


CASIO DIGITAL SYNTHESIZER

OPERATION MANUAL 1
 MANUAL DE OPERACION... 117

VZ-8M

ALL OK!	14 VEL 234 678 INVERSE=OFF	16 DELAY TRIG CHECK KEYASSIGN!	18 UIB 2345678 INVERSE=ON	00 INITIALIZE PUSH YES KEY!	+ A-1
M1	15 POS X-FADE CHECK KEYASSIGN!	13 U-SP 234 678 RANGE= 1-127	NORMAL W PST1 A-1:UZ EP	1+2/3+4 K PST1 A-1:UZ EP	00 I
REMOLO					13 CHE
INT	19 A VEL RATE M1 ENA=***	09 PAN PANPOT2=+15	21 COMBI COPY COPY 1+ + (YES)	20 TREM INVERSE CHECK KEYASSIGN!	01
+2/ + 4 ON	13 U-SP + 2+3+4 RANGE= 1-127	01 TRANPOSE=F#	WRITE OPMEM INT **	10 LEV + / 3+4 LEVEL=99	+ A-1
ERSE SSIGN!	01 COPY+M1-M8 M1 INIT+ YES	12 SPLIT + 2/3/4 POINT=E3	00 OP NAME INT A-8:	00 INITIALIZE OK!	OPME A-1:
+ P + +	17 TOTAL VIBRATO TOTAL=ON	WRITE OPMEM OK!	20 TREM 2345678 INVERSE=OFF	09 PAN MODE=FIX	1+2
ERSE SSIGN!	P 1*2 3+ + 5+ + +	11111111 PST1 A-1:UZ EP	00 MIDI AI:2: 1 CHANNEL= 1	15 POSX + 2+3+4 POS=B62-F#3	NORP G-5:
(YES)	19 TOTAL TREMOLO CHECK KEYASSIGN!	15 POSX 1+ + 2+ + 4 POS=C#4-A4	P P P .+. .*. .+. .+ +	80000000 PST1 A-1:UZ EP	+ +
ATE ***	P 1+2 3+ +	17 TOTAL VIBRATO TOTAL=OFF	18 UIB + 2/3+4 INVERSE=ON	01 OP TUNE TUNE=+1, 0, 7	EFFE VOIC
+ 4 0, 7					

CASIO VZ-8M

DIGITAL SYNTHESIZER

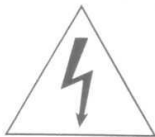
Thank you for purchasing the Casio VZ-8M Digital Synthesizer Module. The VZ-8M is a highly innovative digital synthesizer which features Casio's newly-developed "iPD" (Interactive Phase Distortion) Modular Sound Source system. To obtain optimum performance and assure long-term reliability from your new VZ-8M, be sure to read this manual carefully and store it in a safe place so you can refer to it often.

Internal FC, 44,03,XX,7D,56, F7
Preset 1 FC, 44,03,XX,7D,51,20, F7
Preset 2 FC, 44,03,XX,7D,51,21, F7

	CAUTION RISK OF ELECTRIC SHOCK DO NOT OPEN	
“CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.”		

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



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

Main Features

1 Amazing Synthesis Versatility Thanks to Casio's All-new iPD Sound Source

Casio's all-new "Interactive Phase Distortion" (iPD) sound source system actually consists of 8 independent "modules" (M1 to M8). Each of these modules contains a DCO and a DCA, and is capable of generating independent waveforms. In the iPD system, the wave generated by any module can be used in either of two ways; to produce audible sounds or to modify waves generated by other modules.

The 8 iPD sound source modules work in associated pairs that are called "Internal Lines," or simply "lines." There are 4 internal lines — A, B, C and D.

The waveforms generated by both modules in any line can be used together in three different ways. They can be mixed, or one of the waveforms can be used to modulate the other for RING modulation or as the PHASE of a succeeding line.

2 Instant Recall of up to 320 Sounds and 320 Operation Memories

128 presets give you a wide range of vocal versatility. And with the use of an optional ROM card, the VZ-8M gives you incredible tonal expansion potential — up to 128 patches and 128 multi-patch setups are literally at your fingertips. What's more, you can store up to 64 sounds and 64 operation memories on on-board memory or an optional RAM card, for even greater freedom of timbral expression.

3 Player-selectable Keyboard, Guitar & Wind MIDI Performance Modes

The VZ-8M lets you select from 3 different MIDI performance modes, according to the type of MIDI controller you're using. Just select a sound and choose the performance mode — the "K" performance mode arranges sounds in full polyphony, for realistic keyboard performance. The "G" performance mode lets you play the same sound in mono, emulating the individual strings of a guitar, while the "W" performance mode provides the natural after-touch characteristics necessary for playing with wind controllers.

4 Multi-Channel MIDI Performance

The VZ-8M features Casio's exclusive multi-channel mode which can accept up to 8 timbres from separate MIDI sound sources. These can then be divided into constituent polyphonics and ensembled in any format you desire. Multi-timbral MIDI expansion, monophonic MIDI performance, or total 8-note MIDI polyphony can be selected.

5 Built-in Panning Function

The VZ-8M's built-in panning function lets you choose from three different panning effects; Fixed panning, Controlled panning and Auto panning. Each panning effect adds spacial realism and ambience to your sound.

6 "Player-friendly" Menus and Functions

Virtually all of the VZ-8M's editing and programming operations are organized into three basic menus — the VOICE PARAMETER menu, EFFECT menu and TOTAL CONTROL menu — that feature a variety of "functions." Each of these functions is further broken down into "parameters," which are constants that have changeable values or settings. To alter sounds or programming, you simply alter the value of these parameters using value keys.

7 Combination Mode Provides Layered and Split Voicing

The VZ-8M's "Combination" mode lets you mix together up to 8 different patches in any of 9 different patch mix or patch split configurations. (1+2, 3+4, 1+2+3+4, 1+2+3+4+5+6+7+8, 1/3, 1+2/3, 1/3+4, 1+2/3+4, 1/2/3/4) You can set effect and amp levels independently for each patch.

8 Velocity Split & Positional Cross Fade

The VZ-8M puts powerful multi-voice performance in your hands, with advanced features such as velocity split and positional cross fade. Set up multi-layered voices with up to 3 split points, and "fade" the voices into one another so there's no audible "split point" with the cross fade function, or control multiple voices through velocity message using velocity split.

9 Optional ROM & RAM Cards

Choose from optional ROM or RAM cards for expanded sound storage and recall capabilities. Each ROM card holds an impressive 128 patches and 128 different operation memories. With a RAM card, you can store up to 64 patches and 64 operation memories. What's more, VZ-8M patches can be used in a Casio PG series guitar synth.

Important Terms

Throughout this manual you will encounter terms (words) which you may — or may not — be familiar with. Before jumping into the operations, it's important to make sure that you understand the basic usage of these terms in this manual. Take a few moments to read through these words and become familiar with them — you'll find it will enhance your overall understanding of this unit.

