YAMAHA

MUSIC SYNTHESIZER

SY35



GETTING STARTED MANUAL

Congratulations!

Your SY35 Music Synthesizer offers extraordinary musical versatility and control with a "vector synthesis" system than combines 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 SY35 keyboard features both velocity sensitivity and after-touch response that can be assigned to a number of musical parameters. The more you play the SY35, 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 — all in an extended waveform ROM for superior sound quality — provide an extensive library of sonic "building blocks" from which to create new voices.
- 64 preset voices plus 64 editable internal voice memory locations containing an additional 64 voices.
- 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, layered multi-voice performance, and split keyboard effects.
- 16 preset multi-play setups plus 16 editable internal multi-play memory locations containing an additional 16 multi-play setups.
- 16 internal digital effects including reverb and 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

Getting Started Manual

Precautions....3

About the Manuals....5
- The Getting Started Manual....5
- Icons....6
- The Feature Reference Manual....7

The Controls & Connectors....8
- Front Panel....8
- Rear Panel....12

1. Setting Up Your System....14
   - Connections....14
   - Power-on Procedure....14
   - Play the Demo....15

2. Selecting And Playing Voices....16
   - Play the Presets....16
   - The PRESET, INTERNAL, and CARD Voice Memories....19
   - Overlapping Voice Selection....20

3. Vectors....21
   - Manual Vector Control....21
   - How the VECTOR CONTROL Works....22
   - Advanced Control: Dynamic Vectors....24
   - Try Out the SE∗Elect Dynamic Vector....24
   - Recording An Original Dynamic Vector....25
   - Store Your Voice & Vector In INTERNAL Memory....28
   - For More Detailed Vector Control ….....30

4. Instant Voice Programming....31
   - For Serious Voice Editing ….....33

5. The Multi Mode....34
   - Try Out the Preset Multi Setups....34
   - When You Want To Create an Original Multi ….....37
   - The INTERNAL and CARD Memories....37
   - Multi Polyphony & Dynamic Voice Allocation....37
   - Using the [STORE] Key to Store Voices and Multi Setups in INTERNAL or CARD Memory....38
   - Conclusion....40

Glossary....41

Index....44

Getting Started Manual

Precautions

!! PLEASE READ THIS BEFORE PROCEEDING !!

1. AVOID EXCESSIVE HEAT, HUMIDITY, DUST AND VIBRATION	Keep the SY35 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 SY35 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 SY35 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 SY35 (the correct INPUT voltage is marked on the adaptor).
8. ELECTRICAL INTERFERENCE	Since the SY35 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 SY35 further away from the affected equipment.
9. MIDI CABLES	When connecting the SY35 to MIDI equipment, be sure to use high-quality cables made especially for MIDI data transmission. Also avoid cables longer than about 15 meters, as longer cables can pick up electrical noise that can causes data errors.

10. MEMORY BACKUP

The SY35 contains a special backup battery that will retain the contents of the internal RAM memory for up to approximately five years from the date of manufacture. When the battery finally fails the contents of the RAM memory will be lost, so we recommend that you make regular backup copies of important data by transferring the data to external memory cards (see page 41 of the Feature Reference manual for information on card data storage). For even greater security (memory card data can be lost due to battery failure, accidental erasure, etc.) save your data to floppy disk via a MIDI data filer unit such as the Yamaha MDF2.

Have the backup battery replaced by qualified Yamaha service personnel (see your Yamaha dealer) after approximately 5 years.

IMPORTANT!: Yamaha cannot be held responsible for data loss caused by backup failure or improper operation of the SY35!

11. THIRD-PARTY SOFTWARE

Yamaha can not take any responsibility for software produced for this product by third-party manufacturers. Please direct any questions or comments about such software to the manufacturer or their agents.

About the Manuals

The SY35 comes with two manuals — Getting Started and Feature Reference.

● The Getting Started Manual (this manual)

In addition to an overview of the SY35 controls and connectors (page 8), the Getting Started manual contains five separate tutorials that take you step-by-step through the main procedures you will need to know to become familiar with your SY35:

1. Setting Up Your System [Page 14]
   Basic system connections.

2. Selecting And Playing Voices [Page 16]
   Selecting and playing voices from the PRESET, INTERNAL and CARD voice banks.

3. Vectors [Page 21]
   Using and understanding manual and dynamic vectors.

4. Instant Voice Programming [Page 31]
   The fast way to create an unlimited range of new voices for the SY35.

5. The Multi Mode [Page 34]
   Play several voices simultaneously, or control multiple SY35 voices from an external MIDI sequencer.

We recommend that you go through the tutorials in sequence while actually carrying out procedures on your SY35. Once you've gone through the entire TUTORIALS section in this way, you should be familiar enough with the SY35 to need only the Feature Reference manual in future.

• Icons

The following simple icons are used throughout the Getting Started manual to draw attention to important points and information where necessary. The icons also make it easier to differentiate between information that you should read immediately and information that can be skipped until later, hopefully helping you to become familiar with the SY35 in the quickest, most efficient manner possible.



This icon warns of possible hardware damage, software malfunction, or any other serious problem that may occur due to improper operation or set up.



This icon marks information that you *must read* — i.e. important steps or procedures that are essential for proper, efficient, or easy operation.



The magnifying-glass icon indicates information that may not be essential for general operation, but is a more detailed explanation of a feature, a description of the principle involved, etc. You can skip this information if full details are not required immediately.



Suggestions as to how a feature or function can be applied musically are identified by this icon.



Hints or ideas that are not specifically musical but may make operation easier or more interesting are marked by the light-bulb icon.

● The Feature Reference Manual

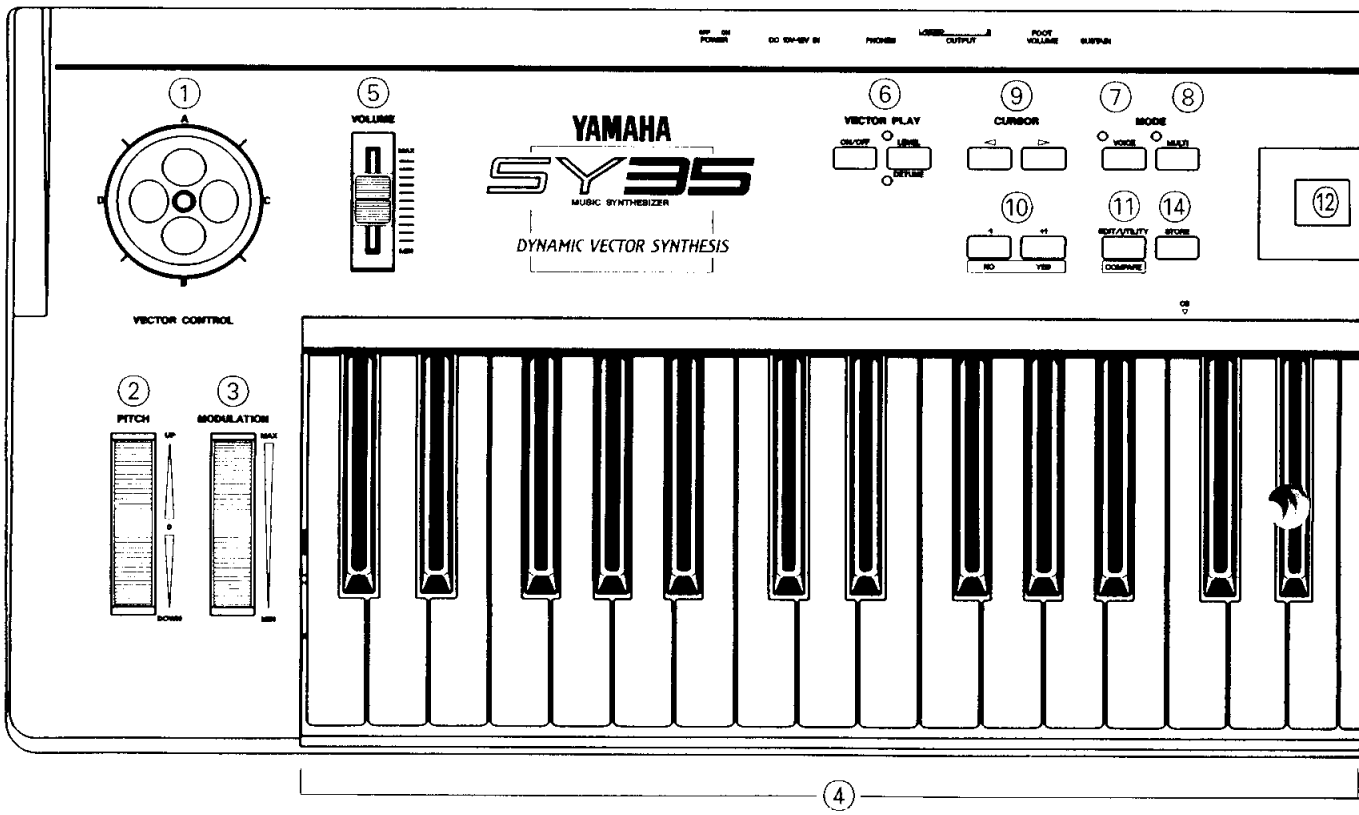
The Feature Reference manual is the “nuts and bolts” reference for the SY35, individually describing its many functions in detail. The Feature Reference manual is divided into eight main sections, each describing the various functions within a particular SY35 edit or utility mode.

1. VOICE COMMON [Page 3]
2. VOICE VECTOR [Page 9]
3. ELEMENT TONE [Page 15]
4. ELEMENT ENVELOPE [Page 25]
5. MULTI [Page 33]
6. UTILITY SETUP [Page 39]
7. UTILITY RECALL [Page 47]
8. UTILITY MIDI [Page 51]

Once you have become familiar with the way the SY35 works by going through the Getting Started manual, you should only need to refer to the Feature Reference manual 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 section of the Feature Reference manual 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.

■ Front Panel



① VECTOR CONTROL

This is the key to SY35'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 real-time recording of dynamic level and detune vectors.

➲ Getting Started: page 21...30.
Feature Reference: page 9...13.

② [PITCH BEND] Wheel

This self-centering pitch wheel allows smooth upward and downward pitch bends.

➲ Getting Started: page 19.
Feature Reference: page 6, 55.

③ [MODULATION] Wheel

Can be assigned to apply pitch and/or amplitude modulation for a range of expressive effects.

➲ Getting Started: page 19.
Feature Reference: page 6.

④ Keyboard

The SY35 keyboard is both velocity and after-touch sensitive for broad, intimate expressive control.

➲ Feature Reference: page 7, 20, 21, 55.

