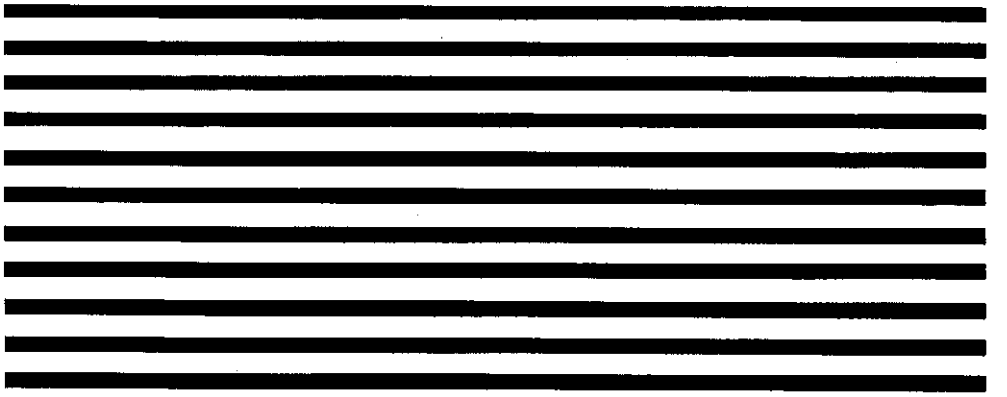
YAMAHA

MUSIC SYNTHESIZER

# SY22



## OPERATING MANUAL

## Congratulations!

You're about to enter an exciting new world of vector synthesis combining Yamaha's advanced AWM sample playback technology with high-performance FM tone generation. Vector synthesis allows you to create and control synthesized sound with unprecedented ease — in a very intimate, "human" way, putting you more closely in touch with your instrument and music. The vector control lets you blend sounds manually in real time, and dynamic vectors let you "record" dynamic vector sweeps that will play automatically whenever you play a note. For even more expressive capability, the SY22 keyboard features both velocity sensitivity and after-touch response that can be assigned to a number of musical parameters. The more you play the SY22, the more you'll find that "vectors" will become an indispensable part of your musical repertoire.

- Yamaha AWM and FM tone generators for superior sound and tonal versatility.
- 2-element or 4-element voice architecture brings AWM and FM waveforms together.
- Vector control for 2-axis control of element level and detuning.
- Dynamic level and detune vectors can be recorded easily in real time.
- 128 preset AWM waveforms and 256 preset FM waveforms provide an extensive library of sonic "building blocks" from which to create new voices.
- 64 preset voices and 64 user voice memory locations.
- External memory cards provide limitless backup and storage capability.
- Easy-edit features make creating new voices quick and virtually programming-free.
- Detailed programming parameters for in-depth programming when necessary.
- Fully programmable 8-part multi-play mode is perfect for sequencer-driven applications and layered multi-voice performance.
- 16 internal digital effects including reverb, delay and distortion.
- Overlapping voice selection capability for seamless voice transitions.
- Velocity and after-touch sensitive keyboard.
- Pitch bend and modulation wheels.
- Stereo output.

# CONTENTS



## TUTORIALS SECTION



## REFERENCE SECTION

# HOW TO USE THIS OPERATING MANUAL

**This operation manual is broadly divided into two main sections — TUTORIALS and REFERENCE.**

## What's In the TUTORIALS Section

The TUTORIALS section contains four separate tutorials that take you step-by-step through the main procedures you will need to know to become familiar with your SY22:

1. SETTING UP YOUR SYSTEM [Page 9]
   Basic system connections.
2. SELECTING AND PLAYING VOICES [Page 11]
   Selecting and playing voices from the PRESET, INTERNAL and CARD voice banks.
3. VECTORS [Page 14]
   Understanding and using manual and dynamic vectors.
4. INSTANT VOICE PROGRAMMING [Page 25]
   The fast way to create an unlimited range of new voices for the SY22.

We recommend that you go through the tutorials in sequence while actually carrying out procedures on your SY22. Once you've gone through the entire TUTORIALS section in this way, you should be familiar enough with the SY22 to need only the REFERENCE section in future.

## What's In the REFERENCE Section

The REFERENCE section is the "nuts and bolts" section of the manual, individually describing each of the SY22's many functions in detail. The REFERENCE section is divided into eight sub-sections, each describing the various functions within a particular SY22 edit or utility mode.

1. VOICE COMMON [Page 29]
2. VOICE VECTOR [Page 35]
3. ELEMENT TONE [Page 41]
4. ELEMENT ENVELOPE [Page 51]
5. MULTI [Page 59]
6. UTILITY SETUP [Page 67]
7. UTILITY RECALL [Page 75]
8. UTILITY MIDI [Page 79]

Once you have become familiar with the way the SY22 works by going through the TUTORIALS section, you should only need to refer to the REFERENCE section from time to time to get details on functions you've never used before, or refresh your memory about functions that you don't use very often.

Each sub-section of the REFERENCE section has its own table of contents, so you should be able to locate any particular function quickly and easily. Functions and references can also be located by referring to the INDEX at the back of the manual.

# PRECAUTIONS

## !! PLEASE READ THIS BEFORE PROCEEDING !!

1. **Avoid Excessive Heat, Humidity, Dust and Vibration**

   Keep the unit away from locations where it is likely to be exposed to high temperatures or humidity — such as near radiators, stoves, etc. Also avoid locations which are subject to excessive dust accumulation or vibration which could cause mechanical damage.

2. **Avoid Physical Shocks**

   Strong physical shocks to the unit can cause damage. Handle it with care.

3. **Do Not Open The Case Or Attempt Repairs Or Modifications Yourself**

   This product contains no user-serviceable parts. Refer all maintenance to qualified Yamaha service personnel. Opening the case and/or tampering with the internal circuitry will void the warranty.

4. **Make Sure Power Is Off Before Making Or Removing Connections**

   Always turn the power OFF prior to connecting or disconnecting cables.

5. **Handle Cables Carefully**

   Always plug and unplug cables by gripping the connector, not the cord.

6. **Clean With a Soft Dry Cloth**

   Never use solvents such as benzine or thinner to clean the unit. Wipe clean with a soft, dry cloth.

7. **Always Use the Correct Power Supply**

   Always use the supplied AC Adaptor to power your SY22 or, if the original adaptor is lost or broken, a replacement or equivalent type obtained from your Yamaha dealer. Also, make sure that the adaptor you have is appropriate for the AC mains supply voltage in the area where you intend to use the SY22 (the correct INPUT voltage is marked on the adaptor).

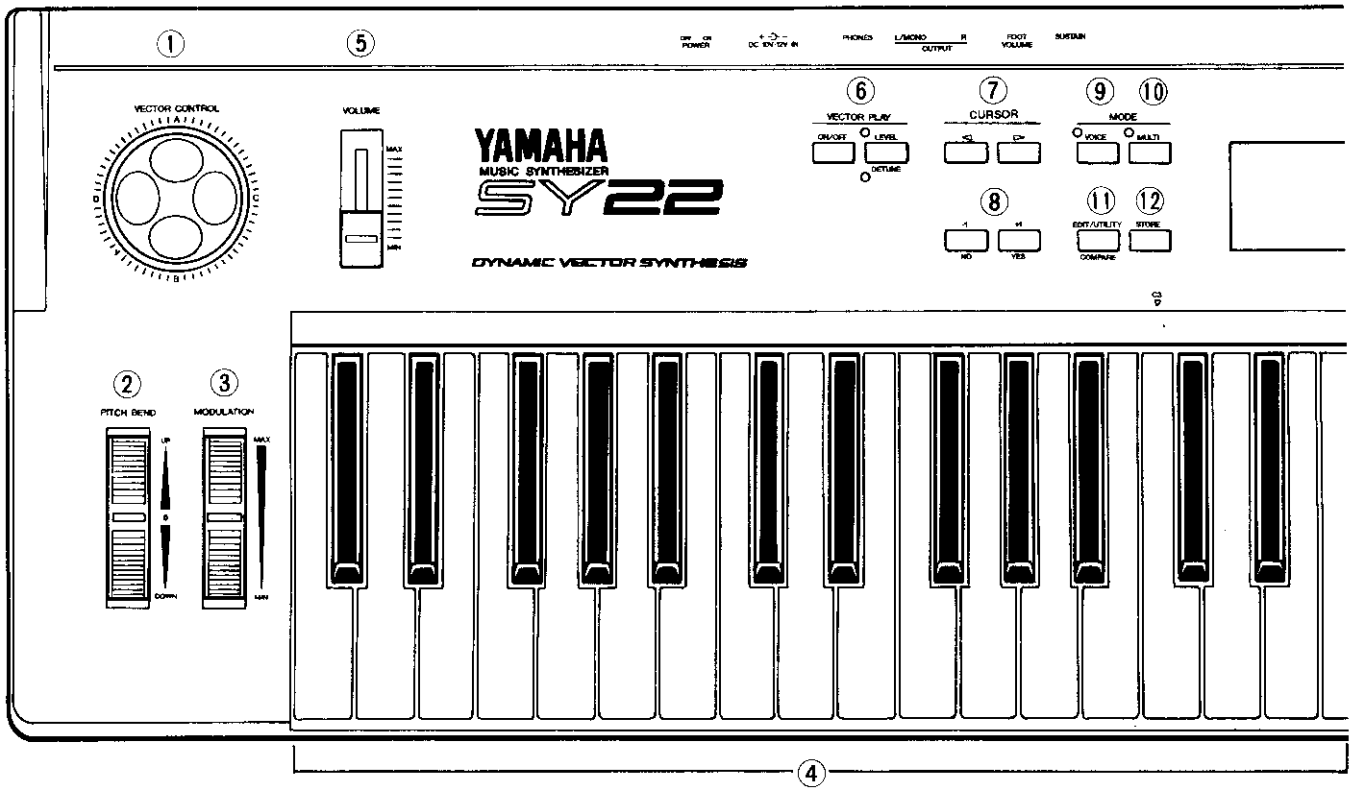
8. **Electrical Interference**

   Since the SY22 contains digital circuitry, it may cause interference and noise if placed too close to TV sets, radios or similar equipment. If such a problem does occur, move the SY22 further away from the affected equipment.

9. **Memory Backup**

   The SY22 contains a special backup power system that will retain the contents of the internal RAM memory for up to approximately one month even when the power is turned off! If the power is left off continuously for longer periods, the contents of the internal memory may be lost. Be sure to turn the SY22 on for a short period at least once a month if you wish to retain data in the internal memory.

## ■ FRONT PANEL




① **[VECTOR CONTROL]**
This is the key to SY22's remarkable vector synthesis system. The [VECTOR CONTROL] allows manual control of level or detune for 2 or 4 voice "elements" simultaneously. It also allows realtime recording of dynamic level and detune vectors.

② **[PITCH BEND] Wheel**
This self-centering pitch wheel allows smooth upward and downward pitch bends.

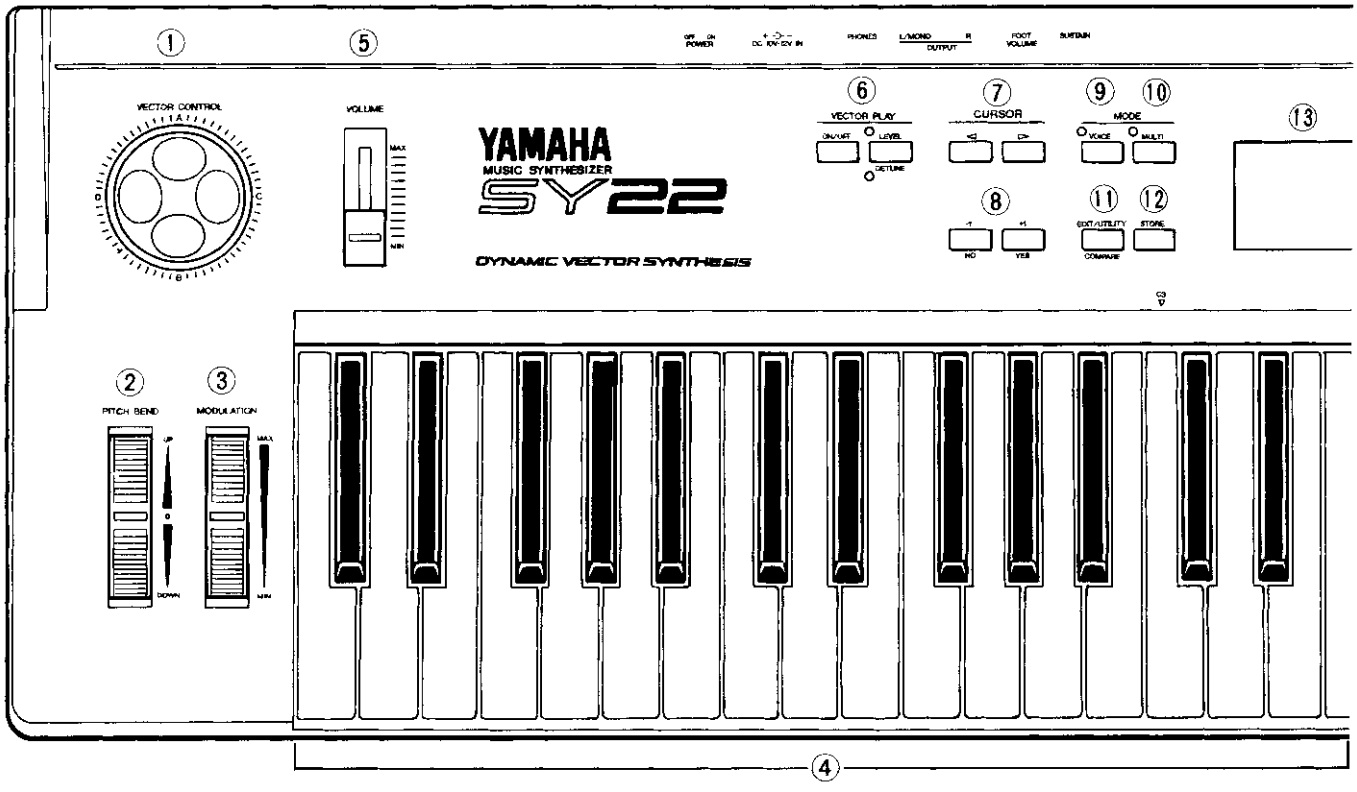
③ **[MODULATION] Wheel**
Can be assigned to apply pitch and/or amplitude modulation for a range of expressive effects.

④ **Keyboard**
The SY22 keyboard is both velocity and after-touch sensitive for broad, intimate expressive control.

⑤ **VOLUME Control**
Adjusts the volume of the sound delivered via the rear-panel OUTPUT and PHONES jack.

⑥ **VECTOR PLAY [ON/OFF] and [LEVEL/DETUNE] Keys & Indicators**
The [ON/OFF] key turns manual vector control on or off, while the [LEVEL/DETUNE] key selects level or detune control.

⑦ **[◁] and [▷] Cursor Keys**
Move the screen cursor from parameter to parameter in many of the SY22 editing functions.




⑧ **[–1/NO] and [+1/YES] Keys**
Can be used to select voices and multi-play setups, and are used to edit parameter values in any of the SY22 edit modes. Either key can be pressed briefly for single stepping in the specified direction, or held for continuous scrolling. These keys are also used to answer the "Are you sure?" confirmation prompt when saving or initializing data.

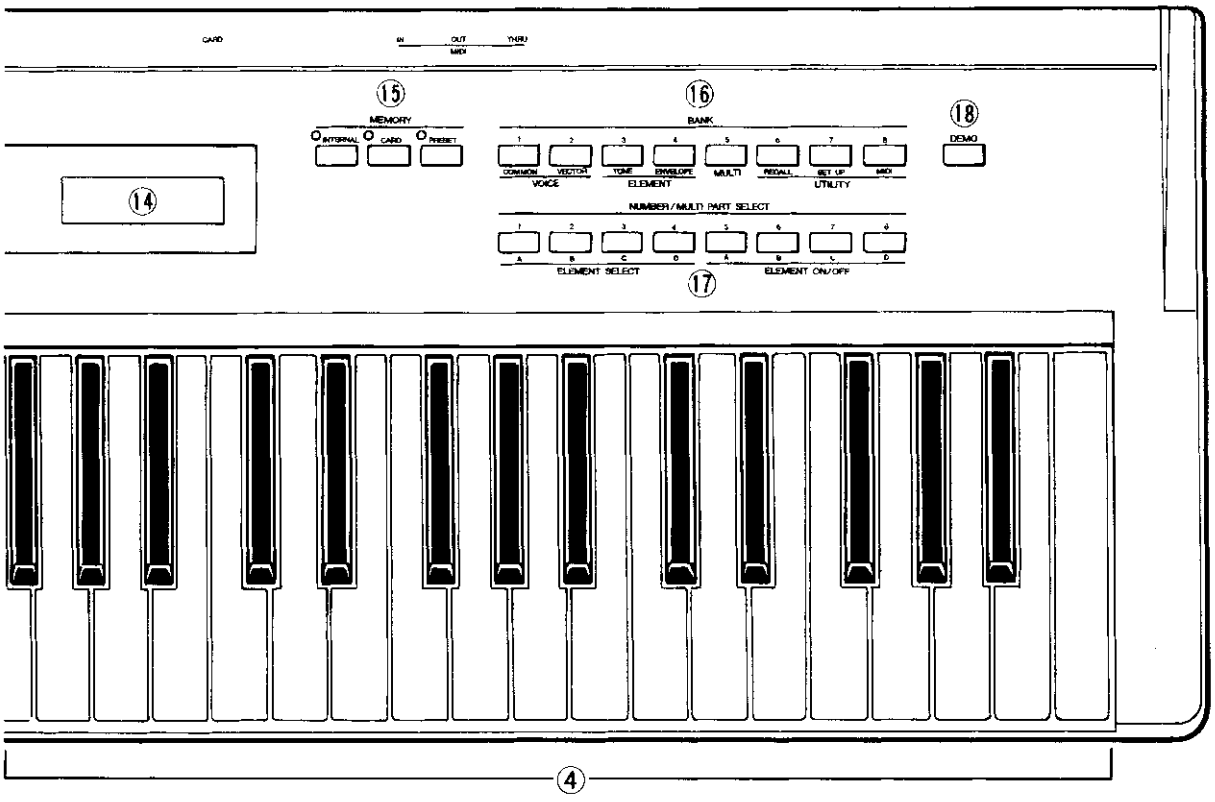
⑨ **[VOICE] Key & Indicator**
Selects the normal voice play mode in which any of the SY22's preset, internal or card voices can be played via the keyboard or other controller connected to the MIDI IN connector.

⑩ **[MULTI] Key & Indicator**
Selects the multi-play mode in which up to 8 voices can be played via simultaneously via the keyboard or controlled on different MIDI channels via an external MIDI sequencer.

⑪ **[EDIT/UTILITY/COMPARE] Key**
Accesses the SY22's voice edit, multi-play edit and utility modes. Also activates the compare function when in any edit mode, allowing quick comparison of the original and edited voice or multi-play setup.

⑫ **[STORE] Key**
Used to store the selected voice on multi-play setup to an internal or card memory location.

⑬ **LED Display**
This 2-digit 7-segment LED numeric display shows the bank and number of the currently selected voice or multi-play setup in the VOICE PLAY or MULTI PLAY mode. It also indicates when an edit or utility mode is active, and shows the character — A, B, C or D — of the currently selected element in one of the element edit modes.




**⑭ Liquid Crystal Display Panel**
This 16-character x 2-line backlit liquid crystal display panel shows the selected voice or multi-play setup name in the voice or multi-play modes, as well as function names and parameters in the utility and edit modes.

**⑮ [INTERNAL], [CARD], and [PRESET] Keys & Indicators**
Select the data bank — preset, internal or card — from which voices or multi-play setups will be selected.

**⑯ [BANK] Select and Edit/Utility Mode Access keys**
In the VOICE PLAY or MULTI PLAY mode, these keys — [1] through [8] — are used to select the bank of the voice or multi-play setup to be selected.

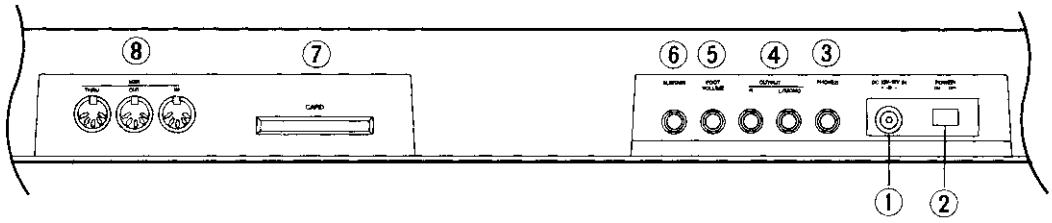
In an edit or utility mode, or immediately after the [EDIT/UTILITY] key has been pressed to access these modes, these keys are used to selected the desired edit or utility function group (green labels below the keys).

**⑰ [NUMBER/MULTI PART SELECT] and Element Control Keys**
In the VOICE PLAY or MULTI PLAY mode, these keys — [1] through [8] — are used to select the number of the voice or multi-play setup to be selected.

In the MULTI edit mode they select the multi-play part to be edited, and in the ELEMENT TONE or ELEMENT ENVELOPE edit mode they are used to select individual elements and turn individual elements on and off for editing (green labels below the keys).

**⑱ [DEMO] Key**
Activates the SY22 built-in demonstration — a great way to hear what the SY22 can do after you set up your system.

## ■ REAR PANEL




**① DC 10V-12V IN Jack**

The DC output cable from the supplied AC Adaptor should be connected here. When connecting the power supply, make sure that the SY22 POWER switch is in the OFF position (extended), then plug the AC adaptor output cable into the DC 10V-12V IN jack, and finally the adaptor's AC plug into a convenient AC wall outlet. The cable clip located immediately below the DC 10V-12V IN jack helps to prevent accidental unplugging of the power supply during use. Wrap the DC cable firmly around the clip a few centimeters from the plug end.

**CAUTION!**
Do not attempt to use a different AC adaptor to power the SY22. The use of an incompatible adaptor may cause irreparable damage to the SY22, and might pose a serious shock hazard!

**② [POWER] Switch**

Slide to the "ON" position to turn power ON.

**③ PHONES Jack**

Accepts a standard pair of stereo headphones (1/4" stereo phone plug) for headphone monitoring of the SY22 sound without the need for external amplification equipment.

**④ OUTPUT R and L/MONO Jacks**

These are the main stereo outputs from the SY22. If a plug is inserted only into the L/MONO jack, the left and right-channel signals are combined and delivered via this jack (for connection to a monaural sound system).

**⑤ FOOT VOLUME Jack**

An optional Yamaha FC-7 foot controller connected here can be used for volume control.

**⑥ SUSTAIN Jack**

An optional Yamaha FC-4 or FC-5 footswitch can be connected here for press-on/release-off sustain control.

**⑦ CARD Slot**

The CARD slot accepts Yamaha MCD64 or MCD32 Memory Cards for storage and retrieval of SY22 voices.

**⑧ MIDI IN, OUT and THRU Connectors**

The MIDI IN connector receives the data from a sequencer or other MIDI controller which is to control the SY22. The MIDI THRU connector simply retransmits the data received at the MIDI IN connector, allowing convenient chaining of MIDI devices. The MIDI OUT connector transmits data corresponding to all SY22 performance operations, or bulk data when one of the MIDI voice data transmission functions are activated.

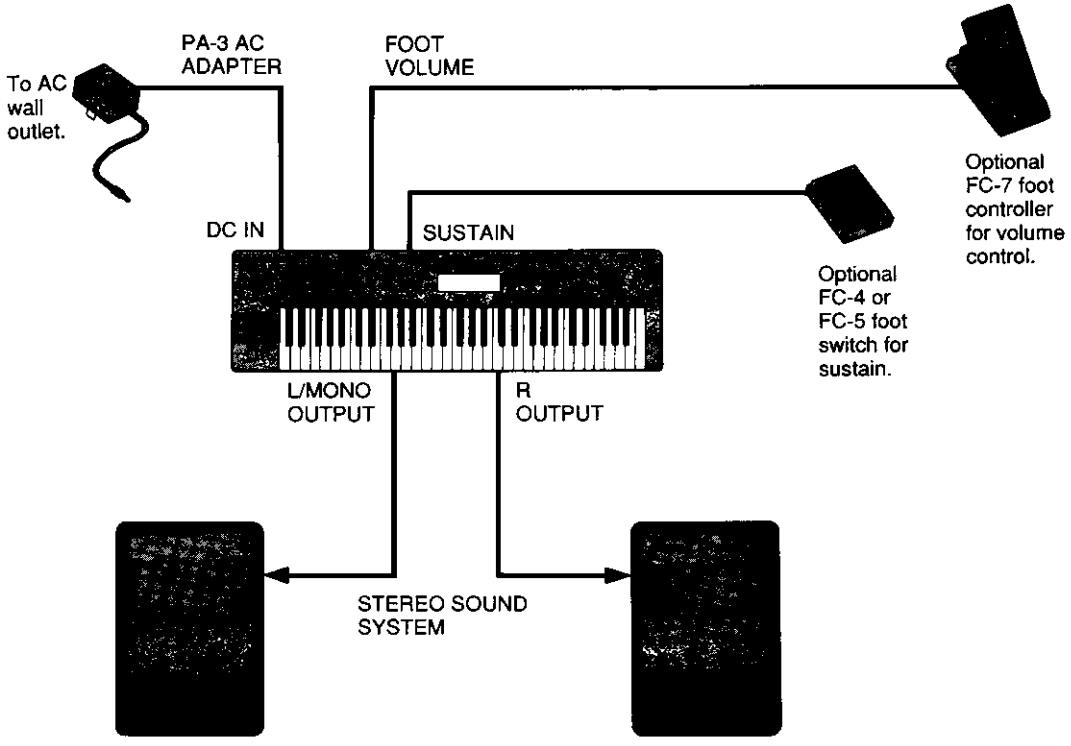
# TUTORIALS SECTION

# 1. SETTING UP YOUR SYSTEM

## Connections

The diagram below shows the basic connections in a setup using only the SY22 and a stereo sound system.

**CAUTION!!:** Make sure that both the SY22 and your sound system are turned OFF when making connections.




## Power-on Procedure

1. Make sure your sound system's volume control and the SY22 volume control are turned all the way down prior to turning power on.
2. Turn on the SY22.
3. Turn on the sound system.
4. Raise the sound system volume to a reasonable level.
5. Gradually raise the SY22 VOLUME control while playing the keyboard to set the desired listening level.