MENU	A displayed list of the various FUNCTIONS you can use to edit sounds. There are three basic Menus which can be selected; the VOICE PARAMETER menu (VOICE menu), EFFECT menu, and TOTAL CONTROL menu (TOTAL menu).
FUNCTION	Any of the items listed on the menus. Each Function contains a variety of PARAMETERS, and is identified by a two-digit number. For example, Function 02 in VOICE PARAMETER menu contains parameters related to detuning.
PARAMETER	A constant control which features variable levels. These parameters control not only data that affects the various components of a sound, but also aspects of the overall setup.
VALUE	The level or setting assigned to an individual parameter.
MODULE	The iPD sound source features 8 independent "modules." These can be thought of as independent — <i>but interrelated</i> — oscillators with controls.
INTERNAL LINE	Sound source MODULES work together in "pairs." These pairs form what is known as an INTERNAL LINE, or simply "line." For example, Module 1 and Module 2 (M1 and M2) form Internal Line A — known in this manual as LINE A. M3 and M4 form LINE B, etc.
EXTERNAL PHASE	In addition to using the output of any LINE to create audible sounds, you can utilize the output to modulate the succeeding line. For example, the output of LINE A can be used to modulate LINE B. This configuration is known as "External Phase." (Refer to "Theory: iPD Modular Sound System" for details.)
PATCH	With analog synthesizers, a "patch" literally referred to the way in which various synthesizer blocks or modules were hard-wired (hooked up). With digital synthesizers, this term has come to refer to completed sound data which can be output by the synthesizer. In this manual, you can think of "patch" as referring to any completed sound data coming from modules 1 through 8.
OPERATION MEMORY	An operation memory is literally a full "multi-timbral setup" or "performance setup", complete with specifications for multiple patches (when desired), keyboard and velocity split, MIDI settings, etc. The onboard memory allows storage of 128 preset operation memories.
ENVELOPE	A voltage which changes as a function of time. Envelopes are generally triggered by controllers, and are used to shape the amplitude (volume) and pitch of a note.
MODE	A particular operational function or condition. In "VZ language", there are 4 basic operational modes, including the NORMAL mode, the COMBINATION mode, the OPERATION MEMORY mode, and the MULTI CHANNEL mode. Each of these serves an independent purpose described later in this manual.

PERFORMANCE MODE	There are 3 basic “MIDI Performance Modes”, which should not be confused with the basic operational “modes”. The “Performance Modes” are actually preset parameter setups programmed for each sound individually, which can be selected to “match” the selected sound with the type of MIDI controller you are using. For example, if you’re using a MIDI keyboard, you’ll want to select the “K” or keyboard performance mode. In addition to “K”, there are “G” (Guitar) and “W” (Wind) MIDI performance modes.
K MODE	Short for “ Keyboard Mode ” — one of three VZ-8M MIDI performance modes.
G MODE	Short for “ Guitar Mode ” — one of three VZ-8M MIDI performance modes.
W MODE	Short for “ Wind Mode ” — one of three VZ-8M MIDI performance modes.
VOICE-09	Throughout this text, the names of each of the three main “menus” is listed in capital letters. In this case, VOICE-09 indicates function “09” in the “Voice Parameter” menu — the “AMP ENV” function.
EFFECT-05	Throughout this text, the names of each of the three main “menus” is listed in capital letters. In this case, EFFECT-05 indicates function “05” in the “Effect” menu — the “DEF CONTROL” function.
CONTROL-04	Throughout this text, the names of each of the three main “menus” is listed in capital letters. In this case, CONTROL-04 indicates function “04” in the “Total Control” menu — the “MIDI CHANNEL” function.
OPE EFFECT	Indicates the EFFECT menu in the OPERATION MEMORY mode. For example, “OPE EFFECT-01” represents function “01” in the OPERATION MEMORY mode’s EFFECT menu — the “OP TUNE” function.
PROG NO KEYS	Short for “Program Number Keys”. These keys are used in a variety of sound synthesis and editing operations.
MOD WHEEL	Short for “Modulation Wheel”.
DEF CONTROL	Short for “Definable Control”.
PAGE KEYS	Used to “scroll” or advance up and down the selected VZ menu.
COMBI MODE	Short for “Combination Mode” — one of the 4 basic operational modes used in synthesis, editing and performance.
MULTI CH MODE	Short for “Multi Channel Mode” — another of the basic operational modes.
M ON/OFF KEY	Short for “Module ON/OFF Key” — keys used to turn the VZ’s sound source modules ON and OFF.

Theory: Flow of Operations

Although the VZ-8M features a complex operating system, it has been designed so that actual operations are quite simple — after a few hours you'll be amazed at how simple the unit is to operate, and how versatile it is. In order to appreciate the beauty of the VZ, it's important to have a clear initial understanding of its basic "flow of operations" — in other words the basic order of operations you will probably want to follow to make the most of this synthesizer.

Simply speaking, operations can be divided into four different types — these correspond to the four basic operational "modes" — the **NORMAL** mode, the **COMBINATION** mode, the **OPERATION MEMORY** mode and the **MULTI CHANNEL** mode.

You can select any of these modes by pressing the corresponding key on the front panel. After selecting the MODE, you can select any of the editing modes. To select either the VOICE PARAMETER menu (VOICE menu) or EFFECT menu, press the EDIT key so that the key's LED indicator lights. To select the TOTAL CONTROL menu (TOTAL menu), simply press the TOTAL CONTROL key.

But before you start pressing keys, take a few moments to read through the following text. This should give you a clearer understanding of the relationship between the different basic modes.

NORMAL MODE

The **NORMAL** mode is what you might think of if you've used a "normal" single-patch synthesizer that does not feature the extensive sound layering and memory capabilities of the VZ.

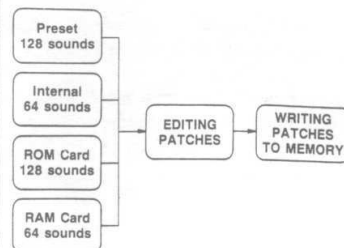
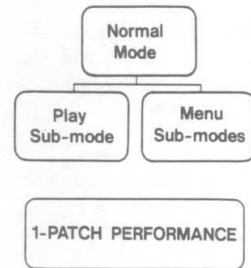
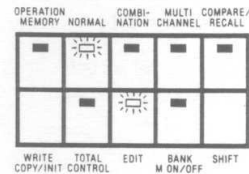
The **NORMAL** mode can be further broken down into two sub-modes — the **PLAY** sub-mode and the **MENU** sub-mode. In other words, you can "play" or perform normally in this mode, or use any of the three editing MENUs to edit and create individual patches.

In the **PLAY** sub-mode, you can freely choose any of the sounds contained in the VZ's preset, internal or card-memories, and use it in performance. If you want to edit the sound, you simply select any of the editing MENUs which contain a wide range of "FUNCTIONS" for sound editing. Whenever you've selected any of the three editing MENUs, you're working in the "MENU" sub-mode.

