KORG

Music Workstation M1

OWNER'S MANUAL

AI Synthesis System

Congratulations and thank you for purchasing the Korg Music Work Station M1. Please read this manual carefully to obtain optimum performance and help assure long term reliability.

PRECAUTIONS

ENVIRONMENT

Avoid using this unit in environments where it will be exposed to the following conditions:

* Direct sunlight
* High temperature or humidity
* Dust or sand
* Excessive vibration

POWER SUPPLY

Use this unit only with the rated AC voltage. If you intend to use this unit in areas where the voltage is different from the rated AC voltage, consult your KORG dealer about a suitable voltage transformer unit.

INTERFERENCE WITH OTHER APPLIANCES

This unit uses microprocessor circuitry that may cause interference with nearby radio or TV receivers. If problems occur, use at a greater distance from the radio or TV.

HANDLE GENTLY

Although this unit is designed and constructed to KORG's high standards, the use of excessive force may cause damage to its keys and knobs.

CLEANING

Use only a soft, dry cloth to clean the exterior of this unit. Never use benzene, volatile cleaners or solvents, polish or cleaning compounds.

WARRANTY PROCEDURE

The product warranty ensures that all repairs conducted within one year from the day of purchase are free of charge, but if the necessary steps were not taken in filling out the warranty card at the time of purchase, portions or all of the warranty may be invalid. Make certain to fill out the warranty card completely at the store where the instrument was purchased and keep the card in a safe place.

OWNER'S MANUAL

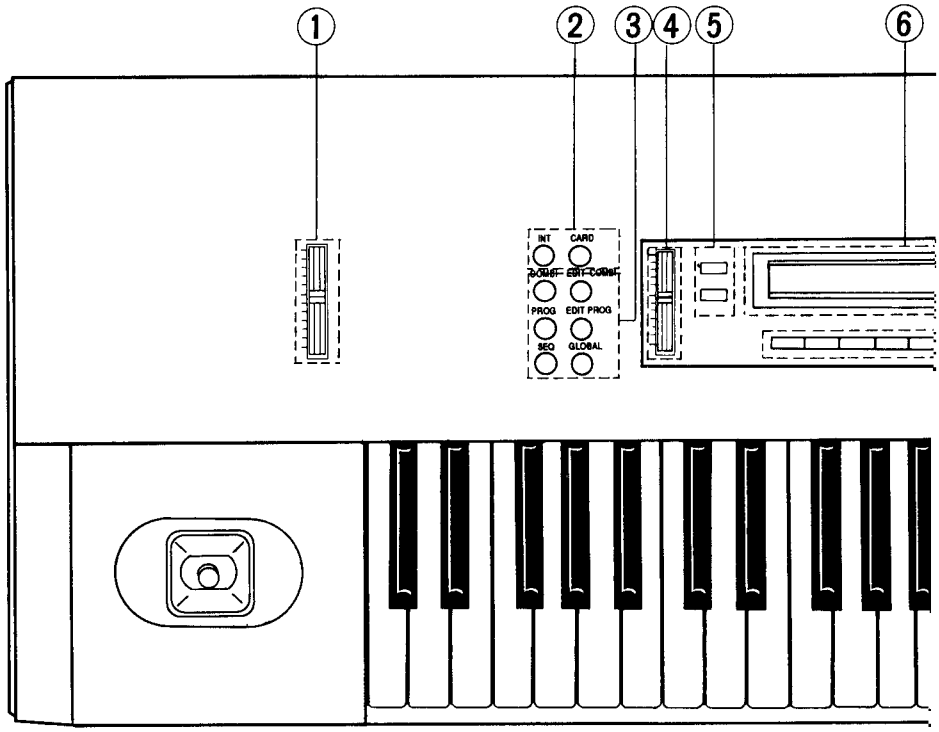
The M1 is a sophisticated digital music device with many functions. Therefore, we suggest that you keep this manual handy at all times, for reference.

CONTENTS

FRONT/REAR PANELS

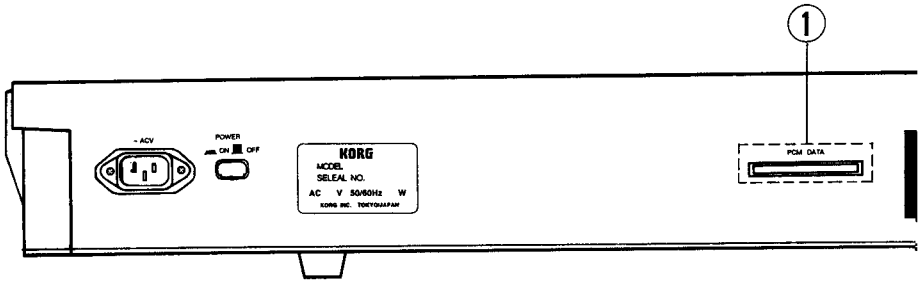
FRONT PANEL

(See the KEYS AND SLIDERS section, p. 7, for explanations on each key and slider)



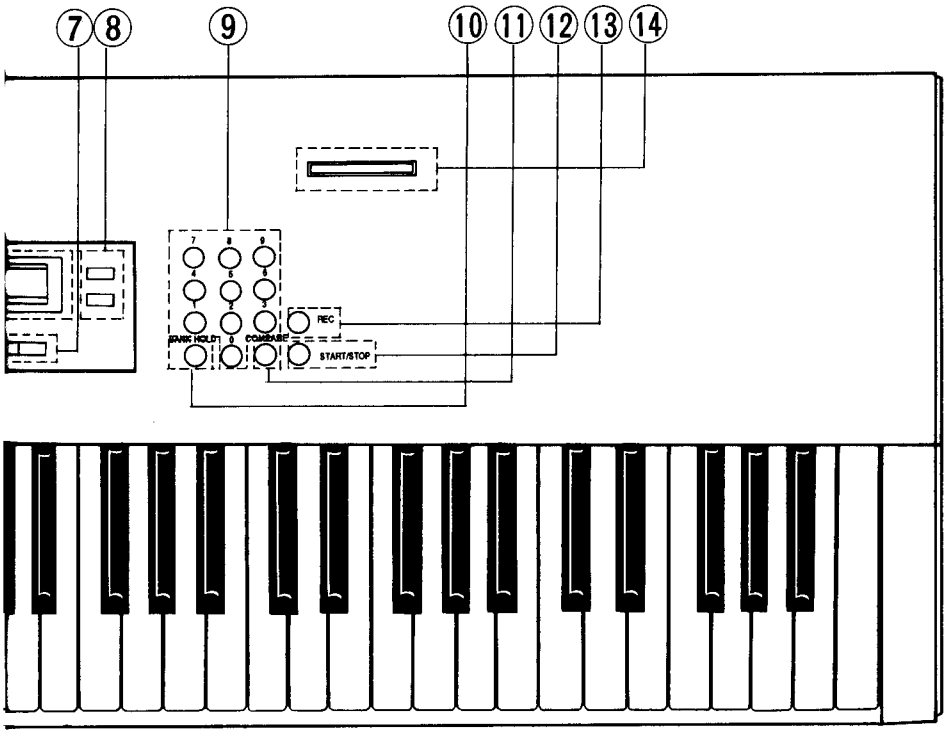
① MASTER VOLUME slider
② INT key/CARD key
③ Mode select keys
COMBI = COMBINATION Mode
EDIT COMBI = EDIT COMBINATION Mode
PROG = PROGRAM Mode
EDIT PROG = EDIT PROGRAM Mode
SEQ = SEQUENCER Mode
GLOBAL = GLOBAL Mode
④ VALUE slider
⑤ UP(▲)/DOWN (▼) key
⑥ Display
⑦ Cursor keys (A to H)

REAR PANEL



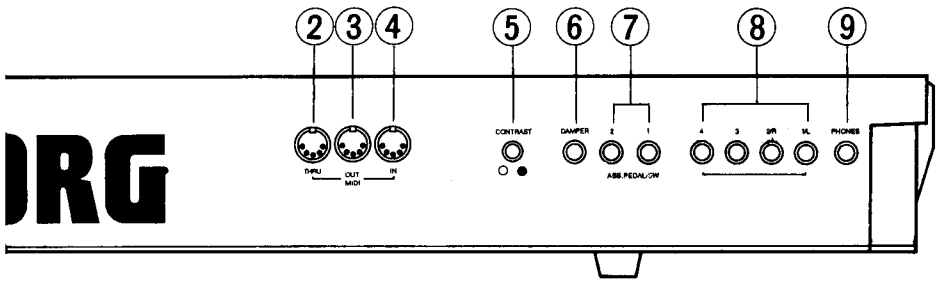
① PCM DATA slot
Only cards that are stored with PCM (Multisound) data should be inserted here. Do not insert the Program/ sequence data card here; it should be inserted only in the PROG/SEQ DATA slot on the front panel.

② MIDI THRU jack
③ MIDI OUT jack
④ MIDI IN jack
⑤ CONTRAST button
This controls the brightness of the display on the front panel. Turning the button clockwise darkens the characters on the display and turning it counterclockwise lightens them.



