CASIO DIGITAL SYNTHESIZER

OPERATION MANUAL ·········· 1
MANUAL DE OPERACION ··· 117

VZ-8M

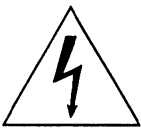|				
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| 1+2/3
A-1:VZ |
| 00 LIN
INT |

CASIO VZ-8M MEM K PST1 A-S:MELLOW PAD

| 13 VE
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+2/+4 ON	19 A VEL RATE M1 ENA=***	09 PAN PANPOT2=+15	21 COMBI COPY COPY 1→ (YES)	20 TREM INVERSE CHECK KEYASSIGN!
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| 01 TRA |
| 1+2/3
A-1:VZ |
| OPMEM
A-1:SE |
| 1+2 3+ |
| NORMAL
G-5:VZ |
| 1+2 3+ |
| EFFECT
VOICE |

CASIO.

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.

CONTENTS

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.

About this Manual

While you may not realize it quite yet, this unit is an incredibly complex digital synthesizer that has a lot more in common with a personal computer than it does an "electronic" musical instrument. This manual is intended only as a reference to provide instructions on the most basic operations.

When you take the unit out of its box for the first time, you'll probably want to connect it to an external keyboard, guitar or wind controller equipped with MIDI and plug it in immediately to see how it sounds.

Once you're ready to begin studying the true power of this synth module, you'll need to have a basic knowledge of its iPD modular sound source system. Read "Theory: iPD Modular Sound System" thoroughly — if you're not familiar with basic sound synthesis terms and theory, be sure to study the "VZ Sound Seminar" as well.

Next, you should familiarize yourself with the operating system controls. Read through the "Operating System Controls" for an introduction to these controls.

When you're ready to start using the advanced editing and sound data storage capabilities, you'll need to learn how to use the "FUNCTION INDEXES". **Be sure** to work through the "Function Index Practice Exercise" as well. These will give you a fairly solid understanding of basic synthesis operations.

The FUNCTION INDEXES will be an invaluable aid in all editing operations. For this reason, be sure to keep this manual handy whenever editing sounds.

Most importantly, remember that this manual is meant as a reference only — you'll only be able to realize the true power of this unit as you apply it to your own musical performance.

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 — *but interrelated* — 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.

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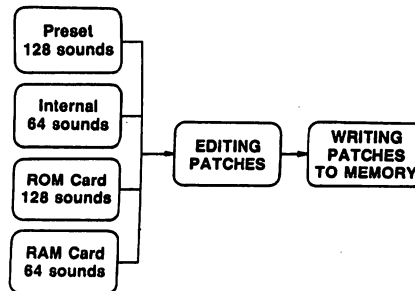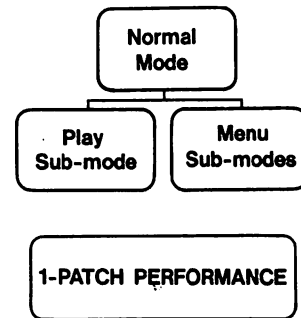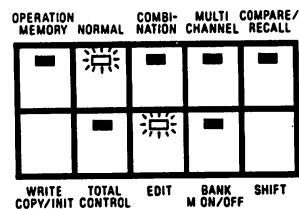
One important thing to remember when you select the NORMAL mode is that you're working with only **1 patch at a time** — you can recall one patch at a time, edit one patch at a time, perform with one patch at a time, and write an individual patch to memory.

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 or 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.
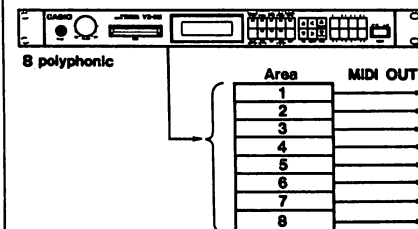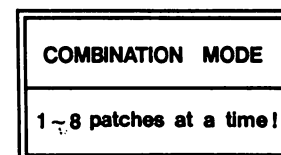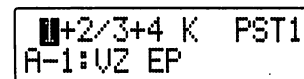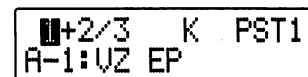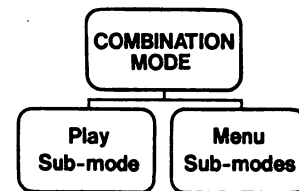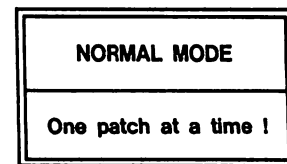
OPERATION MEMORY MODE

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.
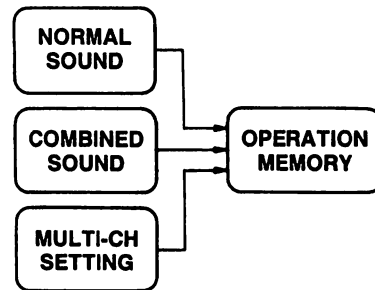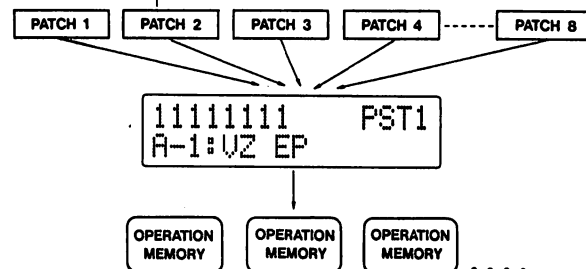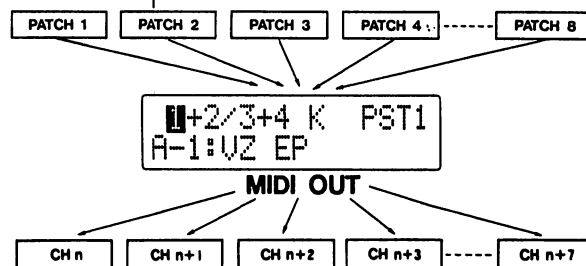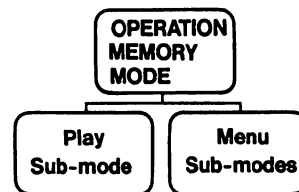
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Keyboard Pe
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of MIDI Guitar:
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Wind Perfor
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the "K" and "(
"W" mode, hc
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NOTE: When
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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.

[KEYBOARD MODE]

```
NORMAL    K   PST1
A-1:VZ EP
```

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

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.

[GUITAR MODE]

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
```

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.

[WIND MODE]

```
NORMAL    W   PST1
A-1:VZ EP
```

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

FIG-A
< NORMAL AFTER TOUCH >
SENSITIVITY=0
SENSITIVITY=99
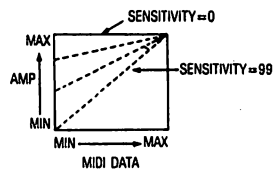
FIG-B
< WIND MODE AFTER TOUCH >
SENSITIVITY=0
SENSITIVITY=91
SENSITIVITY=92
SENSITIVITY=99
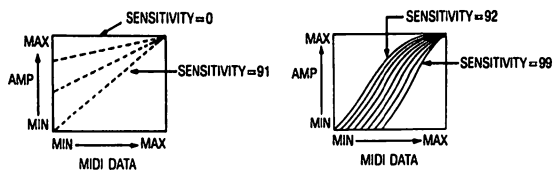
NOTE: When in "W" performance mode, the transmitting wind controller should be set so that after touch data can be used to affect volume.

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)

    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 MODULA-TION, which is created according to the formula shown below. (⑤)

    RING MOD: M2 + M2 × 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.
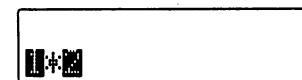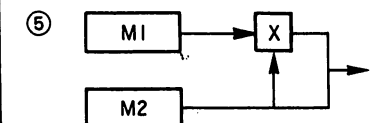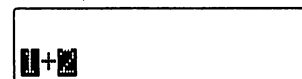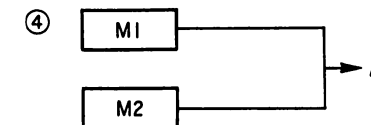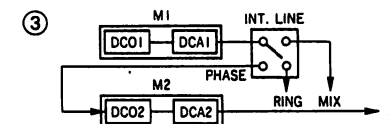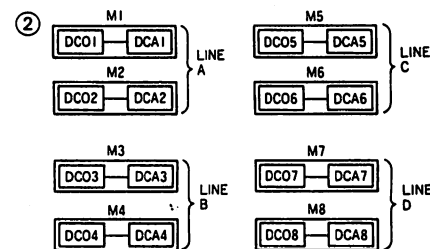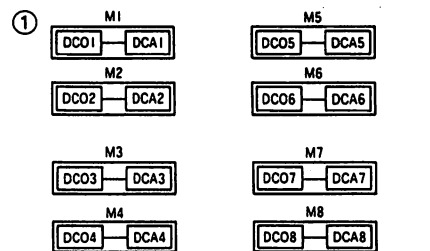
PHASE

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.
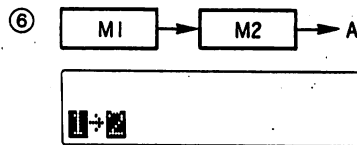
⑦ Diagram of relationship between DCA ENVELOPE and timbre.
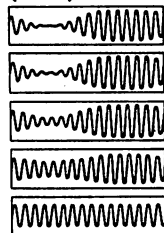
▲ FREQUENCY M1 : M2 = 1 : 16
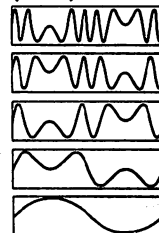
▲ WAVEFORM = SINE
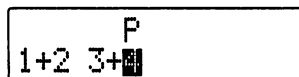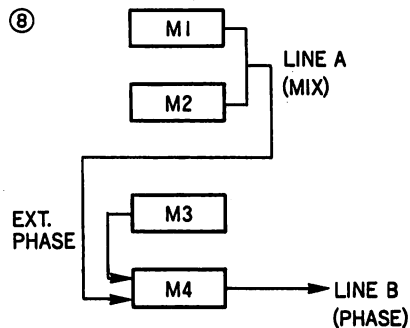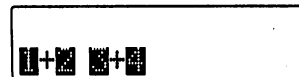
(EXAMPLE 2)
In this state, the internal line of LINE A is set to MIX, while LINE B is set to PHASE — i.e. M3 becomes the phase of M4. (⑫)

⑫
```
00 LINE      M3M4
   INT LINE=PHASE
```

```
█+█ 3→█
```

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)

⑬
```
         P
1+2 3→█
```

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)

⑭
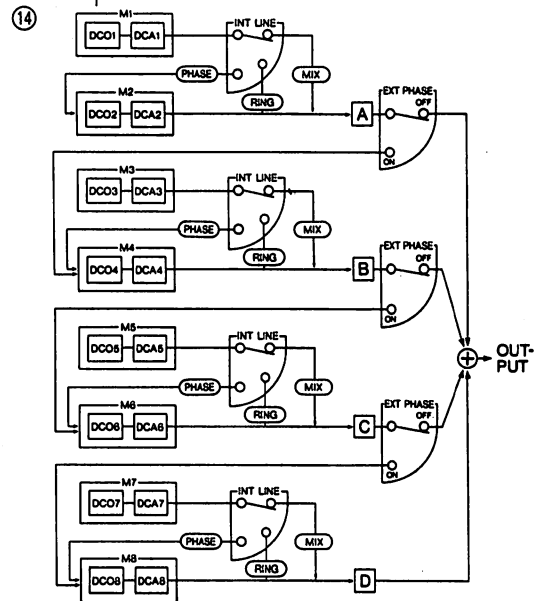
The VZ lets you use all 8 modules entirely independently — using combinations of MIX, RING and PHASE output from each LINE to create a complex sonic matrix which is called a "patch". Once again, remember that a "patch" is simply the completed tone data coming from modules 1 through 8. Or, in simpler 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	$D = M8(M7 + C)$

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.

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 COMBINATION 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
	09	PAN
COMBINATION MULTI CHANNEL	10	LEVEL
	11	PITCH
COMBINATION	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 NORMAL COMBINATION MULTI CHANNEL	00	MASTER TUNE
	01	TRANSPOSE
	02	MEMORY PROTECT
	03	SAVE/LOAD
	04	MIDI CHANNEL
	05	MIDI DATA
	06	CARD FORMAT

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.

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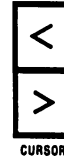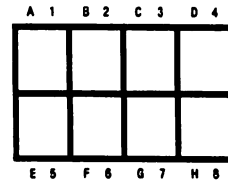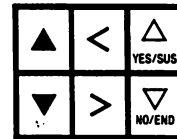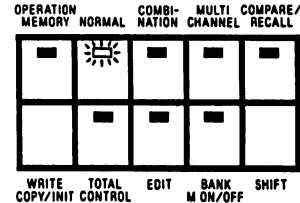
Within each Menu you will find a number of "Functions." Each of these functions is further broken down into "parameters," which are constants that have changeable values or settings.

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 COMBINATION 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
		09 PAN
COMBINATION MULTI CHANNEL		10 LEVEL
		11 PITCH
COMBINATION		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 NORMAL COMBINATION MULTI CHANNEL		00 MASTER TUNE
		01 TRANSPOSE
		02 MEMORY PROTECT
		03 SAVE/LOAD
		04 MIDI CHANNEL
		05 MIDI DATA
		06 CARD FORMAT

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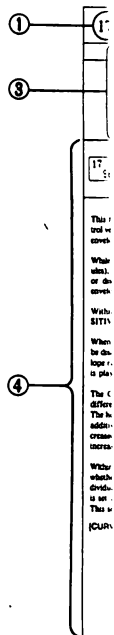
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In the following section, you will find information on each "function" for all three menus. The function "indexes" listed on the following pages contain a variety of important information on the function and its parameters, as shown below;

①Function Number
This number corresponds to the number of the function on the menu table on the preceding page.

②Function Name
This name corresponds to the name of the function as it is listed the menu table on the preceding page.

③Individual parameters and value range
This list shows all the parameters contained in the selected Function, as well as the range of values or settings which can be made for each parameter. For example, the SENSITIVITY parameter in the VELOCITY RATE function can be set at any level between 0 and 31.

④Explanation of function/parameters
This text provides a brief explanation of the purpose of the function, as well as its individual parameters.

⑤O/S (Operating System) control operation
Indicates the basic keys and controls used to select the function and move through the display hierarchy to edit settings for each parameter.

⑥Domain
GLOBAL — In some functions, settings are "Global," which means the settings effect the entire operating system, and all the sounds in it.
Reception in the COMBI mode is limited to KEY ASSIGN 1 data.
Reception in the "G" performance mode is limited to the primary channel set in EFFECT-00.

MODULAR — In some functions, settings can be made for each iPD module individually. In this case, the setting is said to be "modular."
LINE — In other functions, settings are made for each module "LINE" (remember, this is a set of modules — M1M2, for example).
PATCH — In the COMBI mode, some parameters affect each patch independently. In this case, the patch presently being edited is shown highlighted on the display. You can select a patch to edit with the PROG NO keys.
8-PATCH MIX GLOBAL — When an 8-patch mix is used in the COMBI mode, some parameters affect all 8 patches globally.
8-PATCH MIX COUPLE — When an 8-patch mix is used in the COMBI mode, certain parameters affect the patches in "couples". In this case, settings made for patch 1, for example, will also affect patch 5. The couple assignments are; 1↔5, 2↔6, 3↔7, 4↔8. Note that both patches in each "couple" are highlighted on the display when either is selected.
AREA — When parameters are displayed along with the Area number in the MULTI CH mode, the data affects each area independently. You can select an area to edit with the PROG NO keys.

⑦Related Functions
Lists the other editing functions that are closely interrelated with the selected function. In this case, the P VEL RATE (VOICE-18) function is closely related to such functions as VOICE-17 (the VEL RATE SENSITIVITY function), and VOICE-09 (the DCA ENVELOPE function).

⑧Modes
Lists all of the "operational modes" — NORMAL, COMBINATION, etc. — in which the function operates. (See the menu table on the preceding page. The left-hand column of the menu hierarchy shows the MODEs related to the FUNCTIONs on the right.)

⑨Menu
This "tab" at the edge of the page shows which "menu" the function can be accessed in. In this case, "VOICE" indicates that the VELOCITY RATE SENSITIVITY function can be accessed in the VOICE PARAMETER menu.

REMEMBER....
These indexes provide only basic information on each function and parameter. Many of these functions and parameters are interrelated, and it would take literally volumes to provide a technical explanation of how they actually affect the sounds. To gain a practical understanding, be sure to go through the PRACTICE EXERCISE found on the next page.

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 |

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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 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
Guitar	18 } GLOBAL
Wind	19 MODULAR

```
                    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.

```
△ YES/SUS
▽ NO/END
VALUE
```

```
19 A VEL RATE M1
ENA=**
```

```
A 1   B 2   C 3   D 4
┌───┬───┬───┬───┐
│   │   │   │   │
├───┼───┼───┼───┤
│   │   │   │   │
└───┴───┴───┴───┘
E 5   F 6   G 7   H 8
```

```
┌───┐
│   │
└───┘
H 8
```
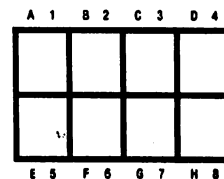
```
      P   P   P
.→.  .*.  .→.  .+▦
```

```
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.

```
        P   P   P
1→2 3*4 5→6 █+█
```

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.

```
19 A VEL RATE M8
   ENA=EEEE
```

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.

BANK
M ON/OFF

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.)

```
        P   P   P
1→2 3*4 5→6 █+█
```

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.

OPERATION
MEMORY

OPERATION MEMORY	NORMAL	COMBI-NATION	MULTI CHANNEL
▬	▬	░	▬

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 another function, be sure to refer back to this example.

NORMAL

EDIT

▼
PAGE

VOICE

NORMAL

00	LINE		Related Functions

Parameters	O/S	EDIT—PAGE DOWN—PAGE—CURSOR—VALUE

	Domain	
INT LINE = MIX / RING / PHASE EXT PHASE = ON / OFF (for M3 ~ M8)	**Mode**	**Normal**
	Keyboard	
	Guitar	LINE
	Wind	

```
00 LINE    M1M2
  INT LINE=RING
```
/A

```
00 LINE    M3M4
  INT LINE=PHASE
```
/B

```
00 LINE    M3M4
  EXT PHASE=ON
```
/C

```
          P
1*2 3→▓ 5→▓ ▓+▓
```
/D

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).

FORM

```
01 WAV
   FORM
```

With this
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8 basic wa
various ty
Note that
dependent

COPY/IN
This func
which all
one modu
ule to a S

Parameters	O/S	EDIT — PAGE DOWN — PAGE — CURSOR — VALUE

FORM = SINE / SAW1 / SAW2 / SAW3 / SAW4 / SAW5 / NOISE1 / NOISE2	Domain	
	Mode	**Normal**
	Keyboard	
	Guitar	MODULAR
	Wind	

```
01 WAVE FORM  M1
  FORM=SINE
```
/A

```
01 WAVE FORM  M2
   FORM=SAW1
```
/B

```
01 COPY→M1-M8 M1
   INIT→ YES
```
/C

With this function, you can choose the basic waveforms which are produced by each module. Waveforms determine the basic timbre — one of the three basic elements of any sound (pitch, timbre and volume). You can choose from 8 basic waveforms. (See information below for details on various types of waveforms.)

Note that waveforms can be selected for each module independently.

COPY/INITIALIZE

This function features COPY and INTIIALIZE functions which allow you to "copy" waveform specifications from one module to another, and to "initialize" the selected module to a SINE wave.

To COPY the waveform of the selected module to another module, first select VOICE-01 and the module containing the waveform you want to copy from. Next, hold down the WRITE key (FIG-C) and then press the PROG NO key corresponding to the module you want to copy into.

To INITIALIZE the selected module, first select VOICE-01 and the module containing the waveform you want to initialize. Next, hold down the WRITE key and then press the YES key. A SINE wave (initialized setting) will be selected for the FORM parameter.

About Waveforms

You can choose from 8 different waveforms.

These waveforms have the following types of characteristics.

Sine – the purest waveform possible with only the fundamental frequency and no other harmonics present. A "pure" whistling type of sound.

Saw 1~5 – A "buzzing" type of waveform with harmonics present from the fundamental on higher in decreasing amplitude. (Saw 1 has the least amount of uppr harmonics and Saw 5 has the most.)

Noise 1 – A waveform consisting of all harmonics present, producing a non-pitched type of sound resembling static.

Noise 2 – Anothr noise waveform which does have the fundamntal pitch present along with the "static".

Parameters	O/S	EDIT—PAGE DOWN—PAGE—CURSOR—VALUE

PITCH FIX = ON/OFF
ON: RANGE = ×1/ ×$^1/_{16}$
OFF: HARMONIC = $^1/_{63}$ ~ 63
     TUNE = +/− (POLARITY), 0~5 (OCT),
          0~11 (NOTE), 0~63 (FINE)

Domain		
	Mode	Normal
	Keyboard	
	Guitar	MODULAR
	Wind	

```
02 DETUNE    M1
PITCH FIX=OFF
```
/A

```
02 DETUNE    M1
TUNE=+3,10,56
```
/B

```
02 DETUNE    M1
HARMONIC=11H
```
/C

```
02 DETUNE    M1
RANGE= *1/16
```
/D

This function lets you establish the pitch independently for each module. By detuning some modules, you can create a "thick" sound, or emphasize certain "harmonic", etc.

The PITCH FIX parameter can also be set in this function. This lets you simulate the "attack" sound of certain instruments, by fixing the frequency of one module so that the same pitch is produced by any note number.

Parameters with PITCH FIX set to OFF (normal detuning)
HARMONIC: Used to set the harmonic level at which the detuned module will sound in comparison with the standard frequency. When the harmonic level is set, other parameters are adjusted to appropriate corresponding levels automatically. At a value of "1," the standard frequency is specified and no detuning is effected.
With PITCH FIX set to OFF, the TUNE parameter features a total of four different settings; Polarity, Octave, Note and Fine Tuning.
POLARITY (POL): Used to specify whether the module will be tuned above (+) or below (−) the standard frequency.
OCTAVE (OCT): Used to raise pitch in 1-octave increments.
NOTE (NOTE): Used to raise or lower fixed pitch in half-tone (100-cent) increments.
FINE TUNING (FINE): Used to alter pitch in 1.6-cent increments (approximate).

When detuning is effected with the NOTE and FINE parameters, the resulting harmonic will not be an "exact" harmonic of the standard frequency. Because of this, "H" and "L" marks to the right of the HARMONIC indicate that the harmonic is slightly higher or lower than the displayed harmonic value (differs with detuning).
(FIG-C)

Parameters with PITCH FIX set to ON
RANGE (×1 or 1/16): When set to "×1", the "octave range" of the fixed-pitch sound will correspond to the MIDI instrument pitch (and OCTAVE parameter setting), within a range of approximately F# -1 to C# 10.

By selecting the "×1/16" parameter (FIG-D), the fixed-pitch sound will be shifted to a range is equal to F# -5 to approximately C# 6. (In some cases, the sound will not be audible, as it's frequency is too low for the human ear. Try raising the OCT value in this case.)

PITCH (Fixed Frequency)

C#10 ---- RANGE= ×1
C#6 (B4)
(B1) RANGE= ×1/16
F#-1 ---- 4 octaves
F#-5 ---- DETUNE
OCT = 0   OCT = 5   OCT = 10
NOTE = 0   NOTE = 4   NOTE = 7
FINE = 0   FINE = 0   FINE = 0
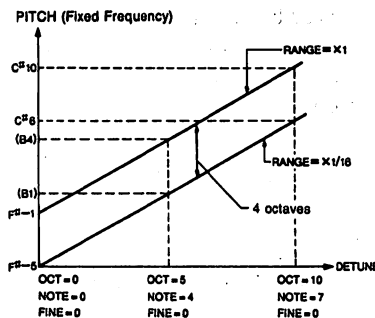
With PITCH FIX set to ON, the TUNE parameter features a total of four different settings; Octave, Note and Fine Tuning.
OCTAVE: Used to raise pitch in 1-octave increments. (When the NOTE parameter is set to a value higher than "7", the OCTAVE parameter can be set between "0" and "9".)
NOTE (NOTE): Used to raise or lower fixed pitch in half-tone (100-cent) increments. (When OCT is set to "10," this range is limited to between "0" and "7.")
FINE TUNING (FINE): Used to alter pitch in 1.6-cent increments.

COPY/INITIALIZE
This function features COPY and INITIALIZE functions which allow you to "copy" detune specifications from one module to another, and to "reset" the selected module to an initialized setting (DETUNE OFF).
To COPY the detuning specifications of the selected module to another module, first select VOICE-02 and the module containing the detune settings you want to copy from. Next, hold down the WRITE key and then press the PROG NO key corresponding to the module you want to copy into.
To INITIALIZE the selected module, first select VOICE-02 and the module containing the detuning specifications you want to initialize. Next, hold down the WRITE key and then press the YES key. Detuning settings will be reset to initialized values (DETUNE OFF).

Parameters	O/S	EDIT—PAGE DOWN—PAGE—CURSOR—VALUE

		Domain	
R1~R8 (RATE)=0~99 L1~L8 (LEVEL)=−63~+63 SS=SUSTAIN STEP (YES key) ED=END (NO key)		**Mode**	**Normal**
		Keyboard	GLOBAL
		Guitar	
		Wind	

```
03 PITCH ENV
R1=99  L1=+13 **
```
A

```
03 PITCH ENV
R1=99  L1=+13 SS
```
B

```
03 PITCH ENV
R2=84  L2=+ 0 ED
```
C

The DCO envelope determines the change in pitch over time for all 8 modules. The unit features 8-step envelopes, which means that RATEs and LEVELs can be set at up to 8 points in the envelope.

A level value of "0" indicates no change in pitch. (standard pitch played on keyboard). This means that positive values cause the pitch to rise, while negative values lower the pitch.

SS & ED POINTS
In addition to RATE and LEVEL values, SS (Sustain, FIG-B) and ED (End, FIG-C) points can be specified at any step in the DCO envelope.

•To enter an SS point in any step, press the YES (VALUE ▲).

When a sustain point is inserted in the envelope, the PITCH will be sustained until a note off message is received. The step immediately following the SS step then becomes the "release" point (as in ADSR type pitch envelopes).

•To delete a sustain point, press the YES (VALUE ▲) key once again.

•To enter an ED point in any step, simply press the NO (VALUE ▼) key.

As there are up to 8 steps in the DCO envelope, the end point is initially set in step 8. The end point can be moved to any step, however subsequent steps will automatically be deleted.

Note that ED points can be set for any step, regardless of its LEVEL value.

•To delete the end point from any step (1 through 7), simply move the cursor to the step and press the NO (VALUE ▼) key once again. The end point returns to step 8 automatically.
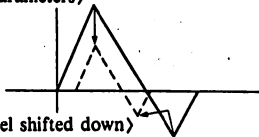
Note that the actual change affected by the level parameter depends on the setting of the envelope depth in VOICE-04. When this depth is at its maximum, a value of −63 to +63 represents more than a 5-octave change in pitch (up or down).

INITIALIZE
To INITIALIZE the patch, first select VOICE-03 and the module containing the specifications you want to initialize. Next, hold down the WRITE key and then press the YES key.

Note that when this function is initialized, the PITCH ENVELOPE of the selected module as well as enabled steps in the PITCH ENV of VOICE-18 are initialized.

Parameters	O/S	EDIT — PAGE DOWN — PAGE — CURSOR — VALUE

DEPTH = 0 ~ 63
RANGE = WIDE / NARROW

Domain	
Mode	**Normal**
Keyboard	
Guitar	**GLOBAL**
Wind	

```
04 P ENV DEPTH
   DEPTH=53
```
/A

```
04 P ENV DEPTH
   RANGE=WIDE
```
/B

〈Envelope set using VOICE-03 parameters〉

〈Actual envelope level shifted down〉 /C

```
05 P K
KEY1=C
```

This function contains two parameters — DEPTH and RANGE. Both of these parameters affect the DCO ENVELOPE settings which are specified in function 03 (VOICE-03).

The ENVELOPE DEPTH parameter can be used to "shift" the level of the entire envelope produced using the DCO ENVELOPE parameters (03). At a value of "63", the envelope is produced as set in VOICE-03. And at a value of "0", the pitch is not changed by DCO ENVELOPE set in VOICE-03.

The RANGE parameter is a toggle which can be set to either WIDE or NARROW. When WIDE is selected, units used in setting the ENVELOPE LEVEL in VOICE-03 are equal to 100 cents and the maximum setting range is + / − 5 octaves. When NARROW is selected, LEVEL is changed in 25-cent increments, and the maximum setting range is decreased to approximately more than + / − 1 octave.

The param
Keyboard
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VOICE-04
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BOARD I

NORMAL

Parameters	O/S	EDIT—PAGE DOWN—PAGE—CURSOR—VALUE
		Domain

KEY 1 ~ KEY 6 = C0 ~ C9
L1 ~ L6 (LEVEL) = 0 ~ 63

Mode		Normal
Keyboard		
Guitar		GLOBAL
Wind		

```
05 P KF LEVEL
KEY1=C2  L1=50
```
/A

```
05 P KF LEVEL
KEY2=C4  L2=25
```
/B

The parameters in this function are used to determine how Keyboard Follow (KF) affects the DCO envelope (pitch) produced using the parameters in VOICE-03 and VOICE-04. The unit features 6-step keyboard follow, which means that LEVELs can be set at 6 points in the KEYBOARD FOLLOW CURVE.

The key parameter represents positions in the Key Setting Range (C0 ~ C9). In this state, each "POINT" in the KF curve can be moved in harf-tone increments. As the "LEVEL" parameter value is increased, the contour of the curve is increased, while it is decreased as the value is decreased.

POINT	P1	P2	P3	P4	P5	P6
KEY	E2	C4	A4	C6	A♭6	F#7
LEVEL	50	25	63	35	57	28

P VEL LEVEL (DCO)

· **Parameters**	**O/S**	EDIT — PAGE DOWN — PAGE — CURSOR — VALUE

		Domain	
SENS (SENSITIVITY) = 0 ~ 31 CURVE = 1 ~ 8		**Mode**	**Normal**
		Keyboard	
		Guitar	**GLOBAL**
		Wind	

```
06 P VEL LEVEL
   SENS= 4
```

A

SENS=31 〈Envelope set using
CURVE=1 VOICE-03 parameters〉
  —— with strong attack ——
  —— with weak attack ——

SENS=10
CURVE=1

〈Actual envelope level shifted down〉

B

This function features 2 basic parameters which are used to contour the velocity level message control over the DCO (pitch) envelope's level for all modules (M1 ~ M8). In other words, these settings — SENSITIVITY and CURVE — determine how responsive all 8 modules will be to key touch dynamics with regards to changes in pitch.

The CURVE parameter lets you choose from any of 8 different velocity curves, which determine the contour of velocity message control over time. The SENSITIVITY parameter lets you set the range of change in the DCO ENVELOPE by velocity message control. At a setting of "0", the selected module will be totally unresponsive to velocity message control — in other words, your keyboard attack will have no effect over changes in pitch. A setting of "31" indicates maximum sensitivity. (FIG-B)

The CURVE parameter is used to select one of the 8 velocity curves (contours) as shown in the figures below. These curves determine how the pitch actually changes over time.

[CURVES]

1 Pitch — SENS=0 — SENS=31 — Velocity

3 SENS=0 — SENS=31

5 SENS=0 — SENS=31

7 SENS=0 — SENS=31

2 SENS=0 — SENS=31

4 SENS=0 — SENS=31

6 SENS MIN ← → SENS MAX

8 SENS MIN ← → SENS MAX
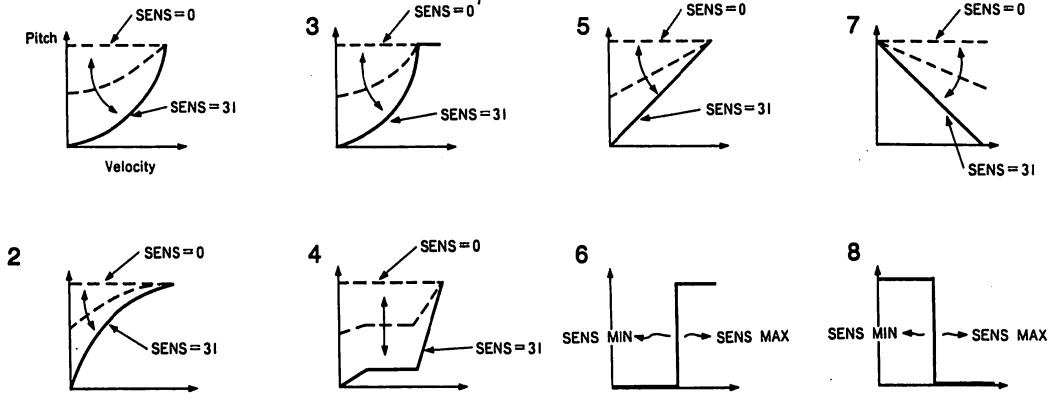
The VIBR... log synth... and this ... waveform... tion — W

The WAV... of the vib... DOWN, ... mation b... which ca...

You can ... vibrato o... the value... "0", no v... before al...

The RAT... to oscillat... effect.
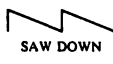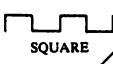
Parameters	O/S	EDIT — PAGE DOWN — PAGE — CURSOR — VALUE

Parameters	Domain	
WAVE = TRIANGLE / SAW UP / SAW DOWN / SQUARE DEPTH = 0 ~ 99 RATE = 0 ~ 99 DELAY = 0 ~ 99 MULTI = ON / OFF	**Mode**	**Normal**
	Keyboard	
	Guitar	GLOBAL
	Wind	

```
┌─────────────────┐      ┌─────────────────┐
│ 07 VIBRATO      │      │ 07 VIBRATO      │
│    WAVE=TRIANGLE │      │    DEPTH= 3     │
└─────────────────┘      └─────────────────┘
        A                        B
```

TRIANGLE   SAW UP

SAW DOWN   SQUARE   **C**

The VIBRATO function corresponds to the LFO of an analog synthesizer. It oscillates the low frequencies of the DCO, and this oscillation adds a "vibrato" effect to the selected waveform. There are five basic parameters within this function — WAVE, DEPTH, RATE, DELAY and MULTI.

The WAVE parameter lets you choose the basic waveform of the vibrato oscillation. There are 4 — SQUARE, SAW DOWN, SAW UP, and TRIANGLE. (FIG-C) (See information below for details on various types of waveforms which can be selected.)

You can use the DEPTH parameter to set the "depth" of vibrato oscillation (how strong the vibrato is). The larger the value, the deeper the vibrato effect. (If this is set to "0", no vibrato will be generated. Be sure to raise the value before altering other settings.)

The RATE parameter is used to set the "speed" of vibrato oscillation. The higher the value, the faster the vibrato effect.

The DELAY parameter is used to set the period of time from initial note on message until the point where vibrato oscillation begins. The larger the value, the longer the delay before vibrato is applied.

The MULTI parameter features a toggle which can be set to either ON or OFF. When MULTI is set to ON, the vibrato effect is engaged independently as keys are played, so that each note's vibrato is independent (not synchronized with vibrato delay and oscillation of note messages received previously or subsequently). This effect is useful in creating "ensemble" sounds.

When this parameter is set to OFF, vibrato oscillation is synched for all notes, regardless of when they are sounded (in unison or independently).

[WAVEFORMS]
Triangle – produces a smooth repeating up and down pitch variation.
Saw Up – produces a repeating pitch rise starting from the fundamental frequency.
Saw Down – produces a repeating pitch "swoop" down from above to the fundamental frequency.
Square – produces a repeating "trill" between the original pitch and a higher pitch.

NORMAL

08	OCTAVE	Related Functions

·Parameters	O/S	EDIT—PAGE DOWN—PAGE—CURSOR—VALUE

OCTAVE = $-2/-1/0/+1/+2$

	Domain	
	Mode	Normal
	Keyboard	
	Guitar	GLOBAL
	Wind	

```
08 OCTAVE= 0
```
A

```
08 OCTAVE=+1
```
B

This function features only one parameter — OCTAVE, which is used to raise or lower the overall octave of all 8 modules (M1~M8) globally. At a value of "0", the octave for all 8 modules is set at the standard pitch level (A4=442Hz). (This is assuming that "Detune" is set to "Harmonic 1" for the module in question......). You can raise or lower the octave by a maximum of 2 octaves, in 1-octave increments.

—— Right column (page 09, partially visible) ——

```
09 AMF
R2=23
```

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in between
Furthermo
Source, if
next LINE
succeeding

(For more
ELs and S

SS & ED
In addition
B) and EI
step in the

•To enter
(VALUE

When a su
will be sus
step imme
"release"

•To delete
once aga

•To enter
(VALUE
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point is in
to any ste
be delete

09   AMP ENV (DCA)

Parameters	O/S	EDIT—PAGE DOWN—PAGE—CURSOR—VALUE

	Domain	
R1~R8 (RATE)=0~99 L1~L8 (LEVEL)=0~99 SS=SUSTAIN STEP (YES key) ED=END (NO key)	**Mode**	**Normal**
	Keyboard	
	Guitar	MODULAR
	Wind	

```
09 AMP ENV    M1
R2=23  L2=92  **
```
A

```
09 AMP ENV    M1
R4=60  L4=75  SS
```
B

```
09 AMP ENV    M1
R8=87  L8= 0  ED
```
C

This function basically contains 8 "STEPs", each of which is broken down into RATEs and LEVELs which you can use to create 8-step (maximum) amplitude envelopes for each module (M1 ~ M8).

These DCA "envelopes" determine how the amplitude (remember, amplitude = loudness) of each module changes over time. In other words, the sound attack and decay, and all the changes in volume which the sound goes through in between.

Furthermore, as mentioned in the section on the iPD Sound Source, if the module LINE is set to EXT PHASE for the next LINE, ENVELOPE DCA affects the timbre of the succeeding LINE.

(For more information on ENVELOPEs, RATEs, LEVELs and STEPs, refer to the VZ Sound Seminar.)

SS & ED POINTS
In addition to RATE and LEVEL values, SS (Sustain, FIG-B) and ED (End, FIG-C) points can be specified at any step in the DCA envelope.

• To enter an SS point in any step, simply press the YES (VALUE ▲).

When a sustain point is inserted in the envelope, the sound will be sustained until a note off message is received. The step immediately following the SS step then becomes the "release" point (as in ADSR type amplitude envelopes).

To delete a sustain point, press the YES (VALUE ▲) key once again.

To enter an ED point in any step, simply press the NO (VALUE ▼) key.
As there are up to 8 steps in the DCA envelope, the end point is initially set in step 8. The end point can be moved to any step, however subsequent steps will automatically be deleted.

To delete the end point from any step (1 through 7), simply move the cursor to the step and press the NO (VALUE ▼) key once again. The end point returns to step 8 automatically.

COPY / INITIALIZE
This function features COPY and INITIALIZE functions which allow you to "copy" DCA specifications from one module to another, and to "reset" the selected module to an initialized setting.
To COPY the DCA specifications of the selected module to another module, first select VOICE-09 and the module containing the detune settings you want to copy from. Next, hold down the WRITE key and then press the MODULE SELECT key corresponding to the module you want to copy into. When this procedure is carried out, complete DCA data (VOICE-10, 11, 12, 14, 17) is copied into the destination module.
To INITIALIZE the selected module, first select VOICE-09 and the module containing the specifications you want to initialize. Next, hold down the WRITE key and then press the YES key. DCA settings for VOICE-09 and VOICE-19 (VEL RATE) will be reset to initialized values.

Note that when this function is initialized, the AMP ENVELOPE of the selected module, as well as enabled steps in the AMP ENV of VOICE-19 are initialized.

Parameters	O/S	EDIT—PAGE DOWN—PAGE—CURSOR—VALUE
		Domain

	Mode	Normal
ENV DEPTH = 0 ~ 99	Keyboard	
	Guitar	MODULAR
	Wind	

```
10 ENV DEPTH  M1
  DEPTH=99
```
A

〈Amp envelope set using in VOICE-09 parameters〉
〈Actual envelope level shifted down〉

B

This function lets you raise or lower the entire contour of the DCA envelopes for all 8 modules, created using VOICE-09 (DCA Envelope). Note that this function has no direct effect on the actual envelope, but simply raises or lowers its overall "level". Simply speaking, the overall volume level of the selected module is decreased as you lower the ENV DEPTH level. Settings can be made for all 8 modules independently.

