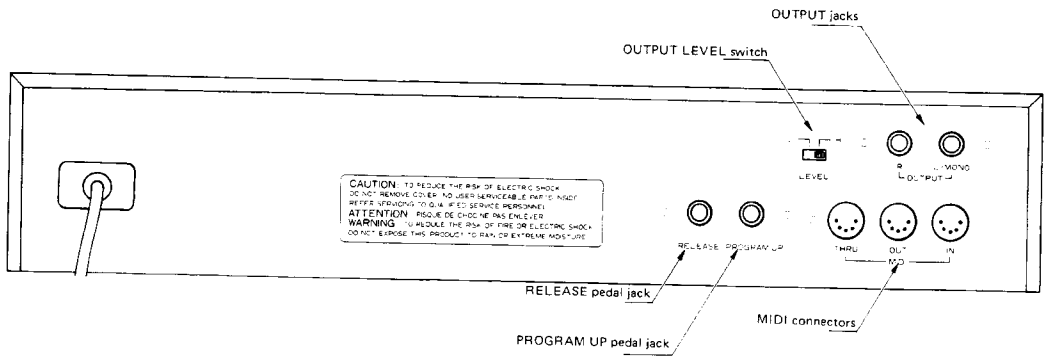
- Turn off the memory protect switch on the front panel (INTERNAL patch) or the memory cartridge.
- Press the WRITE switch. (The LED next to it will light.)
- Select a tone patch number for the edited version. Either write over the old patch by re-entering the original patch location, or enter a new tone patch location. (The LED next to the WRITE switch will go out.)
- Turn on the appropriate memory protect switch.

Table of Contents

1. Parts and Connections

1.1 Names of Parts





Care and Maintenance

For proper care, protect your K-3m from:

- Direct sunlight and exposure to the elements
- Temperature and humidity extremes
- Unstable or "noisy" AC power
- Dust and sand
- Vibration during transport

Power Supply

- Use a supply within the stated voltage limits.
- Make sure that all power switches are off before changing equipment connections.
- Connect the synthesizer module as shown on p. 3.

Cleaning

- Clean the instrument with a soft cloth, a mild detergent, and lukewarm water.
- Never use harsh or abrasive cleansers or organic solvents.

Helpful Hints

■ Battery Backup

The lithium battery protecting the memory contents while the power supply is off is good for more than five years of normal use. We recommend, however, that you have your nearest authorized service representative replace it promptly after five years have passed.

■ Line Noise Reset

In the unlikely event of a "lockup" due to line interference, simply turn the K-3m off for a few seconds and then reapply the power.

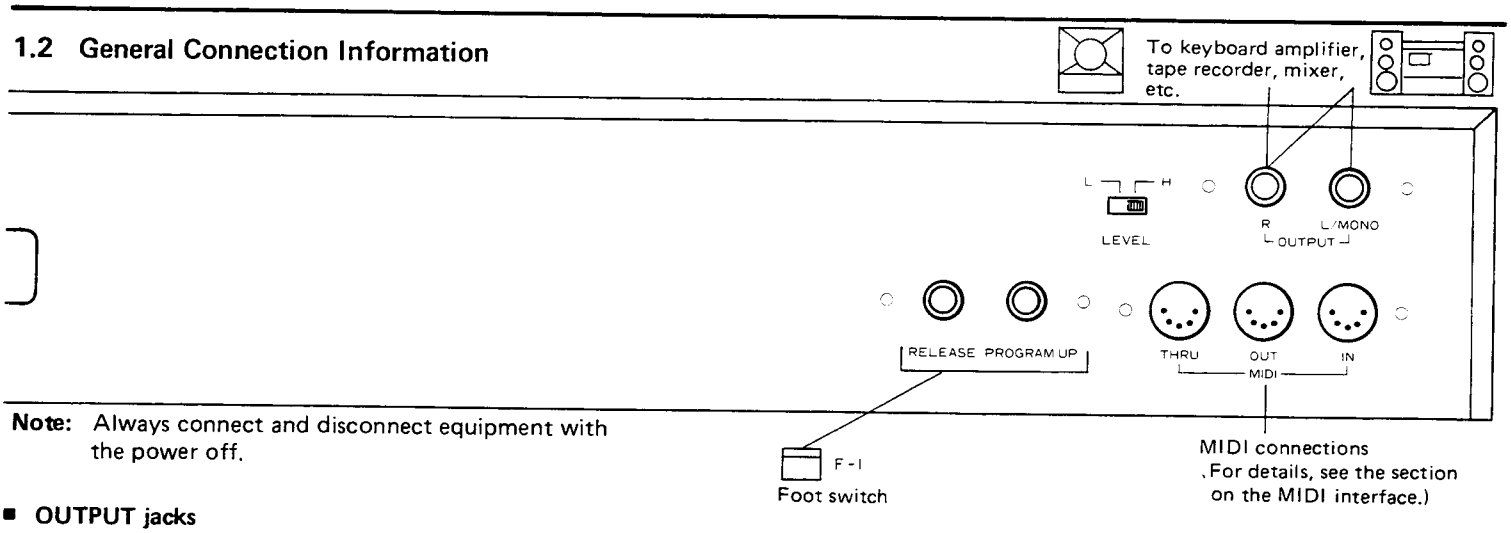
■ Repairs

Always save the INTERNAL tone patches to a memory cartridge before taking the synthesizer in for repairs or servicing. Otherwise, they may be lost in the course of testing.

■ Avoiding Surges

Always turn equipment off before connecting and disconnecting it.

1.2 General Connection Information



Note: Always connect and disconnect equipment with the power off.

■ OUTPUT jacks

The K-3m contains no amplifier or speakers – only a headphone jack for private listening and these line outputs for connection to a keyboard amplifier, public address system, or other audio system. (Use the stereo output for a richer chorus effect.)

■ LEVEL switch

This switch provides a choice of two output levels. Choose the one best matching the amplifier characteristics:

HIGH – for power amplifiers, audio mixers, and other equipment with input attenuation
LOW – guitar and other sensitive amplifiers with high gain

■ PROGRAM UP pedal jack

A foot switch connected to this jack allows you to change tone patch programs without taking your hands from the keyboard.

■ RELEASE pedal jack

A foot switch connected to this jack allows you to turn the damper pedal effect, which controls the amount of time it takes sound to fade after the key is released, on and off.

■ MIDI connectors

These accept cables joining the synthesizer to other MIDI instruments. (For a more detailed description, see the section on the MIDI interface.)

■ PROTECT switch

When the protect switch is ON, the internal memory (programs) of the K-3m are protected from accidental erasure or overwriting. It must be in the OFF position to save patches or user waves to the internal memory.

■ Memory cartridge

The K-3m comes with one memory cartridge as standard equipment. When inserting a cartridge in the slot provided in the upper left hand corner, first place the cartridge's memory protect switch in the ON position. Orient the cartridge with the switch facing up and then press firmly into place.

■ HEADPHONE jack (stereo)

Plug a set of headphones in this jack for private listening.

■ VOLUME control

This controls the level of the output jacks and the Headphone jack.

■ MIDI indicator

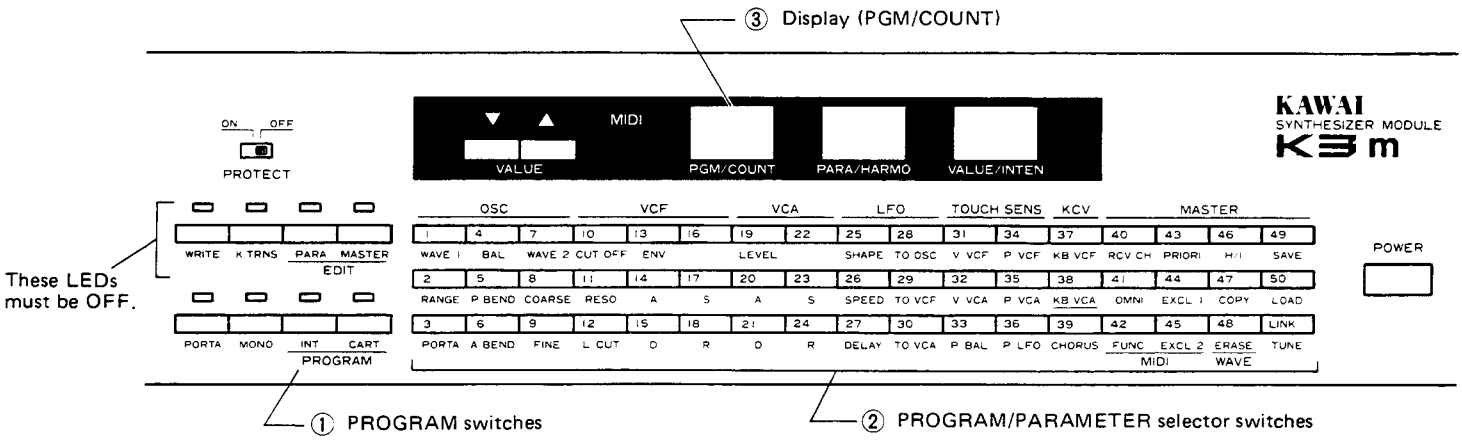
This indicator lights up whenever MIDI information is received. If the indicator does not light up when sending MIDI data to the K-3m, check your MIDI connections and settings on both units. (For details, see the section on the MIDI interface.)

2. Selecting a Tone Patch

2.1 Tone Patch Numbers

The K-3m holds fifty tone patches in its internal memory and another fifty in a removable memory cartridge. Changing tone patches is as easy as pressing two switches.

2.2 Panel Controls

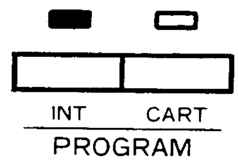


Note:
The Guide Sheet included with your K-3m lists the names of the 100 factory-installed patches. Choose your favorite and use the K-3m editing facilities to modify it to suit your taste. Do not, however, touch the WRITE switch until you are thoroughly familiar with your K-3m.

Note:
- The stock factory set of fifty INTERNAL tone patches can always be restored by holding down the first three switches (#1, #2, #3) as you turn on the power. You may, however, first want to copy the current patches to a cartridge so that you do not lose your custom patches.

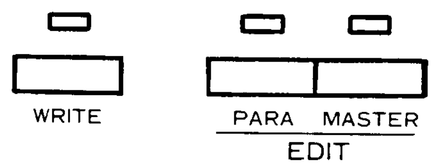
2.3 Procedure

(1) Press the appropriate PROGRAM switch (INTERNAL or CARTRIDGE) so that the LED next to it lights.



Only one LED will light.

(2) Make sure that the two EDIT switches and the WRITE switch are OFF. (If the LED next to one of these three switches is lit, press the switch to turn it off.)



These three LEDs must be out.

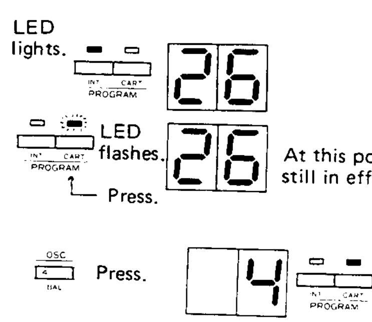
> **Note:** The above two steps can be done in either order.

(3) Press one of the PROGRAM/PARAMETER selector switches (numbered 1-50 and located to the right of the control switches) to change the module's tone patch. (The first two digits of the LED will give, in green, the tone patch number.)

(Example)

These three steps change the tone patch to that stored as internal tone patch #26.

> **Note:**
> • Pressing the CARTRIDGE switch at this point will not affect the tone patch. The INTERNAL LED will go out, but the CARTRIDGE LED will flash until you press a PROGRAM/PARAMETER selector switch. The LED will then light steadily to indicate that the change has been made and that you are currently using a tone patch from the memory cartridge.



At this point, INTERNAL No. 26 is still in effect.

Tone patch CARTRIDGE No. 4 is now in effect.

> **Note:**
> • If the LED display changes CtrGEr ("Cartridge Error"), the cartridge is missing or not firmly in place. Reinsert the cartridge and repeat the selection procedure.

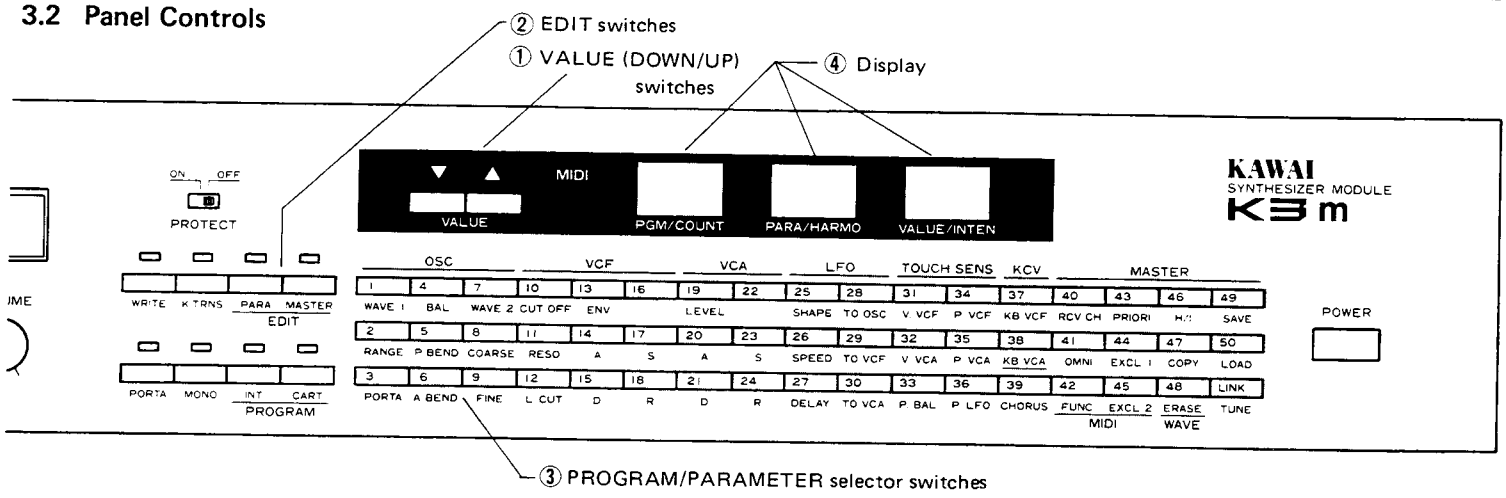
3. Editing Tone Patch Data

The K-3m makes it easy for you to create a distinctive sound because it provides 100 readymade patterns that can act as starting points. All you have to do is choose the one closest to the desired sound and then adjust the parameters — a process that takes much less time than starting from scratch.
This editing capability extends even to the waveform used as the sound source. More advanced users will appreciate the greater freedom of expression possible with the programmable digital waveform feature.
The results of your editing can even be saved, either in the module's internal memory or in a removable memory cartridge, for future use. (See "Storing Tone Patch Data" on p. 24.)

3.1 Parameters and Values

On a synthesizer, a particular tone patch is described in terms of "parameters" — components such as range, filter cutoff, and amount of resonance, for example — and "values", the numbers assigned to each parameter. On the K-3m, the value for a parameter is limited to a particular range of numbers (0-31, 0-99, etc.). Increasing or decreasing the value for a particular parameter changes the sound or the effect that parameter has on the sound.

3.2 Panel Controls



1 VALUE (DOWN/UP) switches

These switches control the settings (numerical values) of individual parameters. Pressing the left one decreases the value; pressing the right one increases the value.

2 EDIT switches

To edit tone patch parameters, press the PARAMETER switch so that the LED next to it lights.

> **Note:** The MASTER switch is used for more advanced types of editing: setting the instrument's MIDI channels, editing a sound source waveform, and transferring data between the internal memory and the memory cartridge. The two LEDs will never light simultaneously.
> To turn off the LED, press the corresponding switch. If either LED is lit, the instrument is in the edit mode.
>
> **Note:** The PARAMETER switch also provides a compare function which allows you to compare the current, edited sound with the original. (See p. 9.)

3 PROGRAM/PARAMETER selector switches

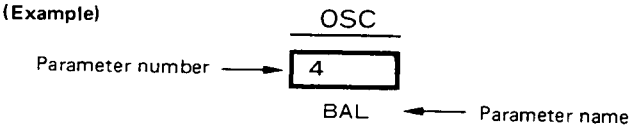
When the LED next to the PARAMETER switch is lit, switches 1-39 function as parameter selector switches. The others (switches 40-50) only function when the LED next to the MASTER switch is lit.

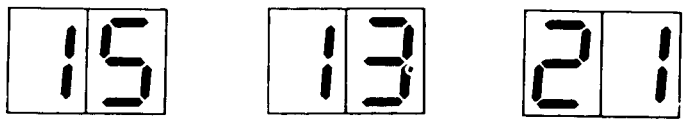
4 Display

The display consists of three pairs of digits:

PROGRAM/COUNT	tone patch number
PARAMETER/HARMONIC	parameter number
VALUE/INTENSITY	current parameter value

(Example)



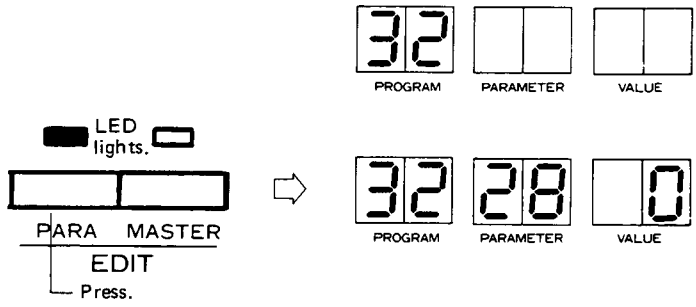


Tone patch number (green) | Parameter number (red) | Parameter value (red)

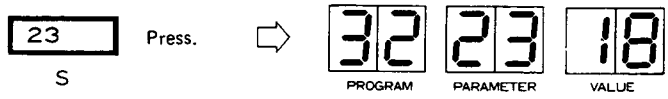
3.3 Procedure

(1) Select the tone patch closest to the desired effect.

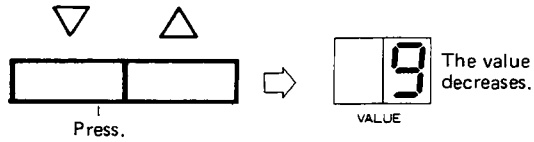
(2) Press the PARAMETER switch so that the LED next to it lights and the parameter last edited and its value appear on the display.

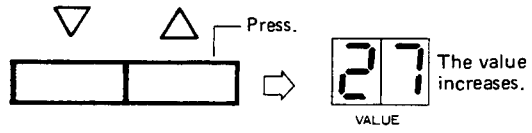


(3) Press a parameter selector switch so that the parameter number and its current value appear on the LED display.



(4) Use the VALUE (DOWN/UP) switches to control the value.





> **Note:** It is also possible, by turning the PARAMETER switch on and off, to compare the current tone patch with the original.