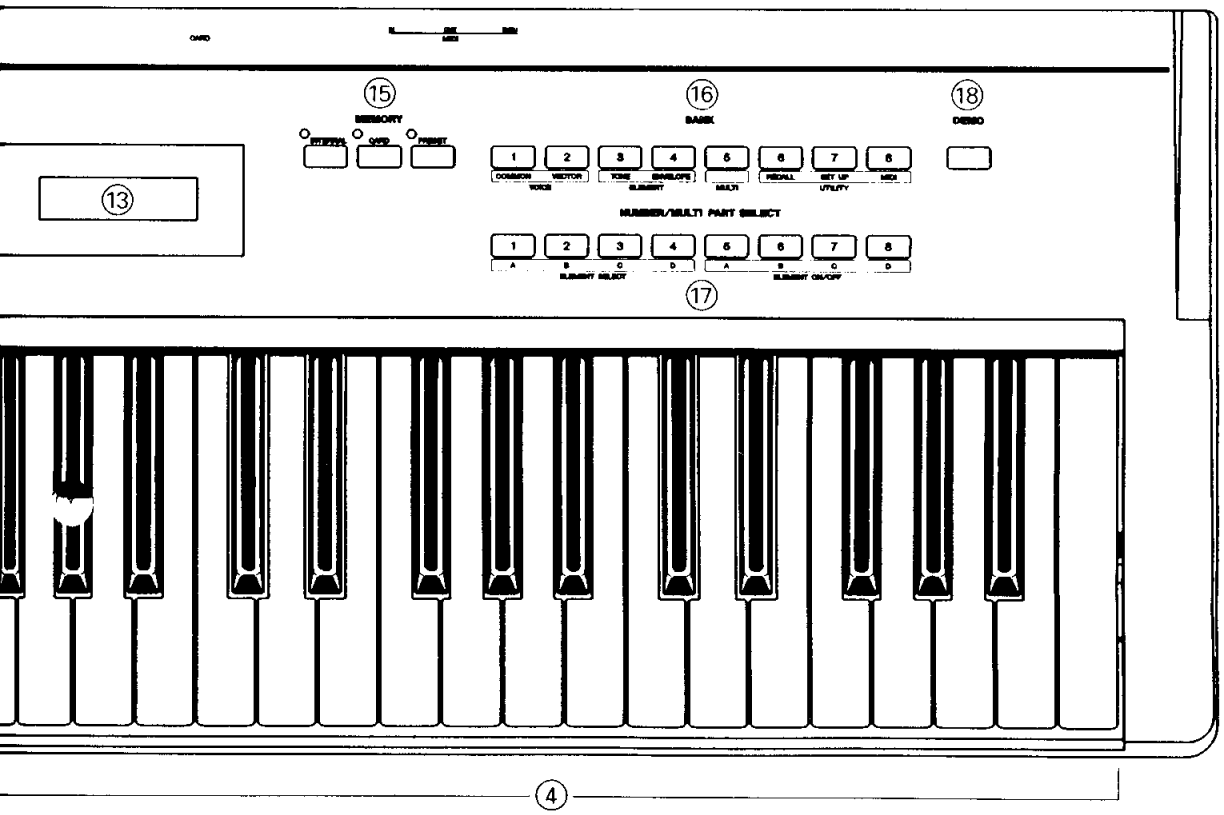
⑤ VOLUME Control

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.

➲ Getting Started: page 21, 22.



⑦ **[VOICE] Key & Indicator**
Selects the normal voice play mode in which any of the SY35's preset, internal or card voices can be played via the keyboard or other controller connected to the MIDI IN connector.

➲ Getting Started: page 16.

⑧ **[MULTI] Key & Indicator**
Selects the MULTI 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.

➲ Getting Started: page 34.

⑨ **[◁] and [▷] Cursor Keys**
Move the screen cursor from parameter to parameter in many of the SY35 editing functions.

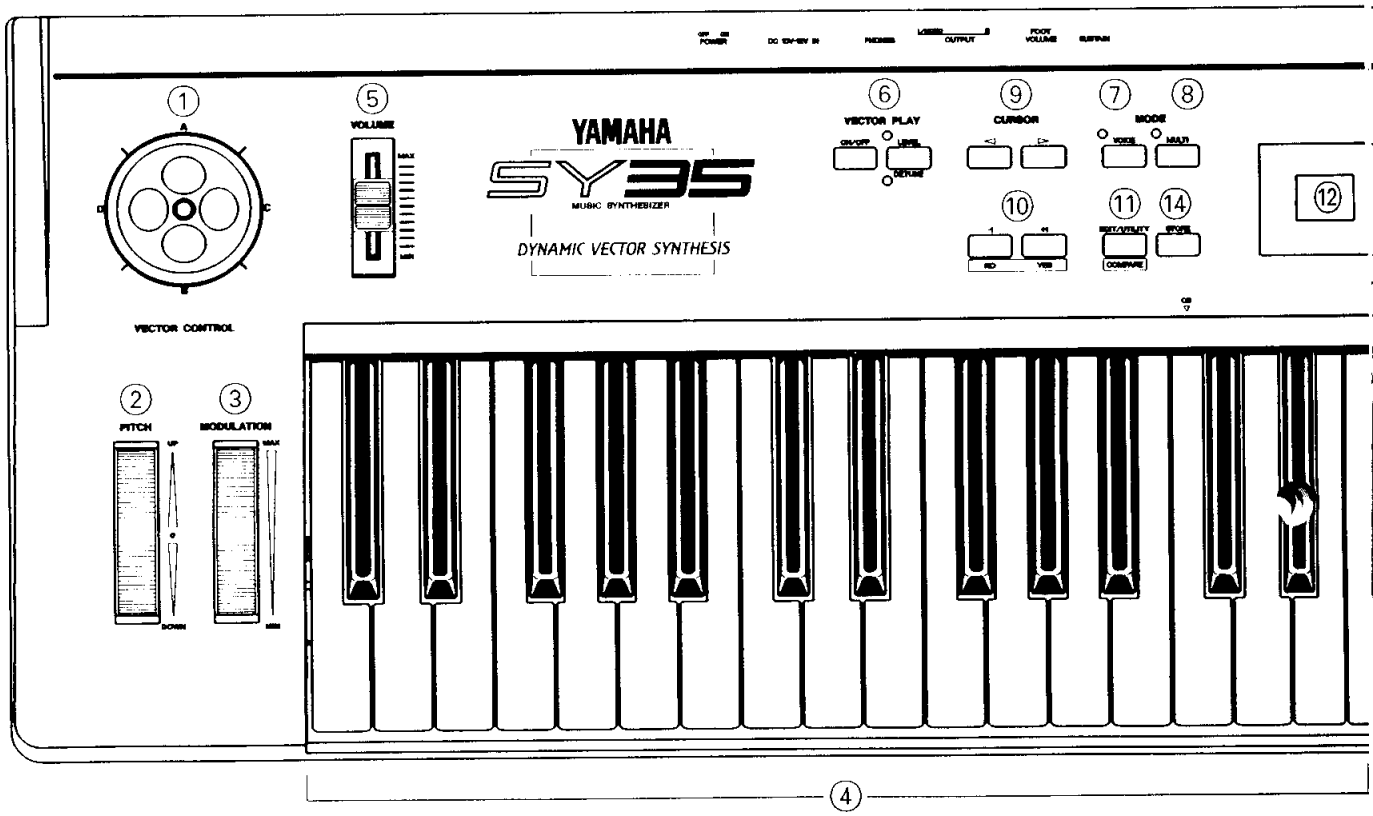
➲ Getting Started: page 26.

⑩ **[–1/NO] and [+1/YES] Keys**
Can be used to select voices and multi setups, and are used to edit parameter values in any of the SY35 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.

➲ Getting Started: page 17.

⑪ **[EDIT/UTILITY/COMPARE] Key**
Accesses the SY35'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.

➲ Getting Started: page 25.
Feature Reference: page 4.



⑫ **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.

➲ Getting Started: page 17.

⑬ **Liquid Crystal Display Panel**

This 16-character × 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.

➲ Getting Started: page 17.

⑭ **[STORE] Key**

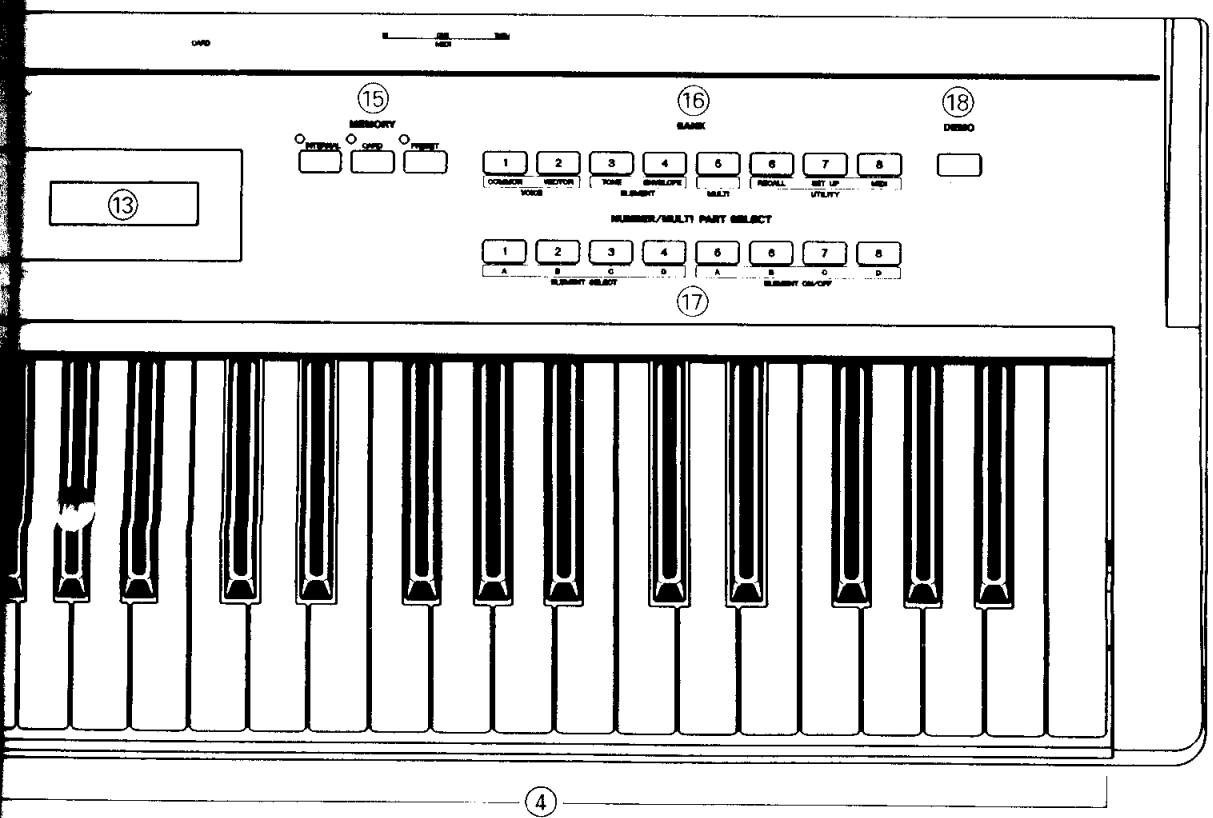
Used to store edited data to an internal or card memory location.

➲ Getting Started: page 38.

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.

➲ Getting Started: page 19, 20.



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).

➲ Getting Started: page 17, 37.
Feature Reference: page 4.

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 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).