The **NORMAL** mode is the basic performance mode, where "patches" created through the modular sound source system can be selected and output individually for 1-patch performance. You can make use of the wide range of the sound effects in this mode, for expanded performance versatility.

You can also use the **NORMAL** mode to create new patches by altering values for existing patches and writing them in either the internal or card memory. Or create entirely new sounds by initializing a memory area and programming values.

Once you've created sounds you want to save, you can write them to one of 64 internal memory areas in the **NORMAL** mode, or to an optional RAM card which holds as many as 64 sounds.



One important thing to remember when you select the NORMAL mode is that you're working with only **1 patch at a time** — you can recall one patch at a time, edit one patch at a time, perform with one patch at a time, and write an individual patch to memory.

COMBINATION MODE

The COMBINATION mode is a "buffer" (for those with computer experience), or "work area" where you can "combine" the patches you've created in the NORMAL mode to make detailed, multi-timbral setups featuring keyboard split point, velocity split specifications, and individual effect specifications for each patch in the setup.

The COMBINATION mode can be further broken down into two sub-modes — the **PLAY** sub-mode and **MENU** sub-modes.

The PLAY sub-mode is selected for normal performance, while the MENU sub-modes are selected for further editing of sound, effect, and multi-timbral setup data.

In this work area, you can select up to 8 different patches created in the NORMAL mode (preset, or those you've created), and arrange them freely to create a multi-timbral setup. The "arrangement" of these sounds is accomplished by choosing from any of 9 different KEY ASSIGN settings, which feature both SPLIT and LAYERED patch arrangements (see "Performance/Editing in the Combination Mode").

A variety of the functions can be used to determine keyboard split points, as well as velocity split for each patch in the sound.

Effects can also be set individually for each patch in this mode. What's more, relative amplitude levels can be set for each patch, allowing total control of "balance" within the multi-patch sound.

This unit is designed so that you can quickly and conveniently arrange the patches you use in the multi-patch sound — if you don't like what you hear, you can choose a replacement patch or delete it from the sound altogether.

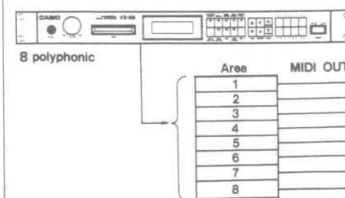
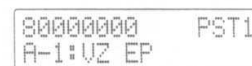
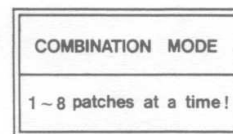
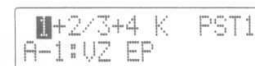
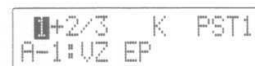
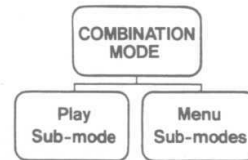
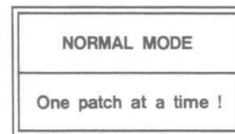
One important thing to remember when you select the COMBINATION mode is that you're working with **up to 8 patches at a time**. Another important point is that the COMBINATION mode is only a "work area," where you can "work" on one "combined" (multi-patch) sound at a time.

MULTI CHANNEL MODE

The **MULTI CHANNEL** mode is basically a performance mode, which makes advanced use of MIDI — the Musical Instrument Digital Interface.

The VZ is capable of receiving MIDI performance messages two basic ways; (1) with 8-note polyphony wherein all notes and performance data transferred uses the same MIDI channel (MIDI mode 3 — omni OFF/poly), and (2) with 8-note polyphony, wherein each of the MIDI Multi Channel Areas (1 ~ 8) is assigned an individual timbre. In this status, each of the 8 areas is monophonic.

Each AREA can be assigned an independent sound, a polyphonic value (maximum number of note which may sound at one time for the specified area), output level, and the MIDI Receive channel number.



OPERATION MEMORY MODE

Once you've created a sound you want to save — whether it's an individual patch in the NORMAL mode, a combined sound in the COMBI mode or a MIDI setting in the MULTI CH mode — you can write it to one of 64 built-in Operation Memories.

The **OPERATION MEMORY** mode is used to memorize and recall not only the individual patches and combined sounds created in the first two modes and MIDI settings in the MULTI CH mode, it also holds sound-related details of effect and control panel settings. This is where you “store” the multi-patch setups and patches you've created, for instant recall during performance.

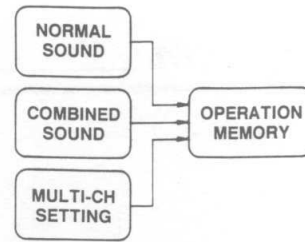
This mode is actually used in concurrence with the NORMAL and COMBINATION and MULT CH modes, as it stores and recalls data which have been created in them.

The OPERATION MEMORY mode can be further broken down into **sub-modes** - the **PLAY** sub-mode and **MENU** sub-modes. The PLAY mode is selected for normal performance, while the MENU modes are selected for further editing of sound and effect data in the selected operation memory.

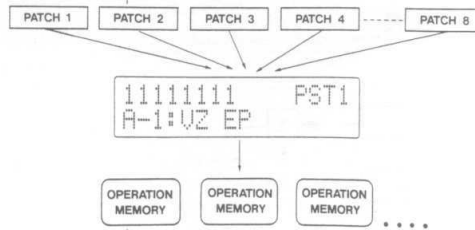
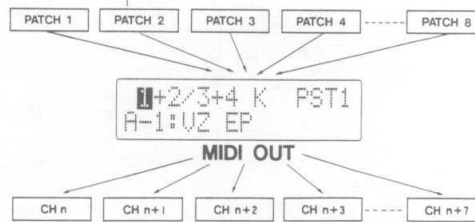
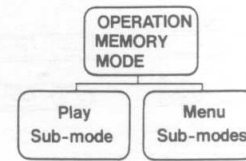
Now that you understand the basic theory of VZ operations, the “BIG” picture becomes clearer;

- 1 — Write, edit and recall individual patches using the **NORMAL** mode.
- 2 — “Combine” patches to make multi-timbral setups (combined sounds) in the **COMBINATION** mode.
- 3 — Create up to 8 MIDI “Multi Areas” in the **MULTI CHANNEL** mode.

- 4 — Write patches, combined sounds and multi-channel MIDI settings to any of 64 operation memories and recall them for performance in the **OPERATION MEMORY** mode.



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OPMEM K PST1
A-1:SEE GOD
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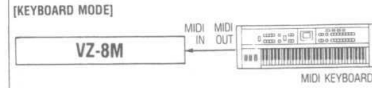
The MIDI "Performance Modes" are actually preset parameter setups, programmed for each sound individually, which can be selected to "match" the selected sound with the type of MIDI controller you are using. For example, if you're using a MIDI keyboard, you'll want to select the "K" or keyboard performance mode. In addition to "K", there are "G" (Guitar) and "W" (Wind) MIDI performance modes.