```
11 KF
KEY1=E
```

The paran
Keyboard
ness) proc
VOICE-10
means tha
BOARD

Parameters	O/S	EDIT—PAGE DOWN—PAGE—CURSOR—VALUE

Parameters		Domain	
KEY 1~KEY 6 = C0~C9 L1~L6 (LEVEL) = 0~99		**Mode**	**Normal**
		Keyboard	
		Guitar	MODULAR
		Wind	

```
11 KF LEVEL    M1
KEY1=E2  L1=79
```
A

```
11 KF LEVEL    M1
KEY6=F#7 L6=44
```
B

The parameters in this function are used to determine how Keyboard Follow (KF) affects the DCA envelope (loudness) produced using the parameters in VOICE-09 and VOICE-10. The unit features 6-step keyboard follow, which means that LEVELs can be set at 6 points in the KEYBOARD FOLLOW CURVE.

The settings for this function are made in exactly the same way is in the DCO (pitch) KF LEVEL function (VOICE-05). But, DCA KF LEVEL can be set for each MODULE independently.

POINT	P1	P2	P3	P4	P5	P6
KEY	E2	C4	A4	C6	A♭6	F#7
LEVEL	79	40	99	56	90	44

Parameters	**O/S**	EDIT — $\frac{PAGE}{DOWN}$ — PAGE — CURSOR — VALUE	
		Domain	
SENS (SENSITIVITY) = 0 ~ 31 CURVE = 1 ~ 8		**Mode**	**Normal**
		Keyboard	
		Guitar	**MODULAR**
		Wind	

```
12 VEL LEVEL  M1
   SENS=15
```
A

SENS = 31 / CURVE = 1   Amp. envelope with strong attack
Amp. envelope with weak attack

SENS = 10 / CURVE = 1   Amp. envelope with strong attack
Amp. envelope with weak attack
B

This function features 2 basic parameters which are used to contour the key-touch control over the DCA (amplifier) envelope's level, for each module (M1 ~ M8). In other words, these settings — SENSITIVITY and CURVE — determine how responsive the waveform produced by any given module will be to key touch dynamics.

The CURVE parameter lets you choose from any of 8 different velocity curves, which determine the contour of velocity control over time. The SENSITIVITY parameter lets you select values between "0" and "31". At a setting of "0", the selected module will be totally unresponsive to velocity control message. A setting of "31" indicates maximum sensitivity.

The CURVE parameter is used to select one of the 8 velocity curves (contours) as shown in the figures below. These curves determine how the amplitude actually changes with key velocity.

Notice that if you choose — for example — curve 7 for one module and curve 8 for another, each will sound quite differently according to the velocity message.

Note that the degree of this effect is dependent on settings mode in VOICE-10 (AMP ENV) as well as in VOICE-11 (KF. ENV.)
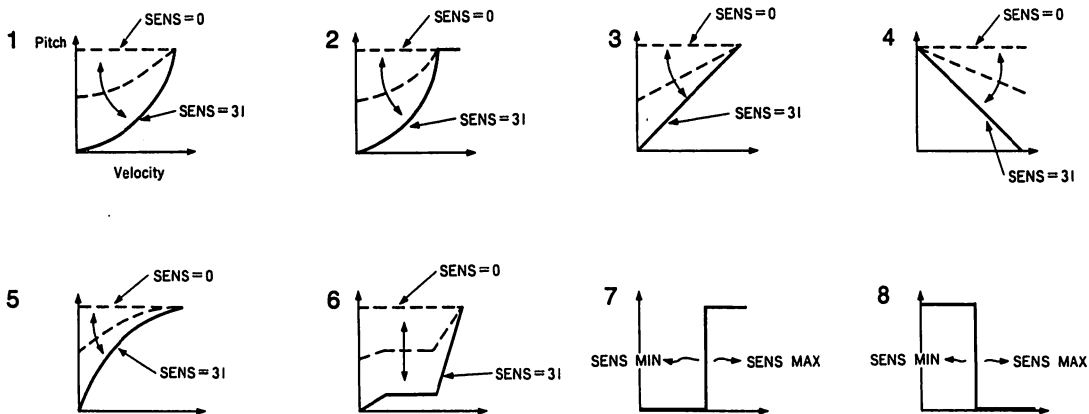
[CURVES]

1   Pitch ↑   SENS = 0 / SENS = 31   Velocity →

2   SENS = 0 / SENS = 31

3   SENS = 0 / SENS = 31

4   SENS = 0 / SENS = 31

5   SENS = 0 / SENS = 31

6   SENS = 0 / SENS = 31

7   SENS MIN ← → SENS MAX

8   SENS MIN ← → SENS MAX

Functions
-09, 10, 11
FECT—14

—VALUE

nal

JLAR

13   TREMOLO

VOICE

Parameters	O/S	EDIT—PAGE DOWN—PAGE—CURSOR—VALUE	
WAVE = TRIANGLE / SAW UP / SAW DOWN / SQUARE DEPTH = 0 ~ 99 RATE = 0 ~ 99 DELAY = 0 ~ 99 MULTI = ON / OFF		**Domain**	
		Mode	**Normal**
		Keyboard	
		Guitar	GLOBAL
		Wind	

```
13 TREMOLO
  WAVE=TRIANGLE
```
A

```
13 TREMOLO
  DEPTH=14
```
B

TRIANGLE   SAW UP

SAW DOWN   SQUARE

C

Tremolo is a form of low-frequency oscillation which affects the DCA to produce cyclical changes in volume characteristics. The parameters in this function are used to create a "tremolo" effect globally. Note, however, that settings for parameters in VOICE-14 (AMP SENS) can be made independently for each module. This allows you to control the depth of each module independently, while settings in the TREMOLO function (VOICE-13) are used to create and control the "actual" tremolo oscillation.

The WAVE parameter lets you choose the basic waveform of the tremolo oscillation. There are 4 — SQUARE, SAW DOWN, SAW UP, and TRIANGLE. (See information below for details on how various types of waveforms affect volume changes.)

You can use the DEPTH parameter to set the "depth" of tremolo oscillation (how strong the tremolo is). The larger the value, the deeper the tremolo effect. (If this parameter is set to "0", no tremolo will be generated. Be sure to raise the level before altering other parameter settings.)

The RATE parameter is used to set the "speed" of tremolo oscillation. The higher the value, the faster the tremolo effect.

The DELAY parameter is used to set the period of time from initial key depression until the point where tremolo oscillation begins. The larger the value, the longer the delay before tremolo is applied.

The MULTI parameter features a toggle which can be set to either ON or OFF. When MULTI is set to ON, the tremolo effect is engaged independently as Note On messages are received, so that each note's tremolo is independent (not synchronized with tremolo delay and oscillation of messages received previously or subsequently). When this parameter is set to OFF, tremolo oscillation is synched for all keys, regardless of when the note on messages are received (in unison or independently).

NORMAL

[WAVEFORMS]
Triangle – produces a smooth "pulsating" volume shift.
Saw Up – produces a repeating rise and then cutoff in volume.
Saw Down – produces a repeating "swoop" down in volume.
Square – produces an "on and off" volume characteristic.

VOICE

NORMAL

14

AMP SENS (DCA)

Related Functions
VOICE—13
EFFECT—03~06, 19

15

. Parameters	O/S	EDIT— $\frac{\text{PAGE}}{\text{DOWN}}$ —PAGE—CURSOR—VALUE

SENS (SENSITIVITY) = 0 ~ 7	**Domain**		
	Mode		**Normal**
	Keyboard		
	Guitar		MODULAR
	Wind		

```
14 AMP SENS   M1
   SENS=0
```
A

```
14 AMP SENS   M2
   SENS=7
```
B

15 TOTA
LEVEL

This function features only one parameter, SENSITIVI-TY, which is set independently for each module. This "sensitivity" level determines how "sensitive" each module is to the effects listed below. (Or, in simpler terms, SENSI-TIVITY determines the degree of "depth" or "strength" the effects have in the specified module.)

When SENSITIVITY is set to a value of "0", the all effects listed below will not affect the specified module's sound. At a value of "7", the effects will be strongest.

This functio
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of the unit

⟨Related Functions⟩
VOICE-13 TREMOLO DEPTH
EFFECT-03 TREMOLO DEPTH (After Touch)
EFFECT-04 TREMOLO DEPTH (Modulation Wheel)
EFFECT-05 TREMOLO DEPTH (Definable Control)
EFFECT-06 TREMOLO DEPTH (Foot VR)
EFFECT-03 DCA ENV BIAS (After Touch)
EFFECT-04 DCA ENV BIAS (Modulation Wheel)
EFFECT-05 DCA ENV BIAS (Definable Control)
EFFECT-06 DCA ENV BIAS (Foot VR)
EFFECT-19 DEPTH (Total Tremolo)

15 TOTAL LEVEL (DCA)

Functions
OICE—13
03~06, 19

—VALUE

ial

LAR

Parameters		O/S	EDIT—$\frac{PAGE}{DOWN}$—PAGE—CURSOR—VALUE
			Domain
LEVEL = 0~99			**Mode**	**Normal**
			Keyboard	
			Guitar	GLOBAL
			Wind	

```
15 TOTAL LEVEL
   LEVEL=65
```
A

```
15 TOTAL LEVEL
   LEVEL=99
```
B

", the all ef-
ed module's
e strongest.

This function features only one parameter, TOTAL LEV, which is used to control the overall amplitude (volume) level of the unit (for all modules, M1~M8).

This parameter acts as a "governer", controlling the maximum possible volume level which can be attained with the volume control. With a value of "0", no sound is output — even when the volume slider is set to MAX. The maximum amplitude level can be selected by inputting a level of "99".

NORMAL

Parameters		O/S	EDIT — PAGE DOWN — PAGE — CURSOR — VALUE

		Domain	
KEY 1~KEY 6 = C0~C9 R1~R6 (RATE) = 0~99		**Mode**	**Normal**
		Keyboard	
		Guitar	GLOBAL
		Wind	

```
16 KF RATE
KEY1=C1  R1=22
```
/A

```
16 KF RATE
KEY6=F7  R6=99
```
/B

```
17 VE
   SEN
```

This function features a total of 6 "POINTs", which are used to create a KEY FOLLOW CURVE. This function is directly related to the KF LEVEL functions (VOICE-05 and VOICE-11). Notice that with the LEVEL functions, you can set specify KEYs and LEVELs for each POINT in the curve(s). The KF RATE function is used to specify the RATE (remember, rate and level together determine time) for each point in the curve.

These settings are global, affecting all DCO and DCA envelopes (VOICE-03 and VOICE-09).

In steps where the rate value is higher, a rapid "attack" or "decay" is effected. In a position where the rate value is low, the rate of the envelope is equal to that set in VOICE-03 and VOICE-09.

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CURVES

POINT	P1	P2	P3	P4	P5	P6
KEY	C1	A1	E2	C5	F#6	F7
RATE	22	50	0	22	53	99

17, 18, 19　　VEL RATE (DCO/DCA)

Parameters	O/S	EDIT—PAGE DOWN—PAGE—CURSOR—VALUE	
17 (VEL RATE SENS)		**Domain**	
SENS (SENSITIVITY)=0~31			
CURVE=1~8		Mode	Normal
18 (P VEL RATE)		Keyboard	17 } GLOBAL
ENA=E/*		Guitar	18 } GLOBAL
19 (A VEL RATE)		Wind	19　MODULAR
ENA=E/*			

```
17 VEL RATE SENS        18 P VEL RATE                              19 A VEL RATE M1
SENS=15                 ENA=E*E                                    ENA=E*E
```

A　　　　　　　　　　B　　　Pitch envelope set in VOICE-03　　C　　　　　　D

Pitch envelope with strong attack

This function features parameters which are used to control velocity RATE, in correspondence with DCO and DCA envelopes created using VOICE-03 and VOICE-09.

While the velocity RATE setting is global (affects all 8 modules), you can choose whether RATE control is enabled or disabled for each step in both the DCO and DCA envelopes.

Within function No. 17 ("VEL RATE SENS"), the SENSITIVITY and CURVE parameters can be selected.

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 external keyboard is played with a strong (fast) attack (high "velocity").

The CURVE parameter lets you choose from one of 8 different VELOCITY RATE curves, as diagrammed below. The horizontal axis of the VELOCITY CURVE represents additive values to the rate parameter. As the value is increased, the rate of steps in the envelope (DCO/DCA) are increased further.

Within function No. 18 ("P VEL RATE"), you can specify whether or not the VEL RATE curve will affect the individual steps of the PITCH ENV (DCO envelope) which is set using VOICE-03.
This setting is global, affecting all 8 modules (M1~M8).

To ENABLE (make effective) the VEL RATE for any step in the envelope, simply move the cursor to the desired step position and press the YES key ("E" is displayed). To disable, simply press the NO key ("*" is displayed). (If you set less than 8 steps, steps following END POINT are not displayed.) If the parameter is set as in FIG-B, the envelope changes as illustrated in FIG-C, with a strong attack (The rate of steps 1 and 4 become acute).

Within function No. 19 ("A VEL RATE"), 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. These settings can be made for each module (M1~M8) individually.

To ENABLE the VEL RATE for any step in the envelope, simply move the cursor to the desired step position and press the YES key ("E" is displayed). To disable, simply press the NO key ("*" is displayed).

Notice that there are no identifying "numbers" assigned to the step display. Note, however, that there are "" or "E" which corresponds to each active step position.*

[CURVES]

1　Rate　SENS=31　SENS=0　Velocity
2　SENS=31　SENS=0
3　SENS=31　SENS=0
4　SENS=31　SENS=0
5　SENS=31　SENS=0
6　SENS=31　SENS=0
7　SENS MIN ← → SENS MAX
8　SENS MIN ← → SENS MAX

NORMAL

Parameters	O/S	EDIT — PAGE DOWN — PAGE — CURSOR — VALUE

		Domain	
Alphabet = A ~ Z Numeral = 0 ~ 9 Marks = " . ", " — ", " / "		**Mode**	**Normal**
		Keyboard	
		Guitar	GLOBAL
		Wind	

```
20 NAME    PST1
A-1:
```
/A

```
20 NAME    PST1
A-1:SYNTH-VOICE1
```
/B

This function is used to assign a name to the "patches" created using other VOICE menu functions.

The names you choose may contain both letters and numbers, and may be up to 12 characters in length.
Character input is carried out using the VALUE keys, with alphanumeric characters and marks being displayed cyclically by holding either VALUE key down.

```
21 INIT
   EXECUT
```

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94 of this n

21 INIT VOICE

Parameters	O/S	EDIT — PAGE DOWN — PAGE — CURSOR — VALUE

	Domain	
EXECUTE? (YES) PUSH YES KEY!	Mode	Normal
	Keyboard	
	Guitar	GLOBAL
	Wind	

```
┌─────────────────┐
│21 INIT VOICE    │
│  EXECUTE? (YES) │
└─────────────────┘
                /A
```

```
┌─────────────────┐
│21 INIT VOICE    │
│  PUSH YES KEY!  │
└─────────────────┘
                /B
```

This function is used to intialize all VOICE MENU data. By executing this function, initialized data is loaded to the internal memory's COMPARE/RECALL area. (Note that once initialization is completed, the COMPARE/RECALL key indicator comes ON, if the COMPARE/RECALL function has not already been selected.)

Respond to the [EXECUTE?] prompt by pressing the YES key and then press it once again to execute initialization. The display appears as in FIG-B. Parameter values and settings will all be reset to the initialized values shown on page 94 of this manual.

NORMAL

MIDI CHANNEL

EFFECT

Parameters	O/S	EDIT—PAGE—CURSOR—VALUE			
		Domain			
CHANNEL = 1 ~ 16	Mode	Normal	Combination		Multi channel
			4 mix/split	8 mix	
	K		GLOBAL		
	G	GLOBAL	GLOBAL		AREA
	W		GLOBAL		

```
00 MIDI CHANNEL
  CHANNEL= 1
```
A

```
00 MIDI  A1:8: 1
  CHANNEL= 1
```
B

```
00 MIDI CHANNEL
-TOTAL=ON  CH 1-
```
C

```
00 MIDI CHANNEL
  CHANNEL= 1- 6
```
D

```
01 PC
 -POR
```

The MIDI CHANNEL function is used to assign the MIDI receive channel for the basic operating modes — the NORMAL mode, COMBI mode and MULTI-CH mode.

Note that if function 04 in the TOTAL CONTROL menu (MIDI CHANNEL) is set to ON in either the NORMAL or COMBI mode, it will be impossible to set the MIDI channel using TOTAL-04.

It's important to remember that the channel set using this function is held in Operation Memory along with other parameter settings.

Notice that in the "G" Performance Mode, the parameter is displayed as shown in FIG-D, however the cursor cannot be moved. Notice also that the number on the right changes automatically when the number on the left is altered (the number on the right being 5 "strings" higher than the number on the left).

In the MULTI CH mode, the Area Number, polyphony and MIDI channel are all shown on the display, as illustrated in FIG-B.

To select the Area Number, use the PROG NO keys. The MIDI channel number on the upper right side changes automatically when the Area Number is altered.

NORMAL **COMBINATION** **MULTI CHANNEL**

01 PORTAMENTO/SOLO

Parameters	O/S	EDIT—PAGE—CURSOR—VALUE

PORTAMENTO = ON / OFF
PORTM TIME = 0~99
PORTM MODE = TIME CONST / RATE CONST
SOLO = ON / OFF
[Guitar] POLY / MONO = POLY / MONO

Domain

Mode	Normal	Combination 4 mix/split	8 mix	Multi channel
K	GLOBAL	PATCH	GLOBAL	AREA
G	GLOBAL	GLOBAL	GLOBAL	AREA
W		GLOBAL	GLOBAL	

Left margin (partial):

Multi channel

AREA

HANNEL
= 1- 6

D

```
01 PORTM/SOLO
   PORTAMENTO=ON
```
A

```
01 PT/S  ■+2
   PORTAMENTO=ON
```
B

```
01 PORTM/SOLO
   POLY/MONO=MONO
```
C

```
01 PT/S  A1:4: 1
   PORTAMENTO=ON
```
D

Right margin vertical labels: **EFFECT**, **NORMAL**, **COMBINATION**, **MULTI CHANNEL**

Left margin fragments:
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e parameter
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The parameters in this function are used to establish and control built-in portamento and "solo" effects.

The PORTAMENTO parameter is a "toggle" (or switch) which is used to turn the portamento effect simply ON or OFF.

NOTE: The PORTAMENTO parameter must be set to "ON", in order to control portamento time using AFTER TOUCH, MOD WHEEL, DEF CONTROL or FOOT VR.

The PORTM TIME parameter determines the "portamento time" between notes — in other words, the time that it takes the pitch to "glide" from one note to the next note message received. The higher the value of this parameter, the longer the portamento time.
Note that even when the PORTM TIME is set to "0", the portamento effect can affect the overall sound, depending on the patch or sound which is being edited.
The PORTM MODE parameter determines whether the "constant" which portamento is based on. When this parameter is set to TIME CONST, the time required for pitch to glide between notes is constant — regardless of the distance between the notes. (FIG-E)

When the PORTM MODE parameter is set to RATE CONST, the rate or "speed" of portamento glide becomes constant. (FIG-F)

FIG-E
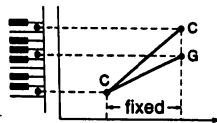
FIG-F
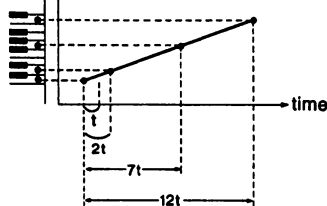
The SOLO parameter is a toggle which can be used to turn the solo function ON or OFF. The solo function is a "last note priority" effect. When this function is ON and more than one note on message is received, the system will cause the only the last one received to sound.
When the SOLO parameter is set to ON, Portamento effect can only be attained by legato performance (notes played without breaks in between).

When the "G" performance mode is selected, the portamento function operates as follows;
With SOLO parameter OFF: Portamento sweep executed independently for each MIDI channel (each string).
With SOLO parameter ON: Portamento sweep executed only when a NOTE ON message is generated while a previous NOTE message is still ON (legato play), regardless of MIDI channel (string).

The POLY/MONO parameter can be set in the "G" Performance Mode. When set to POLY, the notes are sound polyphonically through each MIDI channel (notes can be played during "release" time). When this parameter is set to MONO, notes through each MIDI channel are sounded only monophonically.

When PORTAMENTO-related MIDI mode messages are received, operations automatically switch to this function.

02	PITCH BEND			Related Functions

Parameters	O/S	EDIT — PAGE — CURSOR — VALUE

		Domain			
BEND RANGE = 0 ~ 48. RELEASE = ENA / DIS	Mode	Normal	Combination 4 mix/split	8 mix	Multi channel
	K		PATCH	GLOBAL	
	G	GLOBAL	GLOBAL	GLOBAL	AREA
	W		GLOBAL	GLOBAL	

```
02 PITCH BEND
   BEND RANGE= 2
```
/A

```
02 BEND  █+2
   BEND RANGE= 2
```
/B

```
02 PITCH BEND
   RELEASE=ENA
```
/C

```
02 BEND  A1:4: 1
   BEND RANGE= 2
```
/D

This function features two parameters — BEND RANGE and RELEASE — which are used to determine how the external MIDI instrument pitch bend wheel can be used to raise or lower pitch.

The BEND RANGE parameter can be used to raise or lower the maximum limit that pitch can be bended by an external MIDI instrument, in half-step increments. At the minimum value of "0", the pitch bend wheel has no effect on pitch, while at the maximum value of "48", you can bend notes a maximum of 48 half-steps (4 octaves), up and down.

The RELEASE parameter lets you choose whether or not the external keyboard pitch bend wheel can be used to bend sounds which are sustained after the keyboard is released.

When this parameter is set to DIS (disable), you can bend notes only before actually receiving note off message (before the release point in DCA curve).

When set to ENA (enable), you can also bend any note that is still sounding (portion of sound following the release point in DCA curve) — even after releasing the corresponding key on the external keyboard. (FIG-C)

In the "G" performance mode, parameters set for the sound programmed to MIDI Channel 1 affect the other 5 MIDI channels. The pitch bend message, however, can be received by each string independently.

When PITCH BEND-related MIDI mode messages are received, operations automatically switch to this function.

03

SENSITIVIT
(NORMAL, M
  CHANNEL
(COMBINAT
VIB DEPTH
VIB RATE =

```
03 AFTER
   SENS=2
```

This function
MIDI controll
is used to con

The SENSITI'
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In the COMBI
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message (and
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the effects "de
which are alrea
already set a V
function), so vi
AFTER TOUC
vibrato depth v
ter touch.

The following
trol various so

VIB DEPTH
ON: Vibrato d
OFF: After to

VIB RATE =
ON: Vibrato ra
OFF: After tou

PITCH BEND
— ON: Pitch be
   "99")
OFF: After tou
+ ON: Pitch be
●Pitch bend ran

PORTM TIME
ON: PORTM t
OFF: PORTM

Parameters		O/S	EDIT — PAGE — CURSOR — VALUE

SENSITIVITY   PITCH = +ON/−ON/OFF
(NORMAL, MULTI-   PORTM TIME = ON/OFF
CHANNEL) = 0~99   TREM DEPTH = ON/OFF
(COMBINATION) = −99~ +99   TREM RATE = ON/OFF
VIB DEPTH = ON/OFF   A ENV BIAS = ON/OFF
VIB RATE = ON/OFF

Domain

Mode	Normal	Combination 4 mix/split 8 mix		Multi channel
K		PATCH *1		
G	GLOBAL	PATCH *2		AREA
W		PATCH *2		

03 AFTER TOUCH
SENS=20

03 AFTR █+2
SENS=+20

This function is used to specify the sensitivity of an external MIDI controller "after touch", and the effects that after touch is used to control.

The SENSITIVITY parameter is used to determine how "sensitive" the external controller is to after touch. If sensitivity is high (at a level of "99", for example), it only takes a small amount of pressure on the key to engage the effect(s) which are being controlled by after touch. At a level of "0", the after touch function is totally non-operational.
In the COMBINATION mode, you can set this parameter in a range of −99 to +99 (FIG-C). When negative values are input, after touch is inversed.

The other parameters in this function are toggles, which let you determine which effects will be controlled by after touch message (and how they will be affected).
Note that these effects may already be engaged — even without using after touch. In this case, after touch can be used to make the effects "deeper" or "stronger" than the normal settings which are already engaged. For example, let's assume you have already set a VIB DEPTH value in VOICE-07 (VIBRATO function), so vibrato is engaged in your patch. If you turn the AFTER TOUCH "VIB DEPTH" parameter ON, then the vibrato depth will be increased even further when you use after touch.

The following chart lists how after touch can be used to control various sound effect functions.

VIB DEPTH = ON/OFF
ON: Vibrato depth set in VOICE-07 increased
OFF: After touch message does not control vibrato depth

VIB RATE = ON/OFF
ON: Vibrato rate set in VOICE-07 increased
OFF: After touch message does not control vibrato rate

PITCH BEND = −ON/OFF/+ON
−ON: Pitch bent down (max = 1 octave with sensitivity of "99")
OFF: After touch message does not affect pitch
+ON: Pitch bent up (max = 1 octave with sensitivity of "99")
Pitch bend range does not correspond to EFFECT-02 setting.

PORTM TIME = ON/OFF
ON: PORTM time set in EFFECT-01 is increased
OFF: PORTM time is not affected by after touch message

Note that PORTM TIME can only be set to "ON" when the PORTM/SOLO function (EFFECT-01) "Portamento" parameter is first set to "ON".

TREM DEPTH = ON/OFF
ON: Tremolo depth set in VOICE-13 is increased
OFF: Tremolo depth is not affected by after touch message

TREM RATE = ON/OFF
ON: Tremolo rate set in VOICE-13 is increased
OFF: Tremolo rate is not affected by after touch message

AMP ENV BIAS = ON/OFF
ON: Amplitude envelope bias increased by after touch message, with max. level as set in VOICE-09
OFF: Amplitude envelope bias is not affected by after touch message

In the "W" Performance Mode, aftertouch reacts slightly differently than with the other two performance modes. The curve in FIG-D shows how the SENS parameter affects aftertouch characteristics when set between values of "0" and "91". Notice the changes in these characteristics between values of "92" and "99" (FIG-E). For further details, refer to page 12.

FIG-E
< SPECIAL AFTER TOUCH SENSITIVITY 92 ~ 99 >
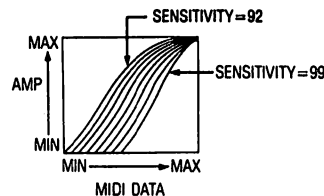
Note that TREM DEPTH, TREM RATE and AMP ENV BIAS levels can be set for each module (M1 ~ M8) independently, in VOICE-14 (AMP SENS). Naturally, these independent settings also affect after touch message characteristics for the above parameters.

*1 In COMBI "K" mode, ON/OFF and SENSITIVITY of only the PITCH (BEND) and A ENV BIAS parameter affect the patches (1 ~ 8) independently.
*2 In COMBI "G" or "W" mode, ON/OFF and SENSITIVITY of only the PORTAMENTO TIME parameter affect the patches (1 ~ 8) globally.

EFFECT

Parameters		O/S	EDIT — PAGE — CURSOR — VALUE

SENSITIVITY
(NORMAL, MULTI-
CHANNEL) = 0~99
(COMBINATION) = −99~ +99
VIB DEPTH = ON/OFF
VIB RATE = ON/OFF

PITCH = +ON/−ON/OFF
PORTM TIME = ON/OFF
TREM DEPTH = ON/OFF
TREM RATE = ON/OFF
A ENV BIAS = ON/OFF

Domain

Mode	Normal	Combination		Multi channel
		4 mix/split	8 mix	
K	GLOBAL	PATCH	COUPLE*1	AREA
G	GLOBAL	PATCH	COUPLE*2	AREA
W		PATCH	COUPLE*2	

```
04 MOD WHEEL
   SENS=50
```
/A

```
04 MOD   ▉+2
    SENS=+50
```
/B

VZ-1
DEF WHEEL 1 /C

The parameters in this function are used to specify the effects that will be controlled by a modulation wheel or MIDI control change No. 1 message (see accompanying MIDI implementation chart) (or when connecting to VZ-1, DEFINABLE WHEEL 1 message).

These parameters are exactly the same as those set in EFFECT-03 (AFTER TOUCH) — the only difference being that the effects are controlled during performance by MIDI control change No. 1 message using a modulation wheel, instead of After Touch (both can be used...).

For details on these parameters, see "EFFECT-03 AFTER TOUCH".

Note that TREM DEPTH, TREM RATE and AMP ENV BIAS levels can be set for each module (M1~M8) independently, in VOICE-14 (AMP SENS). As with after touch, these independent settings also affect MIDI control change No. 1 message control of the above parameters.

*1 In COMBI "K" mode, ON/OFF and SENSITIVITY of only the PITCH and A ENV BIAS parameters affect to the patches in couples. (1&5, 2&6, 3&7, 4&8)
*2 In COMBI "G" or "W" mode, ON/OFF and SENSITIVITY of only the PORTAMENTO TIME parameter affect the patches (1~8) globally.

NORMAL

COMBINATION

MULTI CHANNEL

05 DEF CONTROL

Parameters		O/S	EDIT—PAGE—CURSOR—VALUE

SENSITIVITY
(NORMAL, MULTI-
CHANNEL)=0~99
(COMBINATION)= −99~ +99

PITCH= +ON/ −ON/OFF
PORTM TIME=ON/OFF
TREM DEPTH=ON/OFF
TREM RATE=ON/OFF
VIB DEPTH=ON/OFF
VIB RATE=ON/OFF
A ENV BIAS=ON/OFF

Mode	Normal	Combination 4 mix/split	8 mix	Multi channel
			Domain	
K	GLOBAL	PATCH	COUPLE*1	AREA
G	GLOBAL	PATCH	COUPLE*2	AREA
W		PATCH	COUPLE*2	

```
05 DEF CONTROL
  SENS=50
```
A
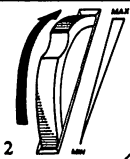
```
05 DEF   ▌+2
  SENS=+50
```
B

VZ-1
DEF WHEEL 2
C

EFFECT

The parameters in this function are used to specify the effects that will be controlled by MIDI Control change No. 12 ~ 31 messages (for details see accompanying MIDI implementation chart), or when connecting to VZ-1, DEFINABLE WHEEL 2 message.

These parameters are exactly the same as those set in EFFECT-03 (AFTER TOUCH) — the only difference being that the effects are controlled during performance by using MIDI Control change No. 12 ~ 31 messages, instead of After Touch message or modulation wheel message.

For details on these parameters, see "EFFECT-03 AFTER TOUCH".

Note that TREM DEPTH, TREM RATE and AMP ENV BIAS levels can be set for each module (M1~M8) independently, in VOICE-14 (AMP SENS). As with after touch, these independent settings also affect MIDI Control change No. 12 ~ 31 message control of the above parameters. (The MIDI control change number can be using TOTAL-05, the MIDI DATA function.)

*1 In COMBI "K" mode, ON/OFF and SENSITIVITY of only the PITCH and A ENV BIAS parameters affect to the patches in couples. (1&5, 2&6, 3&7, 4&8)

*2 In COMBI "G" or "W" mode, ON/OFF and SENSITIVITY of only the PORTAMENTO TIME parameter affect the patches (1~8) globally.

NORMAL COMBINATION MULTI CHANNEL
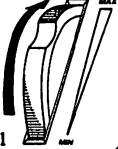
EFFECT

NORMAL

COMBINATION

MULTI CHANNEL

Parameters		O/S	EDIT—PAGE—CURSOR—VALUE

SENSITIVITY (NORMAL, MULTI-CHANNEL) = 0~99 (COMBINATION) = −99 ~ +99
VIB DEPTH = ON/OFF
VIB RATE = ON/OFF

PITCH = +ON/−ON/OFF
PORTM TIME = ON/OFF
TREM DEPTH = ON/OFF
TREM RATE = ON/OFF
A ENV BIAS = ON/OFF

Mode	Normal	Combination 4 mix/split 8 mix		Multi channel
		Domain		
K		PATCH : COUPLE*1		
G	GLOBAL	PATCH : COUPLE*2		AREA
W		PATCH : COUPLE*2		

```
06 FOOT VR
  SENS=50
```
A
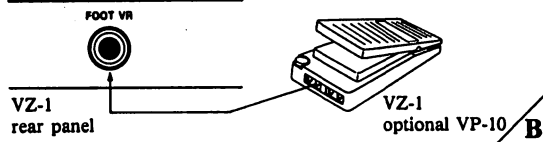
FOOT VR

VZ-1 rear panel

VZ-1 optional VP-10   B

```
06 F VR [I]+2
  SENS=-20
```
C

```
07 FOOT Sk
   =SUSTF
```

The parameters in this function are used to specify the effects that will be controlled by MIDI Control change No. 4 message (see accompanying MIDI implementation chart), or when connecting to VZ-1, Foot Control ("foot variable resistor" — Foot VR) message.

These parameters are exactly the same as those set in EFFECT-03 (AFTER TOUCH) — the only difference being that the effects are controlled by MIDI Control change No. 4 messages, instead of After Touch messages.

For details on these parameters, see "EFFECT-03 AFTER TOUCH".

Note that TREM DEPTH, TREM RATE and AMP ENV BIAS levels can be set for each module (M1 ~ M8) independently, in VOICE-14 (AMP SENS). As with after touch, these independent settings also affect MIDI Control change No. 4 message control of the above parameters.

*1 In COMBI "K" mode, ON/OFF and SENSITIVITY of only the PITCH and A ENV BIAS parameters affect to the patches in couples. (1&5, 2&6, 3&7, 4&8)
*2 In COMBI "G" or "W" mode, ON/OFF and SENSITIVITY of only the PORTAMENTO TIME parameter affect the patches (1 ~ 8) globally.

The parameters
fects that will be
sage number
implementation
sustain-pedal n
keyboard.
The following ch
utilized;

SUSTAIN: Soun
     FOC
     recei
SOSTENUTO: S
     (
DISABLE: FOC

07 FOOT SW

	Parameters	O/S	EDIT—PAGE—CURSOR—VALUE

FOOT SW = SUSTAIN
SOSTENUTO
DISABLE

Mode	Normal	Combination 4 mix/split	8 mix	Multi channel
K		PATCH	GLOBAL	
G	GLOBAL	PATCH	GLOBAL	AREA
W		PATCH	GLOBAL	

Domain

```
07 FOOT SW
  =SUSTAIN
```
A

VZ-1
optional SP-2
B

```
07 F SW  ▮+2
  =SOSTENUTO
```
C

The parameters in this function are used to specify the effects that will be controlled by MIDI control change message number 64 (refer to accompanying MIDI implementation chart). They are also used when sending sustain-pedal messages to a connected Casio MIDI keyboard.
The following chart lists what FOOT SW messages can be utilized;

SUSTAIN: Sound is sustained before or after receiving the FOOT SW ON message until OFF message is received.
SOSTENUTO: Sound is sustained only until FOOT SW ON data is received.
DISABLE: FOOT SW ON data cannot be received.

EFFECT

NORMAL | COMBINATION

MULTI CHANNEL

VEL TABLE SELECT

EFFECT

Parameters	O/S	EDIT — PAGE — CURSOR — VALUE

		Domain			
TABLE No. = 1 ~ 8	Mode	Normal	Combination 4 mix/split 8 mix		Multi channel
	K		GLOBAL		
	G	GLOBAL	GLOBAL		AREA
	W		GLOBAL		

```
08 VEL TABLE SEL
   TABLE NO.1
```
/A

```
08 VEL    A1:3: 1
   TABLE NO.8
```
/B

The parameter in this function is used to specify the velocity at which MIDI IN data is received. This is accomplished by selecting one of 8 built-in "tables" (curves), using the VALUE keys.

By altering the MIDI IN velocity data, it is possible to actually "correct" or "modify" the velocity curve of the transmitting MIDI device, for use with the VZ-8M. Selection can be made from the following 8 Velocity Tables;

[VEL TABLES]
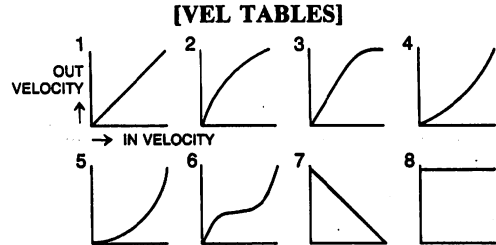
NOTE;
4. With this table, you must play with a hard attack in order to produce sound.
7. Reversed curve
8. Velocity totally OFF (For use with "W" performance mode).

NORMAL

COMBINATION

MULTI CHANNEL

09 PAN

Parameters	O/S	EDIT — PAGE — CURSOR — VALUE

MODE = FIX / CONTROL / AUTO

FIX: PANPOT 1/2 = -15 ~ 0 ~ +15   AUTO:
CONTROL: PAN 1/2 = ON/OFF
 CONTROL 1/2 (CONTROLLER)   RATE = 0 ~ 63
  = AFTER/FT VR/MOD/DEF/   DEPTH = 0 ~ 31
  PAN   CONTROL (CONTROLLER)
 RANGE 1/2 = L/R/C→L/R/C   = AFTER/FOOT VR/
                MOD/DEF/OFF

Domain

Mode	Normal	Combination 4 mix/split 8 mix	Multi channel
K		GLOBAL	
G	GLOBAL	GLOBAL	AREA
W		GLOBAL	

```
09 PAN
  MODE=FIX
```
/A

```
09 PAN
  PANPOT2=+15
```
/B

AUTO ... controlled by controller ... RATE ... TIME ... LEVEL ... DEPTH /C

The parameters in the PAN function are used to specify the "panning mode", as well as specify the actual L/R panning position for VZ-8M sound source outputs 1 and 2.

Output Channels

Depending on the mode selected, sounds are output through channel 1 or channel 2, as shown in the chart below;

MODES	CHANNEL 1	CHANNEL 2
NORMAL K	Switched between 1 and 2 according to order of MIDI IN NOTE ON messages.	
G*1	MIDI CH +2/+4	MIDI CH +1/+3/+5
W	Switched between 1 and 2 according to order of MIDI IN NOTE ON messages.	
COMBINATION 1+2	1	2
3+4	3	4
1+2+3+4	1, 2	3, 4
1/3	1	3
1/3+4	1	3, 4
1+2/3	1, 2	3
1+2/3+4	1, 2	3, 4
1/2/3/4	1, 2	3, 4
1+2+3+4+5+6+7+8	1, 2, 3, 4	5, 6, 7, 8
MULTI CHANNEL*2	AREA 1~4	AREA 5~8

*1 Reception in "G" performance mode is limited to six channels between MIDI CH and MIDI CH+5.
*2 Sounds are output through channel 1 and 2 separately if areas 1~4 and areas 5~8 are set for 4-poly performance, respectively.

Initially, you must select one of three PAN "modes" — FIX, CONTROL or AUTO.
In the FIX mode, the PAN function acts as a two-channel mixer, fixing the position of the "panpot" for each channel. In the CONTROL mode, each of the two panpots can be controlled by an independent external controller, such as a modulation wheel, foot VR, etc. This allows actual "manual" panning during performance. In the AUTO mode, both panpots can be programmed to "pan" the sound of each channel over time — automatically.

Parameters with mode set to "FIX"
PANPOT 1/2: Used to specify localization from OUTPUT 1 or 2. Note that "0" is equivalent to a "center" setting, with negative values (up to -15) panning the sound to the left, and positive values (up to +15) panning sounds to the right.

Parameters with mode set to "CONTROL"
CONTROL 1/2: Allows selection of the external control device to be assigned to PANPOT1 (channel 1 sounds) with the VALUE keys. There are 5 possible choices, AFTER (aftertouch), FT VR, MOD (modulation wheel), DEF (definable control) or PAN.
RANGE 1/2: Establishes the "range" within which the controller will be able to pan the sound, as well as the panning direction. Note that the "C" stands for "center".

FIX

CONTROL
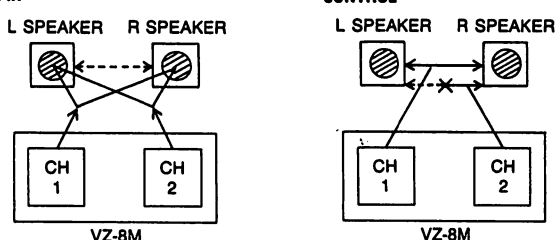
Parameters with mode set to "AUTO" (FIG-C)
PAN 1/2: Allows selection of whether or not selected PANPOT will pan automatically. This is a toggle switch which simply turns the function ON or OFF for the selected PANPOT (channel).
RATE: Universal for both PANPOT channels. This parameter is used to set panning "speed" — the higher the value, the faster panning is performed.

DEPTH: Universal for both channels. This parameter is used to set panning "depth" — the higher the value, the deeper the panning effect.
CONTROL: Establishes the external controller which can be used to manually adjust AUTO PAN depth.

In order to utilize and external controller to control panning in the MULTI CH mode or to control auto-panning depth, the MIDI channel of the controller must be the same as that set in TOTAL-04.

EFFECT

Parameters	O/S	EDIT—PAGE—CURSOR—VALUE

		Domain			
LEVEL = 0 ~ 99	Mode	Normal	Combination 4 mix/split 8 mix	Multi channel
	K		PATCH	
	G	—	PATCH	AREA
	W		PATCH	

```
10 LEV  █ / 3+4
   LEVEL=99
```
A

```
10 LEV   A1:4: 1
   LEVEL=85
```
B

The parameters in this function are used to set relative volume levels of the patches "combined" in the Combination Mode. Naturally, this function can only be accessed after entering this Mode.

Up to 8 "levels" are set in this function, depending on the number of patches which are combined (according to KEY ASSIGN specifications).

If minimum value of "0" is assigned, the corresponding patch will not sound, while a value of "99" indicates a maximum volume level. These settings can be used to "mix" the relative volume levels of all patches making up the combined sound.

COMBINATION

MULTI CHANNEL

```
11 PITC
   TUNE=
```

The paramet
the pitch of a
in the Combi
be accessed

The POLAR
will be raise

The OCTAV
bined pitch
increments.

| 11 | PITCH | **Related Functions** |

Parameters	**O/S**	**EDIT — PAGE — CURSOR — VALUE**			
POLARITY = + / − OCTAVE = 0 ~ 5 NOTE = 0 ~ 11 FINE = 0 ~ 63		**Domain**			
	Mode	**Normal**	**Combination** 4 mix/split 8 mix		**Multi channel**
	K		PATCH		
	G	—	PATCH		AREA
	W		PATCH		

```
11 PITCH 1 / █+4
   TUNE=+1, 0, 7
```
/A/

```
11 PITCH A1:4: 1
   TUNE=+2, 0, 0
```
/B/

The parameters in this function are used to raise or lower the pitch of all patches used to create a "combined sound" in the Combination Mode. Naturally, this function can only be accessed after entering this mode.

The POLARITY parameter is used to specify whether pitch will be raised (+) or lowered (−).

The OCTAVE parameter is used to raise or lower the combined pitch by a maximum of 5 octaves, in 1-octave increments.

The NOTE parameter is used to raise or lower the combined pitch by a maximum of 1100 cents, in 100-cent increments.

The FINE parameter is used to make "fine tuning" adjustments in 1.6-cent increments (approximate). By making "fine" tuning adjustments, a "thick" ensemble sound can be created.

EFFECT

COMBINATION

MULTI CHANNEL

Parameters	O/S	EDIT—PAGE—CURSOR—VALUE

<table>
<tr><td rowspan="3">POINT = C0 ~ C9</td><td colspan="5">Domain</td></tr>
<tr><td>Mode</td><td>Normal</td><td colspan="2">Combination
4 mix/split   8 mix</td><td>Multi
channel</td></tr>
<tr><td></td><td></td><td></td><td></td><td></td></tr>
</table>

Mode	Normal	Combination 4 mix/split	8 mix	Multi channel
K		PATCH(Split)	—	
G	—	PATCH(Split)	—	—
W		PATCH(Split)	—	

A

B

C

```
12 SPLIT ■/■/3/4
   POINT=E3
```

```
12 SPLIT POINT
CHECK KEYASSIGN!
```

D

The parameters in this function are used to specify "keyboard split" points in the Combination Mode.

Depending on KEY ASSIGN specifications, either one or three keyboard split points are assigned using this function.

When only one split point is used, as in the KEY ASSIGN configurations in FIG-A, this function contains only one parameter — the SP POINT parameter.

When the KEY ASSIGN configuration in FIG-B is selected, the display appears as in FIG-C. In this case, there are three split points. Notice that area numbers 1 and 2 are highlighted. This indicates that the "POINT" parameter is to be set for the "LOWER" split point. For the MIDDLE split point, move the cursor so that "2" and "3" are highlighted. Likewise, when 3 & 4 are highlighted, the UPPER split point can be set.

Key split ranges for these split points are as shown below;

UPPER SPLIT POINT = D0 ~ C9 (chromatic)
MIDDLE SPLIT POINT = C#0 ~ B8
LOWER SPLIT POINT = C0 ~ Bb 8

If the parameters in this function are accessed when a KEY ASSIGN configuration has been selected which does not contain any keyboard split point — when patches are "layered" without being split — the display appears as in FIG-D.

To input a split point, you must first exit this function (SPLIT POINT) by pressing the COMBINATION key or the EDIT key. Next, choose a KEY ASSIGN configuration which contains a keyboard split point by pressing the VALUE keys.

13 VEL SPLIT

	Parameters	O/S	EDIT—PAGE—CURSOR—VALUE

RANGE = 1 ~ 127

			Domain			
		Mode	Normal	Combination 4 mix/split	8 mix	Multi channel
ion 8 mix	Multi channel	K		PATCH(Layered)	COUPLE	
—		G	—	PATCH(Layered)	COUPLE	—
—	—	W		PATCH(Layered)	COUPLE	
—						

```
SPLIT POINT
CK KEYASSIGN!
```
/D

```
13 V-SP █+2+3+4
   RANGE= 1-127
```
/A

```
13 V-SP  1+█+3+4
   RANGE= 1-127
```
/B

```
13 V-SP █234█678
   RANGE= 1-127
```
/C

```
13 VEL SPLIT
CHECK KEYASSIGN!
```
/D

s are as shown below;

(chromatic)
B8
8

: accessed when a KEY
lected which does not
— when patches are
e display appears as in

first exit this function
MP██TION key or
Y A█   N configura-
it point by pressing the

The parameters in this function are used to specify VZ-8M "velocity split" characteristics in the Combination Mode. Depending on KEY ASSIGN specifications, between one and four velocity split "ranges" are assigned using these parameters.

By assigning maximum and minimum "velocity" values (1 ~ 127) to each patch in a combined sound, you can create a "velocity range" wherein the specified patch will sound. If velocity message is transmitted at a velocity level that is outside this range, the specified patch will not sound.

Note that this function differs from the "KEYBOARD SPLIT" function, as VEL SPLIT can only be used with KEY ASSIGN configurations containing "layered" (+) patches (such as "1+2" or "1/3+4"), as opposed to KEY ASSIGN configurations containing only "split" points (such as "1/3" or "1/2/3/4").

If the parameters in this function are accessed when a KEY ASSIGN configuration has been selected which contains only keyboard split points — without any "layered" patches, the display appears as in FIG-D.

If you want to use velocity split and no layered patches are specified in the present KEY ASSIGN configuration, you must first exit this function (VEL SPLIT) by pressing the COMBINATION key or the EDIT key. Next, choose a KEY ASSIGN configuration which contains layered patches (for example, "1 + 2") by pressing the VALUE keys.

EFFECT

COMBINATION

· **Parameters**		**O/S**	EDIT—PAGE—CURSOR—VALUE			
			Domain			
INVERSE = ON / OFF		Mode	Normal	Combination		Multi channel
				4 mix/split 8 mix		
		K		PATCH(Layered)	COUPLE	
		G	—	PATCH(Layered)	COUPLE	—
		W		PATCH(Layered)	COUPLE	