**Caution:** The SY22 automatically transmits MIDI control change data corresponding to its control status when its power switch is turned ON or OFF. This can interfere with operation of other MIDI equipment connected to the SY22 MIDI OUT connector. If the SY22 is connected to other MIDI equipment, the SY22 power switch should be ON *first*, and turned OFF *last*.

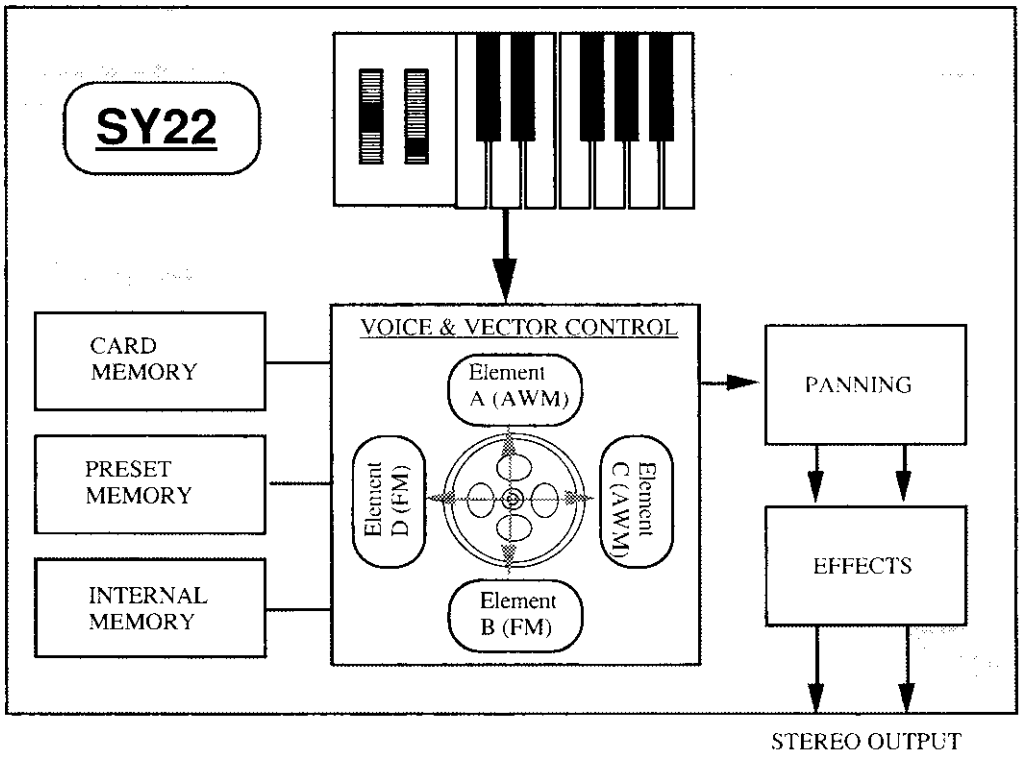
## Enjoy the Demo

The SY22 is programmed with a demonstration sequence that you might enjoy listening to after setting up your system. Take a short break and enjoy the demo:

1. Press the [DEMO] key. "Yes to Start" will appear on the LCD display.
2. Press the [+1/YES] key to start demo playback. "No to Stop" will appear on the LCD display.
3. Press the [–1/NO] key when you want to stop demo playback.

## The PRESET, INTERNAL and CARD Voice Memories

Here's a global view of the SY22 system:




Please note that the voices played by the SY22 can come from three different sources: the PRESET voice memory, the INTERNAL voice memory, or a CARD voice memory:

### PRESET

The PRESET voice memory contains 64 pre-programmed voices in ROM (Read Only Memory) that cannot be overwritten or changed in any way. The PRESET voice memory is represented on the display by the letter "P".

**PRESET VOICE LIST**

| | No. | Voice Name | EL* | | No. | Voice Name | EL* | | No. | Voice Name | EL* | | No. | Voice Name | EL* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1.1 | Genesis | 4 | 17 | 3.1 | Piano | 2 | 33 | 5.1 | Oboe | 2 | 49 | 7.1 | Inca | 4 |
| 2 | 1.2 | DXlegend | 4 | 18 | 3.2 | PinPiano | 4 | 34 | 5.2 | Sax | 2 | 50 | 7.2 | Voyager | 4 |
| 3 | 1.3 | Full Str | 4 | 19 | 3.3 | Elekroad | 2 | 35 | 5.3 | 12String | 4 | 51 | 7.3 | Crystals | 4 |
| 4 | 1.4 | Dist Gtr | 4 | 20 | 3.4 | MalletEP | 4 | 36 | 5.4 | Mute Gtr | 4 | 52 | 7.4 | VCO Sync | 4 |
| 5 | 1.5 | Itopia | 4 | 21 | 3.5 | Clavi | 2 | 37 | 5.5 | WoodBass | 2 | 53 | 7.5 | VCO Lead | 4 |
| 6 | 1.6 | PowerBrs | 4 | 22 | 3.6 | ThinClav | 2 | 38 | 5.6 | PlukBass | 2 | 54 | 7.6 | MiniLead | 2 |
| 7 | 1.7 | RainNite | 4 | 23 | 3.7 | RokOrgan | 2 | 39 | 5.7 | FunkBass | 2 | 55 | 7.7 | Groover | 2 |
| 8 | 1.8 | Nostromo | 4 | 24 | 3.8 | JazOrgan | 4 | 40 | 5.8 | SlapBass | 4 | 56 | 7.8 | Digicord | 2 |
| 9 | 2.1 | Matrix22 | 4 | 25 | 4.1 | PipeOrgn | 2 | 41 | 6.1 | Fretless | 2 | 57 | 8.1 | SuperPad | 4 |
| 10 | 2.2 | Arpegi8 | 4 | 26 | 4.2 | Trumpet | 2 | 42 | 6.2 | Syn Bass | 2 | 58 | 8.2 | Prophecy | 4 |
| 11 | 2.3 | SadAngel | 4 | 27 | 4.3 | Trombone | 4 | 43 | 6.3 | Strings | 4 | 59 | 8.3 | Industry | 4 |
| 12 | 2.4 | DynaPad | 4 | 28 | 4.4 | Fr Horn | 2 | 44 | 6.4 | Chamber | 2 | 60 | 8.4 | Evolver | 4 |
| 13 | 2.5 | IceField | 4 | 29 | 4.5 | BrasSect | 4 | 45 | 6.5 | Syn Str | 4 | 61 | 8.5 | VectaEko | 4 |
| 14 | 2.6 | Nautilus | 4 | 30 | 4.6 | Fanfare | 4 | 46 | 6.6 | BoyChoir | 4 | 62 | 8.6 | Zombie | 4 |
| 15 | 2.7 | VectaSeq | 4 | 31 | 4.7 | FatBrass | 4 | 47 | 6.7 | Marimba | 2 | 63 | 8.7 | Rap Perc | 4 |
| 16 | 2.8 | Thriller | 4 | 32 | 4.8 | Flute | 2 | 48 | 6.8 | Bell Wah | 4 | 64 | 8.8 | Dr.Kit | 2 |

*EL = No. of elements.

**INTERNAL**

The INTERNAL voice memory is a RAM (Random Access Memory) area into which you can store up to 64 voices that you create or load from an external memory card. The INTERNAL voice memory is represented on the display by the letter "I".

**CARD**

The CARD memory bank is a Yamaha MCD64 or MCD32 Memory Card (or pre-programmed voice card) plugged into the SY22 CARD slot on the rear panel. Memory cards are convenient for external storage and transportation of voices that you or others create. You can also store sets of related voices on different memory cards. An MCD32 Memory Card allows storage of up to 64 voices. An MCD64 Memory Card holds two banks of 64 voices each — a total of 128 voices per card (REFERENCE SECTION, page 70). The CARD voice memory is represented on the display by the letter "C".

**Note:** No warning is given on the SY22 displays when a memory card backup battery is about to fail. See your memory card owner's manual for details.

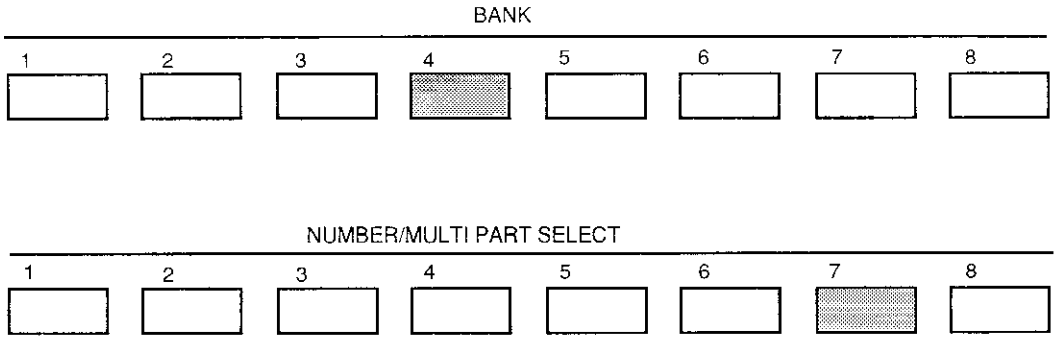
Any voice in any of these voice memories can be selected and played while the SY22 is in the VOICE PLAY mode.

## Selecting the VOICE PLAY Mode, a Voice Memory, and Voice

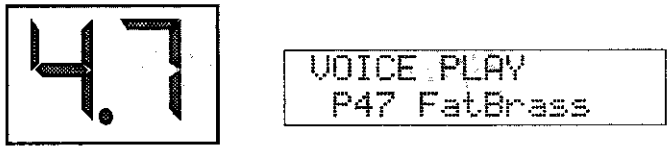
1. If the VOICE PLAY mode is not already selected — as indicated by a lit [VOICE] key LED and "VOICE PLAY" across the top of the LCD — press the [VOICE] key to select it.


2. The [INTERNAL], [CARD], and [PRESET] keys are used to select the desired voice memory. If no memory card is inserted in the CARD slot, the "Card not ready!" display will appear if you attempt to select the card voice memory.

3. The 64 voices in each voice memory are organized into 8 banks of 8 voices each (8 x 8 = 64). Any voice can be selected by specifying its bank using the BANK keys, and its number using the NUMBER/MULTI PART SELECT keys.
   Voice numbers are displayed on the LCD in the same way. " ," for example, is not preset voice number 25, but rather preset voice bank 2, number 5. On the large LED display, this would be shown as "2.5". The 64th preset voice, therefore, is displayed as "P88" on the LCD or "8.8" on the LED display.
   To select voice bank 4 number 7, for example, press the BANK [4] key and NUMBER/MULTI PART SELECT [7] key — in any order.




The displays should look something like this:




To select a different number within the same bank it is only necessary to press the appropriate NUMBER key. In the same way, to select the same number in a different bank all you have to do is press the appropriate BANK key.
The [–1/NO] and [+1/YES] keys can also be used to select a voice in the VOICE PLAY mode. Holding the [–1/NO] or [+1/YES] key causes continuous scrolling in the specified direction.

4. Play the keyboard.
   If you don't get any sound at this point:

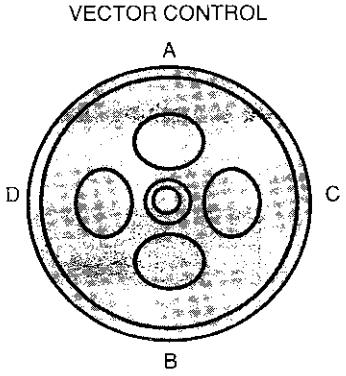
- Make sure your sound system is turned ON and the volume is turned up to a reasonable level.
- Make sure that the SY22 VOLUME control is turned up to a reasonable level.
- Check all connections carefully.

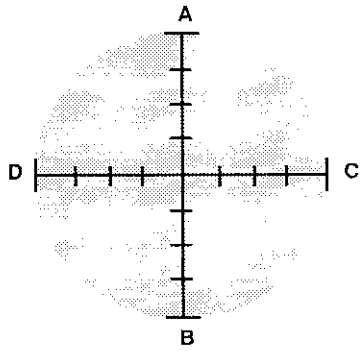
## Overlapping Voice Selection

The SY22 has been designed to allow overlapping voice selection. That is, if you select a new voice while holding notes on the keyboard (or by using a sustain footswitch), the held notes will continue playing the previous voice while subsequently played notes will use the new voice. Although the primary reason for this feature is to allow smooth switching between voices without unnatural sound cutoff or gaps, it is actually possible to play several voices at once by holding a note or two, selecting a new voice, holding a couple more notes, selecting a second new voice, and so on. Please note, however, that if different voices selected using this method have different effects, a corresponding change in effect will be heard.

## Voice Configurations

SY22 voices can have either a 2-element or 4-element configuration (REFERENCE SECTION, page 31). Each "element" is actually an independent sound or "waveform," and vector control allows the 2 or 4 different waveforms in a voice to be blended and detuned in a variety of ways — manually or automatically.




For the sake of clarity, we'll represent the SY22 vector control by a simple graph like the one shown to the right for the rest of the tutorial.

The "A," "B," "C," and "D" markings around the [VECTOR CONTROL] correspond to the voice elements. A 2-element voice uses only elements A and B, while a 4-element voice uses all four elements — A, B, C and D.

Elements A and C are *always* AWM elements, while B and D are *always* FM elements. When you start programming your own voices you can assign any of 128 preset AWM waveforms to elements A and C, and any of 256 preset FM waveforms to elements B and D (REFERENCE SECTION, page 43).

**AWM & FM:** AWM stands for "Advanced Wave Memory," Yamaha's sophisticated sampling technology that allows high-fidelity reproduction of digitally recorded "live" sound. FM is Yamaha's proven Frequency Modulation synthesis technology which is capable of creating extraordinarily warm, vibrant simulations of actual instruments, as well as an infinite variety of original sounds.

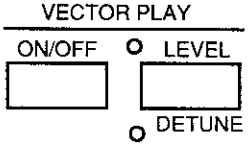
## Two Types of Vectors: Manual & Dynamic

Vector control can be accomplished in two ways: manually by operating the [VECTOR CONTROL] while playing, or automatically. Automatic vectors are called "dynamic vectors" in the SY22, and these play automatically whenever you play a note on the keyboard. Dynamic vectors can be recorded in real time via the [VECTOR CONTROL] by using the procedure described in the "Recording an Original Dynamic Vector" section on page 20. Dynamic vectors function whenever the VECTOR PLAY mode is OFF — i.e. when both the VECTOR PLAY [LEVEL] and [DETUNE] indicators are out.

Manual vector control is possible whenever the VECTOR PLAY mode is ON — i.e. when either the VECTOR PLAY [LEVEL] or [DETUNE] indicator is lit.

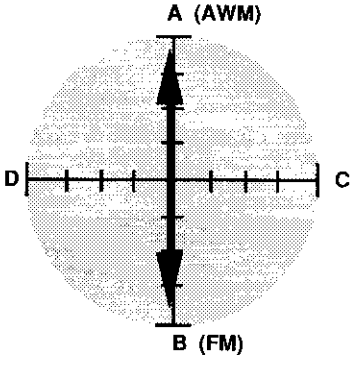
## Manual Vector Control

Manual vector control while playing can be accomplished by turning the vector play mode on — press the VECTOR PLAY [ON/OFF] key so that either the [LEVEL] or [DETUNE] indicator lights, and then select either level or detune control by pressing the VECTOR PLAY [LEVEL/DETUNE] key.

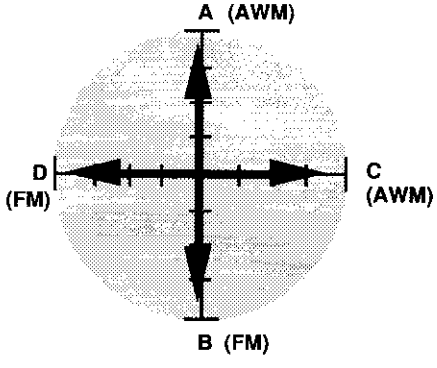



The [VECTOR CONTROL] can then be used to control the selected parameter — level or detune — along the vertical axis only if a 2-element voice is selected, or along both the vertical and horizontal axes if a 4-element voice is selected.

**2-ELEMENT VOICE**



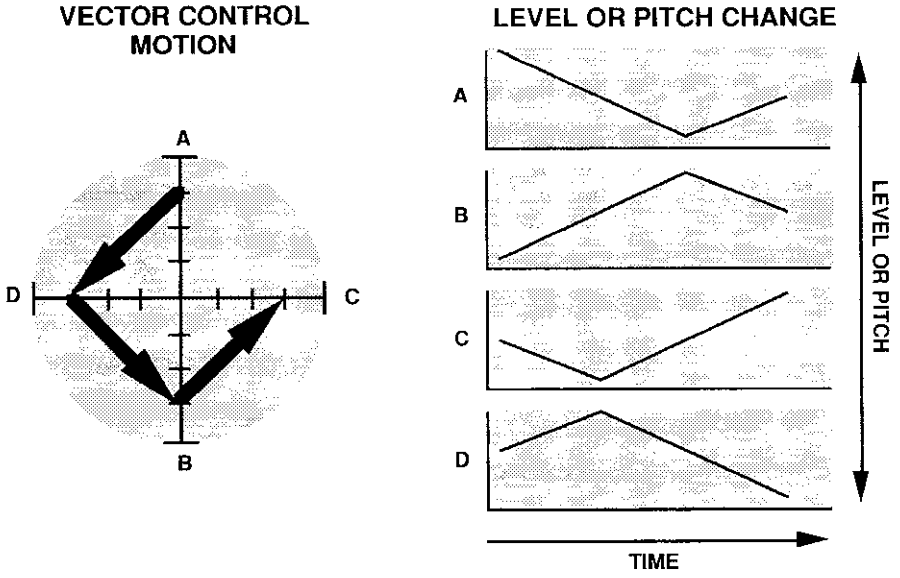

**4-ELEMENT VOICE**




When level vector control is selected, moving the control towards one element (A, B, C or D) increases the level of that element while decreasing the level of the others proportionally. The [VECTOR CONTROL] works in a similar way when detune vector control is selected — moving the control towards one element increases the pitch of that element while decreasing the pitch of the others.

If the selected voice has a dynamic detune vector, the detune vector will play while manual level vector control is selected, and vice versa.

The following diagrams should give you a rough idea of how the level or pitch of each element in a 4-element voice is affected by [VECTOR CONTROL] motion.




## An Exercise

The best way to discover what vector control can do for you is to listen and experiment. Here's a list of the preset voices including the configuration of each (2 or 4-element) and the names of the waveforms assigned to each element.

**PRESET VOICE Performance Note**

| | No. | Voice Name | EL* | Vector*2 | Wave | Effect | Comments |
|---|---|---|---|---|---|---|---|
| 1 | 1.1 | Genesis | 4 | Yes/No | 043 Choir<br>103 Sus. 6<br>126 SEQ 8<br>111 Sus. 14 | Rev Hall | Play long notes. Switch on VECTOR PLAY LEVEL, turn VECTOR CONTROL to C, hear SEQ 8 wave (Sequence wave) |
| 2 | 1.2 | DXlegend | 4 | No/Yes | 001 E.Piano<br>072 Vibes 3<br>001 E.Piano<br>072 Vibes 3 | Rev Hall | Electronic piano |
| 3 | 1.3 | Full Str | 4 | No/Yes | 039 Vn.Ens.<br>068 Str 6<br>038 Strings<br>069 Str 7 | Rev Hall | Light touch for small, heavy for large string section.<br>After-touch volume. |
| 4 | 1.4 | Dist Gtr | 4 | Yes/No | 022 E.Gtr 1<br>157 Square<br>098 Digital2<br>193 Wave8-1 | Dist&Rev | Heavy guitar. Slow fade to feedback.<br>Switch on VECTOR PLAY LEVEL, turn VECTOR CONTROL from A to D, B, C for manual feedback. |
| 5 | 1.5 | Itopia | 4 | Yes/Yes | 044 Itopia<br>103 Sus.6<br>044 Itopia<br>233 Wave21-2 | Rev Hall | Breathy choir<br>After-touch volume. |
| 6 | 1.6 | PowerBrs | 4 | No/Yes | 102 Saw 1<br>095 Lead 5<br>102 Saw 1<br>095 Lead 5 | Rev Hall | Powerful analog brass pad.<br>After-touch vibrato. |
| 7 | 1.7 | RainNite | 4 | Yes/Yes | 085 Str. Body<br>235 Wave22-1<br>068 Coin<br>220 Wave17-1 | Rev Metal | Best with long chords. |
| 8 | 1.8 | Nostromo | 4 | Yes/No | 055 Hit<br>061 Bass 8<br>049 Timpani<br>122 Move 5 | Rev Hall | Best with long chords.<br>After-touch vibrato. |

*EL = No. of elements.
*2 = Vector Yes/Yes
↑ ↑
LEVEL VECTOR DETUNE VECTOR

| No. | Voice Name | EL* | Vector*2 | Wave | Effect | Comments |
|---|---|---|---|---|---|---|
| 9 | 2.1 | Matrix22 | 4 | Yes/Yes | 039 Vn.Ens.<br>121 Move 4<br>038 Strings<br>122 Move 5 | Rev Hall | Big orchestra with sweeping brass. |
| 10 | 2.2 | Arpegi8 | 4 | Yes/Yes | 044 Itopia<br>061 Bass 8<br>038 Strings<br>043 Clavi 2 | Rev Metal | Play broken chords (arpeggios) and hold down each note of the arpeggio. The late envelope will echo what you play. |
| 11 | 2.3 | SadAngel | 4 | No/Yes | 044 Itopia<br>122 Move 5<br>044 Itopia<br>122 Move 5 | Pan Ref | Best with long notes. Pitch bending by LFO. |
| 12 | 2.4 | DynaPad | 4 | Yes/Yes | 044 Itopia<br>111 Sys. 14<br>080 Slam<br>077 Bells 1 | Pan Ref | Best with long notes. |
| 13 | 2.5 | IceField | 4 | Yes/Yes | 043 Choir<br>121 Move 4<br>043 Choir<br>122 Move 5 | Rev Metal | Best with long chords. |
| 14 | 2.6 | Nautilus | 4 | Yes/Yes | 067 Stream<br>115 Attack 3<br>038 Strings<br>016 Brass 3 | Pan Ref | Best with long chords. |
| 15 | 2.7 | VectaSeq | 4 | Yes/No | 042 SynStr.<br>023 Brass 10<br>093 Gtr wv<br>067 Str 5 | Rev Hall | 4 note sequence voice by Vector.<br>Switch on VECTOR PLAY LEVEL, turn VECTOR CONTROL for manual sequence. |
| 16 | 2.8 | Thriller | 4 | Yes/Yes | 055 Hit<br>123 Move6<br>068 Coin<br>166 Digi 6 | Pan Ref | Best with long notes. |
| 17 | 3.1 | Piano | 2 | No/No | 000 Piano<br>005 E.Piano6 | Rev Club | Orthodox acoustic piano |
| 18 | 3.2 | PinPiano | 4 | No/Yes | 090 EP wv<br>188 Wave6-2<br>000 Piano<br>005 E.Piano6 | Rev Hall | Electric piano with brilliant attack like "Prepared piano" |
| 19 | 3.3 | Elekroad | 2 | No/No | 004 Celesta<br>002 E.Piano3 | Rev Room | Dark Electronic piano. |
| 20 | 3.4 | MalletEP | 4 | No/Yes | 001 E.Piano<br>071 Vibes 2<br>001 E.Piano<br>071 Vibes 2 | Rev Hall | Electric piano with sharp attack. |
| 21 | 3.5 | Clavi | 2 | Yes/Yes | 002 Clavi<br>042 Clavi 1 | Early Ref | Fat, funky clavi. |
| 22 | 3.6 | ThinClav | 2 | No/No | 058 Sync<br>043 Clavi 2 | Early Ref | Funky clavi with wide touch range. |
| 23 | 3.7 | RokOrgan | 2 | Yes/No | 006 E.Organ1<br>007 E.Organ2 | Pan Ref | Rock Organ.<br>After-touch vibrato. |
| 24 | 3.8 | JazOrgan | 4 | No/Yes | 007 E.Organ2<br>007 E.Organ2<br>007 E.Organ2<br>007 E.Organ2 | Delay 1 | Full, rich organ with rotating speaker effect.<br>Add more effect by using VECTOR PLAY. |
| 25 | 4.1 | PipeOrgn | 2 | No/Yes | 005 P.Organ<br>008 E.Organ3<br>008 E.Organ3 | Rev Hall | Big Church Organ |
| 26 | 4.2 | Trumpet | 2 | No/No | 009 Trumpet<br>017 Brass 4 | Rev Hall | Solo trumpet.<br>After-touch vibrato. |
| 27 | 4.3 | Trombone | 4 | Yes/Yes | 011 Trombone<br>017 Brass 4<br>011 Trombone<br>024 Brass 11 | Rev Room | Solo trombone<br>After-touch vibrato. |

*EL = No. of elements.