Keyboard Performance Mode — In the "K" or "Keyboard" performance mode, patches and multi-patch sounds are setup for MIDI polyphonic performance, matched to the performance capabilities and characteristics of MIDI keyboards.

Guitar Performance Mode — In the "G" or "Guitar" performance mode, patches and multi-patch sounds are setup for MIDI monophonic performance, matched to the performance capabilities and characteristics of MIDI Guitars, including Casio PG and MG series guitars. As each guitar string is assigned an individual MIDI channel, MIDI bend messages are received entirely independently for each string. In addition, string release sounds are more natural than with poly performance.

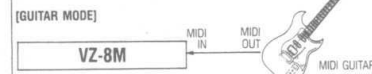
NOTE: When in "G" performance mode, the transmitting guitar should be set for MONO performance, allowing independent transmission of bend data for each string.

Wind Performance Mode — In the "W" or "Wind" performance mode, MIDI aftertouch data is automatically adapted to match the performance capabilities and characteristics of MIDI wind controllers. In both the "K" and "G" modes, MIDI data changes as shown in FIG-A. In the "W" mode, however, this same data changes as shown in FIG-B. This shows how the SENS parameter affects aftertouch characteristics when set between values of "0" and "91". The changes in these characteristics between values of "92" and "99" make it easier to perform using a wind controller, reproducing the delicate dynamic changes which are possible with wind instruments.



NORMAL K PST1
A-1:VZ EP

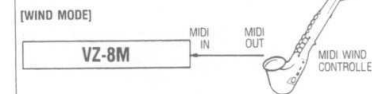
1+2/3+4 K PST1
A-1:VZ EP



1ch — 1st string
2ch — 2nd string
3ch — 3rd string
4ch — 4th string
5ch — 5th string
6ch — 6th string

NORMAL G PST1
A-1:VZ EP

1+2/3+4 G PST1
A-1:VZ EP



NORMAL W PST1
A-1:VZ EP

1+2/3+4 W PST1
A-1:VZ EP

FIG-A
<NORMAL AFTER TOUCH>

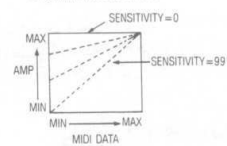
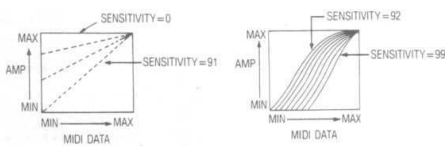


FIG-B

<WIND MODE AFTER TOUCH>



NOTE: When in "W" performance mode, the transmitting wind controller should be set so that after touch data can be used to affect volume.

Theory: iPD Modular Sound System

At the heart of the VZ's amazing sound synthesis capabilities is an all-new "iPD" (interactive Phase Distortion) sound source. In order to get the most out of your unit, it is vitally important that you understand at least the basic theory behind this new sound source.

MODULES

The iPD sound source system actually consists of 8 independent **modules** (M1 to M8).

Each module contains a DCO and a DCA, and is capable of generating independent waveforms. (1) If you're familiar with analog synthesis, you can think of the modules as oscillators with controls. In the iPD system, the wave generated by any module can be used in either of two ways;

- 1 — to produce audible sounds
- 2 — to modify waves generated by other modules

LINES

Generally speaking, the 8 sound source modules work in associated pairs that are called "**Internal Lines**," or simply "**lines**." There are 4 internal lines — A, B, C and D, as shown to the right. (2)

The waveforms generated by both modules in any line can be used together in three different ways. The waveforms can be mixed, or one of the waveforms can be used to modulate the other for RING modulation or PHASE, as diagrammed at the right. (3)

To show how the modules in each line are interrelated, let's analyze the relationship between the two modules which make up LINE A.

LINE A consists of two different modules — M1 and M2. While these modules are entirely independent and generate totally independent waveforms, they can be utilized together in any of three different output formats — **MIX** (mixed output), **RING** (ring modulation) and **PHASE** (phase).

MIXED WAVEFORM OUTPUT

When MIX is selected, the waveforms generated by M1 and M2 are output together, according to the formula given below. (4)

$$\text{MIX: } M1 + M2$$

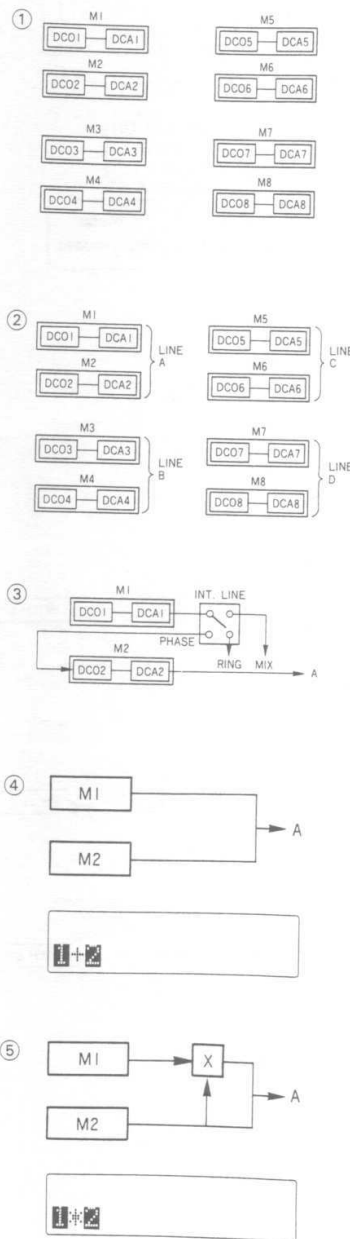
This may look a bit complex at first, but it's really not. It may be easiest to think of M1 and M2 as individual oscillators (which they are). In the MIX format, both of these oscillators sound together.

RING MODULATION

These same two waveforms can also be output using RING MODULATION, which is created according to the formula shown below. (5)

$$\text{RING MOD: } M2 + M2 \times M1$$

You've probably heard ring modulation — even if you don't recognize the term. Typically, it creates a "clangorous" or metallic sound and is often used in synthesizing gongs, bells and other ringing percussive sounds.



PHASE

The 2 waveforms in LINE A (M1 and M2) can also be output using PHASE, according to the formula shown below. (⑥)

PHASE: M2(M1)

In this format, only one oscillator is heard, as one oscillator is used to modulate the other. In this case, M2 is produced using M1 as the phase to "read" the M2 waveform.

The degree of RING and PHASE effect is dependent on the amplifier (DCA) envelope of related modules. (In addition, to amp envelope, the degree of changes in sound (waveform) are affected by amp envelope-related parameters such as key Follow, Velocity, etc.) (⑦)

Naturally, these same functions and formulas apply to all 4 internal lines — LINE A, LINE B, LINE C and LINE D. And they can be used to modify the other Internal Lines through **External Phase** processing.