```
14 VEL   ■+2/3+4      14 VEL   ■234■678
   INVERSE=ON            INVERSE=OFF
```
A   B

INVERSE = OFF / INVERSE = ON / Vol / Velocity
C

```
14 VEL INVERSE
CHECK KEYASSIGN!
```
D

```
15 POSX
   X-FADE
```

The parameters in this function let you choose whether you want to literally "invert" the velocity level curves created in VOICE-12 for each patch in a combined sound. Depending on KEY ASSIGN specifications, between two and four toggles are contained in this function, which turn the INVERSE function On or Off for each patch in the combined sound.

By "inverting" the VELOCITY LEVEL curve for any given patch, the velocity characteristics are actually "inverted" so that modules in a patch previously "triggered" only by receiving a fairly high velocity rate message (strong external keyboard attack) are turned OFF by a high velocity rate. In other words, the velocity characteristics for the selected patch is virtually reversed, as illustrated in FIG-C.

Note that this function is similar to the VEL SPLIT function, as it can only be used with KEY ASSIGN configurations containing "layered" (+) patches (such as "1 + 2" or "1/3 + 4"), as opposed to KEY ASSIGN configurations containing only "split" points (such as "1/3" or "1/2/3/4").

If the parameters in this function are accessed when a KEY ASSIGN configuration has been selected which contains only keyboard split points — without any "layered" patches, the display appears as in FIG-D.

If you want to use the VEL INVERSE function, you must first exit this function (VEL INVERSE) by pressing the COMBINATION key or the EDIT key. Next, choose a KEY ASSIGN configuration which contains layered patches by pressing the VALUE keys.

NOTE: In the cases listed below, velocity curves of each module are not inverted — even when the INVERSE function is set to ON;
— When the INT LINE is set to PHASE for any particular LINE.
— When EXT PHASE is specified for a particular LINE.

The POS C
the Combina
ration conta
as "1 + 2",

This functio
tain point o
determining
in the patche
sition" or "

As FIG-E illu
one patch be
becomes soft
ates a "fadin
point — one
up or down

This function
— an EFFEC
FADE effect
CROSS POS
cations, eithe

Initially, you
you've set th
to the actuall
figuration fea
example) is s
this case, ther
bers 1 and
"POINT" pa
point. For th
that "2" and
are highlighte
Notice that w
sor flashes bel
selected positio
it again to se
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POS CROSSFADE

Parameters	O/S	EDIT — PAGE — CURSOR — VALUE			

X – FADE = ON / OFF
POS = C0 ~ C9

		Domain			
Mode	Normal	Combination 4 mix/split	8 mix	Multi channel
K		PATCH(Layered)	—	
G	—	PATCH(Layered)	—	—
W		PATCH(Layered)	—	

```
15 POSX  1+2+3+4        15 POSX  ▮+▮+3+4        15 POSX  1+▮+▮+4        15 POS X-FADE
X-FADE=OFF               POS=B62-F#3             POS=C#4-A4              CHECK KEYASSIGN!
```
/A   /B   /C   /D

The POS CROSSFADE function can only be utilized in the Combination Mode, when a KEY ASSIGN configuration containing only "layered" patches is selected (such as "1+2", "3+4" and "1+2+3+4").

This function is used to "fade" together patches at a certain point on the scale (known as the "cross point"), by determining the range on the external keyboard that wherein the patches will fade together (known as the "cross position" or "POS").

As FIG-E illustrates, in the cross position range (aaa-bbb), one patch becomes progressively more audible, as the other becomes softer and gradually fades out entirely. This creates a "fading" effect, so that there is no audible cutoff point — one patch simply fades into the other as you move up or down the external keyboard.

This function, then, features two basic types of parameters — an EFFECT toggle, which is used to turn the CROSS-FADE effect ON or OFF, and POS range settings for each CROSS POSITION. Depending on KEY ASSIGN specifications, either one or three POS ranges are set (FIG-B).

Initially, you must set the X-FADE ON/OFF toggle. Once you've set this toggle, press the cursor [▶] key to move to the actually POS settings. When a KEY ASSIGN configuration featuring only layered patches (1+2+3+4, for example) is selected, the display appears as in FIG-B. In this case, there are three cross points. Notice that area numbers 1 and 2 are highlighted. This indicates that the "POINT" parameter is to be set for the "LOWER" cross point. For the MIDDLE cross point, move the cursor so that "2" and "3" are highlighted. Likewise, when 3 & 4 are highlighted, the UPPER cross point can be set. Notice that when the cursor [▶] is first pressed, the cursor flashes below the lower limit of the cross range for the selected position ([1] + [2]). After setting this position, press it again to set the upper limit of cross range. Next, simply press the cursor [▶] key once again to move to the next cross position.

FIG-E
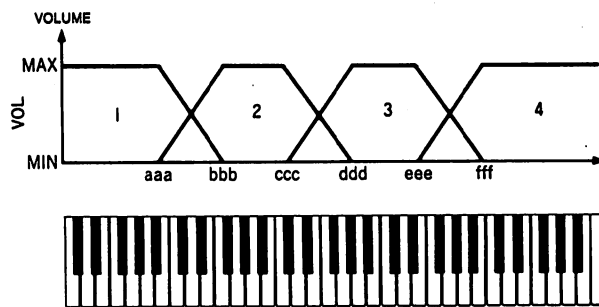
If the parameters in this function are accessed when a KEY ASSIGN configuration has been selected which contains keyboard split points or 8 patches mix — as opposed to only "layered" patches, the display appears as in FIG-D.

If you want to use the POSITIONAL CROSSFADE function and a split KEY ASSIGN configuration is selected, you must first exit this function (POSITIONAL CROSS-FADE) by pressing the COMBINATION key or the EDIT key. Next, choose a KEY ASSIGN configuration which contains only layered patches by pressing the VALUE keys.

EFFECT

Parameters	O/S	EDIT—PAGE—CURSOR—VALUE			
		Domain			
DELAY TRIG = 0~99	Mode	Normal	**Combination**		Multi channel
			4 mix/split	8 mix	
	K		PATCH(Layered)	—	
	G	—	PATCH(Layered)	—	—
	W		PATCH(Layered)	—	

```
16 DLY  █+2+3+4
 DELAY TRIG= 0
```
/A

```
16 DELAY TRIG
CHECK KEYASSIGN!
```
/B

```
17 T
   TO
```

The delay trigger function can be used to "delay" the NOTE ON message for any layered patch(es) in a combined sound. Delay time is increased as the DELAY parameter value is raised. At a value of "0", the patch is sounded immediately after Note On message received, while at a value of "99", there is a long delay before the patch sounds.

Note that this function can only be used with KEY ASSIGN configurations containing "layered" (+) patches (such as "1+2" or "1/3+4"), as opposed to KEY ASSIGN configurations containing only "split" points (such as "1/3" or "1/2/3/4") and 8 patch-mix ("1 2 3 4 5 6 7 8").

If the parameters in this function are accessed when a KEY ASSIGN configuration has been selected which contains only keyboard split points — without any "layered" patches, the display appears as in FIG-B.

If you want to use the DELAY TRIGGER function and a KEY assign function is selected which contains only split patches (such as 1/3), or when an 8-patch mix is selected, you must first exit this function by pressing the COMBINATION key or the EDIT key. Next, choose a KEY ASSIGN configuration which contains layered patches by pressing the VALUE keys.

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COMBINATION

Parameters	O/S	EDIT—PAGE—CURSOR—VALUE			
		Domain			
TOTAL = ON/OFF	Mode	Normal	Combination 4 mix/split 8 mix		Multi channel
	K		PATCH(Layered)	GLOBAL	
	G	—	PATCH(Layered)	GLOBAL	—
	W		PATCH(Layered)	GLOBAL	

EFFECT

17 TOTAL VIBRATO TOTAL=OFF /A	17 TOTAL VIBRATO . MULTI=ON /B	17 TOTAL VIBRATO TOTAL=ON /C	17 TOTAL VIBRATO CHECK KEYASSIGN! /D

The TOTAL VIBRATO function is a toggle switch which can be used to turn the TOTAL VIBRATO function ON or OFF, and contains parameters related to total-vibrato control.

When this function is turned OFF, patches are affected by the data programmed individually in VOICE-07 (VIBRATO function). When set to ON, COMBI sounds are affected globally — regardless of independent VOICE-07 settings.

There are five basic parameters within this function — WAVE, DEPTH, RATE, DELAY and MULTI. These correspond to the parameters in VOICE-07 (VIBRATO function). For details on operations, see page 32.

Note that when an 8-patch MIX is selected with the KEY ASSIGN function, the TOTAL parameter is automatically turned ON.

If the parameters in this function are accessed when a KEY ASSIGN configuration has been selected which contains only keyboard split points — without any "layered" patches, the display appears as in FIG-D.

If you want to use the TOTAL VIBRATO function when this display appears, you must first exit this function (TOTAL VIBRATO) by pressing the COMBINATION key or the EDIT key. Next, choose a KEY ASSIGN configuration which contains layered patches ("1 + 2", for example) by pressing the VALUE key.

COMBINATION

EFFECT

Parameters	O/S	EDIT—PAGE—CURSOR—VALUE			
		Domain			
INVERSE = ON / OFF	Mode	Normal	Combination		Multi channel
			4 mix/split	8 mix	
	K		PATCH(Layered)	PATCH	
	G	—	PATCH(Layered)	PATCH	—
	W		PATCH(Layered)	PATCH	

A

```
18 VIB  █+2/3+4
   INVERSE=ON
```

B

(WAVE = TRIANGLE) INVERSE = ON INVERSE = OFF

```
18 VIB  █2345678
   INVERSE=ON
```

C

```
18 VIB INVERSE
CHECK KEYASSIGN!
```

D

The parameters in this function let you choose whether you want to literally "invert" the phase of the vibrato effect for each patch in a combined sound. Depending on KEY ASSIGN specifications, between two, four and eight toggles are contained in this function, which turn the INVERSE function On or Off for each patch in the combined sound.

By "inverting" the vibrato phase for any given patch, the vibrato characteristics are actually reversed, so the vibrato "cycle" becomes "inverted." In other words, by inverting the vibrato phase, the pitch will rise in the part of the vibrato cycle where it would normally fall, and fall where it would normally rise, as illustrated in FIG-B.

COMBINATION

As with the DELAY TRIGGER function, this function can only be used with KEY ASSIGN configurations containing "layered" (+) patches (such as "1+2" or "1/3+4"), as opposed to KEY ASSIGN configurations containing only "split" points (such as "1/3" or "1/2/3/4").

Note that this function can, however, be used when an 8-patch mix configuration (1+2+3+4+5+6+7+8) is selected. (FIG-C)

If the parameters in this function are accessed when a KEY ASSIGN configuration has been selected which contains only keyboard split points — without any "layered" patches, the display appears as in FIG-D.

If you want to use the VIB INVERSE function when this display appears, you must first exit this function (VIB INVERSE) by pressing the COMBINATION key or the EDIT key. Next, choose a KEY ASSIGN configuration which contains layered patches ("1+2", for example) by pressing the VALUE keys.

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	Parameters	O/S	EDIT—PAGE—CURSOR—VALUE

		Domain			
		Mode	Normal	Combination	Multi channel
				4 mix/split 8 mix	
Multi channel	TOTAL = ON/OFF	K		PATCH(Layered) GLOBAL	
		G	—	PATCH(Layered) GLOBAL	—
—		W		PATCH(Layered) GLOBAL	

```
┌─────────────────────┐   ┌─────────────────────┐   ┌─────────────────────┐
│19 TOTAL TREMOLO     │   │19 TOTAL TREMOLO     │   │19 TOTAL TREMOLO     │
│ TOTAL=ON            │   │    MULTI=OFF        │   │CHECK KEYASSIGN!     │
└─────────────────────┘   └─────────────────────┘   └─────────────────────┘
        A                         B                         C
```

(ERSE ... SSIGN!) D

The TOTAL TREMOLO function is a toggle switch which can be used to turn the TOTAL TREMOLO function ON or OFF, and contains parameters related to total-vibrato control.

When this function is turned OFF, patches are affected by the data programmed individually in VOICE-13 (TREMOLO function). When set to ON, COMBI sounds are affected globally — regardless of independent VOICE-13 settings.

There are five basic parameters within this function — WAVE, DEPTH, RATE, DELAY and MULTI. These correspond to the parameters in VOICE-13 (TREMOLO function). For details on operations, see page 38.

Note that when an 8-patch MIX is selected with the KEY ASSIGN function, the TOTAL parameter is automatically turned ON.

If the parameters in this function are accessed when a KEY ASSIGN configuration has been selected which contains only keyboard split points — without any "layered" patches, the display appears as in FIG-C.

If you want to use the TOTAL TREMOLO function when this display appears, you must first exit this function (TOTAL TREMOLO) by pressing the COMBINATION key or the EDIT key. Next, choose a KEY ASSIGN configuration which contains layered patches ("1 + 2", for example) by pressing the VALUE key.

EFFECT

COMBINATION

EFFECT

COMBINATION

Parameters	O/S	EDIT—PAGE—CURSOR—VALUE			
		Domain			
INVERSE = ON / OFF	Mode	Normal	Combination 4 mix/split 8 mix		Multi channel
	K		PATCH(Layered) : PATCH		
	G	—	PATCH(Layered) : PATCH		—
	W		PATCH(Layered) : PATCH		

```
20 TREM  1+2/█+4
    INVERSE=ON
```
A
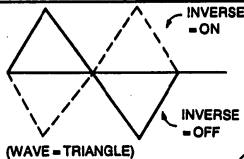
INVERSE =ON
INVERSE =OFF
(WAVE = TRIANGLE)
B

```
20 TREM █2345678
    INVERSE=OFF
```
C

```
20 TREM INVERSE
  CHECK KEYASSIGN!
```
D

21 CO[
   COP'

The parameters in this function let you choose whether you want to literally "invert" the phase of the tremolo effect for each patch in a combined sound. Depending on KEY ASSIGN specifications, between two, four and eight toggles are contained in this function, which turn the INVERSE function On or Off for each patch in the combined sound.

By "inverting" the tremolo phase for any given patch, the tremolo characteristics are actually reversed, so the tremolo "cycle" becomes "inverted." In other words, by inverting the tremolo phase, the volume will rise in the part of the tremolo cycle where it would normally fall, and fall where it would normally rise, as illustrated in FIG-B.

Note that this function is similar to the VIB INVERSE function, as it can only be used with KEY ASSIGN configurations containing "layered" (+) patches (such as "1+2" or "1/3+4"), as opposed to KEY ASSIGN configurations containing only "split" points (such as "1/3" or "1/2/3/4"). Note that this function can, however, be used when an 8-patch mix configuration (1+2+3+4+5+6+7+8) is selected. (FIG-C)

If the parameters in this function are accessed when a KEY ASSIGN configuration has been selected which contains only keyboard split points — without any "layered" patches, the display appears as in FIG-D.

If you want to use the TREMOLO INVERSE function and this display appears, you must first exit this function by pressing the COMBINATION key or the EDIT key. Next, choose a KEY ASSIGN configuration which contains layered patches by pressing the VALUE keys.

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Parameters	O/S	EDIT—PAGE—CURSOR—VALUE				
		Domain				
		Mode	Normal	Combination 4 mix/split 8 mix		Multi channel
COPY = 1~8→1~8		K		PATCH		
		G	—	PATCH		—
		W		PATCH		

```
 COMBI COPY          21 COMBI COPY        22 COMBI COPY
 COPY ▋→2               COPY 1→▋ (YES)        COPY·1→2  OK!
       /D                        /A                   /B                   /C
```

The COMBI COPY function can be used to "copy" the EFFECT menu data of one patch in a combination to another patch position.

For example, the patch number and effect data (EFFECT-01~20) assigned to the Patch 1 position can be copied into any of the 3 or 7 remaining positions by using this function.

Copying can be executed by simply specifying the "source" patch number (FIG-A), and the patch number of the "destination" patch by moving the cursor to the right and pressing a PROG NO key (A1~H8) (FIG-B). After this, just press the YES key (FIG-C).

Data which is copied includes the source patch timbre, and all effect data specified using EFFECT menu functions 01 through 20, with the exception of 8, 9, 12, 15, 17 and 19.

The following data is copied using COMBI COPY function (universal for K, G and W performance modes).

MENU \ KEY ASSIGN	1~4	including 5~8
00 MIDI CH	—	—
01 PORTAMENTO/SOLO	O	—
02 PITCH BEND	O	—
03 AFTER TOUCH	O	—
04 DEF CONTROL	O	O
05 MOD WHEEL	O	—
06 FOOT VR	O	—
07 FOOT SW	O	—
08 VEL TABLE SELECT	—	—
09 PAN	—	—
10 LEVEL	O	O
11 PITCH	O	O
12 SPLIT POINT	—	—
13 VEL SPLIT	O	—
14 VEL INV	O	—
15 POS X FADE	—	—
16 DELAY TRIG	O	—
17 TOTAL VIBRATO	—	—
18 VIB INV	O	O
19 TOTAL TREMOLO	—	—
20 TREMOLO INV	O	O
Program number	O	O

Setting example

1 → 3	2 → 8
4 → 2	5 → 7
	5 → 4

"O" indicates that data is copied.

EFFECT

COMBINATION

OPE EFFECT

Parameters	O/S	EDIT — PAGE — CURSOR — VALUE

		Domain	
Alphabet = A ~ Z Numeral = 0 ~ 9 Marks = ". ", " – ", " / "		Mode	Operation memory
		Keyboard	
		Guitar	1 Set-up
		Wind	

```
00 OP NAME  INT
A-1:
```
A

```
01 OP TU
   TUNE=+
```

This function is used to assign a name to the VZ-8M's Operation Memories.

The names you choose may contain both letters and numbers, and may be up to 12 characters in length.

Character input is carried out using the VALUE keys, with alphanumeric characters and marks being displayed cyclically by holding either VALUE key down. The procedure is the same as for VOICE-20 ("VOICE NAME").

Note that this function can only be accessed when OPERATION MEMORY is selected.

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OPERATION MEMORY

01	OPERATION TUNE	Related Functions TOTAL—00

· Parameters	O/S	EDIT—PAGE—CURSOR—VALUE

Parameters		Domain	
TUNE= +/− (POLARITY), 0~5 (OCTAVE), 0~11 (NOTE), 0~63 (FINE)		Mode	Operation memory
		Keyboard	
		Guitar	1 Set-up
		Wind	

```
01 OP TUNE
  TUNE=+1, 0, 7
```
/A\

The parameters in this function can be used to set or alter the pitch of each operation memory.
Naturally, this function can only be accessed after entering the OPERATION MEMORY Mode.

By setting this parameter, it becomes possible to perform using the pitch set for the selected operation memory.

The TUNE parameter consists of 4 basic data items. First of all, the cursor flashes under the POLARITY parameter. To set the other parameters, simply move the cursor.

The POLARITY parameter is used to specify whether pitch will be raised (+) or lowered (−).

The OCTAVE parameter is used to raise or lower the pitch by a maximum of 5 octaves, in 1-octave increments.

The NOTE parameter is used to raise or lower the pitch of the selected AREA by a maximum of 1100 cents, in 100-cent increments.

The FINE parameter is used to make "fine tuning" adjustments in 1.6-cent increments (approximate).

The actual pitch used in performance is raised or lowered according to the values set using this function, using the pitch set in the MASTER TUNE function (TOTAL CONTROL-00) as a basis.

OPE EFFECT

OPERATION MEMORY

Parameters	O/S	EDIT—PAGE—CURSOR—VALUE

$$TUNE = -64 \sim 0 \sim +64$$
$$TRANSPOSE = G \sim F^{\#}$$

		Domain				
Mode	Normal	Combination 4 mix/split	8 mix	Operation memory	Multi channel	
K						
G			GLOBAL			
W						

```
00 MASTER TUNE
   TUNE=  0
```
/A

```
01 TRANSPOSE=C
```
/B

```
01 TRANSPOSE=F#
```
/C

```
02 MEM
   INTE
```

The parameters in this function can be used to set the overall "tuning", as well as alter the standard key by using a built-in TRANSPOSE function.

The TUNE parameter allows you to set the standard A4 tuning within a range of 417.2 and 468.3 Hz (+ / – 100 cents from standard), in approximately 1.6-cent increments. (This setting is approximate — use it only as a guide.) The initialized value for this parameter is "0". (FIG-A)

The TUNE parameter can be reset to its initialized value ("0") by pressing both VALUE keys simultaneously.

The TRANSPOSE parameter lets you "transpose" the standard pitch frequency to other key positions. In other words, the pitch that would normally correspond to C can be "shifted" chromatically to another key, within a range of G to F#. This effectually transposes the overall performance key.

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TOTAL

NORMAL

COMBINATION

OPERATION MEMORY

MULTI CHANNEL

Parameters	O/S	EDIT—PAGE—CURSOR—VALUE

INTERNAL = ON / OFF
CARD = ON / OFF

		Domain			
Mode	Normal	Combination 4 mix/split 8 mix		Operation memory	Multi channel
K					
G		GLOBAL			
W					

```
02 MEM PROTECT
   INTERNAL=ON
```
A

```
02 MEM PROTECT
   CARD=ON
```
B

The parameters in this function can be used to protect the memory, so that data cannot be altered or erased.

The INTERNAL parameter features a toggle which can be turned ON or OFF. When set to ON, the contents of the internal and operation memories will be protected.

The CARD parameter also features a toggle which can be turned ON or OFF. When set to ON, the contents of sound and operation memories on the RAM cards will be protected.

Both parameters are automatically set to "ON" each time the unit's power is turned ON.

TOTAL

NORMAL COMBINATION OPERATION MEMORY MULTI CHANNEL

Parameters	O/S	EDIT—PAGE—CURSOR—VALUE				
SAVE/LOAD = SAVE/LOAD CARD/MIDI = CARD 1/CARD 2/MIDI DATA = VOICE/OPMEM/VC + OP/FULL		**Domain**				
		Mode	Normal	Combination 4 mix/split 8 mix	Operation memory	Multi channel
		K		GLOBAL		
		G				
		W				

```
03 SAVE/LOAD
   SAVE/LOAD=SAVE
```
/A

```
03 SAVE
   CARD/MIDI=CARD1
```
/B

```
03 SAVE
   DATA=FULL
```
/C

```
03
   EXECUTE? (YES)
```
/D

```
03 SAVE
   PUSH YES KEY!
```
/E

```
---PROTECT ON---
→ TOTAL CONT 02!
```
/F

```
--MIDI DISABLE--
→ TOTAL CONT 05!
```
/G

```
--TRANS ERROR---
  CHECK SYSTEM!
```
/H

TOTAL

NORMAL / COMBINATION / OPERATION MEMORY / MULTI CHANNEL

This function is essentially a "utility" function, which is used to control data SAVE and LOAD operations.

The SAVE/LOAD parameter is used to specify the type of operation you want to perform. When SAVE is selected, the onboard memory data will be "saved" to an external memory medium, while when LOAD is selected, external data will be "loaded" into the onboard memory.

The CARD 1/CARD 2/MIDI parameter lets you choose the medium to/from which you will SAVE or LOAD data.

When CARD is selected, data will either be saved to, or loaded from a RAM/ROM card inserted in the card slot. If you want to SAVE the data, be sure to also set the CARD parameter to "CARD 1". When MIDI is selected, data will be transferred to or from another VZ series synthesizer.
When using a new RAM card, you must first format it (see TOTAL-06).

The DATA parameter lets you choose the type or combination of data which will be saved or loaded. You can choose from three different settings — VOICE, OP MEM or VC + OP. Note, however, that when using two VZ units connected by MIDI, this setting must be the same for both units (except when executing SAVE or LOAD).

When "VOICE" is selected, all 64 internal sounds can be transferred to or from the internal memory. When "OP MEM" is selected, only data from the 64 operation memories can be transferred to or from the unit.

When "VC + OP" is selected, data from both the 64 internal sounds and the 64 operation memories can be transferred.

When "FULL" is selected, data from the "VC + OP" parameter and TOTAL CONTROL menu functions 00, 01, 04 and 05 can be transferred to or from the unit.

Once you've specified the operation you want to perform, press the YES key. Respond to the menu prompt by pressing the YES key once again.

If you want to abort data transmission, simply press the cursor or NO (VALUE ▼) key of the transmitting or receiving device.

Note that when an Operation Memory featuring INTERNAL sounds is SAVED to a card, the sound specification on the display automatically changes to "CARD" for the formerly INTERNAL sounds.

Note that if the memory protect is set to ON (TOTAL-02), it will be impossible to LOAD data. (FIG-F)
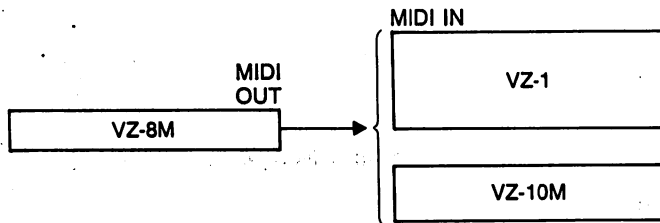
Note that if MIDI Exclusive is disabled (TOTAL-04) or basic channels do not match, MIDI SAVE/LOAD will be impossible.

If data is not transferred successfully for some reason, MIDI SAVE/LOAD will be impossible and display appears as in FIG-H.

If an ERROR message appears, operations can be reset by pressing the MODE, PAGE or CURSOR keys.

VZ-8M Compatibility with VZ-1/VZ-10M

When transferring data between the VZ-8M and the VZ-1 or VZ-10M with the VZ-8M as MASTER, data compatibility is as follows;
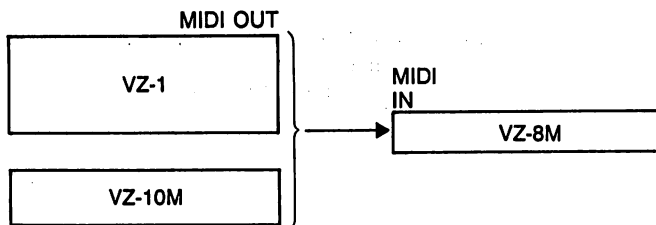
```
                                              MIDI IN
                              MIDI        ┌──────────────────┐
                              OUT         │                  │
            ┌──────────────┐              │      VZ-1        │
            │    VZ-8M     │─────────►    │                  │
            └──────────────┘         {    └──────────────────┘
                                          ┌──────────────────┐
                                          │     VZ-10M       │
                                          └──────────────────┘
```

DATA — VOICE: Totally compatible operation
OP MEM: Compatible within limits of VZ-1 and VZ-10M menu functions.
VC + OP: Treated separately, as listed above.
NOTE: Never attempt to transfer operation memory data which has been sent to the VZ-1 back to the VZ-10M.

When transferring data between the VZ-8M and the VZ-1 or VZ-10M with the VZ-8M as SLAVE, data compatibility is as follows;

```
            MIDI OUT
   ┌──────────────────┐
   │                  │
   │      VZ-1        │    }    MIDI
   │                  │         IN
   └──────────────────┘ ──────►  ┌──────────────────┐
   ┌──────────────────┐          │     VZ-8M        │
   │     VZ-10M       │          └──────────────────┘
   └──────────────────┘
```

DATA — VOICE: Totally compatible operation
OP MEM: Compatible within limits of VZ-1 and VZ-10M menu functions. Functions only available on VZ-8M are set at initialized values.
VC + OP: Treated separately, as listed above.

NOTE: The above is true for data saved/loaded using RAM cards as well.

Parameters	O/S	EDIT—PAGE—CURSOR—VALUE

			Domain			
CHANNEL = 1~16 TOTAL = ON/OFF		Mode	Normal	Combination 4 mix/split 8 mix	Operation memory	Multi channel
		K				
		G	GLOBAL			
		W				

```
04 MIDI CHANNEL
   CHANNEL= 1
```
/A

```
04 MIDI CHANNEL
   TOTAL=OFF
```
/B

```
05 MI
   PRO
```

TOTAL

The MIDI CHANNEL parameter is used to specify the MIDI channel on which the VZ will receive and transmit MIDI messages.

It is possible to program separate MIDI channels for each operational mode (NORMAL, COMBI, OP MEM and MULTI CH). This is accomplished by first selecting the desired mode, and then setting this parameter.

Notice that there are two parameters the "CHANNEL" parameter and the "TOTAL" parameter.

When the TOTAL parameter is set to "ON", the MIDI receive channel in all modes are affected by the channel set in the "CHANNEL" parameter, with the exception of the MULTI CH mode or operation memories using the MULTI CH mode.
To switch between the two parameters, use the cursor keys. The value keys can be used to raise or lower the CHANNEL number and change the TOTAL parameter setting.

NORMAL

COMBINATION

OPERATION MEMORY

MULTI CHANNEL

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0~63: T
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DIS: Pro

The EXC
not sound
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The VOLI
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In additio
set to DIS

Parameters	O/S	EDIT — PAGE — CURSOR — VALUE

PROGRAM = 0 – 127 / 0 – 63 / DIS
EXCLUSIVE = ENA / DIS
DEF CONTROL = OFF / 12 ~ 31
VOLUME = ENA / DIS
OVERFLOW = NORMAL 1 ~ 8

		Domain			
Mode	Normal	Combination 4 mix/split	8 mix	Operation memory	Multi channel
K					
G		GLOBAL			
W					

```
05 MIDI DATA
   PROGRAM=0-63
```
A

```
05 MIDI DATA
   OVERFLOW=2
```
B

The parameters in this function are used to specify a variety of MIDI-related data (with the exception of the MIDI Channel).

The PROGRAM NO parameter lets you choose the MIDI PROGRAM CHANGE message number. Note that messages are distributed as shown in the chart below. You can choose from DIS, 0~63, and 0~127 settings with the VALUE controls.

0~63: The unit receives messages 0~63 in the selected memory area (PRESET 1, PRESET 2, INTERNAL, CARD 1 or CARD 2).

0~127: The unit receives messages 0~63 in INTERNAL areas A1 through H8. 64~127 are received as CARD 1. However, if INTERNAL is selected on the receiving unit, 64~127 are received in the memory area which is selected in MIDI EXCLUSIVE function.
When power is turned ON, memory area is set to CARD 1 (set to "INTERNAL" when no card is inserted).

DIS: Program data is not received.

The EXCLUSIVE parameter lets you choose whether or not sound or operation data or multi-channel mode data is transmitted / received according to MIDI System Exclusive messages. When it is set to ENA (enable), MIDI communication can be controlled through these messages.

The DEF CONTROL (control number) parameter is used to specify the Control Change number of messages controlled by MIDI Control change No. 12 ~ 31 messages (see EFFECT-05 "DEF CONTROL"). When set to OFF, MIDI OUT / IN messages are not transmitted.

The VOLUME parameter can be used to specify whether or not the unit will transmit and receive MIDI Volume messages (control change 07). When set to ENA (enable), the Master volume level can be controlled by MIDI messages from an external device. When set to DIS (disable), the Master volume is independent of external control.
In addition, MIDI Volume messages are not output when set to DIS.

A Channel on which Master volume data is received in respective performance modes is shown below.

performance mode	channel received
K/W mode	Channel which receives NOTE ON.
G mode	Primary channel which receives NOTE ON.
MULTI CH mode (including Operation memory with MULTI CH)	Channel set in TOTAL-04 "MIDI CH" function.

Overflow Mode — NORMAL 1 ~ 8
The overflow mode allows programming so that no sound is produced until a specific MIDI IN NOTE ON message number is received. When set to NORMAL, sound is produced from the reception of the first NOTE ON message, with the last note played having priority.
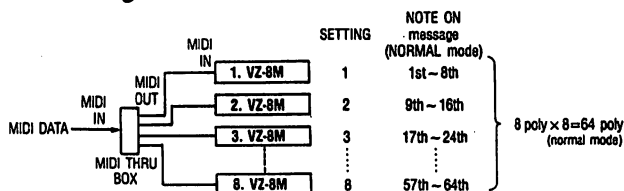When the OVERFLOW MODE is set to "1", sound is also produced from the reception of the first NOTE ON message, with the note previously played having priority.
When set to "2", sound is produced only from the reception of the first NOTE ON message which exceeds the polyphonic limit of the device presently sounding.
When set to "3", sound is produced only from the reception of the first NOTE ON message which exceeds a value which is twice the polyphonic limit of the device presently sounding.
In this way, multiple VZ-8M's can be linked to create up to 64-note polyphony, with the first VZ-8M covering NOTE ON messages 1 through 8, the second covering messages 9 through 16, etc., as shown below.
NOTE: The settings (MODE, operation data and voice data etc.) must be the same for all VZ-8M units when used in this configuration.

	SETTING	NOTE ON message (NORMAL mode)	
1. VZ-8M	1	1st ~ 8th	
2. VZ-8M	2	9th ~ 16th	
3. VZ-8M	3	17th ~ 24th	8 poly × 8 = 64 poly (normal mode)
8. VZ-8M	8	57th ~ 64th	

MIDI IN
MIDI OUT
MIDI DATA — IN
MIDI THRU BOX

TOTAL

NORMAL

COMBINATION

OPERATION MEMORY

MULTI CHANNEL

Parameters	O/S	EDIT—PAGE—CURSOR—VALUE

		Domain				
EXECUTE? (YES) PUSH YES KEY		Mode	Normal	Combination 4 mix/split 8 mix	Operation memory	Multi channel
		K				
		G		GLOBAL		
		W				

```
06 CARD FORMAT
  EXECUTE? (YES)
```
/A

```
---NOT READY----
  INSERT CARD!
```
/B

```
---PROTECT ON---
→ TOTAL CONT 02!
```
/C

```
---NOT READY----
  CHECK CARD!
```
/D

TOTAL

NORMAL · COMBINATION · OPERATION MEMORY · MULTI CHANNEL

This is a utility function which is used to "FORMAT" the accessory RAM card. Before you can store information in RAM cards, you must "initialize" them into a format that the VZ understands.

By executing the FORMAT command, all former contents are erased from the card, and it is prepared to receive fresh sound data. When the RAM card is formatted, it is automatically programmed with the 64 preset (1) patches and 64 preset (1) operation memories.

After inserting the card you want to format in to the card slot, you simply access this function's EXECUTE parameter. A "YES?" prompt will appear on the display (FIG-A). To execute formatting, press the YES key.

If you try to execute formatting without first inserting a RAM card, the display will appear as in FIG-B. First insert the card and try again!

If you try to execute formatting when the memory protect function (TOTAL-02) is ON, the display will appear as in FIG-C. First turn this function OFF, and try again!

If you try to execute formatting when an optional ROM (not "RAM" but "ROM") card is inserted in the card slot, the display will appear as in FIG-D. There is no need to format ROM cards.

To abort execution of this function, press the MODE key or PAGE key.

To select sounds for performance in the normal mode

①Press the NORMAL mode key.

②If you want to choose a **PRESET** or an **INTERNAL** patch, select by using the SHIFT key.

If you want to choose a **CARD** patch, first insert the RAM or ROM card in the card slot and then select by using the SHIFT key.

Each bank holds up to 64 patches and 64 operation memories.

When using a new RAM card, you must first format it (see TOTAL-06). A formatted RAM card is capable of storing up to 64 patches and 64 operation memories.

③Select the patch you want to play.
In order to change the BANK, first press the BANK key (indicator lights). Next press the PROG NO key corresponding to the BANK "letter" you want to choose. (For example, the "B2" key corresponds to the "B" bank.) Notice that the BANK key indicator goes out as soon as you select a bank.
Finally, select the voice number by pressing a PROG NO key once again. In this case, the keys correspond to the numbers digit. (For example, the "B2" key would now correspond to voice number "2".)

④Select the performance mode (Keyboard, Guitar or Wind) by pressing the value keys.

To write a single patch to memory

①Select the patch you want to write to memory (preset, internal or card patch or Compare/Recall ON/OFF) and select one of the performance modes (K, G, W).

②Hold down the WRITE key.

The LCD appears as shown at the right, and the INTERNAL/CARD indicators go out. If you release the WRITE key, the LCD will return to its normal status.

If you've used the COMPARE/RECALL function when editing a patch using VOICE PARAMETER menu functions, be sure that the COMPARE/RECALL indicator is ON. If it is OFF, press the COMPARE/RECALL key.
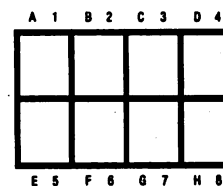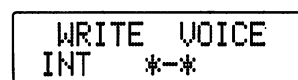
NORMAL

SHIFT

SHIFT

A 1 B 2 C 3 D 4

E 5 F 6 G 7 H 8
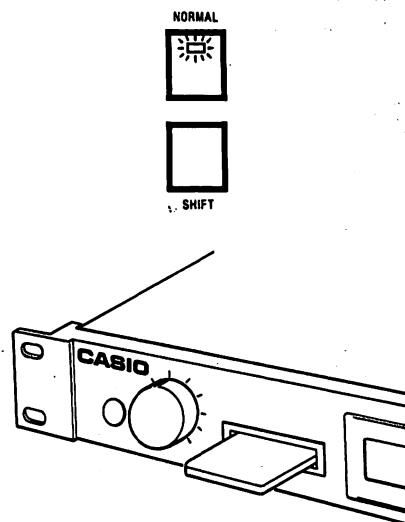
BANK
M ON/OFF

WRITE
COPY/INIT

```
WRITE  VOICE
INT    *-*
```

COMPARE/
RECALL

If the COMPARE/RECALL key is pressed in the NORMAL play sub-mode, the EDIT key indicator also comes ON. If you want to enter the play sub-mode once again to write sounds to memory, you must first press either the NORMAL key or EDIT key so that the EDIT key indicator goes out.

③ While still holding down the WRITE key, select the memory to which you want to write the patch. This is accomplished by pressing the SHIFT key and PROG NO keys. Next, press the YES key.

When using the PROG NO keys, first press a key corresponding to the bank (A1 key for "A" bank, for example) and then press a key corresponding to the voice number (F6 key for "6", for example).

When writing is completed successfully, an "OK!" message appears on the display.

If the memory protect function (TOTAL-02) is ON, writing will be impossible. In this case, you must first turn the protect function OFF by accessing TOTAL-02, reenter the PLAY mode and perform write operations again.

For information on writing patch data to the OPERATION MEMORY, see "Performance/Editing in the Operation Memory Mode."

To edit a single patch
To edit a single patch in the NORMAL mode, simply press the MENU selector (EDIT/PAGE key or TOTAL CONTROL key) corresponding to the function which you want to edit, and access the function. For further data on MENUs, FUNCTIONs and PARAMETERs, refer to " Operating System Controls".

```
WRITE VOICE
INT   A-5 (YES)
```

```
WRITE VOICE
     OK!
```

```
---PROTECT ON---
→ TOTAL CONT 02!
```

```
02 MEM PROTECT
   INTERNAL=OFF
```
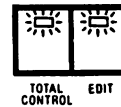
TOTAL EDIT
CONTROL

To specify KEY ASSIGN configurations

①After entering the Combination PLAY sub-mode, you can select from one of 8 different "KEY ASSIGN" configurations by pressing the VALUE keys. When the VALUE keys are pressed, key assign configurations change cyclically.

COMBI-
NATION

```
█+2/3+4 K  PST1
A-1:VZ EP
```

KEY ASSIGN CONFIGURATIONS

( ) .... polyphonic

OUT DISPLAY	MIX OUTPUT	LINE OUT***			
		1		2	
1+2　　*	1+2	1	(4)	2	(4)
3+4　　*	3+4	3	(4)	4	(4)
1+2+3+4　**	1+2+3+4	1+2	(2)	3+4	(2)
1/3	1/3	1	(4)	3	(4)
1/3+4	1/3+4	1	(4)	3+4	(2)
1+2/3	1+2/3	1+2	(2)	3	(4)
1+2/3+4	1+2/3+4	1+2	(2)	3+4	(2)
1/2/3/4	1/2/3/4	1/2	(2/2)	3/4	(2/2)
12345678	1+2+3+4+5+6+7+8	1+2+3+4 (1)		5+6+7+8 (1)	

* Note that when cross-fade is used, each sound features 4-note polyphony and you can use as many as 8 notes simultaneously.
** Note that when cross-fade is used, each sound features 2-note polyphony and you can use as many as 8 notes simultaneously.
*** LINE OUT 1/2 is set for the time being according to EFFECT-09 setting.

To select patches in a combined sound

①After entering the Combination PLAY sub-mode, move the CURSOR to any patch position.

②In order to choose a PRESET or INTERNAL patch, you must first press the SHIFT key.

If you want to choose a CARD patch, first insert the RAM or ROM card in the card slot and then select by using the SHIFT key.

③Select the patch you want to play.

In order to change the BANK, first press the BANK key (indicator lights). Next press the PROG NO key corresponding to the BANK "letter" you want to choose. (For example, the "B2" key corresponds to the "B" bank.) Notice that the BANK key indicator goes out as soon as you select a bank.
Finally, select the voice number by pressing a PROG NO key once again. In this case, the keys correspond to the numbers digit. (For example, the "A1" key would now correspond to voice number "1".)

You can view the patch name by moving the KEY ASSIGN position using the cursor keys.
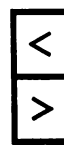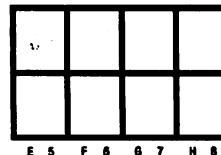
```
1+█/3+4 K  PST1
B-1:R/B BRASS
```

④ Move the cursor to the right to select the performance mode (Keyboard, Guitar or Wind). Performance mode can be selected by pressing the VALUE keys.

To write Combination data to the OPERATION MEMORY

① Select the COMBINATION mode and edit your combined sound until you are satisfied. Then press the COMBINATION key to enter the PLAY sub-mode and select one of the performance modes (K, G, W).

② Hold down the WRITE key.

③ While still holding down the WRITE key, select the memory to which you want to write the patch (the SHIFT key, followed by PROG NO keys), then, press the YES key.

When writing is completed successfully, an "OK!" message appears on the display.

If the memory protect function (TOTAL-02) is ON, writing will be impossible. In this case, you must first turn the protect function OFF by accessing TOTAL-02, reenter the PLAY mode and perform write operations again. Also, it is impossible to write to the Operation Memory when the COMPARE/RECALL function is ON, regardless of the selected key assign setting. For example, if COMPARE/RECALL function is set to ON for key assignment "3 + 4", it will be impossible to write when 1 + 2 is selected as well. If "C/R ON CHECK VOICE NO.!" messages are displayed, be sure to turn the COMPARE/RECALL function OFF for all patches.
Note that writing to the operation memory must be performed in the PLAY sub-mode.

④ Once you've completed writing combined sound data to the operation memory, you can give it a name by using the OPERATION NAME function in OPE EFFECT-00. (After assigning a name, you must re-write the sound again to the Operation Memory.)
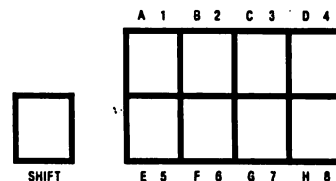
CURSOR

COMBINATION
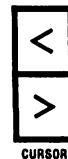
WRITE
COPY/INIT

```
WRITE OPMEM
INT   *-*
```

A 1   B 2   C 3   D 4

SHIFT

E 5   F 6   G 7   H 8

YES/SUS

```
WRITE OPMEM
     OK!
```

```
02 MEM PROTECT
  INTERNAL=OFF
```

```
00 OP NAME  INT
A-8:
```

The OPERA
data from up
internal men

**To copy da
ation Men**
① After ente
the NORM

② Select the
mode (K,

③ Hold dow

④ Press the

⑤ While still
to WRITE
NO key.

When wri
on the dis

⑥ Once you'
memory,
function i
write the
NAME fu
mode.)

**To write o
to another**

① After ente
want to t

The OPERATION MEMORY mode can be used to store effect and sound data from up to 64 sounds (patches or combined sounds) from the VZ-8M internal memory or card memory.

To copy data from the Normal Mode memory into the Operation Memory

①After entering the Normal Mode, select the Play sub-mode by pressing the NORMAL key.

②Select the patch you want to use, as well as the desired performance mode (K, G, or W).

③Hold down the WRITE key. The display appears as shown on the right.

NORMAL

WRITE COPY/INIT

```
WRITE VOICE
INT   *-*
```

④Press the OPERATION MEMORY key.

OPERATION MEMORY

```
WRITE OPMEM
INT   *-*
```

⑤While still holding down the WRITE key, select the patch you want to WRITE by first pressing the SHIFT key, and then pressing the PROG NO key. Finally, press the YES key.

A 1 B 2 C 3 D 4

SHIFT   **E 5 F 6 G 7 H 8**

YES/SUS

When writing is completed successfully, an "OK !" message appears on the display.