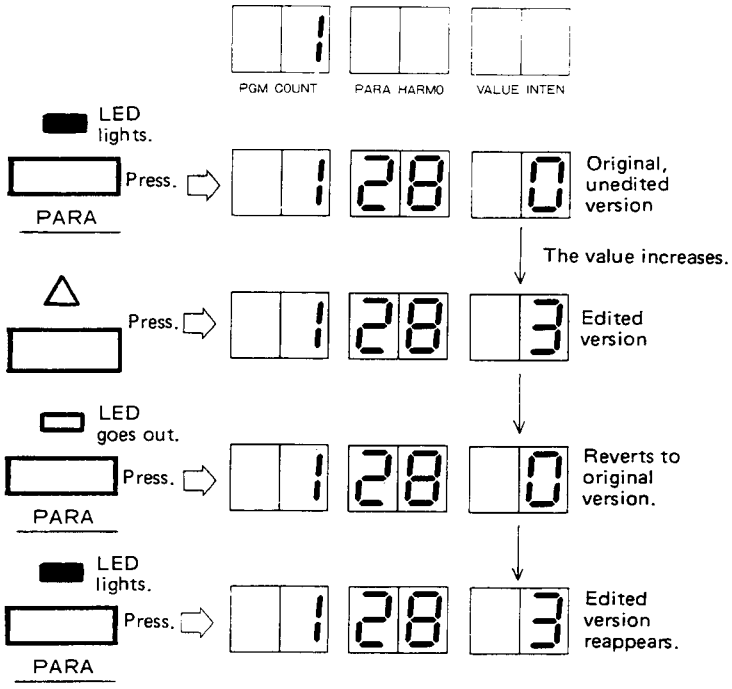
(5) Repeat steps (3) and (4) as often as necessary.

> **Note:** Selecting a new tone patch without saving the edited values (WRITE) erases the edited tone patch.

3.4 Comparing Edit to Original Patch

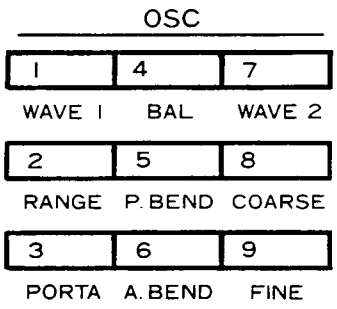
The original tone patch is always available at any stage of the editing session.
Simply pressing the PARAMETER switch, which turns off the LED, returns the module to the original tone patch. At the same time, the value on the display also changes to the original one. Pressing the switch a second time relights the LED and returns the module to the tone patch and the parameter value as it was last edited.

> **Note:** If the LED next to the PARAMETER switch is OFF, the module will store the original patch – NOT the edited version. Similarly, if you use the value switches to alter the tone patch while playing, the module will store the new version, not the old.
> In other words, the K-3m can directly store the tone patch which was just heard.
> Real-time editing is also available by pressing the VALUE switches after selecting a patch. The PARAMETER last selected before the patch was programmed into memory will be changed by the VALUE switches.



3.5 Parameters and Their Values

The following pages list the K-3m's programmable tone patch parameters, their meanings, and their possible values. Each tone patch program represents a particular combination of such values.



[OSC]

#1. WAVE 1 [OSC1 WAVE] (0 to 33)

This parameter specifies the wave source for oscillator No. 1.

Value	Wave source
0	Cancel (no sound)
1	Factory preset waveforms
↓	
31	
32	User-defined waveform (internal or memory cartridge)
33	White noise

#2. RANGE (16/8/4)

This parameter offers, in 1-octave steps, a choice of three pitch ranges for the two oscillators.

Value	Range
16	16 feet (Bass)
8	8 feet (Mid-range)
4	4 feet (Treble)

#3. PORTA [PORTA SPEED] (0 to 99)

This parameter controls the speed with which the pitch changes between notes. This effect is designed to smooth transitions for legato playing.

Note: This effect applies only when the PORTAMENTO switch is on. (This switch setting is also stored with each tone patch data.)

Value	Portamento speed
0	Fastest possible portamento
↓	↓
99	Slowest possible portamento

#4. BAL [BALANCE] (–15 to 15)

This parameter determines the mixing balance for the two oscillators.

Value	Mixing balance
-15	Oscillator No. 1 only
↓	↓
0	Even
↓	↓
15	Oscillator No. 2 only

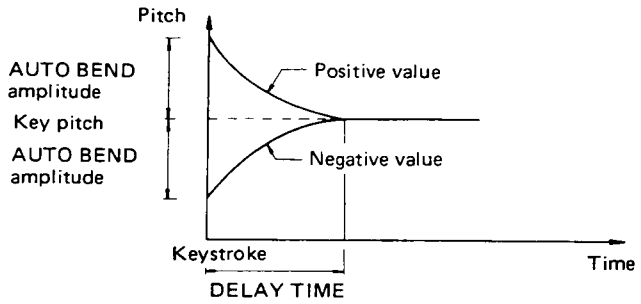
#5. P. BEND [PITCH BEND] (0 to 12)

This parameter determines the maximum range of PITCH BEND information received from MIDI.

Value	Pitch bend range
0	No pitch bend
↓	↓
12	± One octave

#6. A. BEND [AUTO BEND] (–31 to 31)

This parameter determines the amplitude and direction of the glide added to the beginning of each note. The AUTO BEND function does not apply to legato playing.



Note: The delay time (the time required to complete the glide) is determined by parameter #27, LFO DELAY TIME.

Value	PITCH BEND effect
-31	The pitch glides upward to that of the key pressed.
↕	↕
0	No glide.
↕	↕
31	The pitch glides downward to that of the key pressed.

#7. WAVE 2 [OSC2 WAVE] (0 to 33)

This parameter assigns a waveform to oscillator No. 2 just as parameter #1 assigns one to oscillator No. 1.

#8. COARSE [OSC2 COARSE] (–24 to 24)

This parameter turns, in semitones, oscillator No. 2 relative to oscillator No. 1 over a range of two octaves above and below.

Value	OSC 2 pitch relative to OSC 1
-24	2 octaves lower
↕	↕
0	Same
↕	↕
24	2 octaves higher

#9. FINE [OSC2 FINE] (–10 to 10)

This parameter fine-tunes the pitch derived from parameter #8 OSC2 COARSE. Adjusting the pitch this way adds depth to the sound.

Value	OSC 2 pitch relative to OSC 1
-10	30 cents lower
↕	↕
0	Same
↕	↕
10	30 cents higher

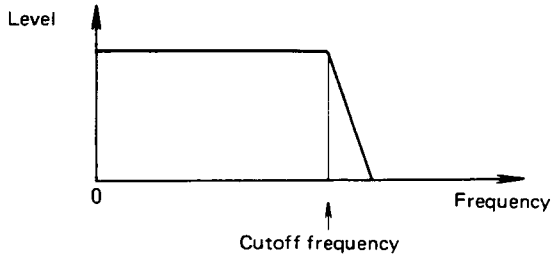
VCF

10	13	16
CUT OFF	ENV	
11	14	17
RESO	A	S
12	15	18
L. CUT	D	R

[VCF]

#10. CUTOFF (0 to 99)

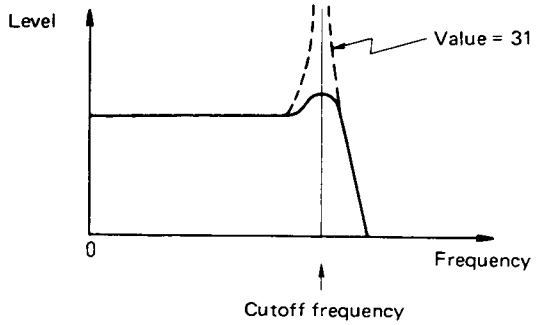
This parameter determines the cutoff frequency for the low-pass filter. As the name should suggest, this filter passes all frequencies below the cutoff point and filters out those above. (See diagram below.) Lowering the value (and hence the cutoff frequency) cuts off the higher harmonics.



Value	Tone effect
0	Softer (All frequencies cut out)
↓	↓
99	Brigher (All frequencies passed)

#11. RESO [RESONANCE] (0 to 31)

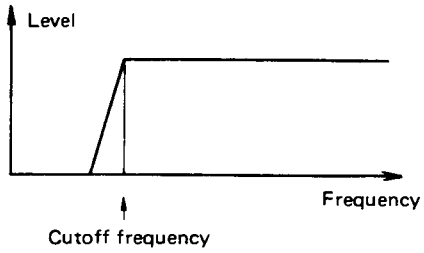
This parameter controls the amount of resonance (emphasis) added to the cutoff frequency. Increasing the resonance enhances the harmonics in this region. The maximum value (31) produces self-oscillation, a filter effect which can be used as a sound source (oscillator) for special effects.



Value	Amount of resonance
0	None
↓	↓
31	Maximum (Self-oscillation)

#12. L. CUT [LOW CUT] (0 to 31)

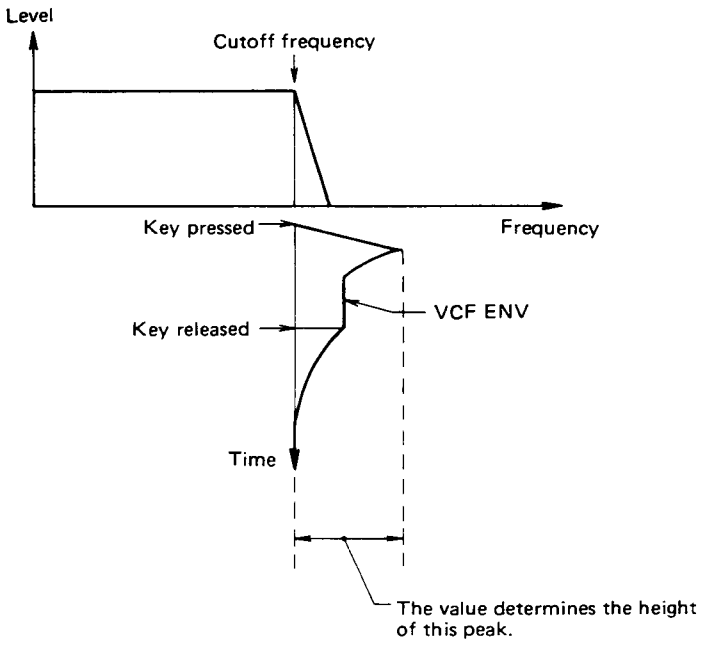
This parameter determines the cutoff frequency for the high-pass filter, a filter which passes all frequencies above the cutoff point and attenuates all frequencies below that point. (See diagram below.) Raising the value (and hence the cutoff frequency) cuts out the bass component of the sound.



Value	Effect on lower frequencies
0	No filtering (All frequencies passed.)
↓	↓
31	Maximum filtering

#13. ENV (0 to 31)

This parameter determines how much the VCF envelope generator (parameters #14, #15, #17, and #18 below) affects the filter output. (See diagram below.) Increasing the value makes the VCF-EG effect more pronounced.



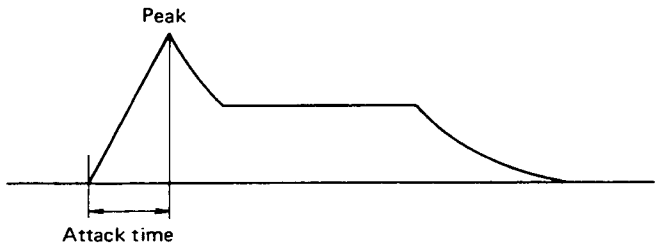
Value	Tone dependence on time
0	None
↓	↓
31	Maximum

VCF

10	13	16
CUT OFF	ENV	
11	14	17
RESO	A	S
12	15	18
L. CUT	D	R

#14. A. [ATTACK] (0 to 31)

This parameter determines the VCF envelope's attack time, the time required to reach the peak of the envelope.

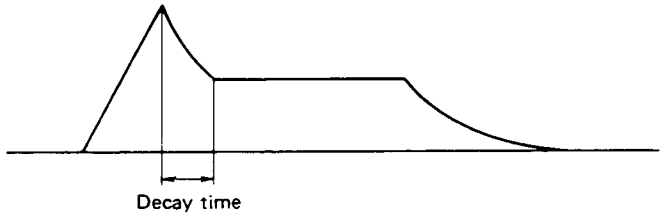


The height of the peak is determined by parameter #13 (ENV Amount). The higher the amount (peak), the more the low-pass filter cutoff frequency varies with time.

Value	Attack time
0	Shorter
↓	↓
31	Longer

#15. D. [DECAY] (0 to 31)

This parameter determines the VCF envelope's decay time, the time required to drop from the peak to the sustain level. The larger this value, the longer the decay time.



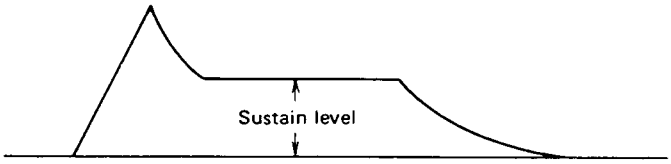
Value	Decay time
0	Shorter
↓	↓
31	Longer

#16. (Vacant)

No parameter has been assigned to this switch. Pressing it will have no effect on the tone patch.

#17. S. [SUSTAIN] (0 to 31)

This parameter determines the VCF envelope's sustain level, the level which follows the decay and lasts as long as the key is depressed.

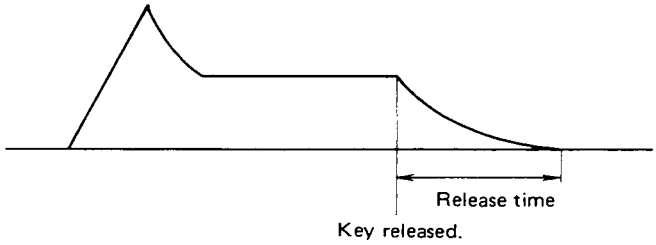


Note: Since the sustain level is defined relative to the peak level, setting it to the maximum (31) eliminates the decay.

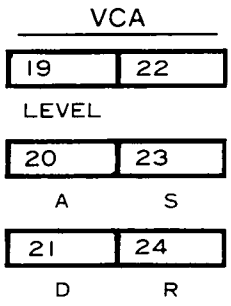
Value	Sustain level
0	0
↓	↓
31	Maximum

#18. R. [RELEASE] (0 to 31)

This parameter determines the VCF envelope's release time, the time required for the sound level to drop from the sustain level to "0" after the key is released. The greater the value, the longer the sound takes to die out completely.



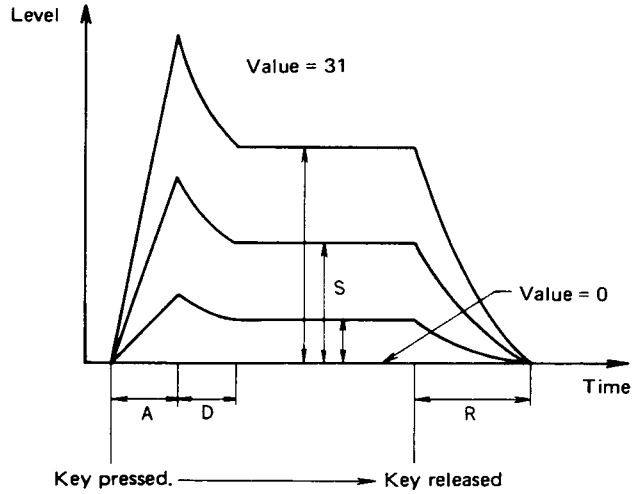
Value	Release time
0	Shorter
↓	↓
31	Longer



[VCA]

#19. LEVEL (0 to 31)

This parameter allows you to control the output level for individual tone patches. The other parameters in this section (#20, #21, #23, and #24) determine the shape of the envelope used to introduce a time dependence to the level of individual notes. (See parameters #13, #15, #17, and #18 for a more detailed explanation.)



A : Attack time
D : Decay time
S : Sustain level
R : Release time

Note: A value of "0" produces no output.

Value	Level
0	0
↓	↓
31	Maximum

#20. A. [ATTACK] (0 to 31)

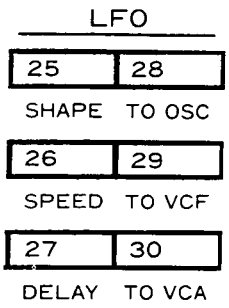
This parameter determines the attack time for the VCA envelope. A value of "0" produces the quickest possible rise.

Value	Attack time
0	Shorter
↓	↓
31	Longer

#21. D. [DECAY] (0 to 31)

This parameter determines the decay time for the VCA envelope. A value of "0" produces the quickest drop to the sustain level.

Value	Decay time
0	Shorter
↓	↓
31	Longer



#22. (Vacant)

No parameter has been assigned to this switch. Pressing it will have no effect on the tone patch.

#23. S. [SUSTAIN] (0 to 31)

This parameter determines the sustain level for the VCA envelope. Setting it to "0" eliminates the sustain effect so that the level decays all the way to "0" from the peak. Setting it to "31", on the other hand, eliminates the decay so that the sustain level is the same as the peak level.

Value	Sustain level
0	0
↓	↓
31	Maximum

#24. R. [RELEASE] (0 to 31)

This parameter determines the release time for the VCA envelope. The greater the value, the longer the sound takes to die out after the key is released.

Value	Release time
0	Shorter
↓	↓
31	Longer

[LFO]

#25. SHAPE (1 to 7)

This parameter determines the waveform for the LFO output.

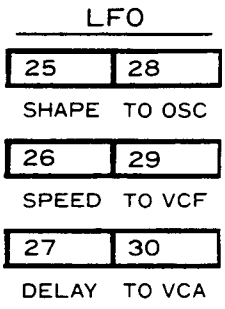
Note: The seventh one, chromatic random, introduces random pitch variations in semitone steps to produce a vibrato effect directly from the oscillator.

Value	Waveform
1	Triangle
2	Sawtooth
3	Reverse sawtooth
4	Square
5	Inverted square
6	Random
7	Chromatic random

#26. SPEED (0 to 99)

This parameter determines the LFO speed (frequency). The higher the value, the more rapid the modulation effect.

Value	Modulation speed
0	Slower
↓	↓
99	Faster



#27. DELAY (0 to 31)

This parameter determines the amount of time which passes before the LFO modulation begins. The greater the value, the longer the interval between the striking of the key and the start of the LFO modulation.

Note: This delay time is also used by the AUTO BEND function (parameter #6).

Value	Delay time
0	"0" (Effect begins immediately.)
↓	↓
31	Longer

#28. TO OSC (0 to 31)

This parameter determines the amount of vibrato generated by applying the LFO output to the oscillator. The greater the value, the greater the pitch variation introduced.

Value	Amount of vibrato
0	None
↓	↓
31	Maximum

#29. TO VCF (0 to 31)

This parameter determines the amount of modulation generated by applying the LFO output to the VCF. The greater the value, the greater the tone variation introduced.