*2 = Vector Yes/Yes
↑ ↑
LEVEL VECTOR DETUNE VECTOR

| | No. | Voice Name | EL* | Vector*2 | Wave | Effect | Comments |
|---|---|---|---|---|---|---|---|
| 28 | 4.4 | Fr Horn | 2 | No/No | 013 Fr Horn<br>236 Wave22-2 | Rev Hall | French Horn ensemble<br>After-touch vibrato. |
| 29 | 4.5 | BrasSect | 4 | No/No | 009 Trumpet<br>016 Brass 3<br>011 Trombone<br>017 Brass 4 | Early Ref | Pop brass section.<br>Switch on VECTOR PLAY LEVEL, turn VECTOR CONTROL for various brass color. |
| 30 | 4.6 | Fanfare | 4 | No/Yes | 082 Tb.Body<br>016 Brass 3<br>011 Trombone<br>017 Brass 4 | Rev Hall | Classical brass section.<br>After-touch vibrato. |
| 31 | 4.7 | FatBrass | 4 | No/Yes | 015 SynBrass<br>026 Brass 13<br>015 SynBrass<br>026 Brass 13 | Early Ref | Fat synthClub brass pad. |
| 32 | 4.8 | Flute | 2 | No/No | 016 Flute<br>062 Bass 9* | Rev Room | Solo flute |
| 33 | 5.1 | Oboe | 2 | No/Yes | 018 Oboe<br>036 Reed 1 | Rev Hall | Solo oboe<br>After-touch vibrato. |
| 34 | 5.2 | Sax | 2 | Yes/No | 019 Sax<br>041 Reed 6* | Early Ref | Solo sax<br>After-touch vibrato. |
| 35 | 5.3 | 12String | 4 | Yes/Yes | 021 Steel<br>044 Clavi 3<br>021 Steel<br>196 Wave9-1 | Pan Ref | Full 12 strings guitar |
| 36 | 5.4 | Mute Gtr | 4 | No/Yes | 023 E.Gtr 2<br>052 Gtr 7<br>024 Mute Gtr<br>050 Gtr 5 | Rev Hall | Light touch for muted, heavy for normal electric guitar.<br>After-touch vibrato. |
| 37 | 5.5 | WoodBass | 2 | No/No | 028 Wood B 1<br>055 Bass 2 | Rev Room | Wood bass<br>After-touch vibrato. |
| 38 | 5.6 | PlukBass | 2 | Yes/Yes | 032 E.Bass 3<br>056 Bass 3 | Rev Club | Picked bass |
| 39 | 5.7 | FunkBass | 2 | Yes/Yes | 031 E.Bass 2<br>057 Bass 4 | Delay 1 | Punchy picked bass |
| 40 | 5.8 | SlapBass | 4 | Yes/Yes | 031 E.Bass 2<br>057 Bass 4<br>034 Slap<br>056 Bass 3 | Gate Rev | Play hard for slap bass sound. |
| 41 | 6.1 | Fretless | 2 | No/No | 035 Fretless<br>055 Bass 2 | Rev Room | Fretless bass<br>After-touch vibrato. |
| 42 | 6.2 | Syn Bass | 2 | No/No | 037 SynBass2<br>138 Decay 14 | Delay 1 | Funky synth bass. |
| 43 | 6.3 | Strings | 4 | No/Yes | 038 Strings<br>064 Str 2<br>038 Strings<br>064 Str 2 | Rev Hall | Large string section |
| 44 | 6.4 | Chamber | 2 | Yes/Yes | 039 Vn.Ens.<br>063 Str 1 | Rev Room | Small violin section |
| 45 | 6.5 | Syn Str | 4 | No/Yes | 042 Syn Str<br>063 Str 1<br>042 Syn Str<br>063 Str 1 | Rev Hall | Analog synth strings.<br>Switch on VECTOR PLAY LEVEL, turn VECTOR CONTROL for various strings voice color. |
| 46 | 6.6 | BoyChoir | 4 | No/Yes | 043 Choir<br>073 Vibes 4*<br>043 Choir<br>000 E.Piano1* | Rev Hall | Choir |
| 47 | 6.7 | Marimba | 2 | No/No | 047 Marimba<br>059 Bass 6 | Early Ref | Traditional marimba |

*EL = No. of elements.
*2 = Vector Yes/Yes
↑ ↑
LEVEL VECTOR DETUNE VECTOR

| No. | Voice Name | EL* | Vector*2 | Wave | Effect | Comments |
|---|---|---|---|---|---|---|
| 48 | 6.8 Bell Wah | 4 | Yes/No | 044 Itopia<br>143 SFX 1<br>043 Choir<br>071 Vibes 2 | Rev Hall | Percussive bell with comig up choir.<br>Best with long notes.<br>After-touch choir volume |
| 49 | 7.1 Inca | 4 | Yes/Yes | 070 Bottle<br>093 Lead 3<br>015 SynBrass<br>239 Wave23-2 | Pan Ref | |
| 50 | 7.2 Voyager | 4 | No/No | 044 Itopia<br>106 Sus.9<br>059 Bell Mix<br>056 Bass 3 | Rev Plate | Choir with "sizzle." Play long chords. |
| 51 | 7.3 Crystals | 4 | No/No | 068 Coin<br>073 Vibes 4<br>056 Harmonic<br>102 Sus. 5 | Rev Plate | |
| 52 | 7.4 VCO Sync | 4 | Yes/Yes | 036 SynBass1<br>058 Bass 5<br>106 Square 1<br>093 Lead 3 | Pan Ref | Fat analog synth lead voice.<br>After-touch vibrato. |
| 53 | 7.5 VCO Lead | 4 | Yes/Yes | 042 Syn Str<br>092 Lead 2<br>100 Digital4<br>097 Lead 7 | Delay 2 | Powerful synth lead voice.<br>After-touch vibrato. |
| 54 | 7.6 MiniLead | 2 | Yes/Yes | 108 Square 3<br>157 Square | Rev Club | Analog square lead voice.<br>After-touch vibrato. |
| 55 | 7.7 Groover | 2 | No/Yes | 036 SynBass1<br>062 Bass 9 | Gate Rev | Funky synth pad. |
| 56 | 7.8 Digicord | 2 | Yes/Yes | 101 Digital5<br>045 Clavi 4 | Rev Plate | Useful synth harpsichord voice for pad. |
| 57 | 8.1 SuperPad | 4 | Yes/Yes | 102 Saw 1<br>061 Bass 8<br>015 SynBrass<br>061 Bass 8 | Pan Ref | Powerful fat synth pad.<br>Use VECTOR CONTROL for various color of voice. |
| 58 | 8.2 Prophecy | 4 | Yes/Yes | 083 HornBody<br>121 Move 4<br>096 Pad wv<br>121 Move 4 | Rev Hall | Warm sweeping synth voice.<br>Best with long chords. |
| 59 | 8.3 Industry | 4 | Yes/Yes | 125 SEQ 7<br>104 Sus. 7<br>038 Strings<br>122 Move 5 | Rev Hall | Strings with sequence wave.<br>Best with long chords. |
| 60 | 8.4 Evolver | 4 | Yes/No | 056 Harmonic<br>054 Bass 1<br>038 Strings<br>118 Move 1 | Rev Hall | Dynamic moving voice.<br>Best with long notes. |
| 61 | 8.5 VectaEko | 4 | Yes/Yes | 113 Pulse 4<br>193 Wave8-1<br>111 Pulse 2<br>190 Wave7-1 | Rev Hall | Best with long notes. |
| 62 | 8.6 Zombie | 4 | Yes/Yes | 122 SEQ 4<br>144 SFX 2<br>123 SEQ 5<br>145 SFX 3 | Rev Hall | Sound effects voice.<br>Best with long notes. |
| 63 | 8.7 Rap Perc | 4 | No/Yes | 087 Reverse1<br>143 SFX 1<br>088 Reverse2<br>143 SFX 1 | Early Ref | Rap Percussion. |
| 64 | 8.8 Dr.Kit | 2 | No/No | 127 Drum set<br>000 E.Piano1* | Rev Plate | Drum set including sound effects. |

*EL = No. of elements.
*2 = Vector Yes/Yes
↑ ↑
LEVEL VECTOR DETUNE VECTOR

Voice number P88 provides a complete drum kit plus a range of valuable percussion sounds. The voice is set up so that each key on the keyboard produces a different drum sound, as shown in the list below. The Dr.Kit voice can be used on its own, or as a source of drums and percussion in a multi-play setup (REFERENCE section, page 59).

**Voice Number P88 Dr.Kit: Drum-set Voice**

| Key | Wave Name |
|---|---|
| C1 | BD 1 |
| C#1 | Triangle closed |
| D1 | SD 1 |
| D#1 | Triangle open |
| E1 | E.Tom 1 |
| F1 | E.Tom 2 |
| F#1 | E.Tom 3 |
| G1 | E.Tom 4 |
| G#1 | BD 2 |
| A1 | BD 3 |
| A#1 | Cross Sticks |
| B1 | Tom 1 |
| C2 | Tom 2 |
| C#2 | SD 2 |
| D2 | Tom 3 |
| D#2 | Rim |
| E2 | SD 3 |
| F2 | Tom 4 |
| F#2 | Claps |
| G2 | Cowbell 1 |
| G#2 | Shaker |
| A2 | HH closed |
| A#2 | Crash 1 |
| B2 | HH open |

| Key | Wave Name |
|---|---|
| C3 | Crash 2 |
| C#3 | Splash |
| D3 | Cup |
| D#3 | Ride |
| E3 | Low Conga |
| F3 | High Conga |
| F#3 | Mute Conga |
| G3 | DigiAtack |
| G#3 | Ooo! |
| A3 | Low Timbales |
| A#3 | High Timbales |
| B3 | Tambourine |
| C4 | Finger snaps |
| C#4 | Claves |
| D4 | Low Agogo |
| D#4 | High Agogo |
| E4 | Low Cuica |
| F4 | High Cuica |
| F#4 | Low Whistle |
| G4 | High Whistle |
| G#4 | Bamboo |
| A4 | Bottle |
| A#4 | Cowbell 2 |
| B4 | Crash |

| Key | Wave Name |
|---|---|
| C5 | SD 4 |
| C#5 | Low Scratch |
| D5 | SD 5 |
| D#5 | High Scratch |
| E5 | Reverse Cymbal |
| F5 | Slam 1 |
| F#5 | Coin |
| G5 | Slam 2 |
| G#5 | Water Drop |
| A5 | Low Timpani |
| A#5 | Cracker |
| B5 | High Timpani |
| C6 | Metal Hit |

Select the "Evolver" voice, turn the VECTOR PLAY mode ON, select level control, and use the [VECTOR CONTROL] to listen carefully to the sound of the various elements and how they interact when the [VECTOR CONTROL] is moved. Repeat this process with a number of different voices and you'll quickly begin to hear how powerful and versatile vector synthesis can be.

## Recording an Original Dynamic Vector

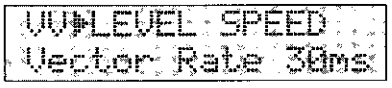
Before you begin recording your own dynamic vector, select the "Evolver" voice (P84), make sure the manual VECTOR PLAY mode is turned OFF (neither the [LEVEL] or [DETUNE] indicators should be lit), and play a nice long note or chord. Notice how the various elements are gradually brought in and blended automatically — this is the result of a dynamic vector. Now press the VECTOR PLAY [ON/OFF] key to turn the VECTOR PLAY mode ON, and select [LEVEL] control. Now set the [VECTOR CONTROL] to center position and play another note or chord. You should hear all 4 elements at the same time, in approximately equal proportions. Play with the [VECTOR CONTROL] a bit to get a feel for this particular combination of elements.

Now we'll go ahead and record an original dynamic level vector for the "Evolver" voice ...

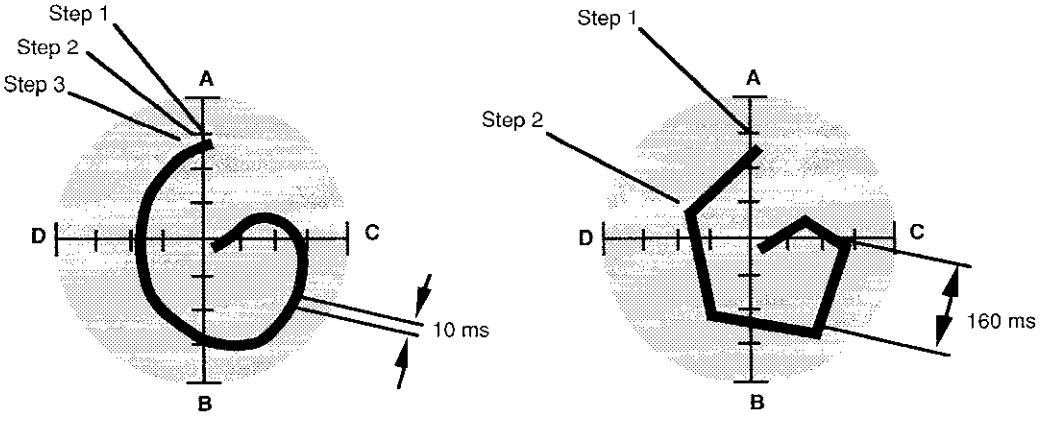
1. The first step is to enter the VOICE VECTOR edit mode, which we do by pressing the [EDIT/UTILITY] key and then the [VOICE VECTOR] key (REFERENCE SECTION, page 36).


Please note that although the display directs you to the "Edit or Utility" switches after pressing the [EDIT/UTILITY] key, this refers to the VOICE, ELEMENT, MULTI, and UTILITY key groups located at the upper right-hand corner of the control panel. Pressing the [EDIT/UTILITY] key a second time has no effect.

2. If the LEVEL SPEED function does not appear immediately when you enter the VOICE VECTOR edit mode, press the [VOICE VECTOR] key a few times until it does appear (REFERENCE SECTION, page 37).




Vectors are recorded by "sampling" the position of the [VECTOR CONTROL] at evenly-spaced steps. This function allows you to set the time between each sample step — i.e. the "Vector rate". Quite logically, short vector rates are best for quick control movements while longer vector rates are better for slow control movements. If you set the vector rate to too long a value for a rapid control movement, you may end up with a "jerky" sounding vector. The diagrams below show the same control movement recorded at 10-millisecond and 160-millisecond vector rates.




Move the cursor to the lower display line by pressing the [▷] cursor key, then use the [–1/NO] and [+1/YES] keys to set the vector rate parameter to "30ms." This is a fairly "average" vector rate, and is a good place to start experimenting with dynamic vectors.


Please note that the LEVEL SPEED parameter can also be used to change the playback speed of pre-recorded vectors.

3. Press the [VOICE VECTOR] key once to move ahead to the LEVEL REC display (REFERENCE SECTION, page 37).


Use the [◁] and [▷] cursor keys to move the cursor to the STBY (standby) parameter. At this point the [VECTOR CONTROL] will be active in the level control mode, and you can rehearse the level vector you are about to record.

4. Move the cursor to the REC parameter. Vector recording will begin the instant you play a note on the keyboard. A rectangular block will flash at the cursor position while recording. Recording will end automatically when the maximum of 50 sampling steps has been reached — how long this takes depends both on the vector rate setting and how fast you move the [VECTOR CONTROL]. When recording finishes, the cursor will move automatically to the PLAY parameter position. At the same time the VECTOR PLAY mode will automatically be turned OFF so that the dynamic vector just recorded is active.
Now you can play on the keyboard to hear how your dynamic level vector turned out. If you don't like the results, simply move the cursor back to REC and record again.

**Detune Vectors:** Although you've just recorded a dynamic level vector, dynamic detune vectors can be recorded in exactly the same way using the DETUNE SPEED and DETUNE REC functions which are also accessible in the VOICE VECTOR edit mode (REFERENCE SECTION, page 39).

5. When you're satisfied with your first vector masterpiece, you can return to the VOICE PLAY mode with the option of storing the voice you have just edited into one of the SY22's INTERNAL memory locations.
There is, however, a slight catch. If you simply go ahead and attempt to store the voice at this point the SY22 will inform you that the internal memory is protected with a "Memory Protected" display, preventing the store operation. If this happens, you'll have to press the [–1/NO] key to exit from the "Memory Protected" display. Both INTERNAL and CARD memory protect functions are automatically activated whenever the SY22 is turned on, to prevent accidental erasure of important voices.
To turn the memory protect function off, press the [UTILITY SETUP] key a few times until the MEM. PROTECT function appears (REFERENCE SECTION, page 73).


Move the cursor to the INT parameter and press the [–1/NO] or [+1/YES] key to turn the internal memory protection off.

6. Now press the [VOICE] key to return to the VOICE PLAY mode. Before actually returning you to the VOICE PLAY mode, however, the SY22 will ask you whether you want to store the voice you have just edited into one of the INTERNAL memory locations.


You can skip this step and go straight to the VOICE PLAY mode by pressing the [–1/NO] key, or you can press [+1/YES] to initiate the voice storage procedure.
If you press [+1/YES], a display similar to the following will appear:


The number of the voice you edited will be shown to the left of the lower display line, and the cursor will be placed to the right of the arrow. Select the memory location to which you want to store the new voice using the standard voice selection procedure.


When the target memory location has been selected, press the [▷] cursor key. "Are you sure?" will appear on the display.


Confirm your intention to store the new voice by pressing the [+1/YES] key, and the store operation will begin. ">>Completed!!<<" will appear on the display briefly when the store operation is finished, and the SY22 will return to the VOICE PLAY mode.

## The STORE Key

As we've just seen, the SY22 automatically gives you the option to store a voice you've just edited when you switch back to the VOICE play mode. You can also activate the store function to store the currently selected voice to a different INTERNAL or CARD memory location by pressing the [STORE] key while in the VOICE play mode. Likewise, the selected multi-play setup (REFERENCE section, page 59–61) can be stored to a different INTERNAL or CARD memory location by pressing the [STORE] key while in the MULTI play mode. In either case, the memory protect function for the memory to which you intend to store the voice or multi-play setup — INTERNAL or CARD — must first be turned OFF via the UTILITY mode MEMORY PROTECT function (REFERENCE section, page 73).

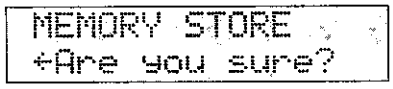
1. Turn the memory protect function for the INTERNAL or CARD memory off.

2. Select the VOICE or MULTI play mode, and select the voice or multi-play setup you want to store to a different memory location (P11 for this example).

3. Press the [STORE] key.


4. If necessary, select the destination memory by pressing the [INTERNAL] or [CARD] key, then enter the bank and number of the destination memory location (I36 for this example).


5. Press the PAGE [▷] key and the "Are you sure?" display will appear.




6. Press [+1/YES] to execute the store operation, or [–1/NO] to cancel. The store procedure can be exited at any time by pressing the [–1/NO] key.

## Conclusion

You now have a edited version of "Evolver" featuring your own original dynamic level vector. You could use the VOICE COMMON edit mode NAME function (REFERENCE SECTION, page 31) to give the voice a new name — "Evolver2" for example. Using the same procedure you could create an infinite range of variations on the preset voices.

The method of dynamic vector recording just described is quick and easy — all you have to do is operate the [VECTOR CONTROL] and use your ears. This quick-and-easy method is recommended for most applications. If you want really fine control, however, the SY22 offers a number of level and detune vector editing functions that allow the position and length of each vector step to be precisely programmed as required. See pages 37 through 40 of the REFERENCE SECTION for details.

# 4. INSTANT VOICE PROGRAMMING

Although the SY22 allows you to program voices in considerable detail, in this section we'll present a simple way to create an unlimited range of new and useful voices.

Detailed parameters for programming individual elements are available in the ELEMENT TONE and ELEMENT ENVELOPE edit modes described in the REFERENCE SECTION, beginning on pages 41 and 51, respectively. Everything we need to have loads of fun — and to create some very serious voices — is available in the VOICE COMMON edit mode.

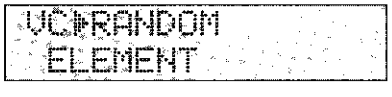
1. Select any preset voice while in the VOICE PLAY mode to serve as a "platform" for your new voice. "Evolver" (P84) is a good choice to start with.

2. Enter the VOICE COMMON edit mode by pressing the [EDIT/UTILITY] key and then the [VOICE COMMON] key (REFERENCE SECTION, page 30).


The VOICE COMMON edit mode provides access to the following functions, of which we're going to use just one!

NAME
CONFIGURATION
EFFECT TYPE
EFFECT DEPTH
PITCH BEND
WHEEL AMPLITUDE MODULATION
WHEEL PITCH MODULATION
AFTER TOUCH AMPLITUDE MODULATION
AFTER TOUCH PITCH MODULATION
AFTER TOUCH PITCH CONTROL
AFTER TOUCH LEVEL CONTROL
ENVELOPE ATTACK
ENVELOPE RELEASE
RANDOM ELEMENT
RANDOM LEVEL
RANDOM DETUNE

3. Press the [VOICE COMMON] key a few times until "RANDOM" appears on the top display line (REFERENCE SECTION, page 34). As long as the cursor is on the top display line next to the function name, it is also possible to scroll backward and forward through the function list by using the [–1/NO] and [+1/YES] key.



4. Use the [◁] and/or [▷] keys to move the cursor to the left-hand parameter on the lower display line (this will either be ELEMENT, LEVEL VEC, or DETUNE VEC) and, if necessary, select "ELEMENT" using the [–1/NO] and/or [+1/YES] keys.

5. Press the [▷] key once so that the cursor appears as a flashing block to the right of the "Y/N?" parameter.


6. Now, each time you press the [+1/YES] key the SY22 will randomly assign different waveforms to the four elements in what used to be the Fanfare voice.
   Try it a few times: press [+1/YES] then play on the keyboard to hear a totally new voice. Since the element combinations are generated randomly, some are not particularly useful ... but others will surprise you. Every few tries you'll probably come up with a combination which, if not ready to use without further modification, can be turned into a very fine voice with a little "brushing up" in the various SY22 editing modes.
   Please note that the RANDOM ELEMENT function *only* replaces the element waveforms and LFO settings in the voice you started with, so, unless you go into further programming, the voice you choose as your platform will determine how controllers like the pitch and modulation wheels function (REFERENCE SECTION, page 32), the shape of the amplitude envelopes used for each element (REFERENCE SECTION, page 53), the type of effect (reverb, delay, etc.) applied to the voice (REFERENCE SECTION, page 31), and more.

7. While trying out the new voices you create, you can turn the VECTOR PLAY mode ON and experiment manually with different vectors. You can also enter the VOICE VECTOR mode by pressing the [VOICE VECTOR] key and record a dynamic vector as described in the previous section.

8. If you come up with something you want to keep, use the same voice store procedure as described on page 22 when returning the the VOICE PLAY mode.

## Conclusion

You're now equipped to create a world of vibrant and very useful new voices with very little actual programming indeed. If you do want to get deep into the details and fine tune your voices until they are perfect, please take the time to read through the REFERENCE SECTION of this manual. In it, each editing function is described individually, often with a few helpful hints that will help you use it most effectively.

# REFERENCE SECTION

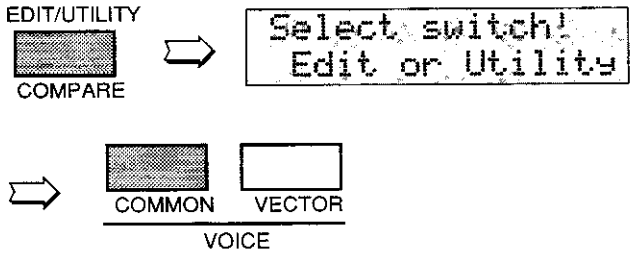
VOICE COMMON

# VOICE COMMON

The VOICE COMMON mode provides access to a range of parameters that affect the selected voice as a whole. Detailed programming of individual elements is provided by the ELEMENT TONE and ELEMENT ENVELOPE edit modes.

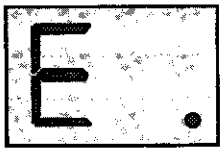
### Selecting the VOICE COMMON Edit Mode

From the VOICE or MULTI mode:




**From another edit or utility mode simply press [VOICE COMMON].**

An "E" will appear on the LED display, indicating that an edit mode has been selected. The dot to the right of the "E" will appear as soon as any parameter is edited.

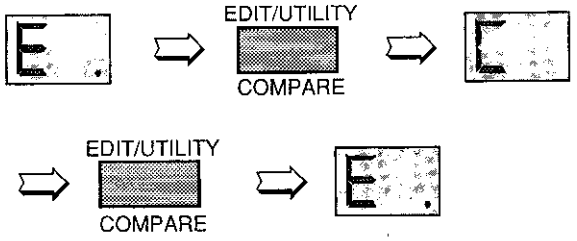


### Selecting the VOICE COMMON Edit Mode Functions

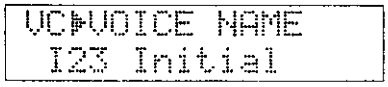
The various VOICE COMMON edit mode functions can be selected in sequence by pressing the [VOICE COMMON] key, or by using the [–1/NO] and [+1/YES] keys when the cursor (▷)is located immediately before the function name on the upper display line.

### The COMPARE Function

You can compare the sound of the edited voice with the sound of the voice before it was edited by pressing the [EDIT/COMPARE] key to activate the COMPARE function. A "C" will appear on the LED display while the COMPARE function is active, and the sound of the voice prior to editing will be heard when you play the keyboard. Press the [EDIT/COMPARE] key again to return to the edit mode.



# NAME




**Summary:** Assigns a name of up to 8 characters to the current voice.

**Settings:** The following characters are available for use in voice names:

(Space) !"#$%&'()*+,-./0123456789:;<=>?@
ABCDEFGHIJKLMNOPQRSTUVWXYZ[¥]^_`
abcdefghijklmnopqrstuvwxyz{|}→←

**Procedure:** Use the [◁] and [▷] cursor keys to place the underline cursor under the character to be changed. Use the [–1/NO] and [+1/YES] keys to select the desired character. Continue until the entire voice name has been programmed.

**Details:** It's a good idea to give your voices names that make them easily identifiable. If you've created a new voice that combines piano and organ elements, for example, you could call it something like "PianOrg".
When selecting characters, scrolling will pause at the beginning of each character group (capitals, lower case, numbers, and symbols).

**Refer to:** Tutorial, page 24.

# CONFIGURATION


**Summary:** Selects the two-element (A-B) or four-element (A-B-C-D) voice configuration.

**Settings:** A-B, A-B-C-D

**Procedure:** Use the [▷] key to move the cursor to the lower display line. Use the [–1/NO] and [+1/YES] keys to select the desired configuration.

**Details:** In the 2-element "A-B" configuration, element A is AWM and element B is FM. In the 4-element "A-B-C-D" configuration elements A and B are the same as in the "A-B" configuration, while element C is AWM and element D is FM.

**A-B:** A = AWM, B = FM.
**A-B-C-D:** A = AWM, B = FM, C = AWM, D = FM.

**Refer to:** Tutorial, page 14.

# EFFECT (Type & Depth)


**Summary:** Selects one of sixteen digital effects, and sets the depth of the selected effect for the current voice.

**Settings:** Effect type:

| | |
|---|---|
| Rev Hall | (Reverb Hall) |
| Rev Room | (Reverb Room) |
| Rev Plate | (Reverb Plate) |
| Rev Club | (Reverb Club) |
| Rev Metal | (Reverb Metal) |
| Delay 1 | (Short Single Delay) |
| Delay 2 | (Long Delay) |
| Delay 3 | (Long Delay) |
| Doubler | (Doubler) |
| Ping-Pong | (Ping Pong Delay) |
| Pan Ref | (Panned Reflections) |
| Early Ref | (Early Reflections) |
| Gate Rev | (Gated Reverb) |
| Dly&Rev 1 | (Delay & Reverb 1) |
| Dly&Rev 2 | (Delay & Reverb 2) |
| Dist&Rev | (Distortion & Reverb) |

**Depth:** 0 ... 7

**Procedure:** Use the [◁] and [▷] cursor keys to place the underline cursor under the effect type or depth parameter. Use the [–1/NO] and [+1/YES] keys to select the desired effect or effect depth.