```
WRITE OPMEM
      OK!
```

⑥Once you've completed writing combined sound data to the operation memory, you can give it a name by using the OPERATION NAME function in OPE EFFECT-00. (After assigning a name, you must re-write the sound again to the Operation Memory. The OPERATION NAME function can only be set while in the OPERATION MEMORY mode.)

```
00 OP NAME  INT
A-8:
```

To write operation memory data from one operation memory to another

①After entering the Operation Memory Mode, select the operation you want to transfer by pressing the BANK key and a PROG NO key.

A 1 B 2 C 3 D 4

BANK M ON/OFF   **E 5 F 6 G 7 H 8**

②Hold down the WRITE key.

③Select the operation memory you want to transfer the selected operation memory to by pressing the PROG NO keys, then, press the YES key.

When writing is completed successfully, an "OK !" message appears on the display.

④Once you've completed transferring the operation memory data, you can give it another name by using the OPERATION NAME function in OPE EFFECT-00. (After assigning a name, you must re-write the sound again to the Operation Memory).

If the memory protect function (TOTAL-02) is ON, writing will be impossible. In this case, you must first turn the protect function OFF by accessing TOTAL-02, reenter the PLAY mode and perform write operations again.

Note that writing to the operation memory must be performed in the PLAY sub-mode.

To edit sound, effect data and MIDI setting data you've already written, preset sounds or sounds from RAM or ROM cards

You must first move the sounds of the selected Operation Memory back to the COMBINATION, NORMAL or MULTI CH MODE memory.

①While in the Operation Memory mode, select the patch that you wish to edit.

②Hold down the WRITE key and press the COMBINATION key, NORMAL key or MULTI CH key (whichever indicator is lit).
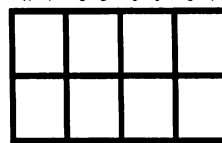
This will write the Operation back into the combination buffer so you can access all of the functions (except for OPE EFFECT-00 and 01) to re-edit your combination or normal sound — months or even years after you originally created it!

③When you've finished editing the sound, re-write it using normal write operations.

WRITE
COPY/INIT

A 1 B 2 C 3 D 4

SHIFT   E 5 F 6 G 7 H 8

△
YES/SUS

```
00 OP NAME   INT
A-9:
```

```
02 MEM PROTECT
   INTERNAL=OFF
```

```
OPMEM    K  PST1
A-1:SEE GOD
```

WRITE
COPY/INIT

+

NORMAL COMBI- MULTI
        NATION CHANNEL

The Multi channel mode can be used to receive or send through up to MIDI channels.

The MULTI CHANNEL mode differs from the normal MIDI Performance MODEs (MIDI mode 4 (OMNI/OFF, MONO), etc.).

To assign a patch to a specific AREA

①After entering the Multi Channel mode by pressing the Multi Channel key, specify the AREA in which you want to assign a patch by pressing the cursor and VALUE keys.

Note there are 8 digits at the top left-hand corner of the display. These digits correspond to memory AREAs 1 through 8, from left to right. The value of each digit indicates the polyphony of the corresponding area. Note that as the VZ-8M features 8-note polyphonic performance, the sum of these digits can be no higher than 8.

②Specify the patch to be assigned by pressing the SHIFT key, the BANK key and the PROG NO key.

To specify polyphony for a specific AREA

①After entering the Multi Channel mode by pressing the Multi Channel key, specify the AREA in which you want to specify polyphony by pressing the cursor keys.

②Specify polyphony for the selected AREA with the value controls. (Note that if this value does not change, you may have to lower the polyphony level for another area, as the maximum sum polyphony totals 8 notes for AREA 1~8.)

To alter volume level for a specific AREA

①After entering the Multi Channel mode by pressing the Multi Channel key, specify the AREA for which you want to alter the output volume level by accessing EFFECT-10.
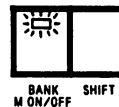
②Lower or raise the relative volume level with the value controls. (Note that at a maximum level of "99," the volume is equal to that as controlled with the master volume on the front panel.)
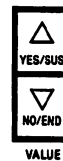
To specify a MIDI channel for a specific AREA

①After entering the Multi Channel mode by pressing the Multi Channel key, specify the AREA for which you want to set the MIDI channel number by accessing EFFECT-00.

②Specify the MIDI channel with the value controls.

Note that these settings are made for each AREA individually. You can change the selected AREA number at any point in editing by pressing the Multi Area keys.

```
00 MIDI  A1:2: 1
   CHANNEL= 1
```

To write MULTI CH data to the OPERATION MEMORY

①Select the MULTI CH mode and edit multi-channel data until you are satisfied. When you're finished editing, press the MULTI CH mode key to enter the PLAY mode.

②Hold down the WRITE key.

```
WRITE  OPMEM
INT   *-*
```

③While holding down the WRITE key, select the memory to which you want to write the patch (SHIFT key, followed by PROG NO keys A1 ~ H8). Then, press the YES key.
When writing is completed successfully, an "OK!" message appears on the display.

```
WRITE  OPMEM
       OK!
```

If the memory protect function (TOTAL-02) is ON, writing will be impossible. In this case, you must first turn the protect function OFF by accessing TOTAL-02, reenter the PLAY mode and perform write operations again.