Value	Amount of tone modulation
0	None
↓	↓
31	Maximum

#30. TO VCA (0 to 31)

This parameter determines the amount of modulation generated by applying the LFO output to the VCA. The greater the value, the greater the level variation introduced.

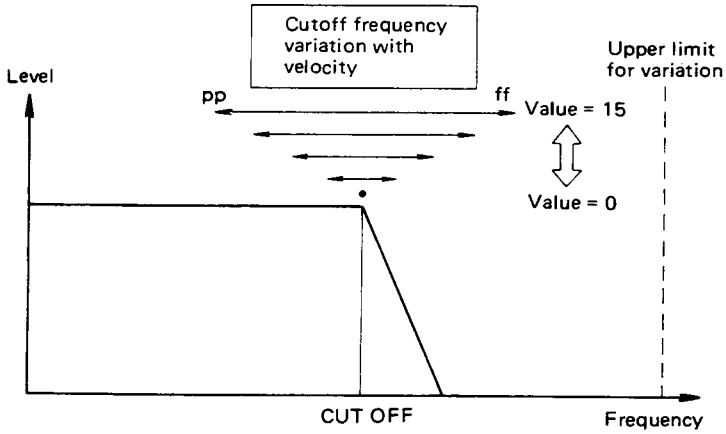
Value	Amount of level modulation
0	None
↓	↓
31	Maximum

[TOUCH SENS]

These functions only have effect when the controlling MIDI keyboard is equipped with Velocity or After-Touch Pressure.

#31. V. VCF [VELO VCF] (0 to 15)

This parameter determines the relationship between velocity the force with which you press the key, and the VCF cutoff frequency.

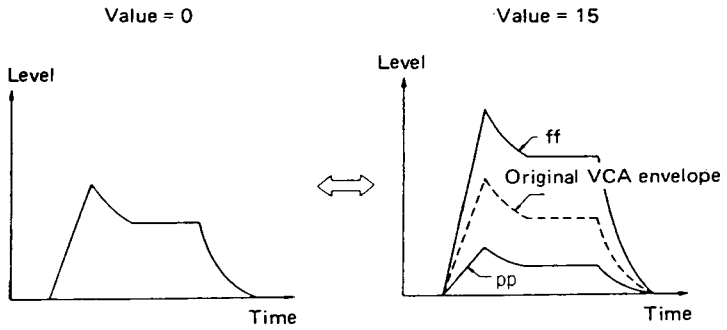


Note: If the maximum setting (15) fails to produce an adequate touch response, adjust parameters #10 (CUTOFF) and #13 (VCF ENV). Too high a value for either parameter severely limits the range of variation possible for the cutoff frequency.

Value	Tone variation with velocity
0	None
↓	↓
15	Maximum

#32. V. VCA [VELO VCA] (0 to 15)

This parameter determines the relationship between velocity and the VCA output level.



Value	Level variation with velocity
0	None
↓	↓
15	Maximum

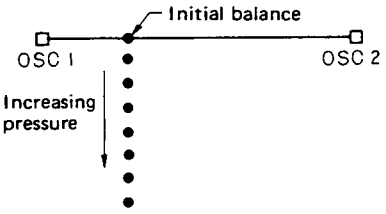
TOUCH SENS

31	34
V. VCF	P. VCF
32	35
V. VCA	P. VCA
33	36
P. BAL	P. LFO

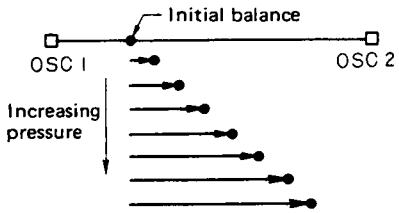
#33. P. BAL [PRES OSC BAL] (0 to 15)

This parameter determines the relationship between key pressure (aftertouch) and the mixing balance between the two oscillators. For a non-zero value, increasing the pressure shifts the balance from the initial one specified with parameter #4 (OSC BALANCE) in favor of oscillator No. 2.

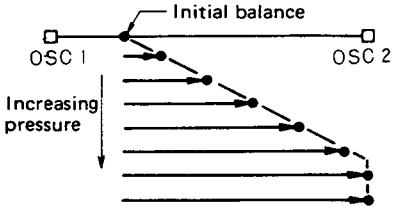
Value = 0



Value = 7



Value = 15



Note: The effect is less pronounced if the initial balance is already heavily shifted in favor of oscillator No. 2.

Value	Shift in mixing balance toward oscillator No.2
0	None
↓	↓
15	Maximum

#34. P. VCF [PRES VCF] (0 to 15)

This parameter determines the relationship between key pressure (aftertouch) and the VCF cutoff frequency. For a non-zero value, increasing the pressure raises the frequency and thereby changes the tone patch.

Note: The effect is less pronounced if any of the following parameters have already raised the cutoff frequency beyond the range in which it can be modulated: #10 CUTOFF, #13 ENV, #17 SUSTAIN, or #31 VELO VCF. (In the last case, the effect diminishes after keystrokes which are heavy from the start.)

Value	Tone variation with key pressure
0	None
↓	↓
15	Maximum

#35. P. VCA [PRES VCA] (0 to 15)

This parameter determines the relationship between key pressure (aftertouch) and the VCA output level. For a non-zero value, increasing the pressure raises the volume.

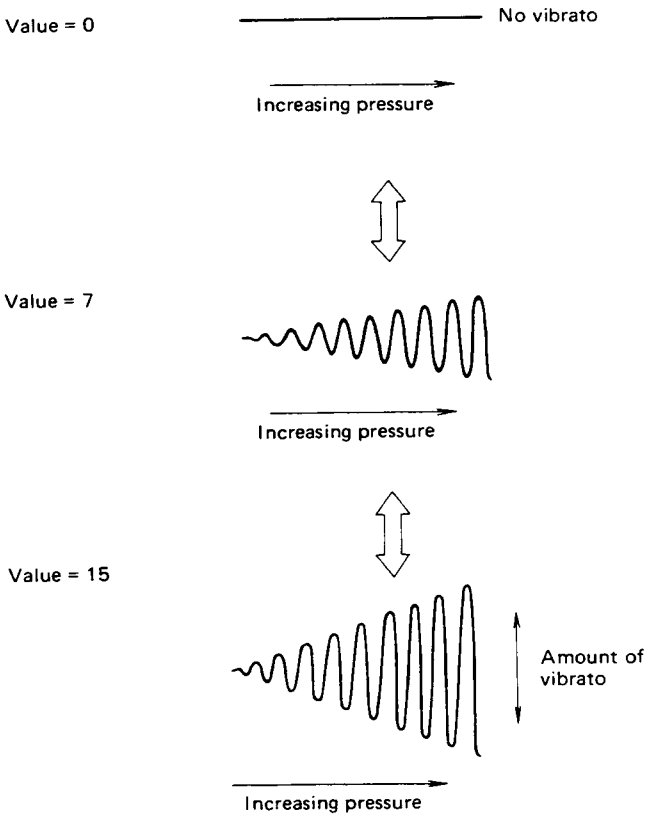
Value	Level variation with key pressure
0	None
↓	↓
15	Maximum

TOUCH SENS

31	34
V. VCF	P. VCF
32	35
V. VCA	P. VCA
33	36
P. BAL	P. LFO

#36. P. LFO [PRES LFO-OSC) (0 to 15)

This parameter determines the relationship between key pressure (aftertouch) and the amount of vibrato added. For a non-zero value, increasing the pressure raises the amount of vibrato.



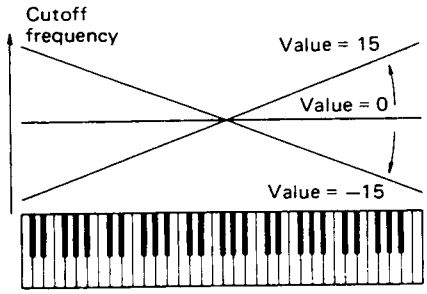
Note: This effect is available even when parameter #28 (LFO OSC) has been set to "0".

Value	Vibrato as a function of key pressure
0	None
↓	↓
15	Maximum

[KCV]

#37. KB VCF (–15 to 15)

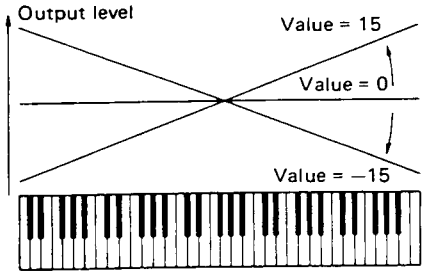
This parameter determines the relationship between the keyboard scale and the VCF cutoff frequency. It is used, for example, to simulate the tendency for the sound of musical instruments to become brighter as the pitch rises.



Value	Cutoff variation as key pitch rises
15	Drops at maximum rate
↓	↓
0	Does not change
↓	↓
15	Rises at maximum rate

#38. KB VCA (–15 to 15)

This parameter determines the relationship between the keyboard scale and the VCA output level.



Value	Level variation as key pitch rises
15	Drops at maximum rate
↓	↓
0	Does not change
↓	↓
15	Rises at maximum rate

[CHORUS]

#39. CHORUS (0 to 7)

This parameter determines the type of chorus or delay added to the tone patch. These stereo effects are built into the K-3m and once selected, can be programmed into a tone patch.

Chorus I : slow choral/phase shift
Chorus II : combination slow/fast shift
Chorus III : medium, random shift
Tremolo : fast, deep, shift
Chorus IV : ambience (1)
Chorus V : ambience (2)
Delay : short (40 – 60 ms)

Note: Use both left and right audio outputs or headphones for best effect.

Value	Chorus effect
0	None
1	Chorus I
2	Chorus II
3	Chorus III
4	Tremolo
5	Chorus IV
6	Chorus V
7	Delay

3.6 Storing Tone Patch Data

The edited tone patch may be saved for future use either in the K-3m's internal memory or a removable memory cartridge, which provide fifty storage locations each. Storing the data to one of the 100 such locations available at any given time erases the previous contents, however. If this is not desired, you can purchase additional cartridges to hold your growing library of tone patches.

Procedure:

(1) When you have finished editing, press the WRITE switch so that the LED next to it lights. (The LED next to the PARAMETER switch should also be lit as well.)

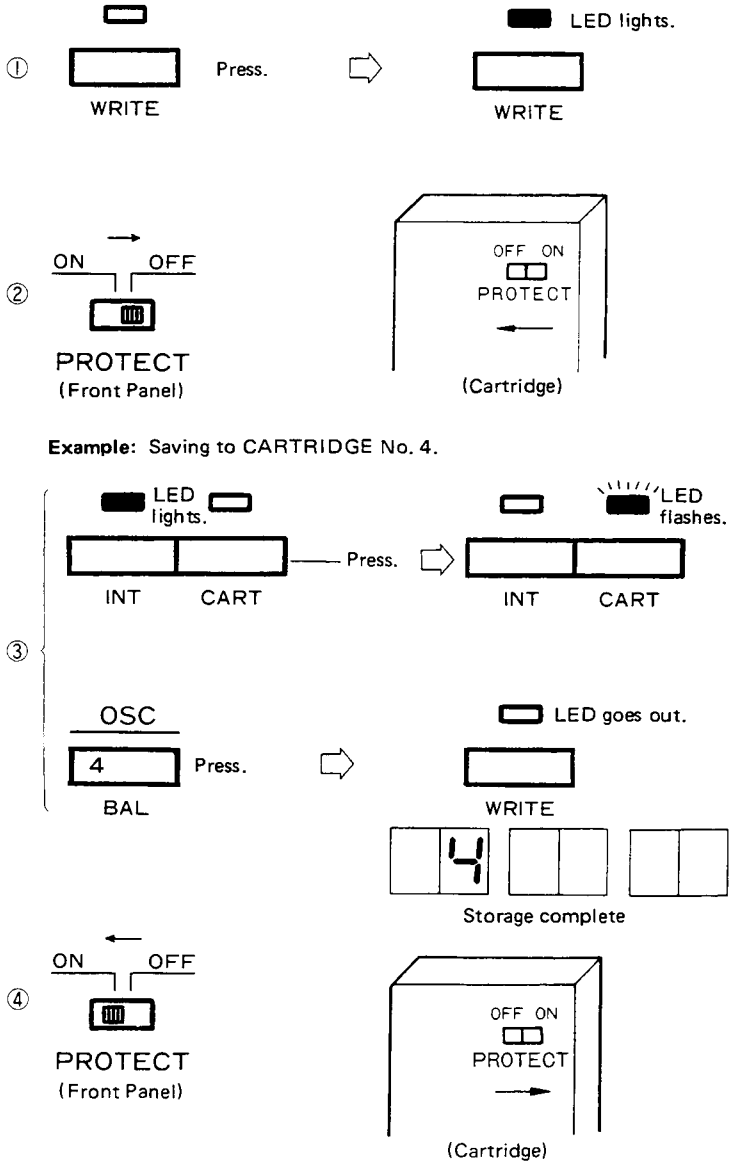
(2) Deactivate the memory protect mechanism by shifting the appropriate PROTECT switch (either on the front panel of the instrument or on the memory cartridge) to its OFF position.

> **Note:** If the PROTECT switch is left in its ON position, the storing operation will fail, and the message Pr ot ct ("Protect") will appear on the LED display.

(3) Press a PROGRAM switch (INTERNAL or CARTRIDGE) and then the PROGRAM/PARAMETER selector switch corresponding to a tone patch that is empty or no longer required. (The LEDs next to the WRITE and PARAMETER switches will go out when the operation is complete.)

(4) Return the PROTECT switch to its ON position as a precaution against accidental erasures.

> **Note:** This operation stores the current values for all parameters — including those that you have left unchanged or unassigned. It may therefore also be used to store minor changes to tone patches that have been edited "on the fly" during the course of a live performance.



4. User-Defined Waveforms

The K-3m comes with 32 preprogrammed sound sources – 32 built-in waveforms available for use as the fundamental building blocks for tone patches. It also provides space for additional user-defined sources. You can create and edit your own waveforms and store one in the internal memory and another one in the memory cartridge. You can also transmit this data to other equipment with MIDI system exclusive messages. (See p. 47.)

4.1 Theory

4.1.1 Pure tone

The purest sound element is a wave with a constant wavelength (pitch), a constant amplitude (loudness), and s shape known to scientists as a sine wave. (Light waves and AC power supplies also feature this waveform.)

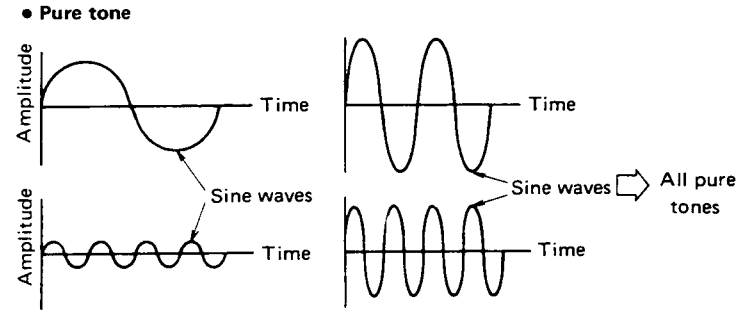
4.1.2 Harmonics

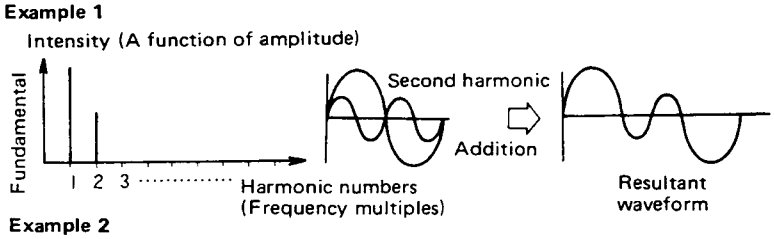
The sound of a musical instrument – a piano or saxophone, for example – has a waveform that is much more complex. The amazing thing is that, at any particular instant, the waveform can be broken down and expressed as the sum of a series of sinusoidal waves whose amplitudes may differ, but whose frequencies are all whole number multiples of a single common frequency. The common frequency is called the "fundamental"; the others, the "harmonics". In music, the second harmonic is one octave above the fundamental.

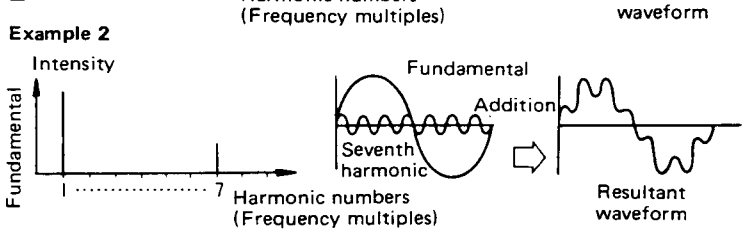
4.1.3 User-defined waveforms

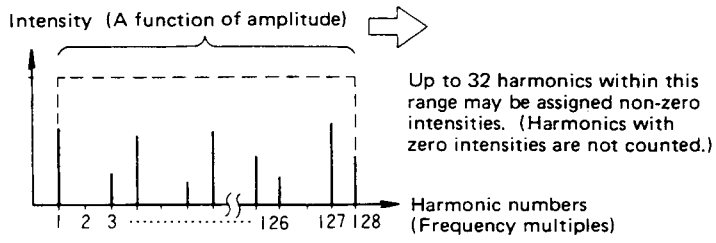
A synthesizer module such as the K-3m reverses the process, mixing a series of sine waves to generate complex patterns for "natural" sounds which we recognize instantly as a piano or a saxophone. In fact, all standard oscillator waveform shapes in popular synthesizers, such as triangle, sawtooth, and square waves are easy to reconstruct in this manner. Alternatively, you can choose a different set of amplitude settings and produce something totally new.

The K-3m allows you to create your own sound sources by specifying the relative intensities (amplitudes) for any 32 of the first 128 harmonics. Each intensity may be anywhere between 1 and 31. (Harmonics assigned an intensity of "0" are suppressed and do not affect the sound.)