**Details:** Setting the depth parameter to "0" is equivalent to turning the effect OFF. A depth setting of "7" produces the greatest effect.

**Refer to:** Tutorial, page 13, 16–19.

# PITCH BEND

```
VC▶PITCH BEND
 Range= 2
```

**Summary:** Sets the range of the pitch bend wheel.

**Settings:** 0 ... 12 max.*

**Procedure:** Use the [▷] key to move the cursor to the lower display line. Use the [–1/NO] and [+1/YES] keys to select the desired pitch bend range.

**Details:** Each increment from "0" to "12" represents a semitone. A setting of "0" produces no pitch bend. A setting of "12" allows a maximum pitch bend of plus or minus one octave, while a setting of "4" allows a maximum pitch bend of plus or minus a major third.

**Refer to:** Page 3.

* This range may be more limited in some cases. An exclamation mark (!) will appear after the range value when the limit is reached.

# WHEEL (Amplitude & Pitch Modulation)

```
VC▶WHEEL
 AM=on  PM=on
```

**Summary:** Assigns the modulation wheel to amplitude and/or pitch modulation.

**Settings:** AM (Amplitude Modulation): off, on
PM (Pitch Modulation): off, on

**Procedure:** Use the [◁] and [▷] cursor keys to place the underline cursor under the AM or PM parameter. Use the [–1/NO] and [+1/YES] keys to turn the selected parameter on or off.

**Details:** Amplitude modulation produces a *tremolo* effect while pitch modulation produced a *vibrato* effect. This function allows the modulation wheel to be assigned to produce either or both. This is only an "off/on" switch, however, and the maximum depth of modulation to be applied must be set using the LFO AM Depth and PM Depth parameters in the ELEMENT TONE edit mode.
When the modulation wheel is assigned to amplitude or pitch modulation, LFO modulation can *only* be applied via the wheel.
If both WHEEL and AFTER TOUCH are assigned to modulation control, the controller via which the highest modulation level is applied will take priority when both are used simultaneously.

**Refer to:** Page 3.

# AFTER TOUCH (Amplitude & Pitch Modulation, Pitch & Level Control)


**Summary:** Assigns keyboard after-touch to amplitude modulation, pitch modulation, pitch control, or level control — or any combination of the above.

**Settings:** AM (Amplitude Modulation): off, on
PM (Pitch Modulation): off, on
Pit (Pitch Control): –12 ... 0 ... +12 max.*
Lev (Level Control): off, on

**Procedure:** Use the [◁] and [▷] cursor keys to place the underline cursor under the AM, PM, Pit, or Lev parameter. The arrows at either end of the display mean that more parameters can be accessed by scrolling in the indicated direction. Use the [–1/NO] and [+1/YES] keys to turn the AM, PM, and/or Lev parameter on or off, or to select the desired Pit control range.

**Details:** As with the modulation wheel, amplitude modulation produces a *tremolo* effect while pitch modulation produced a *vibrato* effect. The harder you press a key, the deeper the modulation. This is only an "off/on" switch, however, and the maximum depth of modulation to be applied must be set using the LFO AM Depth and PM Depth parameters in the ELEMENT TONE edit mode.

When after touch is assigned to amplitude or pitch modulation, LFO modulation can *only* be applied via after touch.

The Pit parameter allows keyboard after touch to be used for note bending. The greater the key pressure the greater the amount of pitch bend. Positive values produce an upward bend when key pressure is applied, and minus values produce a downward bend. Each increment from represents a semitone. A setting of "0" produces no pitch bend. A setting of "12" allows a maximum upward pitch bend of one octave, while a setting of "–4" allows a maximum downward pitch bend of a major third.

When the Lev parameter is turned on it becomes possible to control the level of the sound over a limited range by keyboard after touch. The amount and direction (i.e. an increase or decrease) of level change depends on the setting of the AFTER TOUCH SENSITIVITY parameter in the ELEMENT TONE edit mode.

If both WHEEL and AFTER TOUCH are assigned to modulation control, the controller via which the highest modulation level is applied will take priority when both are used simultaneously.

* This range may be more limited in some cases. An exclamation mark (!) will appear after the range value when the limit is reached.

# ENVELOPE (Attack & Release Rates)

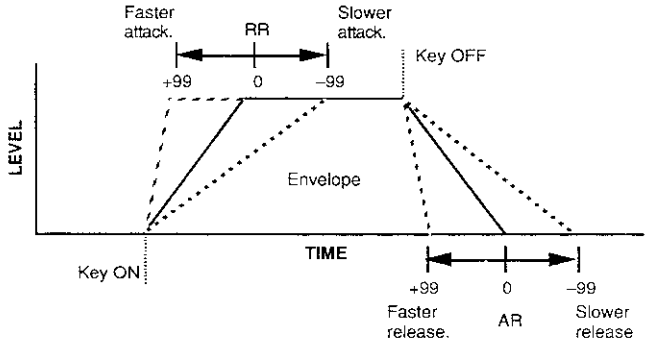

**Summary:** Sets the overall attack and release rates for the current voice.

**Settings:** AR (Attack Rate): –99 ... 0 ... +99 max.*
RR (Release Rate): –99 ... 0 ... +99 max.*

**Procedure:** Use the [◁] and [▷] cursor keys to place the underline cursor under the AR or RR parameter. Use the [–1/NO] and [+1/YES] keys to set the selected parameter as required.

**Details:** Although much more detailed envelope programming capability is available for individual elements (see the ELEMENT ENVELOPE edit mode), these functions provide an easy way to adjust the most important envelope parameters for the overall voice. Positive values produce a faster attack or release time, while negative values produce a slower attack or release time. You might want to lengthen the release time of a voice, for example, to produce a lingering sustain effect after you release the keys.

Please note that the AR parameter will have no effect on elements in which the INITIAL LEVEL parameter (page 54) is set to 99.




**Refer to:** ELEMENT ENVELOPE section page 53–57.

* This range may be more limited in some cases. An exclamation mark (!) will appear after the range value when the limit is reached.

# RANDOM (Element, Level & Detune)

```
VCE▶RANDOM
  ELEMENT
```

**Summary:** Automatically produces random combinations of elements, level vectors, or detune vectors.

**Settings:** None.

**Procedure:** Use the [◁] and [▷] cursor keys to place the underline cursor under the left parameter on the lower display line, then use the [–1/NO] and [+1/YES] keys to select ELEMENT, LEVEL or DETUNE. Press the [▷] to move the cursor to "Y/N," then press the [+1/YES] key to generate random values of the select type. A new set of random values is generated each time the [+1/YES] key is pressed while the cursor is in this position. Pressing the [–1/NO] returns the cursor to the left parameter.

**Details:** This function is actually a very useful programming aid. It allows you try out a virtually unlimited variety of element combinations or level/detune vectors by simply pressing a single key. The random element combinations, in particular, can produce some very surprising and often pleasant results.

When the "A-B" voice configuration is selected (see CONFIGURATION on page 31), random element combinations will always consist of only two elements. When the "A-B-C-D" voice configuration is selected, random element generation will produce combinations of four elements.

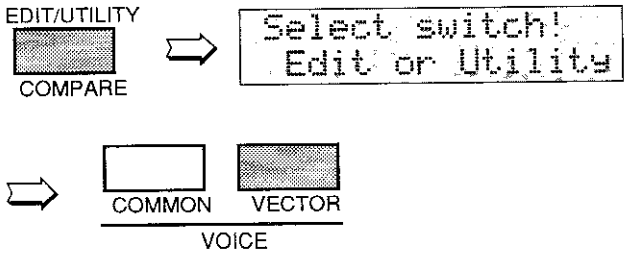
**Refer to:** Tutorial, page 25.

# VOICE VECTOR

The VOICE VECTOR edit mode allows recording and fine editing of dynamic level and detune vectors.

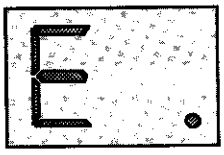
### Selecting the VOICE VECTOR Edit Mode

From the VOICE or MULTI mode:




From another edit or utility mode simply press [VOICE VECTOR].

An "E" will appear on the LED display, indicating that an edit mode has been selected. The dot to the right of the "E" will appear as soon as any parameter is edited.

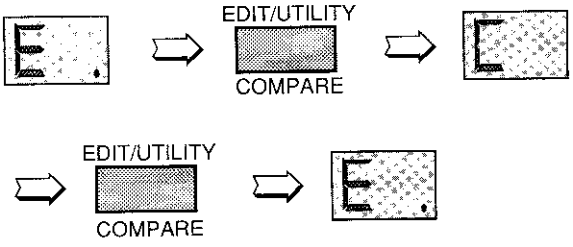


### Selecting the VOICE VECTOR Edit Mode Functions

The various VOICE VECTOR edit mode functions can be selected in sequence by pressing the [VOICE VECTOR] key, or by using the [–1/NO] and [+1/YES] keys when the cursor (▷)is located immediately before the function name on the upper display line.

### The COMPARE Function

You can compare the sound of the edited voice with the sound of the voice before it was edited by pressing the [EDIT/COMPARE] key to activate the COMPARE function. A "C" will appear on the LED display while the COMPARE function is active, and the sound of the voice prior to editing will be heard when you play the keyboard. Press the [EDIT/COMPARE] key again to return to the edit mode.



# LEVEL SPEED (Vector Rate)


**Summary:** Sets the time between level vector steps.

**Settings:** 10 ... 160 milliseconds (in 10-millisecond steps)

**Procedure:** Use the [▷] key to move the cursor to the lower display line. Use the [–1/NO] and [+1/YES] keys to select the desired vector rate.

**Details:** Each dynamic vector is composed of up to 50 "steps" corresponding to points along the path followed by the vector control. This function sets the initial time between each step. The Time parameter in the LEVEL EDIT function, described later, allows the length of individual steps to be edited. The vector rate parameter can be changed even after recording a vector, producing a corresponding change in the spacing between the steps.
The LEVEL SPEED parameter can also be used to change the playback speed of a pre-recorded vector.

**Refer to:** Tutorial, page 21.

# LEVEL RECORD


**Summary:** Allows recording of a dynamic level vector.

**Settings:** STBY, REC, PLAY

**Procedure:** Use the [◁] and [▷] cursor keys to place the underline cursor under STBY. The vector control LEVEL mode will be automatically selected and you can rehearse the vector sweep you wish to record.
Move the cursor to REC. Recording will actually begin as soon as you play a key on the keyboard. When you release the key or when 50 steps have been recorded (See "LEVEL SPEED" above), recording will end and the cursor will move to the PLAY position. You can now play the keyboard to hear how the vector sweep you just recorded sounds.

**Details:** The amount of time available for recording depends both on the vector rate setting and how much the vector control is moved.

**Refer to:** Tutorial, page 22.

# LEVEL EDIT (Step, X-axis, Y-axis & Time)

● ***Step***


**Summary:** Selects any of the 50 steps in a recorded level vector for editing.

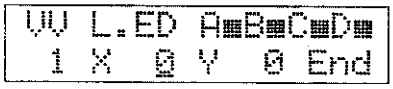
**Settings:** 1 ... 50

**Procedure:** Use the [◁] and [▷] cursor keys to place the underline cursor under the leftmost value on the lower display line (Step). Use the [–1/NO] and [+1/YES] keys to select the step to be edited.

**Details:** Step 1 is the first step recorded and step 50 is the last. Experience will give you a feel for relating specific points in a dynamic vector to the corresponding steps.

**Refer to:** Tutorial, page 21–24.

● *X-axis & Y-axis*

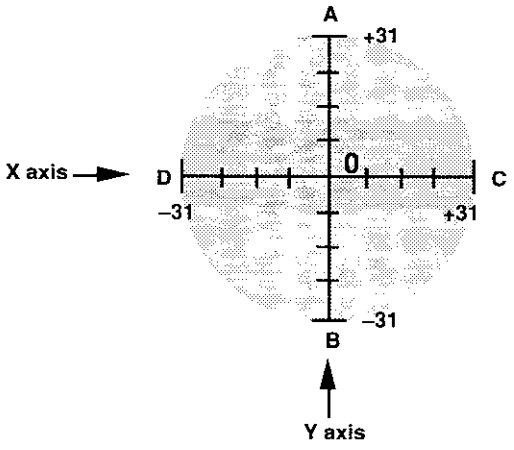



**Summary:** These parameters define the position of the currently selected step on the X and Y axes of the level vector control range.

**Settings:** –31 ... 0 ... +31

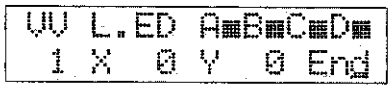
**Procedure:** After selecting the step to be recorded as described in the previous function, use the [◁] and [▷] cursor keys to place the underline cursor under the X or Y parameter. Use the [–1/NO] and [+1/YES] keys to set the value as required.

**Details:** On the X (D-C) axis, a setting of –31 places the step as far as possible toward the D element while a setting of +31 places it as far as possible toward the C element. The Y (A-B) axis values work in the same way: a setting of –31 places the step as far as possible toward the B element while a setting of +31 places it as far as possible toward the A element. In both axes a setting of 0 places the step at center position.




**Refer to:** Tutorial, page 21–24.

● *Time*




**Summary:** Multiplies the vector rate setting of the current level vector step only. Also allows vectors to be looped or ended at the current step.

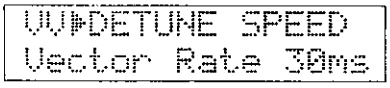
**Settings:** 1 ... 254, Repeat, End

**Procedure:** Use the [◁] and [▷] cursor keys to place the underline cursor under the rightmost value on the lower display line (Time). Use the [–1/NO] and [+1/YES] keys to select the required time value, repeat, or end.

**Details:** Time values multiply the vector rate setting for the current step. If the vector rate parameter is set to 30ms, for example, setting the time parameter to 2 results in a step length of 60ms, setting it to 3 results in a step length of 90ms, and so on. Since the maximum time value is 254, extremely long steps can be created.
If you select the "End" setting, the vector will end at the current step.
The "Repeat" setting causes the vector to loop back to the first step from the current step, repeating continuously.

**Refer to:** Tutorial, page 21–24.

# DETUNE SPEED (Vector rate)




**Summary:** Sets the time between detune vector steps.

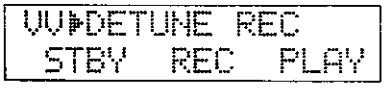
**Settings:** 10 ... 160 milliseconds

**Procedure:** Use the [▷] key to move the cursor to the lower display line. Use the [–1/NO] and [+1/YES] keys to select the desired vector rate.

**Details:** Each automatic vector sweep is composed of up to 50 "steps," corresponding to equally-spaced points along the path followed by the vector control. This function sets the initial time between each step.

**Refer to:** Tutorial, page 22.

# DETUNE RECORD




**Summary:** Allows recording of a dynamic detune vector.

**Settings:** STBY, REC, PLAY

**Procedure:** Use the [◁] and [▷] cursor keys to place the underline cursor under STBY. The vector control DETUNE mode will be automatically selected and you can rehearse the vector sweep you wish to record.
Move the cursor to REC. Recording will actually begin as soon as you play a key on the key board. When you release the key or when all 50 steps have been recorded (See "DETUNE SPEED" above), recording will end and the cursor will move to the PLAY position. You can now play the keyboard to hear how the vector sweep you just recorded sounds.

**Details:** The amount of time available for recording depends both on the vector rate setting and how much the vector control is moved.
Moving the vector control towards an element raises the pitch of that element while lowering the pitch of the others.

**Refer to:** Tutorial, page 22.

# DETUNE EDIT (Step, X-axis, Y-axis & Time)

● ***Step***


**Summary:** Selects any of the 50 steps in a recorded detune vector for editing.

**Settings:** 1 ... 50

**Procedure:** Use the [◁] and [▷] cursor keys to place the underline cursor under the leftmost value on the lower display line (Step). Use the [–1/NO] and [+1/YES] keys to select the step to be edited.

**Details:** Step 1 is the first step recorded and step 50 is the last. Experience will give you a feel for relating specific points in a dynamic vector to the corresponding steps.

**Refer to:** Tutorial, page 21–24.

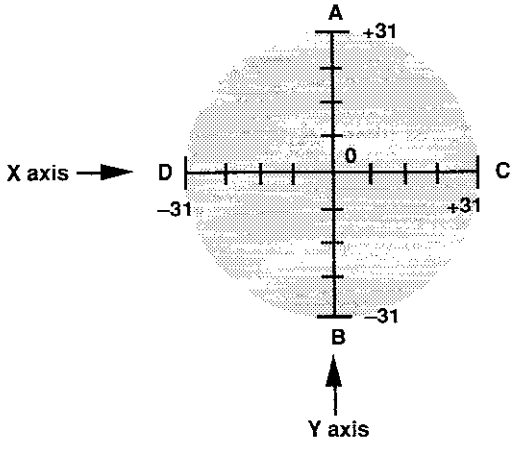
● *X-axis & Y-axis*


**Summary:** These parameters define the position of the currently selected step on the X and Y axes of the detune vector control range.

**Settings:** –31 ... 0 ... +31

**Procedure:** Use the [◁] and [▷] cursor keys to place the underline cursor under the X or Y parameter. Use the [–1/NO] and [+1/YES] keys to set the value as required.

**Details:** On the X (D-C) axis, a setting of –31 places the step as far as possible toward the D element while a setting of +31 places it as far as possible toward the C element. The Y (A-B) axis values work in the same way: a setting of –31 places the step as far as possible toward the B element while a setting of +31 places it as far as possible toward the A element. In both axes a setting of 0 places the step at center position.




**Refer to:** Tutorial, page 21–24.

● *Time*


**Summary:** Multiplies the vector rate setting of the current detune vector step only. Also allows vectors to be looped or ended at the current step.

**Settings:** 1 ... 254, Repeat, End

**Procedure:** Use the [◁] and [▷] cursor keys to place the underline cursor under the rightmost value on the lower display line (Time). Use the [–1/NO] and [+1/YES] keys to select the required time value.

**Details:** Time values multiply the vector rate setting for the current step. If the vector rate parameter is set to 30ms, for example, setting the time parameter to 2 results in a step length of 60ms, setting it to 3 results in a step length of 90ms, and so on. Since the maximum time value is 254, extremely long steps can be created.
If you select the "End" setting, the vector will end at the current step.
The "Repeat" setting causes the vector to loop back to the first step from the current step, repeating continuously.

**Refer to:** Tutorial, page 21–24.

# ELEMENT TONE

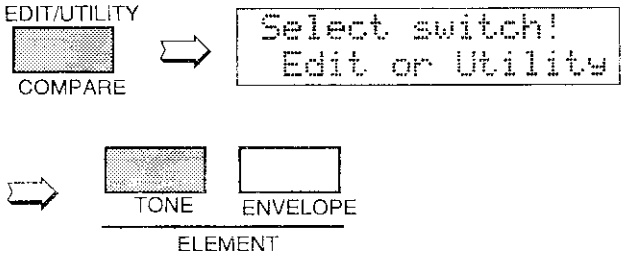
The ELEMENT TONE edit mode allows editing many of the most important sound-determining parameters of each individual element — A and B in a 2-element voice; A, B, C and D in a 4-element voice.



* These four parameters are not available for an AWM element in which wave number 127 (Drum Set) is selected — "Cannot edit" display appears.

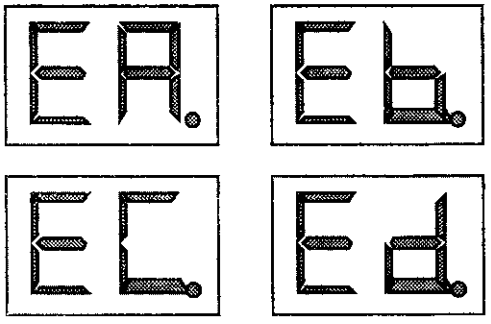
### Selecting the ELEMENT TONE Edit Mode

From the VOICE or MULTI mode:



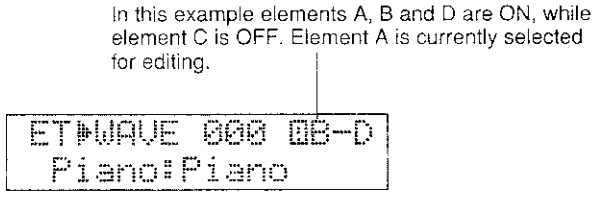

From another edit or utility mode simply press [ELEMENT TONE].

An "E" will appear to the left of the LED display to indicate that an edit mode is selected, and the element selected for editing will be displayed to the right of the display — "A", "b", "C", or "d". A dot will appear to the right of the element character as soon as any parameter has been edited.



Different elements can be selected for editing by pressing the appropriate [ELEMENT SELECT] key — [A], [B], [C] or [D]. If a 2-element voice is being edited, only elements A and B can be selected.

Any of the available elements can also be turned on or off by pressing the appropriate [ELEMENT ON/OFF] key. Each key alternately turns the associated element on and off, and the on/off status of the elements is shown to the right of the upper LCD line. If the element character is showing, the associated element is ON, if a dash appears in place of the element character, that element is OFF. The ability to turn elements on or off while editing makes it easier to hear the effect of parameter changes on a single element. The currently selected element is also shown on the LCD as a reversed (white on black) character.

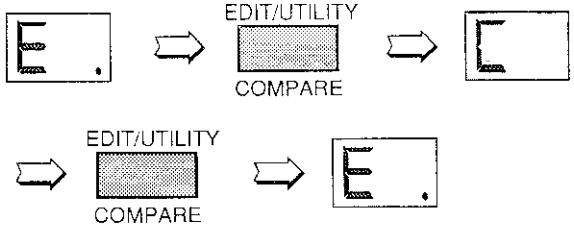



### Selecting the ELEMENT TONE Edit Mode Functions

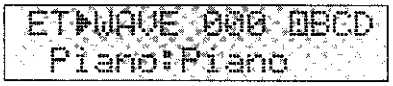
The various ELEMENT TONE edit mode functions can be selected in sequence by pressing the [ELEMENT TONE] key, or by using the [–1/NO] and [+1/YES] keys when the cursor (▷)is located immediately before the function name on the upper display line.

### The COMPARE Function

You can compare the sound of the edited voice with the sound of the voice before it was edited by pressing the [EDIT/COMPARE] key to activate the COMPARE function. A "C" will appear on the LED display while the COMPARE function is active, and the sound of the voice prior to editing will be heard when you play the keyboard. Press the [EDIT/COMPARE] key again to return to the edit mode.



# WAVE TYPE




**Summary:** Assigns a preset wave to the selected element.

**Settings:** Elements A and C (AWM): 0 ... 127
Elements B and D (FM): 0 ... 255

**Procedure:** Use the [◁] and [▷] cursor keys to place the underline cursor under the left parameter on the lower display line to directly select the different wave categories, or under the right parameter to select individual waves. Use the [–1/NO] and [+1/YES] keys to select the desired wave (refer to the wave list, below).

**Details:** The number of waves available depends on whether the currently selected element is an AWM element (A or C) or an FM element (C or D). The SY22 has 128 preset AWM waves (0 ... 127) and 256 preset FM waves (0 ... 255).