External Phase

When the External Phase format is selected, the line output of the two modules (M1 and M2 in our example) is used as the phase of the second module in the succeeding internal line — M4 in LINE B, in our example. (⑧)

Now that you have a basic grasp of how the system is organized, you can start to imagine just how versatile the VZ actually is. Because of the relationships between the sound source modules, you can create patches which contain independent sounds from each module, or use modules to modulate other modules. Theoretically, you can actually use modules 1 through 7 to modulate module 8, so that the only sound you actually hear is output through module 8!

To illustrate this more closely, take a look at the following examples.

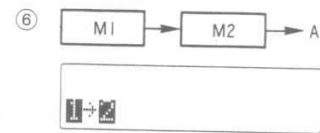
(EXAMPLE 1)

In this state the internal line of both LINEs A and B are set to MIX — i.e. the waveforms of both modules in each line are output "mixed" together, as shown on the display. (⑨) (⑩)

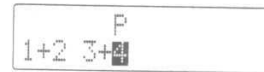
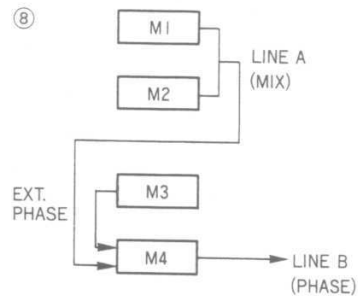
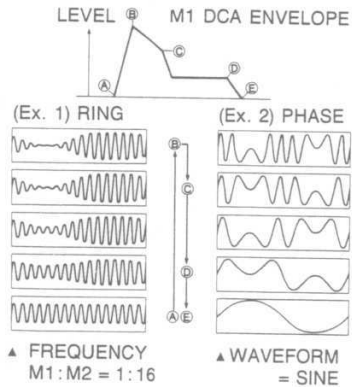
Before actually experimenting with the modular sound system, be sure to read through "Operating System Controls," the "Function Index Practice Exercise" and the "VOICE-00" function index. Note also that the illustration at the right is designed to help you understand the theory of the modular sound system, shows only M1 through M4. In actuality, it is possible to view M5 ~ M8 simultaneously with M1 ~ M4.

If, in this state, EXTERNAL PHASE from LINE A is specified, the display changes to that shown on the right, and the resulting waveform can be output from LINE A. (⑪)

Remember that LINEs which are used as external phase do not sound — they simply become the phase of the succeeding line. In our example, LINE A does not sound, but becomes the phase of LINE B. Notice that the modules which are producing audible sounds appear highlighted on the display.

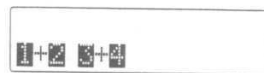


⑦ Diagram of relationship between DCA ENVELOPE and timbre.



⑨ 00 LINE M1M2
INT LINE=MIX

⑩ 00 LINE M3M4
INT LINE=MIX



⑪ 1+2 3+4
P

(EXAMPLE 2)

In this state, the internal line of LINE A is set to MIX, while LINE B is set to PHASE — i.e. M3 becomes the phase of M4. (12)

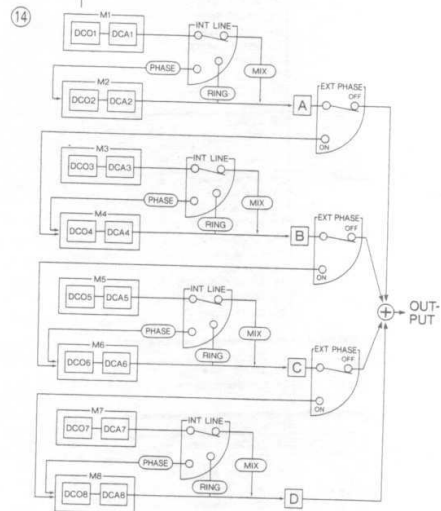
If, in this state, EXTERNAL PHASE from LINE A is specified, the display changes to that shown on the right, and the resulting waveform can be output through LINE B. Once again, LINE A does not sound, but is used only as the phase of LINE B. (13)

With only one oscillator you can produce only one sound. But with 8 independent oscillators, you can create patches with varying degrees of complexity — using the oscillators together to create a “fat” layered patch consisting of sounds from all 8 modulators, or to create an individual sound output from a single oscillator with a “chain” of modulation stretching from M8 all the way back to M1. (14)

00 LINE M3M4
INT LINE=PHASE

1+2 3+4

1+2 3+4 P



The VZ lets you use all 8 modules entirely independently — using combinations of MIX, RING and PHASE output from each LINE to create a complex sonic matrix which is called a “patch”. Once again, remember that a “patch” is simply the completed tone data coming from modules 1 through 8. Or, in simpler terms, an individual “sound” being output from the unit.

The number of possible combinations used to create a patch boggles the mind, when you consider the versatility of the control parameters which are used to shape the waveform being output from each module. (15)

⑮

MODULE	EXT PHASE	INT LINE	LINE A~D
M1 M2	/	MIX	$A = M1 + M2$
		RING	$A = M2 + M1 \times M2$
		PHASE	$A = M2 (M1)$
M3 M4	OFF	MIX	$B = M3 + M4$
		RING	$B = M4 + M3 \times M4$
		PHASE	$B = M4 (M3)$
	ON	MIX	$B = M3 + M4 (A)$
		RING	$B = M4 (A) + M3 \times M4 (A)$
		PHASE	$B = M4 (M3 + A)$
M5 M6	OFF	MIX	$C = M5 + M6$
		RING	$C = M6 + M5 \times M6$
		PHASE	$C = M6 (M5)$
	ON	MIX	$C = M5 + M6 (B)$
		RING	$C = M6 (B) + M5 \times M6 (B)$
		PHASE	$C = M6 (M5 + B)$
M7 M8	OFF	MIX	$D = M7 + M8$
		RING	$D = M8 + M7 \times M8$
		PHASE	$D = M8 (M7)$
	ON	MIX	$D = M7 + M8 (C)$
		RING	$D = M8 (C) + M7 \times M8 (C)$
		PHASE	$D = M8 (M7 + C)$

Operating System Controls

In some ways, your VZ is very similar to a computer, as it is capable of storing and generating a large amount of digital sound data. This "data processing" is maintained by the "Operating System," which you can think of as a collection of system programs that control the overall operation of the unit.

The main interface with the operating system can be found in the menu **functions**. These functions contain a number of **parameters**, which determine the various characteristics of the sounds. In fact, sound synthesis on the unit basically consists of inputting **values** for these parameters.

With a computer, you generally execute a certain program, and use a **cursor** to move to different positions in the displayed page, and use the keyboard to input commands, values, text, etc. (this is, of course a simplified explanation.)

Your unit works much in the same way, and it features a number of basic "Operating System Controls" which are used to perform the same functions a computer keyboard or mouse would perform.