```
02 MEM PROTECT
   INTERNAL=OFF
```

④Once you've completed writing the MULTI CH data to the operation memory, you can give it a name by using the OPERATION NAME function (OPE EFFECT-00). After assigning a name you must re-write the data again to the Operation Memory.
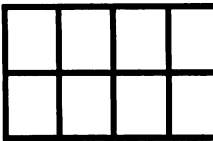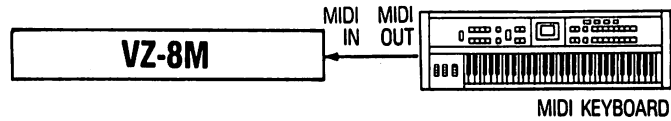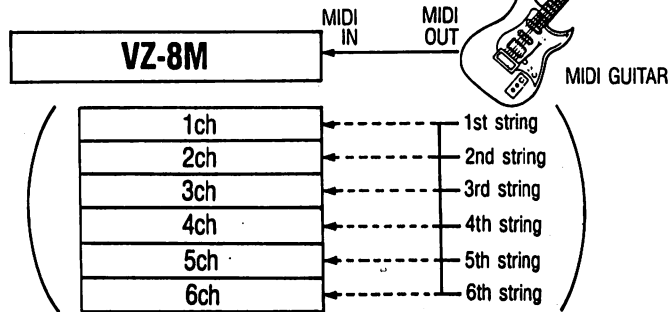
```
00 OP NAME   INT
A-9:
```

MIDI — Musical Instrument Digital Interface

This Digital Synthesizer module is equipped with MIDI — the Musical Instrument Digital Interface. To play using the module's sounds, you must connect the unit to other MIDI-equipped electronic musical instruments, drum, rhythm machines, sequencers or even personal computers through MIDI terminals.

[KEYBOARD MODE]

VZ-8M	MIDI IN	MIDI OUT	

MIDI KEYBOARD

[GUITAR MODE]

VZ-8M	MIDI IN	MIDI OUT	

MIDI GUITAR

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

[WIND MODE]

VZ-8M	MIDI IN	MIDI OUT	

MIDI WIND CONTROLLER

VZ-8M   MIDI instrument

MIDI   MIDI

IN		OUT	OUT		IN
VZ-8M			Sequencer		Drum machine

MIDI   MIDI

OUT		IN	THRU		IN
Sequencer		VZ-8M			Drum machine
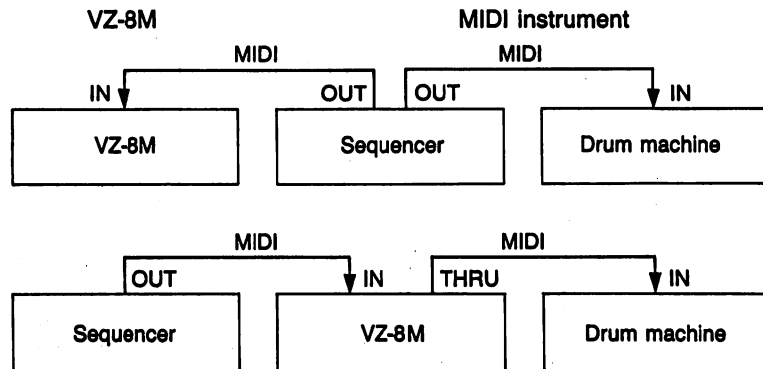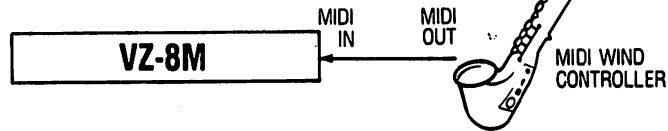
MIDI-related settings are made using the MIDI CHANNEL and MIDI DATA functions found in TOTAL-04, 05. For details on how to set MIDI-related parameters, refer to the corresponding function indexes.

STANDARD COMMUNICATION DATA

MIDI MESSAGES \ MODES	OP. MEM SEND	OP. MEM RECEIVE	NORMAL SEND	NORMAL RECEIVE	COMBI SEND	COMBI RECEIVE	MUL. CH SEND	MUL. CH RECEIVE
Key pitch, Note ON/OFF, Velocity		O		O		O		O
After touch		O		O		O		O
Pitch bend		O		O		O		O
Definable wheel		O		O		O		O
Modulation wheel		O		O		O		O
Foot VR		O		O		O		O
Main volume		O		O		O		O
Portamento time		O		O		O		O
Portamento ON/OFF		O		O		O		O
Sustain pedal		O		O		O		O
Bend range		O		O		O		O
Program change (*1)		O		O		O		O
Mono mode (SOLO=ON)		O		O		O		O
Poly mode (SOLO=OFF)		O		O		O		O

*1: When PROG CHANGE=DIS is set in TOTAL-04, program change data is not transmitted/received.

SYSTEM EXCLUSIVE MESSAGES

MIDI MESSAGES \ MODES	OP. MEM SEND	OP. MEM RECEIVE	NORMAL SEND	NORMAL RECEIVE	COMBI SEND	COMBI RECEIVE	MUL. CH SEND	MUL. CH RECEIVE
Single patch data (*1)			O	O				
Single operation data (*2)	O	O		O		O		O
Multi Channel data (*3)								O
SAVE/LOAD data	O	O	O	O	O	O	O	O
Master tune data		O		O		O		O
Key transpose data		O		O		O		O
Mode change data 1 (*4)		O		O		O		O
Mode change data 2 (*5)				O		O		
Shift change data (*6)		O		O		O		O
Bend range data		O		O		O		O

(*1) Single patch data sent when sound number is changed using VZ-8M controls in NORMAL PLAY MODE, or when SEND REQUEST MESSAGE is received.
Single operation data sent when operation number is changed using VZ-8M controls in OP MEM PLAY MODE, or when SEND REQUEST MESSAGE is received. In individual modes, operation data created in corresponding mode is received; when set to NORMAL MODE, operation data created in NORMAL MODE is received. When set to COMBI MODE, operation data created in COMBI MODE is received, etc.
Above data transmission/reception is impossible if TOTAL CONTROL "EXCLUSIVE" parameter (TOTAL-05) is disabled (set to DIS).
(*2) Transmission/reception is impossible if TOTAL CONTROL "EXCLUSIVE" parameter (TOTAL-05) is disabled (set to DIS).
(*3) Can only be executed in TOTAL CONTROL MODE. Transmission/reception is impossible if TOTAL CONTROL "EXCLUSIVE" parameter (TOTAL-05) is disabled (set to DIS).
(*4) MODE CHANGE-1 is used to switch between NORMAL, COMBI, MULTI CH, and OP MEM modes.
(*5) MODE CHANGE-2 is used to switch between K (Keyboard), G (Guitar), and W (Wind) performance modes.
(*6) Transmission/reception is impossible if TOTAL CONTROL "PRG NO" parameter (TOTAL-05) is disabled (set to DIS).

Initi

The VZ-8M
reset the enti
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SYSTEM
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VOICE-00 L.
When this pa.
are initialized

VOICE-09 E.
When this pa.
AMP VEL R

VOICE-03 E.
When this pa.
PITCH VEL

EFFECT N
PRESET 1 o
for the EFFE
CH mode, re

The VZ-8M can be "initialized" in a number of ways, allowing you to reset the entire unit to its initial factory settings or initialize only the data of a specific MODE or FUNCTION, for example. The following describes the various initializing procedures.

SYSTEM ALL INITIALIZE

To initialize **all** internal operation memory, voice and effect data to factory preset values, hold down the WRITE key and turn the unit power ON. All internal data is reset to its original state as listed on page 93.
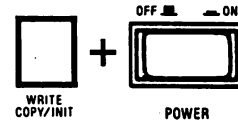
INITIALIZING VOICE menu FUNCTIONS

To initialize **all parameters** in any **single** VOICE menu function for a selected MODULE, simply press the EDIT key and the PAGE DOWN key and use the PAGE keys to select the desired function. Then hold down the WRITE (COPY/INITIALIZE) key and respond to the prompt by pressing the YES key.

The values of all parameters in the selected function are then reset to their initialized state (see page 94). Parameter values in other functions, however, remain unaffected.
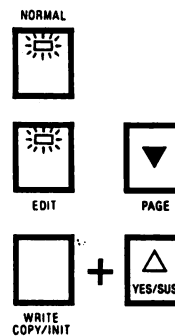
VOICE-00 LINE (M1M2-M7M8)
When this parameter is initialized, LINE DATA of all modules (M1-M8) are initialized automatically.

VOICE-09 ENVELOPE (DCA)
When this parameter is initialized, the data of not only VOICE-09 but AMP VEL RATE in VOICE-19 is automatically initialized.

VOICE-03 ENVELOPE (DCO)
When this parameter is initialized, the data of not only VOICE-03 but PITCH VEL RATE in VOICE-18 is automatically initialized.

EFFECT MENU INITIALIZED DATA

PRESET 1 operation memories H-6 throgh H-8 contain initialized data for the EFFECT MENU NORMAL mode, COMBI MODE and MULTI CH mode, respectively. (See page 96~98.)

As a "sound synthesizer," your synth module is a device used to create "sounds". You probably use this word — sound — quite frequently, but did you ever actually think about nature of "sound" — what it is and how it is generated?

Before diving into operations, you may want to read through this section carefully — after all, there's no point in studying how to operate a tool without first understanding what it was designed to do!
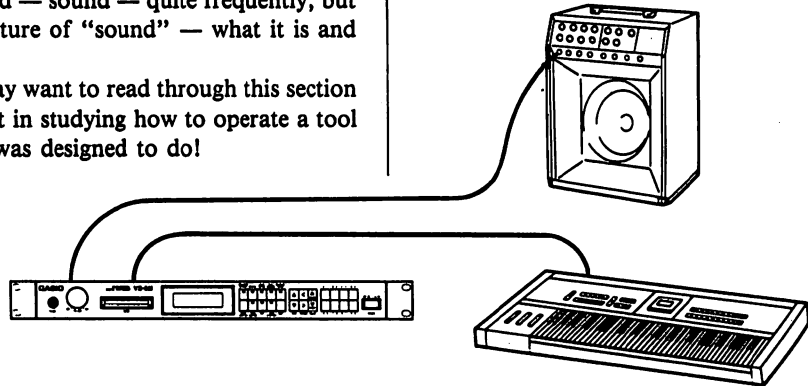
SOUND: A product of air?

Each day, we hear a great variety of sounds — music, human voices, raindrops — even our own footsteps. In other words, we live our lives literally surrounded by sound. Naturally, we can't see sound — so how can we describe it?

Technically speaking, sound is the sensation that we experience when movement or vibrations in the air are detected by our ears.

As a practical example, let's see how the "sound" of a bell is produced, and how it is sensed by our ears.
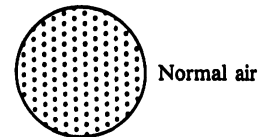
If we were to examine a mass of air where no sound is being carried, we would find that air particle density is relatively uniform. Naturally, there would be some movement of air particles, but there wouldn't be enough to generate an audible "sound". For this example, we will strike a bell with a hammer, in such a "sound-free" environment.

When kinetic (motive) energy is applied to a bell with a hammer, the bell surface is temporarily "deformed" — in other words, the shape of the bell structure is temporarily changed. Energy then goes to work to restore the bell to its original shape — this is called vibration. When the bell surface vibrates, two different — but interrelated — phenomena occur.
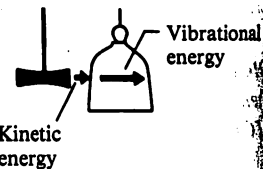
When the surface of the bell is "stretched in" (as bell is struck), random air particles surrounding the bell suddenly occupy a much larger air space than normal — in other words, the air suddenly becomes less dense immediately around the bell's surface. This is known as "rarefaction." In simple terms, rarefied air is air with low atmospheric pressure, or less density than the surrounding air mass.

Immediately after the bell's surface is "stretched" by the hammer, the tension of the bell's surface causes it to spring outwards. This causes the same air particles which were just rarefied to become compressed. In simple terms, the air mass around the bell which was low in atmospheric pressure suddenly becomes high in atmospheric pressure.

The surface of the bell will then continue to oscillate back and forth until it settles back into its original shape.
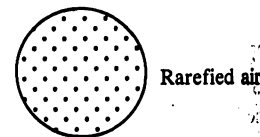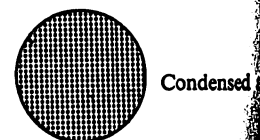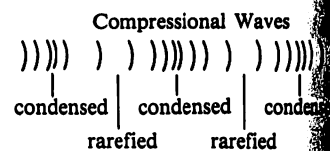
Normal air

Vibrational energy

Kinetic energy

Rarefied air

Condensed

Compressional Waves

condensed | condensed | conden
rarefied   rarefied

As you might imagine, the cyclical changes in air pressure caused by the oscillation of the bell's surface produced what are known as "compressional waves." These waves of air pressure cause our eardrums to vibrate, and nerves in the inner ear translate these vibrations into "sound."

Naturally, the type of vibration produced is dependent on a great number of factors — as the vibrating body differs so will the vibrations, and so will the sound.

Seeing Sounds With Our Eyes: Waveforms

As we discussed in the introduction to this sound seminar, sounds cannot actually be seen with the human eye. However you've probably heard such expressions as "the waveform is different" "this is almost a pure sine wave," with regards to sound. But what exactly is meant by these terms — waveform and wave — and how can they be observed?

For a moment, let's consider the how a microphone works. As you probably already know, a microphone converts compressional waves into electrical signals, which can then be transmitted to an amplifier and speakers for output as sound. As shown in the illustration, these electrical signals are simple conversions of compressional waves — with condensed air being output as positive (+) electrical charges and rarefied air being output as negative (−) charges. The **compressional waves** of air are, then, transformed into electrical "waves", which can be viewed on electronic devices such as **oscilloscopes**. These waves are cyclical, and their form over time produces a visible shape or form which is called — you· guessed it, a **waveform**.

The Three Basic Elements of Sound

When we hear an individual sound, it can be defined by considering three different parameters; **Pitch**, **Timbre** and **Amplitude** (loudness).
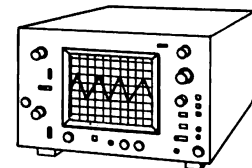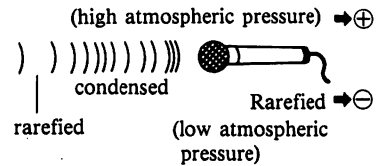
ELEMENT 1: PITCH

Pitch is the quality of a sound which makes it seem higher or lower than other sounds. For example, the notes at the top or right-hand end of a keyboard are "higher in pitch" than those at the left-hand end.
The pitch of a note is determined by the rate at which vibrations are set up in the air particles — i.e. the rate at which cyclical compression and rarefaction takes place.

If we convert sounds into electrical signals and look at them on an oscilloscope, we can see that the number of waves per time unit differ between "high-pitched" and "low-pitched" sounds.

For a moment, let's go back to our bell example. As the bell produces compressions and rarefactions at a fixed rate, waves of particle vibrations are generated in the air surrounding the bell. These waves move away from the fork at a fixed rate — the speed of sound. As waves move away from our sound source (the bell) at a fixed rate, the length of each wave depends on the rate at which the bell's surface vibrates. A single cycle of a sine wave is shown on the right.

Vibrational (Eardrum) energy
Air
Kinetic energy
Waves of condensation and rarefaction

(high atmospheric pressure) ➡ ⊕
condensed
rarefied
Rarefied ➡ ⊖
(low atmospheric pressure)

Oscilloscope

Low sounds   High sounds
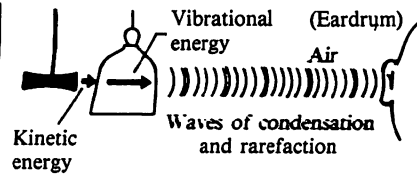
(low register)   (high register)
Few waves   Many waves

0   Time
1 cycle
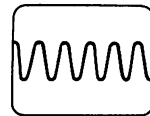
The distance that a wave covers in the time it takes to complete one cycle is known as the "**wavelength**," while the number of cycles that are made each second is known as the "**frequency**."

How does all this relate to pitch? Very simple — **the higher the frequency of a sound, the higher the pitch.** A low frequency sound will have a long waveform and a low pitch, while a high frequency sound will have a shorter waveform and a higher pitch. In the world of science (and music!), frequency is measured in units called "Hertz" (Hz). For example, 100Hz indicates that vibrations occur at the frequency of 100 times per second. Also, it's interesting to note that doubling the frequency of a sound will raise it by one octave.

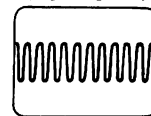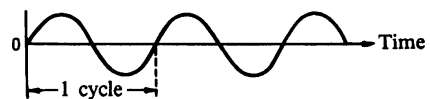Well, that explains the length and speed of our "wave", but what about its height? Aha! The next element of sound — amplitude....
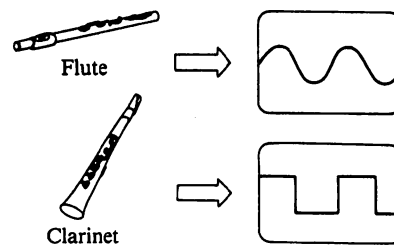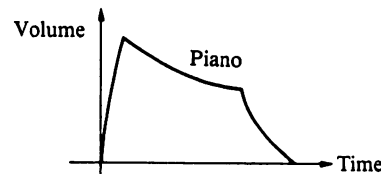
ELEMENT 2: Amplitude

Compared with pitch, amplitude (loudness) is very easy to understand. If we consider the sine wave produced by our bell again, the harder the bell is hit by the hammer, the larger the bell vibrations and the more the air particles are compressed and rarefied. As a result, the peaks and troughs of the sound wave will be larger, and our ears will detect that the sound being produced is much louder. The vertical "height" of the wave, or the distance from the top of a peak to the bottom of a trough in a single cycle is known as **amplitude**. Simply speaking, we perceive amplitude as loudness — **the higher the amplitude, the louder the sound.**

When we consider the loudness of a sound, the dynamics (changes in loudness) are a vital aspect. For example, listen to the sound produced by playing a single note on a piano. As the hammer strikes the strings (**attack**), the output of the piano rises from total silence to a maximum level almost instantly. The sound then starts to die away, or "**decay**", as the vibration of the strings is damped by the surrounding air. When you release the key, the piano dampers deaden the string vibration and the note dies away relatively quickly.

Note that all through this process, the loudness, or amplitude, has been changing. If we were to view these changes in volume over time graphically, we could see that amplitude takes a "shape" over time. This "shape" is known as the note's **amplitude envelope**.

But even if you play, for example, a flute and a clarinet at the exactly the same pitch and at exactly the same volume level, you won't hear the same sound.

Which brings us to the third element of sound — **timbre**.
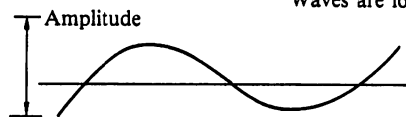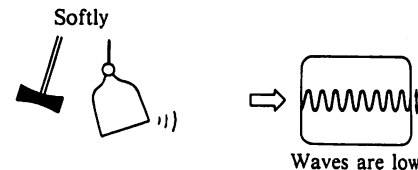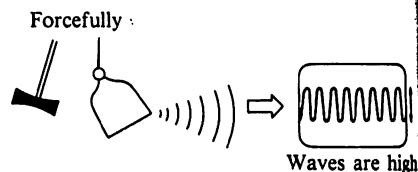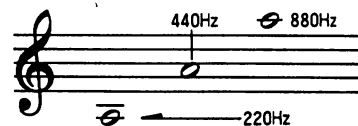
440Hz   880Hz   220Hz

Forcefully   Waves are high.

Softly   Waves are low.

Amplitude

Volume   Piano   Time

Flute

Clarinet

ELEMENT 3: Timbre

Timbre is the quality of a sound that enables us to distinguish the sound from another of the same pitch. If we look once again at the waveform produced by our bell, it's easy to see that the shape of the waveform is determined by the compressions and rarefactions of air produced by the bell's vibration.

Now look at the particles shown on the right.
As you can see, the source of the sound is such that the particles are compressed to a certain pressure for a fixed period of time and then rarefied for an equal period.

If we view this graphically, the resulting waveform is "square". This is, of course, what is known as a "square wave".
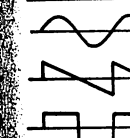
One Cycle

Increase in Air Particle Density

Decrease in Air Particle Density

Remember though, that the square wave still travels at the same speed as our sine wave, so, if it is of the same wavelength, our ears will interpret its pitch as being the same. But because the air particles are vibrating in a different way, we will hear the sound as an entirely different "**timbre**".

Very basically, we can divide waveforms into three types, shown below.

WAVEFORM	TYPE	TIMBRE	INSTRUMENTS
	Sine wave	Soft	Flute, whistle
	Saw-tooth wave	Bright	Violin, trumpet
	Square wave	Simple	Clarinet, oboe

The VZ-8M offers a total of 8 different waveforms. You'll become extremely familiar with the characteristics of each as you use the VZ-8M.

Fundamental Waves and Harmonics — Shaping the Timbre

Now that you have a basic idea of what sound is and how it is generated, you would probably like to know how you can determine the **shape of a wave** (=timbre) in order to create the kind of sound you want.
First, take a look at this diagram.

This figure illustrates the process of combining two sine waves in order to form a saw-tooth wave. B is the basic sine wave, while C is a wave which is oscillating at twice the frequency of B (making it one octave higher in pitch), and at only half the amplitude (volume) of B.

$A = B + C$

$|a| = |b| - |c|$

When we combine B and C, the result is waveform A. A is still not a perfect saw-tooth wave, but it will gradually approach a perfect saw-tooth shape as additional sine waves at 1/3, 1/4, 1/5, etc. the level of the fundamental wave are added.

Waves are high.

Waves are low.

Time
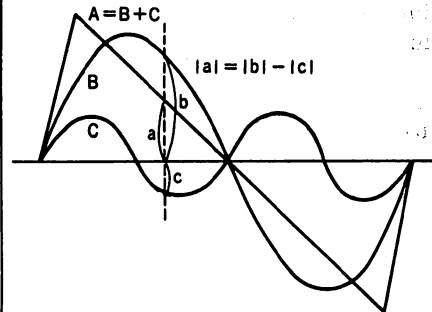
In this manner, any waveform can be created by adding a number of sine waves to a basic sine wave. Waves such as C with frequencies that are integral multiples of the frequency of the fundamental wave are known as "harmonics."

The waveform, and thus the timbre are actually determined by the kind of harmonics added to the basic sine wave. In simple terms, almost all sounds with their different timbres that reach our ears include a variety of different harmonics, and it is these harmonics which are responsible for the countless characteristic timbres.

ENVELOPES: Sound over time

The word "envelope" may be new to you — but it's an extremely important term in understanding sound, and especially important in sound synthesis.

Literally speaking, an "envelope" is a voltage that changes as a function of time. In the VZ-8M, envelopes are used to shape both the amplitude, pitch and timbre of a sound over time.

To understand envelopes more clearly, think of the sound of a violin. When the violinist bows a string, the volume, pitch and even timbre change slightly over time. If there were no changes over time, the sound would have no beginning, no pitch variance, and no end!

Think now of a piano. If a piano note were to sound continuously without decaying, it would be very difficult to distinguish it from the sound of a flute.

Envelopes, then, are what determine the overall "shape" of the sound over time — including the variations in pitch, volume and timbre.

The VZ-8M lets you create envelope contours in up to 8 steps by making **RATE** and **LEVEL** specifications at up to 8 points in the envelope.

■ Saw-tooth wave

Harmonic components

■ Square wave
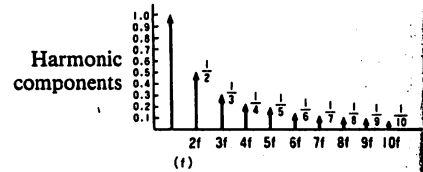
Harmonic components
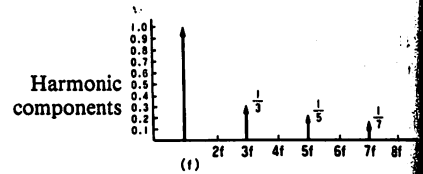
• Graphs such as the ones above which show the harmonic components of a wave form are called "harmonic spectrums".

Envelope Curves of Various Instruments (Sound Volume)

Violin

Piano

Flute
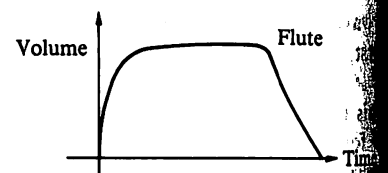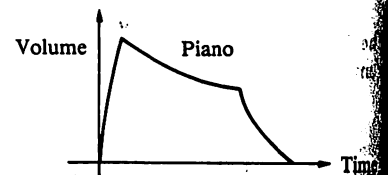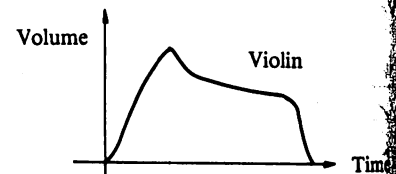
RATE
The RATE
of each step
of nearly 90
value used i
proportion
a rise or fall
while a gen

LEVEL
The LEVEL
falls at each
while for the
level.

How RAT
To understar
look at a typ

Musical S
Depending o
may be classif
cyclical vibrat
(re very few)
licated irregu
or harmonic
noise.

RATE

The RATE indicates the slope (interior angle in relation to horizontal axis) of each step in the envelope. A RATE value of "99" indicates a slope of nearly 90°, while a RATE value of "0" indicates nearly 0°. Since the value used is an absolute value, the slope increases and decreases in direct proportion with the RATE value, regarless of whether the pattern shows a rise or fall. This means that a steep incline results in a quick level change, while a gentle incline results in a slow level change.
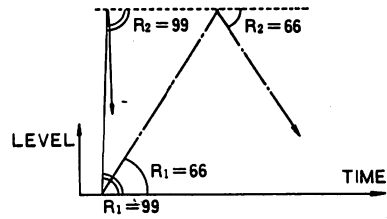
LEVEL

The LEVEL parameter indicates up to what point the envelope rises or falls at each step. For the DCO envelope, LEVEL means pitch height, while for the DCA envelope, LEVEL is equal to the amplitude (volume) level.
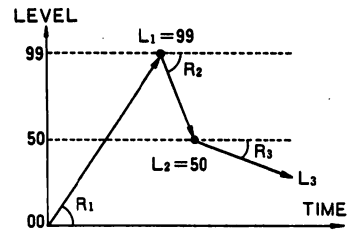
How RATEs and LEVELs Interact

To understand the relationship between RATEs and LEVELs, take a close look at a typical amplitude envelope shown on the right.
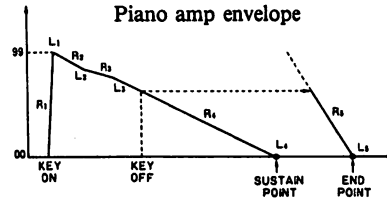
Musical Sounds vs. Noise

Depending on the type of characteristic vibrations it is based on, a sound may be classified as being either "musical" or "noise". Sounds with regular cyclical vibrations (i.e. sound in which components other than harmonics are very few) are considered to be **musical**, while sounds caused by complicated irregular vibrations (i.e. sounds with many components that are not harmonics) whose pitch can therefore not be measured are classified as noise.

SYSTEM INITIALIZED DATA

	Mode	OPERATION MEMORY PST 1 A-1
	Internal	PST 1 64 PRESET TONES PST 2 64 OPERATION MEMORIES
	Compare/Recall	PST 1 voice A-1
WORKING AREA	Operation memory Normal Combination Multi-channel	PST 1 A-1 PST 2 operation memory H-6 see page 96 PST 2 operation memory H-7 see page 97 PST 2 operation memory H-8 see page 98

	Total control	00 MASTER TUNE = 0 (442Hz)
		01 TRANSPOSE = C
		02 MEMORY PROTECT INT = ON
		                                    CARD = ON
		03 SAVE/LOAD SAVE/LOAD = SAVE
		                        CARD/MIDI = CARD1
		                        DATA = VC + OP
		04 MIDI CHANNEL CHANNEL = 1
		                            TOTAL = ON
		05 MIDI DATA PROGRAM = 0-63
		                        EXCLUSIVE = DIS
		                        DEF CONTROL = OFF
		                        VOLUME = ENA
		                        OVERFLOW = NORMAL

INITIALIZED VOICE PARAMETER MENU DATA

VOICE No.	—	VOICE NAME		OCTAVE	0	TOTAL LEV	99

	M1M2	M3M4	M5M6	M7M8		WAVE	DEPTH	RATE	DELAY	MULTI
INT LINE	MIX	MIX	MIX	MIX	VIBRATO	1	0	75	0	OFF
EXT PHASE	/	OFF	OFF	OFF	TREMOLO	1	0	75	0	OFF

M1 (WAVE FORM 1)

DETUNE		ENVELOPE/VEL RATE	STEP	1	2	3	4	5	6	7	8	ENV DEPTH		KEY FOLLOW	POINT	1	2	3	4	5	6	VELOCITY		AMP SENS
FIX	OFF		RATE	99	50	50	50	50	50	50	50	DEPTH	99	KEY		C2	F4	C7	A7	E8	C9	SENS	0	
HARM	1		LEV	99	0	0	0	0	0	0	0													0
POL(×R)	+																							
OCT	0		SS/ED	SS							ED	MOD ON/OFF	ON	LEV		99	99	99	99	99	99	CURVE	1	
NOTE	0		E/*	*	*	*	*	*	*	*	*													
FINE	0																							

M2 (WAVE FORM 1)

DETUNE		ENVELOPE/VEL RATE	STEP	1	2	3	4	5	6	7	8	ENV DEPTH		KEY FOLLOW	POINT	1	2	3	4	5	6	VELOCITY		AMP SENS
FIX	OFF		RATE	99	50	50	50	50	50	50	50	DEPTH	99	KEY		C2	F4	C7	A7	E8	C9	SENS	0	
HARM	1		LEV	99	0	0	0	0	0	0	0													0
POL(×R)	+																							
OCT	0		SS/ED	SS							ED	MOD ON/OFF	ON	LEV		99	99	99	99	99	99	CURVE	1	
NOTE	0		E/*	*	*	*	*	*	*	*	*													
FINE	0																							

M3 (WAVE FORM 1)

DETUNE		ENVELOPE/VEL RATE	STEP	1	2	3	4	5	6	7	8	ENV DEPTH		KEY FOLLOW	POINT	1	2	3	4	5	6	VELOCITY		AMP SENS
FIX	OFF		RATE	99	50	50	50	50	50	50	50	DEPTH	99	KEY		C2	F4	C7	A7	E8	C9	SENS	0	
HARM	1		LEV	99	0	0	0	0	0	0	0													0
POL(×R)	+																							
OCT	0		SS/ED	SS							ED	MOD ON/OFF	ON	LEV		99	99	99	99	99	99	CURVE	1	
NOTE	0		E/*	*	*	*	*	*	*	*	*													
FINE	0																							

M4 (WAVE FORM 1)

DETUNE		ENVELOPE/VEL RATE	STEP	1	2	3	4	5	6	7	8	ENV DEPTH		KEY FOLLOW	POINT	1	2	3	4	5	6	VELOCITY		AMP SENS
FIX	OFF		RATE	99	50	50	50	50	50	50	50	DEPTH	99	KEY		C2	F4	C7	A7	E8	C9	SENS	0	
HARM	1		LEV	99	0	0	0	0	0	0	0													0
POL(×R)	+																							
OCT	0		SS/ED	SS							ED	MOD ON/OFF	ON	LEV		99	99	99	99	99	99	CURVE	1	
NOTE	0		E/*	*	*	*	*	*	*	*	*													
FINE	0																							

M5 (WAVE FORM 1)

DETUNE		ENVELOPE/VEL RATE	STEP	1	2	3	4	5	6	7	8	ENV DEPTH		KEY FOLLOW	POINT	1	2	3	4	5	6	VELOCITY		AMP SENS
FIX	OFF		RATE	99	50	50	50	50	50	50	50	DEPTH	99	KEY		C2	F4	C7	A7	E8	C9	SENS	0	
HARM	1		LEV	99	0	0	0	0	0	0	0													0
POL(×R)	+																							
OCT	0		SS/ED	SS							ED	MOD ON/OFF	ON	LEV		99	99	99	99	99	99	CURVE	1	
NOTE	0		E/*	*	*	*	*	*	*	*	*													
FINE	0																							

M6 (WAVE FORM 1)

DETUNE		ENVELOPE/VEL RATE	STEP	1	2	3	4	5	6	7	8	ENV DEPTH		KEY FOLLOW	POINT	1	2	3	4	5	6	VELOCITY		AMP SENS
FIX	OFF		RATE	99	50	50	50	50	50	50	50	DEPTH	99	KEY		C2	F4	C7	A7	E8	C9	SENS	0	
HARM	1		LEV	99	0	0	0	0	0	0	0													0
POL(×R)	+																							
OCT	0		SS/ED	SS							ED	MOD ON/OFF	ON	LEV		99	99	99	99	99	99	CURVE	1	
NOTE	0		E/*	*	*	*	*	*	*	*	*													
FINE	0																							

M7 (WAVE FORM 1)

DETUNE		ENVELOPE/VEL RATE	STEP	1	2	3	4	5	6	7	8	ENV DEPTH		KEY FOLLOW	POINT	1	2	3	4	5	6	VELOCITY		AMP SENS
FIX	OFF		RATE	99	50	50	50	50	50	50	50	DEPTH	99	KEY		C2	F4	C7	A7	E8	C9	SENS	0	
HARM	1		LEV	99	0	0	0	0	0	0	0													0
POL(×R)	+																							
OCT	0		SS/ED	SS							ED	MOD ON/OFF	ON	LEV		99	99	99	99	99	99	CURVE	1	
NOTE	0		E/*	*	*	*	*	*	*	*	*													
FINE	0																							

M8 (WAVE FORM 1)

DETUNE		ENVELOPE/VEL RATE	STEP	1	2	3	4	5	6	7	8	ENV DEPTH		KEY FOLLOW	POINT	1	2	3	4	5	6	VELOCITY		AMP SENS
FIX	OFF		RATE	99	50	50	50	50	50	50	50	DEPTH	99	KEY		C2	F4	C7	A7	E8	C9	SENS	0	
HARM	1		LEV	99	0	0	0	0	0	0	0													0
POL(×R)	+																							
OCT	0		SS/ED	SS							ED	MOD ON/OFF	ON	LEV		99	99	99	99	99	99	CURVE	1	
NOTE	0		E/*	*	*	*	*	*	*	*	*													
FINE	0																							

PITCH

	STEP	1	2	3	4	5	6	7	8				POINT	1	2	3	4	5	6		
RATE		50	50	50	50	50	50	50	50	RANGE	NARROW	KEY		C2	F4	C7	A7	E8	C9	SENS	0
LEV		0	0	0	0	0	0	0	0												
SS/ED		SS							ED	DEPTH	63	LEV		63	63	63	63	63	63	CURVE	1
E/*		*	*	*	*	*	*	*	*												

PITCH/AMP

	POINT	1	2	3	4	5	6		
KEY		C2	F4	C7	A7	E8	C9	SENS	0
RATE		+0	+0	+0	+0	+0	+0	CURVE	1

*With regards to INIT VOICE function (VOICE-21);
1. Only M1 is ON. M2~M8 are all OFF.
2. ENV DEPTH set to "99" for M1, and "85" for M2~M8.

VOICE No.		VOICE NAME			OCTAVE		TOTAL LEV	
	M1M2	**M3M4**	**M5M6**	**M7M8**		**WAVE**	**DEPTH**	**RATE**	**DELAY**	**MULTI**
INT LINE					**VIBRATO**					
EXT PHASE	/				**TREMOLO**					

WAVE FORM	DETUNE		ENVELOPE/VEL RATE									ENV DEPTH	KEY FOLLOW							VELOCITY	AMP SENS
		STEP	1	2	3	4	5	6	7	8		POINT	1	2	3	4	5	6		
M1	FIX	RATE									DEPTH	KEY							SENS	
	HARM	LEV																		
	POL(×R)																			
	OCT	SS/ED									MOD ON/OFF	LEV							CURVE	
	NOTE	E/*																		
	FINE																			
M2	FIX	RATE									DEPTH	KEY							SENS	
	HARM	LEV																		
	POL(×R)																			
	OCT	SS/ED									MOD ON/OFF	LEV							CURVE	
	NOTE	E/*																		
	FINE																			
M3	FIX	RATE									DEPTH	KEY							SENS	
	HARM	LEV																		
	POL(×R)																			
	OCT	SS/ED									MOD ON/OFF	LEV							CURVE	
	NOTE	E/*																		
	FINE																			
M4	FIX	RATE									DEPTH	KEY							SENS	
	HARM	LEV																		
	POL(×R)																			
	OCT	SS/ED									MOD ON/OFF	LEV							CURVE	
	NOTE	E/*																		
	FINE																			
M5	FIX	RATE									DEPTH	KEY							SENS	
	HARM	LEV																		
	POL(×R)																			
	OCT	SS/ED									MOD ON/OFF	LEV							CURVE	
	NOTE	E/*																		
	FINE																			
M6	FIX	RATE									DEPTH	KEY							SENS	
	HARM	LEV																		
	POL(×R)																			
	OCT	SS/ED									MOD ON/OFF	LEV							CURVE	
	NOTE	E/*																		
	FINE																			
M7	FIX	RATE									DEPTH	KEY							SENS	
	HARM	LEV																		
	POL(×R)																			
	OCT	SS/ED									MOD ON/OFF	LEV							CURVE	
	NOTE	E/*																		
	FINE																			
M8	FIX	RATE									DEPTH	KEY							SENS	
	HARM	LEV																		
	POL(×R)																			
	OCT	SS/ED									MOD ON/OFF	LEV							CURVE	
	NOTE	E/*																		
	FINE																			
PITCH		RATE									RANGE	KEY							SENS	
		LEV																		
		SS/ED									DEPTH	LEV							CURVE	
		E/*																		
PITCH /AMP												KEY							SENS	
												RATE							CURVE	

	OPERATION No.	
1	VOICE No.	
	NAME	
5	VOICE No.	
	NAME	
	MODE	
	K.G.W	
	KEY ASSIGN	
	PORTAMENTO/SOLO	
	PITCH BEND	
	MOD WHEEL	
	DEF CONTROL	
	FOOT VR	
	FOOT SW	
	VEL TABLE	
	VEL SPLIT	
	VEL INV	
	DELAY TRIG	

OPERATION No.		OPERATION NAME	INIT NORMAL	OPERATION TUNE	+, 0, 0, 0

1	VOICE No.	PST 1 A-1	2	VOICE No.		3	VOICE No.		4	VOICE No.	
	NAME			NAME			NAME			NAME	

5	VOICE No.		6	VOICE No.		7	VOICE No.		8	VOICE No.	
	NAME			NAME			NAME			NAME	

MODE	NORMAL
K.G.W	K
KEY ASSIGN	

PAN	MODE	FIX
	PAN 1	0 (OFF)
	PAN 2	0 (OFF)
	CONTROL 1	MOD
	CONTROL 2	MOD
	RANGE 1	L→R
	RANGE 2	R→L
	RATE	20
	DEPTH	31
	CONTROL	OFF

Value with MODE set to AUTO in parentheses.

		1	2	3	4
MIDI CH		1			
PORTAMENTO/SOLO	PORTM ON/OFF	OFF			
	PORTM TIME	0			
	PORTM MODE	TIME CONST			
	SOLO	OFF			
	MONO/POLY	MONO			
PITCH BEND	BEND RANGE	2			
	RELEASE	ENA			
MOD WHEEL	SENSITIVITY	50			
	VIB DEPTH	OFF			
	VIB RATE	OFF			
	PITCH	OFF			
	PORTM TIME	OFF			
	TREM DEPTH	OFF			
	TREM RATE	OFF			
	A ENV BIAS	OFF			
DEF CONTROL	SENSITIVITY	50			
	VIB DEPTH	OFF			
	VIB RATE	OFF			
	PITCH	OFF			
	PORTM TIME	OFF			
	TREM DEPTH	OFF			
	TREM RATE	OFF			
	A ENV BIAS	OFF			
FOOT VR	SENSITIVITY	50			
	VIB DEPTH	OFF			
	VIB RATE	OFF			
	PITCH	OFF			
	PORTM TIME	OFF			
	TREM DEPTH	OFF			
	TREM RATE	OFF			
	A ENV BIAS	OFF			
FOOT SW	FOOT SW	SUSTAIN			
VEL TABLE	VEL TABLE SEL	1			
VEL SPLIT	RANGE (FROM)				
	RANGE (TO)				
VEL INV	INVERSE				
DELAY TRIG	DELAY				

SPLIT POINT	SP POINT	
	LOWER SP	
	MIDDLE SP	
	UPPER SP	
POS X-FADE	EFFECT	
	POS (FROM)	
	POS (TO)	
	L POS (FROM)	
	L POS (TO)	
	M POS (FROM)	
	M POS (TO)	
	U POS (FROM)	
	U POS (TO)	

		1	2	3	4	5	6	7	8
AFTER TOUCH	SENSITIVITY	20							
	VIB DEPTH	OFF							
	VIB RATE	OFF							
	PITCH	OFF							
	PORTM TIME	OFF							
	TREM DEPTH	OFF							
	TREM RATE	OFF							
	A ENV BIAS	OFF							
LEVEL	LEVEL								
PITCH	POLARITY								
	OCTAVE								
	NOTE								
	FINE								
VIBRATO INV	INVERSE								
TREMOLO INV	INVERSE								

	ON/OFF	WAVE	DEPTH	RATE	DELAY	MULTI
TOTAL VIBRATO						
TOTAL TREMOLO						

[COMBINATION MODE] (OPERATION MEMORY   PST 2   H-7)   [MULTI

OPERATION No.				OPERATION NAME		INIT COMBI	OPERATION TUNE		+, 0, 0, 0	

1	VOICE No.	PST 1 . A-1	2	VOICE No.	PST 1 B-1	3	VOICE No.	PST 1 C-1	4	VOICE No.	PST 1 D-1
	NAME			NAME			NAME			NAME	

5	VOICE No.	PST 1 E-1	6	VOICE No.	PST 1 F-1	7	VOICE No.	PST 1 G-1	8	VOICE No.	PST 1 H-1
	NAME			NAME			NAME			NAME	

MODE	COMBI
K.G.W	K
KEY ASSIGN	1+2

PAN	MODE	FIX
	PAN 1	− 15 (OFF)
	PAN 2	+ 15 (OFF)
	CONTROL 1	MOD
	CONTROL 2	MOD
	RANGE 1	L→R
	RANGE 2	R→L
	RATE	20
	DEPTH	31
	CONTROL	OFF

Value with MODE set to AUTO in parentheses.

		1	2	3	4
MIDI CH		1			
PORTAMENTO/SOLO	PORTM ON/OFF	OFF	←	←	←
	PORTM TIME	0	←	←	←
	PORTM MODE	TIME CONST	←	←	←
	SOLO	OFF	←	←	←
	MONO/POLY	MONO			
PITCH BEND	BEND RANGE	2	←	←	←
	RELEASE	ENA	←	←	←
MOD WHEEL	SENSITIVITY	50	←	←	←
	VIB DEPTH	OFF	←	←	←
	VIB RATE	OFF	←	←	←
	PITCH	OFF	←	←	←
	PORTM TIME	OFF	←	←	←
	TREM DEPTH	OFF	←	←	←
	TREM RATE	OFF	←	←	←
	A ENV BIAS	OFF	←	←	←
DEF CONTROL	SENSITIVITY	50	←	←	←
	VIB DEPTH	OFF	←	←	←
	VIB RATE	OFF	←	←	←
	PITCH	OFF	←	←	←
	PORTM TIME	OFF	←	←	←
	TREM DEPTH	OFF	←	←	←
	TREM RATE	OFF	←	←	←
	A ENV BIAS	OFF	←	←	←
FOOT VR	SENSITIVITY	50	←	←	←
	VIB DEPTH	OFF	←	←	←
	VIB RATE	OFF	←	←	←
	PITCH	OFF	←	←	←
	PORTM TIME	OFF	←	←	←
	TREM DEPTH	OFF	←	←	←
	TREM RATE	OFF	←	←	←
	A ENV BIAS	OFF	←	←.	←
FOOT SW	FOOT SW	SUS-TAIN	←	←	←
VEL TABLE	VEL TABLE SEL	1			
VEL SPLIT	RANGE (FROM)	1	←	←	←
	RANGE (TO)	127	←	←	←
VEL INV	INVERSE	OFF	←	←	←
DELAY TRIG	DELAY	0	←	←	←

SPLIT POINT	SP POINT	B3
	LOWER SP	E3
	MIDDLE SP	A♭ 4
	UPPER SP	C6
POS X-FADE	EFFECT	OFF
	POS (FROM)	C3
	POS (TO)	F5
	L POS (FROM)	B♭ 2
	L POS (TO)	F♯ 3
	M POS (FROM)	C♯ 4
	M POS (TO)	A4
	U POS (FROM)	F5
	U POS (TO)	C♯ 6

		1	2	3	4	5	6	7	8
AFTER TOUCH	SENSITIVITY	20	←	←	←	←	←	←	←
	VIB DEPTH	OFF	←	←	←	←	←	←	←
	VIB RATE	OFF	←	←	←	←	←	←	←
	PITCH	OFF	←	←	←	←	←	←	←
	PORTM TIME	OFF	←	←	←	←	←	←	←
	TREM DEPTH	OFF	←	←	←	←	←	←	←
	TREM RATE	OFF	←	←	←	←	←	←	←
	A ENV BIAS	OFF	←	←	←	←	←	←	←
LEVEL	LEVEL	99	←	←	←	←	←	←	←
PITCH	POLARITY	+	←	←	←	←	←	←	←
	OCTAVE	0	←	←	←	←	←	←	←
	NOTE	0	←	←	←	←	←	←	←
	FINE	0	←	←	←	←	←	←	←
VIBRATO INV	INVERSE	OFF	←	←	←	←	←	←	←
TREMOLO INV	INVERSE	OFF	←	←	←	←	←	←	←

	ON/OFF	WAVE	DEPTH	RATE	DELAY	MULTI
TOTAL VIBRATO	OFF	TRIANGLE	0	75	0	OFF
TOTAL TREMOLO	OFF	TRIANGLE	0	75	0	OFF

EFFECT MENU INITIALIZED DATA

[MULTI CH MODE]

OPERATION No.	
OPERATION NAME	INIT MULTI
OPERATION TUNE	+, 0, 0, 0
MODE	MULTI

1	VOICE No.	PST 1 A-1	2	VOICE No.	PST 1 B-1
	NAME			NAME	

3	VOICE No.	PST 1 C-1	4	VOICE No.	PST 1 D-1
	NAME			NAME	

5	VOICE No.	PST 1 E-1	6	VOICE No.	PST 1 F-1
	NAME			NAME	

7	VOICE No.	PST 1 G-1	8	VOICE No.	PST 1 H-1
	NAME			NAME	

PAN	MODE	FIX
	PAN 1	0 (OFF)
	PAN 2	0 (OFF)
	CONTROL 1	MOD
	CONTROL 2	MOD
	RANGE 1	L→R
	RANGE 2	R→L
	RATE	20
	DEPTH	31
	CONTROL	OFF

Value with MODE set to AUTO in parentheses.

		1	2	3	4	5	6	7	8
NOTE — POLYPHONIC		8	0	0	0	0	0	0	0
MIDI CH		1	2	3	4	5	6	7	8
PORTAMENTO/ SOLO	PORTM ON/OFF	OFF	←	←	←	←	←	←	←
	PORTM TIME	0	←	←	←	←	←	←	←
	PORTM MODE	TIME CONST	←	←	←	←	←	←	←
	SOLO	OFF	←	←	←	←	←	←	←
PITCH BEND	BEND RANGE	2	←	←	←	←	←	←	←
	RELEASE	ENA	←	←	←	←	←	←	←
AFTER TOUCH	SENSITIVITY	20	←	←	←	←	←	←	←
	VIB DEPTH	OFF	←	←	←	←	←	←	←
	VIB RATE	OFF	←	←	←	←	←	←	←
	PITCH	OFF	←	←	←	←	←	←	←
	PORTM TIME	OFF	←	←	←	←	←	←	←
	TREM DEPTH	OFF	←	←	←	←	←	←	←
	TREM RATE	OFF	←	←	←	←	←	←	←
	A ENV BIAS	OFF	←	←	←	←	←	←	←
MOD WHEEL	SENSITIVITY	50	←	←	←	←	←	←	←
	VIB DEPTH	OFF	←	←	←	←	←	←	←
	VIB RATE	OFF	←	←	←	←	←	←	←
	PITCH	OFF	←	←	←	←	←	←	←
	PORTM TIME	OFF	←	←	←	←	←	←	←
	TREM DEPTH	OFF	←	←	←	←	←	←	←
	TREM RATE	OFF	←	←	←	←	←	←	←
	A ENV BIAS	OFF	←	←	←	←	←	←	←
DEF CONTROL	SENSITIVITY	50	←	←	←	←	←	←	←
	VIB DEPTH	OFF	←	←	←	←	←	←	←
	VIB RATE	OFF	←	←	←	←	←	←	←
	PITCH	OFF	←	←	←	←	←	←	←
	PORTM TIME	OFF	←	←	←	←	←	←	←
	TREM DEPTH	OFF	←	←	←	←	←	←	←
	TREM RATE	OFF	←	←	←	←	←	←	←
	A ENV BIAS	OFF	←	←	←	←	←	←	←
FOOT VR	SENSITIVITY	50	←	←	←	←	←	←	←
	VIB DEPTH	OFF	←	←	←	←	←	←	←
	VIB RATE	OFF	←	←	←	←	←	←	←
	PITCH	OFF	←	←	←	←	←	←	←
	PORTM TIME	OFF	←	←	←	←	←	←	←
	TREM DEPTH	OFF	←	←	←	←	←	←	←
	TREM RATE	OFF	←	←	←	←	←	←	←
	A ENV BIAS	OFF	←	←	←	←	←	←	←
FOOT SW	FOOT SW	SUS-TAIN	←	←	←	←	←	←	←
VEL TABLE	VEL TABLE SEL	1	←	←	←	←	←	←	←
LEVEL	LEVEL	99	←	←	←	←	←	←	←
PITCH	POLARITY	+	←	←	←	←	←	←	←
	OCTAVE	0	←	←	←	←	←	←	←
	NOTE	0	←	←	←	←	←	←	←
	FINE	0	←	←	←	←	←	←	←

Value with MODE set to AUTO in parentheses.

5	6	7	8
←	←	←	←
←	←	←	←
←	←	←	←
←	←	←	←
←	←	←	←
←	←	←	←
←	←	←	←
←	←	←	←
←	←	←	←
←	←	←	←
←	←	←	←
←	←	←	←
←	←	←	←
←	←	←	←

	DELAY	MULTI
	0	OFF
	0	OFF

[NORMAL/COMBINATION MODE]

OPERATION No.			OPERATION NAME			OPERATION TUNE		

1	VOICE No.		2	VOICE No.		3	VOICE No.		4	VOICE No.	
	NAME			NAME			NAME			NAME	
5	VOICE No.		6	VOICE No.		7	VOICE No.		8	VOICE No.	
	NAME			NAME			NAME			NAME	

MODE	
K.G.W	
KEY ASSIGN	

		1	2	3	4
MIDI CH					
PORTAMENTO/SOLO	PORTM ON/OFF				
	PORTM TIME				
	PORTM MODE				
	SOLO				
	MONO/POLY				
PITCH BEND	BEND RANGE				
	RELEASE				
MOD WHEEL	SENSITIVITY				
	VIB DEPTH				
	VIB RATE				
	PITCH				
	PORTM TIME				
	TREM DEPTH				
	TREM RATE				
	A ENV BIAS				
DEF CONTROL	SENSITIVITY				
	VIB DEPTH				
	VIB RATE				
	PITCH				
	PORTM TIME				
	TREM DEPTH				
	TREM RATE				
	A ENV BIAS				
FOOT VR	SENSITIVITY				
	VIB DEPTH				
	VIB RATE				
	PITCH				
	PORTM TIME				
	TREM DEPTH				
	TREM RATE				
	A ENV BIAS				
FOOT SW	FOOT SW				
VEL TABLE	VEL TABLE SEL				
VEL SPLIT	RANGE (FROM)				
	RANGE (TO)				
VEL INV	INVERSE				
DELAY TRIG	DELAY				

PAN	MODE	
	PAN 1	
	PAN 2	
	CONTROL 1	
	CONTROL 2	
	RANGE 1	
	RANGE 2	
	RATE	
	DEPTH	
	CONTROL	
SPLIT POINT	SP POINT	
	LOWER SP	
	MIDDLE SP	
	UPPER SP	
POS X-FADE	EFFECT	
	POS (FROM)	
	POS (TO)	
	L POS (FROM)	
	L POS (TO)	
	M POS (FROM)	
	M POS (TO)	
	U POS (FROM)	
	U POS (TO)	

		1	2	3	4	5	6	7	8
AFTER TOUCH	SENSITIVITY								
	VIB DEPTH								
	VIB RATE								
	PITCH								
	PORTM TIME								
	TREM DEPTH								
	TREM RATE								
	A ENV BIAS								
LEVEL	LEVEL								
PITCH	POLARITY								
	OCTAVE								
	NOTE								
	FINE								
VIBRATO INV	INVERSE								
TREMOLO INV	INVERSE								

	ON/OFF	WAVE	DEPTH	RATE	DELAY	MULTI
TOTAL VIBRATO						
TOTAL TREMOLO						

[MULTI CH MODE]

OPERATION No. [____]

OPERATION NAME [____]

OPERATION TUNE [____]

MODE [____]

	VOICE No.			VOICE No.	
1	NAME		2	NAME	

	VOICE No.			VOICE No.	
3	NAME		4	NAME	

	VOICE No.			VOICE No.	
5	NAME		6	NAME	

	VOICE No.			VOICE No.	
7	NAME		8	NAME	

PAN	MODE	
	PAN 1	
	PAN 2	
	CONTROL 1	
	CONTROL 2	
	RANGE 1	
	RANGE 2	
	RATE	
	DEPTH	
	CONTROL	

	6	7	8

	LAY	MULTI

		1	2	3	4	5	6	7	8
NOTE — POLYPHONIC									
MIDI CH									
PORTAMENTO/ SOLO	PORTM ON/OFF								
	PORTM TIME								
	PORTM MODE								
	SOLO								
PITCH BEND	BEND RANGE								
	RELEASE								
AFTER TOUCH	SENSITIVITY								
	VIB DEPTH								
	VIB RATE								
	PITCH								
	PORTM TIME								
	TREM DEPTH								
	TREM RATE								
	A ENV BIAS								
MOD WHEEL	SENSITIVITY								
	VIB DEPTH								
	VIB RATE								
	PITCH								
	PORTM TIME								
	TREM DEPTH								
	TREM RATE								
	A ENV BIAS								
DEF CONTROL	SENSITIVITY								
	VIB DEPTH								
	VIB RATE								
	PITCH								
	PORTM TIME								
	TREM DEPTH								
	TREM RATE								
	A ENV BIAS								
FOOT VR	SENSITIVITY								
	VIB DEPTH								
	VIB RATE								
	PITCH								
	PORTM TIME								
	TREM DEPTH								
	TREM RATE								
	A ENV BIAS								
FOOT SW	FOOT SW								
VEL TABLE	VEL TABLE SEL								
LEVEL	LEVEL								
PITCH	POLARITY								
	OCTAVE								
	NOTE								
	FINE								

PRESET (1)

	A	B	C	D	E	F	G	H
1	SEE GOD	BRASS CHORUS	SLAP BASS	HEAVY SPLIT	R/B BRASS	VZ EP	G.STEEL GTR	W.BRASS
2	SEE GOD 2	BRASS QUART	PICK BASS	STRING/FLUTE	CZ BRASS	VZ PIANO	G.VZ VIBES	W.SAX
3	VIB/STR SOFT	COPPERFUNK	FRETLESS BS	BASS/EP	ANALOG BRASS	VZ EP 2	G.LEAD	W.PAN FLUTE
4	ICE AGE	BRASS DETUNE	CC LEAD	BASS/VIBES	VELO ORCH	GITIANO	G.BASS-LEAD	W.OBOE
5	MELLOW PAD	VIOLINT ATCK	YES I GOT	BS/VBNO-SRNE	ORCHESTRA	CLAVI	G.ACO BASS	W.CLARINET
6	PEACE TREATY	DOUBLEGUITAR	VZ SOLO LEAD	VELOMONICA	HIGH STRINGS	WARM ORGAN	G.BS/TRUMPET	W.RECORDER
7	PIANO/LOCH	VZ VIBES	VZ PERC PAD	TRUMPOCITY	PAN VIBES	COOL ORGAN	G.BS/MONICA	W.SYNTH STR
8	DIGIVOICES	HEAVY METAL	TAKE A	HARP ROLL	TOI-TOY	BELL TREE	G.MULTI	W.POWER 5TH

PRESET (2)

	A	B	C	D	E	F	G	H
1	ICE HORNS	ACOUSTAR	FLANGE BASS	BS/GTNO-RICH	BEGINNING	WARM EP	G.JAZZ GTR	M.JAZZ BAND
2	VOCAL BELLS	TOY PIANO	SAXY LEAD	TXTURL SPL	SWIRLING STR	DYN VZ PIANO	G.WARM EP	M.FUNK BAND
3	TWINKY	DELAY VIBES	RING FLUTE	TXTURL SPL 2	HORN/STRINGS	DREAMY EP	G.DISTORTAR	M.ROCK BAND
4	FESTIVAL	OCTAVEMALLET	LIVE LEAD	EASTERN SPLT	VIB/PAN STR	DIGIPIANO	G.LEAD 2	M.CHAMBER
5	MELLIFLUENCE	STR QUARTET	VANUGENT 5TH	PASTOR/CLAVI	FESTIVAL 2	CLAVI PIANO	G.LEAD 3	M.NEW WAVE
6	FLUTE/STRING	STEREO BRASS	GAMELAN BELZ	VELOFLUTE	SOFT ORCHEST	ORGAN	G.EL BASS	INIT NORMAL
7	PEACEFUL	RECORDERS	OVERSEAS	SAXOPHOCITY	EP-SERENE	CHURCH ORGAN	G.BASS/SAX	INIT COMBI
8	GEN PURPOSE	PIPEONMONDAY	FEMALE VOICE	SOUND OF FUN	HEADBANGER	CAR HCRN	G.MULTI GTR	INIT MULTI

*You can shift between PRESET banks (1) and (2) by pressing the SHIFT key once again.

About Operation Memory Preset Sounds

Each VZ operation memory has been programmed for use with a specific type of MIDI controller in mind. Normally, these OP MEMs are programmed for use with keyboard controllers — for example, PST 1 "A-6:PEACE TREATY" is designed for use with keyboards.

When OP MEMs are programmed for use with MIDI guitar or woodwind controllers, the performance mode is indicated in the first digit of the OP MEM name.

For example; [G-6:G.BS/TRUMPET]. In this case, the "G." indicates that the sound is best suited for use with a MIDI guitar controller. For woodwind controllers, a "W" appears as the first digit.

Also, when the sound has been programmed for multi-channel use, an "M" appears as the first digit.

OP MEM MIDI Guitar Applications

When an OP MEM is programmed for use with a MIDI guitar controller, MIDI CHANNELs 1 through 6 are assigned independently to each guitar string (MONO MODE). In addition, the bend range is set to 12. (In this case, the TOTAL parameter (TOTAL-04) must be set to OFF on the VZ-8M. If set to ON, the MIDI CH should be set to "1").

Woodwind Controllers

When using another manufacturer's woodwind controller or wind synthesizer, the controller should be set for aftertouch control. (Note that as OP MEMs programmed for use with wind controllers vary in volume and timbre through aftertouch control, some OP MEMs may not sound when played using a keyboard.)

VOICE NAMES

PRESET (1)

	A	B	C	D	E	F	G	H
1	VZ EP	R/B BRASS	VZ TRUMPET	VZ BASS	FUSION LEAD	RICH ORCH	BRASS CHORUS	VZ VIBES
2	VZ PIANO	BRASSECTION	THE SAX	BASS GUITAR	DISTORTAR FB	SERENE ORCH	SYNBRASSES	VZ VIBES 2
3	VZ PIANO 2	RESO-BRASS	VZ-MONICA	FRETLESS BS	HEAVY LEAD	DIGIVOICE	BRASS BALLS	VIBIANO
4	VZ EP 2	MELLOW BRASS	FLUTE	60S BASS	VZ PERC PAD	SPACE ORCH	PRIMALSCREAM	TOI-TOY
5	VZ EP 3	VELO ORCH	STRINGATTACK	STEEL STRING	WHINING LEAD	FLUTE JUICE	VZ TOUCH	VZ MARIMBA
6	GITIANO	VZ STRINGS	WARM ORGAN	NYLON STRING	PIPE LEAD	CRYSTAL PAD	AVANALOCH	STEEL DRUM
7	CLAVI	ORCHESTRA	COOL ORGAN	HARP	SEQ BASS	ETHEREAL	CINEMA	BELLS
8	CLAVI 2	HORN/STRINGS	PIPE SYNTH	KOTO	BASS-SYNTH	NEW RAGE	CEREMONY	BELL TREE

PRESET (2)

	A	B	C	D	E	F	G	H
1	WARM EP	CZ BRASS	JAZZ SAX	ACOUSTAR	SYNTH FLUTE	PRETTY	GEN PURPOSE	SHARP VIBES
2	DYN VZ PIANO	ANALOG BRASS	JAZZ FLUTE	ACOUSTAR 2	FLUTISH LEAD	RICH ORCH 2	PLUCKED ATCK	VZ VIBES 3
3	VZ PIANO 3	BRASS LICKS	RECORDER	JAZZ GUITAR	SYNC LEAD	BELL/STRINGS	PLUCKED ATK2	MELLOW VIBES
4	DREAMY EP	FUNK BRASS	VIOLIN	FUNK BASS	LIVE SYNTH	FESTIVAL	ANALOGUE	TOI PERCUSS
5	DIGIPIANO	HORN SWELL	CELLO	VZ BASS 2	DISTORTAR	PASTORALE	DIGIVOICE 2	COWBELL
6	COOL CLAVI	ORCHESTRA 2	ORGAN	DIRTY BASS	DISTORTAR 2	TUBIANO	MELLIFLUENCE	CHURCH BELL
7	HEAVY CLAVI	HIGH STRINGS	PIPE ORGAN	PIANO BASS	OBOE-FORMIDI	MIDEASTMARKT	CHORUS	GAMELAN BELL
8	CLAVI PIANO	SLOPHASESTR	CHURCH ORGAN	WOOD BASS	CLA-FOR MIDI	ETHNICBREATH	ABOVE CLOUD	CAR HORN

*You can shift between PRESET banks (1) and (2) by pressing the SHIFT key once again.

You can change the performance mode that is preset for any operation memory by using the following procedure:
1. Select the operation memory for which you wish to change the performance mode.
2. Hold down the WRITE key and press either the COMBINATION key or NORMAL key. Press the key (COMBINATION or NORMAL) whose indicator is lit.
3. Set the performance mode to K, G, or W using the cursor keys and VALUE keys.

W.BR.	
W.SAX	
W.PAN FLUTE	
W.OBOE	
W.CLARINET	
W.RECORDER	
W.SYNTH STR	
W.POWER 5TH	

H
M.JAZZ BAND
M.FUNK BAND
M.ROCK BAND
M.CHAMBER
M.NEW WAVE
INIT RMAL
INIT MBI
INIT MULTI

ind. Normally,
CE TREATY"

e mode is indi-

for use with a

igit.

rough 6 are as-
2. (In this case,
d be set to "1").

be set for after-
timbre through

OPERATION MEMORIES
•PRESET 1

A-1 SEE GOD
Unique synthetic sound with a bell-like attack and thick sustain sound.

A-2 SEE GOD 2
Another variation of the "SEE GOD" sound; slightly lighter than A-1. Sounds good when played legato.

A-3 VIB/STR SOFT
Vibe sound on attack with sustained strings underneath; best suited to backing layers.

A-4 ICE AGE
"Cool" crystalline sound changes to voice timbre with velocity.

A-5 MELLOW PAD
Mellow, lazy sound; best suited to slower passages.

A-6 PEACE TREATY
Tonic sound mixed with 5th. Note that one pitch of one sound changes with modulation.

A-7 PIANO/LOCH
Mixed sound featuring electric piano and strings.

A-8 DIGIVOICES
Spacial bell chorus sound which emulates female chorus.

B-1 BRASS CHORUS
Cross-breed of brass and chorus sounds with a "classical" mood.

B-2 BRASS QUART
Emulates brass quartet featuring sax and trumpet sounds.

B-3 COPPERFUNK
Funky brass mix featuring 4 different sounds.

B-4 BRASS DETUNE
Mixed brass sounds with second sound shifted to 5th. Pitch of one sound can be altered with modulation.

B-5 VIOLINT ATCK
Violin sound with a sharp attack; sounds best when played percussively.

B-6 DOUBLEGUITAR
Emulates acoustic guitar; panning localization changes with velocity.

B-7 VZ VIBES
"Clear", crystal-like vibes sound. Delay trigger used to produce stereo effect.

B-8 HEAVY METAL
Distortion guitar mixed sound with one sound shifted to 5th. Use aftertouch to bend down; sustain for "feedback".

C-1 SLAP BASS
Heavy duty "slap" style electric bass. Play with percussive touch for best effect.

C-2 PICK BASS
Emulates electric bass played with pick. Note that octave of one sound changes with modulation.

C-3 FRETLESS BS
Smooth, fretless electric bass; aftertouch control of bend.

C-4 CC LEAD
Thick lead sound with sharp, metallic attack.

C-5 YES I GOT
Lead sound with electric piano attack. perfect for "fusion" sound. Aftertouch control of vibrato.

C-6 VZ SOLO LEAD
Percussive lead sound. Aftertouch control of vibrato.

C-7 VZ PERC PAD
Lead sound with sharp, metallic attack; lower end emulates "slap" style electric bass. Aftertouch control of vibrato.

C-8 TAKE A
Tasty synth reed; aftertouch control of vibrato.

D-1 HEAVY SPLIT
Split setup featuring distorted sound and heavy-duty, dirty bass. Split at F# 3.

D-2 STRING/FLUTE
Split setup featuring flute and strings. Note interesting flute attack sound. Split at F# 4.

D-3 BASS/EP
Split setup featuring electric piano and bass guitar. Aftertouch control of note bend for bass sound only. Split at C4.

D-4 BASS/VIBES
Split setup featuring vibes and percussive bass timbre. Split at C4.

D-5 BS/VBNO-SRNE
Split setup featuring percussive bass sound and a vibes/strings layered sound. Split at C4.

D-6 VELOMONICA
Velocity split featuring VZ-MONICA and AVANALOCH patches. Aftertouch control of bending with VZ-MONICA patch; sustain pedal controls only AVANALOCH.

D-7 TRUMPOCITY
Velocity split featuring VZ-TRUMPET and MELLOW BRASS patches. Aftertouch control of bending with VZ-TRUMPET patch; sustain pedal controls only MELLOW BRASS.

D-8 HARP ROLL
Produce diminished chord arpeggio by holding down just one key!

E-1 R/B BRASS
⟨Normal⟩ Powerful brass sound. Modulation controls fast panning effect.

E-2 CZ BRASS
⟨Normal⟩ Synthesized brass with "wide" effect created through panning.

E-3 ANALOG BRASS
⟨Normal⟩ Analog style synth brass; modulation control of panning effect.

E-4 VELO ORCH
⟨Normal⟩ Orchestra sound with panning effect; timbral changes through velocity.

E-5 ORCHESTRA
⟨Normal⟩ Orchestra sound with panning effect; panning changes through modulation.

E-6 H
⟨N
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E-7 P
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E-8 T
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ta
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F-1 V
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F-2 V
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F-3 V
⟨N
m

F-4 G
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F-5 Cl
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F-6 W
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F-7 C
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F-8 Bl
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G-1 G.
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G-2 G.
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G-3 G.
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G-4 G.
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G-5 G.
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G-6 G.
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G-7 G.
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6t

E-6 HIGH STRINGS
(Normal) Synthetic strings with "width" added through panning effect.

E-7 PAN VIBES
(Normal) Vibes sound made "wide" through panning.

E-8 TOI-TOY
(Normal) Mix featuring percussive sound and sustained strings; modulation-controlled panning adds spacial effect.

F-1 VZ EP
(Normal) Electric piano with addition of panning.

F-2 VZ PIANO
(Normal) Gorgeous piano sound with modulation controlling panning effect.

F-3 VZ EP 2
(Normal) Vibe-like electric piano sound with modulation control of panning.

F-4 GITIANO
(Normal) Velocity split featuring gradual transition from electric piano to guitar sound; aftertouch control of bend.

F-5 CLAVI
(Normal) Sharp clavi sound with modulation control of panning effect.

F-6 WARM ORGAN
(Normal) Panning effect emulates electric organ rotating speaker sound.

F-7 COOL ORGAN
(Normal) Similar to "F-6: WARM ORGAN" but with faster rotating speaker.

F-8 BELL TREE
(Normal) "Moving" bell sound emulated through panning.

G-1 G.STEEL GTR
Steel guitar sound designed for use with MIDI guitar controller.

G-2 G.VZ VIBES
Vibes sound with panning effect; designed for use with MIDI guitar controller.

G-3 G.LEAD
Mix of twin synth lead sounds; designed for use with MIDI guitar controller.

G-4 G.BASS LEAD
Mixed sound featuring synth lead sound and electric bass in unison; designed for use with MIDI guitar controller. Independent panning of each string.

G-5 G.ACO BASS
Emulates twin acoustic bass sound; designed for use with MIDI guitar controller.

G-6 G.BS/TRUMPET
Designed for use with MIDI guitar controller; first four strings control trumpet sound with 5th and 6th strings controlling bass sound.

G-7 G.BS/MONICA
Designed for use with MIDI guitar controller; first four strings control harmonica timbre with 5th and 6th strings controlling bass timbre.

G-8 G.MULTI
Designed for use with MIDI guitar controller; Different sound for each string, including vibes, synth bass and bell timbres. Play all strings in a high-range chord for interesting effect.

H-1 W.BRASS
Designed for use with MIDI wind controller; features funky brass sound with sharp attack. Play percussively for best results.

H-2 W.SAX
Designed for use with MIDI wind controller; note the changes in sound with stronger attack.

H-3 W.PAN FLUTE
Designed for use with MIDI wind controller; pan flute sound. Note louder attack noise with stronger attack.

H-4 W.OBOE
Designed for use with MIDI wind controller; oboe-like synthetic sound is especially realistic from mid-range down.

H-5 W.CLARINET
Clarinet-like synth sound designed for use with MIDI wind controller.

H-6 W.RECORDER
"Woody" recorder sound designed for use with MIDI wind controller.

H-7 W.SYNTH STR
Synthesizer strings featuring panning effect for ambience; play harder for brighter strings sound. Designed for use with MIDI wind controller.

H-8 W.POWER 5TH
Thick 8-sound mix with 5th added; designed for use with MIDI wind controller.

•PRESET 2

A-1 ICE HORNS
Analog style synthetic sound emulates thick, bell-like timbre. .

A-2 VOCAL BELLS
Mix of human voice and bells using velocity inverse; play softly for best results.

A-3 TWINKY
Synthethic timbre; note timbral changes when played staccato.

A-4 FESTIVAL
Interesting synthetic sound; useful when played as single notes or in unison.

A-5 MELLIFLUENCE
Mix of human voice and bells; useful in chords or in counter melodies.

A-6 FLUTE/STRING
Mix featuring flute sound and strings with a slow attack.

A-7 PEACEFUL
Metallic, percussive sound features timbral changes with alterations in velocity.

A-8 GEN PURPOSE
Multi-purpose percussive sound; good for leads, backing chords, etc.

B-1 ACOUSTAR
Acoustic guitar sound; useful when played in guitar arpeggios or in clavi-like "chops".

B-2 TOY PIANO
Huge "toy piano" sound; extremely realistic in mid and upper ranges.

B-3 DELAY VIBES
Vibe sound with short delay effect; nice for slower chord work.

B-4 OCTAVEMALLET
Percussive "mallet" sound in octave mix setup.

B-5 STR QUARTET
Lightweight string quartet; modulation adds vibrato.

B-6 STEREO BRASS
Interesting "stereo" setup featuring two different types of brass — one left, one right.

B-7 RECORDERS
Interesting recorder "ensemble".

B-8 PIPEONMONDAY
Slightly rough pipe organ sound; note changes from high range to lower range.

C-1 FLANGE BASS
Mixed arrangement featuring 4 different bass sounds and "flanger" effect.

C-2 SAXY LEAD
Sax-liek synth lead sound; aftertouch control of vibrato.

C-3 RING FLUTE
Flute-like synthetic sound with metallic attack noise.

C-4 LIVE LEAD
Heavy-duty synth lead sound; aftertouch control of heavy vibrato.

C-5 VANUGENT 5TH
Another heavy distortion lead sound with a 5th added; aftertouch control of bend.

C-6 GAMELAN BELZ
Emulates ethnic Indonesian "gamelan" bell-like sound; 4-sound mix.

C-7 OVERSEAS
4-sound ethnic mix with 5th added; play staccato for timbral variations.

C-8 FEMALE VOICE
Realistic, female vocal sound; note changes in attack sound with velocity.

D-1 BS/GTNO-RICH
Heavy-duty bass split featuring "GITIANO" and "RICH ORCH"; split at C4.

D-2 TXTURL SPL
Another interesting split setup featuring velocity-controlled brass and a percussive bass sound. Split at D4.

D-3 TXTURL SPL 2
Another split setup with a gorgeous synth sound and a heavy-duty bass sound. Split at D4.

D-4 EASTERN SPLT
Split setup with 2 different ethnic sounds; aftertouch control of bend. Split at D4.

D-5 PASTOR/CLAVI
Mix of PASTORALE and CLAVI sounds with timbral variations through velocity inverse function.

D-6 VELOFLUTE
Velocity split featuring synthetic sound and flute timbre.

D-7 SAXOPHOCITY
Velocity split featuring HORN SWELL and JAZZ SAX timbres. JAZZ SAX timbre feature aftertouch control of bend; sustain pedal controls HORN SWELL part only.

D-8 SOUND OF FUN
Play a single key for an automatic 4-note arpeggio (C, D, E, F,...); features bell-like sound.

E-1 BEGINNING
Huge ensemble sound emulates mixed sound featuring a number of different synth sounds. Modulation alters R/L assignment.

E-2 SWIRLING STR
Strings with slow attack; "swirling" effect through panning.

E-3 HORN/STRINGS
String-like sound with wide ambience through panning effect.

E-4 VIB/PAN STR
Mixed sound featuring vibes and strings with panning.

E-5 FESTIVAL 2
Synth ensemble featuring panning.

E-6 SOFT ORCHEST
Lightweight bells and strings; modulation controls panning effect.

E-7 EP SERENE
Mixed sound featuring electric piano sound and synth timbre with panning.

with a 5th

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E-8 HEADBANGER
Distorted sound made "wider" through panning effect; second sound raised an octave through modulation.

F-1 WARM EP
(Normal) Orthodox electric piano sound; modulation controls PAN effect.

F-2 DYN VZ PIANO
(Normal) Standard electric piano with panning effect.

F-3 DREAMY EP
(Normal) Dream-like electric piano sound with panning effect.

F-4 DIGIPIANO
(Normal) Big electric piano sound; muse modulation for "thrilling" effect.

F-5 CLAVI PIANO
(Normal) Clavi sound; sound moves from left to right each time a key is pressed.

F-6 ORGAN
(Normal) Rockin' organ sound; modulation controls rotating speaker effect.

F-7 CHURCH ORGAN
(Normal) Big church pipe organ; modulation controls panning effect.

F-8 CAR HORN
(Normal) Realistic "European" auto horn; modulation changes panning localization.

G-1 G.JAZZ GTR
Designed for use with MIDI guitar controller; realistic jazz guitar with independent panning for each string.

G-2 G.WARM EP
Designed for use with MIDI guitar controller; vibes sound with panning effect.

G-3 G.DISTORTAR
Designed for use with MIDI guitar controller; mix featuring twin distortion guitar sounds.

G-4 G.LEAD 2
Designed for use with MIDI guitar controller; mixed sound featuring distorted synth lead sound with reverb.

G-5 G.LEAD 3
Designed for use with MIDI guitar controller; mix sound featuring twin lead synth guitars; play up to 4 notes for effective cutting.

G-6 G.EL BASS
Designed for use with MIDI guitar controller; mixed sound featuring twin electric bass sounds.

G-7 G.BASS/SAX
Designed for use with MIDI guitar controller; sax sound on strings 1 through 4, bass sound on strings 5 and 6.

G-8 G.MULTI GTR
Designed for use with MIDI guitar controller; slightly different acoustic guitar timbres on each string.

H-1 M.JAZZ BAND
Multi Channel setup; CH1:WOOD BASS/2-note poly; CH2:VZ EP/4-note poly; CH3:THE SAX/3-note poly.

H-2 M.FUNK BAND
Multi Channel setup; CH1:VZ BASS/2-note poly; CH2:GITIANO/3-note poly; CH3:R/B BRASS/3-note poly.

H-3 M.ROCK BAND
Multi Channel setup; CH1:PIANO BASS/2-note poly; CH2:ORGAN/3-note poly; CH3:DISTORTER/3-note poly.

H-4 M.CHAMBER
Multi Channel setup; CH1:CELLO/2-note poly; CH2:BRASS CHORUS/2-note poly; CH3:VIOLIN/2-note poly; CH4:FLUTE/2-note poly.

H-5 M.NEW WAVE
Multi Channel setup; CH1:SEQ BASS/2-note poly; CH2:DIGI VOICE/4-note poly; CH3:VZ MARIMBA/2-note poly.

H-6 INIT NORMAL
Features initialized data for NORMAL mode.

H-7 INIT COMBI
Features initialized data for COMBI mode.

H-8 INIT MULTI
Features initialized data for MULTI CHANNEL mode.

Care of Your Unit

1. Avoid heat, humidity and direct sunlight.
Do not overexpose your unit to direct sunlight, place it near a heater, or in any area are subject to high temperatures.

2. Severe impact can result in malfunction.
This digital synthesizer is composed of precision electronic components which can be damaged when subjected to severe impacts. Be sure to pack it carefully when transporting, using a case whenever possible.

3. Avoid direct contact with liquids, dirt, dust, etc.
Never allow foreign matter to enter this product. Also, be especially careful of metallic objects such as hairpins, sewing needles or coins. Do not allow the unit to get wet.

4. Never attempt to modify any part of the unit.
Any modification of, or tampering with the unit internal components can cause trouble or malfunction. If your unit is not operating properly, be sure to take it to an authorized Casio service center.

5. Do not use caustic cleaning agents.
Clean your unit with a soft cloth dampened with a mild detergent solution. Use of thinner, alcohol, benzene and similar chemicals should be avoided under all circumstances.

6. Avoid using this unit near televisions, radios, etc.
Because this unit uses digital circuitry, it may cause interference with other electronic devices such as televisions, radios, etc.

Care of Your Optional ROM or RAM Card
1. Take care not to bend or drop your memory cards. Never carry a card in your back pocket or leave it in other areas where it may be damaged.
2. When not in use, be sure to store your card in its custom case to prevent damage due to dust etc.
3. Your card contains precision electronic components. Never try to take it apart for any reason.
4. Casio claims no responsibility whatsoever for damages due to losses of card data.

Features and Functions

①Master volume   ②Liquid crystal display

CASIO   PROFESSIONAL DIGITAL SYNTHSIZER VZ-8M

MIN VOLUME MAX   CARD

PHONES

⑨Headphone jack   ⑩Card slot
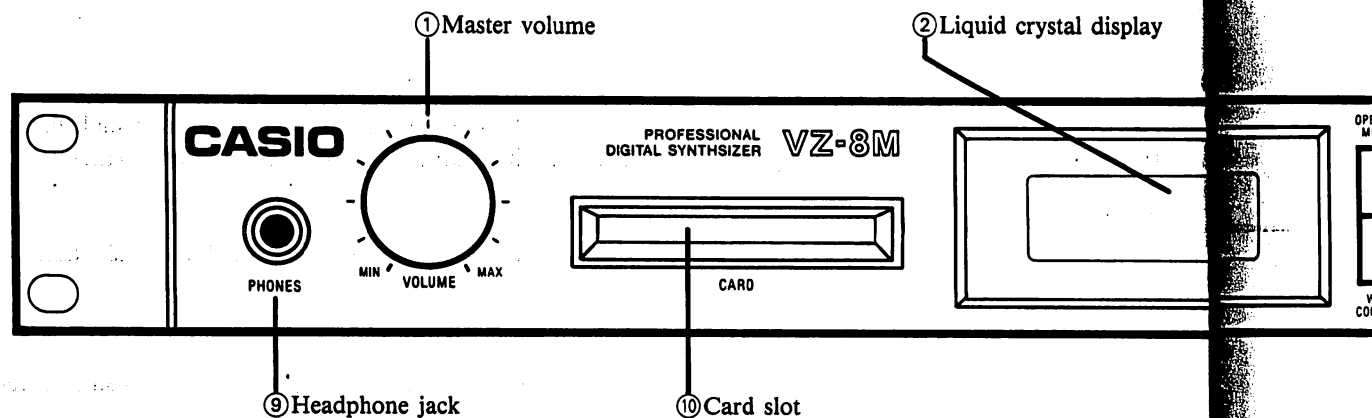
①**Master volume**
Used to adjust the overall output volume.

②**Liquid crystal display**
Backlit liquid crystal graphic display is used to display all menu functions.

③**Operation memory mode key**
Used to select the OPERATION MEMORY operational mode.

④**Normal mode key**
Used to select the NORMAL operational mode.

⑤**Combination mode key**
Used to select the COMBINATION operational mode.

⑥**Multi Channel mode key**
Used to select the MULTI CHANNEL operational mode.

⑦**Compare/Recall key**
Used during editing to "recall" the original sound (sound before editing) and "compare" it with the edited version. When the indicator is OFF, the original sound is output. When the indicator is ON, the edited version is output.

⑧**Curso**
Used to
functions.

⑨**Headp**
Connect

⑩**Card**
Insert RO
With a RO
operation
storage of

③ Operation memory mode key

④ Normal mode key

⑤ Combination mode key

⑥ Multi Channel mode key

⑦ Compare/Recall key

⑧ Cursor key

:rystal display
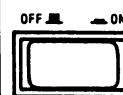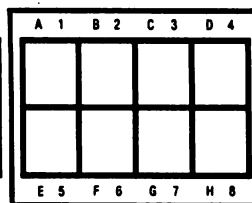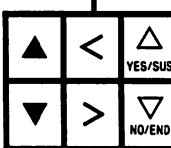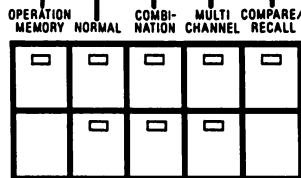
OPERATION MEMORY	NORMAL	COMBI-NATION	MULTI CHANNEL	COMPARE/RECALL		▲	<	△ YES/SUS		A 1	B 2	C 3	D 4		OFF ■ — ON
WRITE COPY/INIT	TOTAL CONTROL	EDIT	BANK M ON/OFF	SHIFT		▼	>	▽ NO/END		E 5	F 6	G 7	H 8		POWER
						PAGE	CURSOR	VALUE							

⑰ Value keys

⑲ Power switch

⑯ Page keys

⑱ Program No keys (A~H/1~8)

⑮ Shift key

⑭ Bank key (Module ON/OFF key)

⑬ Edit key

⑫ Total Control key

⑪ Write key (Copy/Initialize)

⑧ Cursor key
Used to move the "cursor" within the various menu functions.

⑨ Headphone jack
Connect headphones for "private" performance.

⑩ Card slot
Insert ROM or RAM cards for save/load of sound data. With a ROM card, up to 128 individual patches and 128 operation memories can be stored. RAM cards allow storage of up to 64 patches and 64 operation memories.

⑪ Write key (Copy/Initialize)
Used to write edited sounds to either internal, card or operational memories.

⑫ Total Control key
Used to access the TOTAL CONTROL editing menu.

⑬ Edit key
Used to access the VOICE PARAMETER and EFFECT editing menus.

:rational mode.

EL operational

al sound (sound
e edited version.
al sound is out-
dited version is

⑭ Bank key (Module ON/OFF key)

Used to begin bank selection process. After pressing this key, you can select BANKs A through H using the PROG NO keys. This key is also used to turn iPD sound source modules ON and OFF when editing sounds using VOICE PARAMETER menu functions.

⑮ Shift key

Used to select the memory area (PRESET 1 or 2, INTERNAL, CARD 1 or 2).

⑯ Page keys

Used when accessing various editing functions. The PAGE [▲] key increments function numbers, while the PAGE [▼] key decrements these numbers.

⑰ Value keys

Used to raise or lower values of various VZ-8M parameters.

⑱ Program No keys (A ~ H/1 ~ 8)

The Program Number keys are used to select iPD sound source modules (M1 ~ M8), and also to specify the sound bank (A ~ H) as well as sound number (1 ~ 8).

⑲ Power switch

Switches unit ON and OFF.

REAR PANEL CONNECTIONS
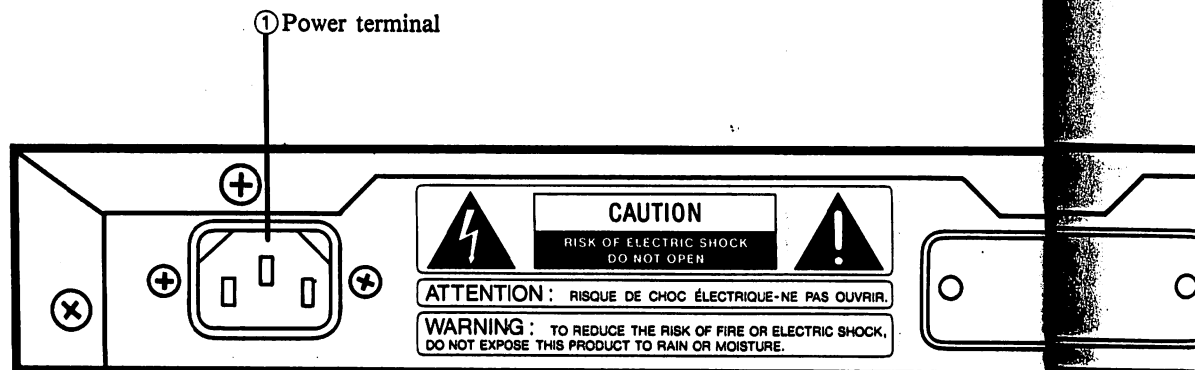
① Power terminal

① Power terminal

For connection of accessory AC power cord

② MIDI terminals (IN/OUT/THRU)

For connection of other MIDI-equipped instruments and devices.

③ Line out jacks (R/L)

In the Combination mode or Multi-Channel mode, up to 4 patches or up to 8 areas are separated and assigned automatically into Line Out R or Line Out L. Mixed (mono) sound is output through the "R" jack.

various VZ-RM

selec... sound
specify the sound
r (1 ~ 8).

②MIDI terminals
(IN/OUT/THRU)

③Line out jacks (R/L)

THRU   OUT   IN   R/MIX   L
        MIDI   LINE OUT

⑧...
Usab...
func...
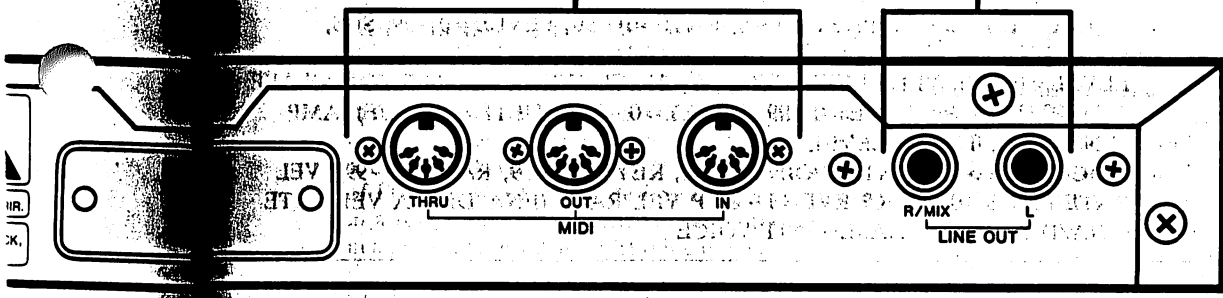
...nel mode, up
...l and assigned
...Out L. Mixed
..." jack.

⑩ Card
Incr...
...Mix...
oper...
...stored

Specifications

Total c

Input/(

Output

Display

Power s

Memory

Power c

Dimensi

Weight:

Standard

*Design c

Model:	VZ-8M
Range:	F#-1 ~ G9 (MIDI NOTE No. 6 ~ 127(10))
Polyphonic:	8 note-polyphonic
Sound source:	iPD (interactive phase distortion) SYSTEM
Modes:	NORMAL K (keyboard), NORMAL G (guitar), NORMAL W (wind instrument), COMBINATION K, COMBINATION G, COMBINATION W, OPERATION MEMORY, MULTI CHANNEL
Programmer:	128 preset voices, 64 internal voices, 128 card voices (with ROM card), 64 card voices (with RAM card RA-500), 1 compare/recall voice, 128 preset operation memory, 64 internal operation memory, 128 card operation memory (with ROM card), 64 card operation memory (with RAM card RA-500)
Modules:	8 × (DCO+DCA), ON/OFF
Voice parameters:	INT LINE (MIX/RING/PHASE), EXT PHASE(ON/OFF), WAVE FORM: 8, DE-TUNE (PITCH FIX, RANGE, HARMONIC, TUNE) <DCO> ENVELOPE(STEP=1~8, RATE=0~99, LEVEL=-63~+63, SUS, END), ENV DEPTH (RANGE=WIDE/NARROW, DEPTH=0~63), KF LEVEL (POINT=1~6, KEY=C0~C9, LEVEL=0~63), VEL LEVEL (SENS=0~31, CURVE=1~8), VIBRATO (WAVE: 4, DEPTH=0~99, RATE=0~99, DELAY=0~99, MULTI=ON/OFF), OCTAVE (-2~+2) <DCA> ENVELOPE (STEP=1~8, RATE=0~99, LEVEL=0~99, SUS, END), ENV DEPTH (0~99), KF LEVEL (POINT=1~6, KEY=C0~C9, LEVEL=0~99), VEL LEVEL (SENS=0~31, CURVE=1~8), TREMOLO(WAVE: 4, DEPTH=0~99, RATE=0~99, DELAY=0~99, MULTI=ON/OFF), AMP SENS (0~7), TOTAL LEVEL (0~99) <DCO/DCA> KF RATE (POINT=1~6, KEY=C0~C9, RATE=0~99), VEL RATE (SENS=0~31, CURVE=1~8), P VEL RATE (ENA/DIS), A VEL RATE (ENA/DIS), VOICE NAME, INIT VOICE
Effect parameters:	MIDI CHANNEL (1~16), PORTAMENTO/SOLO(PORTM=ON/OFF, PORTM TIME=0~99, PORTM MODE=TIME CONST/RATE CONST, SOLO=ON/OFF, POLY/MONO), PITCH BEND(RANGE=0~48, RELEASE=ENA/DIS), AFTER TOUCH/MOD WHEEL/DEF CONTROL/FOOT VR (SENS=0~99, -99~+99, VIB DEPTH=ON/OFF, VIB RATE=ON/OFF, PITCH=+ON/-ON/OFF, PORTM TIME=ON/OFF, TREM DEPTH=ON/OFF, TREM RATE=ON/OFF, A ENV BIAS=ON/OFF), FOOT SW (SUSTAIN/SOSTENUTO/DISABLE), VEL TABLE SELECT (TABLE NO.=1~8), PAN(MODE=FIX/CONTROL/AUTO, FIX: PANPOT1/2=-15~0~+15, CONTROL: CONTROL1/2=AFTER/FOOT VR/MOD/DEF/PAN, RANGE1/2=L/R/C~L/R/C, AUTO:PAN1/2=ON/OFF, RATE=0~63, DEPTH=0~31, CONTROL=AFTER/FOOT VR/MOD/DEF/OFF), LEVEL (0~99), PITCH (POLARITY=+/-, OCTAVE=0~5, NOTE=0~11, FINE=0~63), SPLIT POINT (C0~C9), VEL SPLIT (RANGE=1~127), VEL INVERSE (ON/OFF), POS CROSSFADE (X-FADE=ON/OFF, POS=C0~C9), DELAY TRIGGER (0~99), TOTAL VIBRATO (ON/OFF), VIBRATO INVERSE (ON/OFF), TOTAL TREMOLO (ON/OFF), TREMOLO INVERSE (ON/OFF), COMBI COPY (1~8), OPERATION NAME, OPERATION TUNE

Total control parameters:	MASTER TUNE ($-64 \sim +64$), TRANSPOSE ($G \sim F\#$), MEMORY PROTECT (INTERNAL = ON/OFF, CARD = ON/OFF), SAVE/LOAD (SAVE/LOAD, CARD1/CARD2/MIDI, DATA = VOICE/OPMEM/VC + OP/FULL), MIDI CHANNEL (CHANNEL = $1 \sim 16$, TOTAL = ON/OFF), MIDI DATA (PROGRAM = $0 \sim 127/0 \sim 63$/DIS, EXCLUSIVE = ENA/DIS, DEF CONTROL = OFF/$12 \sim 31$, VOLUME = ENA/DIS, OVERFLOW = NORMAL/$1 \sim 8$, CARD FORMAT
Input/output:	line out × 2 (MIX/R, L) Output impedence: $2.2k\Omega$
Output voltage:	1.3V (RMS) MAX, headphones, MIDI (IN/OUT/THRU), card slot
Display:	16 characters × 2 (with back-up light)
Power supply:	AC 100V, 120V, 220V, 240V using supplied AC cord
Memory back up:	Built-in lithium battery (life: approx. 5 years)
Power consumption:	13W
Dimensions:	482.6 × 300 × 53.6mm (19″ × 11$^{13}⁄_{16}$″ × 2$^1⁄_8$″)
Weight:	4.0kg (8.8lbs)
Standard accessories:	AC power cord, plug cord set, MIDI cable (3m), Menu table

Design and specifications are subject to change without notice.

GUIDELINES LAID DOWN BY FCC RULES FOR USE OF THE UNIT IN THE U.S.A. (not applicable to other areas).

This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

..... reorient the receiving antenna
..... relocate the equipment with respect to the receiver
..... move the equipment away from the receiver
..... plug the equipment into a different outlet so that equipment and receiver are on different branch circuits.

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful: "How to Identify and Resolve Radio-TV Interference Problems". This booklet is available from the US Government Printing Office, Washington, D.C., 20402, Stock No. 004-000-00345-4.

WARNING:
CHANGING THE VOLTAGE SELECTOR MAY REQUIRE THE USE OF A DIFFERENT LINE CORD OR ATTACHMENT PLUG, OR BOTH. TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

IMPORTANT SAFETY INSTRUCTIONS

"INSTRUCTIONS PERTAINING TO A RISK OF FIRE, ELECTRIC SHOCK, OR INJURY TO PERSONS"

WARNING — When using electric products, basic precautions should always be followed, including the following:

1. Read all the instructions before using the product.

2. Do not use this product near water - for example, near a bathtub, washbowl, kitchen sink, in a wet basement, or near a swimming pool, or the like.

3. This product should be used only with a stand that is recommended by the manufacturer.

4. This product, either alone or in combination with an amplifier and headphones or speakers, may be capable of producing sound levels that could cause permanent hearing loss. Do not operate for a long period of time at a high volume level or at a level that is uncomfortable. If you experience any hearing loss or ringing in the ears, you should consult an audiologist.

5. The product should be located so that its location or position does not interfere with its proper ventilation.

6. The product should be located away from heat sources such as radiators, heat registers, or other products that produce heat.

7. The product should be connected to a power supply only of the type described in the operating instructions or as marked on the product.

8. This product may be equipped with a polarized line plug. This is a safety feature. If you are unable to insert the plug into the outlet, contact an electrician to replace your obsolete outlet. Do not defeat the safety purpose of the plug.

9. The power-supply cord of the product should be unplugged from the outlet when left unused for a long period of time.

10. Care should be taken so that objects do not fall and liquids are not spilled into the enclosure through openings.

11. The product should be serviced by qualified service personnel when:

A. The power-supply cord or the plug has been damaged; or

B. Objects have fallen, or liquid has been spilled into the product; or

C. The product has been exposed to rain; or

D. The product does not appear to operate normally or exhibits a marked change in performance; or

E. The product has been dropped, or the enclosure damaged.

12. Do not attempt to service the product beyond that described in the user-maintenance instructions. All other servicing should be referred to qualified service personnel.

SAVE THESE INSTRUCTIONS

This product must be grounded. If it should malfunction or break-down, grounding provides a path of least resistance for electric current to reduce the risk of electric shock. This product is equipped with a cord having an equipment-grounding conductor and a grounding plug. The plug must be plugged into an appropriate outlet that is properly installed and grounded in accordance with all local codes and ordinances.

DANGER — Improper connection of the equipment-grounding conductor can result in a risk of electric shock. Check with a qualified electrician or serviceman if you are in doubt as to whether the product is properly grounded. Do not modify the plug provided with the product — if it will not fit the outlet, have a proper outlet installed by a qualified electrician.

CASIO DIGITAL SYNTHESIZER

Model **VZ-8M** **MIDI Implementation Chart**

Version: 1.0

Function ...		Transmitted	Recognized	Remarks
Basic Channel	Default	1-16	1-16	Hold in memory.
	Changed	1-16	1-16	
Mode	Default	Mode 3	Mode 3	
	Messages	X	POLY/MONO	
	Altered	*************		
Note Number:		*************	0-127	
	True voice		0-127	
Velocity	Note ON	X	◯ 9n v = 1-127	
	Note OFF	X	X 9n v = 0, 8n v = X X	X X = irrelevant
After Touch	Key's	X	X	
	Ch's	X	◯	
Pitch Bender		X	◯	14 bit effective, 0~48 half tones
Control Change	1	X	◯	MODULATION WHEEL
	4	X	◯	FOOT VR
	5	X	◯	PORTAMENTO TIME
	6, 38	X	◯	DATA ENTRY (RPC)
	7	X	◯	MASTER VOLUME
	10	X	◯	PAN
	12~31	X	◯	DEF CONTROL (*1)
	64	X	◯	SUSTAIN
	65	X	◯	PORTAMENTO ON/OFF
	100, 101	X	◯ (#0)	RPC (LSB, MSB) (*2)
Prog Change:	True #	X	0-63, 0-127	0~63 or 0~127 transmitted according to setting in TOTAL CONTROL menu.
		*************		
System Exclusive		◯	◯	VOICE DATA OPERATION DATA etc.
System Common	: Song Pos	X	X	
	: Song Sel	X	X	
	: Tune	X	X	
System Real Time	: Clock	X	X	
	: Commands	X	X	
Aux Messages	: Local ON/OFF	X	X	
	: All notes OFF	X	X	
	: Active Sense	X	X	
	: Reset	X	X	

Remarks

*1: One control change message transmitted as set in TOTAL CONTROL menu-05.

*2: RPC: Registered Program Control Number.
  #0: Pitch Bend Range
  Parameter values set using DATA ENTRY.

CASIO DIGITAL SYNTHESIZER

VZ-8M

MIDI SYSTEM EXCLUSIVE

CASIO.

VZ-8M MIDI SYSTEM EXCLUSIVE

VZ-8M MIDI System Exclusive

The VZ-8M is capable of transmitting and receiving MIDI system exclusive message as listed below. The transmit/receive status of each message is also noted.

I. System Exclusive Message Transmit/ Receive

MESSAGE	OP. MEM		NORMAL		COMBI		MULTI	
	TRANS	REC	TRANS	REC	TRANS	REC	TRANS	REC
Single voice (patch) data (*1)			O	O				
Single operation data (*1)	O	O		O		O		O
Multi Channel data (*2)								O
SAVE/LOAD data (*3)	O	O	O	O	O	O	O	O
Master tune data		O		O		O		O
Key transpose data		O		O		O		O
Mode change data 1 (*4)		O		O		O		O
Mode change data 2 (*5)				O		O		
Shift change data (*6)		O		O		O		O
Bend range data		O		O		O		O

(*1) Single voice data sent when sound number is changed using VZ-8M controls in NORMAL PLAY MODE, or when SEND REQUEST message is received.
Single operation data sent when operation number is changed using VZ-8M controls in OP MEM PLAY MODE, or when SEND REQUEST message is received. In individual modes, operation data created in corresponding mode is received; when set to NORMAL MODE, operation data created in NORMAL MODE is received. When set to COMBI (COMBINATION) MODE, operation data created in COMBI MODE is received, etc.
Above data transmission/reception is impossible if TOTAL CONTROL "EXCLUSIVE" parameter (TOTAL-05) is disabled (set to DIS).

(*2) Transmission/reception is impossible if TOTAL CONTROL "EXCLUSIVE" parameter (TOTAL-05) is disabled (set to DIS).

(*3) Can only be executed in TOTAL CONTROL MODE. Transmission/reception is impossible if TOTAL CONTROL "EXCLUSIVE" parameter (TOTAL-05) is disabled (set to DIS).

(*4) MODE CHANGE-1 is used to switch between NORMAL, COMBI, MULTI CH (MULTI CHANNEL), and OP MEM (OPERATION MEMORY) MODES.

(*5) Mode Change-1 is used to switch between K (Keyboard), G (Guitar), and W (Wind) performance modes.

(*6) Transmission/reception is impossible if TOTAL CONTROL "PRG NO" parameter (TOTAL-05) is disabled (set to DIS).

II. Message Formats

1. Voice Data

A single Voice Data in NORMAL MODE is transmitted/ received.
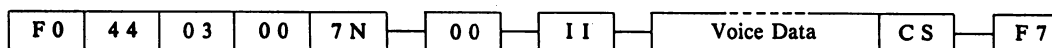
(1) Data format

| F0 | 44 | 03 | 00 | 7 N |—| 0 0 |—| I I |—| Voice Data | C S |—| F 7 |

N(HEX): Basic Channel
*Basic channel is the MIDI channel that set in TOTAL-04 (TOTAL CONTROL menu No.05).
   N = Display data - 1 (N = 0 ~ F(HEX))
II(HEX): Data receive area
*II indicates range in which data is received by receiving device. Received with II = 40 in NORMAL MODE C/R (COMPARE/RECALL) area.
CS(HEX) : Check Sum (7bit)
*Refer to page 14 for information on internal format of single voice data.

(2) Transmit/Receive status

	Transmit/Receive Validity Mode	TOTAL CONTROL-05 EXCLUSIVE =
Transmitted	NORMAL PLAY MODE	ENA
Received	NORMAL PLAY MODE	ENA

(3) Transmit/Receive Operations
TRANSMIT: When voice selection is made on NORMAL PLAY MODE or when C/R key is pressed, selected tone data is transmitted to receiving device.
RECEIVE: When voice details received in NORMAL PLAY MODE, C/R LED lights and LCD point indicates C/R. Name of received voice is displayed and received voice is sounded.

(4) Data transmission/reception to & from VZ-1, VZ-10M.
*II = 40 (HEX) (NORMAL C/R area) data from voice data is transmitted/received to or from VZ-1 or VZ-10M as described above.

2. SEND REQUEST for Single Voice Data

When a SEND REQUEST is received, voice data for a single NORMAL MODE voice is transmitted.

(1) Data Format
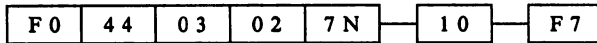
| F 0 | 4 4 | 0 3 | 0 2 | 7 N | — | 1 0 | — | F 7 |

N(HEX): Basic Channel
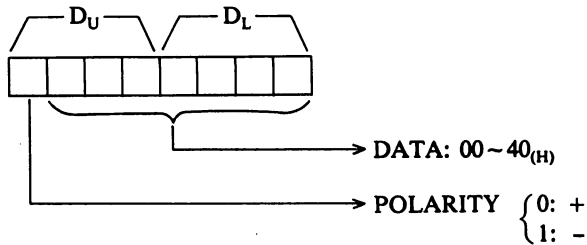*Basic channel is that set in TOTAL-04.
    N = Display data - 1 (N = O ~ F (HEX))

(2) Transmit/Receive Status

	Transmit/Receive Validity Mode	TOTAL CONTROL-05 EXCLUSIVE =
Transmitted	—	—
Received	NORMAL PLAY MODE	ENA

(3) Receive Operations
RECEIVE: When SEND REQUEST is received in the NORMAL PLAY MODE, voice data for a single voice is transmitted through MIDI OUT to the C/R (or sound area) of the receiving device.
*Refer to page 14 for information on the internal format of single voice data.

3. Operation Data

A single Operation Memory Data in OP MEM MODE is transmitted/received.

(1) Data format
A: Data common to VZ-1/10M
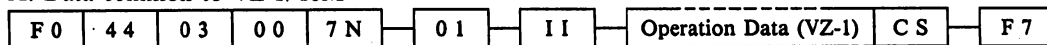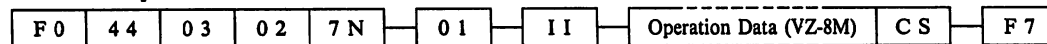
| F 0 | 4 4 | 0 3 | 0 0 | 7 N | — | 0 1 | — | I I | — | Operation Data (VZ-1) | C S | — | F 7 |

B: Data unique to VZ-8M

| F 0 | 4 4 | 0 3 | 0 2 | 7 N | — | 0 1 | — | I I | — | Operation Data (VZ-8M) | C S | — | F 7 |

N(HEX): Basic Channel
*Basic channel is the MIDI channel that set in TOTAL-04 (TOTAL CONTROL menu No.04).
        N = Display data - 1 (N = 0~F(HEX))
II(HEX) : Data receive area
*II indicates range in which data is received by receiving device. Received with II = 40 in OP MEM MODE sound area.
CS(HEX) : Check Sum (7bit)
*Refer to page 24 for information on internal format of single operation data.

(2) Transmit/Receive status

	Transmit/Receive Validity Mode	TOTAL CONTROL-05 EXCLUSIVE =
Transmitted	OP MEM PLAY MODE	ENA
Received	NORMAL/COMBI/MULTI CH OP MEM PLAY MODE	ENA

- Receiving Operation Data in each mode.
  Only Operation Memory Data created in NORMAL MODE can be received the NORMAL MODE.
  Only Operation Memory Data created in COMBI MODE can be received in the COMBI MODE.
  Only Operation Memory Data created in MULTI CH MODE can be received in the MULTI CH MODE.
  All Operation Memory Data can be received in the OP MEM MODE.

(3) Transmit/Receive Operations
    TRANSMIT: When Operation memory numbers are made using the program keys (or other controllers) in the OP MEM PLAY MODE, the Operation Data called up (VZ-1/VZ-10M format and VZ-8M format data) is transmitted to the sound area of the receiving device.
    RECEIVE: When Operation data is received in OP MEM PLAY MODE, Operation data is received in Operation Memory sound area. The LCD shows the program number selected before the data is received, however the Operation name and internal Operation Data correspond to the received data. In addition, Operation Memories created in the NORMAL, COMBI and MULTI CH MODES can also be received.
           Note, however,that the contents of Operation Memory Data include pointers for the voices to be used as well as effects, so the voices data of the receiving device.

(4) Data transmission/reception to & from VZ-1, VZ-10M.
- Reception of single operation data from VZ-1, VZ-10M.
  Operation data from VZ-1 or VZ-10M can also be received. Only portions of data common to VZ-1/10M (data "A") are received at this time. Data parameters unique to VZ-8M are loaded with initialized value.
- VZ-1/10M reception of VZ-8M single operation data.
  Operation data from VZ-8M is comprised of portions common to VZ-1/10M (data "A") and data unique to VZ-8M (data "B"). Because of this, only portions of data common to VZ-1/10M (data "A") can be received.
  Note, however, that data which has once been received by a VZ-1 or VZ-10M cannot be transmitted back for reuse in the VZ-8M.

4. SEND REQUEST for Single Operation Data
When a SEND REQUEST is received, a single OP MEM MODE operation memory is transmitted.

(1) Data Format
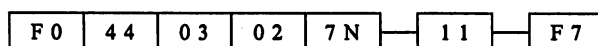
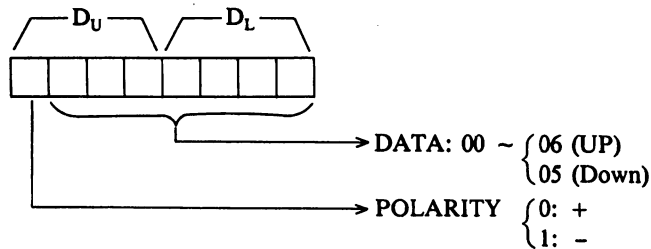| F 0 | 4 4 | 0 3 | 0 2 | 7 N |—| 1 1 |—| F 7 |

N(HEX) : BASIC CHANNEL
        Basic channel is the MIDI channel that set in TOTAL-04.
            N = Display data - 1 (N = O ~ F (HEX))

(2) Transmit/Receive Status

	Transmit/Receive Validity Mode	TOTAL CONTROL-05 EXCLUSIVE =
Transmitted	—	—
Received	OP MEM PLAY MODE	ENA

(3) Transmit/Receive Operations
    RECEIVE: When SEND REQUEST is received in the OP MEM PLAY MODE, voice data for a single operation memory is transmitted through MIDI OUT to the sound area of the receiving device.
    *Refer to page 24 for information on the internal formal of voice data for a single operation memory. In addition, for information on operations when receiving operation memory data, refer to page 2.

5. Multi Channel Mode Data

A single Multi Channel Mode Data is received.

(1) Data Format:

| F 0 | 4 4 | 0 3 | 0 0 | 7 N |—| 0 2 |—| 0 0 |—| Multi Channel Data | C S |—| F 7 |

N(HEX): BASIC CHANNEL
*Basic channel is the MIDI channel that set in TOTAL-04.

$$N = \text{Display data} - 1 \ (N = O \sim F \ (HEX))$$

CS(HEX): Check Sum (7bit)
*Refer to page 47 for information on the internal format of Multi Channel Data.

(2) Transmit/Receive Status

	Transmit/Receive Validity Mode	TOTAL CONTROL-05 EXCLUSIVE =
Transmitted	—	—
Received	MULTI CH PLAY MODE	ENA

(3) Transmit/Receive Operations
RECEIVE: Although MULTI CH data is received in the MULTI CH PLAY MODE, the cursor will remain in the position of the previously selected area. The contents of the MULTI CH data include a pointer for voices used in each area as well as effect data. The voices which actually sound in each voice area will depend on the voice data of the receiving device. MULTI CH data is in VZ-1/10M format, so data parameters unique to the VZ-8M are loaded with initialized values.

(4) Reception of VZ-1/10M data
*Refer to "(3) Transmit/Receive Operations" above.

6. SAVE/LOAD

Voice Data for all 64 internal voices, Operation Memory Data for 64 internal Operation Memories and TOTAL CONTROL Data is transmitted/received.

(1) Data Format
i) Data common to VZ-1/10M

OPEN: | F 0 | 4 4 | 0 3 | 0 0 | 7 N |—| 7 0 |—| K K |—| F 7 |

CLOSE: | F 0 | 4 4 | 0 3 | 0 0 | 7 N |—| 7 1 |—| F 7 |

OK: | F 0 | 4 4 | 0 3 | 0 0 | 7 N |—| 7 2 |—| F 7 |

ERROR: | F 0 | 4 4 | 0 3 | 0 0 | 7 N |—| 7 3 |—| F 7 |

DATA: | F 0 | 4 4 | 0 3 | 0 0 | 7 N |—| 7 4 |—| Data | CS | Data | CS | ... | Data | CS |—| F 7 |

Voice data or Operation data (VZ-1)

ii) Data unique to VZ-8M

OPEN: | F 0 | 4 4 | 0 3 | 0 2 | 7 N |—| 7 0 |—| K K |—| F 7 |

CLOSE: | F 0 | 4 4 | 0 3 | 0 2 | 7 N |—| 7 1 |—| F 7 |
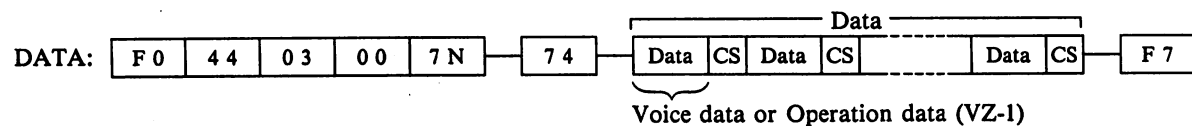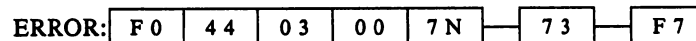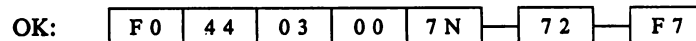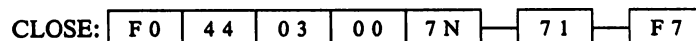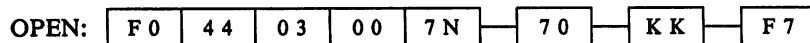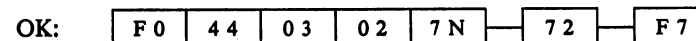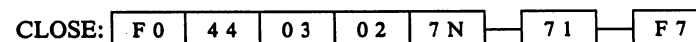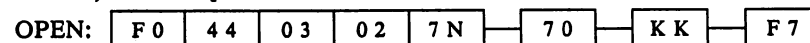
OK: | F 0 | 4 4 | 0 3 | 0 2 | 7 N |—| 7 2 |—| F 7 |

ERROR: | F0 | 44 | 03 | 02 | 7N |—| 73 |—| F7 |