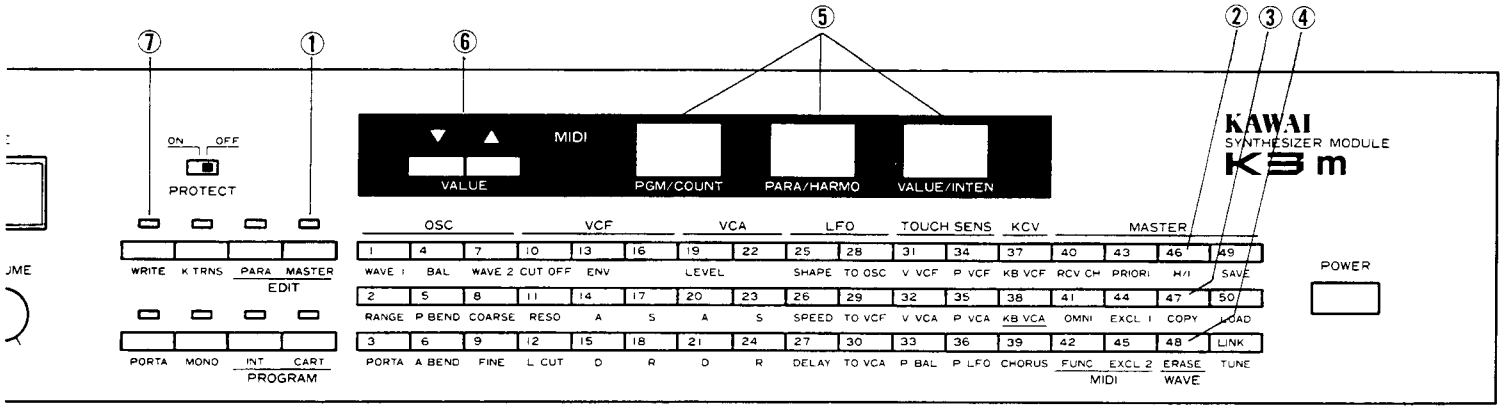






4.2 Procedure

4.2.1 Panel Controls



1 MASTER switch

The LED next to this switch must be on.

2 H/I (HARMONIC/INTENSITY) switch

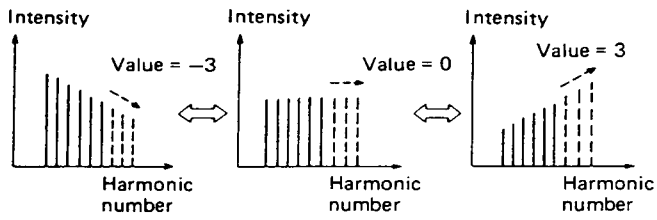
This switch is used to switch between selecting the harmonic number (1-128) and the intensity (0-31). The K-3m accepts up to 32 non-zero intensities out of the first 128 harmonics.

Value	Harmonic number
1	1
↓	↓
128	128

Value	Intensity
0	0
↓	↓
31	Maximum

3 COPY switch

This switch controls a copy function that allows you to specify a series of steadily increasing or decreasing intensities.



Value	Step
3	Intensity decreases by 3 for each harmonic.
↓	↓
0	Intensity remains the same.
↓	↓
3	Intensity increases by 3 for each harmonic.

4 ERASE switch

This switch reduces the intensity for the current harmonic to zero. Holding it down while using the VALUE (DOWN/UP) switches erase a series of harmonics.

5 Display

Pressing the MASTER switch and then the H/I switch changes the LED display to COUNT, HARMONIC, and INTENSITY.

6 VALUE (DOWN/UP) switches

Pressing these switches changes the HARMONIC or INTENSITY setting.

7 WRITE switch

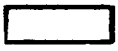
This switch controls the playback and write functions used to test and store the edited waveform.

4.2.2 Procedure

> **Note:** The K-3m will not let you change tone patch program location once the editing session has started. Always select the desired tone patch program location before starting to edit or create your waveform.

(1) Press the MASTER switch so that the LED next to it lights.


LED lights.

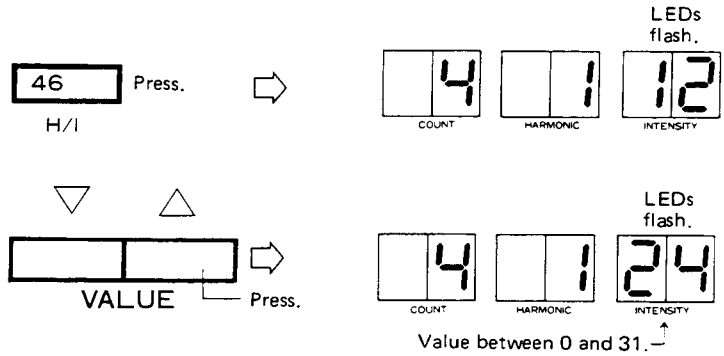

MASTER

> **Note:** Specifying waveform #32 (user-defined waveform) for one of the oscillators makes it easier to check the new waveform.

(2) Press the H/I switch to start the editing session:

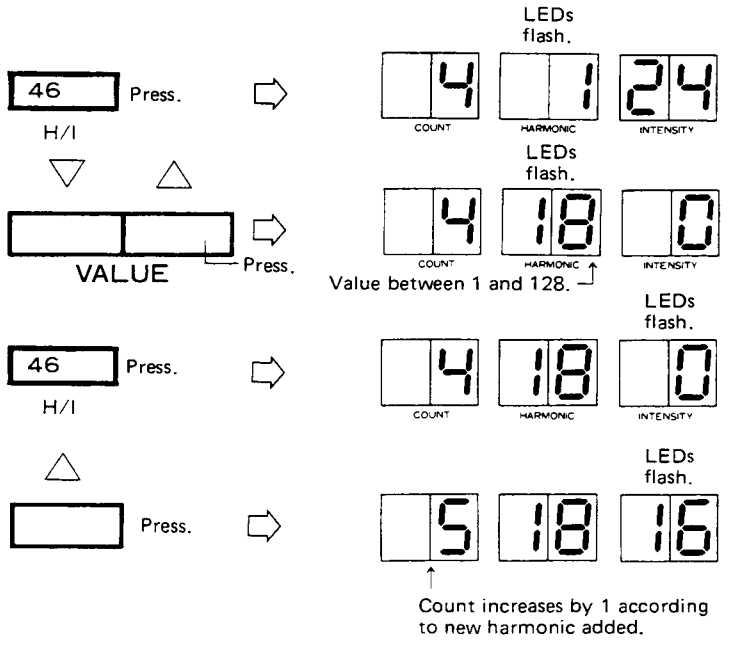
COUNT	The number of harmonics with non-zero intensities.
HARMONIC	The number of the harmonic being edited. (initially "1").
INTENSITY	The intensity assigned to the current harmonic.

The rightmost pair of digits (INTENSITY) will flash on and off to indicate that pressing the VALUE switches will change the intensity setting for the current harmonic.



(3) Press the H/I switch a second time to change to the HARMONIC section of the LED display. Pressing the VALUE switches will now change the harmonic number. The intensity assigned to that number will automatically appear in the rightmost two digits of the LED display.

(4) To change the intensity, press the H/I switch once again to return to step (2) and then pressing the VALUE switches. If the intensity is zero, changing it will increase the number in the COUNT part of the LED display by 1.
Conversely, lowering the intensity to zero will decrease the count by 1.



(5) Repeat steps (2) to (4) until the desired waveform is complete. Definition stops when COUNT reads 32.

4.2.3 Checking the new waveform

While the waveform is being edited, only the original (See 4.2.5 below.) and an edited version are available. To test the edited version, you must first have the K-3m calculate it from the new intensity specifications.

(1) Press the WRITE switch so that the LED next to it lights. In a few seconds, the waveform will be ready to test. (The LED next to the appropriate PROGRAM switch will flash to indicate that the K-3m is using the edited version.)

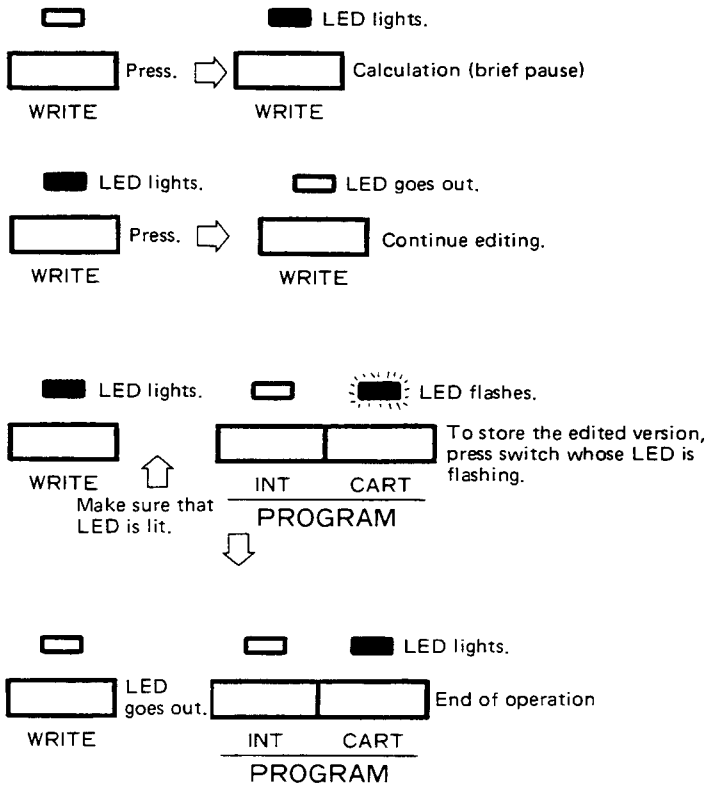
(2) To continue editing, press the WRITE switch so that the LED goes out. The edited version of the waveform is still available for testing. (The LED next to the PROGRAM switch is still flashing.)

4.2.4 Storing the waveform

(1) Press the WRITE switch so that the LED next to it is ON.

(2) Press the PROGRAM switch (INTERNAL or CARTRIDGE) whose LED is flashing. (When the operation is complete, the LED next to the WRITE switch will go out, and the K-3m will leave the editing mode. The LED next to the MASTER switch will remain it, however.)

Note: The new waveform is stored as waveform #32 in the corresponding location: the internal memory or the removable cartridge.



4.2.5 Comparing with the original

Until overwritten by the procedure just given (4.2.3), the original waveform is also available for comparison with the edited version.

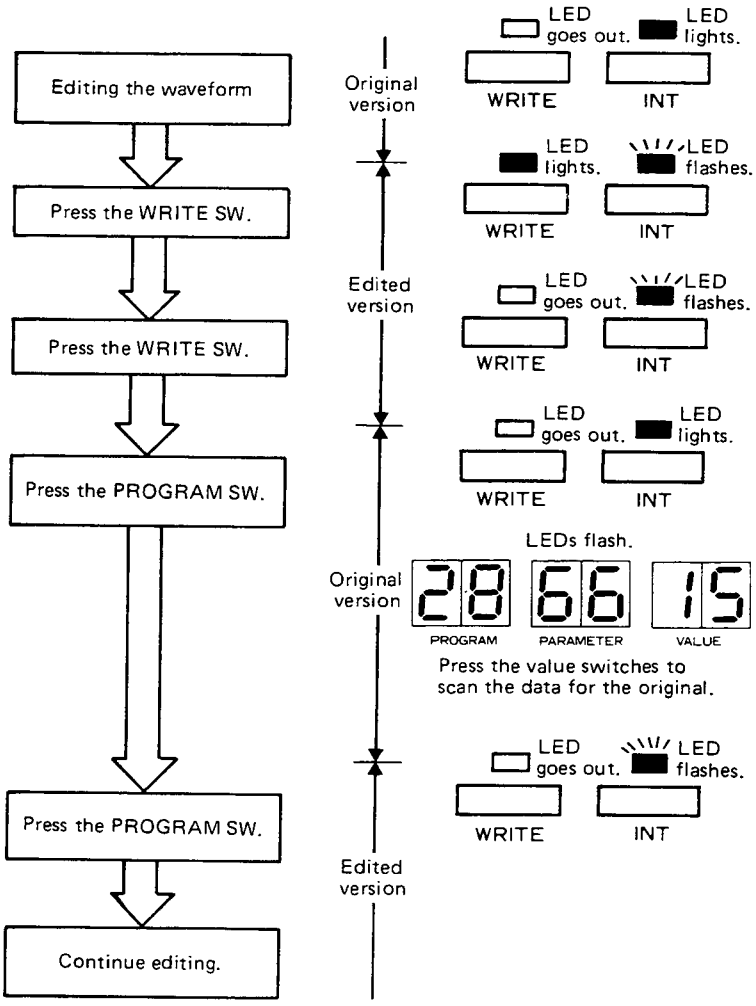
(1) Press the WRITE switch so that the LED next to it is OFF and the LED next to the PROGRAM switch is still flashing. It means that the edited version is available.

> **Note:** If the LED next to the WRITE switch is lit, the next step will destroy the original version, replacing it with the edited version.

(2) Press the appropriate PROGRAM switch. (Its LED will light to indicate that the synthesizer is using the original version.)

> **Note:** The HARMONIC portion of the LED display will flash to indicate that you may press the value switches to scan the intensities stored for each harmonic. You cannot, however, press the H/I switch to edit them.

(3) Press the appropriate PROGRAM switch a second time to return to the edited version. (Its LED will start flashing again.)



4.2.6 Additional functions

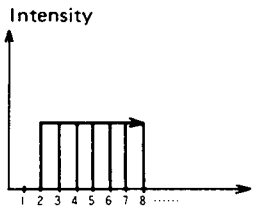
The K-3m also features two functions designed to make editing and creating waveforms easier: the COPY and ERASE functions.

1 COPY

The COPY function is the fastest way to assign intensities to a series of harmonics so that the intensities (a) are all the same, (b) increase at a steady rate, or (c) decrease. It is available when either the HARMONIC or the INTENSITY part of the LED display is flashing.

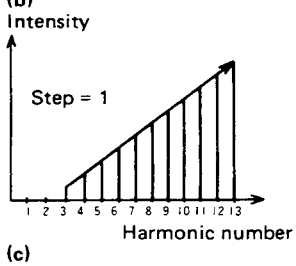
Example

(a)



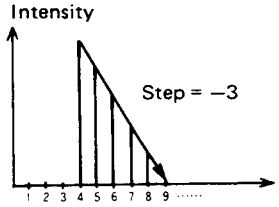
Harmonic number	1	2	3	4	5	6	7	···
Intensity	0	8	8	8	8	8	8	···

(b)



Harmonic number	3	4	5	6	7	8	···
Intensity	1	2	3	4	5	6	···

(c)



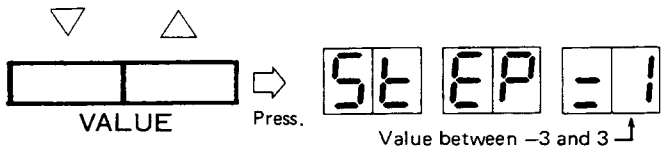
Harmonic number	4	5	6	7	8	···
Intensity	16	13	10	7	4	···

■ **Procedure**

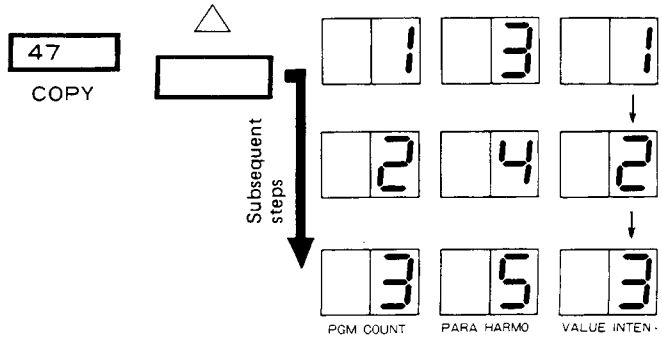
(1) Set the intensity for the first (lowest) harmonic in the series.

(2) Press the COPY switch to activate the function. The LED display will change to the prompt  ("STEP = ?").

(3) Press the VALUE switches to select one of the seven step sizes available: -3 -2 -1 0 1 2 3 (−3 to 3)



(4) Hold down the COPY switch and press the VALUE UP switch to assign intensities to the rest of the series.



> **Note:** The COPY function will stop functioning when the count reaches 32.

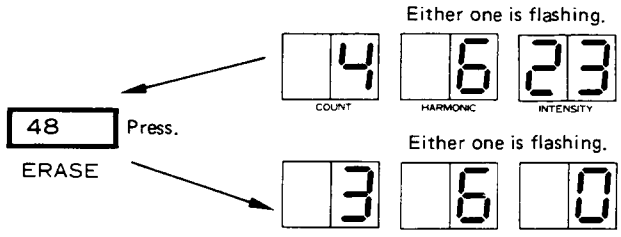
(5) Release the COPY switch and continue editing the harmonics in the normal way.

2 ERASE

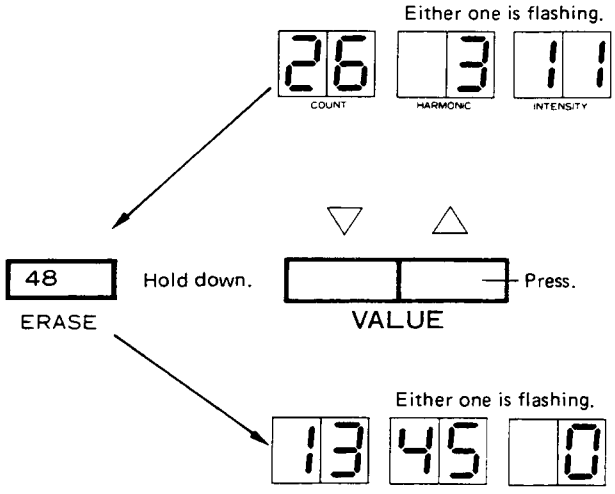
The ERASE function is the fastest way to reduce the intensity of the current harmonic to zero. It may also be combined with the VALUE switches to clear a series of harmonics. It is available when either the HARMONIC or the INTENSITY part of the LED display is flashing.

■ **Procedure**

(1) Press the ERASE switch to instantly change the INTENSITY part of the LED display to zero.



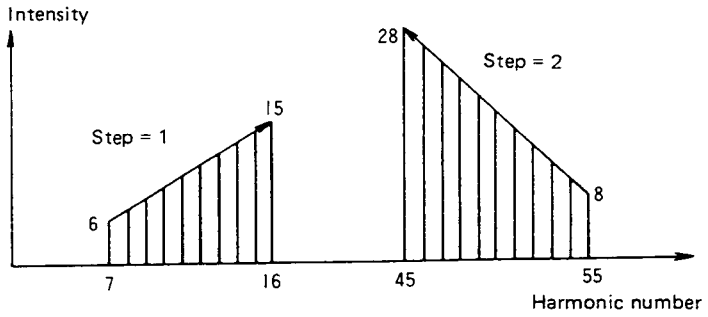
(2) Hold down the ERASE switch and press the VALUE switches to clear the intensities over a range of harmonics.



The above procedure suppresses the harmonics 3-45.

4.2.7 Sample editing session

The procedure below builds a new waveform from the harmonics shown in the graph. It assumes that all intensities have already been cleared to zero. (Use the ERASE function to do so.)



Harmonic number	7	8	9	10	11	12	13	14	15	16	—	45	46	47	48	49	50	51	52	53	54	55	···
Intensity	6	7	8	9	10	11	12	13	14	15	—	28	26	24	22	20	18	16	14	12	10	8	···

■ **Procedure**

(1) Press the MASTER switch so that the LED next to it lights.

(2) Press the H/I switch.
. . . . . INTENSITY part of the LED display flashes.