Look at the MENUs shown to the right; this list gives you a bird's-eye view of how the MENUs, and FUNCTIONS within the menus, are organized. Notice that these menus are divided into sections, with the relative basic MODEs listed on the left, and the various FUNCTIONS on the right. The MODE side shows in which modes the various functions are operative.

To work in the operating system, you first choose what **MODE** you want to work in, by pressing one of the **MODE** keys.

After you've selected the mode, you must specify what **MENU** you want to enter, by pressing **EDIT** key or **TOTAL CONTROL** key.

Now that you've specified the **MODE** and **MENU**, choose the actual **FUNCTION** containing the parameters you want to access by using the **PAGE** keys. You can scroll continuously through the functions in any selected menu with these keys. To scroll up (increment numbers), press the **PAGE [▲]** key. To scroll down (decrement numbers), press the **PAGE [▼]** key.

VOICE PARAMETER		
NORMAL	DCO	00 LINE
		01 WAVE FORM
		02 DETUNE
		03 ENVELOPE
		04 ENV DEPTH
		05 KF LEVEL
		06 VEL LEVEL
		07 VIBRATO
DCA		08 OCTAVE
		09 ENVELOPE
		10 ENV DEPTH
		11 KF LEVEL
		12 VEL LEVEL
		13 TREMOLO
		14 AMP SENS
		15 TOTAL LEVEL
DCO/ DCA		16 KF RATE
		17 VEL RATE SENS
		18 PITCH VEL RATE
		19 AMP VEL RATE
		20 VOICE NAME
		21 INIT VOICE

EFFECT	
NORMAL	00 MIDI CHANNEL
	01 PORTAMENTO/SOLO
	02 PITCH BEND
	03 AFTER TOUCH
	04 MOD WHEEL
	05 DEF CONTROL
	06 FOOT VR
	07 FOOT SW
	08 VEL TABLE SELECT
COMBI- NATION	09 PAN
	10 LEVEL
MULTI CHANNEL	11 PITCH
COMBI- NATION	12 SPLIT POINT
	13 VEL SPLIT
	14 VEL INVERSE
	15 POS CROSSFADE
	16 DELAY TRIG
	17 TOTAL VIBRATO
	18 VIBRATO INV
	19 TOTAL TREMOLO
	20 TREMOLO INV
	21 COMBI COPY

EFFECT	
OPERATION MEMORY	00 OPMEM NAME
	01 OPMEM TUNE

TOTAL CONTROL	
OPERATION MEMORY	00 MASTER TUNE
	01 TRANSPOSE
	02 MEMORY PROTECT
	03 SAVE/LOAD
	04 MIDI CHANNEL
	05 MIDI DATA
MULTI CHANNEL	06 CARD FORMAT

OPERATION MEMORY	NORMAL	COMBI- NATION	MULTI CHANNEL	COMPARE/ RECALL
■	☀	■	■	■
■	■	☀	■	■

WRITE COPY/INIT TOTAL CONTROL EDIT BANK M ON/OFF SHIFT

▲	<	△
		YES/SUS
▼	>	▽
		NO/END

PAGE CURSOR VALUE

With some functions, you'll notice a module indicator (for example, "M2") at the top right-hand corner of the display. These indicators appear only when the selected function features a parameter which can be set for each sound source module individually. To select the module you want to edit, simply press the corresponding PROGRAM key (A1 ~ H8).

To alter the various PARAMETERS contained in any function, you use the CURSOR keys. These keys let you move up or down, and right or left in the lower section of the menu.

Once you've moved to a parameter which you want to set or edit with the cursor, you can use the VALUE keys to input values.

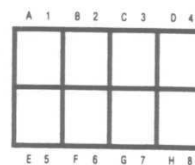
You can increment or decrement the value one step at a time by pressing the value keys. If you hold a value key down, the values increment or decrement automatically at high speed. When the lowest or highest value is reached, scrolling stops automatically.

(Note that this works with the "function" list in each of the three menus, as well, however scrolling continues in an endless loop as long as the key is held down.)

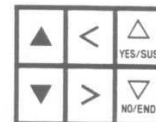
When you want to exit from any function, menu or mode, you can simply press any of the MODE keys, the EDIT key, or the TOTAL CONTROL key.

Notice that when you reselect a particular MENU, the function you last selected in that MENU is recalled. (Function "00" always selected in Operation Effect mode, however.)

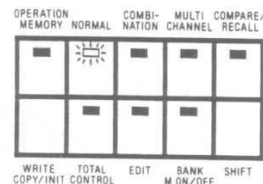
Difficult? Not at all! If it's not entirely clear, try going through the "Function Index Practice Exercise". This will familiarize you with the "Operating System Controls" — the VZ controls which are used to "communicate" with your VZ's operating system.



CURSOR



PAGE CURSOR VALUE



Menus and Functions

Within each Menu you will find a number of "Functions." Each of these functions is further broken down into "parameters," which are constants that have changeable values or settings.

For example, in VOICE menu, you can select from a variety of functions which affect the characteristics of the sound produced by each individual module (oscillator). To alter the characteristics of the sound, you simply alter the values of the various parameters contained in each VOICE menu function.

When the EFFECT menu is chosen, you can select from a variety of functions which control built-in "sound effects". These can be used in the NORMAL, COMBI, and MULTI CH modes. In addition, 2 functions from the OPE EFFECT menu are used to make settings for Operation Memories in the OPERATION MEMORY mode.

When the TOTAL CONTROL menu is chosen, you can select from functions which provide "overall" control over the VZ-8M's performance. They include such parameters as tuning, MIDI settings, etc.

Take a look at the MENUS, this "menu hierarchy" gives you a clear view of how MENUS and FUNCTIONS are organized.

VOICE (PARAMETER) menu — **SOUND EDITING FUNCTIONS**
EFFECT menu — **EFFECT-RELATED FUNCTIONS**
TOTAL CONTROL menu — **TOTAL CONTROL FUNCTIONS**

It's important to remember that not all FUNCTIONS can be accessed in every MODE — notice that the menus are divided into sections, with the relative MODEs listed on the left. Remember that when you choose a particular function, the related operational mode must first be specified. You'll also notice that each FUNCTION INDEX lists the operational modes in which the function operates.