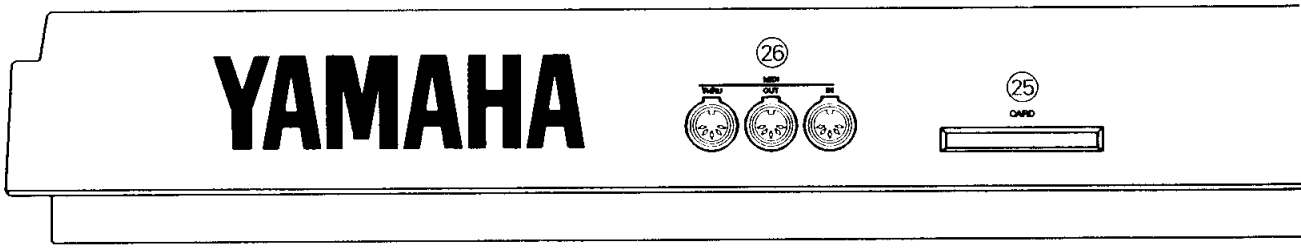
➲ Getting Started: page 17, 34.
Feature Reference: page 16, 26.

⑱ **[DEMO] Key**

Activates the SY35 built-in demonstration — a great way to hear what the SY35 can do after you set up your system.

➲ Getting Started: page 15.

■ REAR PANEL



⑲ 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 SY35 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.



Do not attempt to use a different AC adaptor to power the SY35. The use of an incompatible adaptor may cause irreparable damage to the SY35, and might pose a serious shock hazard!

➲ Getting Started: page 14.

⑳ [POWER] Switch

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

➲ Getting Started: page 14.

㉑ PHONES Jack

Accepts a standard pair of stereo headphones (1/4" stereo phone plug) for headphone monitoring of the SY35 sound without the need for external amplification equipment.

㉒ OUTPUT R and L/MONO Jacks

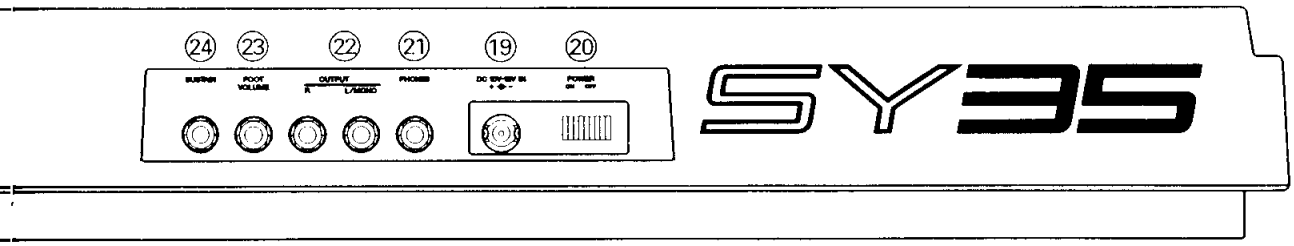
These are the main stereo outputs from the SY35. If a plug is inserted only into the L/MONO jack, the left and right-channel signals are combined and delivered via this jack (for connection to a monaural sound system).

➲ Getting Started: page 14.

㉓ FOOT VOLUME Jack

An optional Yamaha FC7 foot controller connected here can be used for volume control.

➲ Getting Started: page 14.



㉔ SUSTAIN Jack

An optional Yamaha FC4 or FC5 footswitch can be connected here for press-on/release-off sustain control.

➲ Getting Started: page 14.

㉕ CARD Slot

The CARD slot accepts Yamaha MCD64 or MCD32 Memory Cards for storage and retrieval of SY35 voices.

➲ Getting Started: page 20. Feature Reference: page 41.

㉖ 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 SY35. The MIDI THRU connector simply re-transmits the data received at the MIDI IN connector, allowing convenient chaining of MIDI devices. The MIDI OUT connector transmits data corresponding to all SY35 performance operations, or bulk data when one of the MIDI voice data transmission functions are activated.

➲ Feature Reference: page 51...56.

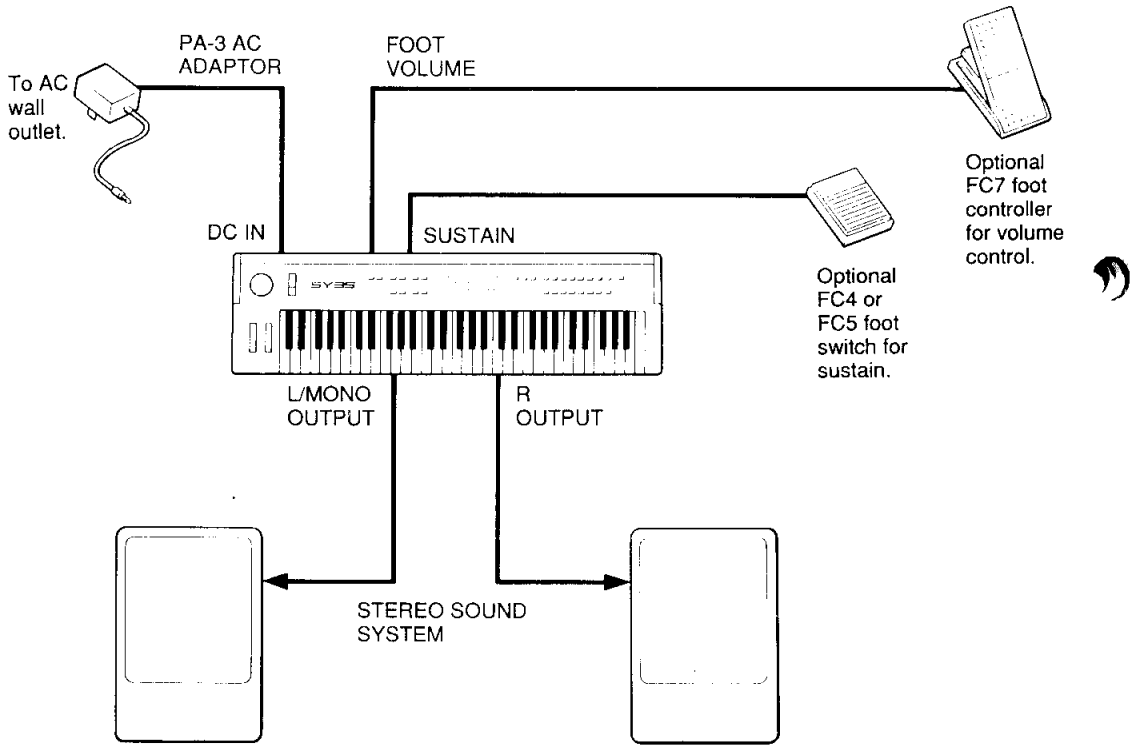
1. Setting Up Your System

Connections

The diagram below shows the basic connections in a setup using only the SY35 and a stereo sound system.

CAUTION!

Make sure that both the SY35 and your sound system are turned OFF when making connections.



Power-on Procedure

Believe it or not, there's actually a "right" way to turn on a sound system that will minimize the possibility of damage to the equipment (and your ears!).

1. Make sure your sound system's volume control and the SY35 volume control are turned all the way down prior to turning power on.
2. Turn on the SY35.
3. Turn on the sound system.
4. Raise the sound system volume to a reasonable level.
5. Gradually raise the SY35 VOLUME control while playing the keyboard to set the desired listening level.

IMPORTANT

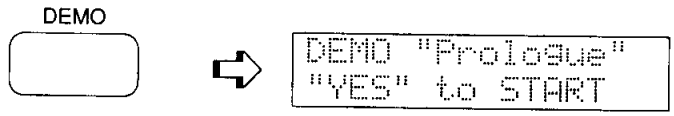
The SY35 automatically transmits MIDI control change data corresponding to its control status when its power switch is turned ON or OFF. This can interfere with operation of other MIDI equipment connected to the SY35 MIDI OUT connector. If the SY35 is connected to other MIDI equipment, the SY35 power switch should be turned ON first, *and turned OFF* last.

Play the Demo

The SY35 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:

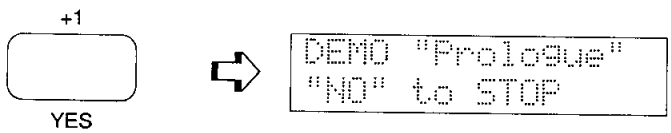
1 Press [DEMO] Key

Press the [DEMO] key. "Yes to Start" will appear on the LCD display.



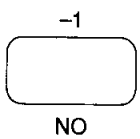
2 [+1/YES] to Start the Demo

Press the [+1/YES] key to start demo playback. "No to Stop" will appear on the LCD display. The demonstration will play continuously.



3 [–1/NO] to Stop the Demo

Press the [–1/NO] key when you want to stop demo playback.



2. Selecting And Playing Voices

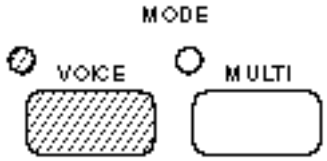
The first thing you'll want to do with your SY35 is select and play some of its outstanding voices … this section will show you how to do just that. We'll also look at the overall SY35 voice memory configuration.

Play the Presets

Although the SY35 can access three different voice memories — PRESET, INTERNAL, and CARD — let's begin by selecting and playing some of the preset voices.

1 Select the Voice Play Mode

If the MODE [VOICE] key indicator is lit, then the Voice Play mode is already selected and you can go directly to the next step. If it isn't, press the [VOICE] key to select it.



The words "VOICE PLAY" also appear on the top line of the LCD panel when the Voice Play mode is selected.

```
VOICE  PLAY
P11  AP:Rock
```

2 Select the PRESET Voice Memory

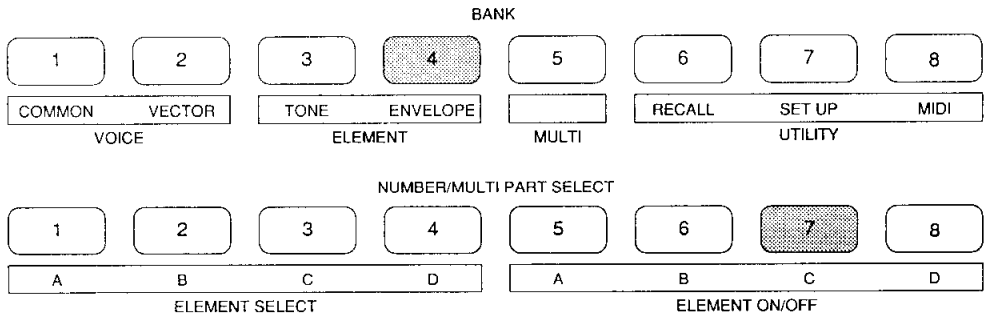
If the MEMORY [PRESET] key indicator is already lit, then the PRESET voice memory is already selected and you can go straight to the next step. If it isn't, press the [PRESET] key to select it.



3 Select a Voice

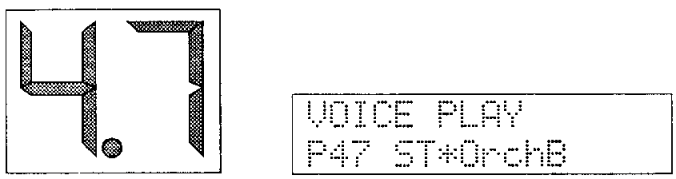
The SY35's 64 preset voices are organized into 8 banks of 8 voices each (8 × 8 = 64). Any voice can be selected by specifying its bank using the BANK keys, and its number using the NUMBER/MULTI PART SELECT keys.

To select voice bank 4 number 7, for example, press the BANK [4] key and NUMBER/MULTI PART SELECT [7] key — in any order.