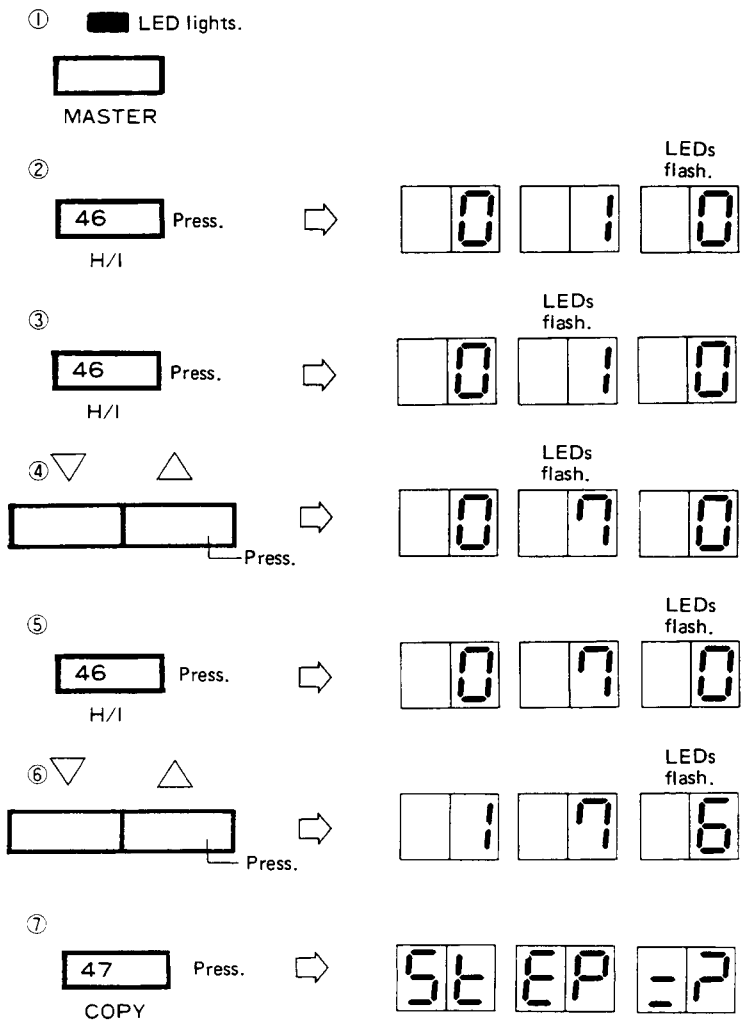
(3) Press the H/I switch.
. . . . . HORMONIC part of the LED display flashes.

(4) Use the VALUE switches to change the harmonic number to "7".

(5) Press the H/I switch.
. . . . . INTENSITY part of the LED display flashes.

(6) Use the VALUE switches to change the intensity number to "6".

(7) Press the COPY switch to activate the COPY function.



(8) Use the VALUE switches to change the step number to "1".

(9) Hold down the COPY switch and press the VALUE UP switch. Release the COPY switch when the harmonic number reads "16".
. . . . . INTENSITY part of the LED display flashes.

(10) Press the H/I switch.
. . . . . HARMONIC part of the LED display flashes.

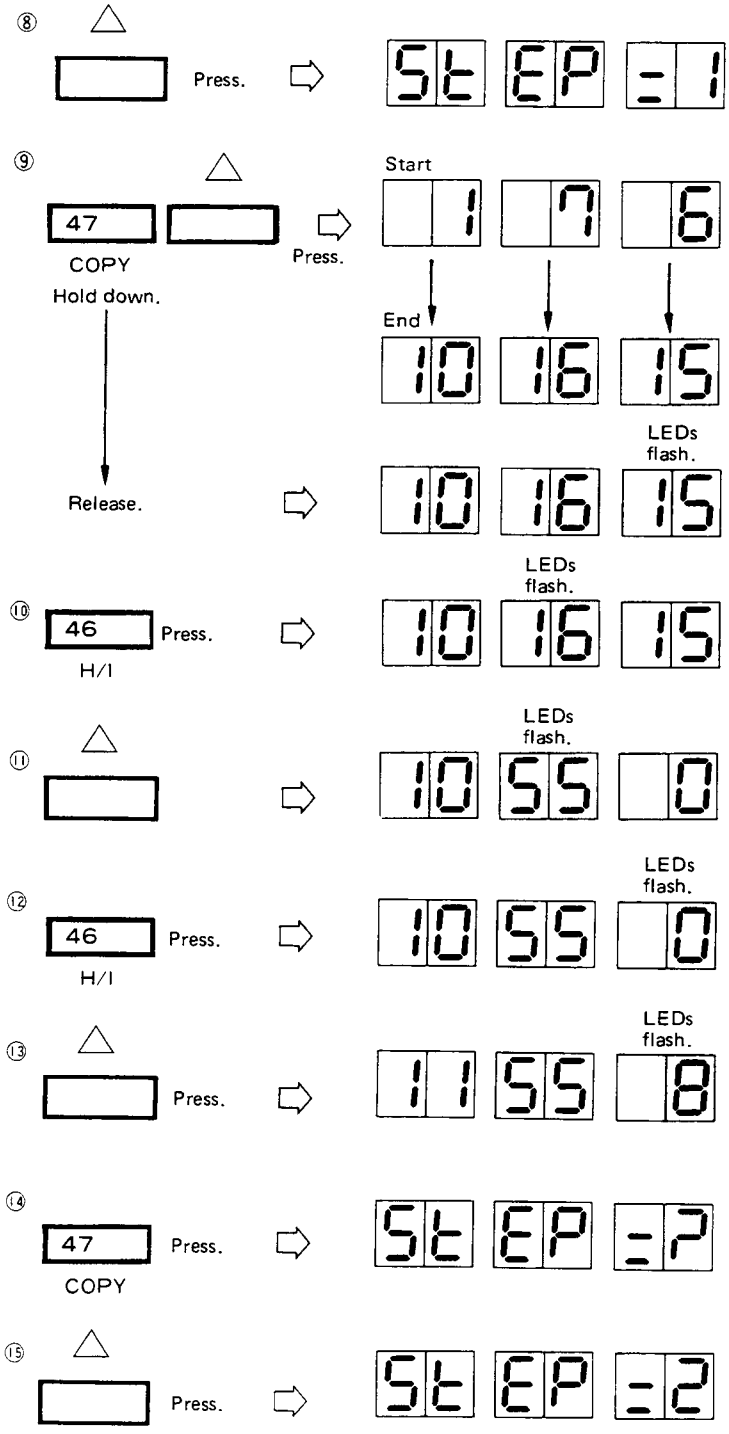
(11) Use the VALUE switches to change the harmonic number to "55".

(12) Press the H/I switch.
. . . . . INTENSITY part of the LED display flashes.

(13) Use the VALUE switches to change the intensity number to "8".

(14) Press the COPY switch to activate the COPY function.


(15) Use the VALUE switches to change the step number to "2".



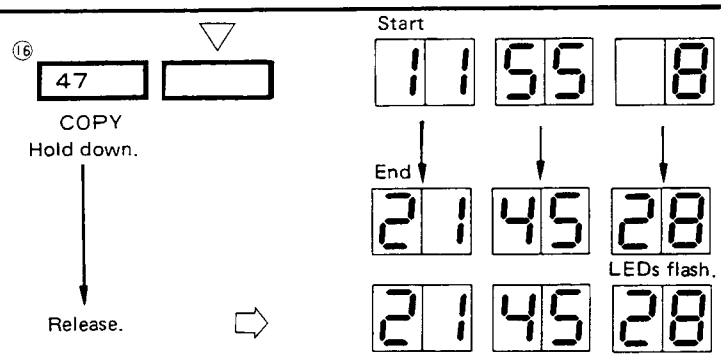
(16) Hold down the COPY switch and press the VALUE DOWN switch. Release the COPY switch when the harmonic number reads "45".

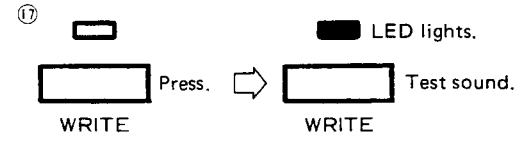
. . . . . INTENSITY part of the LED display flashes.

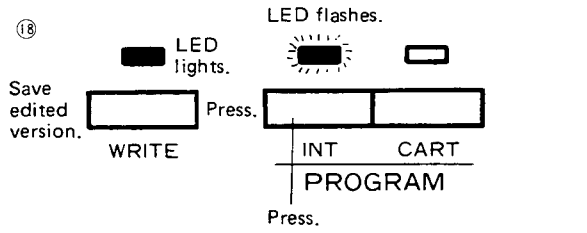
> **Note:** Intensity changes by step number are set by pressing the VALUE (DOWN/UP) switches. This example uses a positive step size and a negative VALUE to produce a steadily decreasing series of HARMONICS, as shown on the right side of the HARMONICS graph above. This same series could also be produced with a negative step size and a positive VALUE setting.

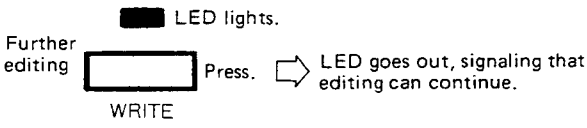
(17) Press the WRITE switch to light the LED next to it and then wait a couple of seconds while the K-3m makes the necessary calculations.

(18) If satisfied with the resultant waveform, store it by pressing the PROGRAM switch (INTERNAL or CARTRIDGE) whose LED is flashing. Otherwise, press the WRITE switch so that the LED next to it goes out and continue editing.









5. Performance Functions

This section describes the K-3m features especially useful for live performance.

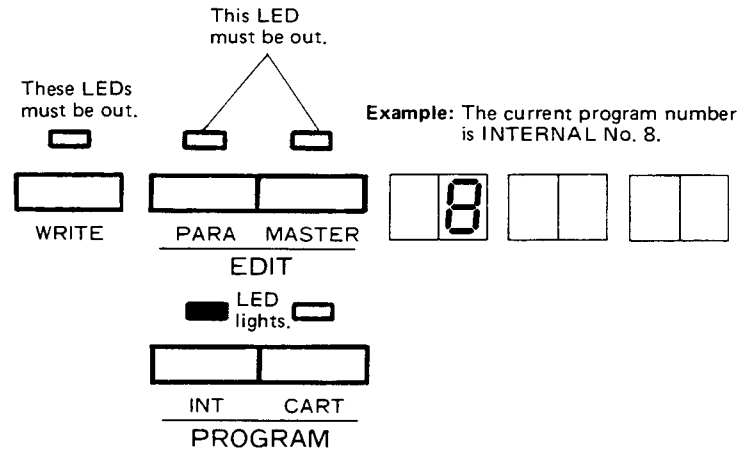
5.1 LINK

5.1.1 Description

This function allows you to link together, in advance, a sequence of up to 31 tone patch programs into a chain. Then, in the middle of a performance, all that is needed to step through the chain is a single touch of the LINK switch.

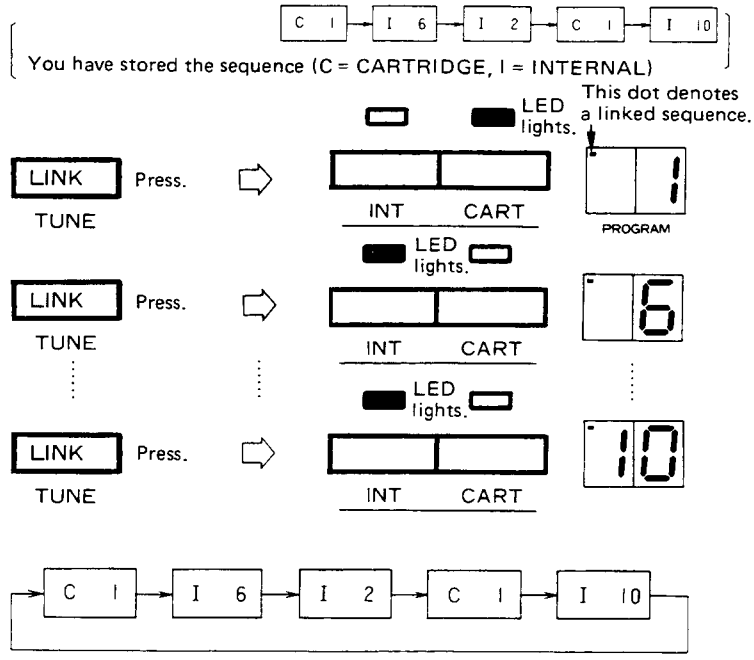
5.1.2 Using the function

(1) Make sure that the K-3m is in the program mode — that is, that only a PROGRAM LED (INTERNAL or CARTRIDGE) is lit.



(2) Press the LINK switch to change to the first tone patch of the sequence. A dot will appear to the upper left of the program number on the LED display to indicate that the K-3m is using a patch from a chain.

(3) When it is time to change to the next number of the chain, press the LINK switch.



Notes:

(1) The chain may freely mix tone patches from both the internal memory and the removable memory cartridge.

(2) The chain is an endless loop. At the end of the chain, pressing the LINK switch changes the tone patch from the last to the first.

(3) To break out of the loop, simply change tone patches manually.

(4) Pressing the LINK switch to reenter the loop automatically restarts the sequence from the first tone patch.

(5) A foot switch plugged into the PROGRAM UP jack on the K-3m's rear panel provides the same linking function.

5.1.3 Storing a chain

(1) Press the WRITE switch so that the LED next to it lights.

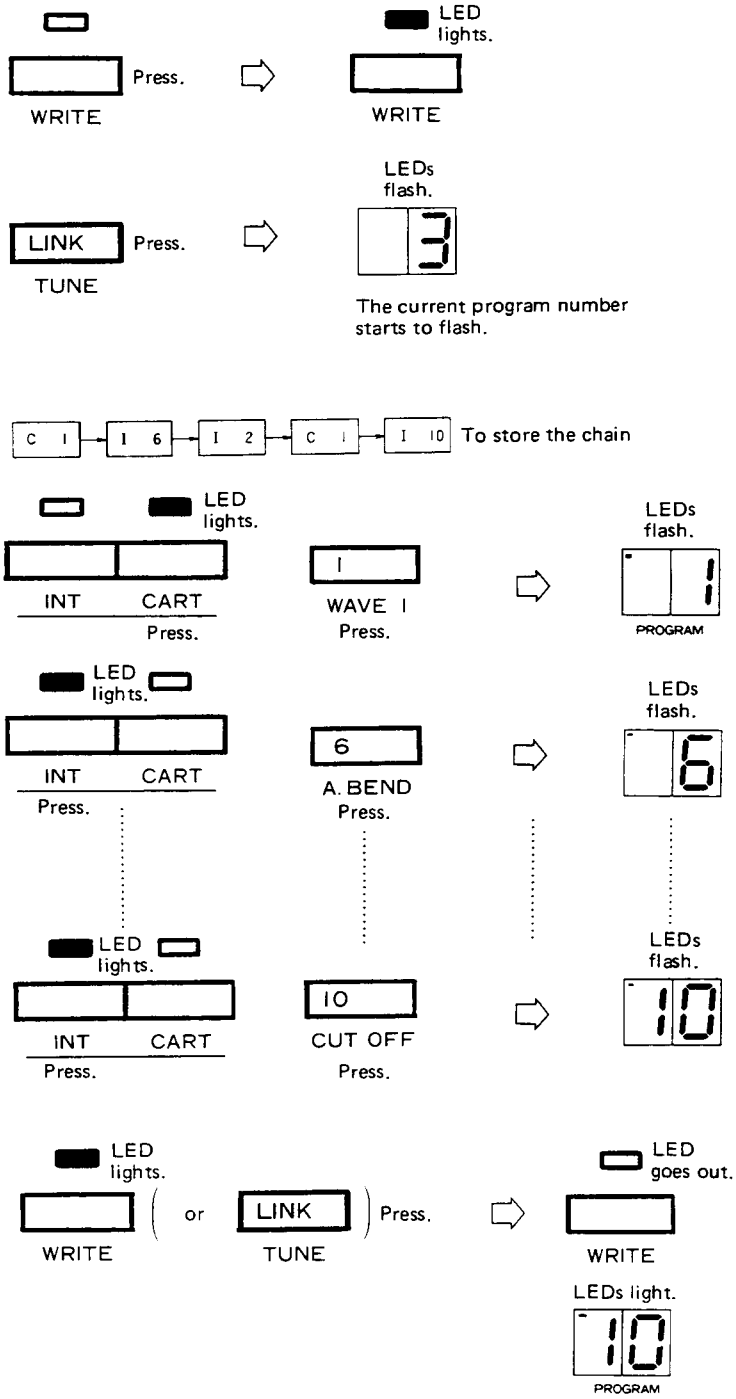
(2) Press the LINK switch. The PROGRAM part of the LED display will flash to indicate that the K-3m is waiting for input.

> **Note:** If no selection has been made, pressing the WRITE switch a second time turns off the LED and cancels the storage operation.

(3) Press the switch combinations for the desired sequence of tone patches. (Remember that it is always possible to change banks by pressing INTERNAL or CARTRIDGE before pressing a number selector.)
Pressing the first such combination will change the PROGRAM part of the LED display to the selected program number and a dot. It will also destroy any previously recorded sequence.

(4) When the series is complete, press the WRITE or LINK switch to turn off the LED next to the WRITE switch.

> **Note:** Up to 31 program numbers can be stored in a link.



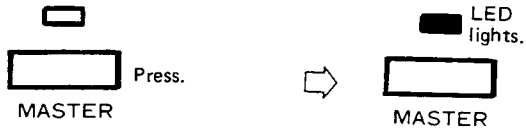
5.2 TUNE

This function allows you to adjust the pitch of the K-3m to match another instrument.

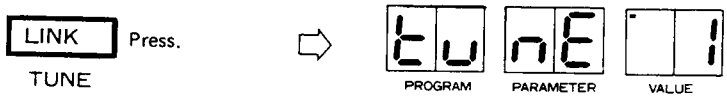
Value	Tuning
-50	Lower
⋮	⋮
0	A3 = 440 Hz
⋮	⋮
50	Higher

■ **Procedure**

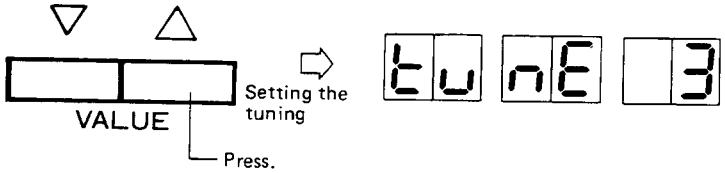
(1) Press the MASTER switch so that the LED next to it lights.



(2) Press the LINK/TUNE switch.



(3) Use the VALUE switches to adjust the pitch.



Note: This setting remains in effect even after the power is turned off.

5.3 KEY TRANSPOSE

The K-3m can be transposed within a one octave range, transpose between keys of five semitones below and six semitones above the original key.