```
                                         ┌──────────── Data ────────────┐
DATA: | F0 | 44 | 03 | 02 | 7N |—| 74 |—| Data |CS| Data |CS| ──── | Data |CS |—| F7 |
                                         └─┬─┘
                              Operation data (VZ-8M) or TOTAL CONTROL data
```

*"(VZ-1)" indicates VZ-1/10M format data, while "(VZ-8M)" indicates data format unique to VZ-8M.

N(HEX): Basic Channel

*Basic channel is the MIDI channel that set in TOTAL-04.

$$N = \text{Display data} - 1 \ (N = O \sim F \ (HEX))$$

KK(HEX): Transmitted data

*KK indicated contents of transmitted data.

KK(H)	Content
00	INT 64 voices
01	INT 64 operations
02	INT 64 voices + 64 operations
03	INT 64 voices + 64 operations + TOTAL CONTROL data

The internal format of transmitted data is identical to Voice Data & Operation Memory Data for both VZ-1 and VZ-8M formats. This transmission is repeated a total of 64 times, or a single TOTAL CONTROL message is transmitted. In addition, a CS(Check Sum) message is transmitted along with each data type of data refer to the following pages : Voice Data : page 14 ; Operation Memory Data : page 24 ; TOTAL CONTROL Data : page 51.

(2) Transmit/Receive Status

	Transmit/Receive Validity Mode	TOTAL CONTROL-05 EXCLUSIVE =
Transmitted	TOTAL-03	ENA
Received	TOTAL-03	ENA

(3) Transmit/Receive Operations

When SAVE/LOAD operations are carried out between 2 VZ-8M units, a "handshake" is created by connecting MIDI cables as shown in the figure below.

For this example, the transmitting device (SAVE side) is unit "A", while the receiving device (LOAD side) is unit "B".

Also, we will assume that respective TOTAL CONTROL settings are as shown in the chart below.

TOTAL CONTROL	VZ-8M Unit A	VZ-8M Unit B
02 MEM PROTECT	——	INTERNAL = OFF
03 SAVE/LOAD	SAVE/LOAD = SAVE	SAVE/LOAD = LOAD
	CARD/MIDI = MIDI	CARD/MIDI = MIDI
	DATA = Same as unit B	DATA = Same as unit A
04 MIDI CHANNEL	Same as unit B	Same as unit A
05 MIDI DATA	EXCLUSIVE = ENA	EXCLUSIVE = ENA


```
        ┌────────────────┐              ┌────────────────┐
        │  IN    OUT     │              │  IN    OUT     │
        │    MIDI        │              │    MIDI        │
        │ ┌────────────┐ │              │ ┌────────────┐ │
        │ │ 03 SAVE    │ │              │ │ 03 LOAD    │ │
        │ │ EXECUTING! │ │              │ │ EXECUTING! │ │
        │ └────────────┘ │              │ └────────────┘ │
        └────────────────┘              └────────────────┘
           VZ-8M Unit A                    VZ-8M Unit B
```
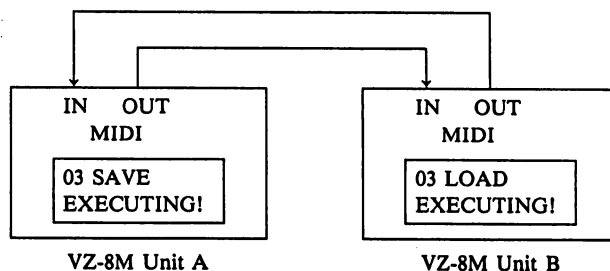
Operations with a handshake set up through the above connection and settings are as follows.

SAVE/LOAD of Voice Data

```
            VZ-8M Unit A                    VZ-8M Unit B

        OPEN (VZ-1) TRANS ──────────▶
                          ◀────────── OK (VZ-1) TRANS
      ┌ 1 VC data + CS TRANS ──────▶
      │                     ◀────────── OK (VZ-1) TRANS ┐
      │ 1 VC data + CS TRANS ──────▶
      │                     ◀────────── OK (VZ-1) TRANS │
  64 ─┤         ⋮              ⋮              ⋮          ├─ 64
      │                                                 │
      │                                                 │
      └ 1 VC data + CS TRANS ──────▶
                            ◀────────── OK (VZ-1) TRANS ┘

            EOX TRANS ──────────▶
      CLOSE (VZ-1) TRANS ──────────▶
                         ◀────────── OK (VZ-1) TRANS

                              TRANS = transmission
                              VC data = Voice data
```
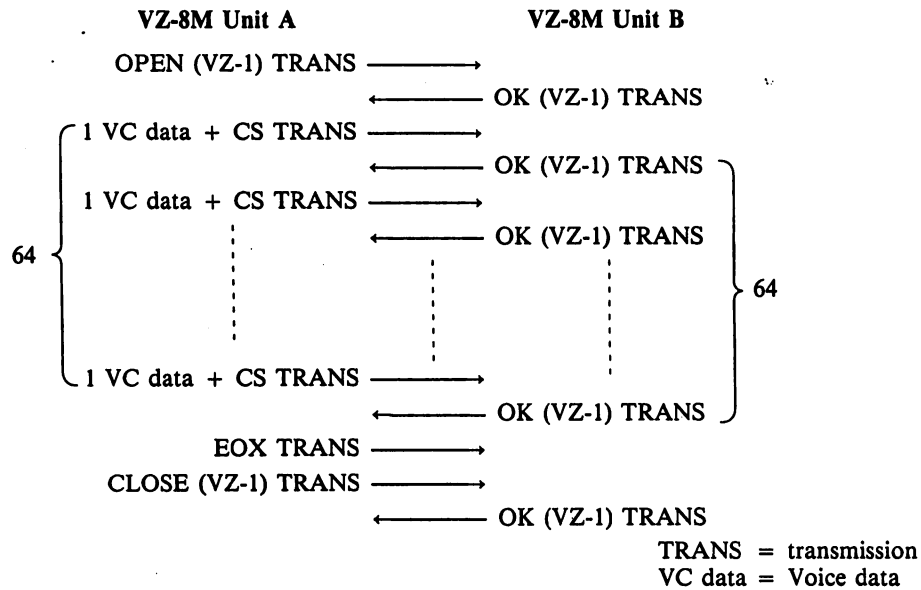
When a unit-A SAVE is executed, an OPEN request is first transmitted. This OPEN request contains information which determines exactly what data is to be saved. When unit B receives this request, a confirmation of the data which is to be loaded is made, after which B transmits an OK message back to A. If data which is to be loaded does not match the request, an ERROR message is transmitted.

When unit A receives the OK message, voice data for a single voice is transmitted along with a CS (check sum) message. After confirming that the check sum calculation is correct, B transmits an "OK" message to the internal area (starting with "A-1") of A. If the CS calculation is not correct, B transmits an ERROR message.

This process is repeated a total of 64 times, after which A transmits an EOX (F7) message followed by a CLOSE request. After confirming that the handshake is completed, B transmits an OK message.

SAVE/LOAD of Operation Memory Data

```
            VZ-8M Unit A                    VZ-8M Unit B

        OPEN (VZ-1) TRANS ──────────▶
                          ◀────────── OK (VZ-1) TRANS
    ┌ 1 OP data (VZ-1) + CS TRANS ──▶
    │                        ◀────────── OK (VZ-1) TRANS ┐
 64─┤          ⋮               ⋮              ⋮           ├─ 64
    │                                                    │
    └ 1 OP data (VZ-1) + CS TRANS ──▶
                             ◀────────── OK (VZ-1) TRANS ┘

            EOX TRANS ──────────▶
      CLOSE (VZ-1) TRANS ──────────▶
                         ◀────────── OK (VZ-1) TRANS ─────────◀
                                                         │
                                                         ▼
                              Common with the VZ-1, 10M
```

```
              OPEN (VZ-8M) TRANS ─────────→
                                   ←───────── OK (VZ-8M) TRANS
        ┌  1 OP data (VZ-8M) + CS TRANS ─────────→
        │                                  ←───────── OK (VZ-8M) TRANS ┐
   64   ⎨            ⋮                                        ⋮         │ 64
        │                                                              │
        └  1 OP data (VZ-8M) + CS TRANS ─────────→                     │
                                  ←───────── OK (VZ-8M) TRANS          ┘
              EOX TRANS ─────────→
              CLOSE (VZ-8M) TRANS ─────────→
                                   ←───────── OK (VZ-8M) TRANS
```
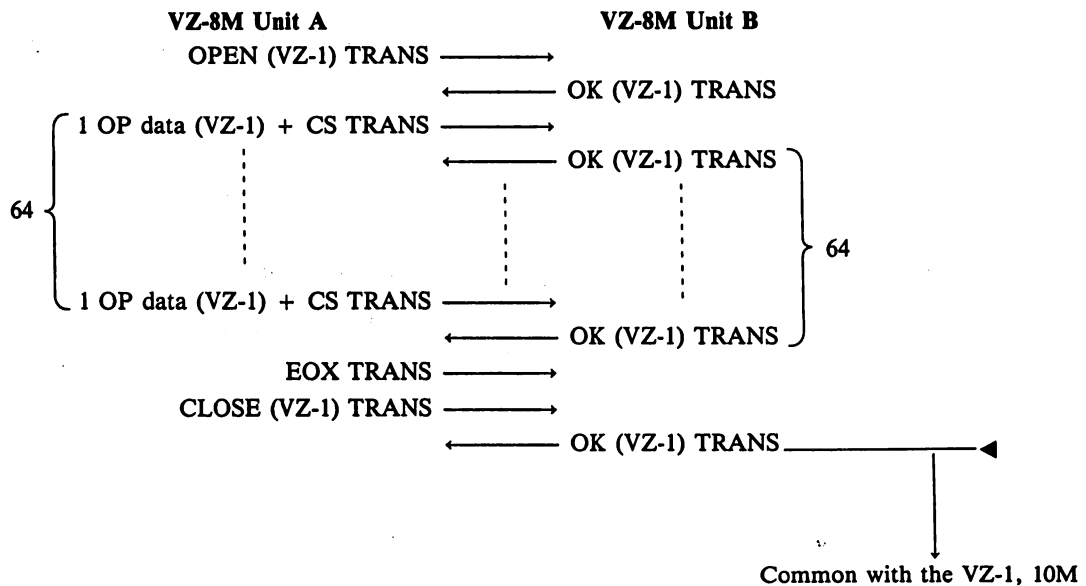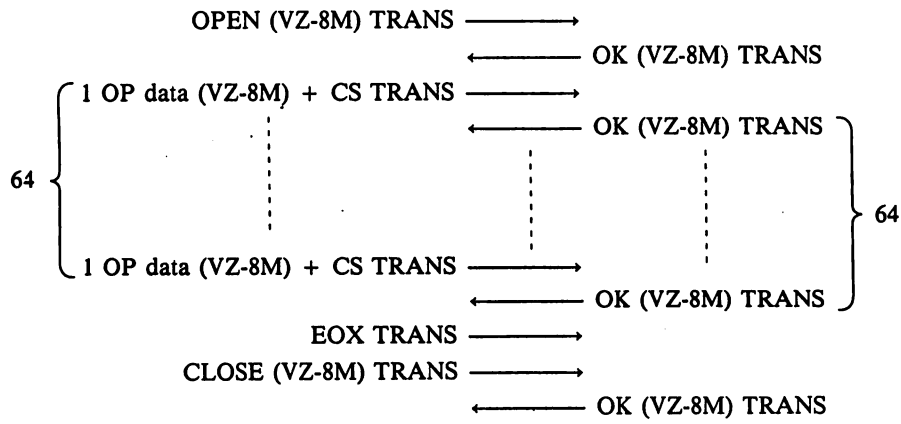
OP data = Operation data

SAVE/LOAD of Voice + Operation Memory Data

VZ-8M Unit A   **VZ-8M Unit B**