Voice numbers are displayed on the LCD in the same way. "P25," 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.

After selecting voice bank 4, number 7, 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

Try playing the selected voice on the keyboard. Select a number of different voices and try them out.



The SY35 INTERNAL memory initially contains an additional 64 voices that you can select and play in the same way. Press the [INTERNAL] key and then select any of the 64 internal voices in the same way as described in step 3, above. The following is a list of the PRESET and INTERNAL voices.

PRESET VOICE LIST

No.	Voice Name	No.	Voice Name	No.	Voice Name	No.	Voice Name
11	AP:Rock	31	BR:Trmpt	51	BA:Wood	71	PL:Gypsy
12	AP:Clsic	32	BR:Mute	52	BA:Frtls	72	PL:Folk
13	AP∗Chors	33	BR:Tromb	53	BA∗Slap	73	PL∗Wide
14	AP:HTonk	34	BR:Flugl	54	BA:Fingr	74	PL∗Mute
15	AP:Soft	35	BR:FrHrn	55	BA:Pick	75	PL:Rock
16	AP∗Pf&St	36	BR∗Sect1	56	BA:Synth	76	PL∗Dist
17	AP:Blend	37	BR∗Sect2	57	BA:Tchno	77	PL:Chrng
18	AP∗Bell	38	BR∗Fanfr	58	BA:Groov	78	PL:Sitar
21	EP∗Tine	41	ST∗Arco1	61	WN:Sax	81	CH∗Pure
22	EP:Light	42	ST:Arco2	62	WN:Flute	82	CH∗Itopy
23	EP:Old	43	ST:Cello	63	WN:Clari	83	CH∗Uhh--
24	EP∗Malet	44	ST∗SlwAt	64	WN:Oboe	84	CH∗Angel
25	KY∗Clav1	45	ST∗Pizz	65	WN∗PanFl	85	CH∗Bell
26	KY:Clav2	46	ST∗Treml	66	WN∗SaxEm	86	CH∗Snow
27	KY:Celst	47	ST∗OrchB	67	WN∗Ensmb	87	CH∗Vcodr
28	KY:Hrpsi	48	ST∗OrchS	68	WN∗Orch	88	CH∗Marin

INTERNAL VOICE LIST

No.	Voice Name	No.	Voice Name	No.	Voice Name	No.	Voice Name
11	SP∗Warm	31	SL∗Saw	51	BR∗Punch	71	ME∗Wide!
12	SP∗Resnc	32	SL:Squar	52	BR∗Power	72	ME∗Drama
13	SP∗Full!	33	SL∗Sync	53	BR∗Fat	73	ME∗SlwSg
14	SP∗Bell	34	SL∗Power	54	BR:Lite	74	ME∗Grand
15	SP∗Filtr	35	SL∗Whstl	55	ST∗Modrn	75	ME∗Typhn
16	SP∗Deep	36	SL∗2VCO	56	ST∗Soft	76	ME∗Tzone
17	SP∗Fog	37	SL∗Fat	57	ST∗Mild	77	ME∗Space
18	SP∗Dyna	38	SL∗AnaSy	58	ST:Lite	78	ME∗Memry
21	SC∗Dgcrd	41	OR:Tango	61	SE∗Hit	81	PC:Vibe
22	SC∗Elgnt	42	OR:Paris	62	SE∗Start	82	PC∗Marim
23	SC∗sFz<	43	OR∗Rock1	63	SE∗Who?	83	PC:M.Box
24	SC∗Coin	44	OR∗Rock2	64	SE∗Open	84	PC:Timp
25	SC∗Brash	45	OR∗Rock3	65	SE∗Emgsy	85	PC∗Batl
26	SC:Water	46	OR∗Cat	66	SE∗Elect	86	PC∗Human
27	SC∗Sand	47	OR∗Big	67	SE∗GoUp!	87	DR∗Auto
28	SC∗Reso	48	OR∗Combo	68	SE∗and>?	88	DR:Kit

Note that the voices are arranged in categories for easier access. For example, preset bank 1 contains acoustic piano voices, preset bank 2 contains electric piano and other keyboards, bank 3 is all brass, bank 4 is strings, and so on. The category of each voice is identified by a two-character prefix, as follows:

AP = Acoustic Piano	WN = Wind	OR = Organ
EP = Electric Piano	PL = Plucked	SE = Sound Effect
KY = Keyboard	CH = Chorus	ME = Musical Effect
BR = Brass	SP = Synth Pad	PC = Percussive
ST = Strings	SC = Synth Comp	DR = Drums
BA = Bass	SL = Synth Lead	

Also note that the delimiter which separates the category prefix from the voice name indicates whether the voice is a 2-element or 4-element type: colon (:) = 2-element voice, asterisk (*) = 4-element voice.

A more detailed voice list is provided in the Feature Reference manual appendix, on page 59.



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 SY35 VOLUME control is turned up to a reasonable level, and check all connections carefully.

5 **Try Out the Pitch Bend & Modulation Wheels**

While you're experimenting with the PRESET and INTERNAL voices, try out the PITCH BEND and MODULATION wheels to the left of the keyboard.

PITCH BEND WHEEL: Rolling the PITCH BEND wheel upward (away from you) will raise the pitch of notes played on the keyboard, while rolling the wheel in the opposite direction will lower the pitch. The PITCH BEND wheel is self-centering and will always return to center position (normal pitch) when released.



The maximum range of the PITCH BEND wheel can be set using the PITCH BEND function described on page 6 of the Feature reference manual.

MODULATION WHEEL: Rolling the MODULATION wheel upward (away from you) will increase the depth of the type of modulation set for the currently selected voice. The MODULATION wheel stays wherever it is set, so you can set it and leave it at any position that produces the desired modulation effect.

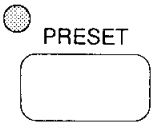


The MODULATION wheel can control both pitch and amplitude modulation, and the the type of modulation applied to each voice is determined by the settings of the voice's LFO AM and LFO PM parameters described on page 22 of the Feature Reference manual.

The PRESET, INTERNAL, and CARD Voice Memories

Now that you're familiar with the PRESET voices and how they're selected and played, let's look at the overall SY35 voice memory configuration.

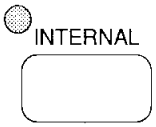
Voices played by the SY35 can come from three different sources: the PRESET voice memory, the INTERNAL voice memory, or a CARD voice memory. Any voice in any of these voice memories can be selected and played while the SY35 is in the VOICE PLAY mode. Simply press the [PRESET], [INTERNAL] or [CARD] MEMORY key, and then select the desired voice BANK and NUMBER as described in the preceding section.



When you press the MEMORY [PRESET] key you select the PRESET voice memory. 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".

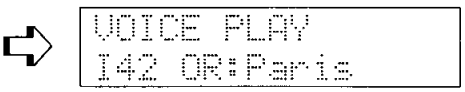
For example, PRESET bank 2, voice number 5 looks like this ...

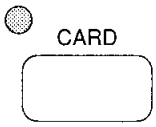




The INTERNAL voice memory is a RAM (Random Access Memory) area which initially contains 64 more voices that you can use "as-is" or edit to create variations or totally new voices. Voices in the INTERNAL memory can also be moved around and stored in different INTERNAL memory locations, or new voices can be loaded from an external memory card. The initial factory-set INTERNAL voices can be restored at any time by using the "Factory Voice Restore" function described on page 45 of the Feature Reference manual. The INTERNAL voice memory is represented on the display by the letter "I".

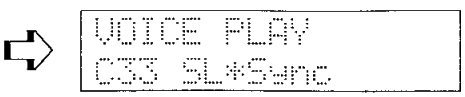
For example, INTERNAL bank 4, voice number 2 looks like this ...





The CARD memory is an optional Yamaha MCD64 or MCD32 Memory Card (or pre-programmed voice card) plugged into the SY35 CARD slot on the rear panel. Memory cards are convenient for external storage and transportation of voices 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. The CARD voice memory is represented on the display by the letter "C".

For example, CARD bank 3, voice number 3 looks like this ...





A properly formatted Yamaha MCD32 or MCD64 memory card (or an appropriate pre-programmed voice card) must be inserted in the rear-panel CARD slot before the CARD memory can be selected. If no memory card is present, the "Card not ready!" display will appear when you attempt to select the card voice memory.

Overlapping Voice Selection

The SY35 has been designed to allow overlapping voice selection. That is, if you select a new voice while holding notes on the keyboard, 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.

3. Vectors

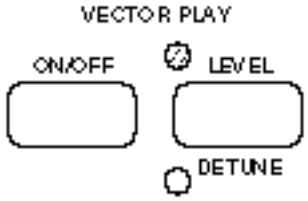
Vectors are a versatile musical tool. You can simply use the VECTOR CONTROL as an expressive controller while playing, or spend some time programming sophisticated “dynamic vectors” that play automatically.

Manual Vector Control

Before we get into the details of vector synthesis, try using the VECTOR CONTROL with some of the preset voices to get a feel for what this versatile feature can do.

1 Select the Vector Play LEVEL Mode

While in the Voice Play mode (see the preceding section if you don’t know how to select the Voice Play mode), turn the Vector Play mode ON by pressing the VECTOR PLAY [ON/OFF] key so that either the [LEVEL] or [DETUNE] indicator lights, then press the [LEVEL/DETUNE] key to select the [LEVEL] indicator (the [LEVEL] and [DETUNE] indicators are selected alternately when the key is pressed).



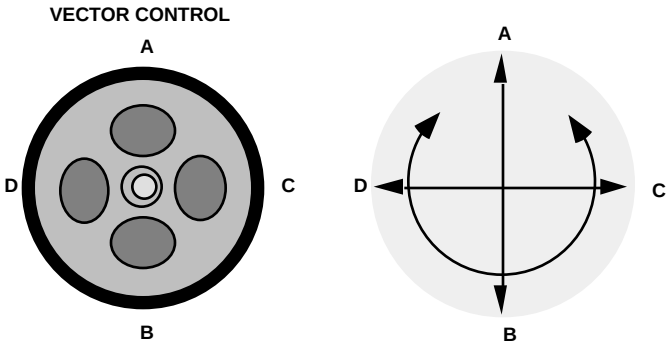
2 Select the SP∗Bell Voice

The SP∗Bell voice (INTERNAL bank 1, number 4) is a good choice to experiment with the VECTOR CONTROL.

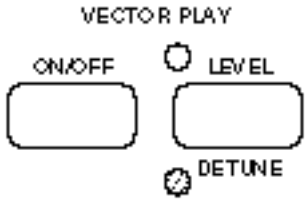


3 Move the Vector Control While Playing

Try moving the VECTOR CONTROL vertically, sideways, and in circles while you play on the keyboard, and listen carefully to how the sound changes.



4 Try DETUNE Vector Control …
Press the VECTOR PLAY [LEVEL/DETUNE] key so that the [DETUNE] indicator lights, move the VECTOR CONTROL while playing, and listen for the difference in sound.