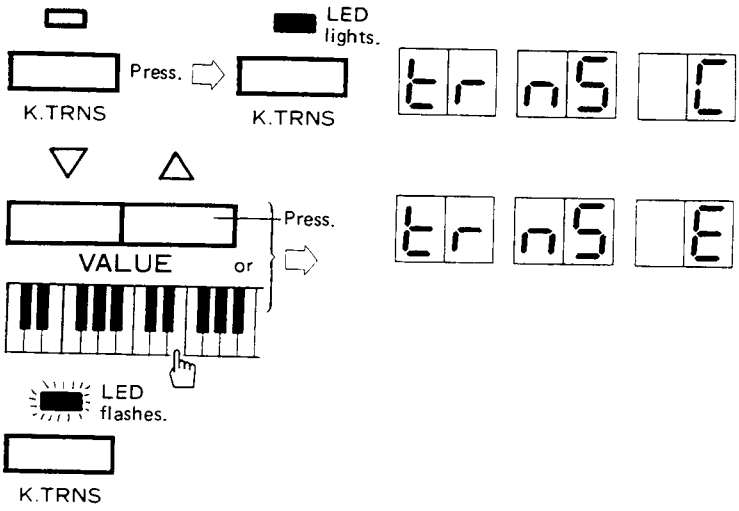
Value	Key Transpose
F	Transpose up six semitones (to F#).
⋮	⋮
C	Original key
⋮	⋮
G	Transpose down five semitones (to G).

■ **Procedure**

(1) Press the K. TRNS switch so that the LED lights.

(2) Set a key either by using the VALUE (DOWN/UP) switches or by playing a note on the keyboard.

(3) After setting the transposition, exit by pressing the K. TRNS switch, or by selecting a program.



(4) If a keys other than "C" has been selected, the LED of the K. TRNS switch will keep flashing, indicating the key transpose status.

Note: This setting remains in effect even after the power is turned off.

5.4 PORTAMENTO Switch

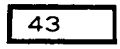
Activating this switch provides a "portamento" or a "gliding" effect. The speed of this glide is determined by parameter #3 (PORTA SPEED). (See p. 10.) This switch setting is also stored with each tone patch data.

PORTA

5.5 MONO Switch

Activating this switch provides fat and rich monophonic sound with either "high note" or "last note" priority.
This priority mode is set with parameter #43 PRIORI.

MONO



PRIORI

- **Procedure**

(1) Press the MASTER switch so that the LED lights.

(2) Press the #43 PRIORI switch.

(3) Select either LAST or HIGH. LASt HIGH

(4) Set the MASTER switch to off.

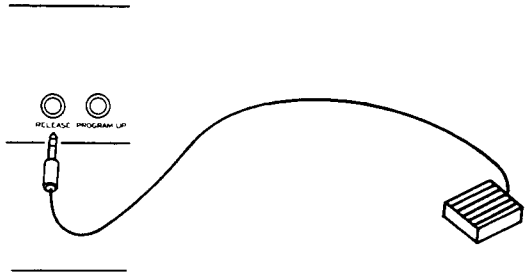
The setting of the MONO switch is stored with each tone patch, but the priority setting is effective for all patches.

The priority setting remains in effect even after the power is turned off.

Value	MONO priority
LASt	LAST-note priority
HIGH	HIGH-note priority

5.6 RELEASE Pedal

A grounded "normally closed" foot switch connected to the RELEASE jack on the rear panel of the K-3m produces an effect similar to that of the damper pedal on a piano. Pressing the pedal (and opening the switch) extends the envelope's release time to the maximum possible.

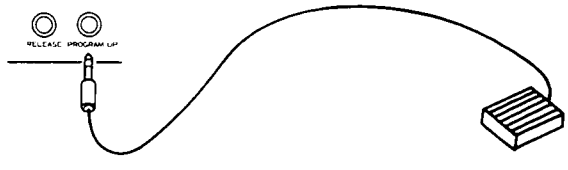


5.7 PROGRAM UP Pedal

A grounded foot switch connected to the PROGRAM UP jack on the rear panel of the K-3m allows you to change tone patches by pressing the pedal. The next tone patch used depends on whether the LINK function is activated — shown by a dot in the PROGRAM part of the LED display:

(1) If the dot is present, the K-3m follows the order specified in a preprogrammed linked series. The pedal therefore duplicates the function of the LINK switch.

(2) If there is no dot, pressing the switch changes the tone patch to the next one in the internal memory or removable memory cartridge.



5.8 VELOCITY SENS

The K-3m responds to MIDI VELOCITY data to vary tone patch sound and volume.

- **Tone patch**

Increasing the velocity amount routed to the filter produces a brighter sound. (See parameter #31, V. VCF, on p. 19.)

- **Volume**

Increasing the velocity amount routed to the loudness circuit produces a higher output level. (See parameter #32, V. VCA, on p. 19.)

5.9 PRESSURE SENS (Aftertouch)

The K-3m responds to aftertouch data (continued pressure after striking) to regulate even more effects.

- **Mixing balance**

Increasing the pressure shifts the mixing balance in favor of oscillator No. 2. (See parameter #33, P. BAL, on. p. 20.)

- **Tone patch**

Increasing the pressure produces a brighter sound. (See parameter #34, P. VCF, on p. 21.)

- **Volume**

Increasing the pressure produces a higher output level. (See parameter #35, P. VCA, on p. 21.)

- **Vibrato**

Increasing the pressure adds more vibrato or LFO effect. (See parameter #36, P. LFO, on p. 22.)

Note: The initial touch and aftertouch functions (8 and 9) are only available if the controlling instrument has touch sensitivity or other touch sensing function.

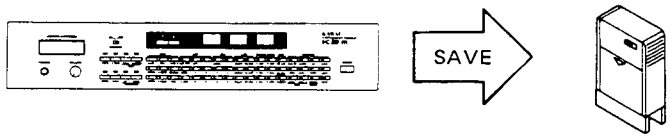
6. Saving and Loading Data

The K-3m uses removable random-access memory (RAM) cartridges for external storage because they provide fast data transfers. Each cartridge holds 50 programs and the harmonic/intensity data for one user-defined waveform. Additional cartridges are available at a reasonable cost for holding additions to your library of sounds and for making backup copies of the data in the K-3m's internal memory. To order, contact your local Kawai dealer.

6.1 SAVE

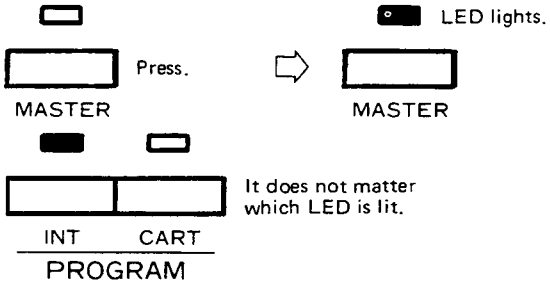
6.1.1 Definition

The SAVE operation copies 50 tones and one user-defined waveform from the module's internal memory to the memory cartridge currently in the slot. The data replaces the previous contents of the cartridge, so be sure to select a cartridge with unnecessary contents and insert it firmly into the slot.



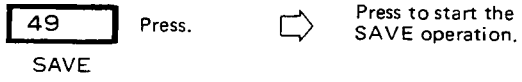
6.1.2 Procedure

(1) Press the MASTER switch so that the LED next to it lights. It does not matter which PROGRAM (INTERNAL or CARTRIDGE) LED is lit.



(2) Shift the PROTECT switch on the cartridge to the OFF position. If the switch is in its ON position, any attempt to write new data to the cartridge will abort, producing the message Pr ot ct ("Protect") on the LED display.

(3) Press the SAVE switch.



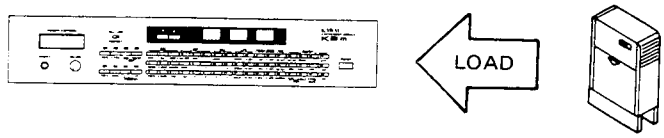
(4) When the operation is complete (in less than one second), return the PROTECT switch on the cartridge to its ON position to protect the contents from accidental erasure.

Note: At the end of the operation, the PROGRAM part of the LED display will change to "1".

6.2 LOAD

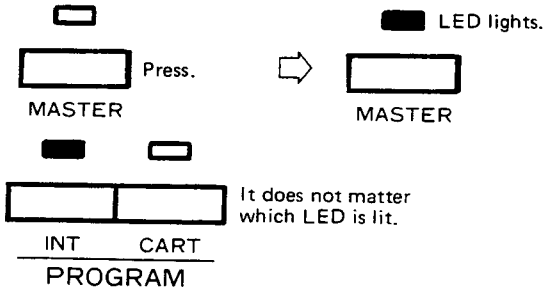
6.2.1 Definition

The LOAD operation copies 50 tones and one user-defined waveform from a memory cartridge to the module's internal memory. The internal memory contents are replaced by the cartridge data, so you may wish to save them to another cartridge first.

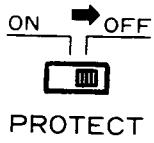


6.2.2 Procedure

(1) Press the MASTER switch so that the LED next to it lights. It does not matter which PROGRAM (INTERNAL or CARTRIDGE) LED is lit.

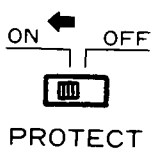


(2) Shift the PROTECT switch on the K-3m's front panel to the OFF position. If the switch is in its ON position, any attempt to write new data to the internal memory will abort, producing the message Pr ot ct ("Protect") on the LED display.



(3) Press the LOAD switch.

(4) When the operation is complete (in less than one second), return the PROTECT switch on the K-3m's front panel to its ON position to protect the contents from accidental erasure.



Note: At the end of the operation, the PROGRAM part of the LED display will change to "1".

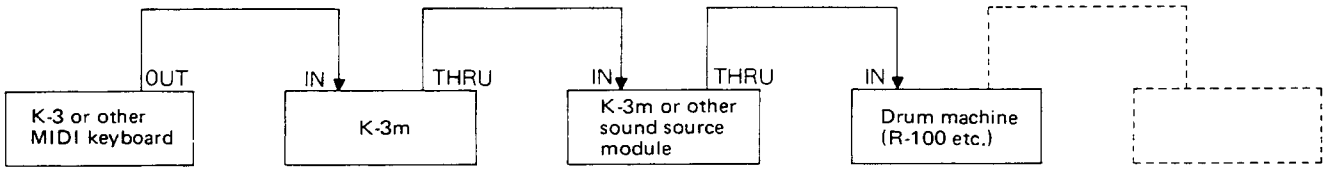
7. MIDI Interface

The letters MIDI stand for Musical Instrument Digital Interface, an international standard for connecting drum machines, synthesizers, other electrical/electronic musical instruments, and personal computers so that they can communicate intelligently.

All such equipment with this interface can be interconnected with standard MIDI – no matter who the individual manufactures may be, however MIDI implementation may vary from manufacturer to manufacturer.

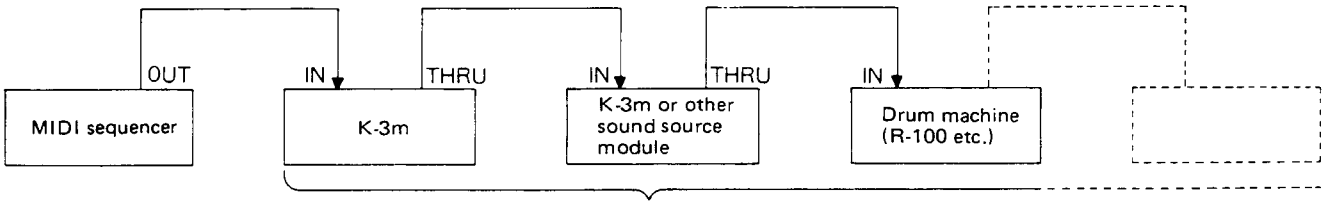
7.1 Typical Connections

7.1.1 Basic MIDI hookup



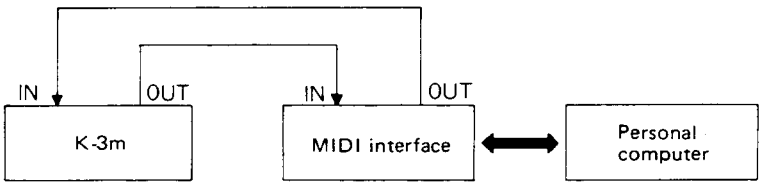
This type of arrangement enables you to play a variety of instruments – either singly or in ensemble – from a single keyboard.

7.1.2 Automatic operation with a MIDI sequencer



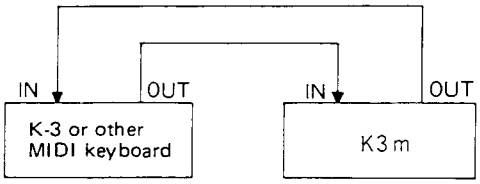
These instruments may be assigned separate channels so that they play separate parts.

7.1.3 Connection to a personal computer



With this arrangement, you can use software to program tone patches or set up tone patch selection sequences for MIDI-equipped instruments. Contact your local Kawai dealer for information regarding availability of K-3m software for your personal computer.

7.1.4 Advanced MIDI hookup



This hookup enables a keyboard split between the K-3m and the keyboard, or 12 note-polyphony.

7.2 The K-3m MIDI Implementation

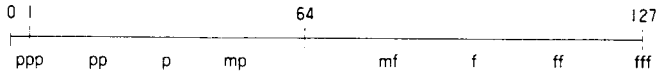
7.2.1 Signals

The K-3m synthesizer is capable of sending and receiving the following types of MIDI signals or "messages".

Message	Meaning	Send	Receive
■ NOTE OFF	Key release from the MIDI source.		○
■ NOTE ON	Includes pitch and velocity from the MIDI source.		○
■ MODULATION	Modulation		○
■ VOLUME	Controls output level.		○
■ PORTAMENTO TIME	Determines the speed of the portamento effect.	○	○
■ DAMPER PEDAL SWITCH	Indicates the status (ON/OFF) of the damper (release) pedal.	○	○
■ PORTAMENTO SWITCH	Turns the portamento effect on and off.	○	○
■ PROGRAM CHANGE	Includes the number of the next program to be used.	○	○
■ CHANNEL PRESSURE	Describes the aftertouch.		○
■ PITCH BENDER CHANGE	Rotates the receiving instrument's pitch bender wheel.		○
■ ALL NOTE OFF	Turns off all current output.		○
■ OMNI MODE OFF	Directs the receiving instrument(s) to accept only data on the assigned MIDI channel.		○
■ OMNI MODE ON	Directs the receiving instrument(s) to accept data on all MIDI channels.		○
■ ACTIVE SENSING	Checks for disconnection.	○	○
■ SYSTEM EXCLUSIVE MESSAGES	Send and receive tone patch and waveform data.	○	○
■ LOCAL OFF	Sends a message disconnecting a synthesizer's keyboard from its own sound source.	○	

Key velocity

MIDI velocity data has a range of 0-127.
The K-3m interprets velocity information according to the scale shown. A keyboard with a touch sensor enables you to control a note's volume or tone by the force with which you strike the key.



Program change

The K-3m uses different sets of program numbers for the tone patches stored in the internal memory and removable memory cartridge and converts between its system and the MIDI system using the scheme outlined in the accompanying chart.

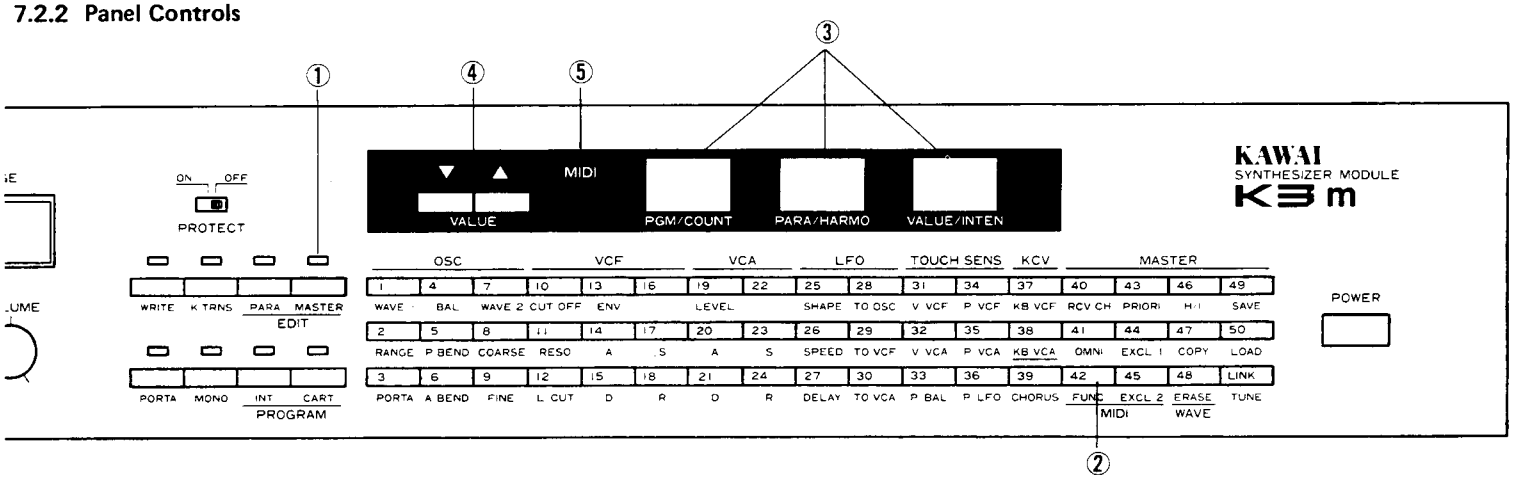
K-3m INTERNAL	1	2	3	4	.....	50
MIDI program number	0	1	2	3	.....	49

K-3m CARTRIDGE	1	2	3	4	.....	50
MIDI program number	50	51	52	53	.....	99

Send : 0~99
Receive : 0~127

Note: All out-of-range numbers received (100~127) are interpreted as INTERNAL 1.

7.2.2 Panel Controls



1 MASTER switch

This switch controls access to the MIDI interface controls.

2 MIDI parameter switches

These five switches (RCV CH, OMNI, FUNC, EXCL 1, and EXCL 2) control the MIDI interface parameters.

3 Display

This uses the same set of labels as the edit function: PROGRAM number, (MIDI) PARAMETER number, and VALUE.

4 VALUE (DOWN/UP) switches

Using these switches change the value of the current MIDI parameter.

5 MIDI indicator

The indicator lights whenever MIDI data is received. This is useful as a visual indicator.

7.2.3 Description of parameters and their values

#40. RCV CH (RECEIVE Channel) (1 to 16)

This parameter determines the only MIDI channel on which the K-3m will receive when parameter #41, OMNI, is OFF.
The value you select will remain unchanged even after the power is turned off.
Send CH is the same as the RCV CH.