**AWM WAVEFORM LIST**

| Category | No. | Name | Category | No. | Name | Category | No. | Name | Category | No. | Name |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Piano | 0 | Piano | Bass | 32 | E.Bass 3 | Synth | 64 | Oh Hit | OSC | 96 | Pad wv |
| | 1 | E.piano | | 33 | E.Bass 4 | SFX | 65 | Water 1 | | 97 | Digital1 |
| | 2 | Clavi | | 34 | Slap | | 66 | Water 2 | | 98 | Digital2 |
| | 3 | Cembalo | | 35 | Fretless | | 67 | Stream | | 99 | Digital3 |
| | 4 | Celesta | | 36 | SynBass1 | | 68 | Coin | | 100 | Digital4 |
| Organ | 5 | P.organ | | 37 | SynBass2 | | 69 | Crash | | 101 | Digital5 |
| | 6 | E.organ1 | Str. | 38 | Strings | | 70 | Bottle | | 102 | Saw 1 |
| | 7 | E.organ2 | | 39 | Vn.Ens. | | 71 | Tear | | 103 | Saw 2 |
| | 8 | Reed | | 40 | Cello | | 72 | Cracker | | 104 | Saw 3 |
| Brass | 9 | Trumpet | | 41 | Pizz. | | 73 | Scratch | | 105 | Saw 4 |
| | 10 | Mute Trp | | 42 | Syn Str | Hits | 74 | Metal 1 | | 106 | Square 1 |
| | 11 | Trombone | Vocal | 43 | Choir | | 75 | Metal 2 | | 107 | Square 2 |
| | 12 | Flugel | | 44 | Itopia | | 76 | Metal 3 | | 108 | Square 3 |
| | 13 | Fr Horn | | 45 | Ooo! | | 77 | Metal 4 | | 109 | Square 4 |
| | 14 | BrasAtak | Perc. | 46 | Vibes | | 78 | Wood | | 110 | Pulse 1 |
| | 15 | SynBrass | | 47 | Marimba | | 79 | Bamboo | | 111 | Pulse 2 |
| Wood | 16 | Flute | | 48 | Bells | | 80 | Slam | | 112 | Pulse 3 |
| | 17 | Clarinet | | 49 | Timpani | Tran. | 81 | Tp. Body | | 113 | Pulse 4 |
| | 18 | Oboe | | 50 | Tom | | 82 | Tb. Body | | 114 | Pulse 5 |
| | 19 | Sax | | 51 | E. Tom | | 83 | HornBody | | 115 | Pulse 6 |
| Gtr | 20 | Gut | | 52 | Cuica | | 84 | Fl. Body | | 116 | Tri |
| | 21 | Steel | | 53 | Whistle | | 85 | Str.Body | | 117 | Sin8' |
| | 22 | E.Gtr 1 | | 54 | Claps | | 86 | AirBlown | | 118 | Sin8'+4' |
| | 23 | E.Gtr 2 | Synth | 55 | Hit | | 87 | Reverse1 | SEQ | 119 | SEQ 1 |
| | 24 | Mute Gtr | | 56 | Harmonic | | 88 | Reverse2 | | 120 | SEQ 2 |
| | 25 | Sitar | | 57 | Mix | | 89 | Reverse3 | | 121 | SEQ 3 |
| | 26 | Pluck 1 | | 58 | Sync | OSC | 90 | EP wv | | 122 | SEQ 4 |
| | 27 | Pluck 2 | | 59 | Bell Mix | | 91 | Organ wv | | 123 | SEQ 5 |
| Bass | 28 | Wood B 1 | | 60 | Styroll | | 92 | M.Tp wv | | 124 | SEQ 6 |
| | 29 | Wood B 2 | | 61 | DigiAtak | | 93 | Gtr wv | | 125 | SEQ 7 |
| | 30 | E.Bass 1 | | 62 | Noise 1 | | 94 | Str wv 1 | | 126 | SEQ 8 |
| | 31 | E.Bass 2 | | 63 | Noise 2 | | 95 | Str wv 2 | Drum | 127 | Drum set |

**AWM Waveform Category Descriptions**

| | |
|---|---|
| Piano | Piano, clavi, and other decay-type keyboard sounds. |
| Organ | Pipe, electric and reed organs. |
| Brass | Acoustic and synthesized brass sounds. |
| Wood | Flute, sax and other woodwind sounds. |
| Gtr | Acoustic and electric guitars. |
| Bass | Acoustic, electric, and synth bass. |
| Str. | Violin ensemble and other strings. |
| Vocal | Choir and other vocal-type sounds. |
| Perc. | Vibes, tympani, etc. |
| Synth | A range of synth sounds (including noise). |
| SFX | Special effects – water, bottles, etc. |
| Hits | Struck metal and woods. |
| Tran. | Transient attack waves and some reverse sounds. |
| OSC | Standard synth waveforms and the basic waveforms from some actual instruments. |
| SEQ | Sequences of sampled sounds. |
| Drum | Drum set waves. |

**FM VOICE LIST**

| Category | No. | Name |
|---|---|---|
| Piano | 0 | E.Piano1 |
| | 1 | E.Piano2 |
| | 2 | E.Piano3 |
| | 3 | E.Piano4 |
| | 4 | E.Piano5 |
| | 5 | E.Piano6 |
| Organ | 6 | E.organ1 |
| | 7 | E.organ2 |
| | 8 | E.organ3 |
| | 9 | E.organ4 |
| | 10 | E.organ5 |
| | 11 | E.organ6 |
| | 12 | E.organ7 |
| | 13 | E.organ8 |
| Brass | 14 | Brass 1 |
| | 15 | Brass 2 |
| | 16 | Brass 3 |
| | 17 | Brass 4 |
| | 18 | Brass 5 |
| | 19 | Brass 6 |
| | 20 | Brass 7 |
| | 21 | Brass 8 |
| | 22 | Brass 9 |
| | 23 | Brass 10 |
| | 24 | Brass 11 |
| | 25 | Brass 12 |
| | 26 | Brass 13 |
| | 27 | Brass 14 |
| Wood | 28 | Wood 1 |
| | 29 | Wood 2 |
| | 30 | Wood 3 |
| | 31 | Wood 4 |
| | 32 | Wood 5 |
| | 33 | Wood 6 |
| | 34 | Wood 7 |
| | 35 | Wood 8 |
| Reed | 36 | Reed 1 |
| | 37 | Reed 2 |
| | 38 | Reed 3 |
| | 39 | Reed 4 |
| | 40 | Reed 5 |
| | 41 | Reed 6 |
| Pluck | 42 | Clavi 1 |
| | 43 | Clavi 2 |
| | 44 | Clavi 3 |
| | 45 | Clavi 4 |
| | 46 | Guitar 1 |
| | 47 | Guitar 2 |
| | 48 | Guitar 3 |
| Pluck | 49 | Guitar 4 |
| | 50 | Guitar 5 |
| | 51 | Guitar 6 |
| | 52 | Guitar 7 |
| | 53 | Guitar 8 |
| Bass | 54 | Bass 1 |
| | 55 | Bass 2 |
| | 56 | Bass 3 |
| | 57 | Bass 4 |
| | 58 | Bass 5 |
| | 59 | Bass 6 |
| | 60 | Bass 7 |
| | 61 | Bass 8 |
| | 62 | Bass 9 |
| Str. | 63 | Str 1 |
| | 64 | Str 2 |
| | 65 | Str 3 |
| | 66 | Str 4 |
| | 67 | Str 5 |
| | 68 | Str 6 |
| | 69 | Str 7 |
| Perc. | 70 | Vibes 1 |
| | 71 | Vibes 2 |
| | 72 | Vibes 3 |
| | 73 | Vibes 4 |
| | 74 | Marimba1 |
| | 75 | Marimba2 |
| | 76 | Marimba3 |
| | 77 | Bells 1 |
| | 78 | Bells 2 |
| | 79 | Bells 3 |
| | 80 | Bells 4 |
| | 81 | Bells 5 |
| | 82 | Bells 6 |
| | 83 | Bells 7 |
| | 84 | Bells 8 |
| | 85 | Metal 1 |
| | 86 | Metal 2 |
| | 87 | Metal 3 |
| | 88 | Metal 4 |
| | 89 | Metal 5 |
| | 90 | Metal 6 |
| Syn.S | 91 | Lead 1 |
| | 92 | Lead 2 |
| | 93 | Lead 3 |
| | 94 | Lead 4 |
| | 95 | Lead 5 |
| | 96 | Lead 6 |
| | 97 | Lead 7 |
| Syn.S | 98 | Sus. 1 |
| | 99 | Sus. 2 |
| | 100 | Sus. 3 |
| | 101 | Sus. 4 |
| | 102 | Sus. 5 |
| | 103 | Sus. 6 |
| | 104 | Sus. 7 |
| | 105 | Sus. 8 |
| | 106 | Sus. 9 |
| | 107 | Sus. 10 |
| | 108 | Sus. 11 |
| | 109 | Sus. 12 |
| | 110 | Sus. 13 |
| | 111 | Sus. 14 |
| | 112 | Sus. 15 |
| | 113 | Attack 1 |
| | 114 | Attack 2 |
| | 115 | Attack 3 |
| | 116 | Attack 4 |
| | 117 | Attack 5 |
| Syn.M | 118 | Move 1 |
| | 119 | Move 2 |
| | 120 | Move 3 |
| | 121 | Move 4 |
| | 122 | Move 5 |
| | 123 | Move 6 |
| | 124 | Move 7 |
| Syn.D | 125 | Decay 1 |
| | 126 | Decay 2 |
| | 127 | Decay 3 |
| | 128 | Decay 4 |
| | 129 | Decay 5 |
| | 130 | Decay 6 |
| | 131 | Decay 7 |
| | 132 | Decay 8 |
| | 133 | Decay 9 |
| | 134 | Decay 10 |
| | 135 | Decay 11 |
| | 136 | Decay 12 |
| | 137 | Decay 13 |
| | 138 | Decay 14 |
| | 139 | Decay 15 |
| | 140 | Decay 16 |
| | 141 | Decay 17 |
| | 142 | Decay 18 |
| SFX | 143 | SFX 1 |
| | 144 | SFX 2 |
| | 145 | SFX 3 |
| | 146 | SFX 4 |
| SFX | 147 | SFX 5 |
| | 148 | SFX 6 |
| | 149 | SFX 7 |
| OSC 1 | 150 | Sin 16' |
| | 151 | Sin 8' |
| | 152 | Sin 4' |
| | 153 | Sin2 2/3 |
| | 154 | Sin 2' |
| | 155 | Saw 1 |
| | 156 | Saw 2 |
| | 157 | Square |
| | 158 | LFOnoise |
| | 159 | Noise 1 |
| | 160 | Noise 2 |
| | 161 | Digi 1 |
| | 162 | Digi 2 |
| | 163 | Digi 3 |
| | 164 | Digi 4 |
| | 165 | Digi 5 |
| | 166 | Digi 6 |
| | 167 | Digi 7 |
| | 168 | Digi 8 |
| | 169 | Digi 9 |
| | 170 | Digi 10 |
| | 171 | Digi 11 |
| OSC 2 | 172 | wave1-1 |
| | 173 | wave1-2 |
| | 174 | wave1-3 |
| | 175 | wave2-1 |
| | 176 | wave2-2 |
| | 177 | wave2-3 |
| | : | : |
| | 220 | wave17-1 |
| | 221 | wave17-2 |
| | 222 | wave17-3 |
| OSC 3 | 223 | wave18-1 |
| | 224 | wave18-2 |
| | 225 | wave18-3 |
| | : | : |
| | 250 | wave27-1 |
| | 251 | wave27-2 |
| | 252 | wave27-3 |
| | 253 | wave28 |
| | 254 | wave29 |
| | 255 | wave30 |

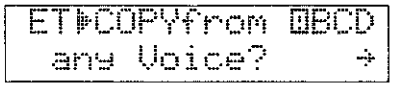
**FM Voice Category Descriptions**

| | |
|---|---|
| Piano | Electric pianos. |
| Organ | Electric organs. |
| Brass | A variety of brass sounds. |
| Wood | Woodwind instrument sounds. |
| Reed | Sax, oboe and other reed instruments. |
| Pluck | Guitar, clavi, and other plucked instrument sounds. |
| Bass | Bass sounds. |
| Str. | Strings. |
| Perc. | Vibes, marimba, bells and other percussion sounds. |
| Syn.S | Sustained lead synth sounds. |
| Syn.M | Synth sounds that vary with time. |
| Syn.D | Decay-type synth sounds. |
| SFX | A range of sound-effect type synth sounds. |
| OSC1 | Sine, sawtooth, and other standard synth waveforms. |
| OSC2 | Basic FM timbres, group 1. |
| OSC3 | Basic FM timbres, group 2. |

If the TYPE parameter in the ELEMENT ENVELOPE edit mode (page 53) is set to PRESET, selecting a WAVE TYPE also selects the corresponding preset envelope. If a different envelope type is selected, the preset envelope is *not* selected together with the wave.

**Refer to:** Tutorial, page 14, 16–19.

# ELEMENT COPY




**Summary:** Copies all element parameters from an element of the same type (AWM or FM) in another voice to the current element of the current voice.

**Settings:** Source: I, C, P
Bank: 1 ... 8
Number: 1 ... 8
Element: A/C or B/D

**Procedure:** Use the [◁] and [▷] cursor keys to move the cursor to the source, bank, or number of the source voice (the voice from which the element parameters are to be copied) to the left of the lower display line. Use the [–1/NO] and [+1/YES] keys to set the selected parameter as necessary.
Next move the cursor to the element type parameter to the right of the lower display line, and select the element from which the data is to be copied using the [–1/NO] and [+1/YES] keys.
Press the [▷] cursor key one more time and the "Are you sure?" display will appear. Press [+1/YES] to execute the element copy operation or [–1/NO] to cancel. ">>Completed!!<<" will appear briefly when the copy operation has finished.

**Details:** In this display the source, bank and number parameters are shown in the standard SY22 voice number format. "P12," for example, is preset bank 1, number 2; "I35" is internal bank 3, number 5, etc.
Data can only be copied between elements of the same type. If the element currently being edited is an AWM element (A or C), only element A or C of the source voice can be copied from. the same applies to FM elements.
The data for all parameters contained in the ELEMENT TONE mode will be copied.

# FREQUENCY SHIFT


**Summary:** Shifts the frequency (pitch) of the selected element up or down in semitone steps.

**Settings:** –12 ... 0 ... +12.

**Procedure:** Use the [▷] key to move the cursor to the lower display line. Use the [–1/NO] and [+1/YES] keys to select the desired amount of frequency shift.

**Details:** A setting of "–12," for example, shifts the pitch of the selected element down by one octave; a setting of "+4" shifts the pitch up by a major third.
The Frequency Shift function can be used to transpose an element to its most useful range, or to create harmony (intervals) between different elements.

# VOLUME

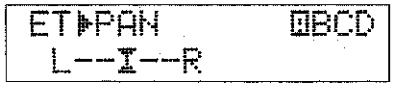

**Summary:** Adjusts the volume of the selected element.

**Settings:** 0 ... 99

**Procedure:** Use the [▷] key to move the cursor to the lower display line. Use the [–1/NO] and [+1/YES] keys to select the desired volume level.

**Details:** A setting of "0" produces no sound while a setting of "99" produces maximum volume.
The ability to independently adjust the volume of each element makes it simple to set up the optimum balance or "mix" between elements.

# PAN




**Summary:** Determines the position in the stereo sound field in which the sound from selected element will be heard (left to right).

**Settings:** Graphic Display: L--+--R, 5 positions from left to right.

**Procedure:** Use the [▷] key to move the cursor to the lower display line. Use the [–1/NO] and [+1/YES] keys to select the desired pan position.

**Details:** The lower line of the display shows a graphic representation of the stereo sound field with "L" representing "left" and "R" representing "right." As you edit the pan parameter the position indicator will appear at the corresponding position on the graphic display. A total of five different positions are available, corresponding to left, left-center, center, right-center, and right.
Interesting stereo effects can be produced by placing the output from different elements at different locations in the stereo sound field.

# VELOCITY SENSITIVITY


**Summary:** Determines how the output level of the selected element changes in response to velocity changes (keyboard initial touch response).

**Settings:** –5 ... 0 ... +5

**Procedure:** Use the [▷] key to move the cursor to the lower display line. Use the [–1/NO] and [+1/YES] keys to select the desired velocity sensitivity.

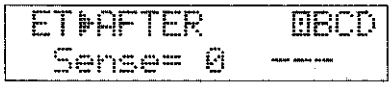
**Details:** Plus "+" settings produce higher output level in response to higher velocity values — i.e. the harder a key is played, the louder the sound. Minus "–" settings produce the opposite effect: lower level in response to higher velocity. A setting of "0" results in no level variation.

0 No response.
+1 Narrow change between medium-hard and hard velocity.

+2 Broader change between medium and hard velocity.
+3 Smooth change all the way from soft to hard velocity.
+4 Large change over small velocity range.
+5 Sudden change from no sound to maximum level at about medium velocity.

"–" Settings have the same effect, but the sound level decreases rather than increasing with increased key velocity. A graphic display to the right of the sensitivity value provides a visual indication as to the type of change produced by each setting.

# AFTER TOUCH SENSITIVITY




**Summary:** Determines how the output level of the selected element changes in response to keyboard after touch pressure changes when the Lev (Level) parameter of the AFTER TOUCH function in the VOICE COMMON mode is set to "on" (see page 33).

**Settings:** –3 ... 0 ... +3

**Procedure:** Use the [▷] key to move the cursor to the lower display line. Use the [–1/NO] and [+1/YES] keys to select the desired after touch sensitivity.

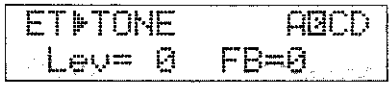
**Details:** Plus "+" settings produce higher output level in response to higher after touch pressure. Minus "–" settings produce the opposite effect: lower level in response to higher pressure. A setting of "0" results in no level variation.

0 No response.
+1 Narrow change between medium-high and high pressure.
+2 Broader change between medium and high pressure.
+3 Smooth change all the way from low to high pressure.

"–" Settings have the same effect, but the sound level decreases rather than increasing with increased after touch pressure. A graphic display to the right of the sensitivity value provides a visual clue as to the type of change produced by each setting.

**Refer to:** AFTER TOUCH, page 33.

# TONE (FM Elements B and D Only)




**Summary:** Adjusts the tone of the selected FM element — B or D.

**Settings:** Lev (Level): 0 ... 99
FB (Feedback): 0 ... 7

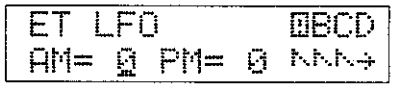
**Procedure:** Use the [◁] and [▷] cursor keys to place the underline cursor under the Lev or FB parameter. Use the [–1/NO] and [+1/YES] keys to set the level or feedback as required.

**Details:** The Lev parameter adjusts the modulation level of the select FM element, so higher values produce a brighter, sharper tone while lower values produce a rounder, more mellow tone. The effect of the feedback parameter varies from element to element, but in general higher values make the sound more brassy or noisy, while lower values make the sound smoother.

**Refer to:** WAVE TYPE, page 43.

# LFO (Low Frequency Oscillator) AM Depth, PM Depth, Type, Delay, Rate & Speed

● *AM (Amplitude Modulation Depth)*




**Summary:** Determines the maximum amount of amplitude modulation that can be applied to the selected element by the modulation wheel or keyboard after touch.

**Settings:** 0 ... 15

**Procedure:** Use the [◁] and [▷] cursor keys to select the AM parameter. Use the [–1/NO] and [+1/YES] keys to set the desired degree of amplitude modulation.

**Details:** A "0" setting produces no modulation while a setting of "15" produces maximum modulation. Amplitude modulation produces a periodic variation in the volume of the sound, thus creating a tremolo effect.
Please note that the AM parameter of the WHEEL and/or AFTER TOUCH function in the VOICE COMMON edit mode must be set to "on" before amplitude modulation can be applied manually (see page 33). Amplitude modulation is applied automatically when these parameters are off.

**Refer to:** WHEEL, page 32. AFTER TOUCH, page 33.

● *PM (Pitch Modulation Depth)*


**Summary:** Determines the maximum amount of pitch modulation that can be applied to the selected element by the modulation wheel or keyboard after touch.

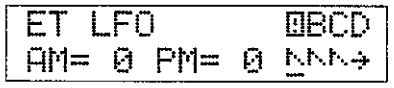
**Settings:** 0 ... 31

**Procedure:** Use the [◁] and [▷] cursor keys to select the PM parameter. Use the [–1/NO] and [+1/YES] keys to set the desired degree of pitch modulation.

**Details:** A "0" setting produces no modulation while a setting of "31" produces maximum modulation. Pitch modulation produces a periodic pitch variation, thereby creating a vibrato effect.
Please note that the PM parameter of the WHEEL and/or AFTER TOUCH function in the VOICE COMMON edit mode must be set to "on" before pitch modulation can be applied manually. Pitch modulation is applied automatically when these parameters are off.

**Refer to:** WHEEL, page 32. AFTER TOUCH, page 33.

● *Type*




**Summary:** Determines the waveform of the LFO for the selected element.

**Settings:**

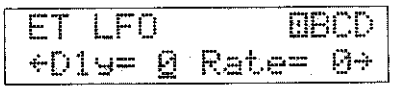
| | | |
|---|---|---|
| SAW UP | SAW DOWN | TRIANGLE |
| SQUARE | SAMPLE&HOLD | |

**Procedure:** Use the [◁] and [▷] cursor keys to select the waveform parameter. Use the [–1/NO] and [+1/YES] keys to select the desired LFO waveform.

**Details:**

= Upward sawtooth.
= Downward sawtooth.
= Triangle.
= Square.
= Sample and hold.

● *Dly (Delay)*




**Summary:** Sets the delay time between the beginning of a note and the beginning of LFO operation for the selected element when the WHEEL and AFTER TOUCH parameters in the VOICE COMMON edit mode are both turned off.

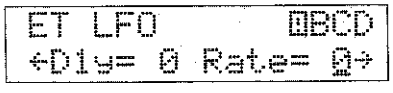
**Settings:** 0 ... 99

**Procedure:** Use the [◁] and [▷] cursor keys to select the Dly parameter. Use the [–1/NO] and [+1/YES] keys to set the desired LFO delay.

**Details:** The minimum setting "0" results in no delay, while the maximum setting of "99" produces maximum delay before the LFO begins operation.

**Refer to:** WHEEL, page 32. AFTER TOUCH, page 33.

● *Rate*




**Summary:** Sets the rate of LFO "fade in" for the selected element when the WHEEL and AFTER TOUCH parameters in the VOICE COMMON edit mode are both turned off.

**Settings:** 0 ... 99

**Procedure:** Use the [◁] and [▷] cursor keys to select the Rate parameter. Use the [–1/NO] and [+1/YES] keys to set the desired LFO fade-in rate.

**Details:** "0" is the fastest rate, causing the LFO to start operation at full depth immediately. A setting of 99 produces the longest LFO fade in.

**Refer to:** WHEEL, page 32. AFTER TOUCH, page 33.

● *Spd (Speed)*


**Summary:** Sets the speed of the LFO for the selected element.

**Settings:** 0 ... 31

**Procedure:** Use the [◁] and [▷] cursor keys to select the Spd parameter. Use the [–1/NO] and [+1/YES] keys to set the desired LFO speed.

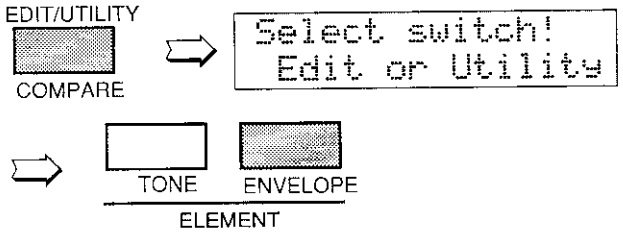
**Details:** "0" is slowest LFO speed setting; "31" is the fastest.
The speed parameter can not be edited when the sample-and-hold (⋰⋱) LFO TYPE is selected.

# ELEMENT ENVELOPE

The ELEMENT ENVELOPE edit mode allows detailed programming of the amplitude envelopes for each element in the selected voice.

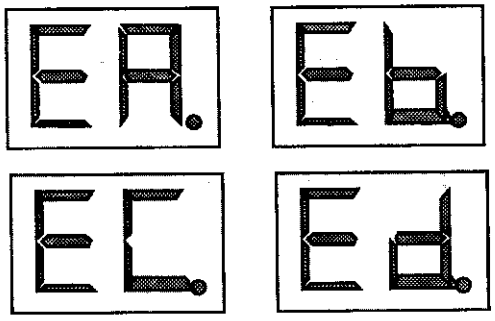
### Selecting the ELEMENT ENVELOPE Edit Mode

From the VOICE or MULTI mode:




From another edit or utility mode simply press [ELEMENT ENVELOPE].

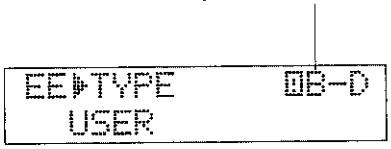
An "E" will appear to the left of the LED display to indicate that an edit mode is selected, and the element selected for editing will be displayed to the right of the display — "A", "b", "C", or "d". A dot will appear to the right of the element character as soon as any parameter has been edited.



Different elements can be selected for editing by pressing the appropriate [ELEMENT SELECT] key — [A], [B], [C] or [D]. If a 2-element voice is being edited, only elements A and B can be selected.

Any of the available elements can also be turned on or off by pressing the appropriate [ELEMENT ON/OFF] key. Each key alternately turns the associated element on and off, and the on/off status of the elements is shown to the right of the upper LCD line. If the element character is showing, the associated element is ON, if a dash appears in place of the element character, that element is OFF. The ability to turn elements on or off while editing makes it easier to hear the effect of parameter changes on a single element. The currently selected element is also shown on the LCD as a reversed (white on black) character.

In this example elements A, B and D are ON, while element C is OFF.
Element A is currently selected for editing.

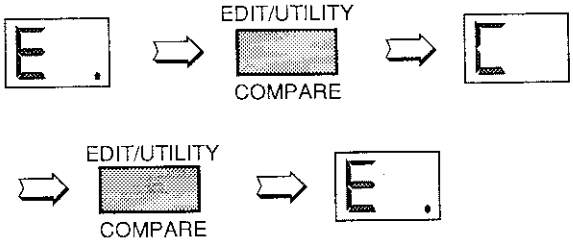



### Selecting the ELEMENT ENVELOPE Edit Mode Functions

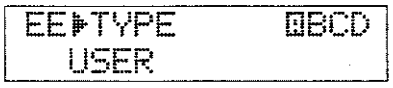
The various ELEMENT ENVELOPE edit mode functions can be selected in sequence by pressing the [ELEMENT ENVELOPE] key, or by using the [–1/NO] and [+1/YES] keys when the cursor (▷)is located immediately before the function name on the upper display line.

### The COMPARE Function

You can compare the sound of the edited voice with the sound of the voice before it was edited by pressing the [EDIT/COMPARE] key to activate the COMPARE function. A "C" will appear on the LED display while the COMPARE function is active, and the sound of the voice prior to editing will be heard when you play the keyboard. Press the [EDIT/COMPARE] key again to return to the edit mode.



# TYPE



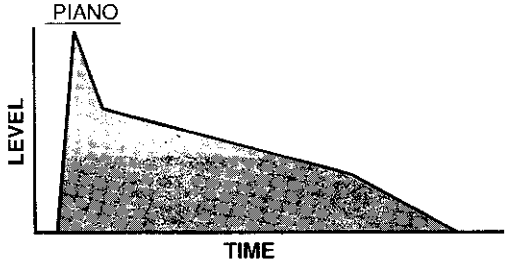

**Summary:** Selects a user or preset amplitude envelope for the selected element.

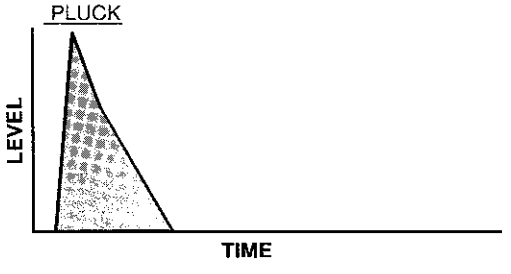
**Settings:** PRESET, PIANO, GUITAR, PLUCK, BRASS, STRINGS, ORGAN, USER

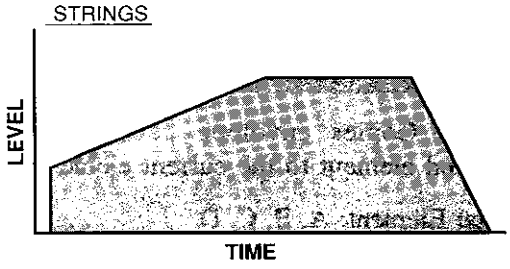
**Procedure:** Use the [▷] key to move the cursor to the lower display line. Use the [–1/NO] and [+1/YES] keys to select the desired envelope.