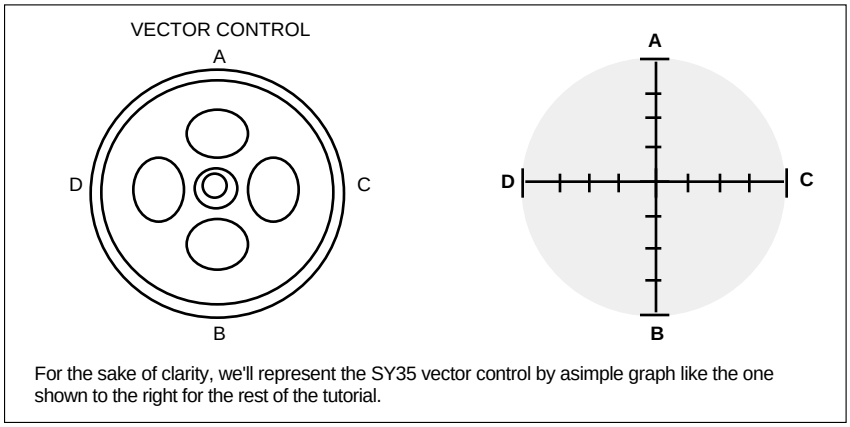
5 Also Try the Vector Control With These Voices …
The following voices also effectively demonstrate the power of the VECTOR CONTROL. Select them and apply LEVEL and DETUNE vector control as you play:

- P68 WN∗Orch
- I74 ME∗Grand
- I78 ME∗Memry

How the VECTOR CONTROL Works

SY35 voices can have either a "2-element" or "4-element" configuration. 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.

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.

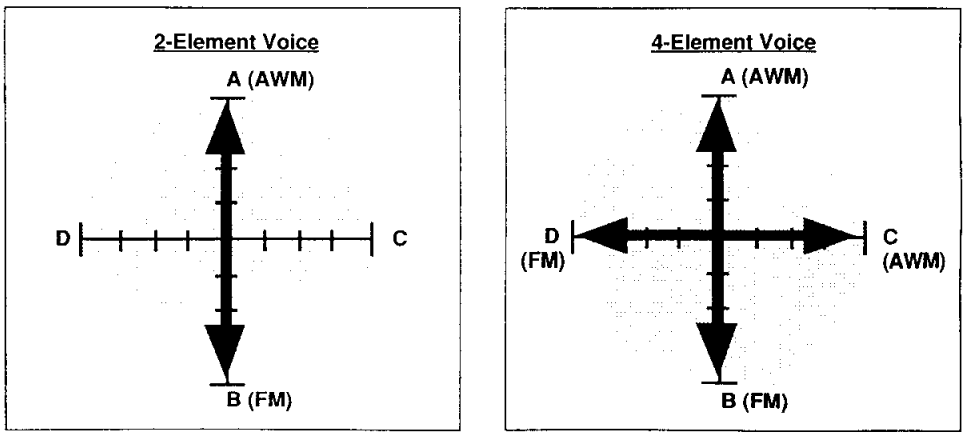


For the sake of clarity, we'll represent the SY35 vector control by asimple graph like the one shown to the right for the rest of the tutorial.



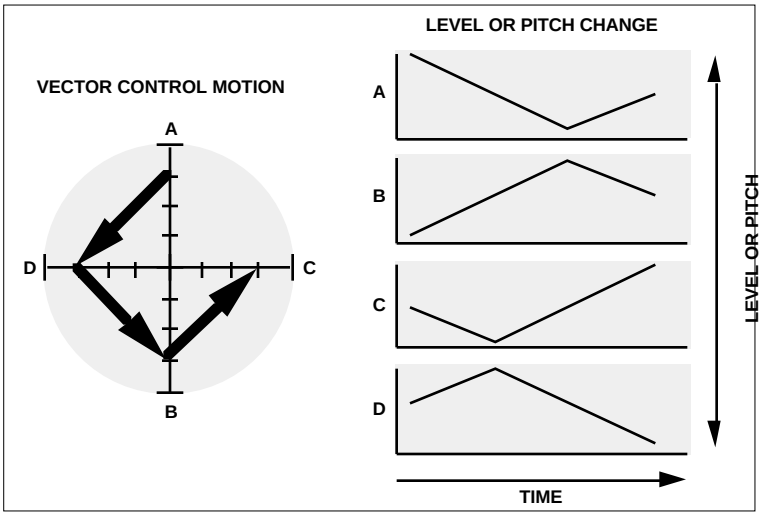
Elements A and C are always *"AWM" elements, while B and D are* always *"FM" elements. AWM stands for "Advanced Wave Memory," Yamaha's sophisticated sampling technology that allows high-fidelity reproduction of digitally recorded "live" sound. FM is Yamaha's proven Frequency Modulation synthesis technology which is capable of creating extraordinarily warm, vibrant simulations of actual instruments, as well as an infinite variety of original sounds. 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 (Feature Reference manual, page 17).*

The VECTOR CONTROL can be used to control the relative amount of either level or detune between the elements of the voice — 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.



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.

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.



Advanced Control: Dynamic Vectors

In addition to the manual vector control capability described so far, the SY35 features advanced automatic vector recording and playback capability. Automatic vectors are called “dynamic vectors” in the SY35, 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, below. While 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, dynamic vectors operate only when the VECTOR PLAY mode is OFF — i.e. when both the VECTOR PLAY [LEVEL] and [DETUNE] indicators are out.

Try Out the SE∗Elect Dynamic Vector

Before we dive in and record an original dynamic vector, spend a few minutes familiarizing yourself with the SE∗Elect voice and its preset dynamic vector.

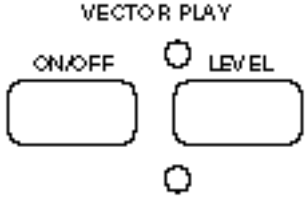
1 Select the SE∗Elect Voice

The SE∗Elect voice (I66) features a distinct dynamic vector that will serve as an ideal foundation for a few initial experiments.

```
VOICE  PLAY
I66  SE*Elect
```

2 Turn Vector Play OFF and Play the Voice

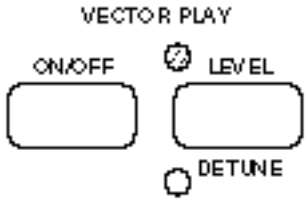
Make sure the manual VECTOR PLAY mode is turned OFF, using the VECTOR PLAY [ON/OFF] key to turn it off if necessary (neither the [LEVEL] or [DETUNE] indicators should be lit).



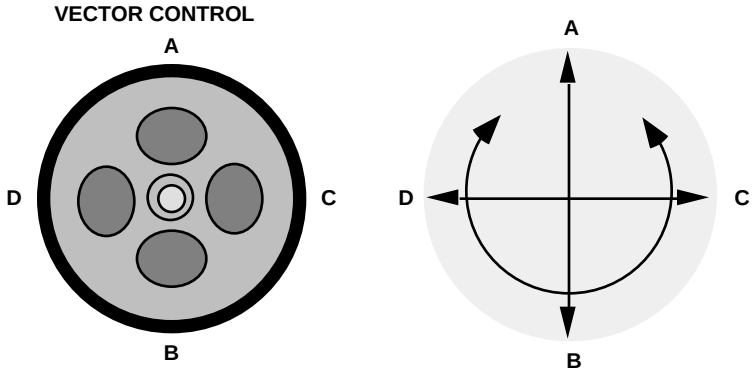
Play a nice long note or chord. Notice how the various elements are gradually brought in and blended automatically — this is the result of a dynamic vector.

3 Turn Vector Play ON

Now press the VECTOR PLAY [ON/OFF] key to turn the VECTOR PLAY mode ON, and select [LEVEL] control.



Since Vector Play is ON, the dynamic vector will not play. 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.

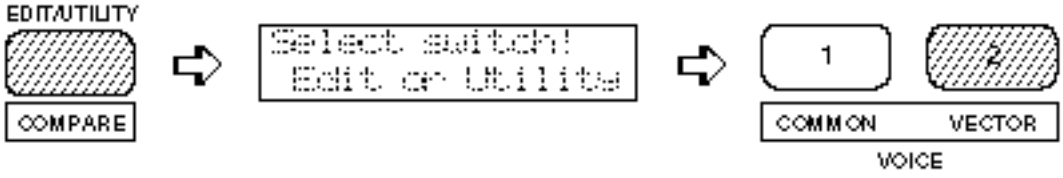


Recording An Original Dynamic Vector

Now we'll go ahead and record an original dynamic level vector for the SP∗ Bell voice.

1 Select the VOICE VECTOR Edit Mode

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.



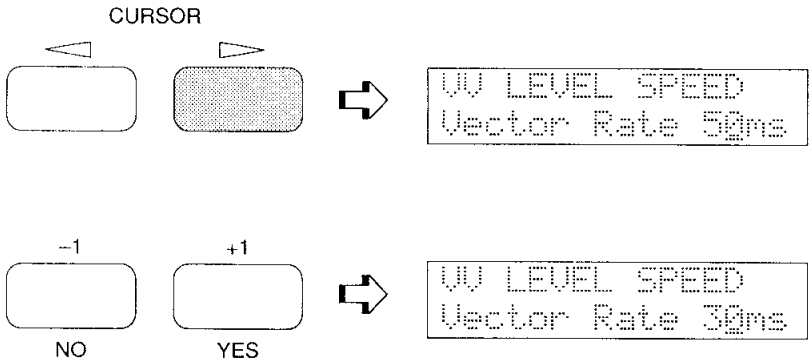
2 Select the LEVEL SPEED Function

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 (Feature Reference manual, page 11).

```
VV>LEVEL  SPEED
Vector  Rate  30ms
```

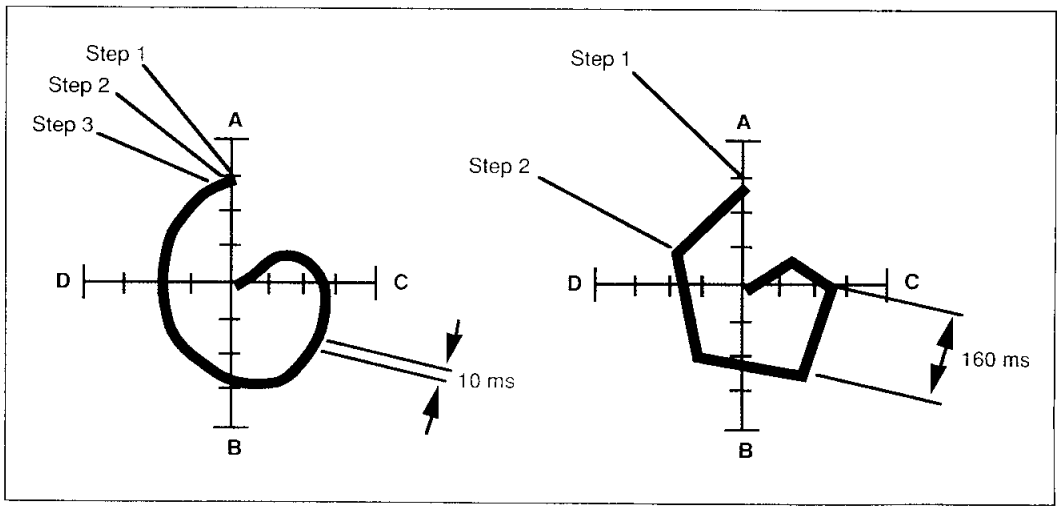
3 **Set the Vector Rate**

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 (in fact, it is the default rate so you might not have to change the setting).