VOICE PARAMETER		
NORMAL	DCO	00 LINE
		01 WAVE FORM
		02 DETUNE
		03 ENVELOPE
		04 ENV DEPTH
		05 KF LEVEL
		06 VEL LEVEL
		07 VIBRATO
	08 OCTAVE	
DCA		09 ENVELOPE
		10 ENV DEPTH
		11 KF LEVEL
		12 VEL LEVEL
		13 TREMOLO
		14 AMP SENS
		15 TOTAL LEVEL
DCO/ DCA		16 KF RATE
		17 VEL RATE SENS
		18 PITCH VEL RATE
		19 AMP VEL RATE
		20 VOICE NAME
		21 INIT VOICE

EFFECT		
NORMAL COMBI- NATION MULTI CHANNEL		00 MIDI CHANNEL
		01 PORTAMENTO/SOLO
		02 PITCH BEND
		03 AFTER TOUCH
		04 MOD WHEEL
		05 DEF CONTROL
		06 FOOT VR
		07 FOOT SW
		08 VEL TABLE SELECT
COMBI- NATION MULTI CHANNEL		09 PAN
		10 LEVEL
COMBI- NATION		11 PITCH
		12 SPLIT POINT
		13 VEL SPLIT
		14 VEL INVERSE
		15 POS CROSSFADE
		16 DELAY TRIG
		17 TOTAL VIBRATO
		18 VIBRATO INV
		19 TOTAL TREMOLO
		20 TREMOLO INV
		21 COMBI COPY

EFFECT		
OPERATION MEMORY		00 OPMEM NAME
		01 OPMEM TUNE

TOTAL CONTROL		
OPERATION MEMORY		00 MASTER TUNE
		01 TRANSPOSE
NORMAL COMBI- NATION MULTI CHANNEL		02 MEMORY PROTECT
		03 SAVE/LOAD
		04 MIDI CHANNEL
		05 MIDI DATA
	06 CARD FORMAT	

Function Index Practice Exercise

About the Function Index Practice Exercise

The following is an example of how you can use the Function Indexes as a guide to actual editing operations. Be sure to go through this exercise carefully, executing the operations as you go. This will not only provide you with an understanding of how you can utilize the indexes, but also a basic understanding of the editing operations.

Practice Exercise: Using Function Indexes

How to use Function Indexes when editing the VELOCITY RATE-related parameters in the VOICE PARAMETER menu.

For this example, let's assume that you want to "edit" the VELOCITY RATE for the DCA envelope. Looking at the menu table, you'll find the VEL RATE SENS function listed as function 17 on the VOICE PARAMETER menu. Notice that this function affects both DCO and DCA envelopes, as shown in the second column.

The Function Indexes are arranged in three main sections in this manual, corresponding to the three editing MENUS. You'll notice a black "tab" at the edge of the page (item ⑨ on opposite page) which lists which "menu" the function can be accessed in.

The related MODEs are listed at the bottom edge of the function index page (item ⑧ on opposite page). In this case, VOICE-17 (VOICE PARAMETER menu, function #17) can only be used when the NORMAL operating mode is selected (when the NORMAL key LED is lit). Since the goal of our practice exercise is to edit the RATE-related parameters for the DCA envelope, you'll want to choose a patch to edit which is audibly "dependent" on these settings. This will make it easier to actually hear how changes in the various parameters will influence the sound.

Try choosing PRESET (1) patch number G-5 — "VZ TOUCH."

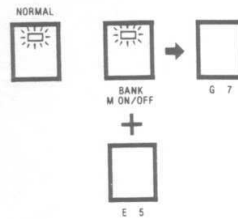
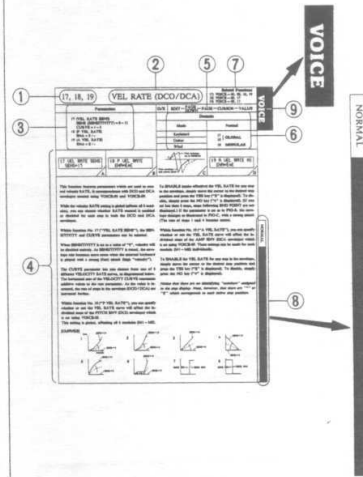
- To do this first select the PRESET (1) area by pressing the SHIFT key.
- Next, press the BANK key followed by the "G" program key (labelled "G7"), and then the "5" key (labelled E5).

Now, play some notes with varying degrees of key velocity, and take note of how velocity affects this sound. Once you've got it down, go on to procedure 1 listed below.

- 1 For this example, we'll work in the NORMAL mode, so first press the NORMAL key.

Take a look at item ⑤ on the function index. This lists the Operating System controls that are used in editing the parameters contained in this function. You'll find this handy when working in any function. (Be sure to refer to this list as you work through this exercise as well.)

VOICE PARAMETER		
NORMAL	DCO	00 LINE
		01 WAVE FORM
		02 DETUNE
		03 ENVELOPE
		04 ENV DEPTH
		05 KF LEVEL
		06 VEL LEVEL
		07 VIBRATO
	08 OCTAVE	
DCA		09 ENVELOPE
		10 ENV DEPTH
		11 KF LEVEL
		12 VEL LEVEL
		13 TREMOLO
		14 AMP SENS
		15 TOTAL LEVEL
DCO/ DCA		16 KF RATE
		17 VEL RATE SENS
		18 PITCH VEL RATE
		19 AMP VEL RATE
		20 VOICE NAME
		21 INIT VOICE



NORMAL K PST1
G-5: VZ TOUCH

⑤
O/S EDIT PAGE DOWN PAGE CURSOR VALUE

2 Next, specify that you want to work in the VOICE menu sub-mode by pressing the EDIT key and the pressing PAGE DOWN key.

If you've previously worked in the VOICE menu sub-mode, the function you selected last will automatically be recalled at this point. For our example, let's assume you last worked in VOICE-00 (LINE).

In this state, you can select function number with the PAGE keys.

Now take a look at item ⑥ in the VELOCITY RATE SENS Function Index. You'll notice that the "Domain" is listed as being "Global." This means that settings made in this function affect all sounds (as opposed to affecting only a single module, single line, etc.).

Many functions feature a "modular" domain. In these cases, a MODULE number will appear at the right of the display. This indicates the module that is presently selected ("M1" for example) — and any settings that are made will affect only this module. You can select a different module by pressing any PROG NO key.

3 Use the PAGE keys to select VOICE-17 (VEL RATE SENS).

Look at item ③ in the index. Here are listed all the parameters contained in each function, as well as related information such as the range in which values can be set. You'll find this comes in handy in VZ-8M editing, as you can look up individual parameters easily without actually accessing a function (Note that VOICE menu functions 17 through 19 are all listed on the same index.)

4 Try changing the SENSITIVITY parameter value by using the VALUE keys. As shown in the Function Index, this parameter can be set between "0" and "31." Set it to a value of about "22."

When SENSITIVITY is set to a value of "0", velocity will be disabled entirely. As SENSITIVITY is raised, the envelope rate becomes more acute when the controller is played with a strong (fast) attack (high "velocity").

The CURVE parameter lets you choose from one of 8 different VELOCITY RATE curves, as shown on the function index.

Try changing the CURVE parameter value by using the cursor key and the VALUE keys. Set it at a value of "4".