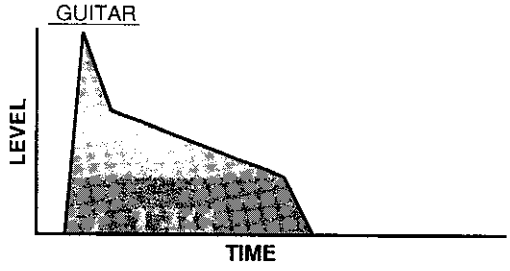
**Details:** When "PRESET" is selected, the original envelope of the wave selected for the current element is used. For example, if the current uses a guitar wave corresponding guitar envelope will be selected.

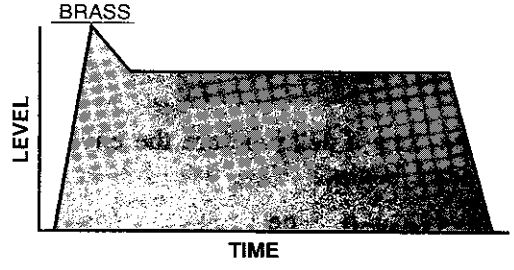
When "PIANO," "GUITAR," "PLUCK," "BRASS," "STRINGS," or "ORGAN" is selected, a generic envelope of the appropriate type is used. Then piano, organ and strings envelopes are roughly as shown below:

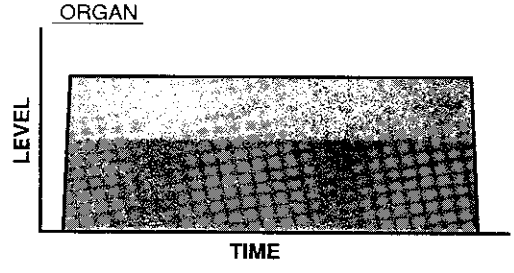



Editing any of the envelope parameters for one of the above types turns the envelope into a "USER" type.

When "USER" is selected, an original envelope can be programmed using the attack, decay, and release parameters described on pages 55, 56.

**Refer to:** Tutorial, page 25. ENVELOPE, page 33.

# ENVELOPE COPY

```
EE▶COPYfrom ▯BCD
 any Element?  →
```

**Summary:** Copies envelope parameters from a selected element to the current element.

**Settings:** Element: A, B, C, D

**Procedure:** Use the [◁] and [▷] cursor keys to move the cursor to the "from" element parameter. Use the [–1/NO] and [+1/YES] keys to select the element from which the envelope data is to be copied.

Press the [▷] cursor key one more time and the "Are you sure?" display will appear. Press [+1/YES] to execute the copy operation or [–1/NO] to cancel. ">>Completed!!<<" will appear briefly when the copy operation has finished.

**Details:** This function can save a lot of programming time by allowing easy copying of complex USER type envelope data between elements.

# DELAY (Delay Rate & ON/OFF)

```
EE▶DELAY      ▯BCD
 Rate= 0     off
```

**Summary:** Sets a delay before the envelopes of all elements begin.

**Settings:** Delay: 0 ... 99
Mode: on/off

**Procedure:** Use the [◁] and [▷] cursor keys to move the cursor to the "Rate" parameter. Use the [–1/NO] and [+1/YES] keys to select the desired delay rate.
Press the [▷] cursor key one more time to move to the on/off mode parameter, and use the [–1/NO] and [+1/YES] keys to set as required.

**Details:** The envelope delay rate parameter affects all envelopes simultaneously. A setting of "0" produces almost no delay while a setting of "99" produces maximum delay.

# INITIAL LEVEL

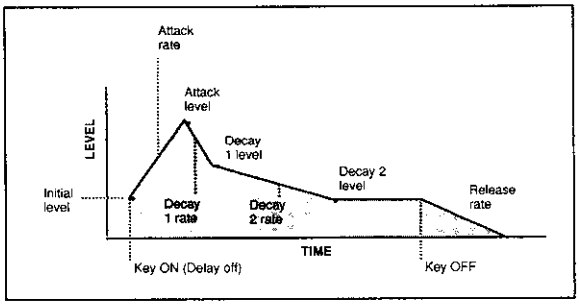
```
EE▶INITIAL    ▯BCD
 Level=  0
```

**Summary:** Sets the starting level of the amplitude envelope for the current element.

**Settings:** 0 ... 99

**Procedure:** Use the [▷] cursor key to move the cursor to the lower display line. Use the [–1/NO] and [+1/YES] keys to set the initial level.

**Details:** A setting of "0" means that the envelope will begin from zero (minimum) level, while a setting of "99"causes the envelope to begin immediately from maximum level. The highest setting produces the sharpest attack.




**Refer to:** ENVELOPE, page 33.

# ATTACK (Level & Rate)


**Summary:** Sets the rate and peak level of the attack of the amplitude envelope for the current element.

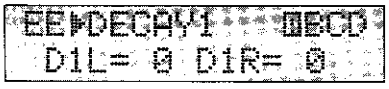
**Settings:** AL (Attack Level): 0 ... 99
AR (Attack Rate): 0 ... 99

**Procedure:** Use the [◁] and [▷] cursor keys to move the cursor to the "AL" or "AR" parameter. Use the [–1/NO] and [+1/YES] keys to set the selected level or rate parameter.

**Details:** Refer to the INITIAL LEVEL function for a complete envelope diagram.
A rate setting of "0" produces the slowest attack, and a setting of "99" produces the fastest attack.
A level setting of "0" produces the lowest attack level, while a setting of "99" produces the highest level.
Please note that the attack may be "biased" by the ENVELOPE Attack Rate parameter in the VOICE COMMON edit mode.

**Refer to:** ENVELOPE, page 33.

# DECAY 1 (Level & Rate)




**Summary:** Sets the rate and final level of the first decay of the amplitude envelope for the current element.

**Settings:** D1L (Decay 1 Level): 0 ... 99
D1R (Decay 1 Rate): 0 ... 99

**Procedure:** Use the [◁] and [▷] cursor keys to move the cursor to the "D1L" or "D1R" parameter.
Use the [–1/NO] and [+1/YES] keys to set the selected level or rate parameter.

**Details:** Refer to the INITIAL LEVEL function for a complete envelope diagram.
A rate setting of "0" produces the slowest decay, and a setting of "99" produces the fastest decay.
A level setting of "0" produces the lowest decay level, while a setting of "99" produces the highest level.

# DECAY 2 (Level & Rate)


**Summary:** Sets the rate and final level of the second decay of the amplitude envelope for the current element.

**Settings:** D2L (Decay 2 Level): 0 ... 99
D2R (Decay 2 Rate): 0 ... 99

**Procedure:** Use the [◁] and [▷] cursor keys to move the cursor to the "D2L" or "D2R" parameter. Use the [–1/NO] and [+1/YES] keys to set the selected level or rate parameter.

**Details:** Refer to the INITIAL LEVEL function for a complete envelope diagram.
A rate setting of "0" produces the slowest decay, and a setting of "99" produces the fastest decay.

A level setting of "0" produces the lowest decay level, while a setting of "99" produces the highest level.

The decay 2 level parameter also sets the hold level at which the note is sustained until released.

# RELEASE RATE


**Summary:** Sets the release rate of the amplitude envelope for the current element.

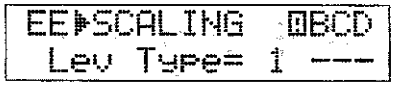
**Settings:** 0 ... 99

**Procedure:** Use the [▷] cursor key to move the cursor to the lower display line. Use the [–1/NO] and [+1/YES] keys to set the release rate.

**Details:** Refer to the INITIAL LEVEL function for a complete envelope diagram.
A release rate setting of "0" produces the slowest release, and a setting of "99" produces the fastest release.
Please note that the release note may be "biased" by the ENVELOPE Release Rate parameter in the VOICE COMMON edit mode.

**Refer to:** ENVELOPE, page 33.

# LEVEL SCALING



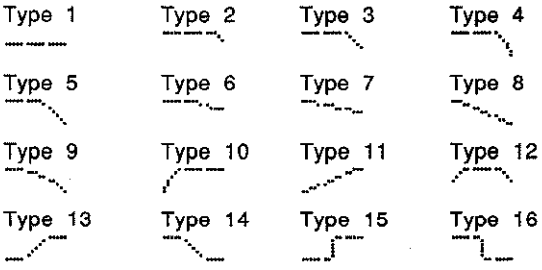

**Summary:** Determines how the level of the current element changes across the range of the keyboard.

**Settings:** 1 ... 16

**Procedure:** Use the [▷] cursor key to move the cursor to the lower display line. Use the [–1/NO] and [+1/YES] keys to set the desired level scaling curve.

**Details:** Most acoustic instruments do not produce a uniform sound level throughout their pitch range. This results in a level curve that can be simulated by appropriate settings of the level scaling parameter. Often, for example, the level decreases slightly as the pitch increases.
Each of the 16 available level scaling curves is shown in graphic form on the LCD when selected, making it easy to locate and select the optimum curve for each application.

● *Level Scaling LCD Graphic*



# RATE SCALING

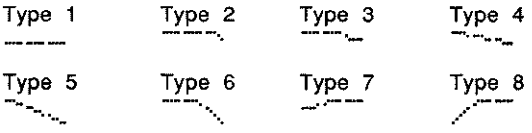

**Summary:** Determines how the overall rate of the amplitude envelope for the current element changes across the range of the keyboard.

**Settings:** 1 ... 8

**Procedure:** Use the [▷] cursor key to move the cursor to the lower display line. Use the [–1/NO] and [+1/YES] keys to set the desired rate scaling curve.

**Details:** Many acoustic instruments do not produce uniform note length throughout their pitch range. This results in a rate curve that can be simulated by appropriate settings of the rate scaling parameter. Often, for example, the overall note length decreases slightly as the pitch increases. Each of the 8 available rate scaling curves is shown in graphic form on the LCD when selected, making it easy to locate and select the optimum curve for each application.

● *Rate Scaling LCD Graphic*



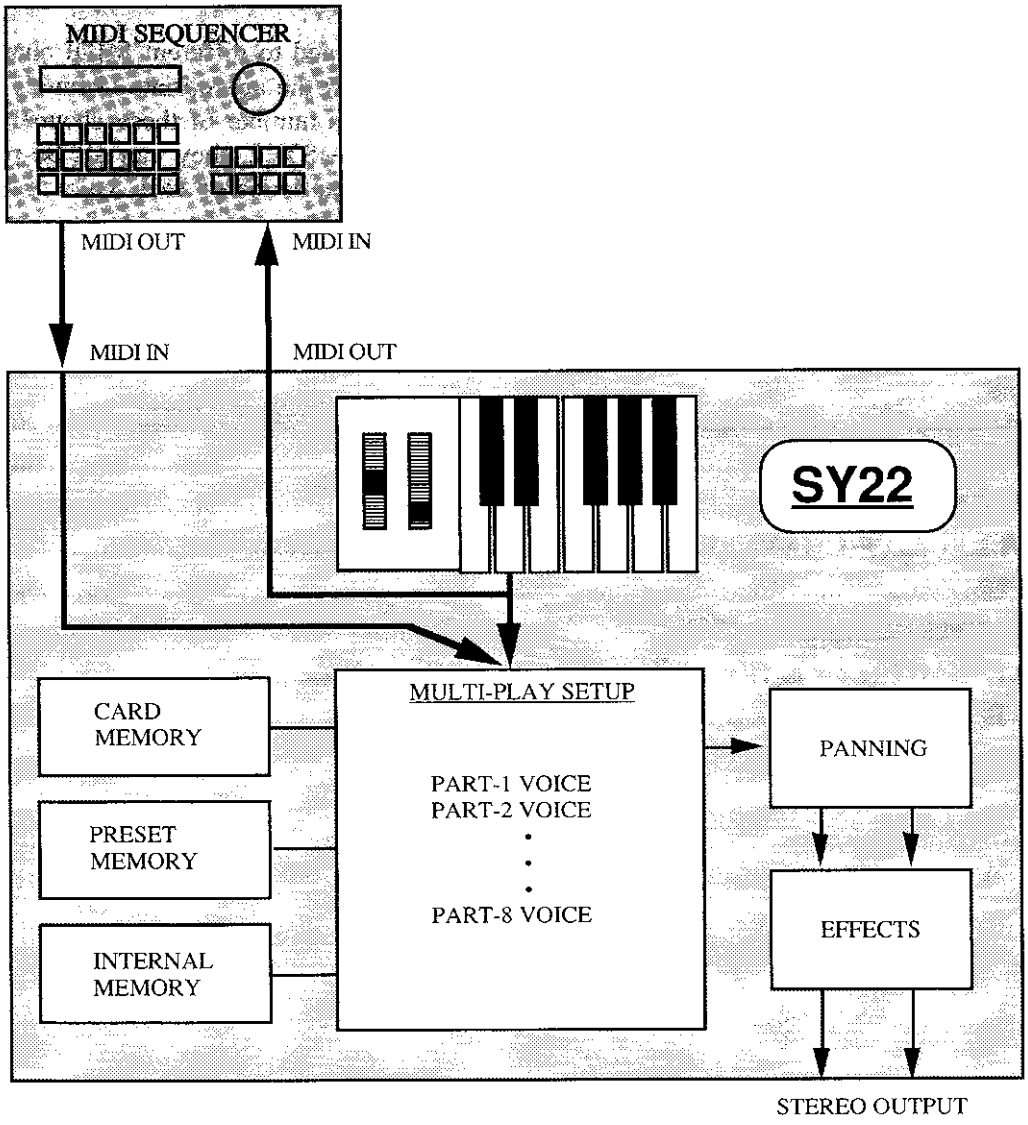
# MULTI

The MULTI edit mode allows 8 different voices to be assigned to different MIDI channels. The assigned voices can then be individually controlled over the appropriate channels from an external MIDI sequence recorder or other controller. If a number of these channel/voice "parts" are assigned to the MIDI transmit channel of the SY22, they can all be played simultaneously from the SY22 keyboard. Individual characteristics of each voice, such as volume and detune, can also be programmed.

### A Basic MULTI PLAY System

The SY22 MULTI PLAY (multi-timbre) mode allows up to 8 different voices to be individual assigned to any of 16 different MIDI channels. Each voice/channel assignment is known as a multi-play "part," just like the various parts in a band or orchestra. You can then record multi-voice compositions on a MIDI sequence recorder and play them back using only the sequencer and SY22.

Here's an example of a sequencer recording and playback setup:




In addition to 16 PRESET multi-play setups, 16 INTERNAL memory locations are provided for complete multi-play setups including voice-to-channel assignments, voice volume, note shift, detune, note limits, and effects for each part. This allows you to create up to 16 original "orchestras" with different combinations of voices that can be recalled whenever needed.

**Other Possibilities**

The MULTI mode is useful even when a sequencer is not used. If you set the MIDI RECEIVE CHANNEL parameter (page 63) of several multi-play parts to the same channel that the SY22 is set to transmit on (TRANSMIT CHANNEL parameter, page 81), those parts can all be played simultaneously via the SY22

keyboard. By setting the low and high NOTE LIMIT parameters (page 64) of parts set to the keyboard channel to limit them to specific regions of the keyboard, it is also possible to create a range of split keyboard effects — e.g. play bass with the left hand and piano with the right.

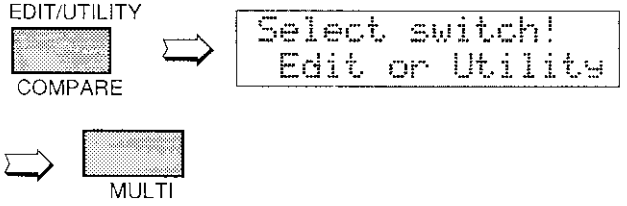
### MULTI PLAY Mode, Bank and Setup Selection

The MULTI mode, memory banks and individual multi-play setups are selected in the same way as the SY22 voices:

- [MULTI] to select the multi-play mode.
- [PRESET] or [INTERNAL] to select the desired memory.
- [BANK] and [NUMBER/MULTI PLAY PART] keys or [–1/NO] and [+1/YES] keys to select the desired multi-play setup.

### Selecting the MULTI Edit Mode

From the VOICE or MULTI mode:




From another edit or utility mode simply press [MULTI].

An "E" will appear to the left of the LED display to indicate that an edit mode is selected, and the multi-setup part selected for editing will be displayed to the right of the display — "1" through "8." A dot will appear to the right of the part number as soon as any parameter has been edited.

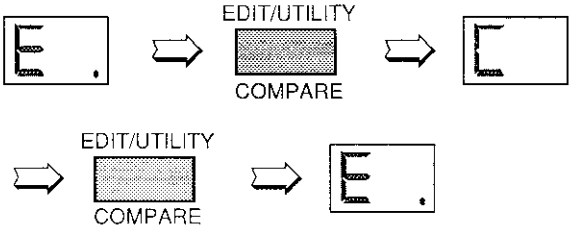

Different parts can be selected for editing by pressing the appropriate [NUMBER/MULTI PART SELECT] key — [1] through [8].

### Selecting the MULTI Edit Mode Functions

The various MULTI edit mode functions can be selected in sequence by pressing the [MULTI] key, or by using the [–1/NO] and [+1/YES] keys when the cursor (▷)is located immediately before the function name on the upper display line.

### The COMPARE Function

You can compare the sound of the edited multi-play setup with the sound of the setup before it was edited by pressing the [EDIT/COMPARE] key to activate the COMPARE function. A "C" will appear on the LED display while the COMPARE function is active, and the sound of the setup prior to editing will be heard when you play the keyboard. Press the [EDIT/COMPARE] key again to return to the edit mode.




**SY22 PRESET MULTI Performance Note**

| No. | Multi Name | Type | Comments | No. | Multi Name | Type | Comments |
|---|---|---|---|---|---|---|---|
| 1 | 1.1 Orchstra | 2 layer | Big Orchestra. Brass and strings. | 9 | 2.1 FltCncrt | Split | Split flute and strings |
| 2 | 1.2 SuperBrs | 2 layer | Powerful brass. | 10 | 2.2 Wb/Piano | Split | Split wood bass and piano. |
| 3 | 1.3 StrPiano | 2 layer | Piano with strings. | 11 | 2.3 Fb/E.Pno | Split | Split fretless bass and E.Piano. |
| 4 | 1.4 MonoLead | 8 layer | Fat monoral synth lead. | 12 | 2.4 RytmSect | Split | Split drum set and funky bass. |
| 5 | 1.5 PinPad | 3 layer | Synth decay pad. | 13 | 2.5 <Pop> | MIDI multi | For Pop music. |
| 6 | 1.6 SyncPad | 4 layer | Fat synth pad. | 14 | 2.6 <Rock> | MIDI multi | For Rock music. |
| 7 | 1.7 PanPad | 2 layer | Breathy synth Pan flute. | 15 | 2.7 <Jazz> | MIDI multi | For Jazz music. |
| 8 | 1.8 Haunted | Split | Image of haunted mansion. | 16 | 2.8 <Demo> | MIDI multi | Used for SY22 Demo song. |

# NAME


**Summary:** Assigns a name of up to 8 characters to the current multi-play setup.

**Settings:** The following characters are available for use in multi-play names:

(Space) !"#$%&'()*+,-./0123456789:;<=>?@
ABCDEFGHIJKLMNOPQRSTUVWXYZ[¥]^_`
abcdefghijklmnopqrstuvwxyz{|}→←

**Procedure:** Use the [◁] and [▷] cursor keys to place the underline cursor under the character to be changed. Use the [–1/NO] and [+1/YES] keys to select the desired character. Continue until the entire multi-play name has been programmed.

**Details:** It's a good idea to give your multi-play setups names that make them easily identifiable. If you've created a new setup using three voices intended for rock music, you could call it something like "RockTrio".

# EFFECT (Type & Depth)


**Summary:** Selects one of sixteen digital effects, and sets the depth of the selected effect for the current multi-play setup.

**Settings:** Effect type:

| | |
|---|---|
| Rev Hall | (Reverb Hall) |
| Rev Room | (Reverb Room) |
| Rev Plate | (Reverb Plate) |
| Rev Club | (Reverb Club) |
| Rev Metal | (Reverb Metal) |
| Delay 1 | (Short Single Delay) |
| Delay 2 | (Long Delay) |
| Delay 3 | (Long Delay) |
| Doubler | (Doubler) |
| Ping-Pong | (Ping Pong Delay) |
| Pan Ref | (Panned Reflections) |
| Early Ref | (Early Reflections) |
| Gate Rev | (Gated Reverb) |
| Dly&Rev 1 | (Delay & Reverb 1) |
| Dly&Rev 2 | (Delay & Reverb 2) |
| Dist&Rev | (Distortion & Reverb) |

**Depth:** 0 ... 7

**Procedure:** Use the [◁] and [▷] cursor keys to place the underline cursor under the effect type or depth parameter. Use the [–1/NO] and [+1/YES] keys to select the desired effect or effect depth.

**Details:** Setting the depth parameter to "0" is equivalent to turning the effect OFF. A depth setting of "7" produces the greatest effect.

**Refer to:** MULTI INITIALIZE, page 72.

# VOICE NUMBER


**Summary:** Assigns a preset, card or internal voice to the selected multi-play part.

**Settings:** Source: I, C, P
Bank: 1 ... 8
Number: 1 ... 8

**Procedure:** Press the [NUMBER/MULTI PART SELECT] key corresponding to the desired multi-play part.
Use the [◁] and [▷] cursor keys to move the cursor to the source, bank, or number parameter. Use the [–1/NO] and [+1/YES] keys to set the selected parameter as necessary.

**Details:** In this display the source, bank and number parameters are shown in the standard SY22 voice number format. "P12," for example, is preset bank 1, number 2; "I35" is internal bank 3, number 5, etc.

**Refer to:** MULTI INITIALIZE, page 72.

# MIDI RECEIVE CHANNEL


**Summary:** Sets the MIDI receive channel for the selected multi-play part to any channel between 1 and 16, or off.

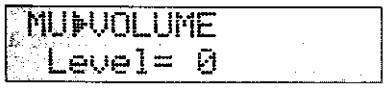
**Settings:** 0 ... 16, off

**Procedure:** Press the [NUMBER/MULTI PART SELECT] key corresponding to the desired multi-play part.
Use the [▷] cursor key to move the cursor to the lower display line. The [–1/NO] and [+1/YES] keys are used to select the desired MIDI channel or turn MIDI reception for that part off.

**Details:** The most logical and easy-to-follow settings for multi-play parts 1 through 8 are, naturally, MIDI channels 1 through 8. Turn MIDI reception "off" for parts you do not intend to use.

**Refer to:** MULTI INITIALIZE, page 72.

# VOLUME




**Summary:** Adjusts the volume of the selected multi-play part.

**Settings:** 0 ... 99

**Procedure:** Press the [NUMBER/MULTI PART SELECT] key corresponding to the desired multi-play part.
Use the [▷] cursor key to move the cursor to the lower display line. Use the [–1/NO] and [+1/YES] keys to select the desired volume level.

**Details:** A setting of "0" produces no sound while a setting of "99" produces maximum volume.
The ability to independently adjust the volume of each multi-play part makes it simple to set up the optimum balance or "mix" between parts.

**Refer to:** MULTI INITIALIZE, page 72.

# DETUNE


**Summary:** Allows slight upward or downward pitch adjustment of the selected multi-play part.

**Settings:** –50 ... 0 ... +50

**Procedure:** Press the [NUMBER/MULTI PART SELECT] key corresponding to the desired multi-play part.
Use the [▷] cursor key to move the cursor to the lower display line. Use the [–1/NO] and [+1/YES] keys to select the desired amount of detuning.

**Details:** The Detune function allows different parts in a multi-play setup to be slightly detuned in relation to each other, thereby "thickening" the overall sound.
Detuning occurs in 3 or 4-cent steps. Since 100 cents equals one semitone, the overall detune range is approximately one semitone. Plus settings tune upward from normal pitch, and minus settings tune downward. A setting of "0" produces normal pitch.

**Refer to:** MULTI INITIALIZE, page 72.

# NOTE LIMIT (Low & High)


**Summary:** Sets the low and high note limits for the selected multi-play part.

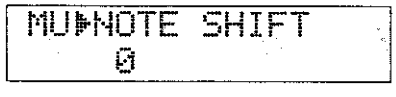
**Settings:** C-2 ... G8

**Procedure:** Press the [NUMBER/MULTI PART SELECT] key corresponding to the desired multi-play part.
Use the [◁] and [▷] cursor keys to select the Low or High parameter. The [–1/NO] and [+1/YES] keys are used to set the low or high note limit.

**Details:** The C-2 to G8 range of this function covers a full 10-1/2 octaves. "C3" corresponds to "middle C" on a keyboard.
This function allows the sound from a multi-play part to be limited to a specific region of the keyboard. If the Low Note Limit is set to C3 and the High Note Limit is set to C4, for example, the sound from that part will only be produced between C3 and C4 — the octave immediately above middle C. This makes it simple to produce split voices.
If the High Note Limit is set to a note that is *lower* than the Low Note Limit, the keys between the limits will produce no sound while all others will operate normally.

**Refer to:** MULTI INITIALIZE, page 72.

# NOTE SHIFT




**Summary:** Shifts the pitch of the selected multi-play part up or down in semitone steps.

**Settings:** –24 ... 0 ... +24.

**Procedure:** Press the [NUMBER/MULTI PART SELECT] key corresponding to the desired multi-play part.
Use the [▷] cursor key to move the cursor to the lower display line. Use the [–1/NO] and [+1/YES] keys to select the desired degree of note shift.

**Details:** A setting of "–12," for example, shifts the pitch of the selected voice down by one octave; a setting of "+4" shifts the pitch up by a major third. The maximum range is plus or minus two octaves.

The Note Shift function can be used to transpose a voice to its most useful range, or to create harmony (intervals) between different parts in a multi-play setup.

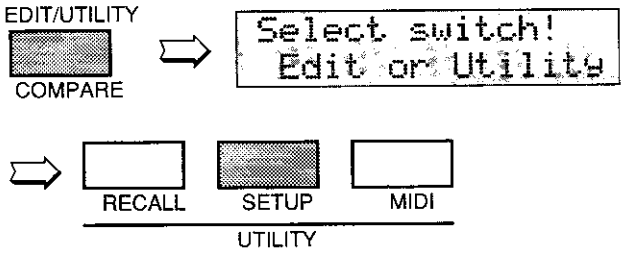
**Refer to:** MULTI INITIALIZE, page 72.