```
              OPEN (VZ-1) TRANS ─────────→
                                   ←───────── OK (VZ-1) TRANS
        ┌  1 VC data + CS TRANS ─────────→
        │                                ←───────── OK (VZ-1) TRANS ┐
   64   ⎨           ⋮                                      ⋮        │ 64
        │                                                           │
        └  1 VC data + CS TRANS ─────────→                          │
                                ←───────── OK (VZ-1) TRANS          ┘
        ┌  1 OP data (VZ-1) + CS TRANS ─────────→
        │                                 ←───────── OK (VZ-1) TRANS ┐
   64   ⎨           ⋮                                       ⋮        │ 64
        │                                                            │
        └  1 OP data (VZ-1) + CS TRANS ─────────→                    │
                                 ←───────── OK (VZ-1) TRANS          ┘
              EOX TRANS ─────────→
              CLOSE (VZ-1) TRANS ─────────→
                                   ←───────── OK (VZ-1) TRANS ────────────◄
              OPEN (VZ-8M) TRANS ─────────→
                                   ←───────── OK (VZ-8M) TRANS
        ┌  1 OP data (VZ-8M) + CS TRANS ─────────→
        │                                  ←───────── OK (VZ-8M) TRANS ┐
   64   ⎨            ⋮                                        ⋮        │ 64
        │                                                             │
        └  1 OP data (VZ-8M) + CS TRANS ─────────→                    │
                                  ←───────── OK (VZ-8M) TRANS         ┘
              EOX TRANS ─────────→
              CLOSE (VZ-8M) TRANS ─────────→
                                   ←───────── OK (VZ-8M) TRANS
```

Common with the
VZ-1, 10M

SAVE/LOAD of FULL Data