5 Press the PAGE [▲] key once again, and select VOICE-18 (P VEL RATE).

Using the next function (VOICE-18, listed on the same index), you can specify whether or not the VEL RATE curve will affect the individual steps of the PITCH ENV (DCO envelope). This setting is global, affecting all 8 modules (M1 ~ M8). Note that the PITCH envelope is set using VOICE-03.

```
EFFECT+PAGE UP
VOICE +PAGE DOWN
```

```
00 LINE      M1M2
INT LINE=PHASE
```

⑥

Domain	
Mode	Normal
Keyboard	17 } GLOBAL 18 } 19 MODULAR
Guitar	
Wind	

```
M1
```

```
17 VEL RATE SENS
SENS= 0
```

③

Parameters
17 (VEL RATE SENS) SENS (SENSITIVITY)=0-31
CURVE = 1-8
18 (P VEL RATE) ENA = E/*
19 (A VEL RATE) ENA = E/*

```
17 VEL RATE SENS
SENS=22
```

```
17 VEL RATE SENS
CURVE=1
```

```
17 VEL RATE SENS
CURVE=4
```

```
18 P VEL RATE
ENA=*****
```

To ENABLE (make effective) the VEL RATE settings for any particular step in the DCO envelope, simply move the cursor to the desired step position and press the YES key.

Step numbers 1 through 8 are displayed from left to right.

To DISABLE the settings, simply press the NO key. For our example, however, skip this function (VOICE-18) and go to VOICE-19 (remember, our goal is to alter only DCA-related settings...).

Using VOICE-19 "AMP ENVELOPE" function, you can specify whether or not the VEL RATE curve will affect the individual steps of the AMP ENV (DCA envelope) which is set using VOICE-09. Note that here, however, only 2 steps have been set, so only 2 are displayed.

Notice that these settings can be made for each module (M1 - M8) individually, as indicated by the module number which appears at the upper right-hand corner of the display.

You can select any module with the PROG NO keys.

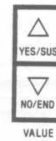
For our example, try selecting MODULE 8 by pressing the corresponding PROG NO key. To turn OFF all other modules, press the M ON/OFF key (BANK key) followed by the PROG NO keys A1 through G7, leaving only H8 on. In this way, you can focus on the DCA envelope for this individual module while editing, as others will not affect the sound.

6 To ENABLE the VEL RATE for any step in the DCA envelope of the selected module (M8), turn OFF the M ON/OFF key and simply move the cursor to the desired step position and press the YES key. To disable, simply press the NO key.

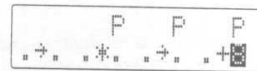
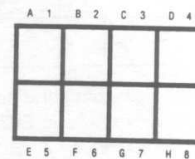
For our example, try enabling the VEL RATE for all 4 active steps in the envelope. Notice that there are no identifying "numbers" assigned to the step display. Note, however, that there are asterisks ("*") which correspond to each active step position (4, in this case). When a step is enabled, an "E" replaces the asterisk.

Now, play a few notes and chords again. Notice how the changes in the RATE curve and sensitivity have affected the sound.

Next, take a look at item ⑦ in the function index. This section lists the functions which are closely related to the VELOCITY RATE function. In this case, both the DCO ENVELOPE (VOICE-03) and DCA ENVELOPE (VOICE-09) are listed. Naturally, the settings of these envelope functions will affect the VELOCITY RATE function, and vice-versa.



19 A VEL RATE M1
ENA=**



19 A VEL RATE M8
ENA=EEEE

⑦

Related Functions
17: VOICE—03, 09, 18, 19
18: VOICE—03, 17
19: VOICE—09, 17

7 Next, to turn ON all 8 modules, press the M ON/OFF key followed by the PROG NO keys and ENABLE the curve and sensitivity for all steps in each module's AMP envelope.

Again, play a few notes and chords and observe the changes in the overall sound.

If you want to hear the "original sound" (the sound as it was before you edited), press the COMPARE/RECALL key. When the indicator is flashing, the original sound can be played. Press it once again to return to the edited version.

8 Since the domain of the settings made using these parameters is "modular" (settings made for each module independently), you may want to have a look at how the iPD modules are organized for this particular sound. This modular LINE configuration has a direct impact on the selected patch's sound, and you may often want to look at the line configuration when making editing decisions.

To access the LINE configuration when making modular parameter settings, simply press the M ON/OFF (BANK) key.

Depending on how the INTERNAL LINE and EXTERNAL LINE settings are made in using the iPD sound source LINE function (VOICE-00), various symbols appear on the display. For example, "→" indicates PHASE, "*" indicates RING, "+" indicates MIX and "P" indicates EXT PHASE. The numbers corresponding to the modules which actually sound appear highlighted on the display. (For details, refer to "Theory: iPD Modular Sound System" in this manual.)

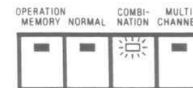
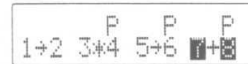
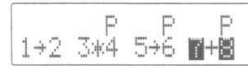
9 For this example, assume that you've now finished editing and you want to move immediately to performance in the OPERATION MEMORY mode. To do so, simply press the OPERATION MEMORY key.

To exit to another mode, simply press the MODE key.

10 Now assume that you want to go back and edit this same function again (for some reason). To do so, simply press the NORMAL key followed by the EDIT key and PAGE DOWN key.

The last-selected FUNCTION in each menu (with the execution of the 2 functions in the OPE EFFECT menu) is held in memory and instantly recalled. Note that function VOICE-19 (VEL RATE AMP) is recalled as soon as you press the EDIT key followed by the PAGE [▼] key.

Although this example only covers a single function, the basic operations are the same for all functions. If you have any difficulties when working in another function, be sure to refer back to this example.



Function Index

VOICE

00

LINE

Related Functions

Parameters		O/S	EDIT — PAGE DOWN	PAGE — CURSOR — VALUE
INT LINE = MIX / RING / PHASE EXT PHASE = ON / OFF (for M3 ~ M8)		Domain		
		Mode		Normal
		Keyboard		LINE
		Guitar		
Wind				
A	B	C	D	

NORMAL

Use this function to specify the line configuration for all four Internal Lines, as well as External Phase relationships. The INT LINE parameter lets you choose from MIX, RING, or PHASE settings, which determines how the waveforms produced by each module are output. Note that a diagram on the display shows the internal line configuration in modular form (FIG-A).

When you want to view another line, press a PROG NO key (C3 ~ H8) of either module in the particular line you want to view (for example, to view the next line, press either the M3 or M4 selector).

In addition, this function features a "toggle" which lets you turn the EXTERNAL PHASE function ON or OFF for modules M3-M8. You can access this function by pressing the cursor key.

When EXTERNAL PHASE is ON, the second module in the specified LINE is modulated by the previous LINE (FIG-C).

To view the overall line configuration, press the M ON/OFF (BANK) key. As shown in FIG-D, LINES used as EXT PHASE as designated by a "P" symbol on the display. For example, notice that M1M2 is used as the EXT PHASE of line M3M4. Also, note that "+" indicates MIX, "*" indicates RING modulation, and "→" indicates PHASE.

The modules which are actually producing audible sounds are highlighted on the display.

(For more information on the modular sound source system, refer to "Theory: iPD Modular Sound System".)

Note that when this function is initialized, data for all 8 modules are reset to factory settings (mixed internal line).