# UTILITY SETUP

The UTILITY SETUP mode provides access to a range of basic utility functions that are essential for general operation of the SY22.

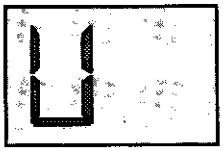
### Selecting the UTILITY SETUP Mode

From the VOICE or MULTI mode:




From another edit or utility mode simply press [UTILITY SETUP].

A "U" will appear on the LED display to indicate that a utility mode has been selected




### Selecting the UTILITY SETUP Mode Functions

The various UTILITY SETUP mode functions can be selected in sequence by pressing the [UTILITY SETUP] key, or by using the [–1/NO] and [+1/YES] keys when the cursor (▷)is located immediately before the function name on the upper display line.

# MASTER TUNE


**Summary:** Tunes the overall pitch of the SY22 over approximately a 100-cent range.

**Settings:** –50 ... 0 ... +50

**Procedure:** Use the [▷] key to move the cursor to the lower display line. Use the [–1/NO] and [+1/YES] keys to set the desired degree of tuning.

**Details:** Tuning occurs in 3 or 4-cent steps. Since 100 cents equals one semitone, the overall tuning range is approximately one semitone — i.e. plus or minus a quarter tone. Plus settings tune upward from normal pitch, and minus settings tune downward. A setting of "0" produces normal pitch.

# TRANSPOSE


**Summary:** Transposes the overall pitch of the SY22 up or down in semitone steps.

**Settings:** –12 ... 0 ... +12

**Procedure:** Use the [▷] key to move the cursor to the lower display line. Use the [–1/NO] and [+1/YES] keys to set the desired degree of transposition.

**Details:** A setting of "–12," for example, transposes down by one octave; a setting of "+4" transposes up by a major third.

# MEMORY CARD (Save, Load, Format, & Bank)

● *Save*


**Summary:** Saves all internal voice and multi-play data to a memory card.

**Settings:** SAVE

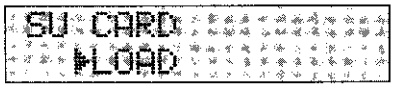
**Procedure:** Use the [▷] key to move the cursor to the lower display line, then use the [–1/NO] and [+1/YES] keys to select "SAVE." Now press the [▷] key again and the "SAVE TO CARD?" display will appear. Press the [+/YES] key to start the save operation, or the [–1/NO] key to cancel. "****SAVE NOW****" will appear on the display while the operation is in progress, and ">>Completed!!<<" will appear briefly when the save operation has finished.

**Details:** The SAVE operation can only be executed if the CARD parameter of the MEMORY PROTECT function described on page 73 is turned "off," and the WRITE PROTECT switch of the MCD32 or MCD64 Memory Card loaded in into the CARD slot is turned "off."
When an MCD64 Memory Card is used, the bank to which the data is to be save can be selected using the BANK function described on page 70.

Exercise caution when saving data to a memory card — the previous card data will be erased and completely replaced by the saved data.

**Refer to:** Tutorial, page 12.

● ***Load***




**Summary:** Loads voice and multi-play data from a memory card into the SY22 internal memory.

**Settings:** LOAD

**Procedure:** Use the [▷] key to move the cursor to the lower display line, then use the [–1/NO] and [+1/YES] keys to select "LOAD." Now press the [▷] key again and the "LOAD from CARD?" display will appear. Press the [+1/YES] key to start the load operation, or the [–1/NO] key to cancel. "****LOAD NOW****" will appear on the display while the operation is in progress, and ">>Completed!!<<" will appear briefly when the load operation has finished.

**Details:** The LOAD operation can only be executed if the INTERNAL parameter of the MEMORY PROTECT function described on page 73 is turned "off."

When an MCD64 Memory Card is used, the bank from which the data is to be loaded can be selected using the BANK function described on page 70.

Exercise caution when loading data from a memory card — the corresponding internal SY22 data will be erased and completely replaced by the loaded data.

**Refer to:** Tutorial, page 12.

● ***Format***


**Summary:** Formats MCD64 or MCD32 Memory Cards so that they can be used by the SY22 to save and load voice and multi-play data.

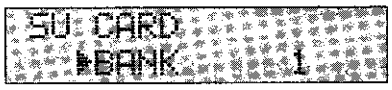
**Settings:** FORMAT

**Procedure:** Use the [▷] key to move the cursor to the lower display line, then use the [–1/NO] and [+1/YES] keys to select "FORMAT." Now press the [▷] key again and the "FORMAT ?" display will appear. Press the [+1/YES] key to start the format operation, or the [–1/NO] key to cancel. ">>Completed!!<<" will appear briefly when the format operation has finished.

**Details:** Formatting can only be carried out if the memory card WRITE PROTECT switch is turned OFF (refer to your MCD64 or MCD32 Memory Card instructions for details).

**Refer to:** Tutorial, page 12.

● ***Bank***




**Summary:** Selects bank 1 or bank 2 of a Yamaha MCD64 type memory card prior to formatting or load/save operations.

**Settings:** 1, 2

**Procedure:** Use the [▷] key to move the cursor to the lower display line, then use the [–1/NO] and [+1/YES] keys to select "BANK." Now press the [▷] key again to move the cursor to the bank number. Use the [–1/NO] and [+1/YES] keys to select the desired bank.

**Details:** MCD32 memory cards only have a single bank, so bank 2 cannot be selected if this type of card is used. MCD64 memory cards allow selection of bank 1 or 2. Each bank holds 64 voices and 16 multi-play setups.

**Refer to:** Tutorial, page 12.

# VOICE INITIALIZE


**Summary:** Initializes all parameters of the current voice.

**Settings:** None.

**Procedure:** After selecting the "INIT. VOICE" display, press the [▷] key. "Are you sure?" will appear on the lower line of the display. Press the [+1/YES] to initialize or [–1/NO] to cancel the initialize operation.
">>Completed!!<<" will appear briefly when the initialization is finished.

**Details:** When Voice Initialize is executed, the voice parameters are initialized to the following values:

| | A | B | C | D |
|---|---|---|---|---|
| **COMMON** | | | | |
| VOICE NAME | Initial | | | |
| CONFIGURATION | A–B–C–D | | | |
| EFFECT | Rev. Hall | | | |
| PITCH BEND Dep | 1 | | | |
| WHEEL AM | 2 | | | |
| WHEEL PM | off | | | |
| AFTER TOUCH AM | on | | | |
| AFTER TOUCH PM | off | | | |
| ENVELOPE Pit | off | | | |
| ENVELOPE Lev | 0 | | | |
| ENVELOPE AR | off | | | |
| ENVELOPE RR | 0 | | | |
| | 0 | | | |
| **VECTOR** | | | | |
| VECTOR LEVEL SPEED | 30 ms | | | |
| STEP/X/Y/TIME | 1 0 0 End | 50 STEP | | |
| | 2 | | | |
| | : | | | |
| | 50 | | | |
| VECTOR DETUNE SPEED | 30 ms | | | |
| STEP/X/Y/TIME | 1 0 0 End | 50 STEP | | |
| | 2 | | | |
| | : | | | |
| | 50 | | | |
| **ELEMENT TONE** | | | | |
| WAVE | 000:PIANO:PIANO | 151:OSC1:sin8' | 039:Str:Vn.Ens | 152:OSC1:sin4' |
| FREQ. shift | 0 | 0 | 0 | 0 |
| VOLUME | 99 | 99 | 99 | 99 |
| PAN | L–∓–R | L–∓–R | L–∓–R | L–∓–R |
| VELOCITY Sense | 2 | 2 | 2 | 2 |
| AFTER Sense | 0 | 0 | 0 | 0 |
| TONE Lev | — | 92 | — | 92 |
| TONE FB | — | 0 | — | 0 |
| LFO AM | 0 | 0 | 0 | 0 |
| LFO PM | 16 | 16 | 16 | 16 |
| LFO TYPE | /\/\ | /\/\ | /\/\ | /\/\ |
| LFO Dly | 0 | 0 | 0 | 0 |
| LFO Rate | 99 | 99 | 99 | 99 |
| LFO Spd | 20 | 20 | 20 | 20 |

| ELEMENT ENV | A | B | C | D |
|---|---|---|---|---|
| TYPE | PRESET | PRESET | PRESET | PRESET |
| DELAY Rate | 0 | 0 | 0 | 0 |
| DELAY ELE. | off | off | off | off |
| INITIAL Level | 67 | 0 | 90 | 0 |
| ATTACK AL | 99 | 92 | 97 | 92 |
| ATTACK AR | 99 | 99 | 64 | 99 |
| DECAY1 D1L | 99 | 92 | 95 | 92 |
| DECAY1 D1R | 0 | 0 | 32 | 0 |
| DECAY2 D2L | 0 | 92 | 95 | 92 |
| DECAY2 D2R | 26 | 0 | 0 | 0 |
| RELEASE Rate | 60 | 76 | 52 | 76 |
| SCALING Lev Type | 2 | 1 | 4 | 1 |
| Rate Type | 3 | 1 | 2 | 1 |

The voice initialize function is useful if you want to begin programming a voice "from scratch."

# MULTI INITIALIZE


**Summary:** Initializes all parameters of the current multi-play setup.

**Settings:** None.

**Procedure:** After selecting the "INIT. MULTI" display, press the [▷] key. "Are you sure?" will appear on the lower line of the display. Press the [+1/YES] to initialize or [–1/NO] to cancel the initialize operation.
">>Completed!!<<" will appear briefly when the initialization is finished.

**Details:** When multi-play Initialize is executed, the multi-play setup parameters are initialized to the following values:

**SY22 MULTI INITIAL**

| | PART1 | PART2 | PART3 | PART4 | PART5 | PART6 | PART7 | PART8 |
|---|---|---|---|---|---|---|---|---|
| NAME | Initial | | | | | | | |
| EFFECT | Rev Hall | | | | | | | |
| EFFECT Dep | 1 | | | | | | | |
| VOICE NUMBER | P12 DXlegend | P37 RokOrgan | P45 BrasSect | P63 Strings | P15 Itopia | P67 Marimba | P62 Syn Bass | P88 Dr.Kit |
| MIDI Rcv.ch | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 16 |
| VOLUME | 99 | 99 | 99 | 99 | 99 | 99 | 99 | 99 |
| DETUNE | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| NOTE LIMIT Low | C-2 | C-2 | C-2 | C-2 | C-2 | C-2 | C-2 | C-2 |
| NOTE LIMIT High | G8 | G8 | G8 | G8 | G8 | G8 | G8 | G8 |
| NOTE SHIFT | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

The multi initialize function is useful if you want to begin programming a voice "from scratch."

**SY22 System Parameter**

| SET UP | |
|---|---|
| MASTER TUNE | 0 |
| TRANSPOSE | 0 |
| CARD BANK | 1 |
| *MIDI* | |
| MIDI | on |
| BASIC Rcv.CH | 1 |
| TRANSMIT CH | 1 |
| LOCAL | on |
| PROG.CHANGE | off |
| CTRL.CHANGE | off |
| AFTER TOUCH | off |
| PITCH BEND | off |
| EXCLUSIVE | off |

# MEMORY PROTECT (Internal & Card)


**Summary:** Turns internal or card memory protection on or off.

**Settings:** INT: on, off
CARD: on, off

**Procedure:** Use the [◁] and [▷] cursor keys to select the INT or CARD parameter. Use [–1/NO] and [+1/YES] keys to turn memory protection on or off.

**Details:** When INT memory protection is "on," the internal memory is protected and voice store operations to the internal memory cannot be carried out. The same applies to card memory: when protection is "on" memory card save operations will be blocked even if the memory card WRITE PROTECT switch is turned OFF.

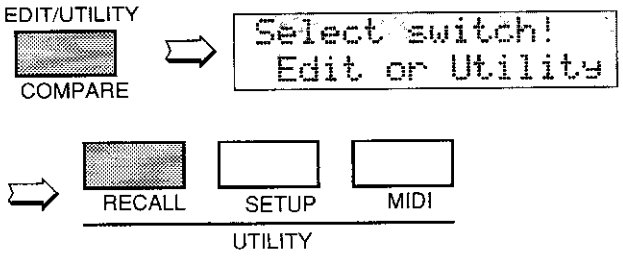
**Refer to:** Tutorial, page 22.

# UTILITY RECALL

The UTILITY RECALL mode accesses the VOICE or MULTI recall function, depending on whether the VOICE or MULTI play mode is selected when the RECALL function is called. RECALL makes it possible to recover a voice or multi-play setup that has been "lost" through failure to store the voice or multi-play setup prior to selecting a different voice or multi-play setup.

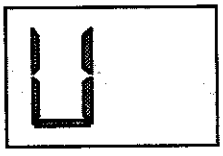
**Selecting the UTILITY RECALL Mode**

From the VOICE or MULTI mode:




From another edit or utility mode simply press [UTILITY RECALL].

A "U" will appear on the LED display to indicate that a utility mode has been selected



# VOICE RECALL (Voice or Multi)


**Summary:** Recalls the last voice or multi-play setup edited from the SY22 edit buffer memory.

**Settings:** None

**Procedure:** The "RECALL VOICE" function is selected if called from the VOICE play mode, while "RECALL MULTI" function is selected if called from the MULTI play mode. "Are you sure?" appears on the lower display line. Press the [+1/YES] key to recall or [–1/NO] to cancel the recall operation.

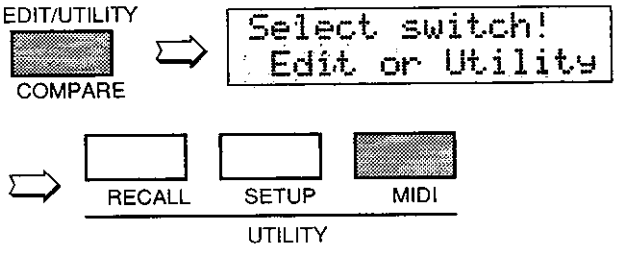
**Details:** Even if you've exited the edit mode and called a different voice or multi-play setup, this function will recall the last voice or multi-play setup edited with all parameters as they were at the time the edit mode was exited.

# UTILITY MIDI

The UTILITY MIDI mode provides access to all of the SY22's MIDI control functions.

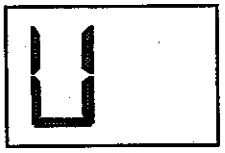
**Selecting the UTILITY MIDI Mode**

From the VOICE or MULTI mode:




From another edit or utility mode simply press [UTILITY MIDI].

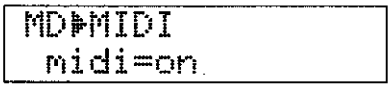
A "U" will appear on the LED display to indicate that a utility mode has been selected.



**Selecting the UTILITY MIDI Mode Functions**

The various UTILITY MIDI mode functions can be selected in sequence by pressing the [UTILITY MIDI] key, or by using the [–1/NO] and [+1/YES] keys when the cursor (▷)is located immediately before the function name on the upper display line.

# MIDI ON/OFF




**Summary:** Turns all MIDI control functions on or off.

**Settings:** on, off

**Procedure:** Use the [▷] cursor key to move the cursor to the lower display line. Use the [–1/NO] and [+1/YES] keys to turn MIDI control on or off.

**Details:** MIDI control can be turned "off" to prevent unwanted interference from external MIDI devices connected to the SY22, and/or to prevent the SY22 from affecting operation of the external equipment.

# BASIC RECEIVE CHANNEL


**Summary:** Sets the SY22 MIDI receive channel to any channel between 1 and 16, or the "omni" mode for reception on all channels.

**Settings:** 1 ... 16, omni

**Procedure:** Use the [▷] cursor key to move the cursor to the lower display line. The [–1/NO] and [+1/YES] keys are used to select the desired MIDI channel or the omni mode.

**Details:** When the SY22 is to receive data from an external MIDI device such as a sequencer, make sure that the SY22 MIDI receive channel is either set to the channel that the external device is transmitting on, or the omni mode.

# TRANSMIT CHANNEL

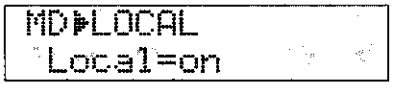

**Summary:** Sets the MIDI transmit channel for the SY22.

**Settings:** 1 ... 16.

**Procedure:** Use the [▷] cursor key to move the cursor to the lower display line. Use the [–1/NO] and [+1/YES] keys to select the desired MIDI transmit channel number.

**Details:** The MIDI transmit channel job is used primarily to match the transmit channel of the SY22 with the receive channel of an external MIDI device being driven by the SY22. When a multi-play setup is selected, however, the MIDI transmit channel setting also determines which of the setup's voices is played via the SY22 keyboard.

# LOCAL CONTROL ON/OFF



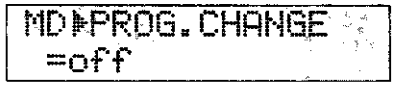

**Summary:** Determines whether the SY22 keyboard controls the internal tone generator system or not.

**Settings:** on, off.

**Procedure:** Use the [▷] cursor key to move the cursor to the lower display line. Use the [–1/NO] and [+1/YES] keys to turn local control on or off.

**Details:** Normally, local control will be turned "on" so that the SY22 keyboard plays its own internal tone generator system. If you want to control an external MIDI tone generator or other device from the SY22 keyboard *without* playing the internal tone generator, turn local control "off." One possibility is to drive the SY22 tone generator system from an external sequencer while independently playing a separate external tone generator from the SY22 keyboard.

# MIDI PROGRAM CHANGE



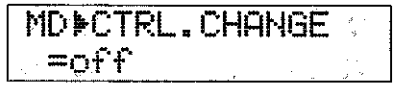

**Summary:** Determines how the SY22 will respond to MIDI program change messages for remote voice/multi selection.

**Settings:** off, common, individual

**Procedure:** Use the [▷] cursor key to move the cursor to the lower display line. The [–1/NO] and [+1/YES] keys are used to select the desired MIDI program change mode.

**Details:** The "off" setting turns MIDI program change reception and transmission off, so MIDI program change messages received from external equipment will not cause the corresponding SY22 voice to be selected, and no program change messages will be transmitted by the SY22 when one of its voices are selected.
In the "common" mode, program change numbers 0 through 63 received from external equipment will select SY22 voices 1.1 through 8.8, and program change numbers 64 through 79 select multi-play setups 1.1 through 2.8. The card, internal or preset voice banks cannot be selected via MIDI control. The corresponding program change number will also be transmitted by the SY22 when one of its voices are selected.
The "individual" mode allows individual voice selection for each multi-play part when the MULTI play mode is active. Program change between 0 and 63 received in a specific MIDI channel will change only the voice for the multi-play part assigned to that channel.

# MIDI CONTROL CHANGE




**Summary:** Determines whether or not the SY22 will receive and transmit MIDI control change messages.

**Settings:** off, on

**Procedure:** Use the [▷] cursor key to move the cursor to the lower display line. The [–1/NO] and [+1/YES] keys are used to turn control change reception/transmission on or off.

**Details:** The "off" setting turns MIDI control change reception and transmission off so that control change messages corresponding to modulation, pitch, volume and other functions will be ignored by the SY22 when received, and the SY22 will not transmit any control change messages.

# AFTER TOUCH ON/OFF


**Summary:** Turns keyboard after touch on or off.

**Settings:** on, off.

**Procedure:** Use the [▷] cursor key to move the cursor to the lower display line. Use the [–1/NO] and [+1/YES] keys to turn after touch on or off.

**Details:** When after touch is turned "off," internal SY22 after touch will function normally but no MIDI after touch data will be transmitted or received.

Keyboard after touch generates a tremendous amount of MIDI data, so you might want to turn after touch "off" when recording to a MIDI sequencer in order to preserve memory capacity.

# PITCH BEND ON/OFF


**Summary:** Turns pitch bend control on or off.

**Settings:** on, off.

**Procedure:** Use the [▷] cursor key to move the cursor to the lower display line. Use the [–1/NO] and [+1/YES] keys to turn pitch bend control on or off.

**Details:** When pitch bend control is turned "off," the SY22 pitch bend wheel will function normally but no MIDI pitch bend wheel data will be transmitted or received.

# EXCLUSIVE ON/OFF

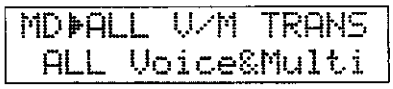

**Summary:** Turns transmission/reception of MIDI system exclusive data on or off.

**Settings:** on, off.

**Procedure:** Use the [▷] cursor key to move the cursor to the lower display line. Use the [–1/NO] and [+1/YES] keys to exclusive transmission/reception on or off.

**Details:** MIDI system exclusive data is transmitted by the SY22 when one of the voice transmit functions described below is used. The same type of data will also be automatically loaded into the SY22 memory when received from a second SY22 or other MIDI device, thus erasing previous data. This function can be turned "off" to prevent accidental erasure of the internal memory, or the memory of external equipment, do to mistaken data reception or transmission.

# ALL V/M TRANSMIT




**Summary:** Initiates MIDI bulk transmission of all voice and multi-play data.

**Settings:** None

**Procedure:** Use the [▷] key to move the cursor to the lower display line. "Are you sure?" will appear on the display. Press the [+1/YES] key to begin transmission, or the [–1/NO] key to cancel. "Transmitting!!" will appear on the display during transmission, and ">>Completed!!<<" will appear briefly when transmission has finished.

**Details:** This function is useful for transferring all the voice and multi-play data from one SY22 to another. If the MIDI OUT of the transmitting SY22 is connected to the MIDI IN of the receiving SY22 via a MIDI cable, the receiving unit will automatically receive and load the data as long as its internal memory protect function is turned "off" and EXCLUSIVE ON/OFF is turned "on." Another possibility is to transfer the data to a MIDI bulk data storage device for long-term storage.

# 1 VOICE TRANSMIT


**Summary:** Initiates bulk transmission of the data for a specified SY22 voice.

**Settings:** Source: I, C, P
Bank: 1 ... 8
Number: 1 ... 8

**Procedure:** Use the [◁] and [▷] cursor keys are used to move the cursor to the source, bank, or number parameter. Use the [–1/NO] and [+1/YES] keys to set the selected parameter as necessary. When the desired voice number has been selected, move the cursor to the Yes/No? parameter and press the [+1/YES] key to begin transmission. "Transmitting!!" will appear on the display during transmission, and ">>Completed!!<<" will appear briefly when transmission has finished.

**Details:** Like the ALL V/M TRANSMIT function described above, the 1 VOICE TRANSMIT function is ideal for transferring voice from one SY22 to another, or to a MIDI bulk storage device for long-term storage.
In this display the source, bank and number parameters are shown in the standard SY22 voice number format. "P12," for example, is preset bank 1, number 2; "I35" is internal bank 3, number 5, etc.

# APPENDIX

# SPECIFICATIONS

**Keyboard:** 61 keys, initial and after-touch response.

**Tone Generator Systems:** AWM (Advanced Wave Memory) & FM (Frequency Modulation).

**Internal Memory:**
Wave ROM; 128 preset AWM & 256 preset FM waveforms.
Preset ROM; 64 preset voices.
Internal RAM; 64 user voices.

**External Memory:** Voice & Multi data; MCD64 or MCD32 memory cards + write & read.

**Displays:**
16-character x 2-line backlit LCD.
7-segment 2-digit LED display.

**Controls:** VOLUME, VECTOR CONTROL, PITCH BEND, MODULATION.

**Key & Switches:** POWER; VECTOR PLAY ON/ OFF, LEVEL/DETUNE; CURSOR ◁ and ▷; MODE VOICE and MULTI; –1/NO and +1/YES; EDIT/ UTILITY/COMPARE; STORE; INTERNAL, CARD, PRESET; BANK 1–8 (VOICE COMMON and VECTOR; ELEMENT TONE and ENVELOPE; MULTI; UTILITY RECALL, SETUP and MIDI); NUMBER/ MULTI PART SELECT 1–8 (ELEMENT SELECT A–D, ELEMENT ON/OFF A–D); DEMO.

**Connectors:** DC 10V–12V IN; PHONES; OUTPUT R & L/MONO, FOOT VOLUME, SUSTAIN.

**MIDI Connectors:**
IN, OUT, THRU.

**Power requirements:**
DC10–12V, 500mA

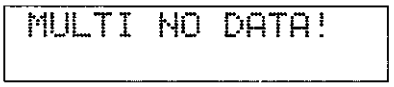
**Dimensions (W x H x D):**
976 x 285 x 93 mm (37-7/8" x 11-1/4" x 3-5/8")

**Weight:** 6.8 kg (14 lbs 16 oz)

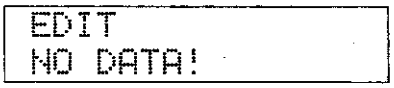
# ERROR MESSAGES

Things do go wrong from time to time, and people do make mistakes. When an error occurs, the SY22 will usually display a message that describes the type of error so you can easily take steps to rectify the problem. The following are quick summaries of the SY22 error displays.


VOICE PLAY (XXX=MEMORY, BANK, NUMBER)

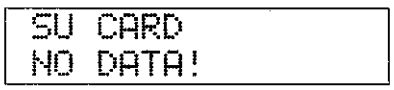



MULTI PLAY




EDIT


STORE

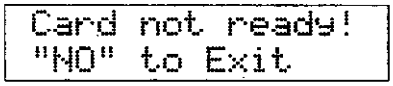



SET UP (CARD LOAD)

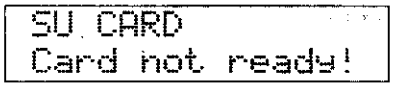
The currently loaded memory contains no data or data that is not recognizable by the SY22.


VOICE PLAY


MULTI PLAY (XXXXXXXX= MULTI NAME)




STORE

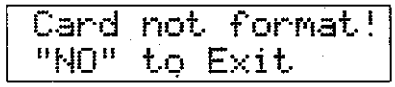



SET UP (CARD SAVE/LOAD/ FORMAT)

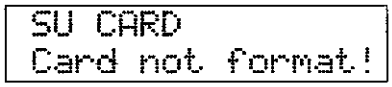
You have attempted to execute a memory card-related operation but no card is inserted in the CARD slot.