⑧ PAGE +/- keys
⑨ Numeric keypad (0 to 9)
⑩ BANK HOLD key
⑪ COMPARE key
⑫ REC key
⑬ START/STOP key
⑭ PROG/SEQ DATA slot

Only cards that are stored with or will be stored with Program (sound color) and sequencer data should be inserted here. Remember that the PCM (Multisound) data card should be inserted in the PCM data slot on the rear panel.



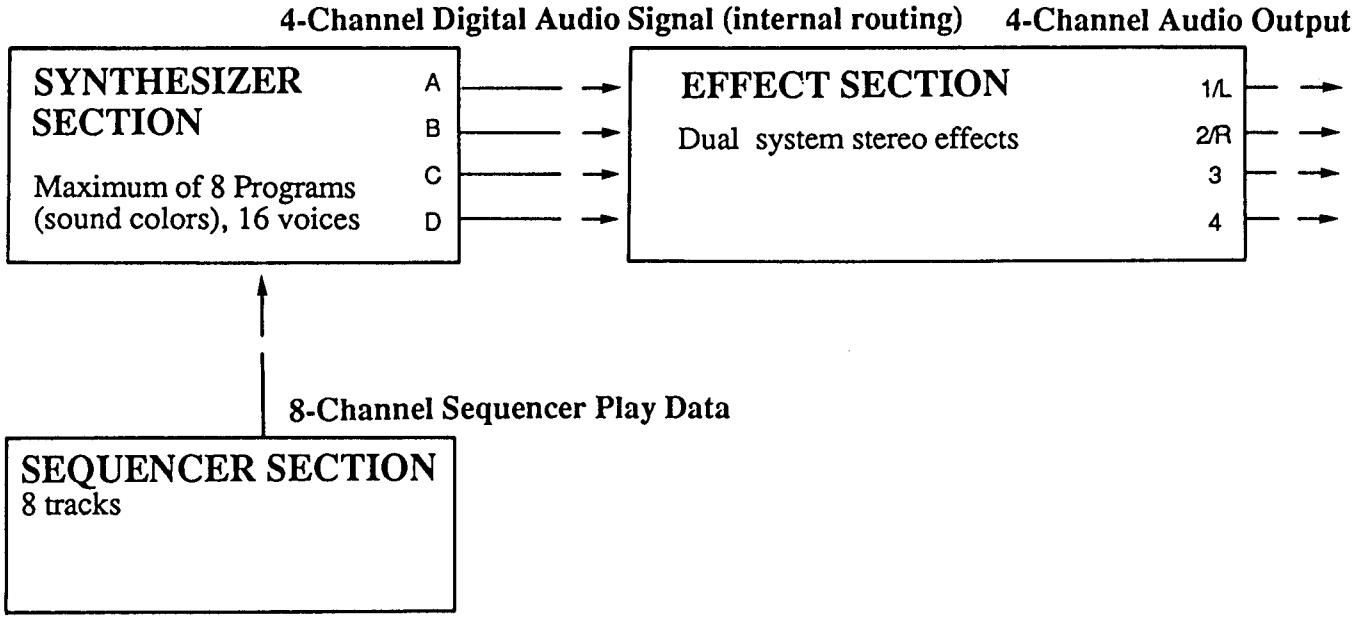
⑥ DAMPER jack
Used for connection of a footswitch for the damper effect.

⑦ ASS. PEDAL/SW jacks (1, 2)
For connection of pedal and footswitches. Assigning parameters to be controlled by the switches is done in the Global Mode, Function 2-2.

⑧ OUTPUT jacks (1/L, 2/R, 3, 4)
These are the M1's voice output jacks. The assignment of voices to the desired jacks is done in each of the Effect Parameter sections of the Edit Program, Edit Combination and Sequencer modes.

⑨ PHONES jack
For connection of a stereo headphone set. The outputs of OUTPUT 1/L and 2/R can be monitored.

STRUCTURE OF THE M1



AI SYNTHESIS SYSTEM

The AI (Advanced Integrated) synthesis system of the M1 makes it possible to combine all various sound types -- from conventional synthesizer sounds to sampled sounds and drum sounds.

For sampled sounds, the large-capacity PCM data memory of 16 bit x 2 mega-words, far greater than that of conventional samplers, has been utilized, and a carefully selected group of Multisounds (a sound whose original wave shape has been multi-sampled[1]) has been installed.

For its synthesizer sounds, not only the D.W.G.S. waveforms[2], which are produced by a process much the same as that of an analog synthesizer, but also aperiodic or irregular waveforms created by extraction of harmonically unrelated frequency components[3] are part of the M1's structure. As a result, creation of new and unique sounds beyond the existing limitations of the conventional synthesizer is possible.

Processing any of the programs or individual sounds with the use of VDFs (Variable Digital Filter) and VDAs (Variable Digital Amplifier) is, of course, possible. Moreover, different effects can be assigned to specific programs in a configuration of 2 systems and 2 channels through the M1's MDE (Multi Digital Effect) feature when playing Multisounds. With the use of these functions, total control over all aspects of sound creation, including effects, is possible.

[1] Multi Sampling

The harmonic structure and overtones present in high pitched sounds usually differs from that of low pitched sounds, even in the same musical instrument. Multi Sampling is a method to recreate those characteristics by sampling an instrument repeatedly over a range of many octaves.

[2] D.W.G.S. (Digital Waveform Generator System) Waveform Data

The instrument sound is reproduced by the following process: Computer analysis determines the frequency components of the sampled instrument sound and reproduces them by creating a harmonic table for them as is done in additive synthesis.

[3] Extraction of Harmonically Unrelated Frequency Components

Separates the aperiodic and harmonically unrelated components characteristic of such sounds as objects being hit or scraped from the sampled wave shapes.

MULTISOUND

(Original Sound Waveforms)

The oscillator (OSC) is selected from the Multisound (00 to 99).

- Multisounds can be selected from the PCM card.
- See EDIT PROGRAM mode, F0-2 for more details.

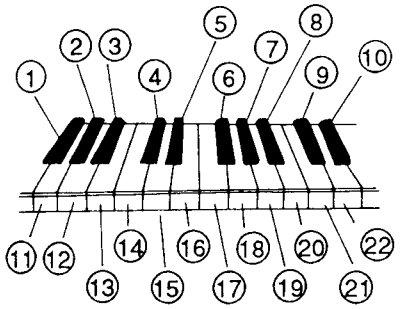
An original program can be created by performing various processes to the Multisound.

- The VDF (Variable Digital Filter) controls the sound color.
- The VDA (Variable Digital Amplifier) controls the sound volume.
- These processes are done in the EDIT PROGRAM Mode.

INSTRUMENT SETTINGS
DRUM KIT

Assigns drum sounds to the keys.

Example:



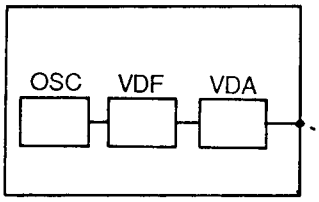
1 BASS DRUM 1
2 SNARE 1
3 HI TOM
4 CLOSED HI HAT
5 OPEN HI HAT
6 CRASH CYMBAL 1
7 RIDE CYMBAL 1
8 HAND CLAPS
9 HI CONGA (MUTED)
10 LO BONGO
11 BASS DRUM 2
12 SNARE 2
13 MID TOM
14 LO TOM
15 CLOSED HI HAT
16 PICCOLO SNARE 1
17 PICCOLO SNARE 2
18 CRASH CYMBAL 2
19 RIDE CYMBAL 2
20 HI CONGA (OPEN)
21 LO CONGA (MUTED)
22 HI BONGO

Instrument settings, including pan, are edited in the GLOBAL Mode.

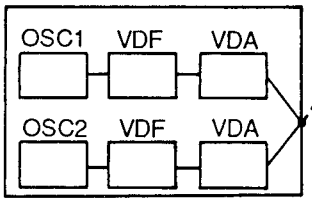
PROGRAM MODE

- The work "Program" as referred to in this manual is synonymous with "sound color" or "preset voice" in other synthesizers.
- Program numbers available for selection are from 00 to 99. (Selection from only 00 to 49 is possible when large sequence allocation is selected.)

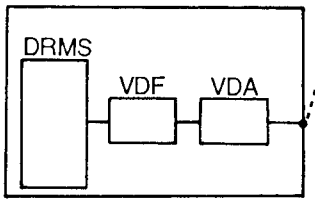
Single



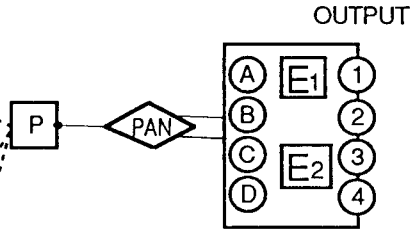
Double



Drum Kit



The EDIT PROGRAM Mode can be used for making settings up to this point.