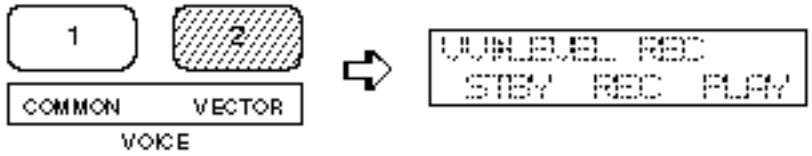


Vectors are recorded by "sampling" the position of the VECTOR CONTROL at evenly-spaced steps. The Vector Rate function allows you to set the time between each sample step. Quite logically, short vector rates are best for quick control movements while longer vector rates are better for slow control movements. 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.

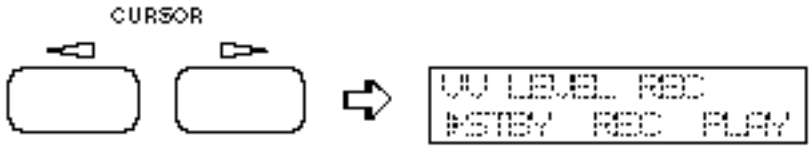


4 Select the LEVEL REC Function

Press the [VOICE VECTOR] key once to move ahead to the LEVEL REC display.



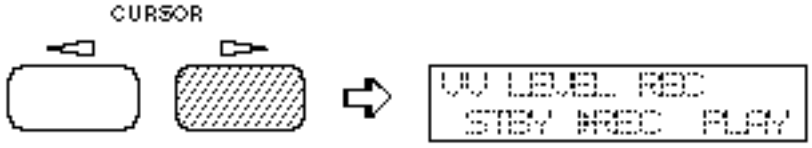
Use the [4] and [6] cursor keys to move the cursor to the STBY (standby) parameter. (The VECTOR PLAY LEVEL LED will light.)



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.

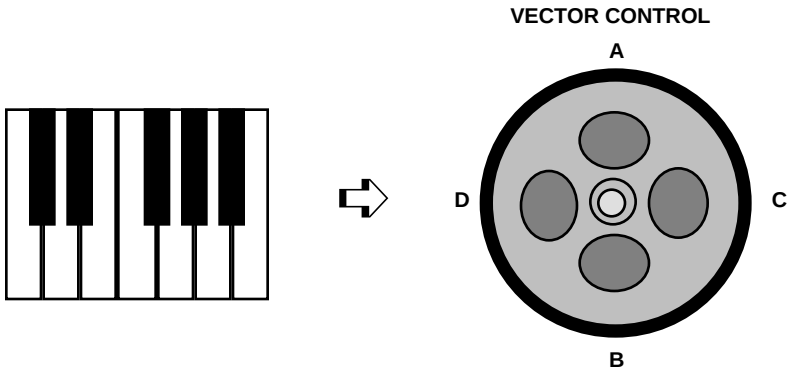
5 Select REC

Move the cursor to the REC parameter (press the CURSOR [6] key).

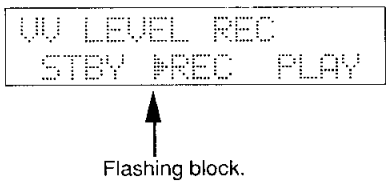


6 Record the Dynamic Vector

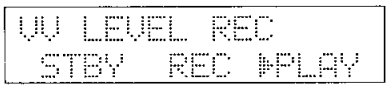
Vector recording will begin the instant you play a note on the keyboard. Play a note (or chord), and begin moving the VECTOR CONTROL.



A rectangular block will flash at the cursor position while recording.



Recording will end automatically when the note or chord you are playing is released, or 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.



7 Try Out Your Original Dynamic Vector

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 (by pressing the CURSOR [◁] key) and record again.



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 (see the Feature Reference manual, page 13).

Store Your Voice & Vector In INTERNAL Memory

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 SY35's INTERNAL memory locations.

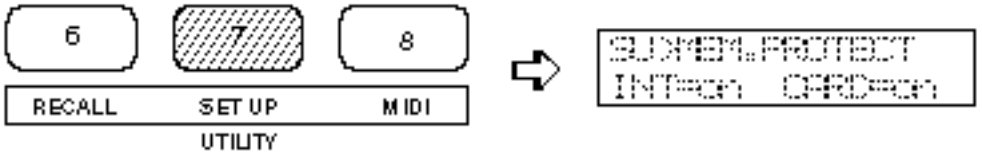
There is, however, a slight catch. If you simply go ahead and attempt to store the voice at this point the SY35 may inform you that the internal memory is protected, preventing the store operation. Both INTERNAL and CARD memories feature protect functions that can be turned on to prevent accidental erasure of important voices.



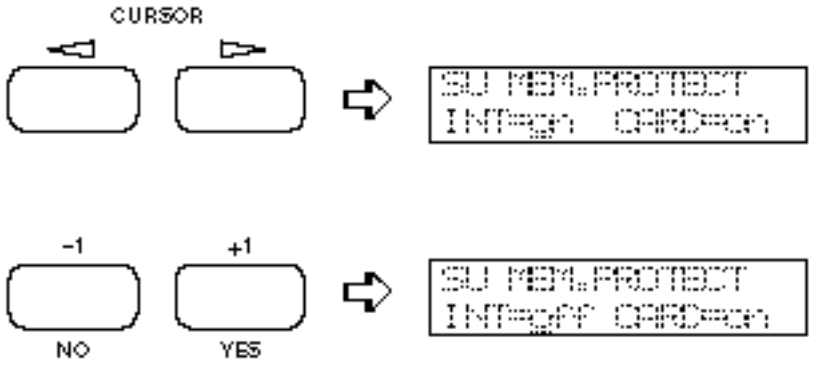
When you store a new voice to an INTERNAL memory location, the voice that was initially in that location will be overwritten and therefore lost. The initial factory-set voices can be restored at any time by using the Factory Voice Restore function described on page 45 of the Feature Reference manual.

1 Turn Memory Protect OFF

To turn the memory protect function off, press the [UTILITY SETUP] key a few times until the MEM. PROTECT function appears.



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



2 Press [VOICE]

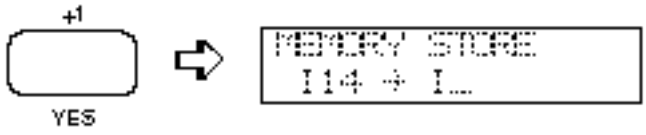
Now press the [VOICE] key to return to the VOICE PLAY mode. Before actually returning you to the VOICE PLAY mode, however, the SY35 will ask you whether you want to store the voice you have just edited into one of the INTERNAL memory locations.



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.

3 Press [+1/YES] If You Want to Store the Voice

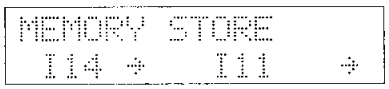
If you press [+1/YES], a display similar to the following will appear:



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.

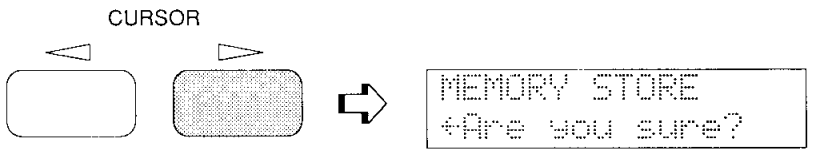
4 **Select the Destination Memory Location**

Select the memory location to which you want to store the new voice using the standard voice selection procedure.



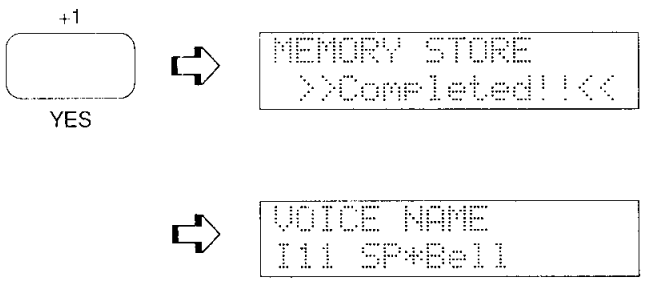
5 **Press CURSOR [▷]**

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



6 **Press [+1/YES] to Confirm and Store**

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 SY35 will return to the VOICE PLAY mode.





The SY35 also has a [STORE] key that can be used to store voices and multi setups (described on page 38) to INTERNAL or CARD memory locations. Operation of the [STORE] key is described on page 10.

For More Detailed Vector Control ...

You now have a edited version of SP*Bell featuring your own original dynamic level vector. You could use the VOICE COMMON edit mode NAME function (Feature Reference manual, page 5) to give the voice a new name — VectBell 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 SY35 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 11 through 14 of the Feature Reference manual for details.

4. Instant Voice Programming

Although the SY35 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 Feature Reference manual, beginning on pages 15 and 25, respectively. Everything we need to have loads of fun — and to create some very serious voices — is available in the VOICE COMMON edit mode.

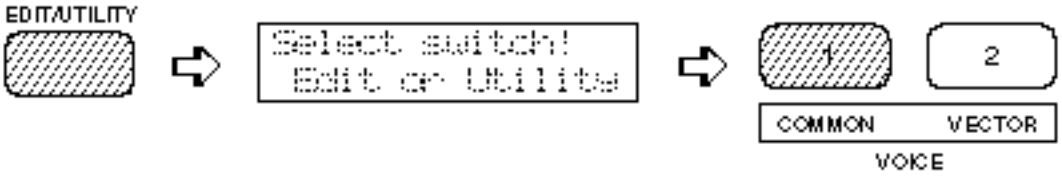
1 Select a Preset Voice To Start With

Select any preset voice while in the VOICE PLAY mode to serve as a "platform" for your new voice. ST∗Arco1 (P41) is a good choice to start with.

```
VOICE  PLAY
P41  ST*Arco1
```

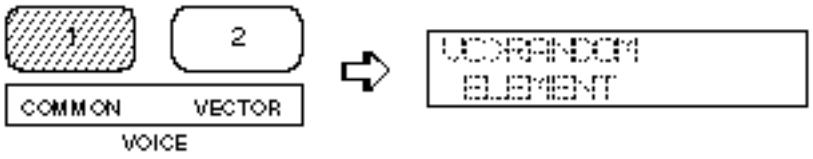
2 Select the VOICE COMMON Edit Mode

Select the VOICE COMMON edit mode by pressing the [EDIT/UTILITY] key and then the [VOICE COMMON] key.



3 Select the RANDOM Function

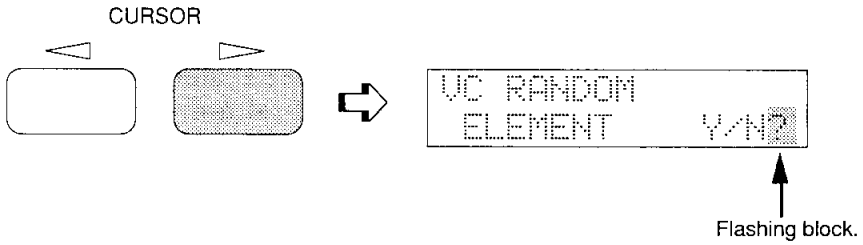
Press the [VOICE COMMON] key a few times until "RANDOM" appears on the top display line. As long as the cursor is on the top display line next to the function name, it is also possible to scroll backward and forward through the function list by using the [–1/NO] and [+1/YES] keys.