VOICE PLAY


MULTI PLAY (XXXXXXXX= MULTI NAME)



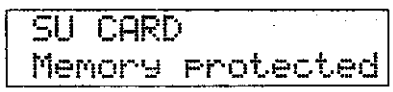

STORE




SET UP (CARD SAVE)

The currently loaded memory card is not properly formatted for use with the SY22.


STORE




SET UP (CARD SAVE/LOAD/ FORMAT)

You have attempted to execute an operation that will after the card or internal memory, but the v=card and/or internal memory protect function is turned ON.


VOICE PLAY


MULTI PLAY (XXXXXXXX= MULTI NAME)


STORE


SET UP (SAVE/LOAD/ FORMAT)

An MCD32 type memory card is loaded but card bank 2 is selected (MCD32 cards only have a single bank — BANK 1 — so it is necessary to select bank 1 if this display appears).

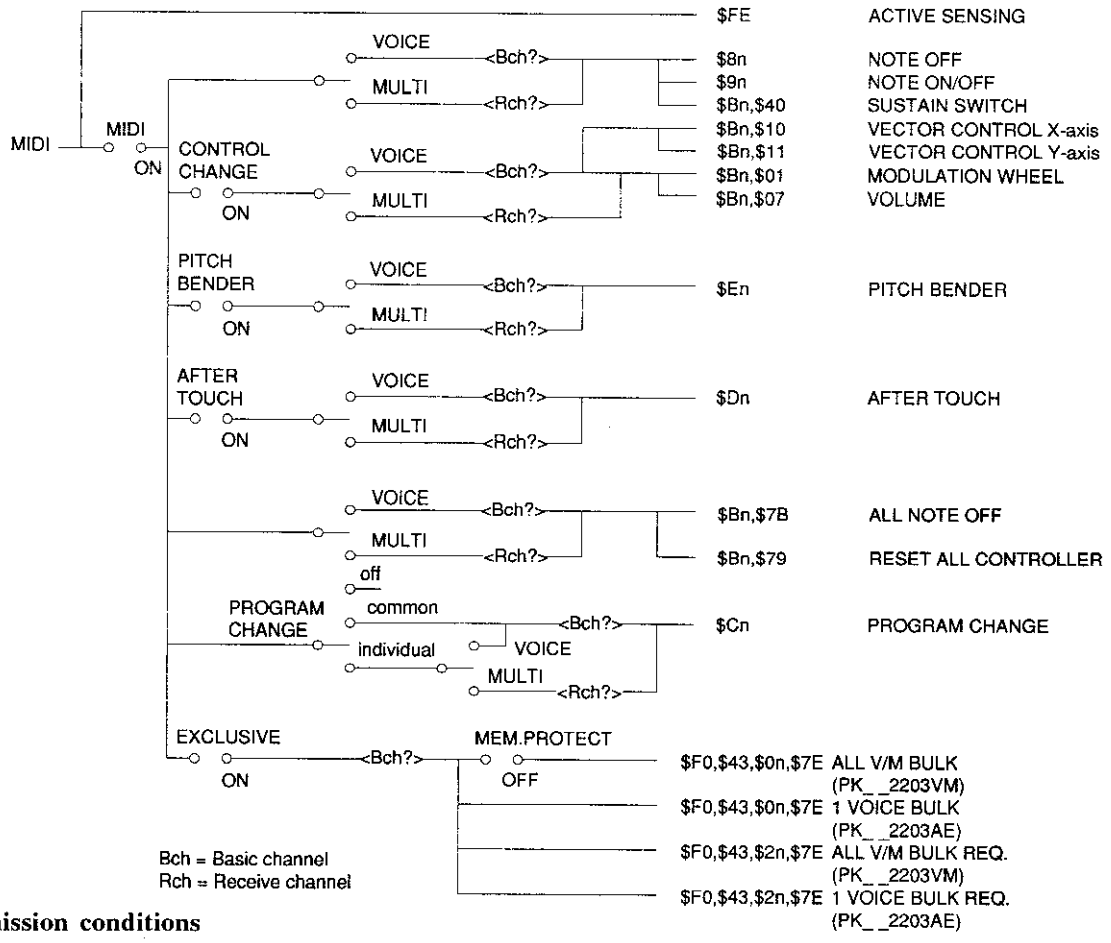

Unrecognizable MIDI bulk data has been received by the SY22.

# INDEX

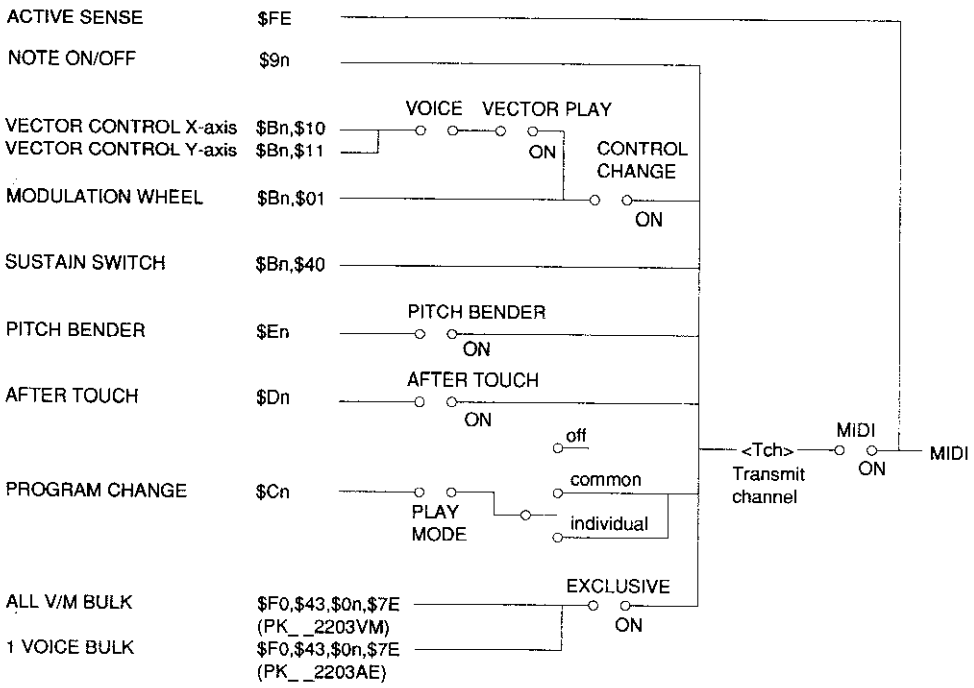
# MIDI DATA FORMAT

## ○ DATA FORMAT

### (1) MIDI reception conditions




### (2) MIDI transmission conditions



## (3) Channel Messages

### 3.1 Note On/Off

Transmission:
- Note range = C1($24)~C6($60)
- Velocity range = 0~$7F (0: note off)
- $9n, note, $00 for note off and $8n is not transmitted.

Reception:
- Note range = C-2($00)~G8($7F)
- Velocity range = 0~$7F

### 3.2 Control Change

MODULATION WHEEL and VECTOR CONTROL is possible to set transmission/reception on/off by the utility control change on/off.

Transmission:
- Output to MIDI through the transmit channel when the following controller is operated irrespective of the play, edit, etc. mode.

| controller | code | output data range |
|---|---|---|
| MODULATION WHEEL | $Bn, $01, $vv | vv = 0~$7F |
| SUSTAIN SWITCH | $Bn, $40, $vv | off:vv=0, on:vv=$7F |
| VECTOR CONTROL<br>X-axis<br>Y-axis | <br>$Bn, $10, $vv<br>$Bn, $11, $vv | <br>vv=0~$7F<br>vv=0~$7F |

- VECTOR CONTROL is transmitted only if the VECTOR PLAY ON/OFF' switch on the panel is on.

Reception:
- The following parameters are accepted by MIDI.

| parameter | code | Description |
|---|---|---|
| MODULATION WHEEL | $Bn,$01,$vv | vv=0(WHEEL:MIN)~$7F(WHEEL:MAX) |
| SUSTAIN SWITCH | $Bn,$40,$vv | vv=0~$3F:SUS OFF, vv=$40~$7F:SUS ON |
| VOLUME | $Bn,$07,$vv | |
| VECTOR CONTROL<br>X-axis<br>Y-axis | $Bn,$10,$vv<br>$Bn,$11,$vv | Depends on the panel [VECTOR PLAY ON/OFF] and [LEVEL/DETUNE] status. |

### 3.3 Program Change

- It is possible to set transmit/receive on/off by the utility program change on/off.

Transmission:
- The voice and multi Nos. and the program change Nos. correspond to each other as shown below.

| | | NUMBER 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|---|
| VOICE | 1 | $00 | $01 | $02 | $03 | $04 | $05 | $06 | $07 |
| | 2 | $08 | $09 | $0A | $0B | $0C | $0D | $0E | $0F |
| | 3 | $10 | $11 | $12 | $13 | $14 | $15 | $16 | $17 |
| | BANK 4 | $18 | $19 | $1A | $1B | $1C | $1D | $1E | $1F |
| | BANK 5 | $20 | $21 | $22 | $23 | $24 | $25 | $26 | $27 |
| | BANK 6 | $28 | $29 | $2A | $2B | $2C | $2D | $2E | $2F |
| | 7 | $30 | $31 | $32 | $33 | $34 | $35 | $36 | $37 |
| | 8 | $38 | $39 | $3A | $3B | $3C | $3D | $3E | $3F |
| MULTI | 1 | $40 | $41 | $42 | $43 | $44 | $45 | $46 | $47 |
| | 2 | $48 | $49 | $4A | $4B | $4C | $4D | $4E | $4F |

Reception:
- The above program change Nos. are accepted. Other Nos. are ignored.

### 3.4 Pitch Bend

- It is possible to set transmission/reception on/off by the utility pitch bend on/off.

Transmission:
- Transmitted at 7-BIT resolution.

Reception:
- Operates by 7 BIT on the MSB side only. The LSB side is ignored.

### 3.5 After Touch

- It is possible to set transmission/reception on/off by the utility after touch on/off.

Channel mode message

Reception:
- With the following codes, receive is possible in each of the voice and multi modes and the corresponding channel process is performed.
  Not accepted if OMNI ON, however.
  The NOTE OFF process is restricted to the MIDI input NOTE only.
  ALL NOTE OFF $Bn, $7B, $00
  RESET ALL CONTROLLER $Bn, $79, $00

## (4) System Common Message

- At statuses $F1~$F6, nothing is done.
- At status $F7, "END OF SYSTEM EXCLUSIVE".

## (5) System Realtime Message

Transmission:
- $FE is transmitted about every 270 msec.

Reception:
- If no signal comes from MIDI for about 300 msec or more after once receiving $FE, the MIDI receive buffer is cleared and the MIDI KEY ON is turned OFF.

## (6) System Exclusive Messages

### 4.1 1 VOICE BULK DUMP

Transmission:
The voice data set by input is transmitted.

Reception:
The received data is saved in the voice edit buffer.

Format:

```
$F0   %11110000   Status
$43   %01000011   Yamaha
$0n   %0000nnnn   n=Receive or Transmit channel
$7E   %01111110
$06   %0nnnnnnn   BYTE Count (MSB)
$21   %0nnnnnnn   BYTE Count (LSB)
$50   %01010000   ASCII 'P      ┐
$4B   %01001011   ASCII 'K      │
$20   %00100000   ASCII '_      │
$20   %00100000   ASCII '_      │  Byte count shows this area.
$32   %00110010   ASCII '2      │
$32   %00110010   ASCII '2      │
$30   %00110000   ASCII '0      │
$33   %00110011   ASCII '3      │
$41   %01000001   ASCII 'A      │
$45   %01000101   ASCII 'E      │
$dd   %0ddddddd ─┐              │
 |        |     1 VOICE DATA    │
$dd   %0ddddddd ─┘              ┘
$ee   %0eeeeeee   CHECK SUM
$F7   %11110111   EOX
```

### 4.2 ALL V/M BULK DUMP

Transmission:
All the internal voice and multi data is transmitted.

Reception:
The received data is internally saved.

Format:

```
$F0   %11110000   Status
$43   %01000011   Yamaha
$0n   %0000nnnn   n=Receive or Transmit channel
$7E   %01111110
$18   %0nnnnnnn   BYTE Count (MSB)
$66   %0nnnnnnn   BYTE Count (LSB)
$50   %01010000   ASCII 'P      ┐
$4B   %01001011   ASCII 'K      │
$20   %00100000   ASCII '_      │
$20   %00100000   ASCII '_      │  Byte count shows this area.
$32   %00110010   ASCII '2      │
$32   %00110010   ASCII '2      │
$30   %00110000   ASCII '0      │
$33   %00110011   ASCII '3      │
$56   %01010110   ASCII 'V      │
$4D   %01001101   ASCII 'M      │
$dd   %0ddddddd ─┐              │
 |        |     VOICE DATA      │
$dd   %0ddddddd ─┘ (00~03)      ┘
$ee   %0eeeeeee   CHECK SUM
-----100 msec WAIT-------------------------------------------------
$18   %0nnnnnnn   BYTE Count (MSB)
$5C   %0nnnnnnn   BYTE Count (LSB)
$dd   %0ddddddd ─┐
 |        |     VOICE DATA
$dd   %0ddddddd ─┘ (04~07)
$ee   %0eeeeeee   CHECK SUM
-----100 msec WAIT-------------------------------------------------
Voice data is transmitted as divided per 4 timbres as shown above.
A time interval of a minimum of 100 msec is always allocated
between them.
-----100 msec WAIT-------------------------------------------------
$09   %0nnnnnnn   BYTE Count (MSB)
$00   %0nnnnnnn   BYTE Count (LSB)
$dd   %0ddddddd ─┐
 |        |     MULTI DATA
$dd   %0ddddddd ─┘ (00~15)
$ee   %0eeeeeee   CHECK SUM
$F7   %11110111   EOX
```

### 4.3.1 VOICE BULK REQUEST

Reception:
The request signal of the above Item 4.1. However, the data transmitted by this request is the timbre No. sounded at VOICE instead of being the one set as specified in Item 4.1.

Format:

```
$F0   %11110000   Status
$43   %01000011   Yamaha
$2n   %0010nnnn   n=Receive channel
$7E   %01111110
$50   %01010000   ASCII 'P
$4B   %01001011   ASCII 'K
$20   %00100000   ASCII '_
$20   %00100000   ASCII '_
$32   %00110010   ASCII '2
$32   %00110010   ASCII '2
$30   %00110000   ASCII '0
$33   %00110011   ASCII '3
$41   %01000001   ASCII 'A
$45   %01000101   ASCII 'E
$F7   %11110111   EOX
```

### 4.4 ALL V/M BULK REQUEST

Reception:
The request signal of the above Item 4.2.

Format:

```
$F0   %11110000   Status
$43   %01000011   Yamaha
$2n   %0010nnnn   n=Receive channel
$7E   %01111110
$50   %01010000   ASCII 'P
$4B   %01001011   ASCII 'K
$20   %00100000   ASCII '_
$20   %00100000   ASCII '_
$32   %00110010   ASCII '2
$32   %00110010   ASCII '2
$30   %00110000   ASCII '0
$33   %00110011   ASCII '3
$56   %01010110   ASCII 'V
$4D   %01001101   ASCII 'M
$F7   %11110111   EOX
```

YAMAHA [ Digital synthesizer ] Date : 1/07 1990
Model SY22 MIDI Implementation Chart Version : 1.0

| Function | | Transmitted | Recognized | Remarks |
|---|---|---|---|---|
| Basic | Default | 1-16 | 1-16 | memorized |
| Channel | Changed | 1-16 | 1-16 | |
| Mode | Default | 3 | 1, 3 | memorized |
| | Messages | X | X | |
| | Altered | ********** | X | |
| Note Number | | 36-96 | 0 -127 | |
| | True voice | ********** | 19-114 | |
| Velocity | Note on | O 9nH,v=1-127 | O v=1-127 | |
| | Note off | X 9nH,v=0 | X | |
| After Touch | Key's | X | X | |
| | Ch's | O *3 | O *3 | |
| Pitch Bender | | O *2 | O 0-12 semi *2 | 7bit resolution |
| Control Change | 1 | O *1 | O *1 | Modulation wheel |
| | 7 | X *1 | O *1 | Volume |
| | 16 | O *1 | O *1 | Vector control X |
| | 17 | O *1 | O *1 | Vector control Y |
| | 64 | O *1 | O *1 | Sustain |
| Program Change | | O 0-79 | O 0-79 | |
| | True # | ********** | 0-79 | |
| System Exclusive | | O *4 | O *4 | |
| System Common | Song Pos | X | X | |
| | Song Sel | X | X | |
| | Tune | X | X | |
| System Real Time | Clock | X | X | |
| | Commands | X | X | |
| Aux Mes- sages | Local ON/OFF | X | X | |
| | All Notes OFF | X | O (123) | |
| | Active Sense | O | O | |
| | Reset | X | X | |

Notes : *1 = transmit/recive if control change sw is on.
*2 = transmit/recive if pitch bend sw is on.
*3 = transmit/recive if after touch sw is on.
*4 = transmit/recive if exclusive sw is on.

Mode 1 : OMNI ON, POLY Mode 2 : OMNI ON, MONO O : Yes
Mode 3 : OMNI OFF, POLY Mode 4 : OMNI OFF, MONO X : No

# IMPORTANT
# SAFETY AND INSTALLATION INSTRUCTIONS

## INFORMATION RELATING TO POSSIBLE PERSONAL INJURY, ELECTRIC SHOCK, AND FIRE HAZARD POSSIBILITIES HAS BEEN INCLUDED IN THIS LIST.

WARNING — When using electronic products, basic precautions should always be followed, including the following:

1. Read all Safety and Installation Instructions, Supplemental Marking and Special Message Section data, and any applicable assembly instructions BEFORE using this product.
2. Check unit weight specifications BEFORE you attempt to move this product.
3. Main power supply verification. Yamaha Digital Musical Instrument products are manufactured specifically for use with the main supply voltage used in the area where they are to be sold. The main supply voltage required by these products is printed on the name plate. For name plate location please refer to the graphic in the Special Message section. If any doubt exists please contact the nearest Yamaha Digital Musical Instrument retailer.
4. Some Yamaha Digital Musical Instrument products utilize external power supplies or adapters. Do NOT connect products of this type to any power supply or adapter other than the type described in the owners manual or as marked on the unit.
5. This product may be equipped with a plug having three prongs or a polarized line plug (one blade wider than the other). If you are unable to insert the plug into the outlet, contact an electrician to have the absolete outlet replaced. Do NOT defeat the safety purpose of the plug. Yamaha products not having three prong or polarized line plugs incorporate construction methods and designs that do not require line plug polarization.
6. WARNING — Do NOT place objects on the power cord or place the unit in a position where any one could walk on, trip over, or roll anything over cords of any kind. An improper installation of this type can create the possibility of a fire hazard and/or personal injury.
7. Environment: Your Yamaha Digital Musical Instrument should be installed away from heat sources such as heat registers and/or other products that produce heat.
8. Ventilation: This product should be installed or positioned in a way that its placement or location does not interfere with proper ventilation.
9. Yamaha Digital Musical Instrument products are frequently incorporated into "Systems" which are assembled on carts, stands, or in racks. Utilize only those carts, stands, or racks that have been designed for this purpose and observe all safety precautions supplied with the products. Pay special attention to cautions that relate to proper assembly, heavier units being mounted at the lower levels, load limits, moving instructions, maximum usable height and ventilation.
10. Yamaha Digital Musical Instrument products, either alone or in combination with amplification, headphones, or speakers, may be capable of producing sound levels that could cause permanent hearing loss. Do NOT operate at high volume levels or at a level that is uncomfortable. If you experience any discomfort, ringing in the ears, or suspect any hearing loss, you should consult an audiologist.
11. Do NOT use this product near water or in wet environments. For example, near a swimming pool, spa, in the rain, or in a wet basement.
12. Care should be taken so that objects do not fall, and liquids are not spilled into the enclosure.
13. Yamaha Digital Musical Instrument products should be serviced by a qualified service person when:
    a. The power supply/power adapter cord or plug has been damaged; or
    b. Objects have fallen, or liquid has been spilled into the product; or
    c. The unit has been exposed to rain; or
    d. The product does not operate, exhibits a marked change in performance; or
    e. The product has been dropped, or the enclosure of the product has been damaged.
14. When not in use, always turn your Yamaha Digital Musical Instrument equipment "OFF". The power supply cord should be unplugged from the outlet when the equipment is to be left unused for a long period of time. NOTE: In this case, some units may lose some user programmed data. Factory programmed memories will not be affected.
15. Electromagnetic Interference (RFI). Yamaha Digital Musical Instruments utilize digital (high frequency pulse) technology that may adversely affect Radio/TV reception. Please read FCC Information (rear cover) for additional information.
16. Do NOT attempt to service this product beyond that described in the user maintenance section of the owners manual. All other servicing should be referred to qualified service personnel.

# PLEASE KEEP THIS MANUAL FOR FUTURE REFERENCE!

This information on safety is provided to comply with U.S.A. laws, but should be observed by users in all countries.

# SPECIAL MESSAGE SECTION

ELECTROMAGNETIC INTERFERENCE (RFI): Your Yamaha Digital Musical Instrument Proapplicable regulations. However, if it is Installed in the immediate proximity of other electronic devices, some form of interference may occur. For additional RFI information see FCC Information section located in this manual.

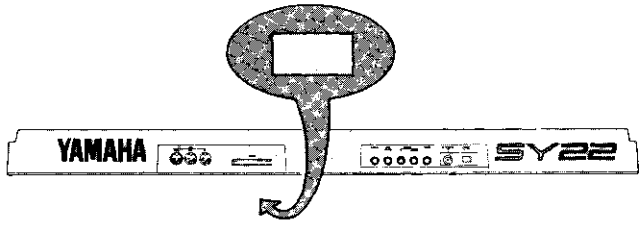
IMPORTANT NOTICE: This product has been tested and approved by independent safety testing laboratories in order that you may be sure that when it is properly installed and used in its normal and customary manner, all foreseeable risks have been eliminated. DO NOT modify this unit or commission others to do so unless specifically authorized by Yamaha. Product performance and/or safety standards may be diminished. Claims filed under the expressed warranty may be denied if the unit is/has been modified. Implied warranties may also be affected.

SPECIFICATIONS SUBJECT TO CHANGE: The information contained in this manual is believed to be correct at the time of printing. Yamaha reserves the right to change or modify specifications at any time without notice or obligation to update existing units.

NOTICE: Service charges incurred due to a lack of knowledge relating to how a function or effect works (when the unit is operating as designed), are not covered by the manufacturer's warranty. Please study this manual carefully before requesting service.

NAMEPLATE LOCATION: The graphic below indicates the location of the Name Plate on your Yamaha Digital Musical Instrument. The Model, Serial Number, Power requirements, etc., are Indicated on this plate.

You should note the model, serial number and the date of purchase in the spaces provided below and retain this manual as a permanent record of your purchase.




STATIC ELECTRICITY CAUTION: Some Yamaha Digital Musical Instrument products have modules that plug into the unit to perform various function. The contents of a plug-in module can be altered/damaged by static electricity discharges. Static electricity build-ups are more likely to occur during cold winter months (or in areas with very dry climates) when the natural humidity is low. To avoid possible damage to the plug-in module, touch any metal object (a metal desk lamp, a door knob, etc.) before handling the module, If static electricity is a problem in your area, you may want to have your carpet treated with a substance that reduces static electricity build-up. See your local carpet retailer for professional advice that relates to your specific situation.

Model _____

Serial No. _____

Purchase Date _____

This information on safety is provided to comply with U.S.A. laws, but should be observed by users in all countries.

## FCC INFORMATION

While the following statements are provided to comply with FCC Regulations in the United States, the corrective measures listed below are applicable worldwide.

This series of Yamaha professional music equipment uses frequencies that appear in the radio frequency range and if installed in the immediate proximity of some types of audio or video devices (within three meters), interference may occur. This series of Yamaha professional music equipment has been type tested and found to comply with the specifications set for a class B computing device in accordance with those specifications listed in subpart J of part 15 of the FCC rules. These rules are designed to provide a reasonable measure of protection against such interference. However, this does not guarantee that interference will not occur. If your professional music equipment should be suspected of causing interference with other electronic devices, verification can be made by turning your professional music equipment off and on. If the interference continues when your equipment is off, the equipment is not the source of interference. If your equipment does appear to be the source of the interference, you should try to correct the situation by using one or more of the following measures:

Relocate either the equipment or the electronic device that is being affected by the interference. Utilize power outlets for the professional music equipment and the device being affected that are on different branch (circuit breaker of fuse) circuits, or install AC line filters.

In the case of radio or TV interference, relocate the antenna or, if the antenna lead-in is 300 ohm ribbon lead, change the lead-in to co-axial type cable.

If these corrective measures do not produce satisfactory results, please contact your authorized Yamaha professional products dealer for suggestions and/or corrective measures.

If you cannot locate a franchised Yamaha professional products dealer in your general area contact the Electronic Service Division, Yamaha Corporation of America, 6600 Orangethorpe Ave., Buena Park, CA 90620, U.S.A.

If for any reason, you should need additional information relating to radio or TV interference, you may find a booklet prepared by the Federal Communications Commission helpful: "How to Identify and Resolve Radio-TV Interference Problems". This booklet is available from the U.S. Government Printing Office, Washington D.C. 20402 – Stock No. 004-000-00345-4.

**SERVICE**

This product is supported by YAMAHA's worldwide network of factory trained and qualified dealer service personnel. In the event of a problem, contact your nearest YAMAHA dealer.

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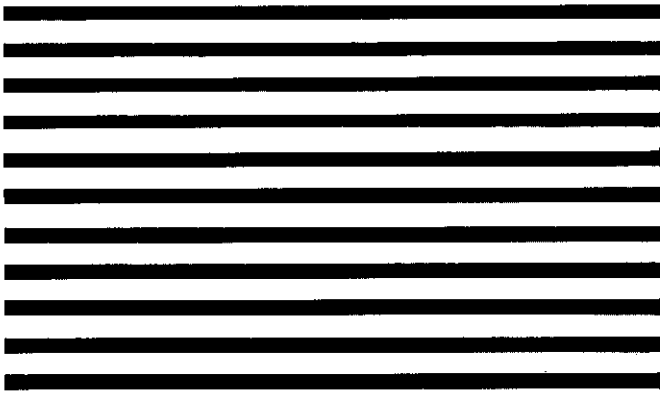

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