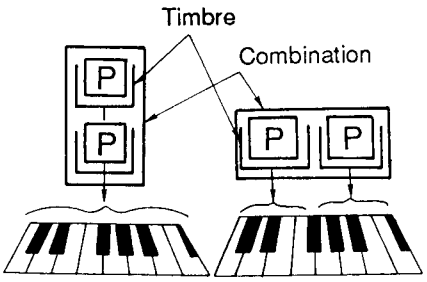


- Choose from 4 different instrument settings.
- The pan setting of the Drum Kit, which is set in the GLOBAL Mode, has priority.

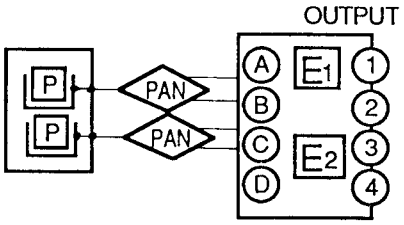
COMBINATION MODE

- The word "Combination" as referred to in this manual means two or more programs that have been grouped together for simultaneous play.
- Combination numbers available for selection are from 00 to 99. (Selection from only 00 to 49 is possible when large sequence allocation is selected.)
- Program changes received via MIDI in the COMBINATION Mode change the Combination.

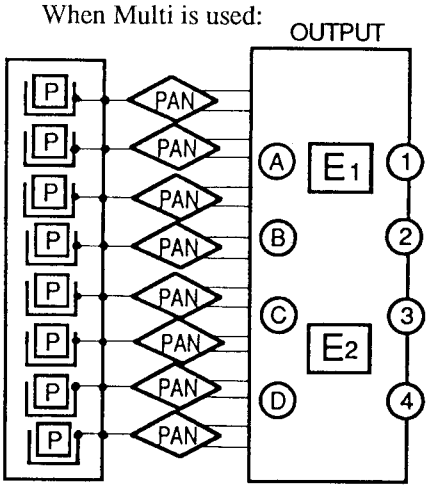
Layer Split



When Layer or Split are used:



When Multi is used:

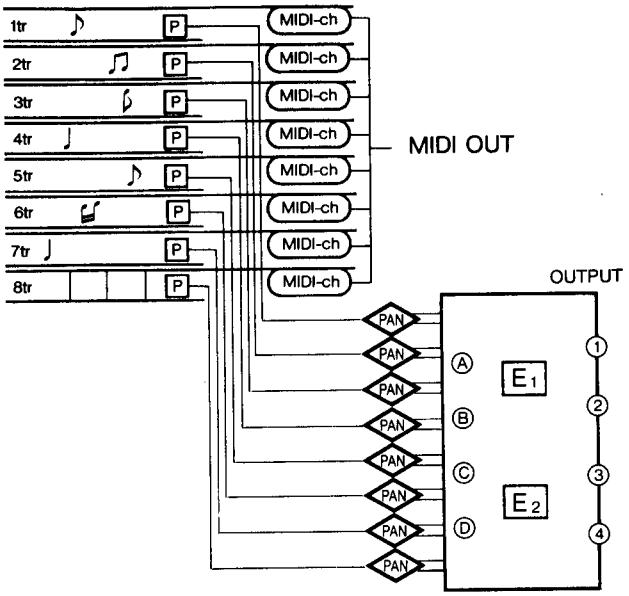


Settings for Layer or Split can be made in the EDIT COMBINATION Mode. Separate MIDI channels can be assigned to each Program (or timbre) when Multi is chosen. In this way, one M1 Music Work station can, with the aid of an external sequencer, output eight different sound colors at the same time.

When using the M1's built-in sequencer, Programs can be assigned to each track of the sequencer without having to create a Combination.

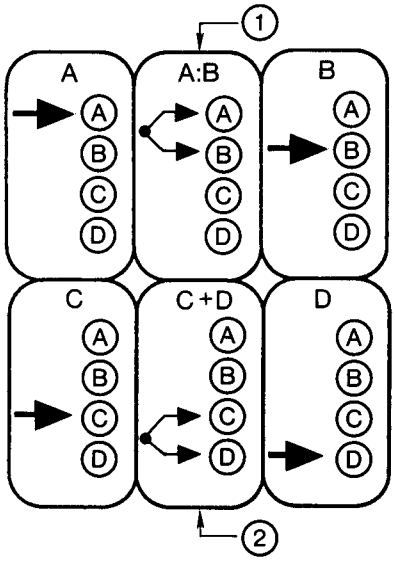
SEQUENCER MODE (Song 0 to 9)

When using external sound sources:



- Programs are assigned to each song.
- The pan setting can be made for each track.
- The effect setting can be made for each song.
- 1 song can be made up of 8 tracks
- Tracks can be created by combining patterns(00 to 99).

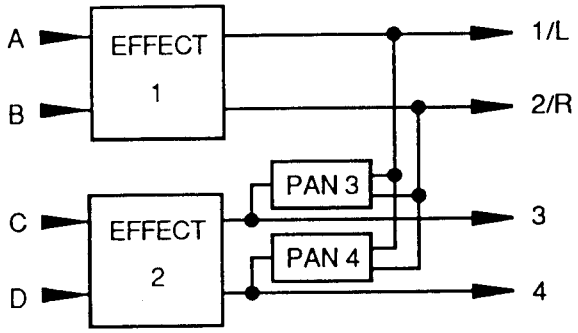
PAN



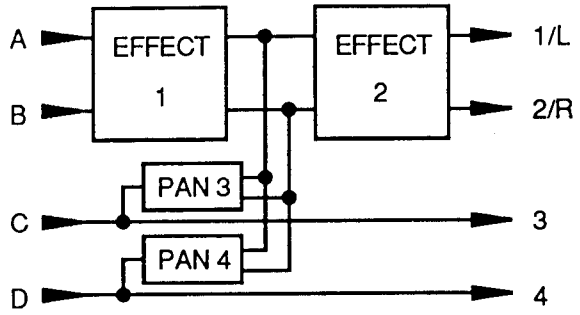
① The volume difference between the two outputs can be changed over a range of ratios from 1:9 ~ 9:1.
② Sends signals to C and D at the same volume.

EFFECT E1, E2

When set to parallel operation:



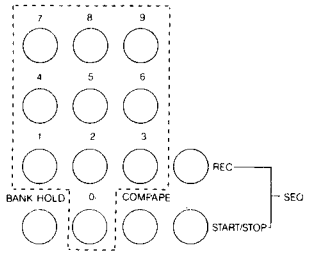
When set to serial operation:



Effect1 and Effect2 are set in the effects pages of each mode.

KEYS AND SLIDERS

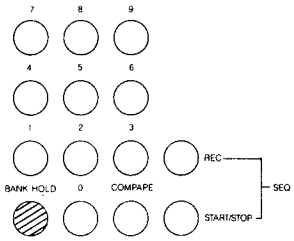
Numeric Keypad



These are used to:

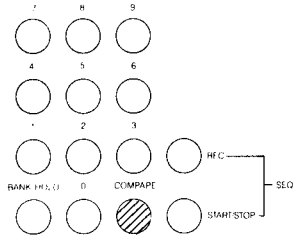
* Select the Combination in the COMBINATION Mode.
* Select functions in other modes.

BANK HOLD Key



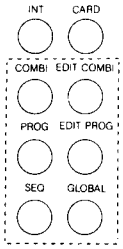
The tens'digit of the program or combination number can be "held" while changing program or combination numbers by using the BANK HOLD key. For example, pressing the BANK HOLD key once after number 21 has been selected will allow you to select other numbers in the 20-29 range simply by pressing the number that corresponds to the ones digit of the desired number; in our example, pressing 3 will change the number to 23, pressing to 7 will change it to 27, and so on. The BANK HOLD key will be lit when the Bank Hold function is on. To turn the function off, press the BANK HOLD key once more.

COMPARE Key



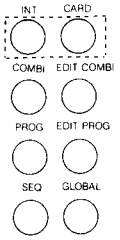
This key temporarily returns the Program or Combination which is being edited in the EDIT COMBINATION or EDIT PROGRAM Mode to the setting that existed before editing. Pressing the COMPARE key again restores the edited parameter values. However, data edited before pressing the COMPARE key will be lost if editing of other parameters or switching to other modes is done. The COMPARE key also functions as a MIDI panic button; in other words, when a stuck note occurs in sequencer play or control through MIDI IN, one press of the COMPARE key will turn the note off. (This can be used in any of the modes.) When the COMPARE key is lit, the original sound can be heard and its parameters are displayed; unlit, the COMPARE key indicates that the edited sound is displayed.

MODE SELECT Keys



The selected mode will be lit.

INT Key and CARD Key

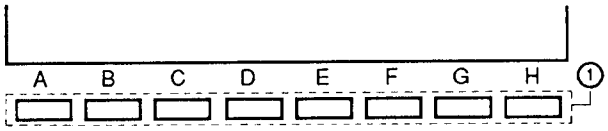


Press the INT key when using the Combination/Program/Song data of the internal memory of the M1. Press the CARD key to access the external (card) data.

NOTE: The waveforms of the PCM (Multisound) card are selected in the Oscillator Assign function of the EDIT PROGRAM Mode and the Drum Kit functions of the GLOBAL Mode. In these exceptions, the INT Key and CARD Key are not used.