```
        VZ-8M Unit A                          VZ-8M Unit B
         OPEN (VZ-1) TRANS  ──────────▶
                                   ◀──────────  OK (VZ-1) TRANS
      ┌─ 1 VC data + CS TRANS  ──────────▶
      │                            ◀──────────  OK (VZ-1) TRANS ┐
   64 ┤         :                         :            :        ├ 64
      │                                                         │
      └─ 1 VC data + CS TRANS  ──────────▶                      │
                                   ◀──────────  OK (VZ-1) TRANS ┘
      ┌─ 1 OP data (VZ-1) + CS TRANS ─────▶
      │                            ◀──────────  OK (VZ-1) TRANS ┐
   64 ┤         :                         :            :        ├ 64
      │                                                         │
      └─ 1 OP data (VZ-1) + CS TRANS ─────▶                     │            Common with the
                                   ◀──────────  OK (VZ-1) TRANS ┘                VZ-1, 10M
         EOX TRANS  ──────────▶
         CLOSE (VZ-1) TRANS  ──────────▶                                              ▲
                                   ◀──────────  OK (VZ-1) TRANS ──────────────────────┤◀
         OPEN (VZ-8M) TRANS  ──────────▶
                                   ◀──────────  OK (VZ-8M) TRANS
      ┌─ 1 OP data (VZ-8M) + CS TRANS ────▶
      │                            ◀──────────  OK (VZ-8M) TRANS ┐
   64 ┤         :                         :            :         ├ 64
      │                                                          │
      └─ 1 OP data (VZ-8M) + CS TRANS ────▶                      │
                                   ◀──────────  OK (VZ-8M) TRANS ┘
         TOTAL CONTROL data
         (VZ-8M) + CS TRANS  ──────────▶
                                   ◀──────────  OK (VZ-8M) TRANS
         EOX TRANS  ──────────▶
         CLOSE (VZ-8M) TRANS  ──────────▶
                                   ◀──────────  OK (VZ-8M) TRANS
```

Related SAVE/LOAD information

• If an ERROR occurs at the unit-B side, (CS does not coincide, etc.), an ERROR message appears on the display of unit B and an ERROR message is transmitted. Upon receiving this message, unit A also displays an ERROR message and transmission is interrupted.

• Data is loaded in the internal memory on the unit-B side after the CS is confirm, however data is not loaded of errors occur. Consequently, there is no chance that incomplete voice data, operation memory data or total control data will be loaded.

• When executing a SAVE/LOAD with only one MIDI cable, (Unit A → Unit B), OK and ERROR messages cannot be received from unit B. Unit A, however, transmits messages in fixed time intervals. Because of this, all unit A data is transmitted and an "OK" message appears, even if an ERROR occurs at unit B.

• Data SAVE/LOAD with VZ-1/10M
Initially, the VZ-8M transmits/receives all data which is common with the VZ-1/10M (VZ-1 format). After this, data peculiar to the VZ-8M (VZ-8M format) is transmitted/received.

•VZ-8M (SAVE side) → VZ-1/10M (LOAD side)
When loading to a VZ-1/10M, the VZ-8M continues to send VZ-8M format data even after the "OK" message appears on the VZ-1 or VZ-10M. Because of this, the VZ-8M "OK" message appears slightly after that of the connected device.

•VZ-1/10M (SAVE side) → VZ-8M (LOAD side)
When loading from a VZ-1/10M to a VZ-8M, VZ-1 format data is initially received. If, after a specified amount of time, VZ-8M format data is not received, the VZ-8M determines that data is from a VZ-1/10M, and an "OK" message appears. Data parameters unique to the VZ-8M are loaded with initialized values.

7. Master Tune

Master Tune Data is received.
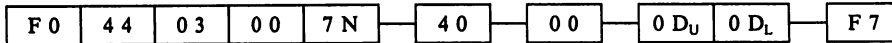
(1) Data Format

| F0 | 44 | 03 | 00 | 7N |—| 40 |—| 00 |—| 0 D_U | 0 D_L |—| F7 |

N(HEX): Basic Channel
*Basic channel is the MIDI channel that set in TOTAL-04.
$\qquad$ N = Display data - 1 (N = O ~ F (HEX))

D_U, D_L:

→ DATA: 00 ~ 40$_{(H)}$

→ POLARITY $\begin{cases} 0: + \\ 1: - \end{cases}$

(2) Transmit/Receive Status

	Transmit/Receive Validity Mode	TOTAL CONTROL-05 EXCLUSIVE =
Transmitted	—	—
Received	ALL MODES	DON'T CARE

(3) Transmit/Receive Operations
RECEIVE: When Master Tune data is received from a personal computer or other device on the OP MEM, NORMAL, COMBI or MULTI CH PLAY, EDIT or TOTAL CONTROL MODES, the display shifts to TOTAL-00 (MASTER TUNE) and shows the received data.

(4) Data reception from VZ-1/VZ-10M
The Master tune Data format of the VZ-8M is the same as that used in the VZ-1 and VZ-10M. Consequently, this data can be received as described above.

8. Key Transpose

Key Transpose Data is received.
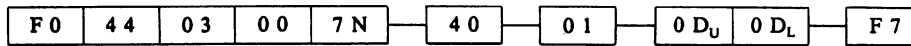
(1) Data Format

F0	44	03	00	7 N	—	40	—	01	—	0 D$_U$	0 D$_L$	—	F 7

N(HEX): Basic Channel
*Basic channel is the MIDI channel that set in TOTAL-04.
N = Display data - 1 (N = O ~ F (HEX))

D$_U$, D$_L$:

DATA: 00 ~ $\begin{cases} 06 \text{ (UP)} \\ 05 \text{ (Down)} \end{cases}$

POLARITY $\begin{cases} 0: + \\ 1: - \end{cases}$

(2) Transmit/Receive Status

	Transmit/Receive Validity Mode	TOTAL CONTROL-05 EXCLUSIVE =
Transmitted	—	—
Received	ALL MODES	DON'T CARE

(3) Transmit/Receive Operations

RECEIVE: When Key Transpose data is received from a personal computer or other device on the OP MEM, NORMAL, COMBI or MULTI CH PLAY, EDIT or TOTAL CONTROL MODES, the display shifts to TOTAL-01 (KEY TRANSPOSE) and shows the received data.

(4) Data reception from VZ-1/VZ-10M

The Key Transpose Data format of the VZ-8M is the same as that used in the VZ-1 and VZ-10M. Consequently, this data can be received as described above.

9. Mode Change-1

Altering NORMAL, COMBI, MULTI CH, OP MEM MODE.

(1) Data Format
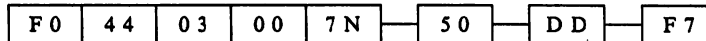
F 0	44	03	00	7 N	—	50	—	D D	—	F 7

N(HEX): BASIC CHANNEL
*Basic channel is that set in TOTAL-04.
N = Display data - 1 (N = O ~ F (HEX))
DD(HEX): Mode Change-1 Data

DD(HEX)	Contents
00	NORMAL MODE
01	COMBI MODE
02	OP MEM MODE
03 - 05	MULTI CH MODE

(2) Transmit/Receive Status

	Transmit/Receive Validity Mode	TOTAL CONTROL-05 EXCLUSIVE =
Transmitted	——	——
Received	ALL MODES	DON'T CARE

(3) Transmit/Receive Operations
   RECEIVE: When a Mode Change-1 message is received from a personal computer or other device in the OP MEM, NORMAL, COMBI, MULTI CH PLAY, EDIT or TOTAL CONTROL MODES, the display shows the corresponding MODE. The displayed voice name and sounding voice correspond to that last used in the MODE which is specified.

(4) Transmission/Reception of VZ-1/10M Data
   The Mode Change-1 data format of the VZ-8M is the same as that used in the VZ-1 and VZ-10M. Consequently, this data can be received as described above.
   Note, however, as with DD=3, when DD=4 or 5, data is only shifted to MULTI CH MODE.

10. Mode Change-2

Altering MIDI performance mode (K, G, W) in NORMAL & COMBI MODES.

(1) Data Format
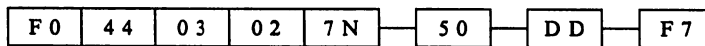
| F0 | 44 | 03 | 02 | 7N |—| 50 |—| DD |—| F7 |

N(HEX): BASIC CHANNEL
*Basic channel is that set in TOTAL-04.
         N = Display data - 1 (N = O ~ F (HEX))
DD(HEX): MODE CHANGE-2 Data

DD(HEX)	Contents
00	K (Keyboard) Mode
01	G (Guitar) Mode
02	W (Wind) Mode

(2) Transmit/Receive Status

	Transmit/Receive Validity Mode	TOTAL CONTROL-05 EXCLUSIVE =
Transmitted	——	——
Received	NORMAL, COMBINATION MODEs (Including TOTAL CONTROL)	DON'T CARE

(3) Transmit/Receive Operations
   RECEIVE: When a Mode Change-2 message is received from a personal computer or other device in the NORMAL or COMBI PLAY, EDIT or TOTAL CONTROL MODES, the display shows the corresponding performance mode. The displayed voice name and sounding voice correspond to that last used in the performance mode which is specified.

11. Shift Change (including Card Bank Change)

Through Shift Change messages, MIDI can be used to alter the card banks for voice number and Operation Memory number selection.

(1) Data Format
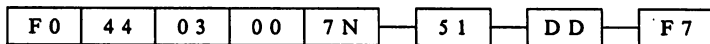
| F 0 | 4 4 | 0 3 | 0 0 | 7 N |—| 5 1 |—| D D |—| F 7 |

N(HEX): Basic Channel
*Basic channel is that set in TOTAL-04.
$\quad\quad\quad\quad$ N = Display data - 1 (N = O ~ F (HEX))
DD(HEX): Shift Change Data (DD = 0 ~7F(HEX))

DD(HEX)	Contents
00 - 1F	CARD BANK
20 - 3F	PST BANK
40 - 5F	INT BANK
60 - 7F	NO DEFINE

(2) Transmit/Receive Status

	Transmit/Receive Validity Mode	TOTAL CONTROL-05 EXCLUSIVE =	TOTAL CONTROL-05 PROG. =
Transmitted	——	——	——
Received	ALL MODES	DON'T CARE	0 - 64, 0 - 127

(3) Transmit/Receive Operations
$\quad$ RECEIVE: When Shift Change data is received from a personal computer or other device in the NORMAL, COMBI or MULTI CH PLAY, EDIT or TOTAL CONTROL MODES, the specified PST, INT or CARD banks are selected.

(4) Reception of VZ-1/10M Data
$\quad$ The CARD BANK portion of Shift Change data for the VZ-1/10M features the same data format as that of the VZ-8M. Consequently, this data can be received as described above.

12. CZ Bend Range

CZ Bend Series Bend Range Data is received.
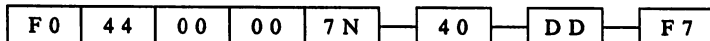
(1) Data Format

| F 0 | 4 4 | 0 0 | 0 0 | 7 N |—| 4 0 |—| D D |—| F 7 |

N(HEX): Basic Channel
*Basic channel is that set in TOTAL-04.
$\quad\quad\quad\quad$ N = Display data - 1 (N = O ~ F (HEX))
DD(HEX): CZ Bend Range Data (DD = 0 ~ 7F(HEX))

DD(HEX)	Contents
00 - 30	BEND RANGE (0-48 half-tone increments, 4oct)

(2) Transmit/Receive Status

	Transmit/Receive Validity Mode	TOTAL CONTROL-05 EXCLUSIVE =
Transmitted	—	—
Received	ALL MODES	DON'T CARE

(3) Transmit/Receive Operations

RECEIVE: When CZ Bend Range data is received from a personal computer or other device in the NORMAL, COMBI, MULTI CH PLAY, EDIT or TOTAL CONTROL MODES, the display indicates the value of the received Bend Range Data for the specified EDIT MODE. In the OP MEM MODE, the Bend Range of the selected sound area is displayed.

III. Internal Format of Data

1. Transmission Format

The VZ-8M transmits data in an 8-bit transmission format. This data is actually divided into 4 bits of high order data and 4 bits of low order data.

(1) 8 bit data:
    (1 Byte)

$$\overbrace{\qquad}^{D_U} \quad \overbrace{\qquad}^{D_L}$$

⇓
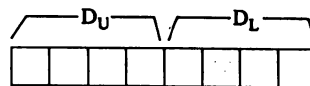
(2) Transmitted Data:

$$\boxed{0\ D_U}\ \boxed{0\ D_L}$$
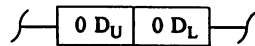
The internal format of various message data is shown as in (1) above. In order to analyze parameter data according to transmitted MIDI data, it is necessary to convert from the format in (2) into the format as shown in (1).

From the following page, the internal format of this data is listed.

This format shows a single byte data....
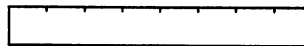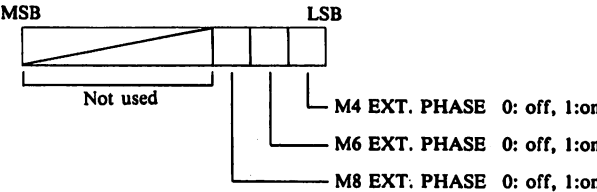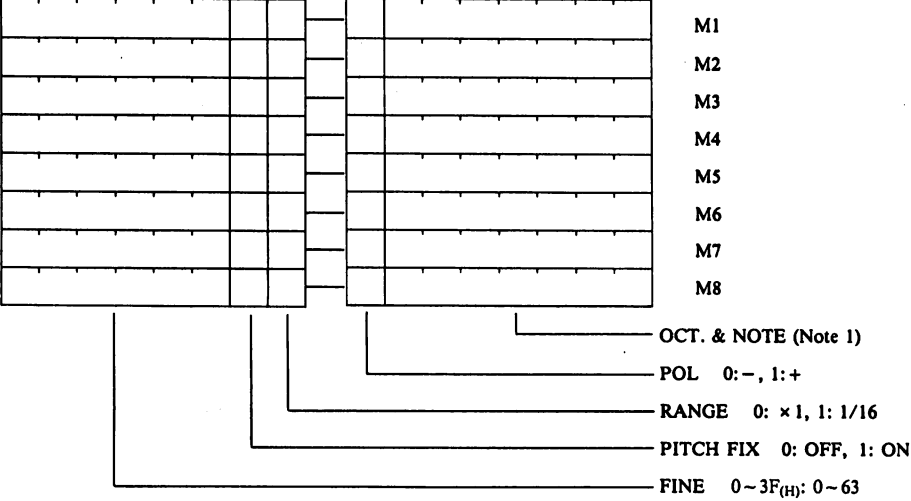
...while this shows two continuous bytes.
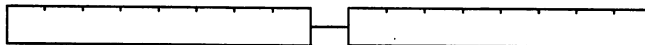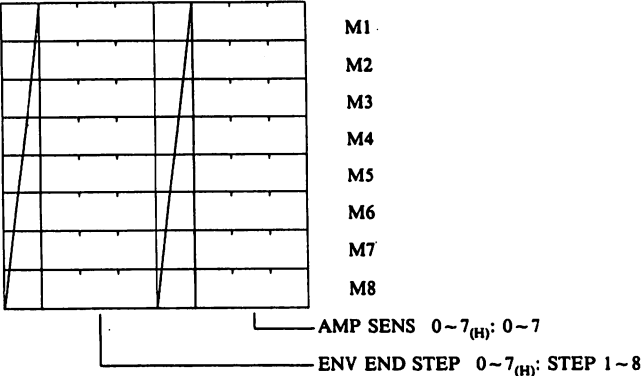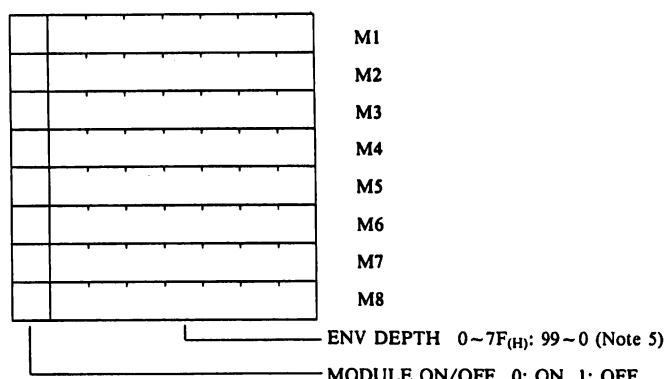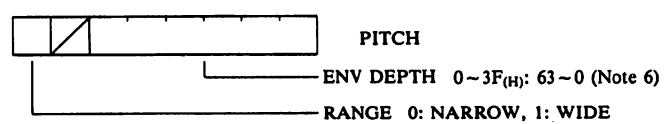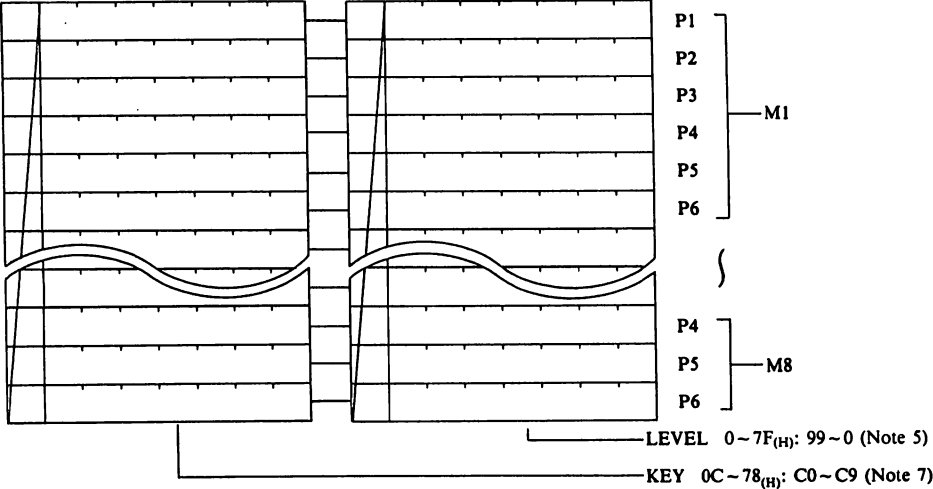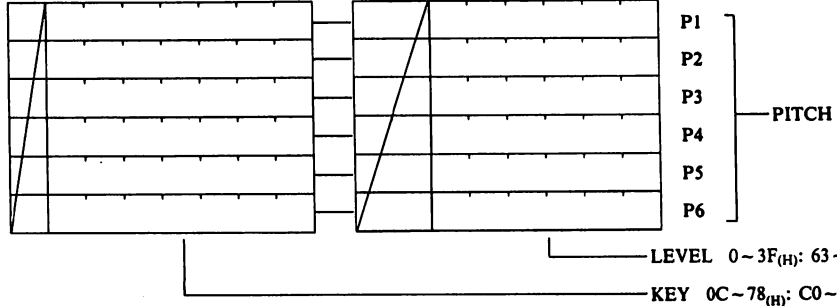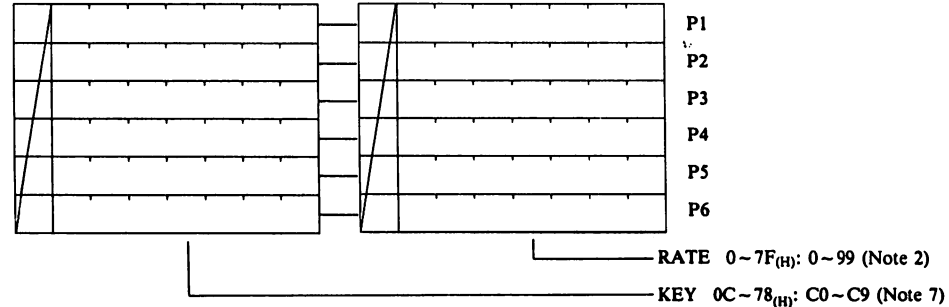
2. Voice Data
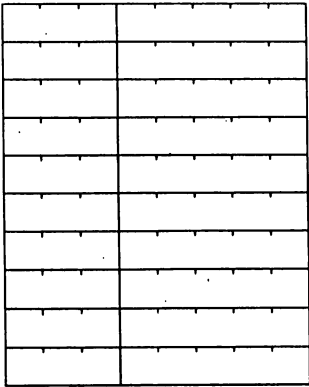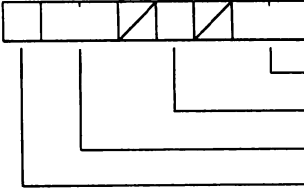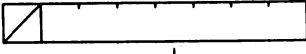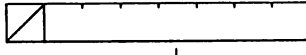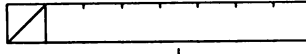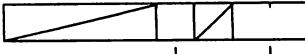
Voice Data is composed of 336 bytes of data and is transmitted in the following order.

Byte No.	DATA
0	**EXT. PHASE (VOICE-00 (VOICE PARAMETER menu No. 00))** MSB ... LSB Not used M4 EXT. PHASE 0: off, 1:on M6 EXT. PHASE 0: off, 1:on M8 EXT. PHASE 0: off, 1:on
1~4	**LINE, WAVE FORM (VOICE-00,01)** M1 M2 | M2 | M1 — M1, M2 M3 M4 | M4 | M3 — M3, M4 M5 M6 | M6 | M5 — M5, M6 M7 M8 | M8 | M7 — M7, M8 WAVE FORM $0_{(H)}$: SINE, $1\sim5_{(H)}$: SAW1~5, $6\sim7_{(H)}$: NOISE 1~2 WAVE FORM $0_{(H)}$: SINE, $1\sim5_{(H)}$: SAW1~5, $6\sim7_{(H)}$: NOISE 1~2 LINE $0_{(H)}$: MIX, $1_{(H)}$: PHASE, $2_{(H)}$: RING
5~20	**DETUNE (VOICE-02)** M1 M2 M3 M4 M5 M6 M7 M8 OCT. & NOTE (Note 1) POL 0: −, 1: + RANGE 0: ×1, 1: 1/16 PITCH FIX 0: OFF, 1: ON FINE $0\sim3F_{(H)}$: 0~63

Byte No.	DATA
21~164	ENVELOPE (PITCH, AMP), VEL RATE (VOICE-03, 09, 17~19)

RATE 1

	M1
	M2
	M3
	M4
	M5
	M6
	M7
	M8
	PITCH

RATE 1   0~7F(H): 0~99 (Note 2)

VEL RATE   0: DIS, 1: ENA

LEV 1

	M1
	M2
	M3
	M4
	M5
	M6
	M7
	M8
	PITCH

LEVEL 1   0~7F(H): 0~99 (M1~M8) (Note 3)

01~40~7F(H): ~63~0~+63 (Note 4)

SUSTAIN 0: NO   1: SUS

RATE 2

	M1
	M8
	PITCH

RATE 2

VEL RATE

LEV 8

	M1
	M8
	PITCH

LEVEL 8

SUSTAIN STEP
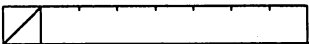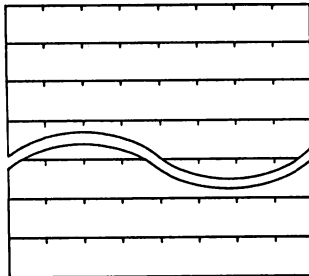
Byte No.	DATA
165~172	**A ENV END STEP, AMP SENS (VOICE-09, 14)** M1 M2 M3 M4 M5 M6 M7 M8 AMP SENS $0\sim7_{(H)}$: $0\sim7$ ENV END STEP $0\sim7_{(H)}$: STEP $1\sim8$
173	**P ENV END STEP (VOICE-03)** PITCH END STEP $0\sim7_{(H)}$: STEP $1\sim8$
174	**TOTAL LEVEL (VOICE-15)** TOTAL LEVEL $0\sim7F_{(H)}$: $99\sim0$ (Note 5)
175~182	**A ENV ENV DEPTH, MODULE ON/OFF (VOICE-10)** M1 M2 M3 M4 M5 M6 M7 M8 ENV DEPTH $0\sim7F_{(H)}$: $99\sim0$ (Note 5) MODULE ON/OFF 0: ON, 1: OFF
183	**P ENV ENV DEPTH, RANGE (VOICE-04)** PITCH ENV DEPTH $0\sim3F_{(H)}$: $63\sim0$ (Note 6) RANGE 0: NARROW, 1: WIDE

Byte No.	DATA
184~279	**LEVEL KF (AMP) (VOICE-11)**
	P1, P2, P3, P4, P5, P6 — M1 ; P4, P5, P6 — M8
	LEVEL 0~7F$_{(H)}$: 99~0 (Note 5)
	KEY 0C~78$_{(H)}$: C0~C9 (Note 7)
280~291	**LEVEL KF (PITCH) (VOICE-05)**
	P1, P2, P3, P4, P5, P6 — PITCH
	LEVEL 0~3F$_{(H)}$: 63~0 (Note 6)
	KEY 0C~78$_{(H)}$: C0~C9 (Note 7)
292~303	**RATE KF (VOICE-16)**
	P1, P2, P3, P4, P5, P6
	RATE 0~7F$_{(H)}$: 0~99 (Note 2)
	KEY 0C~78$_{(H)}$: C0~C9 (Note 7)

Byte No.	DATA
304~313	**VEL SENS (VOICE-06, 12, 17, 18, 19)** M1 M2 M3 M4 M5 M6 M7 M8 PITCH RATE SENSITIVITY 0~1F$_{(H)}$: 0~31 CURVE 0~7$_{(H)}$: CURVE 1~8
314	**VIBRATO (WAVE, MULTI), OCTAVE (VOICE-07, 08)** VIB WAVE 0: TRIANGLE, 1: SAW UP, 2: SAW DOWN, 3: SQUARE VIB MULTI 0: OFF, 1: ON OCTAVE 0~2$_{(H)}$: 0~2 OCTAVE 0: −, 1: +
315	**VIB (DEPTH) (VOICE-07)** DEPTH 0~63$_{(H)}$: 0~99
316	**VIB (RATE) (VOICE-07)** RATE 0~63$_{(H)}$: 0~99
317	**VIB (DELAY) (VOICE-07)** DELAY 0~63$_{(H)}$: 0~99
318	**TREMOLO (WAVE, MULTI) (VOICE-13)** WAVE 0: TRIANGLE, 1: SAW UP, 2: SAW DOWN, 3: SQUARE MULTI 0: OFF, 1: ON

Byte No.	DATA
319	TREM (DEPTH) (VOICE-13) DEPTH 0~63(H): 0~99
320	TREM (RATE) (VOICE-13) RATE 0~63(H): 0~99
321	TREM (DELAY) (VOICE-13) DELAY 0~63(H): 0~99
322~335	VOICE NAME (VOICE-20) 1st character 2nd character 3rd character 10th character 11th character 12th character VOICE NAME (ASCII CODE)

MIDI Transmission Data (HEX)	LCD Display Data OCT	NOTE
00	0	0
01		1
∫		∫
0B		11
0C	1	0
0D		1
∫		∫
17		11
18	2	0
∫		∫
23		11
24	3	0
∫		∫
2F		11
30	4	0
∫		∫
3B		11
3C	5	0
∫		∫
47		11
⋮	⋮	⋮
6C	9	0
∫		∫
77		11
78	10	0
∫		∫
7F		07

PITCH FIX	
OFF	ON

NOTE 2)

MIDI Transmission Data (HEX)	LCD Display Data	MIDI Transmission Data (HEX)	LCD Display Data	MIDI Transmission Data (HEX)	LCD Display Data
00	0	33	40	66	80
01	1	34	41	67	81
02	2	35	42	69	82
03	3	37	43	6A	83
05	4	38	44	6B	84
06	5	39	45	6D	85
07	6	3B	46	6E	86
08	7	3C	47	6F	87
0A	8	3D	48	70	88
0B	9	3E	49	72	89
0C	10	40	50	73	90
0E	11	41	51	74	91
0F	12	42	52	76	92
10	13	43	53	77	93
11	14	45	54	78	94
13	15	46	55	79	95
14	16	47	56	7B	96
15	17	49	57	7C	97
17	18	4A	58	7D	98
18	19	4B	59	7F	99
19	20	4C	60		
1A	21	4E	61		
1C	22	4F	62		
1D	23	50	63		
1E	24	52	64		
20	25	53	65		
21	26	54	66		
22	27	55	67		
23	28	57	68		
25	29	58	69		
26	30	59	70		
27	31	5B	71		
29	32	5C	72		
2A	33	5D	73		
2B	34	5E	74		
2C	35	60	75		
2E	36	61	76		
2F	37	62	77		
30	38	64	78		
32	39	65	79		

NOTE 3)

MIDI Transmission Data (HEX)	LCD Display Data
00	0
1D	1
1E	2
1F	3
∫	∫
7E	98
7F	99

NOTE 4)

MIDI Transmission Data (HEX)	LCD Display Data
7F	+ 63
7E	+ 62
∫	∫
41	+ 1
40	0
3F	− 1
∫	∫
01	− 62
00	− 63

NOTE 5)

MIDI Transmission Data (HEX)	LCD Display Data
00	99
01	98
02	97
∫	∫
61	2
62	1
7F	0

NOTE 6)

MIDI Transmission Data (HEX)	LCD Display Data
00	63
01	62
∫	∫
3E	1
3F	0

NOTE 7)

MIDI Transmission Data (HEX)	LCD Display Data
0C	C0
0D	C#0
∫	∫
45	A4
∫	∫
77	B8
78	C9

Exceptions:
i) Display data note name is "C2" (lowest key note on VZ-1).
ii) With regard to LEV KF (AMP, PITCH) and RATE KF, ranges within which data may be set varies for P1~P6 as shown below.

	MIDI Transmission Data (HEX)	LCD Display Data
P1	0C~73	C0 ~G8
P2	0D~74	C#0 ~A♭8
P3	0E~75	D0 ~A8
P4	0F~76	E♭0 ~B♭8
P5	10~77	E0 ~B8
P6	11~78	F0 ~C9

* Transmission data ranges for P1~P6 do not match;
  P1 < P2 < P3 < P4 < P5 < P6

3. Single Operation Data

Operation Data for a single operation memory consists of 100 bytes of data common with the VZ-1/10M, and 75 bytes which is unique to the VZ-8M.

As shown on page 2, data for COMBI operation memories and NORMAL operations memories is transmitted as follows;

| F 0 | 4 4 | 0 3 | 0 0 | 7 N |— 0 1 —|— I I —| 1 OP data (VZ-1) | C S |— F 7 |

└── 100 Bytes ──┘

followed by

| F 0 | 4 4 | 0 3 | 0 2 | 7 N |— 0 1 —|— I I —| 1 OP data (VZ-8M) | C S |— F 7 |

└── 75 Bytes ──┘
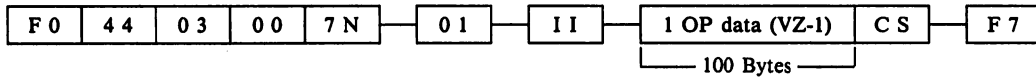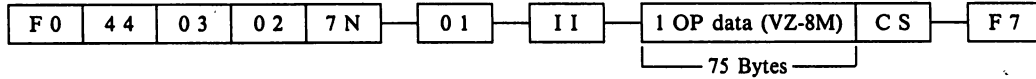
MULTI CH operation memory data is transmitted as follows;

| F 0 | 4 4 | 0 3 | 0 2 | 7 N |— 0 1 —|— I I —| 1 OP data | C S |— F 7 |

└── 175 Bytes ──┘
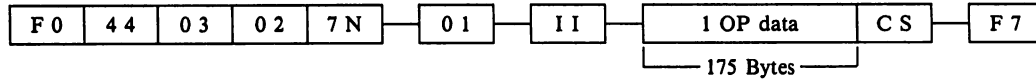
Note that the arrangement of operation memory data differs for COMBI, NORMAL and MULTI CH modes.

3-1-1. COMBI Operation Data (VZ-1 format)

Data common with the VZ-1/10M is composed of 100 bytes of data and is transmitted in the following order.

Byte No.	DATA
0	**MODE, ASSIGN** MODE & ASSIGN $1_{(H)}$: COMBI 1 + 2 $8_{(H)}$: COMBI 1/2/3/4 For $1_{(H)}$ through $8_{(H)}$, byte no. 0 of VZ-8M format (page 28) is the same as the last 4 bits of MODE, ASSIGN data. However, when $9_{(H)}$ is selected (8-voice mix), $0_{(H)}$ is set for this value.
1 ~ 14	**OPERATION NAME** 1st character 2nd character 12th character $03_{(H)}$ $02_{(H)}$ VZ-8M code OPERATION NAME (ASCII CODE)
15	**POS X-FADE (EFFECT) (EFFECT-15)** TOTAL VIB 0: OFF, 1: ON X-FADE 0: OFF, 1: ON TOTAL TREM 0: OFF, 1: ON
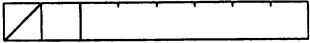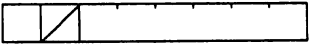
Byte No.	DATA
16~19	**SPLIT POINT (EFFECT-12)** 1 POINT SPLIT 3 POINT SPLIT (LOW) 3 POINT SPLIT (MID) 3 POINT SPLIT (UPPER) SP POINT 0C~78$_{(H)}$: C0~C9 (NOTE 8)
20~27	**POS X-FADE (POINT) (EFFECT-15)** 2 TONE MIX minimum 2 TONE MIX maximum 4 TONE MIX LOW minimum 4 TONE MIX LOW maximum 4 TONE MIX MID minimum 4 TONE MIX MID maximum 4 TONE MIX UPPER minimum 4 TONE MIX UPPER maximum POINT 0C~78$_{(H)}$: C0~C9 (NOTE 9)
28~99	**COMBI SOUND DATA** Byte 28 〜 45 — COMBI 1 46 〜 63 — COMBI 2 64 〜 81 — COMBI 3 82 〜 99 — COMBI 4 (See next page for contents.)

3-1-2. COMBI OPERATION MEMORY SOUND DATA (VZ-1 format)

The contents of previous SOUND DATA are shown below.
The previous SOUND DATA area is composed of 18 bytes × 4 areas.
Note that byte No. has been reset to "0" for simplification.
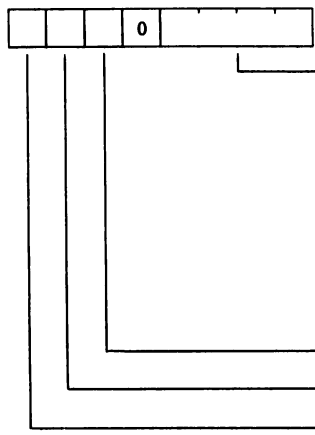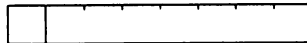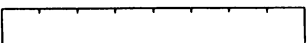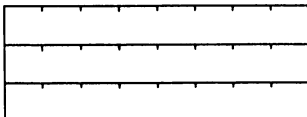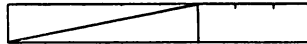
Byte No.	DATA
0	**VOICE NO.** VOICE No. $0 \sim 3F_{(H)}$: A-1~H-8 VOICE No. 0: INT, 1: CARD 1, 2, PST1, 2
1	**EFFECT** PORTAMENTO 0: OFF, 1: ON FOOT SOSTENUTO 0: ENA, 1: DIS SOLO 0: OFF, 1: ON FOOT SUSTAIN 0: ENA, 1: DIS VEL INV 0: OFF, 1: ON VIB INV 0: OFF, 1: ON TREM INV 0: OFF, 1: ON
2	**PORTAMENTO (EFFECT-01)** TIME $0 \sim 63_{(H)}$: 0~99 MODE 0: TIME CONST, 1: RATE CONST
3	**PITCH BEND (EFFECT-02)** RANGE $0 \sim 30_{(H)}$: 0~48 RELEASE 0: ENA, 1: DIS
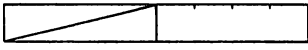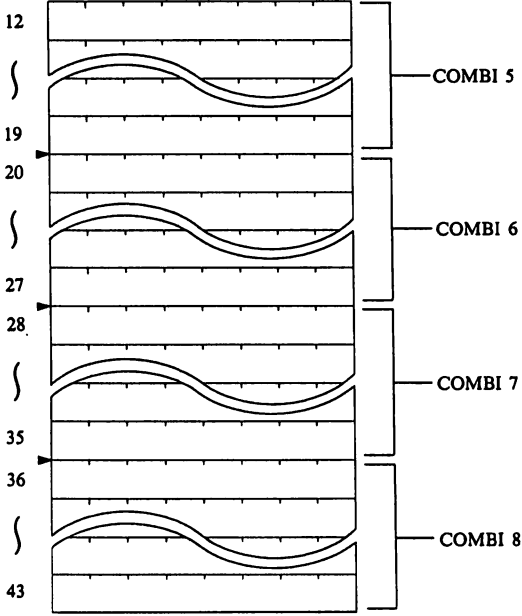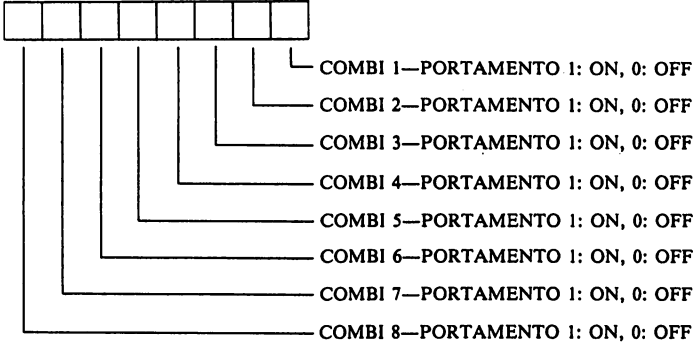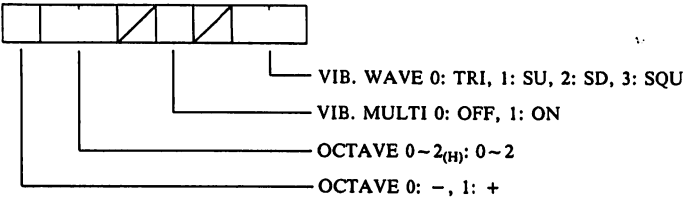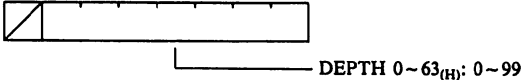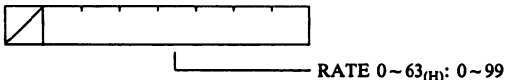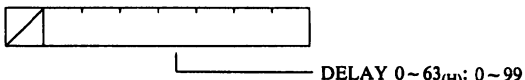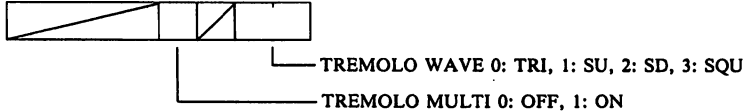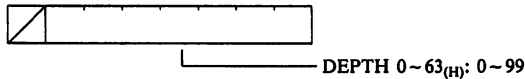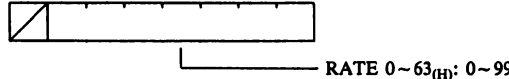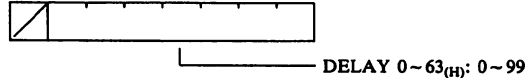
Byte No.	DATA
4~11	**EFFECT SENS, PATCH**

AFTER TOUCH
DEF WHEEL 1
DEF WHEEL 2
FOOT VR

VIB DEPTH 0: OFF, 1: ON
VIB RATE 0: OFF, 1: ON
PTICH + 0: OFF, 1: ON
PITCH − 0: OFF, 1: ON
PRTM TIME 0: OFF, 1: ON
TREM DEPTH 0: OFF, 1: ON
TREM RATE 0: OFF, 1: ON
A NEW BIAS 0: OFF, 1: ON

SENSITIVITY 0~63(H): 0~99
SENSITIVITY 0: +, 1: −

| 12 | **LEVEL (EFFECT-10)** |

LEVEL 0~63(H): 0~99

| 13~14 | **COMBI PITCH (EFFECT-11)** |

13 | | 0 | 0 | LOWER
FINE DATA (100/64-cent increments), 0~FC(H)

14 UPPER
PITCH DATA (half-tone increments) (NOTE 10)
POL: 0: −, 1: +

| 15~16 | **VEL SPLIT (EFFECT-13)** |

15
LOWER LIMIT 0~7F(H): 0~127

16
UPPER LIMIT 0~7F(H): 0~127 (NOTE 11)

| 17 | **DELAY TRIG (EFFECT-16)** |

TIME 0~63(H): 0~99
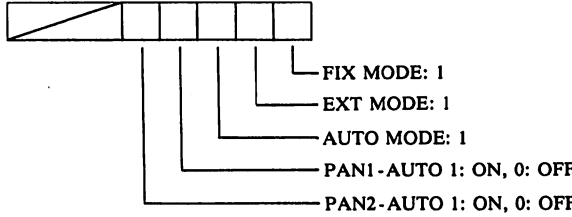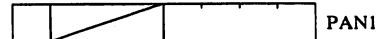
3-1-3. COMBI OPERATION DATA (VZ-8M format)
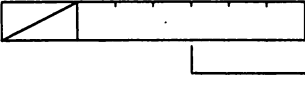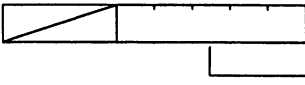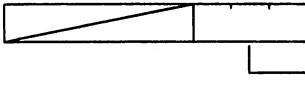
Data unique to the VZ-8M comprises 75 bytes, which are transmitted in the sequence shown below.

Byte No.	DATA
0	**MODE, ASSIGN** MODE & ASSIGN $1_{(H)}$ $1+2$ $2_{(H)}$ $3+4$ $3_{(H)}$ $1+2+3+4$ $4_{(H)}$ $1/3$ $5_{(H)}$ $1/3+4$ $6_{(H)}$ $1+2/3$ $7_{(H)}$ $1+2/3+4$ $8_{(H)}$ $1/2/3/4$ $9_{(H)}$ $1+2+3+4+5+6+7+8$ KEYBOARD MODE: 1 GUITAR MODE: 1 WIND MODE: 1
1~2	**OPERATION TUNE** 1 — LOW FINE DATA (100/64-cent increments), $0 \sim FC_{(H)}$ 2 — UP TUNE DATA (half-tone increments), $0 \sim$ POL: 0: $-$, 1: $+$
3~6	**VOICE SHIFT NO.** COMBI 1 VOICE SHIFT NO. $0_{(H)}$ CARD1 $1_{(H)}$ CARD2 $20_{(H)}$ PST1 $21_{(H)}$ PST2 $40_{(H)}$ INT COMBI 2 COMBI 3 COMBI 4 VOICE SHIFT NO. (Same format as COMBI 1)
7	**VEL TABLE SELECT** VEL TABLE SELECT NO. $0 \sim 7_{(H)}$

Byte No.	DATA
8	MIDI CHANNEL MIDI CHANNEL 0 ~ F(H)
9 ~ 11	Not used
12 ~ 43	COMBI SOUND DATA 12 COMBI 5 19 20 COMBI 6 27 28 COMBI 7 35 36 COMBI 8 43 (See page 33 for contents)
44 ~ 55	Not used
56	PORTAMENTO ON/OFF COMBI 1—PORTAMENTO 1: ON, 0: OFF COMBI 2—PORTAMENTO 1: ON, 0: OFF COMBI 3—PORTAMENTO 1: ON, 0: OFF COMBI 4—PORTAMENTO 1: ON, 0: OFF COMBI 5—PORTAMENTO 1: ON, 0: OFF COMBI 6—PORTAMENTO 1: ON, 0: OFF COMBI 7—PORTAMENTO 1: ON, 0: OFF COMBI 8—PORTAMENTO 1: ON, 0: OFF
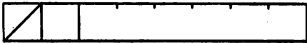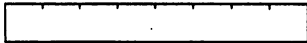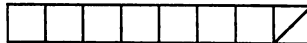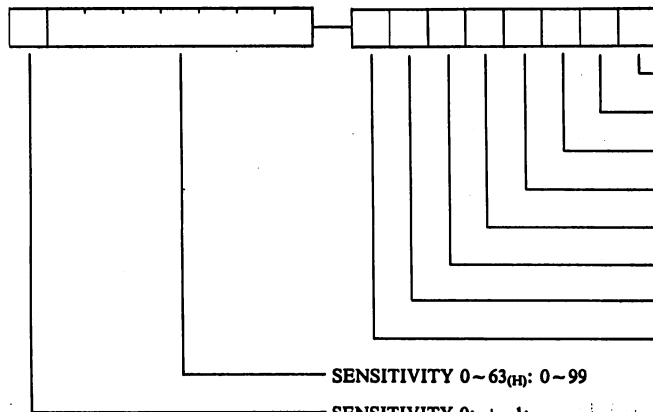
Byte No.	DATA
57	**TOTAL VIB (WAVE, MULTI), OCTAVE** VIB. WAVE 0: TRI, 1: SU, 2: SD, 3: SQU VIB. MULTI 0: OFF, 1: ON OCTAVE $0\sim2_{(H)}$: $0\sim2$ OCTAVE 0: −, 1: +
58	**TOTAL VIB. (DEPTH)** DEPTH $0\sim63_{(H)}$: $0\sim99$
59	**TOTAL VIB. (RATE)** RATE $0\sim63_{(H)}$: $0\sim99$
60	**TOTAL VIB. (DELAY)** DELAY $0\sim63_{(H)}$: $0\sim99$
61	**TOTAL TREMOLO (WAVE, MULTI)** TREMOLO WAVE 0: TRI, 1: SU, 2: SD, 3: SQU TREMOLO MULTI 0: OFF, 1: ON
62	**TOTAL TREMOLO (DEPTH)** DEPTH $0\sim63_{(H)}$: $0\sim99$
63	**TOTAL TREMOLO (RATE)** RATE $0\sim63_{(H)}$: $0\sim99$
64	**TOTAL TREMOLO (DELAY)** DELAY $0\sim63_{(H)}$: $0\sim99$
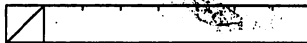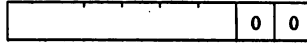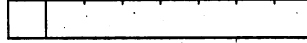
Byte No.	DATA
65	**PAN (MODE)** FIX MODE: 1 EXT MODE: 1 AUTO MODE: 1 PAN1-AUTO 1: ON, 0: OFF PAN2-AUTO 1: ON, 0: OFF
66~67	**PAN (FIX-PLACE)** 66 — PAN1 0~F(H): 0~15 (0 is CENTER) POL: 0: −, 1: + (+ is R, − is L) 67 — PAN2 Same format as PAN1
68~69	**PAN (EXT-CONTROLLER)** 68 — PAN1 CONTROLLER $0_{(H)}$ OFF $1_{(H)}$ AFTER TOUCH $2_{(H)}$ FOOT VR $3_{(H)}$ MODULATION WHEEL $4_{(H)}$ DEFINABLE CONTROLLER $5_{(H)}$ MIDI PAN 69 — PAN2 Same format as PAN1
70~71	**PAN (EXT-CTRL. RANGE)** 70 — PAN1 RANGE $0_{(H)}$ L→R ($0 \rightarrow 7F_{(H)}$) $1_{(H)}$ R→L ($0 \rightarrow 7F_{(H)}$) $2_{(H)}$ C→L ($0 \rightarrow 7F_{(H)}$) $3_{(H)}$ L→C ($0 \rightarrow 7F_{(H)}$) $4_{(H)}$ C→R ($0 \rightarrow 7F_{(H)}$) $5_{(H)}$ R→C ($0 \rightarrow 7F_{(H)}$) 71 — PAN2 Same format as PAN1

Byte No.	DATA
72	PAN (AUTO-RATE)
	RATE 0~3F(H): 0~63
73	PAN (AUTO-DEPTH)
	DEPTH 0~1F(H): 0~31
74	PAN (AUTO-CONTROLLER)
	CONTROLLER $0_{(H)}$ OFF $1_{(H)}$ AFTER TOUCH $2_{(H)}$ FOOT VR $3_{(H)}$ MODULATION WHEEL $4_{(H)}$ DEFINABLE CONTROLLER $5_{(H)}$ MIDI PAN

3-1-4 COMBI OPERATION SOUND DATA (VZ-8M format)

The contents of the "SOUND DATA" previously described are shown below. This SOUND DATA comprises the following 8 bytes × 4. Note that byte numbers has been reset to "0" for simplification.

Byte No.	DATA
0	**VOICE NO.** VOICE NO. 0~3F(H): A-1~H-8 0: INT, 1: CARD 1, 2, PST1, 2

1	**VOICE SHIFT NO.**
	
	 VOICE SHIFT NO. 0(H): CARD1
	                   1(H): CARD2
	                   20(H): PST1
	                   21(H): PST2
	                   40(H): INT

2	**EFFECT** PORTAMENTO 0: OFF, 1: ON FOOT SOSTENUTO 0: ENA, 1: DIS SOLO 0: OFF, 1: ON FOOT SUSTAIN 0: ENA, 1: DIS VEL. INV 0: OFF, 1: ON VIB. INV 0: OFF, 1: ON TREM. INV 0: OFF, 1: ON
3~4	**EFFECT SENSE, PATCH** AFTER TOUCH VIB. DEPTH 1: ON, 0: OFF VIB. RATE 1: ON, 0: OFF PITCH + 1: ON, 0: OFF PITCH − 1: ON, 0: OFF PRTM TIME 1: ON, 0: OFF TREM DEPTH 1: ON, 0: OFF TREM RATE 1: ON, 0: OFF AMP. ENV. BIAS 1: ON, 0: OFF SENSITIVITY 0~63(H): 0~99 SENSITIVITY 0: +, 1: −
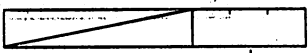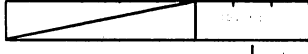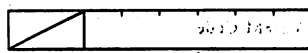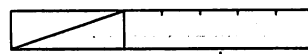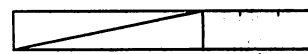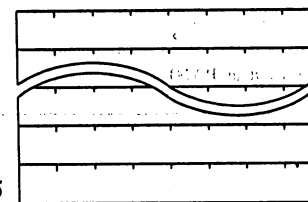
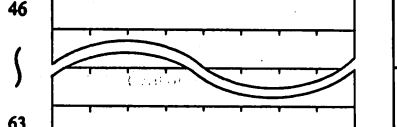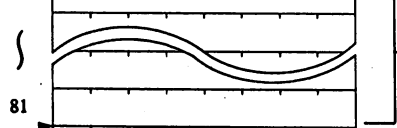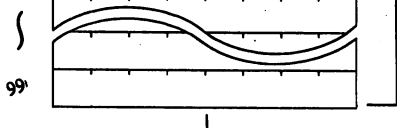| Byte No.	DATA
5	**LEVEL** LEVEL 0~63(H): 0~99
6~7	**COMBI TUNE** 6 ___ 0 0 LOWER FINE DATA (100/64-cent increments), 0~FC(H) 7 ___ UPPER PITCH DATA (half-tone increments), (NOTE 10) POL: 0: −, 1: +

3-2-1. NORMAL OPERATION DATA (VZ-1 format)
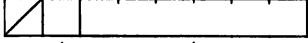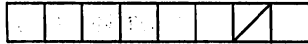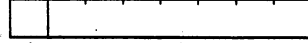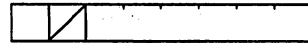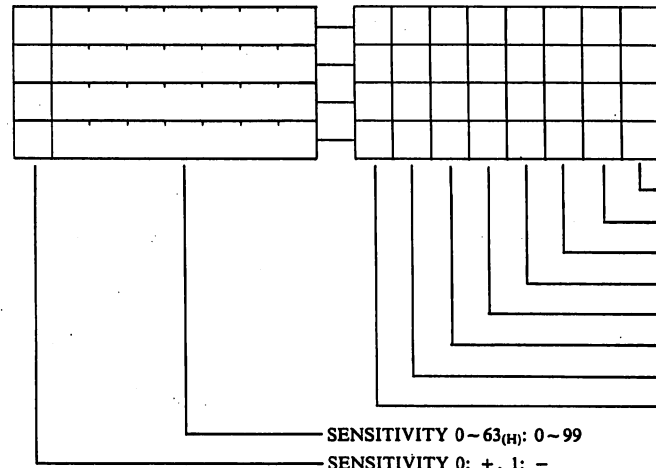
Data common with the VZ-1/10M comprises a total of 100 bytes, which are transmitted in sequence shown below.

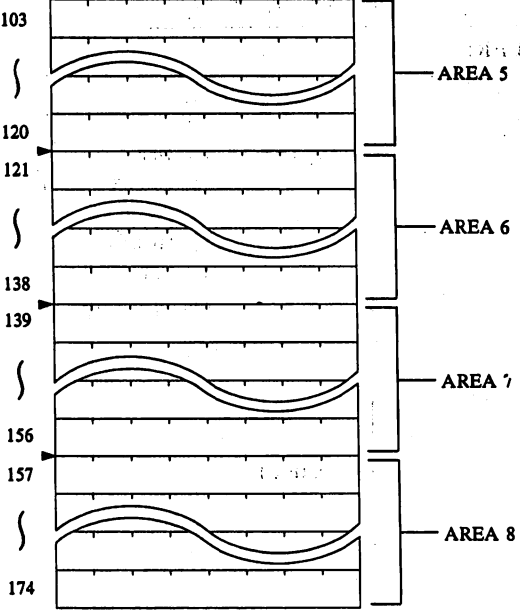| Byte No.	DATA
0	**MODE, ASSIGN** `[____ / ____	0(H)]` └── MODE & ASSIGN $0_{(H)}$
1~14	**OPERATION NAME** 1st Character 2nd Character ⋮ 12th Character $03_{(H)}$ ⎫ $02_{(H)}$ ⎭ VZ-8M Code └── OPERATION NAME (ASCII CODE)
15~17	Not used
18	**PAN (MODE)** └── FIX MODE: 1 └── EXT MODE: 1 └── AUTO MODE: 1 └── PAN1-AUTO 0: OFF, 1: ON └── PAN2-AUTO 0: OFF, 1: ON
19~20	**PAN (FIX-PLACE)** 19 `[__/__	____]` PAN1 └── Bias $0 \sim F_{(H)}$: $0 \sim 15$ (0 is center) └── POL: 1: +, 0: − (+ is R, − is L)  20 `[__/__	____]` PAN2 └── Same format as PAN1
21~22	**PAN (EXT-CONTROLLER)** 21 `[____/	__]` PAN1 └── CONTROLLER $0_{(H)}$ OFF $1_{(H)}$ AFTER TOUCH $2_{(H)}$ FOOT VR $3_{(H)}$ MODULATION WHEEL $4_{(H)}$ DEFINABLE CONTROLLER $5_{(H)}$ MIDI PAN  22 `[____/	__]` PAN2 └── Same format as PAN1

−35−

Byte No.	DATA

23~24	**PAN (EXT-CTRL. RANGE)**
	
	23 — PAN1
	└ RANGE $0_{(H)}$ L→R $(0→7F_{(H)})$
	           $1_{(H)}$ R→L $(0→7F_{(H)})$
	           $2_{(H)}$ C→L $(0→7F_{(H)})$
	           $3_{(H)}$ L→C $(0→7F_{(H)})$
	           $4_{(H)}$ C→R $(0→7F_{(H)})$
	           $5_{(H)}$ R→C $(0→7F_{(H)})$
	
	24 — PAN2
	└ Same format as PAN1

25	**PAN (AUTO-RATE)** └ RATE $0~3F_{(H)}$: 0~63
26	**PAN (AUTO-DEPTH)** └ DEPTH $0~1F_{(H)}$: 0~31

27	**PAN (AUTO-CONTROLLER)**
	
	└ CONTROLLER $0_{(H)}$ OFF
	                   $1_{(H)}$ AFTER TOUCH
	                   $2_{(H)}$ FOOT VR
	                   $3_{(H)}$ MODULATION WHEEL
	                   $4_{(H)}$ DEFINABLE CONTROLLER
	                   $5_{(H)}$ MIDI PAN

28~45	**NORMAL SOUND DATA** 28 { 45 └ (See next page for contents)
46~99	Not used

3-2-2. NORMAL OPERATION SOUND DATA
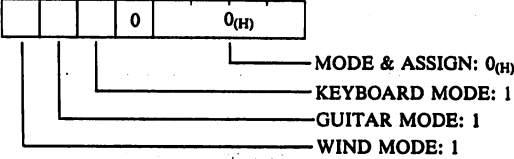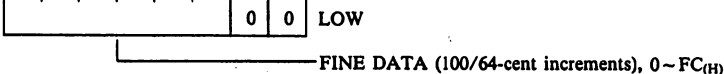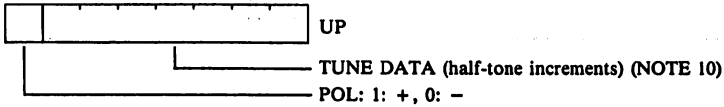
The contents of the "SOUND DATA" previously described are shown below. Note that byte numbers contain a relative "0".

Byte No.	DATA
0	**VOICE NO.** VOICE NO. 0~3F(H): A-1~H-8 0: INT, 1: CARD1, 2, PST1, 2
1	**EFFECT** GUITAR POLY: 1, MONO: 0 (GUITAR MODE) FOOT SOSTENUTO 0: ENA, 1: DIS SOLO 0: OFF, 1: ON FOOT SUSTAIN 0: ENA, 1: DIS VEL. INV 0: OFF, 1: ON VIB. INV 0: OFF, 1: ON TREM INV 0: OFF, 1: ON
2	**PORTAMENTO** TIME 0~63(H): 0~99 MODE: 0: TIME CONST, 1: RATE CONST
3	**PITCH BEND** RANGE 0~30(H), 0~48 RELEASE 0: ENA, 1: DIS
4~11	**EFFECT SENSE, PATCH** AFTER TOUCH DEF WHEEL 1 DEF WHEEL 2 FOOT VR VIB DEPTH 0: OFF, 1: ON VIB RATE 0: OFF, 1: ON PITCH + 0: OFF, 1: ON PITCH − 0: OFF, 1: ON PRTM TIME 0: OFF, 1: ON TREM DEPTH 0: OFF, 1: ON TREM RATE 0: OFF, 1: ON AMP. ENV. BIAS 0: OFF, 1: ON SENSITIVITY 0~63(H): 0~99 SENSITIVITY 0: +, 1: −

Byte No.	DATA
12	LEVEL LEVEL 0~63(H): 0~99
13~14	Not used
15	MIDI CHANNEL MIDI CHANNEL 0~F: 1~16
16	PORTAMENT, VEL. TABLE SELECT VEL. TABLE SELECT 0~7(H): 1~8 PORTAMENTO 0: OFF, 1: ON
17	VOICE SHIFT NO. VOICE SHIFT No. 0(H): CARD1 1(H): CARD2 20(H): PST1 21(H): PST2 40(H): INT
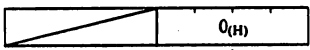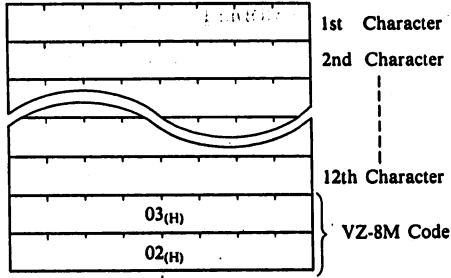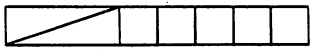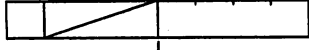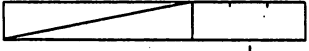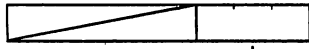
3-2-3. NORMAL OPERATION DATA (VZ-8M format)
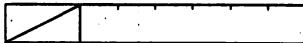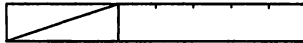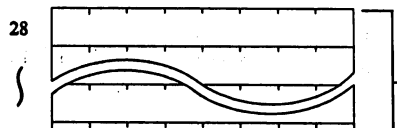
Data unique to the VZ-8M comprises a total of 75 bytes, which are transmitted in sequence shown below.
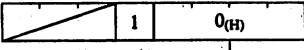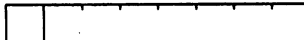
Byte No.	DATA
0	**MODE, ASSIGN** ┌─┬─┬─┬───┬──────┐ │ │ │ │ 0 │ 0(H) │ └─┴─┴─┴───┴──────┘ └─── MODE & ASSIGN: $0_{(H)}$ └─── KEYBOARD MODE: 1 └─── GUITAR MODE: 1 └─── WIND MODE: 1

1~2	**OPERATION TUNE**
	
	1 ┌──────────────┬───┬───┐
	    │ │ 0 │ 0 │ LOW
	    └──────────────┴───┴───┘
	        └─── FINE DATA (100/64-cent increments), $0 \sim FC_{(H)}$
	
	2 ┌───┬──────────────────┐
	    │ │ │ UP
	    └───┴──────────────────┘
	        └─── TUNE DATA (half-tone increments) (NOTE 10)
	    └─── POL: 1: +, 0: −

3~74	Not used

3-3-1. MULTI OPERATION DATA

MULTI OPERATION DATA comprises a total of 175 bytes, which are transmitted in sequence shown below.

Byte No.	DATA
0	MODE, ASSIGN MODE & ASSIGN 0(H)
1 ~ 14	OPERATION NAME 1st Character 2nd Character 12th Character 03(H) ⎫ VZ-8M Code 02(H) ⎭ OPERATION NAME (ASCII CODE)
15 ~ 17	Not used
18	PAN (MODE) FIX MODE: 1 EXT MODE: 1 AUTO MODE: 1 PAN1-AUTO 0: OFF, 1: ON PAN2-AUTO 0: OFF, 1: ON
19 ~ 20	PAN (FIX-PLACE) 19 PAN1 Bias 0~F(H): 0 ~ 15 (0 is center) POL: 1: +, 0: − (+ is R, − is L) 20 PAN2 Same format as PAN1
21 ~ 22	PAN (EXT-CONTROLLER) 21 PAN1 CONTROLLER 0(H) OFF 1(H) AFTER TOUCH 2(H) FOOT VR 3(H) MODULATION WHEEL 4(H) DEFINABLE CONTROLLER 5(H) MIDI PAN 22 PAN2 Same format as PAN1

Byte No.	DATA
23 ~ 24	**PAN (EXT-CTRL. RANGE)**

23 [diagram] PAN1

RANGE
$0_{(H)}$ L→R $(0→7F_{(H)})$
$1_{(H)}$ R→L $(0→7F_{(H)})$
$2_{(H)}$ C→L $(0→7F_{(H)})$
$3_{(H)}$ L→C $(0→7F_{(H)})$
$4_{(H)}$ C→R $(0→7F_{(H)})$
$5_{(H)}$ R→C $(0→7F_{(H)})$

24 [diagram] PAN2

Same format as PAN1

Byte No.	DATA
25	**PAN (AUTO-RATE)**

[diagram]

RATE $0~3F_{(H)}$: 0~63

26	**PAN (AUTO-DEPTH)**

[diagram]

DEPTH $0~1F_{(H)}$: 0~31

27	**PAN (AUTO-CONTROLLER)**

[diagram]

CONTROLLER
$0_{(H)}$ OFF
$1_{(H)}$ AFTER TOUCH
$2_{(H)}$ FOOT VR
$3_{(H)}$ MODULATION WHEEL
$4_{(H)}$ DEFINABLE CONTROLLER
$5_{(H)}$ MIDI PAN

28 ~ 99	**MULTI SOUND DATA**

28 ⌇ 45 — AREA 1

46 ⌇ 63 — AREA 2

64 ⌇ 81 — AREA 3

82 ⌇ 99 — AREA 4

(See page 43 for contents.)

Byte No.	DATA
100	MODE, ASSIGN [diagram: box with `1` and `0(H)`] MODE & ASSIGN 0(H)
101~102	OPERATION TUNE 101 [box with `0` `0`] LOW FINE DATA (100/64-cent increments), 0~FC(H) 102 [box] UP TUNE DATA (half-tone increments) (NOTE 10) POL: 1: +, 0: −
103~174	MULTI SOUND DATA 103 ∫ AREA 5 120 121 ∫ AREA 6 138 139 ∫ AREA 7 156 157 ∫ AREA 8 174 (See next page for contents.)

3-3-2. MULTI OPERATION SOUND DATA

The contents of the "SOUND DATA" previously described are shown below. This SOUND DATA, for Areas 1~4 and 5~8, comprises the following 18 bytes×4. Note that byte numbers contain a relative "0".

Byte No.	DATA
0	**VOICE NO.** VOICE NO. 0~3F(H): A-1~H-8 0: INT, 1: CARD1, 2, PST1, 2
1	**EFFECT** FOOT SOSTENUTO 0: ENA, 1: DIS SOLO 0: OFF, 1: ON FOOT SUSTAIN 0: ENA, 1: DIS VEL. INV 0: OFF, 1: ON VIB. INV 0: OFF, 1: ON TREM INV 0: OFF, 1: ON
2	**PORTAMENTO** TIME 0~63(H): 0~99 MODE: 0: TIME CONST, 1: RATE CONST
3	**PITCH BEND** RANGE 0~30(H), 0~48 RELEASE 0: ENA, 1: DIS
4~11	**EFFECT SENSE, PATCH** AFTER TOUCH DEF WHEEL 1 DEF WHEEL 2 FOOT VR VIB DEPTH 0: OFF, 1: ON VIB RATE 0: OFF, 1: ON PITCH + 0: OFF, 1: ON PITCH − 0: OFF, 1: ON PRTM TIME 0: OFF, 1: ON TREM DEPTH 0: OFF, 1: ON TREM RATE 0: OFF, 1: ON AMP. ENV. BIAS 0: OFF, 1: ON SENSITIVITY 0~63(H): 0~99 SENSITIVITY 0: +, 1: −

Byte No.	DATA
12	LEVEL LEVEL 0~63(H): 0~99
13~14	MULTI TUNE 13 ... 0 0 LOWER FINE DATA (100/64-cent increments) 14 UPPER PITCH DATA (half-tone increments) (NOTE 10) POL 1: +, 0: −
15	MIDI CHANNEL, POLY NO. POLY: 0~7 MIDI CHANNEL 0~F(H): 1~16
16	PORTAMENTO, VEL. TABLE SELECT VEL. TABLE SELECT 0~7(H): 1~8 PORTAMENTO 0: OFF, 1: ON
17	VOICE SHIFT NO. VOICE SHIFT No. 0(H): CARD1 1(H): CARD2 20(H): PST1 21(H): PST2 40(H): INT

—44—

NOTE 8)

MIDI Transmission Data (HEX)	LCD Display Data
0C	C0
0D	C#0
∫	∫
45	A4
∫	∫
77	B8
78	C9

Exceptions:
  i) Display data note name is "C2" (lowest key note on VZ-1).
  ii) Range in which 3 Point Split data may be set varies as shown below.

	MIDI Transmission Data (HEX)	LCD Display Data
LOW	0C ~ 76	C0 ~ B♭8
MID	0D ~ 77	C#0 ~ B8
UPPER	0E ~ 78	D0 ~ C9

* Transmission data ranges for LOW, MID & UPPER do not match; LOW < MID < UPPER

NOTE 9)

MIDI Transmission Data (HEX)	LCD Display Data
0C	C0
0D	C#0
∫	∫
45	A4
∫	∫
77	B8
78	C9

Exceptions:
  i) Display data note name is "C2" (lowest key note on VZ-1).
  ii) Range in which 2 Tone Mix data may be set varies as shown below.

	MIDI Transmission Data (HEX)	LCD Display Data
Maximum	0C ~ 77	C0 ~ B8
Minimum	0D ~ 78	C#0 ~ C9

* Minimum ≤ Maximum

iii) Range in which 4 Tone Mix data may be set varies as shown below.

	MIDI Transmission Data (HEX)	LCD Display Data
LOW Minimum	0C ~ 73	C0 ~ G8
LOW Maximum	0D ~ 74	C#0 ~ A♭8
MID Minimum	0E ~ 75	D0 ~ A8
MID Maximum	0F ~ 76	E♭0 ~ B♭8
UPPER Minimum	10 ~ 77	E0 ~ B8
UPPER Maximum	11 ~ 78	F0 ~ C9

* LOW Min $\leq$ LOW Max $\leq$ MID Min $\leq$ MID Max $\leq$ UPPER Min $\leq$ UPPER Max

NOTE 10)

MIDI Transmission Data (HEX)	LCD Display Data OCT	NOTE
00	0	0
01		1
∫		∫
0B		11
0C	1	0
0D		1
∫		∫
17		11
⋮	⋮	⋮
3C	5	0
3D		1
∫		∫
47		11

NOTE 11) VEL SPLIT Min $\leq$ VEL SPLIT Max
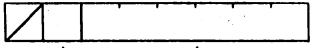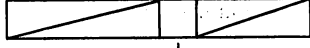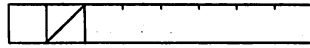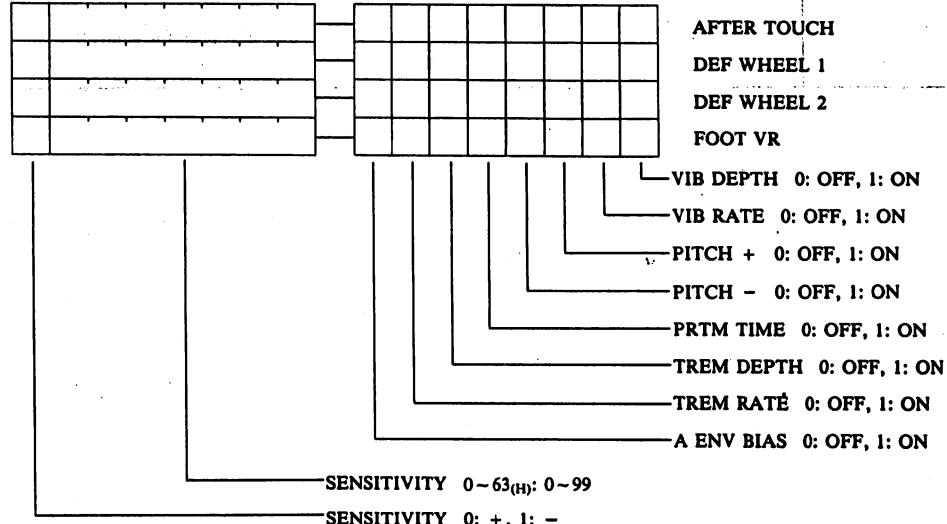
4. Multi Channel Mode Data
Multi Channel Mode data is composed of 144 bytes of data and is transmitted in the following order.

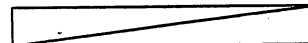| Byte No.	DATA
0 – 143	MULTI SOUND DATA

(See next page for contents.)
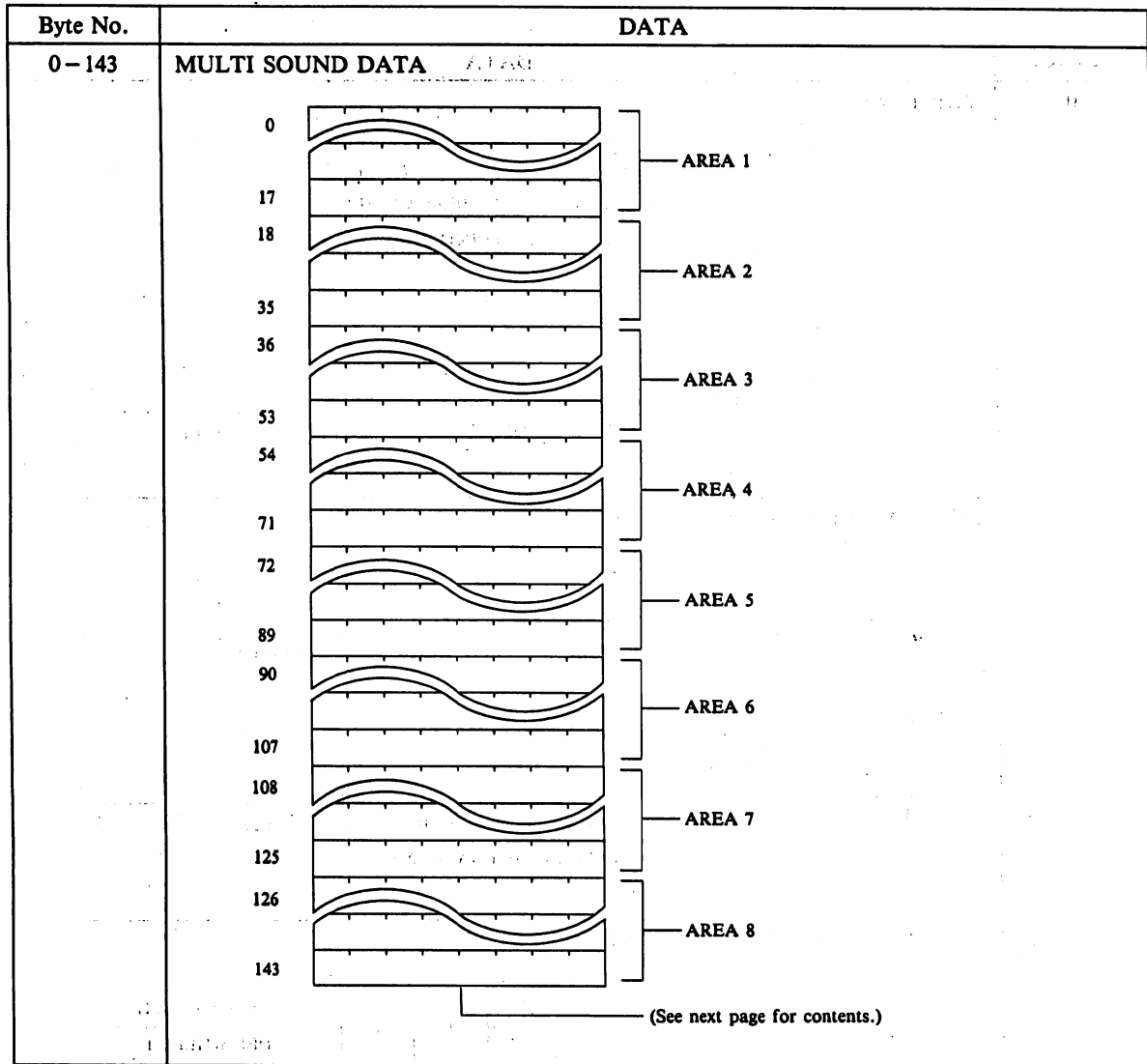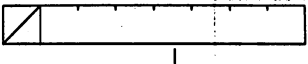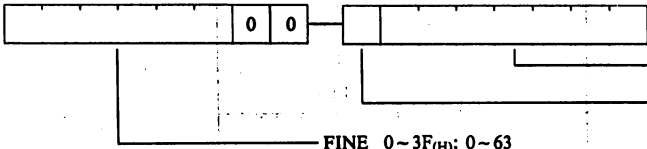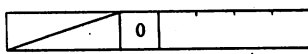
4-1. MULTI SOUND DATA

The contents of previous MULTI SOUND DATA are shown below. Multi Channel mode data is composed of 18 bytes × 8 ares.

Note that byte No. has been reset to "0" for simplifiction.

Byte No.	DATA
0	**VOICE No.** VOICE No. $0 \sim 3F_{(H)}$: A-1 ~ H-8 VOICE No. 0: INTERNAL, 1: CARD
1	**SOLO (EFFECT-01)** SOLO 0: OFF, 1: ON
2	**PORTAMENTO (EFFECT-01)** TIME $0 \sim 63_{(H)}$: 0~99 MODE 0: TIME CONST 1: RATE CONST
3	**PITCH BEND (EFFECT-02)** RANGE $0 \sim 30_{(H)}$: 0~48 RELEASE 0: ENA, 1: DIS
4~11	**AFTER TOUCH ~ FOOT VR (EFFECT-03, 04, 05, 06)** AFTER TOUCH DEF WHEEL 1 DEF WHEEL 2 FOOT VR VIB DEPTH 0: OFF, 1: ON VIB RATE 0: OFF, 1: ON PITCH + 0: OFF, 1: ON PITCH – 0: OFF, 1: ON PRTM TIME 0: OFF, 1: ON TREM DEPTH 0: OFF, 1: ON TREM RATE 0: OFF, 1: ON A ENV BIAS 0: OFF, 1: ON SENSITIVITY $0 \sim 63_{(H)}$: 0~99 SENSITIVITY 0: +, 1: –

Byte No.	DATA
12	**LEVEL (2-07)** LEVEL $0 \sim 63_{(H)}$: $0 \sim 99$
13 ~ 14	**MULTI PITCH (2-18)** OCT. FINE (NOTE 12) POL 0: $-$, 1: $+$ FINE $0 \sim 3F_{(H)}$: $0 \sim 63$
15	**POLY** POLY $0 \sim 8_{(H)}$: $0 \sim 8$ (NOTE 13)
16	**AREA CH.** CH. $0 \sim F_{(H)}$: $1 \sim 16$ ch
17	Not used

* Maximum polyphony for Area 1 ~ Area 8 is 8.
  If this value is exceeded, data must be corrected to bring total poly value within this range.
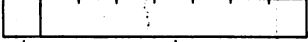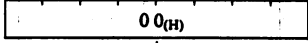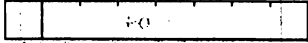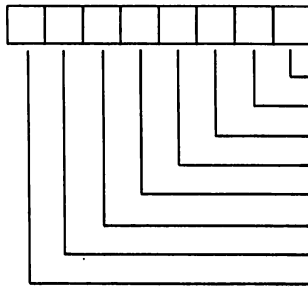
NOTE 12)

MIDI Transmission Data (HEX)	LCD Display Data OCT	NOTE
00	0	0
01		1
∫		∫
0B		11
0C	1	0
0D		1
∫		∫
17		11
⋮	⋮	⋮
3C	5	0
3D		1
∫		∫
47		11

5. TOTAL CONTROL Data

TOTAL CONTROL Data comprises a total of 8 bytes, which are transmitted in sequence shown below.

Byte No.	DATA
0~1	**MASTER TUNE** `0 [_____|0|0]` LOWER └─ FINE DATA (100/64-cent increments), 0~FC(H): 0~63 `1 [_|_____]` UPPER └─ TUNE DATA (half-tone increments) (NOTE 13) └─ POL: 1: +, 0: −
2~3	**TRANSPOSE** `2 [___0 0(H)___]` LOWER └─ FINE DATA (100/64-cent increments), 0(H) `3 [_|_____]` UPPER └─ TRANSPOSE DATA (half-tone increments) (NOTE 14) └─ POL: 1: +, 0: −
4	**BASIC CHANNEL** `[_____]` └─ BASIC CHANNEL 0~F(H): 1~16
5	**TOTAL CONT. FLAGS** `[_|_|_|_|_|_|_|_]` └─ INT. MEMORY PROTECT 0: OFF 1: ON └─ CARD MEMORY PROTECT 0: OFF 1: ON └─ PROGRAM NO. 0: 0~63, 1: 0~127 └─ PROGRAM CHANGE 0: ENA, 1: DIS └─ EXCLUSIVE 0: ENA, 1: DIS └─ MIDI VOL. 0: ENA, 1: DIS └─ DEF. CONTROLLER 0: ENA, 1: DIS └─ BAISC CHANNEL TOTAL 0: ON, 1: OFF
6	**DEFINABLE CONTROLLER** `[///|_____]` └─ CONTROL NO. 0C~1F(H): 12~31
7	**OVERFLOW** `[_|//|_____]` └─ OVERFLOW NO. 0~7(H): 1~8 └─ MODE: OVERFLOW: 1, NORMAL: 0

(NOTE 13)

UPPER	LOWER 0 0	Displayed Data
1 0 0 0 0 0 0 1	0 0 0 0 0 0 0 0	+64
1 0 0 0 0 0 0 0	1 1 1 1 1 1 0 0	+63
1 0 0 0 0 0 0 0	1 1 1 1 1 0 0 0	+62
⁓	⁓	⁓
1 0 0 0 0 0 0 0	0 0 0 0 0 1 0 0	+ 1
1 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0	0
0 0 0 0 0 0 0 0	0 0 0 0 0 1 0 0	− 1
⁓	⁓	⁓
0 0 0 0 0 0 0 0	1 1 1 1 1 0 0 0	−62
0 0 0 0 0 0 0 0	1 1 1 1 1 1 0 0	−63
0 0 0 0 0 0 1	0 0 0 0 0 0 0 0	−64

(NOTE 14)

MIDI Data (HEX)	Displayed Data
1 6	F#
1 5	F
1 4	E
1 3	E♭
1 2	D
1 1	C#
1 0	C
0 1	B
0 2	B♭
0 3	A
0 4	A♭
0 5	G

VOLTAGE SELECTOR

Spannungswähler / SELECTEUR DE TENSION / SELECTOR DE TENSIÓN / SELETTORE DEL VOLTAGGIO / ボルテージセレクター
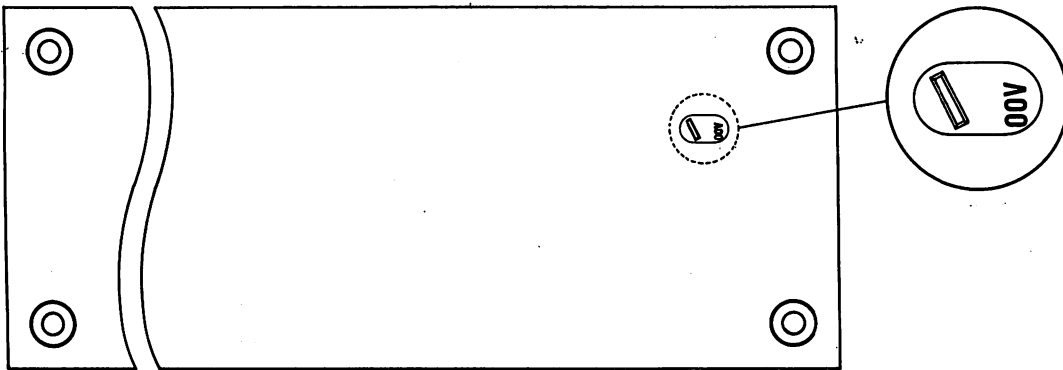
CAUTION

Before connecting the AC cord to the AC source, be sure to check whether the voltage indication on the bottom of the unit fits your local supply rating. If not, contact the original retailer or nearby dealer.

VORSICHT

Bevor das Netzkabel an einen Netzanschluß angeschlossen wird, muß unbedingt geprüft werden, ob die auf dem Boden des Instruments angegebene Spannung mit Ihrer Stromnetzspannung übereinstimmt. Sollte dies nicht der Fall sein, so wenden Sie sich bitte an das Fachgeschäft, in dem Sie das Instrument gekauft haben, oder an Ihren nächsten Kundendienst.

ATTENTION

Avant de brancher le cordon CA à la prise CA, ne pas oublier de contrôler si la tension indiquée au bas de l'appareil correspond à la tension de votre secteur. Si ce n'est pas le cas, contacter le revendeur chez qui vous avez effectué votre achat ou le distributeur le plus proche.

PRECAUCIÓN

Antes de conectar el cordón de CA en el tomacorriente, asegurarse de verificar si el voltaje indicado en la parte inferior de la unidad, coincide con el voltaje de la localidad. De lo contrario, ponerse en contacto con el distribuidor original o concesionario más cercano.

ATTENZIONE

Prima di collegare il cordone con la presa di corrente a disposizione, controllare che il voltaggio scritto sul fondo dell'unità corrisponda col voltaggio della rete a disposizione. In caso contrario prendere contatto col rivenditore autorizzato oppure col dettagliante più vicino.

注意

ご使用になる前に本機の底面にあるボルテージセレクターが「100V」になっていることをご確認ください。

CASIO®