Value	Receive channel
1	Channel 1
⋮	⋮
16	Channel 16

#41. OMNI (0/1)

This parameter switches the OMNI function ON and OFF. If it is ON, the K-3m will act on all MIDI messages on all MIDI channels. Otherwise, it will accept only those messages received on the channel specified with parameter #40, RCV CH.
The value of this parameter may change in response to OMNI ON and OMNI OFF messages received through the MIDI interface. The value will remain unchanged even after the power is turned off.

Value	OMNI mode
0	OFF
1	ON

#42. FUNC [FUNCTION] (1 to 5)

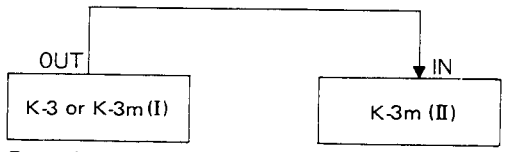
This parameter determines on what level the K-3m will respond to incoming messages. The higher the number, the greater the variety of data it will accept. (See chart.) The value will remain unchanged even after the power is turned off.

Value	Data accepted
1	Key information (without velocity) + damper + volume + active sensing
2	1 + velocity
3	2 + pressure + bender + modulation + portamento
4	3 + program change
5	4 + system exclusive messages

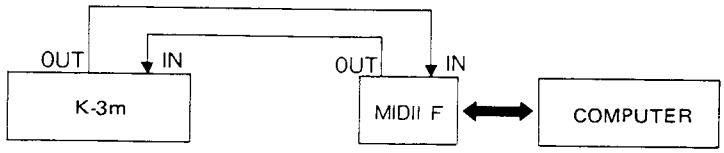
#44. EXCL 1 [EXCLUSIVE 1] (0, 1, 2, 3)

This parameter enables sending tone patch data, the user-defined waveform data, or both using MIDI system exclusive messages.

Value	Data transmitted
0	OFF
1	User-defined waveform data
2	Tone patch data
3	Both



Example: Editing tone patch data on K-3m (II) with K-3 or K-3m (I).



Example: Sending K-3m tone patch data to a personal computer for editing

■ **Procedure** — sending CARTRIDGE No. 3 tone patch data

- Connect the instruments as shown in the drawing and press the MASTER switch.
- Set parameter #44 EXCL 1 to "2".
- Press the MASTER switch a second time so that the LED goes out.
- Select the program number — for example, CARTRIDGE No. 3.
- The above procedure sends the tone patch data to the receiving instrument.
- If you later edit that data, the K-3m will send the amended version.
- To stop sending, press the MASTER switch again and change the PARAMETER part of the LED display to "0".

■ **Procedure** — sending user-defined waveform.

- Connect the instruments as described above.
- Press the PROGRAM switch (INTERNAL or CARTRIDGE) corresponding to the waveform to be sent.
- Press the MASTER switch.
- Set parameter #44 EXCL 1 to "1" (or "3").
- Press the PROGRAM switch a second time.
- The above procedure sends the user-defined waveform to the receiving instrument.
- The PARAMETER part of the LED display automatically returns to "0" (or "2").

Notes:

- The sender and the receiver must be connected to the same MIDI channel.
- Data is not transmitted if the PROTECT switch at the receiving end is ON.

#45. EXCL 2 [EXCLUSIVE 2] (MIDI mode)

The K-3m provides the following modes when used with a K-3m synthesizer or other keyboard that accepts LOCAL OFF commands. This setting remains in effect even after the power is turned off.

■ STANDARD mode

This, the most basic mode, plays all notes received. All MIDI information received is sent to the MIDI OUT, which creates a double between the two instruments.

■ SCOPE mode

This mode limits the K-3m's sound range. MIDI information outside this range is sent to the MIDI OUT, which creates a split between the two instruments.

■ SPILLOVER mode

When the K-3m simultaneously receives data for more than six notes, it plays the first six and sends the others (up to a maximum of six) from MIDI OUT.

■ Procedure

- Press the MASTER switch.
- Press the #45 EXCL 2 switch.
- Use the VALUE switches to change the mode.
- To change the split point for the SCOPE mode, press the #45 EXCL 2 switch a second time and set new values with the VALUE switches on the K-3m or by playing the MIDI keyboard. (For details, see the next section "7.3 Advanced uses of the MIDI modes".)
- Press the MASTER switch a second time to turn it OFF.

• Sending MIDI LOCAL OFF

The K-3m always sends a MIDI LOCAL OFF message when the #45 EXCL 2 switch is pressed with the MASTER switch ON or when the value for #45 EXCL 2 is changed with the VALUE switches.
This function enables combining the K-3m with the other MIDI instruments equipped with the LOCAL OFF function (see the next section "7.3 Advanced uses of the MIDI").
A MIDI keyboard recognizing the LOCAL OFF message, breaks the link between its keyboard and its voices. Instead, the keyboard information is sent to the MIDI OUT while the voices respond to data from the MIDI IN. If LOCAL OFF is not desired, restore the MIDI keyboard to LOCAL ON using the procedure described in your keyboard operation manual — On the K-3, turn the power off and then on again.

Setting	MIDI mode
Stnd	STANDARD
ScoP	SCOPE
SPIL	SPILLOVER

7.3 Advanced uses of the MIDI

■ STANDARD mode

This is the basic mode for the K-3m. All notes are played by both instruments, creating a fat layered sound.

■ Procedure

(1) Press the MASTER switch to light the LED.

(2) Press the #40 RCV CH switch and set the K-3m receiving channel to that for the sending MIDI keyboard.

(3) Press the #42 FUNC switch and specify the information to be received by the K-3m.

(4) Press the #45 EXCL 2 switch to set the LED display to St nd .

(5) Press the MASTER switch a second time to turn it OFF.

■ SCOPE mode

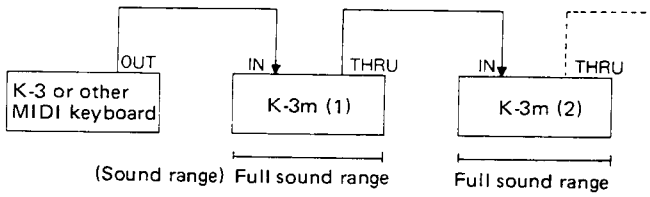
In SCOPE mode, notes are played only by the K-3m within the selected range. Notes outside of this range are played only by the other instrument, resulting in a split keyboard effect.

1. SPLIT – combination with a keyboard that recognizes MIDI LOCAL OFF messages

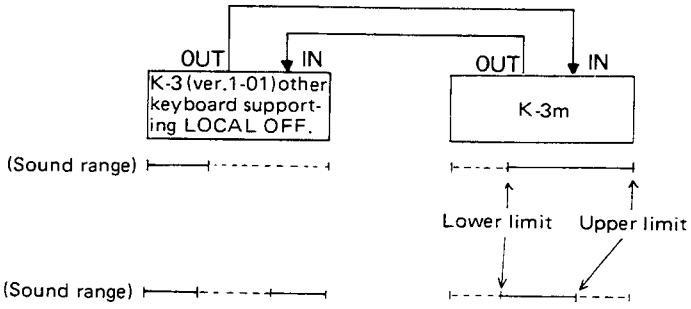
Combining the module with the K-3 (ver.1-01), or other keyboard which supports MIDI LOCAL OFF message allows you to use keys in the lower range different tone patches for the upper and lower halves of the keyboard.

Note: MIDI OUT in the STANDARD mode

Almost the same effects can be obtained by connecting the MIDI OUT on K-3m (1) to the MIDI IN on K-3m (2). The only differences would be that the K-3m would not pass on any exclusive messages which it received and it might add messages of its own. In SCOPE and SPIL modes however, this hookup creates Split and SPILLOVER effects between the two modules, while the controlling keyboard plays all notes. This is also the hookup to use with a MIDI keyboard controller, or a MIDI piano such as the Kawai EP-308M.



It is also possible to split the keyboard into upper, lower, and middle sections.



■ **Procedure**

(1) Connect the MIDI cables as shown in the drawing.

(2) Press the K-3m MASTER switch to light the LED.

(3) Set the MIDI channels for the keyboard and the K-3m. (The K-3m send channel must be the same as the receive channel).

(4) Set the keyboard to accept the LOCAL OFF message. (This step is not necessary for the K-3 (ver.1-01).

(5) Press the K-3m #42 FUNC switch to select the desired information to be received.

(6) Press the K-3m #45 EXCL 2 switch to change the LED display to Sc oP . The K-3m then sends a LOCAL OFF message to the keyboard.

(7) To change the K-3m's playing range, press the #45 EXCL 2 switch again.

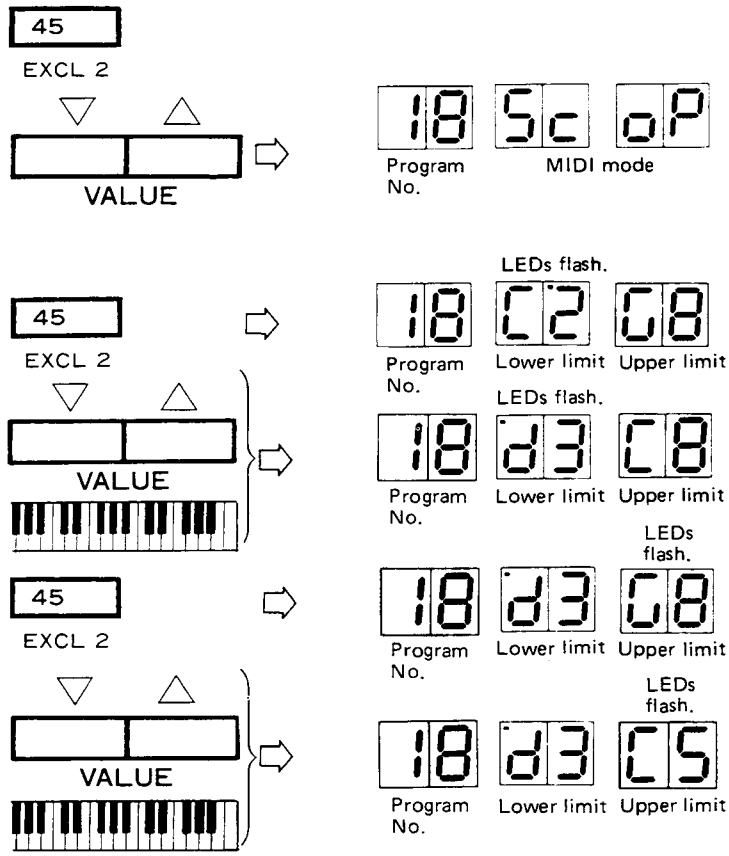
(8) The center LEDs flash for the lower limit setting. Change the setting with the VALUE switches or by playing the keyboard.
The dot in the display is used to indicate a sharp.

(9) Press the #45 EXCL 2 switch a third time to set the upper limit, indicated by the flashing LEDs on the right. Change the VALUE in a similar manner as in step (8) above.

(10) Pressing the #45 EXCL 2 switch alternates between the lower and upper settings.

(11) Press the MASTER switch again to exit.
The MASTER LED goes out.

Note: This MIDI cable connection results in 2 voices playing each note because the key information loops between the two instruments until the keyboard receives the LOCAL OFF message from the K-3m.



Notes:

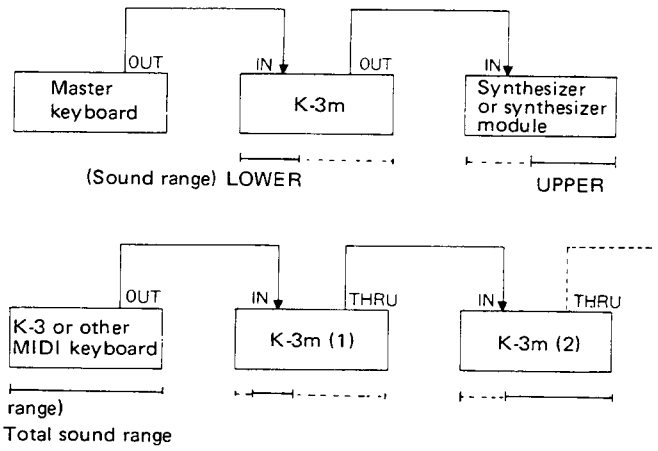
- The settings may be anywhere between C-2 and G8.
- A dot to the left above a letter indicates a black key (#); one above a number, a minus sign.
- Setting a lower limit higher than the current upper limit is not allowed and vice versa.

2. SPLIT – combination with any synthesizer

The arrangement shown allows you to use the SPLIT play even if your present synthesizer does not recognize LOCAL OFF messages. The procedure is the same as for a keyboard that does.

3. ZONE ASSIGN

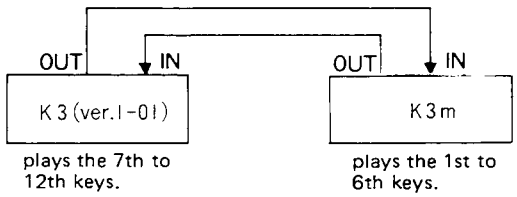
You can use the MIDI THRU terminal as shown to double the sound of the sending keyboard for any ranges. The ranges for K-3m (1) and K-3m (2) can also overlap. The procedure is the same for a keyboard supporting LOCAL OFF.



Note: In the SPILLOVER mode, the MIDI OUT terminal retransmits the 7th to 12th key messages received, all other messages except SYSTEM EXCLUSIVE ones plus own messages.

■ SPILLOVER mode

Although the K-3 and K-3m are six-voice polyphonic synthesizers when used separately, connecting them as shown with this mode enables them to work as one 12-voice polyphonic synthesizer. Simultaneous use of EXCLUSIVE DATA DUMP messages on the K-3 and K-3m further enhances the capabilities of this 12-voice polyphonic synthesizer because they can send and receive tone patch editing information in real time.



■ Procedure

(1) Connect the MIDI cables as shown.

(2) Press the MASTER switch to turn the LED ON.

(3) Set the MIDI channels for the K-3 and K-3m. (The K-3m send channel must be the same as the receive channel.)

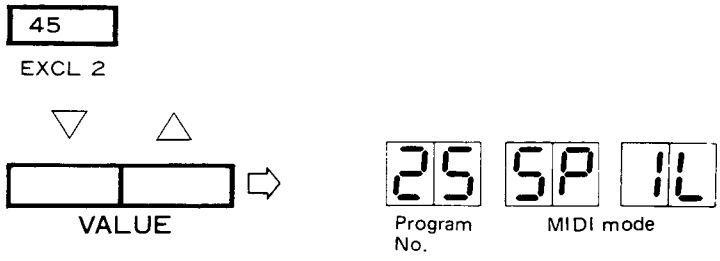
(4) Press the K-3m #45 EXCL 2 switch and use the VALUE switches to change the LED display to SP IL . The K-3m sends a LOCAL OFF message.

(5) The K-3m will play the 1st to 6th keys and pass the 7th to 12th on to the sending keyboard.

(6) To enable the K-3m use the same tone patches as the K-3 (ver. 1-01), set the K-3m PROTECT switch to OFF, change parameter #42 FUNC to "5", and send the EXCLUSIVE DATA DUMP message (tone patch data, waveform data) from the K-3 (ver. 1-01).

Note: On the K-3, turning the power off and then on resets LOCAL CONTROL to ON. So if you play in the SCOPE or SPILLOVER mode again, it is necessary to send a MIDI LOCAL OFF message to the K-3 from the K-3m again (See page 47).
If you play in the STANDARD mode, unplug the MIDI cable between the MIDI OUT of the K-3m and the MIDI IN of the K-3.

Note: Before you use the SPILLOVER mode, it is a good idea to make sure that the K-3 (ver. 1-01) and K-3m are using the same tone patches. It is also recommended that you set the K-3m parameter #45 FUNC to "5" to enable the module to receive the EXCLUSIVE DATA DUMP messages.



Note: In the SPILLOVER mode, the MIDI OUT terminal retransmits the 7th to 12th key messages received, all other messages except SYSTEM EXCLUSIVE ones plus its own messages.

I. MIDI RECEIVE DATA FORMAT

1. MIDI RECEIVE DATA FORMAT

1st	2nd	3rd	Description	
1000nnnn	0kkkkkkk	0xxxxxxx	Note off	kkkkkkk=0~127 (21~108) xxxxxxx Ignored
1001nnnn	0kkkkkkk	0vvvvvvv	Note on/off	kkkkkkk=0~127 (21~108) vvvvvvv=0 Note off vvvvvvv=1~127 Note on
1011nnnn	00000001	0vvvvvvv	Modulation	vvvvvvv=0~127
1011nnnn	00000101	0vvvvvvv	Portamento time	vvvvvvv=0~127
1011nnnn	00000111	0vvvvvvv	Volume	vvvvvvv=0~127
1011nnnn	01000000	0vvvvvvv	Release sw	vvvvvvv=0~63 off vvvvvvv=64~127 off
1011nnnn	01000001	0vvvvvvv	Portamento sw	vvvvvvv=0~63 off vvvvvvv=64~127 on
1100nnnn	0ppppppp	--------	Program change	ppppppp=0~49 Int. 1~50 ppppppp=50~99 Cart. 1~50 ppppppp=100~127 Int. 1
1101nnnn	0vvvvvvv	--------	Channel pressure	vvvvvvv=0~127
1110nnnn	0v000000	0vvvvvvv	Pitch bender	vvvvvvv=0~255
1011nnnn	01111011	00000000	All notes off	
1011nnnn	01111100	00000000	Omni off	
1011nnnn	01111101	00000000	Omni on	
1011nnnn	01111111	00000000	Poly on	
11111110	--------	--------	Active sensing	

2. MIDI RECEIVE EXCLUSIVE DATA FORMAT

The data block is divided into "data-high" and "data-low", and is transmitted in order from high to low.

2-1 One Tone or Wave Request

After receiving this message, the K-3m dumps the tone or wave data.

Status	11110000	F0H	System exclusive
Kawai ID no.	01000000	40H	
Channel no.	0000nnnn	0nH	
Function no.	00000000	00H	One tone or wave request
Group no.	00000000	00H	Synthesizer group
Machine ID no.	00000001	01H	K-3m ID no.
Sub status	0xxxxxxx		Program no. 0~49= Int. 1~50
			50~99= Cart. 1~50
		64H	100= Int. user wave
		65H	101= Cart. user wave
EOX	11110111	F7H	

2-2 ALL TONE REQUEST

After receiving this message, the K-3m dumps all tone data.

Status	11110000	F0H	System exclusive
Kawai ID no.	01000000	40H	
Channel no.	0000nnnn	0nH	
Function no.	00000001	01H	All tone request
Group no.	00000000	00H	Synthesizer group
Machine ID no.	00000001	01H	K-3m ID no.
Sub status	0000000x	00H	0= Int. 50 tones
		01H	1= Cart. 50 tones
EOX	11110111	F7H	

2-3 PARAMETER CHANGE

See TONE DATA LIST regarding to the available value.