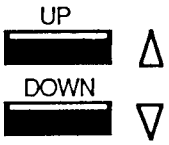
NOTE: Make certain to insert the card straight and firmly into the correct slot.

Cursor Keys and VALUE Slider



Parameter values can be changed by pressing the cursor key below the parameter to be edited on the display, then by moving the VALUE slider up and down. Cursor keys used to access different function and parameters will be indicated in squares (☐) throughout the rest of this manual.

UP/DOWN Keys



These are used when finely adjusting the values of parameters that are difficult to set only by using the VALUE slider or when making fine and detailed alterations in the sound. Pressing UP increases the value by 1 and pressing DOWN decreases the value by 1.

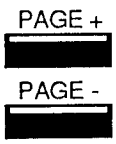
The cursor will appear under the Combination/Program number at the bottom left of the screen when pressing the COMBI key or PROG key of the MODE SELECT keys (immediately after selecting the COMBI or PROG Mode). Pressing the UP key in this condition will advance the Combination or Program number by one and pressing the DOWN key will decrease it by one.

* The VALUE slider cannot be used here to change the Combination or Program.
* Pressing any of the cursor keys ([A] through [H]) will move the cursor to the performance edit parameters, and editing can be done by using the UP/DOWN keys and the VALUE slider.

To return the UP/DOWN keys to function as Program up and down after selecting the performance edit mode: in PROGRAM Mode, press the PROG button; in COMBINATION Mode, press the COMBI button.

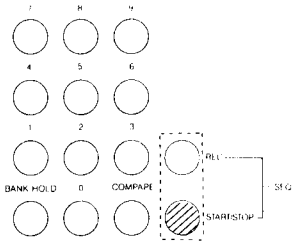
In each case, the cursor will return to its position under the Combination or Program number and the UP/DOWN keys can be used again to increment and decrement the Combination or Program number.

PAGE +/- Keys



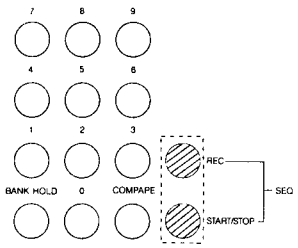
Each function of the M1 is organized in display pages. These keys allow you to access succeeding and preceding display pages by using the PAGE + and PAGE - keys, respectively.

START/STOP Key



This key is used to start or to stop the sequencer. If you press this key in any mode other than the SEQUENCER Mode, the M1 will automatically move to the SEQUENCER Mode and play will start. When the sequencer is playing, the first beatof the measure is indicated on the key by a flashing red light; other beats are indicated by a flashing green light.

REC Key



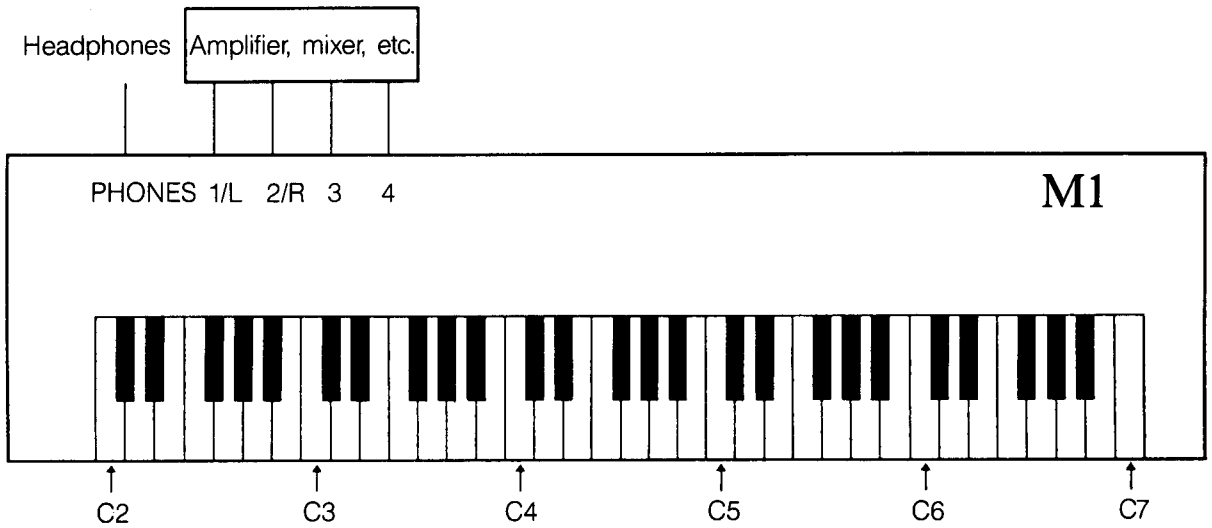
This key is used to begin recording when in the SEQ mode. The lamp remains lit while the sequencer is running.

SETTING UP

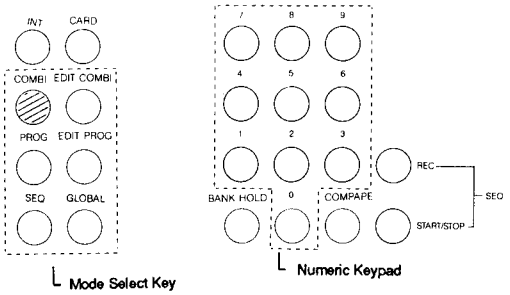
1. First, check that the power switch on the rear panel of the M1 is OFF. Check that the power switches of all connected equipment (amplifiers, mixers, etc.) are also OFF. For protection of all audio equipment (and your ears!) turn the volume of all equipment completely down.
2. Insert the power cord (which is included as standard equipment) into the power plug on the rear panel, then insert the other end of the cord into the proper power outlet.
3. Turn the M1's power switch ON.
4. Turn power switches of all connected equipment ON.

   Then turn the M1's volume and that of the other equipment up gradually to the desired volume.

   The normal octave range of the M1 is C2 - C7, when key transpose is not used. (By using key transpose, the 5 - octave range can be from C1 - G9 (note numbers 0 - 127) are received. (Some Programs may not sound in the higher octaves.)



HOW TO PLAY COMBINATIONS (SOUND COLOR GROUPS)



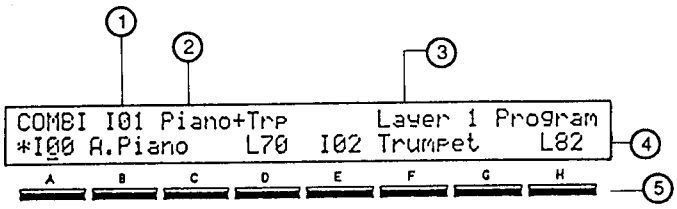
(1)Press the COMBI key of the mode select keys; this puts the M1 in the COMBINATION Mode.

(2)Select the number of the Combination (00 to 99) which you want to play by using the numeric keypad or UP/DOWN keys.

(3)Play the keyboard to hear the sound of the combination selected in step #2.

These are typical displays from the COMBINATION Mode:

Example #1



1 Combination number

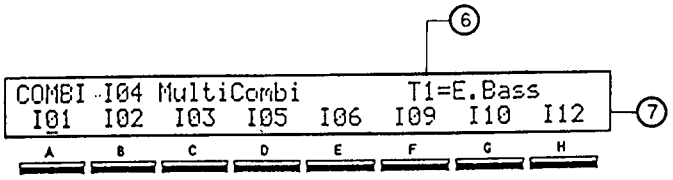
2 Combination name

3 Parameter of currently selected cursor position

4 Number, name and volume level of the program being used

5 Cursor keys

Example #2



6 Program name of cursor position

7 Number of the Program being used

Example 1 shows a display when a Layer Combination is selected. The Program number, Program name and volume level are indicated when the Combination is a Layer or Split.

When replacing the Program of Layer 1 (Program number I00, directly above cursor key [A])with another Program, press cursor key [A] then move the VALUE slider up and down.

The display pages are often laid out such that one parameter description will occupy the space over several cursor keys. The cursor keys just under that parameter (and up to the cursor key of the next parameter) can be used to access the parameter.

The sound volume of Layer 1 can be changed by pressing cursor key [D] then moving the VALUE slider up and down (maximum = 99, minimum = 00).

Press cursor key [E] when you want to replace the Program of layer 2. Press cursor key [H] when changing the volume of layer 2.

Example 2 shows a display when a multi Combination is selected. As in the first example, the Program number shown directly above cursor key [D] (Program number I06) can be changed by pressing cursor key [D] then by moving the VALUE slider up and down.

HOW TO PLAY PROGRAMS (ONE SOUND COLOR)

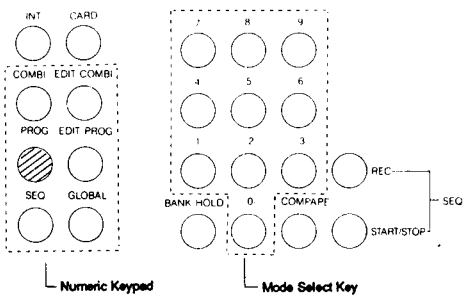
(1) Press the PROG key of the mode select keys; this puts the M1 in the PROGRAM Mode.