If the "ELEMENT" parameter does not appear in the RANDOM display, as pictured above, use the CURSOR [4] and/or [6] 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 [+1/YES] keys.

4 **Press CURSOR [▷]**

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



5 **Press [+1/YES] To Create a New Voice**

Now, each time you press the [+1/YES] key the SY35 will randomly assign different waveforms to the four elements in what used to be the CH*Pure 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 SY35 editing modes.



Please note that the RANDOM ELEMENT function only *replaces the element waveforms 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 (Feature Reference manual, page 6), the shape of the amplitude envelopes used for each element (Feature Reference manual, page 27), the type of effect (reverb, delay, etc.) applied to the voice (Feature Reference manual, page 5), and more.*



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.

6 **Store Your New Voice**

If you come up with something you want to keep, use the same voice store procedure as described on page 28 when returning to the VOICE PLAY mode.

For Serious Voice Editing …

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 Feature Reference manual. In it, each editing function is described individually, often with a few helpful hints that will help you use it most effectively.

5. The Multi Mode

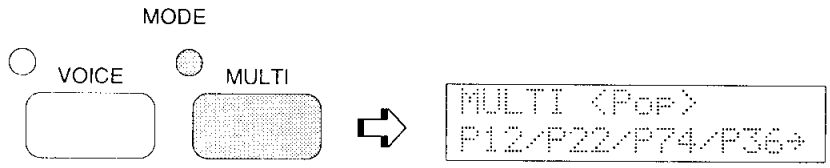
The SY35 MULTI PLAY mode allows up to 8 different voices to be played simultaneously, either via the SY35 keyboard or from an external MIDI sequencer.

Try Out the Preset Multi Setups

The SY35 has 16 preset Multi setups that you can simply select and use. Here's how ...

1 Select the Multi Play Mode

If the MODE [MULTI] key indicator is lit, then the Multi Play mode is already selected and you can go directly to the next step. If it isn't, press the [MULTI] key to select it.

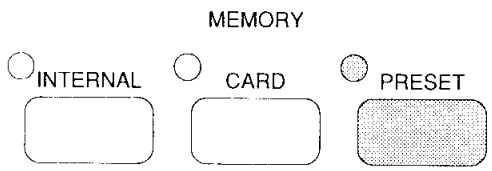




The name of the currently selected Multi setup is shown on the upper line of the display, while the numbers of the individual voices assigned to the Multi setup are shown on the lower display line, four at a time. You can use the CURSOR [◁] and [▷] keys to display voices 1 through 4 or 5 through 8.

2 Select the PRESET Multi Memory

The MEMORY [INTERNAL], [CARD], and [PRESET] keys are used to select the desired MULTI memory. Press [PRESET] to select the PRESET memory.

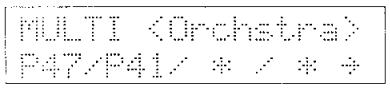




The INTERNAL memory initially contains another 16 Multi setups that you can use or edit as required. The initial factory INTERNAL Multi setups can be restored at any time by using the Factory Multi Restore function described on page 45 of the Feature Reference manual.

3 **Select the Orchstra Multi**

If it's not already selected, select the Orchstra Multi (P11) by pressing the BANK key [1] and [NUMBER/MULTI PART SELECT] key [1].





Since there are 16 Multi setups in each memory area, they are organized into two banks of 8 Multi setups each. That is: 1.1 through 1.8, and 2.1 through 2.8. In the Multi mode BANK keys 3 through 8 have no effect. As with voice selection, to select a different number within the same bank it is only necessary to press the appropriate bottom-row key. In the same way, to select the same number in a different bank all you have to do is press the appropriate upper-row key. The [–1/NO] and [+1/YES] keys can also be used to select a MULTI PLAY setup in the MULTI PLAY mode. Holding the [–1/NO] or [+1/YES] key causes continuous scrolling in the specified direction.

4 **Play**

Play the Orchstra Multi setup on the keyboard. You'll hear a thick orchestra sound that is created by playing the SY35's OrchestraBrass and Strings voices simultaneously. This is a "layered" multi since the two voices are played simultaneously over the entire range of the keyboard.

5 **Select and Play the Wb/Piano Multi**

Now select the Wb/Piano Multi (P22 ... press BANK [2] and NUMBER [2]). You'll find that you can now play a wood bass voice on the left-hand section of the keyboard and a piano voice on the right-hand section of the keyboard. This is a "split" Multi in which the wood bass and piano voices are both played from the keyboard, but are limited to different areas of the keyboard by the NOTE LIMIT function available in the MULTI EDIT mode.



Layered and split Multi setups that allow several voices to be played simultaneously from the SY35 keyboard are created by setting the MIDI receive channels of the voices to the same MIDI channel that the SY35 is set to transmit on.

6 **Select and Try the Other Multi Setups**

Here's a list of the 16 PRESET Multi setups and the factory INTERNAL Multi setups. Setups marked either "Layer" or "Split" can all be played from the SY35 keyboard. Select them and listen to how they sound.

"SY35 Multi List"

PRESET MULTI LIST

No.	MULTI Name	Type	Voice Numbers								Comments
11	Orchstra	Layer	P47	P41							Big orchestra.
12	BigBand	Layer	P36	P37							Big-band brass section.
13	SuperClv	Layer	P25	P26							Layered clavi sound.
14	PianoStr	Layer	P15	P42							Layered piano and strings.
15	VoiceBs	Layer	P52	P87							Layered bass and human voice.
16	FullBrs	Layer	P35	P38							Powerful brass.
17	PanLead	Layer	P63	P63	P65	P65					Pan-flute type lead voice.
18	Str&Cho	Layer	P42	P85							Layered strings and choir.
21	DistLead	Layer	P76	P76	P76	P76	P76	P76	P76	P76	Distortion lead voice.
22	Wb/Piano	Split	P51	P12							Wood bass and piano split.
23	B/BrsSec	Split	P54	P37							Electric bass and brass split.
24	Celo/Flt	Split	P43	P62							Cello and flute split.
25	<Pop>	MIDI Multi	P12	P22	P74	P36	P61	P42	P54	I88	Pop music ensemble.
26	<Rock>	MIDI Multi	P11	I43	P74	P37	P61	P41	P55	I88	Rock group.
27	<Jazz>	MIDI Multi	P15	I46	P71	P32	P61	P42	P51	I88	Jazz ensemble.
28	<Demo>	MIDI Multi	P72	P42	P61	P58	P12	I35	I64	I88	SY35 demo multi.

INTERNAL MULTI LIST

No.	MULTI Name	Type	Voice Numbers								Comments
11	SyncLead	Layer	I33	I33	I33	I33					Fat "sync" lead.
12	SuperSaw	Layer	I31	I31	I31	I31	I31	I31	I31	I31	Extra-fat sawtooth lead.
13	BellPad	Layer	I11	I14							Filter sweep synth pad.
14	SunBeam	Layer	I22	I24							"Sunny" sound for backing.
15	WideDcy	Layer	I25	I27							Bright backing layer.
16	AnaPad1	Layer	I13	I51							Analog synth pad 1.
17	AnaPad2	Layer	I15	I23							Analog synth pad 2.
18	AnaPad3	Layer	I13	I55							Analog synth pad 3.
21	FatBrass	Layer	I51	I53							Fat analog synth brass.
22	HyuhPad	Layer	I71	I76							Synth pad with wind effect.
23	Reggae	Layer	I46	I82							Ideal for Reggae music.
24	Mikado	Layer	I67	I18							Musical effect.
25	Prologue	Layer	I62	I18							Musical effect.
26	Epilogue	Layer	I64	I72							Musical effect.
27	SolidSet	Split	I37	I31							Bass and synth lead split.
28	RytmSec.	Split	I87	I36							Auto drum and bass pattern.



PRESET Multi setups 25 through 28 (labelled "MIDI" in the above list) are designed for use with an external MIDI sequencer. Each has 8 voices assigned to different MIDI channels as shown in the chart below.

PRESET MULTI MIDI CHANNEL ASSIGNMENTS

No.	MULTI Name	Ch1	Ch2	Ch3	Ch4	Ch5	Ch6	Ch7	Ch8	Ch16
25	<Pop>	P12	P22	P74	P36	P61	P42	P54	—	I88
26	<Rock>	P11	I43	P74	P37	P61	P41	P55	—	I88
27	<Jazz>	P15	I46	P71	P32	P61	P42	P51	—	I88
28	<Demo>	P72	P42	P61	P58	P12	I35	I64	I88	—

When You Want To Create an Original Multi ...

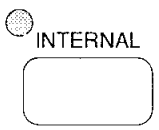
The SY35 MULTI EDIT mode allows you to create your own multi setups, which can then be stored in the INTERNAL or CARD memory (described below). In the MULTI EDIT mode you can assign any of the SY35 voices to the 8 multi parts, assign any of the 16 available MIDI channels to each part, and assign an effect (reverb, delay, etc.) for that multi setup. The following characteristics can also be individually programmed for each voice:

- Volume: allows the voices to be ideally balanced.
- Detune: slight detuning to thicken the sound.
- Note limit: allows split keyboard setups.
- Note shift: transposes up or down in semitone steps.
- Name: assigns an original name to each multi setup.

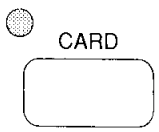
Full details on each of these functions, as well as general editing instructions, are provided in the MULTI section of the Feature Reference manual (page 33). Now that you've had some experience with the SY35, you should be able to access and use the MULTI EDIT mode functions with no problem.

The INTERNAL and CARD Memories

In addition to the PRESET Multi memory, the SY35 provides 16 INTERNAL memory locations into which you can store original Multi setups created in the MULTI EDIT mode. Multi setups can also be stored on external memory cards in the same way as ordinary voices.



The INTERNAL MULTI memory is a RAM (Random Access Memory) area into which you can store up to 16 Multi setups that you create in the MULTI EDIT mode or load from an external memory card. Initially, the INTERNAL MULTI memory contains 16 factory-programmed Multi setups that you can use "as-is" or edit as required. The factory INTERNAL Multi setups can later be restored by using the Factory Multi Restore function described on page 45 of the Feature Reference manual. The INTERNAL multi memory is represented on the display by the letter "I".



The CARD memory bank is a Yamaha MCD64 or MCD32 Memory Card plugged into the SY35 card slot. An MCD32 Memory Card allows storage of up to 16 Multi setups in addition to 64 voices. An MCD64 Memory Card holds two banks of 16 Multi setups each — in addition to 64 voices in each bank. The CARD multi memory is represented on the display by the letter "C".

Multi Polyphony & Dynamic Voice Allocation

Since the SY35 can produce a maximum of 16 notes at the same time (16-note polyphony ... see the "DETAILS" column, below), the number of simultaneous notes that each voice in a Multi setup can produce depends on the number of voices being played at the time. If all 16 voices are played at once, each can produce a maximum of one note. On the other hand, if only one voice is being played the SY35's "Dynamic Voice Allocation" feature allows 16 notes to be played simultaneously by that one voice even if 16 voices are assigned.

The only thing you have to be concerned about in programming sequences to drive the SY35, is that the maximum polyphony of 16 notes is never exceeded.