Status	11110000	F0H	System exclusive
Kawai ID no.	01000000	40H	
Channel no.	0000nnnn	0nH	
Function no.	00010000	10H	Parameter send
Group no.	00000000	00H	Synthesizer group
Machine ID no.	00000001	01H	K-3m ID no.
Sub status	00xxxxxx		Parameter no. 1~39
data	0000xxxx		Value-high
data	0000xxxx		Value-low
EOX	11110111	F7H	

2-4 ONE TONE DATA DUMP

After receiving this message, the K-3m sends the answer back. (See 3-4, 5, 6, 7).
See TONE DATA LIST regarding to the T1 ~ T35 data.

Status	11110000	F0H	System exclusive
Kawai ID no.	01000000	40H	
Channel no.	0000nnnn	0nH	
Function no.	00100000	20H	One Tone data dump
Group no.	00000000	00H	Synthesizer group
Machine ID no.	00000001	01H	K-3m ID no.
Sub status	0xxxxxxx		Program no. 0~49= Int. 1~50
			50~99= Cart. 1~50
data	0000xxxx		T1 data-high
data	0000xxxx		T1 data-low
data	0000xxxx		T2 data-high
data	0000xxxx		T2 data-low
.			
.			
.			
data	0000xxxx		T34 data-high
data	0000xxxx		T34 data-low
data	0000xxxx		T35 data (Check sum)-high
data	0000xxxx		T35 data (Check sum)-low
EOX	11110111	F7H	

2-5 ONE WAVE DATA DUMP

After receiving this message, the K-3m sends the answer back. (See 3-4, 5, 6, 7).
See WAVE DATA LIST regarding to the W1 ~ W65 data.

Status	11110000	F0H	System exclusive
Kawai ID no.	01000000	40H	
Channel no.	0000nnnn	0nH	
Function no.	00100000	20H	One Wave data dump
Group no.	00000000	00H	Synthesizer group
Machine ID no.	00000001	01H	K-3m ID no.
Sub status	0xxxxxxx	64H	100 int. user wave
		65H	101 cart. user wave
data	0000xxxx		W1 data-high
data	0000xxxx		W1 data-low
data	0000xxxx		W2 data-high
data	0000xxxx		W2 data-low
.			
.			
.			
data	0000xxxx		W64 data-high
data	0000xxxx		W64 data-low
data	0000xxxx		W65 data (Check sum)-high
data	0000xxxx		W65 data (Check sum)-low
EOX	11110111	F7H	

2-6 MIDI WAVE DUMP

After receiving this message, the K-3m sends the answer back. (See 3-4, 5, 6, 7.)

Status	11110000	F0H	System exclusive
Kawai ID no.	01000000	40H	
Channel no.	0000nnnn	0nH	
Function no.	00100000	20H	One wave data dump
Group no.	00000000	00H	Synthesizer group
Machine ID no.	00000001	01H	K-3m ID no.
Sub status	01100110	66H	MIDI user wave
data	0000xxxx		W1 data-high
data	0000xxxx		W1 data-low
data	0000xxxx		W2 data-high
data	0000xxxx		W2 data-low
.			
.			
.			
data	0000xxxx		W128 data-high
data	0000xxxx		W128 data-low
data	0000xxxx		W129 data (Check sum)-high
data	0000xxxx		W129 data (Check sum)-low
EOX	11110111	F7H	

2-7 ALL TONE DATA DUMP

After receiving this message, the K-3m sends the answer back. (See 3-4, 5, 6, 7.)
See TONE DATA LIST regarding to the T1 ~ T35 data.

Status	11110000	F0H	System exclusive
Kawai ID no.	01000000	40H	
Channel no.	0000nnnn	0nH	
Function no.	00100001	21H	All tone data dump
Group no.	00000000	00H	Synthesizer group
Machine ID no.	00000001	01H	K-3m ID no.
Sub status	0000000x	00H	0= Int. tone
		01H	1= Cart. tone
data	0000xxxx		T1 data-high
data	0000xxxx		T1 data-low
data	0000xxxx		T2 data-high
			NO. 1 TONE
data	0000xxxx		T34 data-low
data	0000xxxx		T35 data (Check sum)-high
data	0000xxxx		T35 data (Check sum)-low
data	0000xxxx		T1 data-high
data	0000xxxx		T1 data-low
data	0000xxxx		T2 data-high
			NO. n TONE
data	0000xxxx		T34 data-low
data	0000xxxx		T35 data (Check sum)-high
data	0000xxxx		T35 data (Check sum)-low
data	0000xxxx		T1 data-high
data	0000xxxx		T1 data-low
data	0000xxxx		T2 data-high
			NO. 50 TONE
data	0000xxxx		T34 data-low
data	0000xxxx		T35 data (Check sum)-high
data	0000xxxx		T35 data (Check sum)-low
EOX	11110111	F7H	

2-8 WRITE COMPLETE and ERROR

Status	11110000	F0H	System exclusive
Kawai ID no.	01000000	40H	
Channel no.	0000nnnn	0nH	
Function no.	010000xx	40H	Write complete
		41H	Write error
		42H	Write error by protect
		43H	Write error by no cartridge
Group no.	00000000	00H	Synthesizer group
Machine ID no.	00000001	01H	K-3m ID no.
EOX	11110111	F7H	

2-9 MACHINE ID REQUEST

After receiving this message, the K-3m transmits MACHINE ID ACKNOWLEDGE.
(See 3-7.)

Status	11110000	F0H	System exclusive
Kawai ID no.	01000000	40H	
Channel no.	0000nnnn	0nH	
Function no.	01100000	60H	Machine ID request
EOX	11110111	F7H	

2-10 MACHINE ID ACKNOWLEDGE

Status	11110000	F0H	System exclusive
Kawai ID no.	01000000	40H	
Channel no.	0000nnnn	0nH	
Function no.	01100001	61H	Machine ID acknowledge
Group no.	00000000	00H	Synthesizer group
Machine ID no.	00000001	01H	K-3m ID no.
EOX	11110111	F7H	

II. MIDI TRANSMIT DATA FORMAT

The K-3m transmits data as follows.

1. The panel event
2. The receive data
3. The exclusive data

1. THE PANEL EVENT

1st	2nd	3rd	Description	
1100nnnn	0ppppppp	--------	Program change	ppppppp=0~49 Int. 1~50 ppppppp=50~99 Cart. 1~50
1011nnnn	00000101	0vvvvvvv	Portamento time	vvvvvvv=0~127
1011nnnn	01000000	0vvvvvvv	Release sw	vvvvvvv=0 off vvvvvvv=127 on
1011nnnn	01000001	0vvvvvvv	Portamento sw	vvvvvvv=0 off vvvvvvv=127 on
1011nnnn	01111010	00000000	Local control off	
11111110	--------	--------	Active sensing	

2. THE RECEIVE DATA

The K-3m transmits all received data as they are, except the system exclusive message and the key information (Note on/off). The K-3m does't transmit the received system exclusive message.
Key information is changed according to the mode set by the EXCL 2.

2-1 STND mode The standard mode.
The K-3m transmits all received key information.

2-2 SCOP mode The limited range mode.
If the received key is in the scope (limited range), it does sound, but isn't transmitted.
And, if the received key is out of the scope (limited range), It doesn't sound, but is transmitted on the basic (RCV CH) channel*.

2-3 SPIL mode The 12 polyphonic and last note priority assign mode.
The K-3m transmits the received data in the basic (RCV CH) channel* when receiving more than 6 voices at the same time.
If the MONO sw is turned on, it is forced into the STND mode.

* the basic (RCV CH) channel: In OMNI ON mode, the K-3m receives all channel's key data, but these key data are transmitted on the same channel as the RCV CH.

3. MIDI TRANSMIT EXCLUSIVE DATA FORMAT

The "data" block is divided into "data-high" and "data-low", and is transmitted in order from high to low.

3-1 PARAMETER SEND

If the EXCL 2 is set at 2 or 3, this message is transmitted when the tone parameter is edited.
See TONE DATA LIST regarding to the available value.

Status	11110000	F0H	System exclusive
Kawai ID no.	01000000	40H	
Channel no.	0000nnnn	0nH	
Function no.	00010000	10H	Parameter send
Group no.	00000000	00H	Synthesizer group
Machine ID no.	00000001	01H	K-3m ID. no.
Sub status	00xxxxxx		Parameter no. 1~39
data	0000xxxx		Value-high
data	0000xxxx		Value-low
EOX	11110111	F7H	

3-2 ONE TONE DUMP

This message is transmitted if the program is changed when the EXCL 2 is set at 2 or 3, or if ONE TONE REQUEST is received.
See TONE DATA LIST regarding to the T1 ~ T35 data.

Status	11110000	F0H	System exclusive
Kawai ID no.	01000000	40H	
Channel no.	0000nnnn	0nH	
Function no.	00100000	20H	One tone data dump
Group no.	00000000	00H	Synthesizer group
Machine ID no.	00000001	01H	K-3m ID. no.
Sub status	00xxxxxx		program no. 0~49= Int. 1~50 50~99= Cart. 1~50
data	0000xxxx		T1 data-high
data	0000xxxx		T1 data-low
data	0000xxxx		T2 data-high
data	0000xxxx		T2 data-low
.			
.			
.			
data	0000xxxx		T34 data-high
data	0000xxxx		T34 data-low
data	0000xxxx		T35 data (Check sum)-high
data	0000xxxx		T35 data (Check sum)-low
EOX	11110111	F7H	

3-3 ONE WAVE DUMP

This message is transmitted if INT. or CART. switch is pressed when the EXCL 2 is set at 1 or 3.
After this message is transmitted, the value of EXCL 2 is automatically changed to 0 or 2.
Or if ONE WAVE REQUEST is received, it is transmitted.
See WAVE DATA LIST regarding to the W1 ~ W65 data.

Status	11110000	F0H	System exclusive
Kawai ID no.	01000000	40H	
Channel no.	0000nnnn	0nH	
Function no.	00100000	20H	One wave data dump
Group no.	00000000	00H	Synthesizer group
Machine ID no.	00000001	01H	K-3m ID. no.
Sub status	00xxxxxx	64H	Int. user wave
		65H	Cart. user wave
data	0000xxxx		W1 data-high
data	0000xxxx		W1 data-low
data	0000xxxx		W2 data-high
data	0000xxxx		W2 data-low
.			
.			
.			
data	0000xxxx		W64 data-high
data	0000xxxx		W64 data-low
data	0000xxxx		W65 data (Check sum)-high
data	0000xxxx		W65 data (Check sum)-low
EOX	11110111	F7H	

3-4 WRITE COMPLETE

When the received tone or wave data written completely, the K-3m transmits this message.

Status	11110000	F0H	System exclusive
Kawai ID no.	01000000	40H	
Channel no.	0000nnnn	0nH	
Function no.	01000000	40H	Write complete
Group no.	00000000	00H	Synthesizer group
Machine ID no.	00000001	01H	K-3m ID. no.
EOX	11110111	F7H	

3-5 WRITE ERROR

If some illegal data are found in the received tone or wave data, the K-3m transmits this message.

Status	11110000	F0H	System exclusive
Kawai ID no.	01000000	40H	
Channel no.	0000nnnn	0nH	
Function no.	01000001	41H	write error
Group no.	00000000	00H	Synthesizer group
Machine ID no.	00000001	01H	K-3m ID. no.
EOX	11110111	F7H	

3-6 WRITE ERROR BY PROTECT

If the tone or wave data are received when the appropriate memory protect switch is ON position, the K-3m transmits this message.

Status	11110000	F0H	System exclusive
Kawai ID no.	01000000	40H	
Channel no.	0000nnnn	0nH	
Function no.	01000010	42H	Write error by protect
Group no.	00000000	00H	Synthesizer group
Machine ID no.	00000001	01H	K-3m ID. no.
EOX	11110111	F7H	

3-7 WRITE ERROR BY NO CARTRIDGE

If the cartridge tone or wave data are received when no cartridge is inserted, the K-3m transmits this message.

Status	11110000	F0H	System exclusive
Kawai ID no.	01000000	40H	
Channel no.	0000nnnn	0nH	
Function no.	01000011	43H	Write error by no cartridge
Group no.	00000000	00H	Synthesizer group
Machine ID no.	00000001	01H	K-3m ID. no.
EOX	11110111	F7H	

3-8 MACHINE ID ACKNOWLEDGE

This message is transmitted when the K-3m receives MACHINE ID REQUEST.

Status	11110000	F0H	System exclusive
Kawai ID no.	01000000	40H	
Channel no.	0000nnnn	0nH	
Function no.	01100001	61H	Machine ID acknowledge
Group no.	00000000	00H	Synthesizer group
Machine ID no.	00000001	01H	K-3m ID. no.
EOX	11110111	F7H	

III. DATA LIST

THE K-3m TONE DATA LIST

No.	Byte		Parameter	Description	
T1	aacccccc	1	RANGE	aa	0=16', 1=8', 2=4'
		2	OSC1 wave	cccccc	0~33
T2	acccccccc	–	Portamento sw	a	0=off, 1=on
		3	Portamento speed	ccccccc	0~99
T3	xxttttttt	7	OSC2 wave	ttttttt	0~33
T4	zxxttttt	8	OSC2 Coarse	zttttttt	0~+/−24, z:0=+, 1=−
T5	zxxxttttt	9	OSC2 Fine	zttttt	0~+/−10, z:0=+, 1=−
T6	zxxxttttt	4	Balance	zttttt	0~+/−15, z:0=+, 1=−
T7	zxxttttt	6	Auto Bend	zttttt	0~+/−31, z:0=+, 1=−
T8	axxxxccc	–	MONO sw	a	0=off, 1=on
		5	Pitch Bend	ccc	0~12
T9	xttttttt	10	VCF Cutoff	ttttttt	0~99
T10	xxxttttt	11	VCF Resonace	ttttt	0~31
T11	xxxttttt	13	VCF Env	ttttt	0~31
T12	xxxttttt	14	VCF Attack	ttttt	0~31
T13	xxxttttt	15	VCF Decay	ttttt	0~31
T14	xxxttttt	17	VCF Sustain	ttttt	0~31
T15	xxxttttt	18	VCF Release	ttttt	0~31
T16	xxxttttt	19	VCA Level	ttttt	0~31
T17	xxxttttt	20	VCA Attack	ttttt	0~31
T18	xxxttttt	21	VCA Decay	ttttt	0~31
T19	xxxttttt	12	Low Cut	ttttt	0~31
T20	xxxttttt	23	VCA Sustain	ttttt	0~31
T21	xxxttttt	24	VCA Release	ttttt	0~31
T22	xxxxxttt	25	LFO Shape	ttt	0~6
T23	xttttttt	26	LFO Speed	ttttttt	0~99
T24	xxxttttt	27	LFO Delay	ttttt	0~31
T25	xxxttttt	28	LFO-OSC	ttttt	0~31
T26	xxxttttt	29	LFO-VCF	ttttt	0~31
T27	xxxttttt	30	LFO-VCA	ttttt	0~31
T28	aaaacccc	32	Velo-VCA	aaaa	0~15
		31	Velo-VCF	cccc	0~15
T29	aaaacccc	34	Pres-VCF	aaaa	0~15
		33	Pres-OSC Balance	cccc	0~15
T30	aaaacccc	36	Pres-LFO-OSC	aaaa	0~15
		35	Pres-VCA	cccc	0~15
T31	zxxxtttt	37	KCV-VCF	zttttt	0~+/−15, z:0=+, 1=−
T32	zxxxtttt	38	KCV-VCA	zttttt	0~+/−15, z:0=+, 1=−
T33	xxxxxttt	39	Chorus	ttt	0~7
T34	xxttttttt	–	Parameter No.	ttttt	1~39
T35	tttttttt	–	Check Sum	tttttttt	0~255
			Sum of the value from T1 to T34		

Each byte is all divided into two bytes, the high nibble data byte and the low nibble data byte, when transmitted or received. The order is from high to low.

THE K-3m WAVE DATA LIST

No.	Byte	Description	
W1	ttttttt	Harmonics	1~128
W2	xxxttttt	Intensity	1~31
W3	ttttttt	Harmonics	1~128
W4	xxxttttt	Intensity	1~31
	.		
	.		
	.		
	.		
	ttttttt	Harmonics	1~128
	xxxttttt	Intensity	1~31
	00000000	End Mark	0
	xxxxxxxx		
	.		
	.		
	.		
W64	xxxxxxxx		
W65	ttttttt	Check Sum Sum of W1 to W64	0~255

Each byte is all divided into two bytes, the high nibble data byte and the low nibble data byte, when transmitted or received. The order is from high to low.

Event	Exclusive 2			
	0	1	2	3
Tone sw on	Prog change	Prog change	Tone data dump and Prog change	Tone data dump and Prog change
Internal or Cart sw on	Nothing	Int or Cart User Wave data dump	Nothing	Int or Cart User Wave data dump
Parameter Change	Nothing	Nothing	Parameter value	Parameter value

When the EXCL 2 is set at 1 or 3, the wave data dump automatically changes its value to 0 or 2.

8. Specifications

Effective sound range			7 octaves ($C_0 \sim C_7$)
Sound sources			6 voices
Program capacity		INTERNAL/ CARTRIDGE	50 programs each with LINK function
EDIT	PARAMETER	OSC	OSC 1 WAVE, OSC 2 WAVE, OSC 2 COARSE, OSC 2 FINE, RANGE, BALANCE, PITCH BEND, AUTO BEND, PORTA SPEED
		VCF	CUTOFF, RESONANCE, ENV, ATTACK, DECAY, SUSTAIN, RELEASE, LOW CUT
		VCA	LEVEL, ATTACK, DECAY, SUSTAIN, RELEASE
		LFO	SHAPE, SPEED, DECAY, TO OSC, TO VCF, TO VCA
		TOUCH SENS	VELO VCF, VELO VCA, PRES OSC BAL, PRES VCF, PRES VCA, PRES LFO
		KCV	VCF, VCA
		CHORUS	CHORUS
	MASTER	MIDI	RCV CH, OMNI, FUNCTION, EXCLUSIVE 1, EXCLUSIVE 2
		WAVE	HARMONIC/INTENSITY, COPY, ERASE
		CARTRIDGE I/F	SAVE, LOAD
		MASTER TUNE	TUNE
		MONO MODE	PRIORITY
Function switches			WRITE, PORTAMENTO, MONO, and KEY TRANSPOSE
Controls			VALUE (DOWN/UP) switch, and VOLUME knob
Memory cartridge			Memory cartridge (with PROTECT switch) and memory cartridge slot
Front panel			Headphone jack,
Rear panel			Output jacks (L/MONO, R), Output level switch (H/L), PROGRAM UP jack, RELEASE jack, 3 MIDI terminals (IN/OUT/THRU)
Display			Three 2-digit LED displays (PROGRAM/COUNT, PARAMETER/HARMONIC, and VALUE/INTENSITY) MIDI indicator
Dimensions			482 (W) x 323 (D) x 90 (H) mm
Weight			5.5 kg
Power consumption			16 W
Accessories			MIDI cable, Memory cartridge, Owner's manual, Guide sheet

KAWAI

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