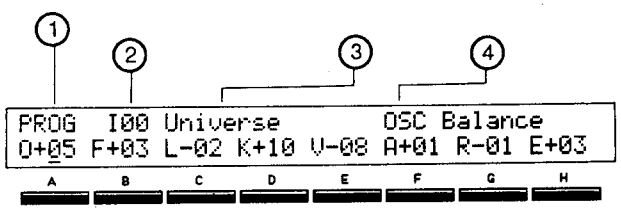
(2) Select the number of the Program (00 to 99) which you want to play by using the numeric keypad or UP/DOWN keys.

(3) Play the keyboard to hear the sound of the Program selected in step #2.

Here is a typical display from the PROGRAM mode:

EXAMPLE





1 Program

2 Internal program number

3 Program name

4 Parameter

The display shown when selecting the PROGRAM Mode is like the one above. While this display is shown, the pressing of any single cursor key and movement of the value slider up and down will change the value of the parameter, which is indicated above the selected cursor key. In this way Programs may be easily edited without having to enter the EDIT PROGRAM Mode. This is particularly convenient for making on-the-spot sound changes during live performance.

* The functions of the parameters are as follows (see pp.18-19 in the PROGRAM Mode for more details):

O = OSC Balance (Oscillator balance)

This parameter controls the relative sound volume of the two oscillators of programs having two oscillators. The larger the value, the greater the volume of OSC 1 becomes.

(Range: -10 to +10.)

F = VDF Cutoff (VDF cutoff frequency)

This parameter controls the frequency point from which all lower frequencies are passed and all higher ones are cut off by the VDF. The higher this number is the clearer or brighter the timbre of the sound becomes, and the smaller the number the more muted or soft the timbre becomes.

(Range: -10 to +10.)

L = VDA Level

This parameter adjusts the level of the entire Program by VDA.

(Range: -10 to +10.)

K = KBD Track (Keyboard tracking)

Used in conjunction with VDF Cutoff, this parameter sets the degree to which keyboard pitch affects the amplitude and the cutoff frequency. The larger the number set with this parameter, the wider the variation in timbre becomes, corresponding to the note played.

(Range: -10 to +10.)

V = Vel. Sens. (Velocity Sensitivity)

This parameter sets the degree to which key velocity affects the amplitude and the cutoff frequency. The larger the value is, the greater the change in timbre becomes, corresponding to how hard the keys are struck.

(Range: -10 to +10.)

A = VDF/A EG Attack Time (VDF and VDA EG attack time)

This parameter controls the attack time of the program. The larger the value is, the longer the attack time becomes.

(Range: -10 to +10.)

R = VDF/A EG Release Time (VDF and VDA EG release time)

This parameter controls the release time of the program. The larger the number is, the longer the release time becomes.

(Range: -10 to +10.)

E = Effect Balance

This parameter controls the volume balance of the effect and direct sounds. The larger the number is, the greater the ratio of effect sound to direct sound becomes.

(Range: -10 to +10.)

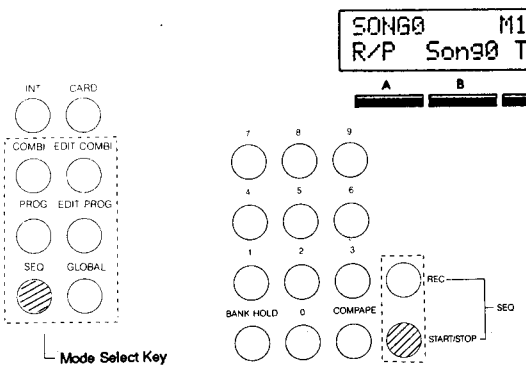
NOTE: The values of the parameters here will return to their original settings when you select other programs. When moving to other modes, the parameter value (and, hence, the sound) remains at its stored or edited setting. When moving back to the PROGRAM Mode, the display value will be reset to zero, but the actual value remains unchanged.

HOW TO OPERATE THE SEQUENCER

Specially prepared sequencer demonstration data has been loaded into the internal memory of the M1 at the factory. Before recording your own data, let's listen to the demonstration data.

1. Press the SEQ key of the mode select keys; this puts the M1 in the SEQUENCER Mode.

2. Press cursor key B.

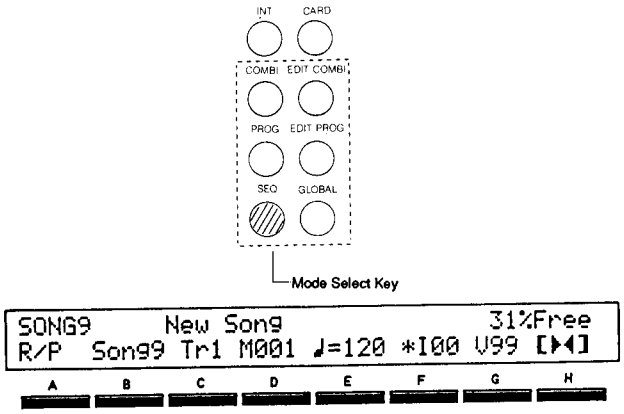


3. The value above the cursor can be changed by moving the VALUE slider up and down. Select song number 0 by moving the VALUE slider all the way down.

4. The sequence can be played by pressing the START/STOP key.

5. Play can be stopped by pressing the START/STOP key again.

HOW TO RECORD WITH THE SEQUENCER

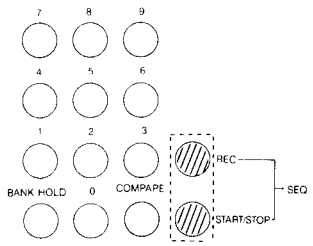


Now that you've heard the demo sequence, follow these steps to record some sequenced music of your own.

1. Press the SEQ key of the mode select keys; this puts the M1 in the SEQUENCER Mode.

2. Press cursor key [B] .

3. Select the song to be recorded by moving the VALUE slider up and down. Select number 9 here.



4. Select the track to be recorded by first pressing cursor key [C] and then moving the VALUE slider up and down. Select 1 here.

5. Select the program that will be used by first pressing cursor key [F] and then moving the VALUE slider up and down. Select any sound color you like.

6. Press the REC key.

7. Press the START/STOP key. Begin playing after a lead in of two measures. Recording starts at this point.

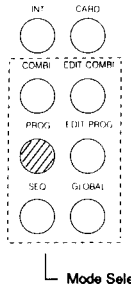
8. Press the START/STOP key once more to stop recording.

9. Playback can be executed by pressing the START/STOP key.

SOUND MAKING PROCESS

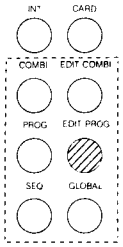
Here is a summary of the M1's sound making process.

1. Select the sound to be edited in the PROGRAM Mode.



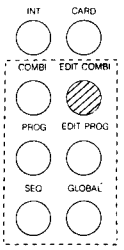
See the MODES AND FUNCTIONS chapter, section #1 PROGRAM MODE (p. 18)

2. Create the sound color in the EDIT PROGRAM mode and write it to memory.



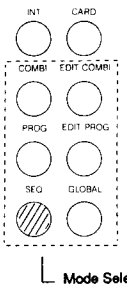
See the MODES AND FUNCTIONS chapter, section #2 EDIT PROGRAM MODE(p.20)

3. Create the Combination by combining the Programs created in step #2 in the EDIT COMBINATION Mode.



See the MODES AND FUNCTIONS chapter, section #5 EDIT COMBINATION MODE (p.61)

3. Record a song using the Programs created in step #2 in the SEQUENCER Mode.



See the MODES AND FUNCTIONS chapter, section #6 SEQUENCER MODE (p.79)

INTERNAL MEMORY ALLOCATION

Large Sequence Allocation	Combination Memory = 50 Program Memory = 50 (memory numbers I50 - I99 cannot be selected)	10 Banks 100 Patterns (a total of less than 7700 steps)
Large Program Allocation (set at the factory prior to to shipment)	Combination Memory = 100 Program Memory = 100	10 Banks 100 Patterns (a total of less than 4400 steps)

There are two different kinds of internal memory allocation (the way available memory is used) in the M1.

* Changing the memory allocation setting is done in the GLOBAL Mode, F6 - 4 (p.117)

NOTE: Be careful when switching the memory allocation setting, since much of your precious data could be irretrievably lost.

MEMORY CARD FORMAT

Program Card	100 Combinations 100 Programs 1 Global Parameter	
Sequencer Card		10 Banks 100 Patterns (a total of less than 7700 steps)
Program/Sequence Card	50 Combinations	10 Banks 100 Patterns (a total of less than 4200 steps)

The M1 has three kinds of memory formats.

* PCM cards are not included in this classification.
* Use KORG MCR-03 RAM cards.
* Two RAM cards are neccesary in order to save all the internal memory data.