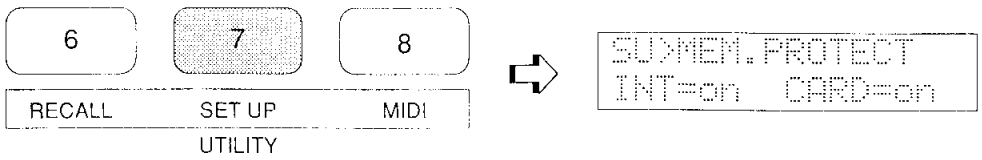
In actual fact, 16-note polyphony is only available with 2-element voices. Voices that use the maximum of 4 elements can produce a maximum of 8 notes simultaneously. This means that the total number of simultaneous notes available in the Multi mode will depend on the voices used — more 4-element voices means that fewer simultaneous notes will be available.

Using the [STORE] Key to Store Voices and Multi Setups in INTERNAL or CARD Memory

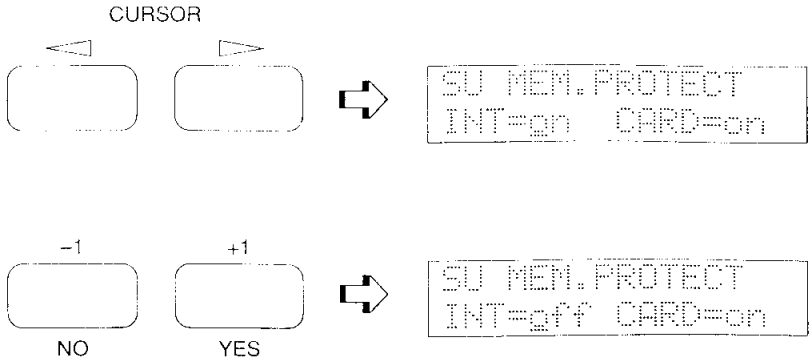
As we've already seen, the SY35 automatically gives you the option to store a voice you've just edited when you switch back to the VOICE play mode. You can also activate the store function to store the currently selected voice to a different INTERNAL or CARD memory location by pressing the [STORE] key while in the VOICE play mode. Likewise, the selected Multi setup (see the following section) 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.

1 Turn Memory Protect OFF

To turn the memory protect function off, press the [UTILITY SETUP] key a few times until the MEM. PROTECT function appears.



Move the cursor to the INT (internal memory) or CARD (card memory) parameter as required, and press the [–1/NO] or [+1/YES] key to turn memory protection off.



2 Select the Source Voice or Multi

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

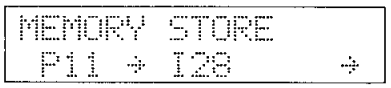
3 **Press [STORE]**

Press the [STORE] key to engage the MEMORY STORE function.



4 **Select the Destination Voice or Multi**

If necessary, select the destination memory by pressing the [INTERNAL] or [CARD] key, then enter the bank and number of the destination memory location (I28 for this example).

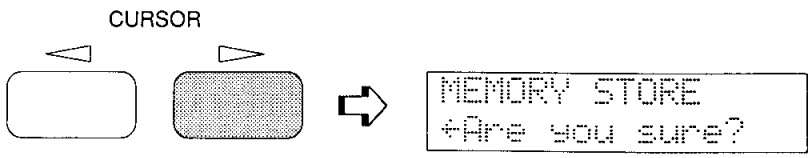




To store a voice or multi to a CARD memory location, a properly formatted MCD32 or MCD64 memory card must be inserted in the rear-panel CARD slot. See page 42 of the Feature Reference manual for card formatting instructions. The card's WRITE PROTECT switch must also be turned OFF — see the instructions accompanying your memory card.

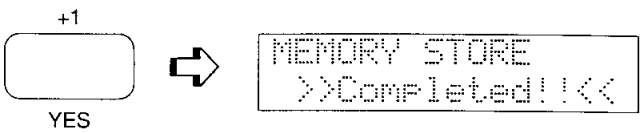
5 **Press CURSOR [▷]**

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



6 **Press [+1/YES] to Confirm and Store**

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

In the preceding tutorials we've covered quite a lot of ground, and by now you should be quite familiar with the SY35. You know how to select and play the voices, how to use manual vector control, how to record dynamic vectors and store the results in memory, how to quickly create new voices, and how to use the multi mode. When you get the urge to go further, please take the time to read through the Feature Reference manual … or at least the section or sections that pertain directly to what you want to do. The more you program and play, the easier it will be!

Glossary

If you're relatively new to electronic music, you might be confused by some of the jargon you run across in the literature you read (such as this manual). The following is a very brief glossary of some terms that are unique to this field.

Aftertouch

Aftertouch response refers to the capability to vary the sound of a note after the note has been struck on the keyboard. This is normally accomplished by varying finger pressure on the key. Depending on the synthesizer, aftertouch can be used to bend the pitch of a note, apply modulation, or apply just about any other effect. In the SY35 aftertouch can be assigned to pitch bend, level control, pitch modulation, or amplitude modulation.

AWM Synthesis

AWM stands for "Advanced Wave Memory," Yamaha's sophisticated sampling technology that allows high-fidelity reproduction of digitally recorded "live" sound.

Cent

Just as a cent coin is one-hundredth of a dollar, a cent in musical lingo is one-hundredth of a semitone. The cent is a useful unit when dealing with very small changes in pitch — such as in synthesizer tuning or detuning functions.

Element

Normally the word "element" refers to a part of something larger. The same applies in synthesizers. In Yamaha synthesizers, an element is an individually controllable part of a voice. In the SY35, each voice can have two or four elements. Each element is actually an independent waveform, so you could have a 4-element voice that is made up of a piano element, a brass element, a strings element, and a wind element.

Envelope

You'll hear the terms "envelope" and "envelope generator" quite a lot in synthesizer talk. Like the envelope that encloses a letter, a synthesizer envelope "encloses" the sound, mainly in one of two ways. An *amplitude envelope* determines the overall "shape" of the sound — i.e. the speed and shape of the attack, how fast the sound decays, etc. A *pitch envelope* determines how the pitch of a note changes over time. Next to the basic waveform, the amplitude and pitch envelopes are the most important factors in determining how a voice sounds.

FM Synthesis

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. The reason for the "FM" name is that this tone generator system employs a number of independent oscillator blocks known as "operators," that are arranged in a variety of configurations known as "algorithms." Depending on their positions in the algorithm, each operator functions either as a "modulator," or a "carrier" that is modulated by a modulator. Since modulators modulate the frequency of carriers, the system is a form of f*requency modulation* — therefore, "FM Synthesis."

LFO	LFO stands for “Low Frequency Oscillator.” This is the oscillator, usually with a frequency variable from about 0.1 to 20 hertz, that is responsible for creating the periodic variation in tremolo, vibrato, chorus, phasing, and other modulation type effects.
MIDI	“MIDI” is an acronym standing for “Musical Instrument Digital Interface.” MIDI allows musical instruments, sequencers, signal processing devices, computers, and other devices to communicate and control each other via a simple cable connection. The introduction of MIDI has revolutionized the music field, making control of the music production process easier and more efficient than ever before.
Modulation	In synthesizers, the term “modulation” usually means to vary the amplitude or frequency of a sound in accordance with some other signal. This “other signal” is most commonly the output from the synthesizer’s LFO (described above), although in Yamaha FM synthesis (also see above) it can also be the signal from a modulator operator in an FM algorithm.
Multi	Although normally a prefix, as in “multi-talented,” the term “multi” on its own has come to refer to multi-timbre setups in the synthesizer world. A multi is usually a group of 8 or 16 voices that can be played simultaneously either from the instrument’s keyboard, sometimes in split-keyboard configurations, or via MIDI. For MIDI control each voice receives on a different MIDI channel number, allowing multi to be handled as multiple tone generators by the controlling sequencer or computer. Multis also allow a number of parameters to be programmed individually for each voice: volume, pitch, effects, etc.
Pan	The word “pan” is derived from the “pan pot” controls found on mixing consoles, which is in turn derived from “panoramic potentiometer.” A pan control or parameter determines the position of a specific sound — e.g. an element of a voice or a drum instrument — within the output stereo sound field. Panning to the left means that more of the corresponding sound is delivered via the left channel than the right channel, and vice versa. The listener then hears the sound at the appropriate position between the stereo speakers or headphones.
Preset	A “preset” can be any unit of data — a voice or multi (see above), for example — that is pre-programmed by the manufacturer and provided with a synthesizer. Presets make life easier for beginning synthesizer users as well as performance-oriented players who simply want to select a sound and play without having to do any programming of their own. The quality of the presets included with an instrument is therefore critical to the value of the instrument.
Vector	Mathematically speaking, a “vector” is a physical quantity with both magnitude and direction. This applies in a similar way to vector synthesis in that the vector control controls the magnitude and direction of a quantity that can be pitch or level.

Velocity

Normally, velocity is simply defined as speed. In a synthesizer, however, it generally refers specifically to the speed with which the keys are played. When we think of playing a keyboard we normally think of playing the keys softer or harder to produce softer and louder notes with the attendant timbre variations. In reality, however, the instrument is responding to how fast the keys are played — therefore the term "velocity response." A synthesizer that has velocity response lets the player produce expressive dynamics and timbre variations according to the way he or she plays the keys.

Voice

Although this term is used in slightly different ways by different manufacturers, at Yamaha a "voice" is any basic sound that can be selected and played on a synthesizer. This is in contrast to a "performance" which is a combination of two or more voices, and a "multi" (see above) which is a group of several voices that can be controlled independently via the MIDI interface.

Index

–1/NO and +1/YES keys 9, 17

A

AWM 23, 41

B

Bank keys 11, 17

C

Card key 10
Card multi memory 37
Card slot 13
Card voice memory 20
Connections 14
Cursor keys 9

D

DC 10V-12V in jack 12
Demo 15
Demo key 11
Detune vectors 22
Dynamic vectors 24
Dynamic voice allocation 37

E

Edit/utility/compare key 9
Element envelope edit mode 31
Element parameter 31
Element tone edit mode 31
Elements 22, 41

F

FM 23, 41
Foot volume jack 12

I

Icons 6
Internal key 10
Internal multi memory 34, 37
Internal voice memory 17, 20

K

Keyboard 8

L

LED display 10
Level rec function 27
Level speed function 25
Level vectors 21
Liquid crystal display 10

M

Manual vector control 21
Memory backup 3
Memory protect 29, 38
MIDI cables 3
MIDI conectors 13
Modulation wheel 8, 19
Multi key 9
Multi list 36
Multi play mode 34
Multi polyphony 37

N

Number/multi part select keys 11, 17

O

Output jacks 12
Overlapping voice selection 20

P

Phones jack 12
Pitch bend wheel 8, 19
Power supply 3
Power switch 12
Power-on procedure 14
Preset key 10
Preset multi memory 34, 37
Preset voice memory 16, 19

R

Random function 31

S

Store 28
Store key 10, 38
Sustain jack 13

V

Vector control 8, 21
Vector play keys 8, 21, 22
Vector rate 26
Vectors 21, 42
Voice categories 18
Voice common edit mode 31
Voice key 9
Voice list 18
Voice play mode 16
Voice vector edit mode 25
Volume control 8

YAMAHA

YAMAHA CORPORATION
P.O.Box 1, Hamamatsu, Japan

VN38770 JCAIR2CMS3.3 ITP