Writing in and reading out of data from cards can be done by using the following functions:

	Read Out	Write In
All Programs, Combinations, sequence data	Global Mode F8 - 1	Global Mode F9 - 1
All Programs, Combinations		
All sequence data		
1 Combination	COMBI Mode	EDIT COMBI Mode F9 - 1
1 Program	PROG Mode	EDIT PROG Mode F9 - 1
1 song	SEQ Mode F9 - 2	- - - - -
1 pattern	SEQ Mode F9 - 3	- - - - -

HOW TO READ THE DISPLAY PAGE CHART

F0 – 2 OSC1 (Oscillator 1) ---------- ①

A	Multisound Select	Multisound Name	OSC 1 Multisound (original waveform) Selection (when the OSC mode is set to SINGLE or DOUBLE)
	Drum Kit	Drum Kit 1 ~ Drum Kit 4	Drum Kit Selection (when the OSC mode is set to DRUMS)
D L	Oscillator Level	0 ~ 99	Volume of Oscillator 1
E	Octave		Octave setting of Oscillator 1
		16'	1 octave down
		8'	standard pitch
		4'	1 octave up

② ③ ④ ⑤ ⑥

① F 0-2 OSC1 (Oscillator 1): Indicates that this is the second page of function 0 and that the function is called Oscillator 1.
② The cursor key to be used to access the parameter.
③ The abbreviation of the parameter that is shown on the display.
④ Name of the parameter.
⑤ The range of values and settings of the parameter.
⑥ Brief explanation of the parameter's function.

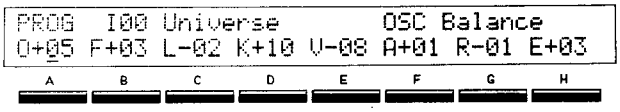
1 -- PROGRAM MODE

In this mode Programs (sound colors or preset voices) can be selected and played. Programs are selected by the numeric keypad (0-9), UP/DOWN keys, footswitch (PROG/COMBI, UP/DOWN) or MIDI program change.

* A Program within the internal memory is selected when INT is selected and a Program within the card is selected.
* Before selecting a Program by footswitch or MIDI, the appropriate function has to be set for operation in the GLOBAL Mode.

NOTE: Panpot settings are given a default value of A:B = 5:5 in all Programs except the Drum Kit. (Signals are not output to Outputs 3 and 4.)

EDITING IN THE PROGRAM MODE



[A] O	OSC Balance	–10 ~ +10	Controls the volume balance of OSC 1 and OSC 2 of the Programs when set to DOUBLE.
[B] F	VDF Cutoff	–10 ~ +10	Controls the cutoff frequency of VDF 1 and VDF 2 (changes the tonal quality of the sound).
[C] L	VDA Level	–10 ~ +10	Controls the level (volume) of OSC 1 and OSC 2.
[D] K	Keyboard Track	–10 ~ +10	Controls the sensitivity at which changes in sound color and volume are affected by the part of the keyboard played.
[E] V	Velocity Sensitivity	–10 ~ +10	Controls the sensitivity at which changes in sound color and volume are affected by how hard the keyboard is played.
[F] A	Attack Time	–10 ~ +10	Controls the attack time of VDFs 1, 2 and VDAs 1, 2.
[G] R	Release Time	–10 ~ +10	Controls the release time of VDFs 1, 2 and VDAs 1, 2.
[H] E	Effect Balance	–10 ~ +10	Controls the balance of the direct sound and the sound of Effects 1 and 2.

When editing parameters in the PROGRAM Mode, corresponding Program parameters in the same Programs of the EDIT PROGRAM Mode are assigned the same values.

* Edited Programs should be written to memory in the EDIT PROGRAM Mode.

Program parameters change as shown in the chart below when selecting positive parameter values ("+" settings). The reverse changes occur when negative values ("-" settings) are used.

PROGRAM Mode Parameters		**Effect of a positive value setting on each parameter**
OSC Balance	OSC 1 Level OSC 2 Level	The level of OSC 1 increases, while that of OSC 2 decreases.*1
VDF Cutoff	VDF 1, 2 Cutoff	Increases (or assumes a positive value).*1
VDA Level	OSC 1, 2 Level	
Keyboard Track	VDF 1, 2 KBD TRK Cutoff EG Time VDA 1, 2 KBD TRK Amplitude EG Time	Increases in proportion to note number of key played.*2
Velocity Sensitivity	OSC 1, 2 EG Level Vel Sens EG Time Vel Sens VDF 1, 2 VEL SENS EG Int EG Time VDA 1,2 VEL SENS Amplitude EG Time	Even when set to a negative value, only the absolute value becomes smaller, but the sign ("+" or "-") does not change Parameters with values set to "0" remain as "0" and do not change.
Attack Time	VDF 1, 2 Attack Time VDA 1, 2 Attack Time	Increases (or assumes a positive value). *3
Release Time	VDF 1, 2 Release Time	Increases. *1
Effect Balance	EFFECT 1, 2 Balance	

*1 Assuming that the original value = V, then the changed value is increased or decreased by 5V.

*2 Assuming that the original value = V, then the changed value increases by a power of 1 + (V/10).

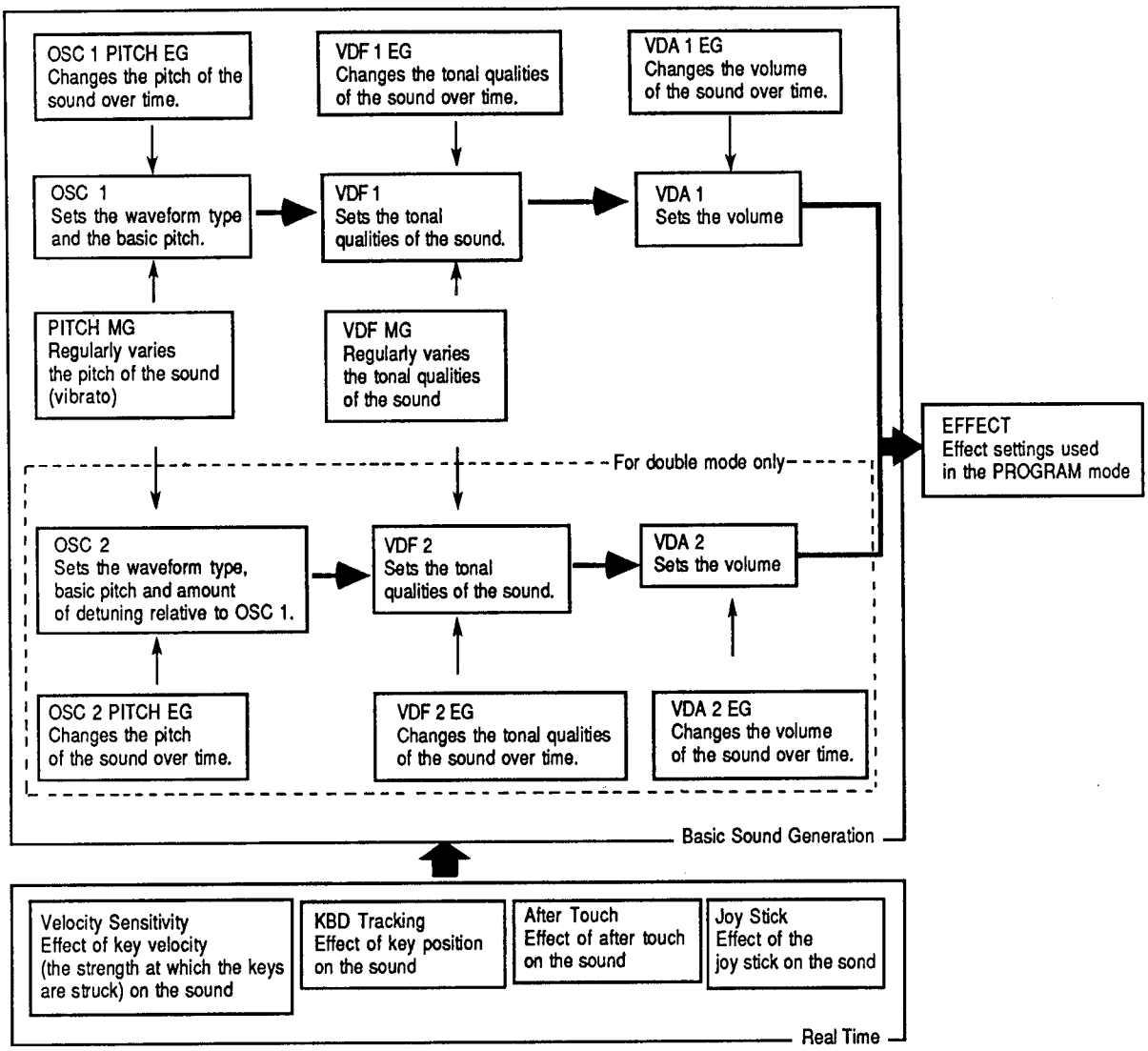
*3 Assuming that the original value = V, then the increase or decrease of the VDF value is by 3V, while that of the VDA value is by 5V.

2 -- EDIT PROGRAM MODE

In this mode the Program parameters (such as original waveform settings and filter EG values, etc.) are set.

* Only the Programs which have been already selected in the PROGRAM Mode can be edited.
* Editing in real time (for changing parameters in live performance) can be done in the PROGRAM Mode.
* Use the F 9 - 1 Write Program function after finishing any edits and the Program will be completed. (Programs which are not written to memory are irretrievably lost when selecting other programs in the PROGRAM Mode.)
* Pressing the COMPARE key during editing can recall the original un-edited program for comparison. Pressing the COMPARE key again and leaving the Program without editing it returns you to the Program which was being edited before the COMPARE key was pressed.

STRUCTURE OF THE M1'S PROGRAM PARAMETERS



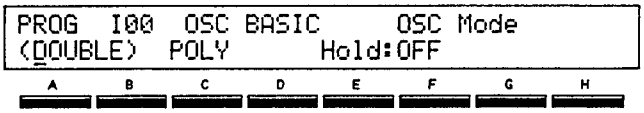
FUNCTIONS IN THE EDIT PROGRAM MODE

* The first page of each function is selected by pressing the numeric keypad (0 to 9). Select the page at which the parameter you want to edit shows using the PAGE + key and PAGE - key.
* The maximum pitch change of the various pitch controls, such as pitch bend, pitch EG, pitch modulation and after touch, is limited to one octave. (Some Multisounds have an even smaller range, depending on the actual pitch range of the sound.)
* VDF and VDF EG parameters as well as the change in timbre by VDF MG are limited to the total controllable range of the VDF.
* Oscillator level and VDA parameters, as well as volume change by VDA EG are limited to the total controllable range of the VDA.

Page		Parameter to be edited
0-1	OSC-BASIC	Oscillator mode
2	OSC1	Waveform, level of Oscillator 1
3	OSC2	Waveform, level, pitch of Oscillator 2 (Double mode)
1-1	OSC1 PITCH EG	Pitch variation over time of Oscillator 1
2	OSC PITCH EG	Pitch variation over time of Oscillator 2 (Double mode)
2-1	VDF1	Cutoff frequency, EG intensity of VDF 1
2	VDF1 EG	Variation of the VDF 1's cutoff frequency over time
3	VDF1 VEL SENS	Degree to which VDF 1 responds to key velocity
4	VDF1 KBD TRK	Degree to which VDF 1 tracks the keyboard
3-1	VDF2	Cutoff frequency, EG intensity of VDF 2 (Double mode)
2	VDF2 EG	Variation of the VDF 2's cutoff frequency over time (Double mode)
3	VDF2 VEL SENS	Degree to which VDF 2 responds to key velocity (Double mode)
4	VDF2 KBD TRK	Degree to which VDF 2 tracks the keyboard (Double mode)
4-1	VDA1 EG	Volume variation of VDA 1 over time
2	VDA1 VEL SENS	Degree to which VDA 1 responds to key velocity
3	VDA1 KBD TRK	Degree to which VDA1 tracks the keyboard
5-1	VDA2 EG	Volume variation of VDA 2 over time (Double mode)
2	VDA2 VEL SENS	Degree to which VDA2 responds to key velocity (Double mode)
3	VDA2 KBD TRK	Degree to which VDA2 tracks the keyboard (Double mode)
6-1	PITCH MG	Pitch modulation (vibrato effect)
2	VDF MG	VDF modulation (wah-wah effect)
7-1	AFTER TOUCH	Degree to which after touch affects tonal quality
2	JOY STICK	Degree to which joy stick affects tonal quality
8-1	EFFECT 1	Selection of Effect 1
2	EFFECT 1 PARAMETER	Parameters of Effect 1
3	EFFECT 2	Selection of Effect 2
4	EFFECT 2 PARAMETER	Parameters of Effect 2
5	EFFECT PLACEMENT	Assignment of Effects 1 and 2
6	EFFECT COPY	Copying of Effect parameter values
9-1	WRITE/RENAME	Writing and renaming of Programs

EDITING IN THE EDIT PROGRAM MODE

F 0 - 1 OSC BASIC (Oscillator)



A	OSC MODE	SINGLE DOUBLE DRUMS	Sound origin mode One-oscillator mode Two-oscillator mode Drum Kit mode
C	Assign	POLY MONO	Number of voices sounded Maximum polyphonic play Monophonic play
F	Hold	ON/OFF	Sound continues even after key release

In the OSC MODE (oscillator mode), the structure of the Program to be made is selected. The oscillator number and the type of sound origin will change according to the setting made here.

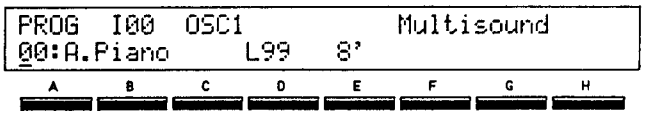
* When switching the OSC MODE, reset the multisound (Drum Kit) of OSC 1 in the following page.
* In SINGLE, a one-system OSC/VDF/VDA is used. The maximum simultaneous voices available is 16.
* In DOUBLE, two OSC/VDF/VDA systems are used.Sounds of greater complexity can be created here, but the maximum simultaneous voices available is decreased to 8.
* DRUM KIT is a mode that uses drum sounds as the sound origin to make up a keyboard-controllable drum kit.

Assign determines whether the program is to be played polyphonically or monophonically.

When the Hold parameter is set to ON, notes played will continue to sound even after releasing the key. This is used mainly for playing the Drum Kit.

* The sound will not stop but will continue for the full duration of the sustain parameter when Hold is set to ON.

F 0 - 2 OSC1 (Oscillator 1)



A	Multisound Drum Kit	 Drum Kit 1 〉 Drum Kit 4	Selection of Oscillator 1 Multisound waveform (when oscillator mode is set to Single or Double) Selection of Drum Kit (when oscillator mode is set to Drums)
D L	OSC Level	0 - 99	Volume of Oscillator 1
E	Octave	 16' 8' 4'	Octave setting of Oscillator 1 One octave below standard pitch Standard pitch One octave above standard pitch

When SINGLE or DOUBLE is selected in function F 0 - 1, OSC MODE, the waveform of Oscillator 1 is selected by Multisound (Multisound Select). (A list of the Multisounds is on the back cover.)

* Since each Multisound (sound origin waveform) has a limited pitch range, it may not sound when playing in a high octave.
* Multisounds can be chosen from CARD if the PCM card (optional) is inserted in the rear panel. Multisounds within the CARD are indicated by a "C" in front of the number on the display and can be seen in succession by moving the VALUE slider up and down.

NOTE: Make sure to insert or take out the PCM card only when the power is OFF or when no sound comes from the M1.

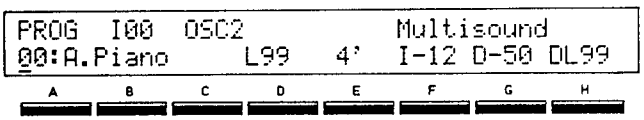
Selects one of the Drum Kits (1 to 4), when DRUM KIT is selected in the OSC MODE.

* Assignment of drum sounds to the Drum Kit is done in GLOBAL Mode.

OSC Level (oscillator level) sets the sound volume of Oscillator 1. The maximum is 99 and minimum is 0.

Octave sets the basic pitch of Oscillator 1 in octave units.

F 0 - 3 OSC 2 (Oscillator 2) --- Only DOUBLE MODE



A	Multisound	Multisound name	Selection of Multisound for Oscillator 2
D L	OSC Level	0 ~ 99	Volume of Oscillator 2
E	Octave	16', 8', 4'	Octave of Oscillator 2
F I	Interval	-12 ~ +12	Pitch of Oscillator 2 relative to Oscillator 1 (adjustable in semitones)
G D	Detune	-50 ~ +50	Detuning of Oscillator 2 relative to Oscillator 1 (adjustable in cents)
H DL	Delay Start	0 ~ 99	Delay time before Oscillator 2's sound begins

Multisound (Multisound select) selects the Multisound of Oscillator 2. The types of Multisound that can be selected are the same as in F 0 - 2, OSC1 Multisound.

OSC Level (oscillator level) sets the sound volume of Oscillator 2.

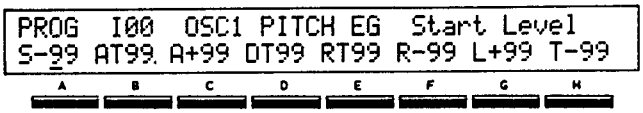
Octave sets the octave of Oscillator 2.

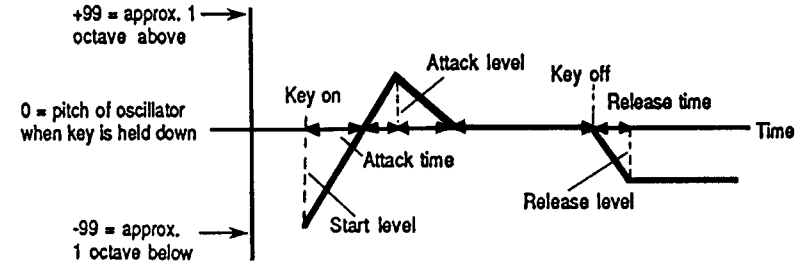
Interval sets the pitch difference between Oscillator 1 and the Oscillator 2 in semitones (over a range of -12 to +12). Creating chords with Oscillators 1 and 2 is possible by adjusting the pitch here.

Detune allows finer adjustment in cents of the pitch difference between Oscillators 1 and 2 (over a range of -50 to +50). A thick sound can be obtained by detuning Oscillator 2 slightly.

Delay Start determines the time it takes between the onset of the sound of Oscillator 1 and the start of Oscillator 2's sound. (Set to "0" when not using this effect.)

F 1 - 1 OSC 1 PITCH EG (Oscillator 1 Pitch EG)



[A] S	Start Level	-99 ~ +99	Determines how the pitch of Oscillator 1 varies over time. 
[B] AT	Attack Time	0 ~ 99	
[C] A	Attack Level	-99 ~ +99	
[D] DT	Decay Time	0 ~ 99	
[E] RT	Release Time	0 ~ 99	
[F] R	Release Level	-99 ~ +99	
[G] L	EG Level Vel. Sens.	-99 ~ +99	Determines to what degree pitch will vary in response to key velocity.
[H] T	EG Time Vel. Sens.	-99 ~ +99	Determines to what degree the total time of the pitch variation will change in response to key velocity.

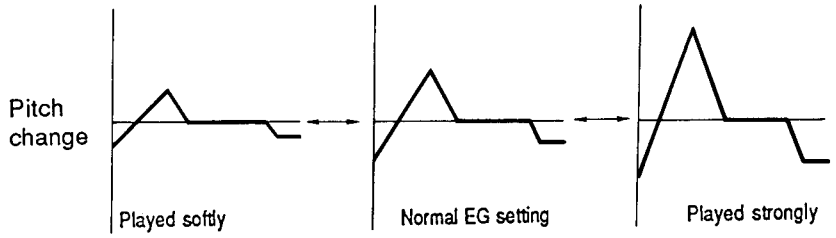
Sets the rate at which the pitch of Oscillator 1 changes.

These parameters set the rate at which the pitch of Oscillator 1 changes.

Setting opposite positive and negative values for each EG level will result in an EG shape reverse of the above.

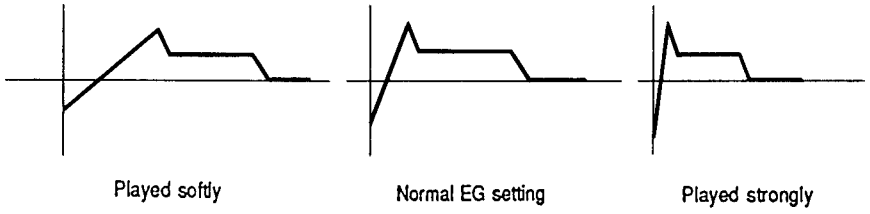
The stronger the key is struck the greater the change of pitch when setting EG Level Vel. Sens. (EG level velocity sensitivity) to "+". (The opposite occurs when set to "-".) The change of pitch by EG is limited to within +/- 1 octave.

* When set to "+":



The stronger the key is struck the shorter the time becomes when setting the EG Time Vel. Sens. (EG time velocity sensitivity) to "+". (The opposite occurs when set to "-".)

* When set to "+":

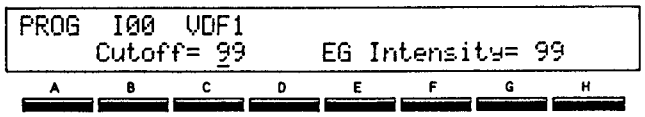


F 1 - 2 OSC 2 Pitch EG (Oscillator 2 Pitch EG)---only DOUBLE Mode

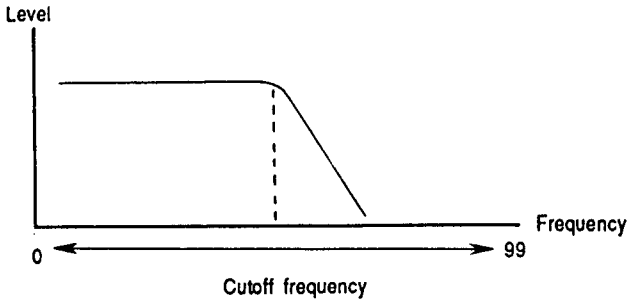
Determines how the pitch of Oscillator 2 varies over time.

* The functions and parameters are the same as F 1 - 1 OSC 1 Pitch EG, as applied to Oscillator 2. Please refer to the section on OSC 1 Pitch EG.

F 2 - 1 VDF 1



D	Cutoff	0 ~ 99	Determines the initial cutoff frequency of VDF 1. (Controls how bright the sound will be.)
H	EG Intensity	0 ~ 99	Determines the degree to which the EG will affect the cutoff frequency.

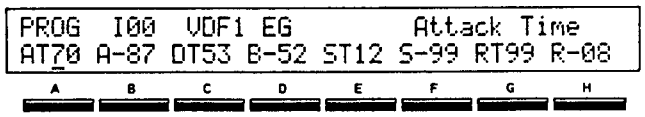


* The VDF (Variable Digital Filter) controls the tonal quality of the sound by damping (cutting off) the high frequency components of the Multisound.

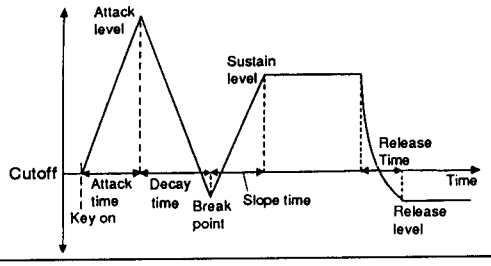
Cutoff sets the cutoff frequency of VDF. The smaller the value is set, the more mellow the tone becomes.

EG Intensity sets the sensitivity of the cutoff frequency to the VDF EG in the succeeding page. The depth of the cutoff change is greatest when set to 99.

F 2 - 2 VDF 1 EG



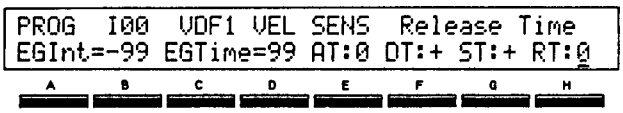
A AT	Attack Time	0 ~ 99	Determines how the VDF 1's cutoff frequency will vary over time. The time parateters (Attack Time, Decay Time, Slope Time, Release Time) are used to set the time it takes to reach the next level. The level parameters (Attack Level, Break Point, Sustain level, Release Level) are used to set the cutoff frequency of the VDF for that segment of the EG.
B A	Attack Level	-99 ~ +99	
C DT	Decay Time	0 ~ 99	
D B	Break Point	-99 ~ +99	
E ST	Slope Time	0 ~ 99	
F S	Sustain Level	-99 ~ +99	
G RT	Release Time	0 ~ 99	
H R	Release Level	-99 ~ +99	



* Each level can be individually set to a positive or negative value in relation to initial cutoff.

* The amount by which each level affects the cutoff frequency is globally controlled by VDF 1 EG Intensity.

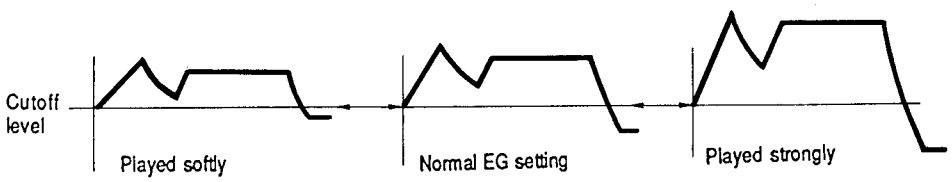
F 2 - 3 VDF 1 VEL SENS (VDF 1 Velocity Sensitivity)



B	EG Int (EG Intensity Velocity Sensitivity)	-99 ~ +99	The degree to which the VDF 1 EG's level is affected by key velocity
D	EG Time (EG Time Velocity Sensitivity)	0 ~ 99	The degree to which the VDF 1 EG's time is affected by key velocity
E AT	Attack Time	-, 0, +	These are the parameters that EG time velocity sensitivity can be programmed to affect; negative and positive values can be individually selected with 0 having no effect.
F DT	Decay Time	-, 0, +	
G ST	Slope Time	-, 0, +	
H RT	Release Time	-, 0, +	

EG Int (EG Intensity Velocity Sensitivity) is an effect that changes the tone color by how hard you strike the keys.

* When a negative setting is chosen, the more softly the keys are played the greater the cutoff frequency change becomes. (The set value by EG intensity is the norm.)
* When set to "+":



* It is true of most acoustic musical instruments that the softer the sound made, the fewer high frequency components that are present in the sound. When imitating this effect, set the cutoff frequency to low in the VDF, set all levels like the sustain level of VDF EG to "+", and set the parameter values of VDF EG intensity and VDF EG intensity Velocity Sensitivity to "+".

EG Time (EG Time Velocity Sensitivity) is an effect that changes the speed of VDF EG by how hard you strike the keys. When set to positive ("+"), the stronger the key is hit the shorter the time of the EG (Attack / Decay / Slope / Release) becomes. (The time becomes longer when set to "-".) Thus, by setting Attack to positive ("+") and release to negative ("-"), the harder the key is struck the shorter the attack but the longer the release.